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► **To cite this version:**

Julie Romagon, Françoise Jabot. The challenge of assessing social cohesion in health impact assessment. *Health Promotion International*, 2021, 36 (3), pp.753-764. 10.1093/heapro/daaa067 . hal-03122562

HAL Id: hal-03122562

<https://univ-rennes.hal.science/hal-03122562>

Submitted on 5 Feb 2021

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**The challenge of assessing social cohesion in Health impact
assessment**

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The challenge of assessing social cohesion in Health impact assessment

Abstract

Health impact assessment (HIA) is a method by which a policy, programme or project falling outside traditional health fields, may be judged as to its potential effects on the health of a population in order to mitigate negative impacts and strengthen the positive ones. Proposals are analysed from the perspective of all the determinants of health. In France, HIAs are mainly applied to urban development projects where social cohesion is a major issue. Although the HIA method is well structured as a step-by-step process, there are no guidelines for assessing social cohesion. This article opens with literature review to clarify the concept of social cohesion, and to understand how the built environment influences social cohesion and how social environment influence health. Drawing on this work, this paper presents an analytical framework to assess social cohesion, integrating both the spatial and physical dimensions of urban design and the perceptions of the neighbourhood characteristics. Following a brief overview of the key findings from applying this framework to HIA of an urban development project, the paper discusses its related strengths and weaknesses. The framework could be a useful tool for HIA as it embraces knowledge from both urban planning and social sciences. It also allows for an overall analysis of all the indicators without relying on a checklist. Nevertheless, it should be tested further to improve its validity.

BACKGROUND

Health impact assessment (HIA) is a method by which a policy, programme or project not mainly health related, may be judged as to its potential effects on the health of a population and the distribution of those effects within the population (World Health Organization, 1999). The purpose of HIA is to influence decision-making in favour of health by ensuring that health-related issues are considered and assessed in all policy-making in a democratic, equitable, sustainable and ethical manner. HIA is a structured process with the following steps: determining whether HIA is appropriate and feasible; setting out the scope and the parameters of HIA; analysing data and assessing health impacts; elaborating a set of recommendations to mitigate negative impacts and reinforce positive impacts; setting up a monitoring mechanism for recommendations; and evaluating the HIA process and its impact on health (Kemmer, 2012). Health is considered as a complex and dynamic process due to the interaction between the different factors

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4 that can influence it such as physical environment, living conditions, social environment,
5 perceptions, attitudes, lifestyle habits and behaviour (World Health Organization, 1986).
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7 In HIA, proposals are analysed from the perspective of all these determinants of health.
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9 One major step involves identifying how the various components of a given project relate
10 to health through health determinants by tracing the pathways that connect project
11 components, determinants and health. These theoretical assumptions are tested against
12 the scientific evidence and contextual data. HIA's method has largely been developed
13 over the last twenty years and it is generally applied to urban development projects
14 (Dannenberg, 2016). These combine various interventions on the built environment (BE)
15 such as housing developments, roads, public spaces, new facilities and infrastructure,
16 some of which are associated with regulatory measures.
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26 In France, interest in HIA is relatively recent and the approach has mainly been applied
27 to urban development projects, many of which have been implemented in deprived areas
28 with low-income households (Author, 2017). These areas give rise to specific policies and
29 funding schemes, with social issues and inequalities being a major concern for policy
30 makers. They turn to HIA capacity in the hope to gain insights on how projects may
31 improve social cohesion and health through living conditions. Social factors shaping
32 environments in which people live are crucial as they influence the resources available
33 for individuals to satisfy their fundamental needs and adapt to their environment. HIA
34 practitioners face two challenges when assessing social cohesion. First, although it may
35 be straightforward to establish links between some project components, some health
36 determinants and health outcomes (transport, air quality and respiratory diseases for
37 instance), the links to the social determinants of health are less obvious. Mechanisms on
38 how the BE influences the social environment and health are numerous and intertwined,
39 and not always clearly identified (Mazumdar et al., 2017). Second, many different
40 concepts underlap social cohesion and social capital, which means scientific evidence is
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4 difficult to use in an approach such as HIA. This is especially true as it doesn't always
5 offer conclusive evidence.
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8 Drawing on a literature review about the links between the built and social environments,
9
10 we sought to achieve an analytical framework for use in HIA and designed to assess the
11 impact of urban development projects on social cohesion as a determinant of health. The
12 framework was derived from HIA implemented on urban projects in France.
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21 METHODS

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24 Our research approach is based on concept analysis (Delves-Yates et al., 2018; Mpanje
25 et al., 2018) and includes the four stages set out below.
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29 **Stage 1.** We conducted a literature review in order to: clarify the meaning of social
30 cohesion, identify the surrogate terms (social capital, social support, social ties, etc.),
31 disentangle the concepts associated and set out an operational definition, map out the
32 current state of knowledge about how social environment influences health (operating
33 mechanisms) and how the BE influences social determinants, especially social cohesion.
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39 We performed a review of scientific and grey literature and started with literature reviews
40 whether systematic or not. We conducted our search on five databases (Google Scholar,
41 ScienceDirect, Springer Link, PubMed et la Banque de Données en Santé Publique)
42 using the following keywords: Built Environment, Urban Design, Public Space, Urban
43 Environment, Urban Planning, Green Areas, Green space, Park, Neighbourhood design
44 / Social environment, Social capital, Social network, Social ties, Social support, Social
45 participation, Social inclusion, Social mix, Community / Health. The literature reviews
46 were supplemented with specific studies and reports to analyse more thoroughly some
47 additional themes and concepts. Databases (Google Scholar, ScienceDirect and
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3 PubMed) were also searched for HIA reports or articles focusing on social cohesion in
4 urban projects as well as articles on the social impact assessment method. Research was
5 limited to papers in English and French.
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10 **Stage 2.** Drawing upon the literature, we identified the features of the BE which influence
11 social cohesion and the mechanisms behind this influence in order to establish the full
12 causal chain between the BE and health through social factors.
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17 **Stage 3.** We carried out a HIA of a wasteland redevelopment project located between
18 disadvantaged neighbourhoods and the city centre in Lille (France). This new district was
19 intended to be appealing for all inhabitants, to improve the continuity between the different
20 districts and the social link between the newcomers and the local residents. Equity
21 regarding access to services and social cohesion were major concerns. We used the
22 findings from the literature to identify urban design attributes that may have impact on
23 social cohesion. We broke down each relevant component of the BE into several
24 questions and variables for analysis and indicators to assess and then designed a first
25 draft of the framework that we applied for this HIA. We found that the analysis could not
26 be limited to the BE variables that questioned the relevance of only assessing urban
27 design attributes without looking further into the characteristics of the population and
28 people's perception. We decided to improve the framework by developing more precise
29 and diverse variables and indicators for the human dimension and by looking further into
30 variables of SCo itself.
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45 **Stage 4.** Faced with a second HIA of an urban development project in Strasbourg with
46 similar issues of urban continuity and social mix, we applied this new framework to assess
47 its usefulness in the evaluation of social cohesion.
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55 RESULTS

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Literature findings

What is social cohesion?

Over the past 20 years, research on social capital has increased. A number of articles have dealt with various concepts such as social relations, social network, social inclusion, social support, social capital, social cohesion. Different authors use different and overlapping definitions, particularly social capital (SC) and social cohesion (SCo) (Moore and Kawachi, 2017).

A first group of concepts concerns the individual and the connectedness between individuals. *Social relations* or interpersonal ties are connections with people, either weak or strong, such as family members, friends, acquaintances, coworkers. Several ties with different individuals are usually described as a *social network*. *Social exclusion* is presented as “a multidimensional process of progressive social rupture, detaching groups and individuals from social relations and institutions and preventing them from full participation in the normal, normatively prescribed activities of the society in which they live” (Silver, 2007). *Social inclusion* is mostly defined as the opposite of exclusion.

A second group of concepts underlines the idea the social environment provides individuals with the resources to manage their lives and improve their health. Literature about social capital is abundant and draws on the work of Bourdieu, Coleman and Putnam (Carpiano, 2006). *Social capital* refers to people's resources and potential for managing their lives. It comes about through networks and social relations and social processes such as trust, reciprocity and collective engagement (Carpiano, 2006). For some authors, it happens on an individual level whereas others emphasise the community level. SC is seen as the capacity to draw on resources from social networks (Portes, 1998) or to access other resources (Bourdieu, 1980). These resources are elements of the social structures (trust, reciprocity norms, mutual help) for individuals and facilitating collective

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4 actions (Carpiano, 2006; Goldberg et al., 2002). Thus, *social support* is mentioned as a
5
6 form of resource given by social networks and ties –people to whom an individual can
7
8 turn when in need (Beauregard and Dumont, 1996). Three types of SC have been defined
9
10 based on the function and nature of the ties created between individuals (Moore and
11
12 Kawachi, 2017). Bonding SC brings together people who share similar values, interests
13
14 and experiences. It is useful on a daily basis and strengthens their identities within
15
16 homogenous groups. In contrast, bridging SC refers to ties between heterogeneous
17
18 groups where members are of different generations, cultures, religions or status. This
19
20 generates trust, better understanding and mutual tolerance, allowing people to open up
21
22 and change perspective. Linking SC establishes connections between people and service
23
24 providers, institutions and sources of power beyond the neighbourhood.

25
26 *Social cohesion* (SCo) differs from SC in that it acts as a mediator and “serves as the
27
28 basis from which SC can be formed” due to trust, familiarity, values, and network ties
29
30 shared among people (Carpiano, 2006). It is the expression of ties and solidarity between
31
32 groups in a society and the absence of latent conflicts, including a sense of belonging to
33
34 a place or community (Kearns and Forrest, 2000). It has been defined as “the glue that
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36 holds societies together and without which there can be no economic growth or human
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38 wellbeing”(Grootaert and Van Bastelaer, 2001). It is used in the field of policy making,
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40 particularly for European policies as a way to improve well-being and political stability
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42 (Klein, 2013). In France, the term “social cohesion” is being widely used in politics,
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44 especially in local urban policy making. It refers to both an expected outcome and the
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46 principle behind urban policy. Policy makers approach SCo through social and cultural
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48 homogeneity, solidarity, trust, and sense of belonging. (Guibet-Lafaye and Kieffer, 2012).
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50 Social cohesion has been included in strategic policy documents in France – and more
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52 broadly in Europe – and is more meaningful for decision makers (than social capital) for
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54 whom it is the synonym for “vivre ensemble”, namely, the ability of a group to live together
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4 in a geographical area. Therefore, while social capital is a prevalent term used across
5 many disciplines to conceptualise the social environment, we used social cohesion as our
6 main concept. The latter concerns a more collective level, even if individual and
7 institutional levels have to be considered (Fonseca et al., 2019), and therefore lends itself
8 better to urban planning and policy making. In conclusion, social cohesion can be seen
9 as the product of some of the previous concepts defined here (social support, social
10 network) taken on a bigger scale (a city, a town, a neighbourhood), while the other
11 concepts are mostly looked at on a smaller scale (an individual's ties within a specific
12 neighbourhood). It is important to understand these different scales when assessing
13 social cohesion through the lens of the BE. With regard to HIAs, the question addresses
14 social cohesion as understood by decision makers, and in relation to urban policy in
15 France.

30 **Social environment and Health**

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33 Several studies have shown a link between an individual's social environment and health
34 (Moore and Kawachi, 2017). Associations have been found between SC and health
35 (Ehsan et al., 2019), and between levels of SC and mortality rates in different countries
36 across the world (Meijer et al., 2012; Murayama et al., 2012; Walsh et al., 2015).
37 Moreover, people with high levels of SC declare their health to be better than others.
38 Other associations were found between social participation and mortality (Jenkinson et
39 al., 2013; Nyqvist et al., 2014), between SC and lung cancer (Hamano et al., 2019), SC
40 and non communicable diseases (Hu et al., 2014) especially for cardiovascular diseases,
41 diabetes and cancer. A good level of SC and social support could help with the recovery
42 (Ewing and Kreutzer, 2006), while socially isolated people were more at risk of dying
43 after a pathology than people with a lot of ties (Chaix et al., 2008). Conversely, in several
44 studies, social isolation is linked to bad health, notably stress and depression (d'Hombres
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4 et al., 2010; McPherson et al., 2013). Some studies have also found links between SC,
5
6 SCo and psychological well-being (Ewing and Kreutzer, 2006; Hassen and Kaufman,
7
8 2016). A systematic review found that high levels of social capital could prevent the
9
10 development of common mental health problems (Ehsan and Silva, 2015). Participation
11
12 in community activities can contribute to reducing stress (Leslie and Cerin, 2008),
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14 behaviour and mental problems among children (McPherson et al., 2013).
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17 Some authors postulated that the links between social determinants and health are
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19 explained by three key mechanisms, which act at the individual and collective levels. First,
20
21 social support contributes to improving self-confidence and access to health-care
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23 services (Kawachi et al., 1999; Stansfeld, 1999; Walsh et al., 2015). By facilitating access
24
25 to information and health resources, social support could play a protective role against
26
27 life events that could cause harm to health (d'Hombres et al., 2010; Ehsan and Silva,
28
29 2015). Second, informal social control leads to the adoption of norms that are in favour of
30
31 healthy behaviour (physical activity) or limiting risky behaviour (alcohol and drug use)
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33 (Berkman et al., 2000; Kawachi et al., 1999; Yuma-Guerrero et al., 2017). The third
34
35 mechanism is collective efficiency, namely the willingness to intervene in the name of the
36
37 common good through social cohesion established between neighbours (Cohen et al.,
38
39 2008). Thus, SC can contribute to creating a healthy neighbourhood with collective
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41 involvement (Maass et al., 2016) or collective action by some neighbourhoods towards
42
43 local authorities (Yuma-Guerrero et al., 2017).
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46 A recent analysis of systematic reviews shows that the relationship between SC and
47
48 health is generally positive with a good level of evidence. It also highlights limitations and
49
50 grey areas to the extent that reviews often provide only certain pieces of the puzzle, do
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52 not always conceptualize SC in the same way, or use different measurement methods
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54 and indicators (Ehsan et al, 2019). Authors also note that few studies are able to untangle
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4 the web between SC and health and that the results can be contradictory, as they vary
5 according to context or population type.
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8 Public health interventions targeting SC include a variety of activities operating at different
9 levels and assigning different roles to SC, such as target, mediator or segmenting variable
10 for identifying potential beneficiaries (Moore and Kawachi, 2017). In line with this
11 classification, SC is a mediating factor between interventions on the BE and health
12 outcomes but also an insight for anticipate negative impacts for specific groups
13 (Villalonga-Olives et al., 2018).
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22 **Social cohesion through the lens of the built environment**

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25 The urban BE is defined as “the human-made space in which people live, work and
26 recreate on a day-to-day basis. It includes the buildings and spaces we create or modify”
27 within the urban settings (Roof and Oleru, 2008). The main components of the BE are
28 public spaces such as those used for traffic and travel, roads, sidewalks, green spaces,
29 parks, squares as well as private spaces such as businesses, facilities, houses and types
30 of housing (Renalds et al., 2010).
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38 The scientific literature pinpoints the effect of the BE on the social environment which in
39 turn influences people’s relationships towards one another, their ties, and network, which
40 can lead to effects on health and healthy behaviours (Mazumdar et al., 2017). The BE
41 influences social cohesion in numerous and intertwined ways. These refer to structural
42 changes in space (urban planning), related policies (housing, social, educational,
43 economic) and how citizens may take ownership of places through (their) “psychosocial
44 orientation and attachment factors” (Baldwin, 2015).
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55 **Urban design**

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4 Urban planning, and more specifically public spaces, can affect social cohesion to the
5 extent that it creates places where people can mingle and form groups. Such places can
6 be conducive to common activities, and thus increase the potential for individuals and
7 groups to meet (Baum et al., 2009). Therefore, the characteristics of the BE (design,
8 density, connectivity of public spaces, functional diversity, urban furniture) may or may
9 not encourage contact between individuals based on planned or unplanned interactions
10 (Renalds et al., 2010). These interactions can be the beginnings of stronger and more
11 supportive forms of social relationships and the structuring of social networks.
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21 Several places have been identified in the literature as places for informal encounters:
22 public spaces, particularly green spaces (Boessen et al., 2017; Mazumdar et al., 2017),
23 equipped with benches for the elderly and sedentary women living alone (Ottoni et al.,
24 2016), sidewalks and pedestrian areas, and porches in front of houses (Cabrera and
25 Najarian, 2015). On the other hand, the lack of identifiable places would be an obstacle
26 to the formation of a social network (Hanna et al., 2009). Housing design can also promote
27 the formation of social networks. For example, when the entrances to houses or buildings
28 face each other, are adjacent or connected to a pedestrian walkway or meeting places,
29 the probability of social interactions is higher (Lavin et al., 2006). However, lack of privacy
30 and overcrowding are variables associated with stress (Wood et al., 2008). Similarly,
31 neighbourhoods that are conducive to walking and have diverse functions (shops, cultural
32 and leisure activities, services, transport) would promote the potential for meeting,
33 strengthen the sense of security and encourage political and social engagement of
34 residents in the community (Foster et al., 2010; Hassen and Kaufman, 2016). These
35 neighbourhoods are suitable for walking because of several attributes: street connectivity,
36 number of intersections, sidewalk quality, pedestrian crossings, traffic lights and street
37 furniture (Hassen and Kaufman, 2016). According to some studies, people living in
38 walkable neighbourhoods have better levels of social capital than those living in areas
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4 where they depend on the car (Renalds et al., 2010). The urban density of a
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6 neighbourhood or city has, according to traffic intensity and population density,
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8 contrasting effects on social cohesion. They may encourage or discourage individuals
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10 from spending time outdoors (Boessen et al., 2017; Wood et al., 2008).

11 12 13 14 **Social diversity**

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17 Implementing social diversity in a neighbourhood does not necessarily imply that the
18
19 different groups will actively and positively interact, as it has been shown in the
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21 Netherlands and in the UK (Kempen and Bolt, 2009). Sometimes, it can lead to conflictual
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23 situations, alter trust between groups, disrupt solidarity networks and deprive the most
24
25 vulnerable people of their social support (Bacqué et al., 2011; Lelévrier, 2013; Melis et
26
27 al., 2013; (Villalonga-Olives and Kawachi, 2017)). Being socially and culturally close to
28
29 one's neighbours can help as they can provide support in similar situations, maintain
30
31 cultural traditions, language, heritage and they provide an overall feeling of safety
32
33 (Phillips, 2006; Tomlins et al., 2002). Some aspect of social mix can work: when the
34
35 income difference between groups is not too wide (Kempen and Bolt, 2009), or when
36
37 social diversity is very low, such as within buildings (Melis et al., 2013). However, too
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39 much diversity at a small scale has also been associated with tensions between
40
41 neighbours (Goodchild and Cole, 2001). The effects of cohabitation in the same area
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43 depend on the scale at which such cohabitation is achieved and the gap between groups.
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45 Thus, the social mix strategy itself is not enough to create social cohesion. It depends on
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47 other policies associated with residents and designed to engage them altogether
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49 (Mugnano and Palvarini, 2013).

50 51 52 **Perception of neighbourhood**

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4 Neighbourhood characteristics (population density, traffic levels and safety, aesthetics,
5 presence of vegetation, functional mix) influence people's perception of their
6 surroundings in terms of sense of security (Leslie and Cerin, 2008). While the presence
7 of a large number of individuals in a neighbourhood is supposed to make it more secure
8 (Hillier, 2004), studies have shown that the arrival of new residents can create unwanted
9 person to person contact with current residents which may lead to a decline in the number
10 of residents using public spaces and therefore interact (Foster et al., 2010). Negative
11 perceptions of the neighbourhood can prevent some individuals from participating in
12 social activities to avoid certain places considered unsafe (Liska et al., 1988), resulting in
13 a barrier to relationship formation and reduced social participation. In addition, other
14 attributes such as urban lighting, clean streets, amenities, maintenance, increase
15 satisfaction with home, may also facilitate social interactions and a sense of well-being
16 (Wood et al., 2006).
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31 The literature on the BE and social cohesion identifies mechanisms that may explain how
32 the BE's features, such as public spaces and walkability, influences social interactions
33 and social cohesion. These findings suggest that spatial, physical, and human factors
34 must all be considered, as well as how they interact with one another. From these
35 findings, an analytical framework was designed for HIA.
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Figure 1. Pathways from built environment to health

A FRAMEWORK FOR THE ASSESSMENT OF SOCIAL COHESION IN HIA

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4 The literature review allowed us to define social cohesion for the purposes of
5 commissioning HIAs, to identify attributes of the BE that could influence social cohesion,
6 and to understand the underlying mechanisms.
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9 10 **Presentation of the analytical framework**

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12 Following the literature review, we consider social cohesion as a construct that can be
13 assessed using several criteria: shared interests and values, tolerance and acceptance
14 of others, sense of common identity, sense of belonging to a territory. It is influenced by
15 the degree of social distance between group members and the presence of social
16 intermediaries.
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20 To analyse urban projects, we considered two perspectives. The first refers to the spatial
21 and physical dimensions of urban planning and the second to the human dimension. The
22 latter relates to the way in which people, considering the geographical and social context,
23 appropriate and invest urban space. We therefore built a framework that comprises
24 criteria linked to each dimension, with specific questions and indicators to assess one by
25 one and in a systemic way. The aim is to understand how each urban development project
26 contributes to social cohesion as a whole (table 1).
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29 30 *Spatial dimension (or urban design)*

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32 Spatial dimension is analysed through four criteria: three related to public spaces
33 (availability, accessibility and walkability, quality), and one related to functional diversity.
34 Relevant indicators are sometimes available (*e.g.*: distance between spaces) while others
35 have to be found by the HIA team (*e.g.*: quality of spaces).
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38 39 *Human dimension*

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41 This dimension is analysed through two main criteria. Social diversity is both influenced
42 by urban design and social policies such as housing and education. Citizens' perceptions
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3 are studied through perceptions of the neighbourhood (safety, aesthetics, attractiveness,
4 peacefulness, friendliness), attachment to the neighbourhood and sense of belonging.
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10 Table 1. Social cohesion framework
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16 **Application to the Port du Rhin urban redevelopment project HIA in Strasbourg** 17

18 The Port du Rhin urban redevelopment project (PdR-URP) is part of a larger project that
19 has been underway for more than ten years. The PdR district is located in an industrial
20 area on the outskirts of the city, along the river forming the border with Germany. It suffers
21 from several disadvantages: isolation, poor housing, amenities, insufficient supply of
22 shops and services. The inhabitants' state of health is poorer than the city average due
23 to the deterioration of the living environment, air pollution in particular, social and
24 economic insecurity as well as limited healthcare facilities.
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32 Several interventions were planned: construction of more than 2000 housing units on the
33 outskirts of the district and high standing housing along the river, redevelopment of public
34 spaces and roads, a new tram line, establishment of private health facilities and local
35 amenities (outlets, public services, bank, cultural centre). The project aimed not only to
36 rehabilitate this neighbourhood but also to connect deprived areas to the city centre and
37 to encourage social diversity by improving the area's appeal. Thus, when new people
38 come to the district, whether to live or not, the population becomes more diverse with
39 different backgrounds and socioeconomic status. Therefore, social cohesion was the
40 main concern for decision makers.
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51 To implement the HIA, we followed the step-by-step process according the international
52 standards (Green et al., 2019) and we used a participative approach by which citizens
53 were included in the steering committee and workshops. To collect data, we did the
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4 following: a) document and data analysis with urban planners, technical officers (to better
5 understand the project); b) walks and field observations (to identify spaces and barriers
6 for meeting); c) workshops with stakeholders and school-aged children, interviews, videos
7 with young people, street interviews with the current residents (to identify perceptions).
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9 To analyse the parameters, we profiled the area and its population, we rated walkability
10 and we conducted a qualitative analysis of the interviews.
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18 Findings

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20 The HIA stressed the improved living environment and also how the make-up of the
21 resident population evolved according to the multiple changes (real estate, arrival of
22 occasional people, workers, patients...) with potential impact in opposite directions.
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27 The transformations, whether in terms of the development of public spaces or the
28 provision of new services, are likely to create opportunities for encounters. This is
29 particularly because they make the district more attractive and more accessible to all
30 types of public given that currently the use of spaces is segmented between different
31 social groups. However, by creating places of sociability and increasing population
32 density with new activities, it can strengthen the sense of security in public spaces and
33 increase the potential for social relations. Conversely, it can create conflict situations as
34 this new population could be perceived as intrusive, which in turn could encourage people
35 already settled to become withdrawn. Furthermore, the projected future residential
36 distribution reveals varying degrees of diversity according to scale and a social
37 specialisation of spaces between buildings to the east and west of the perimeter. It shows
38 streets that could constitute a physical or symbolic barrier between different residential
39 forms.
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53 The renovation operations and the construction of new housing inspire contrasting
54 feelings among the current inhabitants. They have felt dispossessed of their
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4 neighbourhood, particularly so after it was renamed and since some aedicules have been
5 removed and wealthier newcomers have taken up residence. Renovation generates
6 paradoxical effects with a risk of gentrification. These effects include, for the short,
7 medium and long term, enhanced real estate through greater appeal, and better shops
8 and businesses. However, these positive effects can lead in the longer term to population
9 displacement. (Melis et al., 2013). The challenge is to ensure cohabitation between
10 residents and newcomers who have different socioeconomic status. It will depend on the
11 scale at which it is organised and the gap between these groups.
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20 If the project is to be successful in terms of social cohesion, it must overcome several
21 challenges: organising diversity at different scales compatible with the standards of the
22 groups involved; reducing physical or symbolic barriers in order to guarantee access and
23 appropriation of all spaces by all categories of population; organising the development of
24 the district based on the local community fabric and with the involvement of the inhabitants
25 in order to ensure the coexistence of different living practices.
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36 DISCUSSION

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39 The analytical framework offers some strengths and weaknesses.
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41 **Three levels of weakness**

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44 The three levels of weakness refer to the concept of SCo and its operationalization in HIA. The
45 first is that SCo is a fuzzy concept for different reasons: it is used as a synonym of SC; it
46 is an umbrella term for a number of related concepts; it is both a concept and a policy
47 goal; and there is a discrepancy between policy makers who think social diversity means
48 social cohesion, and researchers who think it is more complex. In the scientific literature,
49 there are sometimes different definitions for a same concept, and close definitions for
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4 different terms. We tried to differentiate these concepts to grasp the complexity in which
5 social environment is influenced by BE and by different mechanisms. We also need to
6 understand expectations from the political perspective: what do policy makers mean when
7 they want us to investigate social cohesion? Do we properly understand their
8 perspectives and the definition in the literature?
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14 The second level is related to conclusive evidence. Further studies need to be conducted
15 to substantiate the links between the BE and SCo. Not only does evidence remain weak,
16 with studies generally based on qualitative data, but also the causal link could be reversed
17 due to multiple factors and interactions between the individual, his or her membership
18 group(s) and the broader environment. Strong ties can feed sectarian and exclusive
19 interests fueling the risk of opposition between groups, generations or cultures.
20 Conversely, weak ties would allow less homogeneous groups to get along, without
21 sharing the same ideals; they would help information to flow and establish bridges
22 between communities; they would be conducive to stable urban life and open
23 neighbourhoods (Cabrera and Najarian 2015; Crawford 2006). Moreover, people with
24 more social connections in the neighbourhood tend to make more use of its services and
25 facilities while also being more involved in local activities. (Mackenbach et al., 2016).
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38 The third level refers to method and the fact that the assessment of social impacts is
39 difficult and time consuming. For social impact assessment, there is a broad range of
40 quantitative (models, trends projections, scenarios, comparison of case studies) and
41 qualitative (participatory approaches) techniques with subjective and objective indicators
42 (Arce-Gomez et al., 2015; Karami et al., 2017). While there are resources and tools to
43 measure the social determinants of health, there is little consensus on the indicators used
44 (Elias et al., 2019). Some studies have focused on measuring social cohesion or mainly
45 one aspect such as networks, trust, civic engagement, collective action, coordination with
46 institutions dimensions (Cabrera and Najarian, 2015; (Villalonga-Olives and Kawachi,
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2015). Measuring each dimension precisely with all the indicators would have required significant work and time, which is not compatible with an HIA, the timing of which must match that of the decision. SCo is one of several determinants that must also be assessed. The aim of HIA is to build a solid and credible argument based on a combination of scientific knowledge and field data in order to make the links between the project and health intelligible and lead to a review of the project. As with all intervention research, HIA needs to be useful. Moreover, the assessment of social cohesion has to be modest regarding the other factors that are not related to urban policies but to social policies and housing policies that are beyond the scope of HIA and out of control of urban planners. This issue raises the question of the scope of HIA and the rooms for manoeuvre in making the project evolve.

Three levels of strengths

Despite these limitations, this framework is a useful tool for HIA. First, as mentioned above, in both the HIA guides and reports on this issue, we did not find any guidelines for assessing social cohesion. Therefore, it constitutes a further step towards increased understanding of how to address social cohesion.

Second, instead of just looking for characteristics that have been commonly associated with more social interactions and better cohesion, this framework allows us to ask the question, “how could it work?” taking into consideration not only physical aspects, but also perceptions and human factors. Hence, it can be used in the field without relying on a checklist, but rather on an overall analysis of all these potential indicators. This helps to identify what configuration could work at a specific local level, according to context. This double approach also enables us to consider different scales and perspectives on SCo:

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4 people scale (what they see as their neighbourhood) and the project scale (a macro
5 approach).
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8 Finally, it opens the way for considering social issues more thoroughly with a specific
9 focus on equity. Thanks to a variety of indicators, dimensions and criteria, it rebalances
10 the HIA analysis between environmental and social aspects.
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17 CONCLUSION

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20 Due to the complexity of the concept of social cohesion, we proposed a specific
21 framework to help practitioners assess it in HIA. The assessed interventions such as the
22 components of an urban development project, are new “events in systems” (Shiell et
23 al., 2018) because they modify the urban environment for a multitude of reasons including
24 geographical characteristics, mobility or opportunities of encounters. Thus, the answer to
25 the question of whether urban design interventions have potential impacts on SCo cannot
26 be binary. It depends on the way the intervention is implemented, the characteristics of
27 the populations and the interactions with related policies. HIA practitioners assessing SCo
28 need to keep in mind the need for a holistic, dynamic and multidisciplinary perspective
29 but also a flexible approach in order to tailor the framework to each unique situation. This
30 framework should be tested further to improve its validity and increase the ability of HIA
31 to explore the links between urban projects and health through social impacts. For the
32 future, this framework could be adjusted for HIA in other policies areas.
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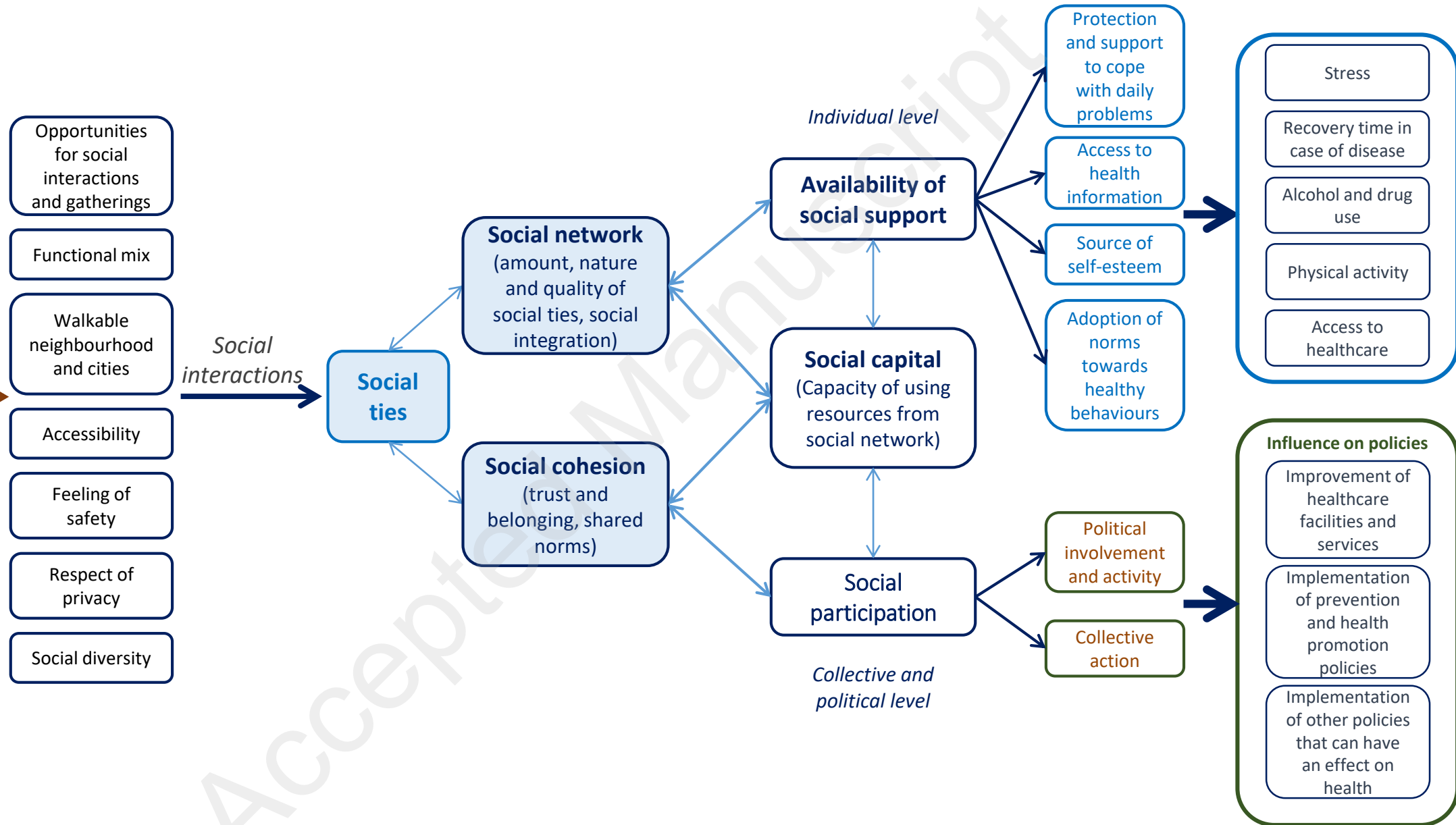
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Social cohesion framework

Urban project	Criteria	Questions	Variables
Spatial aspect Urban design	Availability and type of public spaces	Are there identifiable spaces that could foster social interactions?	<ul style="list-style-type: none"> - type of public space (place, square, parks, gardens street, sidewalks...) - street furniture and facilities (benches, playground, etc.) - potential users - safety
	Accessibility Walkability	<p>Are public spaces accessible?</p> <p>Are public spaces connected to one another with accessible and walkable paths?</p>	<ul style="list-style-type: none"> - distance (length, time) between spaces - availability and safety of pedestrian and bike lanes - presence of major barriers: crossroads, large roads with high level of traffic - quality of paths and spaces
	Quality of the urban spaces	Is the urban design considered as quality and aesthetically pleasing?	<ul style="list-style-type: none"> - design of green spaces and public space (colors, height of building, ...) - preservation of the area's heritage
	Functional diversity / mix	How can facilities and services available in the neighborhood foster social interactions?	<ul style="list-style-type: none"> - available and accessible facilities (schools, sports facilities, cultural facilities,...) - health and social services - types of businesses - collective community places (associations,...)
Human aspect Actual and future population	Social diversity	How does social mix contribute to creating links between inhabitants and successfully promote people living together? On what level? Between which groups?	<ul style="list-style-type: none"> - type of diversity (social, cultural, generational) - degree of proximity between social groups - type of housing (residential houses, buildings with apartments, number of apartments...) - housing prices - location of social housing in the neighborhood (center, fringe) - scale of social diversity: within the same building, neighborhood within schools, within sports facilities...
	Perceptions (feeling of safety, of belonging)	<p>How do people perceive the neighborhood (safety, aesthetics, cleanliness, peaceful, friendliness?</p> <p>How do people perceive their neighbors & other social groups?</p> <p>Do they perceive or recognize the neighborhood as their own?</p>	<ul style="list-style-type: none"> - history of the neighborhood (evolution, special events...) - perception of urban design - perception of otherness - attachment to the neighborhood - sense of identity
Social cohesion		How can the urban planning project contribute to social cohesion within the neighborhood and with the neighborhoods and surrounding?	<ul style="list-style-type: none"> - shared needs, interests, values and expectations - tolerance and acceptance of others - shared identity & feelings of belonging - social distance