

## WHO HEALTH EVIDENCE NETWORK SYNTHESIS REPORT 60

**What quantitative and qualitative methods have been developed to measure health-related community resilience at a national and local level?**

Jane South | Rebecca Jones | Jude Stansfield | Anne-Marie Bagnall



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The Evidence for health and well-being in context project was initiated at the WHO Regional Office for Europe in response to Members States' consideration of Health 2020, the European policy framework for health and well-being. Health 2020 includes a number of promising values-based health concepts that are difficult to measure and report on. In response to this challenge, the WHO Regional Office for Europe convened an expert group to investigate ways of enhancing Health 2020 monitoring and reporting. The first meeting of the Expert Group on Enhancing Health 2020 Monitoring and Reporting was convened by the WHO Regional Office for Europe on 1–2 September 2016. Among other things, the Expert Group recommended commissioning this HEN report outlining qualitative and quantitative methods developed to measure community empowerment at a national level.

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## Abstract

Community resilience is the ability of communities and groups to adapt and thrive in response to external stressors. Building resilient communities as a strategy for population health requires assessment of personal and collective capacities alongside vulnerabilities. This report examines what quantitative and qualitative methods can be used to measure health-related community resilience at national and local levels. Evidence from a rapid review of 33 studies highlighted various methodological challenges. Measurement strategies, mostly drawn from the field of community disaster resilience, include population-level frameworks, mixed methods assessment tools, and qualitative and participatory case studies. The main conclusions are that measurement of health-related community resilience should cover multiple domains (economic, social, health, skills, political and environment) and consider local context and assets. Three stages of policy development are suggested: selection of a set of key indicators to collect data on community resilience, creation of a learning network to share knowledge and tools, and development of a comprehensive measurement framework.

## Keywords

COMMUNITY PARTICIPATION, RESILIENCE (PSYCHOLOGICAL), COOPERATIVE BEHAVIOR, SOCIAL SUPPORT, COMMUNITY HEALTH SERVICES (ORGANIZATION AND ADMINISTRATION)

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## ABBREVIATIONS

C4C	Capacity for Change (model)
IFRC	International Federation of Red Cross and Red Crescent Societies
MWIA	Mental Well-being Impact Assessment (tool)
THRIVE	Tool for Health and Resilience in Vulnerable Environments
WARM	Wellbeing and Resilience Measure

# CONTRIBUTORS

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## Authors

Jane South

Professor, School of Health and Community Studies, Leeds Beckett University and Public Health England, Leeds, United Kingdom

Rebecca Jones

Research Assistant, School of Health and Community Studies, Leeds Beckett University, Leeds, United Kingdom

Jude Stansfield

National Adviser, Public Health England and Leeds Beckett University, Leeds, United Kingdom

Anne-Marie Bagnall

Professor, School of Health and Community Studies, Leeds Beckett University, Leeds, United Kingdom

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## Peer reviewers

Linda Liebenberg

Director, Everfair Research & Evaluation Consulting, Halifax, Canada

Erio Ziglio

Honorary Professor, Health University of Applied Sciences Tyrol, Austria and Visiting Professor, Glasgow Caledonian University, Glasgow, United Kingdom

## **Editorial team, WHO Regional Office for Europe**

### **Division of Information, Evidence, Research and Innovation**

Nils Fietje

Research Officer, Evidence for Health and Well-being in Context

Kjartan Sveistrup Andsbjerg

Consultant, Evidence for Health and Well-being in Context

### **Health Evidence Network (HEN) editorial team**

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# SUMMARY

## The issue

Resilience is a dynamic process whereby individuals, communities and systems adapt and thrive in response to external stressors, including economic and social pressures and environmental threats. Creating resilient communities and supportive environments in the WHO European Region is a priority area for Health 2020. Therefore, suitable measures are needed to monitor community resilience. Such measurement is challenging and encompasses assessment of community strengths, assets and vulnerabilities, alongside the wider social conditions.

## The synthesis question

The purpose of this report is to identify what quantitative and qualitative methods have been developed to measure health-related community resilience at a national level or with the potential to be scaled to this level.

## Types of evidence

This report used rapid review methodology to synthesize the academic and grey literature published between 1 January 2007 and 30 November 2017 in English, French, German or Russian. A total of 33 publications were included, 27 reporting on work from within the WHO European Region and six from outside the Region. All included reports had methods for measuring community resilience that explicitly covered aspects of health and well-being, although this was rarely the primary focus. Most evidence came from the field of community disaster resilience.

## Results

The evidence shows that many different aspects of community resilience need to be measured if assessment is to fully capture how communities respond, adapt and thrive in the face of adversity. Three main types of measurement strategy were found.

**Measurement frameworks using population data.** These build up a population profile of resilience indicators at national or subnational level by analysing routinely collected quantitative data. Social, economic and environmental indicators indicate strengths and vulnerabilities, typically within a city or neighbourhood.

**Mixed methods assessment frameworks.** These combine quantitative and qualitative data with stakeholder views to produce an assessment that can inform planning and performance evaluation. A social determinants of health approach means gathering information on needs and assets from different sectors, including local services, the economy and communities.

**Qualitative and participatory approaches.** Qualitative case studies explore resilience indicators at a community level and give vital information on how community resilience can be built in a specific context; participatory methods help to build better understanding of local problems and foster alliances to improve health and well-being by actively involving community members in assessment.

A cross-cutting theme was the importance of measuring local assets alongside community capacities. Although insufficient to identify the best indicators for national-level measurement, the available evidence indicates that assessment should cover multiple domains, including social, economic, health and well-being, education, environment, crime and community safety, political leadership and civic participation, and local infrastructure/access to services. The social domain, covering aspects of social capital, is considered a priority area for measurement, alongside economic indicators. A finding was the need to contextualize information on community resilience by taking account of differences between communities and the specific pressures they experience.

Existing frameworks need to be validated in different contexts. Many frameworks were from urban and rural areas within the WHO European Region, highlighting the potential for shared learning. Further research should take account of the diversity between and within communities and inequalities in resilience. Participatory research with marginalized communities will help to build cross-cultural understanding of resilience processes and outcomes.

## Policy considerations

Based on the review findings, three levels of policy development on community resilience can be considered by Member States: (i) a minimum dataset with key social and economic indicators; (ii) combining the minimum indicator set with national/local case studies and contributing data to a learning network with

shared tools; and (iii) long-term development of a comprehensive measurement framework integrating qualitative approaches. Taking a staged approach would enable Member States to build a national measurement strategy aligned to their information needs, routinely collected data, available funding and current best practice.

The main policy considerations proposed to Member States that wish to measure health-related community resilience at a national level are to:

- ensure that measurement of resilience (at national or subnational level) is embedded within public health planning frameworks and linked to actions to strengthen communities and build on existing assets to protect and promote health and well-being;
- collect data across multiple domains based on the social determinants of health, giving priority to social and economic indicators that measure population vulnerabilities and supportive environments;
- frame measurement strategies in terms of capacities or capitals (social, human, cultural, environmental and economic) because these are the fundamental resources for building resilience for individuals and communities;
- contextualize quantitative population-level data by including case studies that examine how community resilience is built in localities in response to specific stressors;
- develop a whole-system approach to measuring common domains of resilience by promoting intersectoral collaboration among the health, emergency planning, economic development and education sectors and civil society organizations;
- engage citizens in assessment and use participatory methods to promote collective action and develop a shared understanding of community resilience within marginalized communities;
- produce a high-level summary of vulnerabilities and assets at a population level as a “strategic lens” to guide public health action on community resilience; and
- share with other countries knowledge and practice from effective interventions and case studies that have measured and empowered resilient communities.





# 1. INTRODUCTION

## 1.1 Background

### 1.1.1 Defining community resilience

Resilience is often described simply as the ability to recover (bounce back) after adverse events (1) and can be an attribute of individuals (e.g. coping skills), communities (e.g. social resources that help communities to respond to threats) (2,3) and systems (e.g. preparedness for responding to natural disasters) (4). Core definitions involve both “positive adjustment” and “exposure to stressors” (5), reflecting an understanding that resilience is a dynamic process of adaptation as well as an outcome (1,6,7). In general, community resilience relates to the social structures, networks and interdependencies that make communities able to withstand, adapt and (potentially) flourish in response to adversity (7). Threats can include prolonged events that create adversity in communities over time (such as economic instability (8)), as well as natural disasters requiring immediate responses.

Research into community resilience has its origins in understanding responses to environmental threats (9). A large body of literature on community disaster resilience covers areas such as engineering, community development and place-based responses (4,10–13). However, there is little consensus on definitions of community resilience (14,15), theoretical models (12,16) or methodologies for measurement (4,10,11). Some studies into community disaster resilience have focused on capacities and the agency of communities to prepare, respond and adapt to threats (5,6,17). Important aspects include the natural and built environment, economy, social structures, education, health, local services and the role of institutions (9); these are all major determinants of health. There is also discussion of whether community resilience should be viewed as a response to an adverse event, as seen in the engineering field, or as a process that reflects community capacity and adaptability, more typical of socio-ecological approaches (4). Magis, for example, define community resilience as the community resources developed by communities so they can thrive in a changing environment (17):

Members of resilient communities intentionally develop personal and collective capacity that they engage to respond to and influence change, to sustain and renew the community, and to develop new trajectories for the communities’ future.


### 1.1.2 The Health 2020 approach

Creating resilient communities and supportive environments is one of four priority areas in the Health 2020 policy framework for improving health and reducing health inequalities in the WHO European Region (18). A whole-of-society approach to health recognizes that community-level determinants, such as the local environment, social connections, community cohesion, empowerment and resilience, are important determinants of health and, moreover, can help to mitigate or buffer the impact of structural conditions that drive health inequities (19,20). There is increasing interest in community resilience as a way of thinking about population health (21,22) in terms of how individuals, communities and systems can better respond to economic, environmental, psychological, social or other stressors (2,23,24) and how they can flourish through a focus on building community assets and strengths (22,25). This has led to a need to identify suitable measures for monitoring community resilience in the WHO European Region. In seeking to build resilient communities, Health 2020 defines resilience as (19):

[t]he dynamic process of adapting well and responding individually or collectively in the face of challenging circumstances, economic crisis, psychological stress, trauma, tragedy, threats, and other significant sources of stress. It can be described as an ability to withstand, to cope or to recover from the effects of such circumstances and the process of identifying assets and enabling factors. Health 2020 places particular emphasis on the importance of creating resilient communities and the idea of helping people to help themselves.

### 1.1.3 Health-related community resilience

Health-related community resilience is a relatively new field for health policy and practice. It builds on notions of community resilience as an attribute of social systems, rather than merely a set of responses to a specific threat (25). Earlier work on resilience and health explored the role of resilience in healthy development for children and young people (5) and on its relationship with positive mental health and well-being (2,26). While the focus has often been on personal or individual resilience, there is broad acknowledgement of the important links between individual, community and system resilience and the ways in which social conditions can either support individuals to flourish or adversely affect their capacities to adapt (2,3,7,24). Four types of resilience capacity were identified in a recent publication by the WHO Regional Office for Europe linking community resilience to the Sustainable Development Goals (22):

- 
- **adaptive resilience** – the ability to withstand and adjust to unfavourable conditions and shocks;
  - **absorptive resilience** – the ability to withstand but also to recover and manage using available assets and skills;
  - **anticipatory resilience** – the ability to predict and minimize vulnerability; and
  - **transformative resilience** (applies to systems) – transformative change so that systems better cope with new conditions.

The field of community resilience related to public health is at an early stage of development and the understanding of what is required to strengthen community resilience to improve population health is still emerging. Three aspects of community resilience are prominent in health literature and underpin discussion in this report.

**The social domain.** This includes social cohesion, trust, connectedness and collective control/empowerment (3,27,28). These social determinants are highlighted as important protective factors operating at the community level, alongside vulnerabilities such as poverty and social exclusion, that influence health and the capacity of individuals and communities to deal with adversity (27). Social capital is an important concept for resilience and this covers the strength of social networks, norms of reciprocity within communities and trust in people and institutions (29). Empowerment is another important interrelated concept (3,21). Strategies to empower communities can seek to increase social cohesion, as well as community capacity to self-manage and take collective action to challenge and change social conditions (30).

**Health assets.** Community resilience is explicitly linked to an asset-based approach to health (22), building on the social resources found within communities (31,32). An emphasis on health assets requires developing new models for public health evidence that balance a traditional focus on health deficits with understandings of community assets and indicators of positive health (33,34). Health 2020 highlights the critical role of health assets in efforts to strengthen community resilience (18).

**Systems for population health.** Health-related community resilience links to a place-based approach to population health, involving intersectoral action and community engagement (20,35). This, in turn, relates to the importance of having resilient systems for population health (21,22). The ultimate goal is to create supportive local environments in which individuals and communities can flourish (18). Measurement, therefore, needs to relate to the processes and outcomes that might be seen in a healthy, resilient community (6), while

also recognizing the link to individual well-being and resilience (36–38) and to system-level resilience (24).

#### 1.1.4 Objectives of this report

This report focuses on health-related community resilience as a means to promote health and well-being and reduce inequalities (2,22,39). Emerging interest in health-related community resilience has been accompanied by some discussion about measurement and on how to best capture assets and capacities, along with vulnerabilities and needs (25,40). This requires a clear conceptualization of community resilience and which components should be measured. The challenge is that community resilience is a complex, multidimensional concept that crosses different disciplines (3,4,10).

A rapid review of strategies for measuring community resilience was commissioned as part of work to enhance Health 2020 monitoring and reporting in the WHO European Region and carried out in conjunction with a rapid review on measurement of community empowerment at a national level (41). The literature on community disaster resilience shows the enormity of the task of developing validated measures and the difficulty of agreeing common terms. The review takes into account that community resilience indicators can have many functions for policy-makers and others, from descriptors of community conditions and population trends to tools for building action and evaluation (13). This report summarizes the best available evidence to address the following synthesis question “What quantitative and qualitative methods have been developed to measure health-related community resilience at a national and local level?”

## 1.2 Methodology

A rapid review was undertaken to identify the best available evidence on quantitative and qualitative methods that have been developed for measuring health-related community resilience, either at a national level or with the potential to be scaled up. This encompassed policy-relevant approaches to measurement, including relevant conceptual/measurement frameworks; indicators and proxy indicators; data sources; and guidance and tools. Sources for the review published in English, French, German or Russian between 1 January 2007 and 30 November 2017 were identified from the peer-reviewed and grey literature, including the websites of government, nongovernment organizations, academic and collaborative organizations at local, national and international levels.





A total of 3753 articles were identified and assessed based on their abstracts and then on the main text, giving 33 articles (6,25,28,37,39,40,42–68); of these, 27 were on work developed or applied within the WHO European Region and six were from outside the Region.

Annex 1 has full details of the search strategy, including the inclusion criteria and data extraction.

## 2. RESULTS

The review identified a range of measurement strategies for assessing community or population-level resilience, including frameworks developed and/or applied in the WHO European Region. Community resilience is a complex, multidimensional concept and many studies have used comprehensive approaches to assessment. Although the primary focus was rarely on health and well-being, community-level determinants of health, such as strong social networks, were deemed important. No evidence was found on the use of measurement frameworks for health-related community resilience at a national or pan-European level and no agreed measure (or set of measures) is currently available.

The available evidence ranged from potentially transferable frameworks through to single case studies, making comparison and synthesis challenging. Nonetheless, the approaches cluster into three broad measurement strategies, with some degree of overlap:


- measurement (quantitative) frameworks using population datasets;
- mixed methods (quantitative and qualitative) assessment frameworks; and
- qualitative and participatory approaches (including use of focus groups, interviews and workshops).

According to the classification adopted by Ostadtaghizadeh and colleagues (11), this report uses **domain** as the preferred term for an area of measurement (instead of dimension or category) and **indicator** as the preferred term for a specific measure (instead of variable or criteria).

### 2.1 Mapping the measurement domains

Approaches to measurement differ depending on how community resilience is conceptualized and the focus for measurement. Community resilience is typically analysed across a set of domains, many of which map directly to the social determinants of health (e.g. the local economy or built environment). Some frameworks specified an indicator set with suggested variables, while others were more generic, requiring health planners to select data to populate the framework based on availability and relevance. However, there was insufficient evidence to determine the best indicators to measure health-related community resilience.

Measurement domains were mapped to identify the priority areas for measurement. For this, the measurement domains reported in quantitative and mixed methods



frameworks were listed and then measurement areas were mapped to these domains and classified as either a key domain or a subdomain (Table 1). This exercise confirmed that health-related community resilience is multidimensional. The most prominent measurement domains were social and economic, but other domains were health and well-being, education, environment, crime and community safety, political leadership and civic participation (also a subdomain of social capital), and local infrastructure/access to services. Of the two most prominent measurement domains, the social domain included aspects of social capital (such as social networks, family composition and a sense of belonging) and civic participation (such as volunteering rates), while the economic domain included indicators that might cause vulnerabilities (such as unemployment, lack of diverse livelihoods and percentage living in poverty). Health and well-being was represented in seven frameworks as an area of measurement, although the aspects measured ranged considerably from individual well-being (43) to use of services and mortality (50). Access to services/community facilities was often included in frameworks (43,46,48,53,58,61), but this was often highly contextual and comparison across countries is difficult owing to different welfare and data systems (42).

A cross-cutting theme for measurement domains was an emphasis on measuring local assets and community resources. Several frameworks, and some qualitative studies, used the notion of capacities (6,28,39,54) or focused on types of community capital (social, economic or human) (54,61,65,66) as a basis for measuring community resilience. The importance of personal, community and system-level resources was also highlighted (43,45,61).

## 2.2 Measurement frameworks using population datasets

Measurement frameworks provide a clear structure to gather and analyse data on community resilience, usually across a number of domains, to build up a population profile at country, regional or area level using routinely collected population datasets. In the field of disaster resilience, a variety of measurement frameworks are available to assess levels of community or system resilience in response to threats and environmental hazards, such as earthquakes (4,10,11). In contrast, this review identified only a small number of health-related measurement frameworks using population data. These included health and well-being as a determinant, outcome or major domain of community resilience. None of the frameworks were applied at a national level to capture data on community resilience, although one project

Table 1. Main domains of measurement for health-related community resilience

Source	Health and well-being	Social	Economic	Human skills and education	Community safety/crime	Environment: built/natural	Local services	Political leadership and civic participation
City Resilience Index (2015) (48)	✓✓	✓	✓✓	-	-	-	✓✓	✓✓
Comber et al. (2012) (52)	-	✓✓	✓	-	-	-	✓✓	-
C4C (59)	-	✓✓	✓✓	-	-	-	-	-
Glasgow City Council (2016) (49)	✓✓	-	✓✓	-	-	-	-	✓✓
IFRC Framework for Community Resilience (2014) (58)	✓✓	✓✓	✓✓	✓✓	✓	✓✓	✓✓	✓✓
Institute for Sustainable Communities (2016) (57)	-	✓✓	✓✓	-	-	✓✓	-	-
Manor House Development Trust (2015) (61)	✓	✓✓	-	✓✓	-	✓✓	✓✓	-
Cooke & Stansfield, 2009 (56); MWIA Tool	✓✓	✓✓	-	-	-	-	-	-

Table 1 (contd)

Source	Health and well-being	Social	Economic	Human skills and education	Community safety/crime	Environment: built/natural	Local services	Political leadership and civic participation
Platts-Fowler & Robinson (2016) (51)	✓✓	-	✓✓	✓✓	✓✓	-	-	✓
Poortinga (2011) (53)	-	✓✓	-	-	-	-	-	✓✓
Sherrieb et al. (2010) (54)	-	✓✓	✓✓	-	-	-	-	-
Davis et al. (2015) (39); THRIVE	-	✓✓	✓✓	✓✓	✓	✓✓	-	-
Mguni & Bacon (2010) (43); WARM	✓✓	✓✓	✓	-	✓	-	✓✓	-

✓✓: major domain; ✓: subdomain; C4C: Capacity for Change; IFRC: International Federation of Red Cross and Red Crescent Societies; MWIA: Mental Well-being Impact Assessment; THRIVE: Tool for Health and Resilience in Vulnerable Environments; WARM: Wellbeing and Resilience Measure.

explored the potential to do this in the WHO European Region (42). Two of the frameworks, the Wellbeing and Resilience Measure (WARM) and the City Resilience Index, have undergone considerable development through evidence review, expert input, fieldwork and testing in different communities and countries.


### 2.2.1 WARM

The WARM framework is an analytical tool for measuring resilience across a geographical area, such as a neighbourhood, using existing datasets (37,42–45). The framework has three domains that broadly correspond to notions of individual, community and system-level resilience, and it covers both objective and subjective indicators (43):

- self – income, employment, self-reported health, education levels and life satisfaction;
- support – family circumstances, social networks and one-to-one services; and
- systems and structures – local economy, crime rates and effective public services.

WARM was developed by the Young Foundation, a nongovernmental organization based in the United Kingdom, to improve the understanding of patterns of well-being and resilience at a local level and inform actions to build these characteristics in communities (37). The five-stage process starts with measuring well-being and resilience in a local area using the indicators listed above for each domain (self, support, and systems and structures), followed by mapping local assets and vulnerabilities and then benchmarking against national averages. For this, municipalities and local organizations select an indicator set depending on availability of local and national data. Data are then displayed using a 21-point spider-web format to provide a visual comparison of local and national percentages. The final two stages are planning interventions and taking action. Qualitative research on informal community networks and activities is recommended to complement the quantitative analysis.

The e-Frame (European Framework for Measuring Progress) project later explored the transferability of WARM as a framework to encourage more consistent measurement of social progress in a European context. Case study 1 describes the use of WARM in two neighbourhoods (Barcelona, Spain, and Malmö, Sweden) (44). A mapping exercise of European measures (42) showed how existing datasets and indicators at national, subnational and local levels could be used to populate the WARM framework. In addition to the datasets, data availability in England (United Kingdom), France, Ireland, Spain and Sweden was explored. The available data mapped well to indicators for the self and support domains, but less well



to indicators for the structures and systems domain because of the different administrative and welfare systems in place across the WHO European Region. Six European indicators were found for the support domain, which is of relevance for community resilience (Table 2). Of these, five covered household composition and one covered social capital (using the percentage of people volunteering regularly). Nationally and locally available data varied across the five countries, particularly on volunteering and sense of place/belonging. Although the report confirmed the potential for selecting some European measures of resilience, a number of measurement challenges were highlighted, including data accessibility and variability, as well as variable definitions of key terms and differing administrative structures across Member States (42).

### Case study 1. Using WARM to understand adaptive resilience in two urban neighbourhoods

The WARM framework (self, support, systems and structures) was tested in two case study sites (Roquetes in Barcelona, Spain; Lindängen in Malmö, Sweden) to assess its applicability within different European contexts (44). A resilient community was defined as:

one that has a collectively held belief in their ability to adapt and thrive in spite of adversity... emergent action (by community members) can bring about positive change, boosting protective factors to ensure that a community can transform itself over time in the face of challenges).

As well as analysing quantitative data using WARM, qualitative interviews with residents, policy-makers and other local stakeholders were carried out in each neighbourhood. The assessment identified pressure points that could stimulate or hinder a resilient response: some of these (e.g. overcrowding) required input from public services, but informal community responses based on the links and relationships between residents, local groups and front-line staff were also important in creating positive change. The project highlighted some implications for public policy to build resilience, such as better engagement between the state and communities. The discussion of measurement emphasized the importance of policy-makers going beyond collecting data on quality-of-life indicators and access to services, to understanding neighbourhood assets and informal networks that exist.

This case study shows how WARM can be applied in different contexts to stimulate and support local change.

Table 2. Applying WARM in Europe: country-level indicators for the support domain

Subdomain	Key terms and concepts	Source(s)
Social capital	Percentage of people who volunteer regularly	Eurofound second EQLS (2007), EU-SILC PS100, EVS (2008)
Household composition	Percentage of people in workless households	Eurostat
	Percentage of single pensioners living alone	Urban Audit
	Percentage of family units with married or two adults	EU-SILC (2013)
	Percentage of people who care for someone else part-time	Eurofound second EQLS (2007)
	Percentage of lone parents	EU-SILC

EQLS: European Quality of Life Survey; EU-SILC: European Union statistics on income and living conditions; EVS: European Values Study; PS100: participation in informal voluntary activities.

Source: Mguni & Caistor-Arendar, 2013 (44).

### 2.2.2 City Resilience Index

The City Resilience Index self-assessment tool provides a comprehensive global framework for measuring resilience (including health-related individual and community resilience) at a city level (46–48). Development, testing and implementation of the City Resilience Index have been led by Arup International Development with support from the Rockefeller Foundation. Its primary purpose is as a tool for city decision-makers and planners to assess urban resilience and identify priority actions to improve resilience. Resilience profiles are available for cities across the globe for which a City Resilience Index assessment has been completed (69). The Index reflects an understanding of cities as complex social systems with the potential to build resilient, supportive environments that enable residents to thrive, especially the poor and vulnerable (46). The Index is based on the City Resilience Framework, which has 12 goals (outcomes) within four domains: (i) health and well-being of individuals (people); (ii) urban systems and





services (place); (iii) economy and society (organization); and (iv) leadership and strategy (knowledge). The Index comprises 52 generic indicators mapped across the four domains that can be applied flexibly depending on data availability. These indicators are accompanied by 156 variables providing statements ranked on a Likert five-point scale designed to help planners to monitor resilience and predict a future trajectory of resilience for their city (47,48). Reporting is supported by a web-based platform with a resilience dashboard enabling city-level analysis across the 52 indicators. Examples of health-related community resilience indicators include robust public health systems, relevant skills and training, local community support, cohesive communities, and effective mechanisms for communities to engage with government (47,48).

A number of European cities are involved in the 100 Resilient Cities Network, which provides strategies to build urban resilience to social, economic and physical challenges (70). These cities are, therefore, likely to have population data on community resilience and experience of using the framework. A report on Glasgow's resilience strategy outlined plans for a monitoring and evaluation framework to measure city resilience (49). The strategy has an explicitly "public health informed approach" based around four pillars of resilience: (i) empowering citizens to strengthen personal and collective resilience; (ii) place-based solutions; (iii) innovation for economic growth; and (iv) fostering civic participation. A set of social, economic and health indicators representing aspects of community resilience include measures of income inequality, fuel poverty, healthy life expectancy and social capital measures.

### 2.2.3 Other examples


A case study in the United Kingdom described an approach for the secondary analysis of routinely collected population data to measure health-related community resilience. This pilot project in Leicester developed a method for undertaking a spatial analysis of community well-being, resilience and vulnerability in a single municipality using population data available at local government level (52). Four groups of variables were used: access to facilities, access to community-level facilities, vulnerability (based on demographic and social data such as age, disability and income) and social problems. A distinctive feature of this approach is the use of geographical information systems combined with community engagement to provide an in-depth analysis of the assets and vulnerabilities of selected neighbourhoods (i.e. output areas). A further example of a mixed methods approach using population-level data across a municipality is described in section 2.3.1.

The importance of understanding patterns of social capital as a major determinant of community resilience was reflected in two further studies (53,54). The first presents a secondary analysis of United Kingdom citizenship survey data (England and Wales) to investigate whether aspects of social capital buffered the effects of neighbourhood deprivation (53). Indicators for bonding, bridging and linking capital were included in a multilevel regression model along with variables on neighbourhood deprivation and self-reported health. This was one of a few studies where the primary purpose was to improve the knowledge base around community resilience itself, as opposed to measurement strategies to inform local planning. An important caveat was made around the limitations of aggregating individual-level data to assess social assets at a community level, particularly where the administrative units (neighbourhoods and municipalities) used for analysis may not reflect the community networks that contribute to social capital (53).

The second study described the development of a composite indicator for economic development and social capital using county data from Mississippi, United States of America (54). It used a conceptual model and theory of community disaster resilience based on four sets of adaptive capacities which communities need to respond effectively to and recover from disasters: economic development; social capital; information and communication; and community competence (71). An indicator set developed for the first two sets based on population data (including 10 indicators for local economic resources and seven indicators for social capital) was used to create a composite Community Resilience Index with a numeric score (54). Although located outside Europe, this was the sole example of a validated community resilience measure using population data.

## 2.3 Mixed methods assessment frameworks

Understanding community-level determinants of resilience is fundamental to a public health approach that seeks to build on community assets (34,55). In local planning, population data are often combined with stakeholder engagement to provide a comprehensive assessment of needs and assets. Six very different examples of mixed methods were identified, all demonstrating scalability or providing a transferable framework for assessing community vulnerabilities and resilience (39,56–61). Although developed for different purposes, all the assessment frameworks have been used for either planning or evaluating large-scale community-based initiatives. They commonly feature a structured or staged approach to gathering data from multiple sources, followed by data analysis to inform action. A social



determinants of health approach underpinned assessments of community resilience (39), with data typically gathered from different sectors.

### 2.3.1 Assessing community resilience and local assets

Several reports from the United Kingdom, where there has been a growth of interest in asset-based working, discussed methodologies and available frameworks for measuring community resilience (25,40,55,56). A key theme was the importance of measuring protective factors as well as vulnerabilities and needs. A public health tool, the Mental Well-being Impact Assessment (MWIA), measures the impact of policies, services or programmes on the mental well-being of the population (56). Four domains (based on important protective factors for mental health) form the assessment framework: (i) increasing resilience and community assets (but with no recommendation on how this domain should be measured), (ii) enhancing control, (iii) facilitating participation, and (iv) promoting inclusion. These domains are assessed at both individual and community/organization levels, with organizations selecting their own indicators to profile the community, alongside an assessment of the population groups which are most affected and the wider determinants that might impact them. A later edition of MWIA merges the participation and inclusion domains (72). The assessment takes a structured approach, starting with screening and scoping, followed by collection of a range of evidence (including community profiles) to appraise positive and negative impacts, and finally reporting to decision-makers and identifying indicators. Following a comprehensive development, piloting and evaluation process, the MWIA has been used in over 300 impact assessments, including in large-scale, area-based initiatives such as Liverpool's year as European Capital of Culture (56).

The Tool for Health and Resilience in Vulnerable Environments (THRIVE), developed by the United States Prevention Institute, is a public health approach to building community resilience as a means to increase health equity for low-income populations and “communities of color” that experience discrimination (39). THRIVE is both a framework for understanding how social determinants shape community conditions at a macro (or structural) level and a tool to engage community members and practitioners in local assessment and action planning. Based on an extensive review and development process, 12 domains are grouped into three clusters: (i) people, concerning the sociocultural environment (e.g. social connectedness and participation); (ii) place, covering aspects of the built and natural environment; and (iii) equitable opportunity, covering how resources and opportunities are distributed. A comprehensive list of determinants, derived from review of 22 public health frameworks, is mapped to each domain, demonstrating

how community resilience needs to be assessed across multiple sectors, including housing, transport and education, while maintaining a health equity focus.


Case study 2 describes the Institute of Sustainable Communities analytical framework on community resilience in Maricopa County (Arizona, United States), illustrating a similar intersectoral approach to resilience assessment across a large region (57).

### Case study 2. An intersectoral approach to assessment: building community resilience in Arizona

Building Community Resilience in Maricopa County (Arizona, United States) (57) was an intersectoral assessment of community resilience across a large region with around four million residents. In taking a whole-system approach, sectors included environment, economic development, education, arts, family services, public health and private and non-profit-making sectors. Regional challenges included rapid population and economic growth, an intense desert climate and perceptions of a limited role for the public sector in society. The Institute for Sustainable Communities, with support from a charitable trust, set out to assess community resilience in Maricopa County for the purpose of planning actions and investment. Resilience was defined as “the ability of people, communities and systems to manage shocks and stressors and build stronger, more prosperous communities” (57).

The assessment team measured community resilience to inform strategy by combining a desk-based review with qualitative research, including 46 key informant interviews, six sector-based focus groups with leaders from the public and private sectors, and a three-day capacity-building workshop with non-profit-making service organizations. This interactive workshop provided community resilience assessment tools for both the organizations and the populations they work with. The assessment framework used three interlinked domains of community resilience to obtain information on both vulnerabilities and assets:

- economic domain:
  - vulnerability of a regional economy overly dependent on construction and development; and
  - assets of mild winter weather and 330 days of sunshine per year;



### Case study 2. (contd)

- social domain:
  - vulnerabilities of low social connectedness and cohesion; and
  - asset of a dedicated social service sector;
- environmental domain:
  - vulnerabilities of increasing average summer temperatures and more frequent extreme heat events; and
  - asset of significant institutional expertise in water supply management.

The report concluded that the community resilience framework “has the ability to knit together disparate efforts to build economic, social and climatic resilience by spotlighting the connections and the critical interdependencies between them” (57).

This case study illustrates that extensive data collection across multiple sectors can provide a high-level summary of regional vulnerabilities and assets as a “strategic lens” to inform intersectoral action on community resilience.

Another example, in Sheffield, illustrates how a mixed methods approach to assessing community resilience can be applied across an urban area using existing population datasets to rank neighbourhoods (Case study 3) (50,51).

### Case study 3. What makes a resilient community? Neighbourhood-level analysis in Sheffield, United Kingdom

Set in 100 neighbourhoods in Sheffield (a city affected by the economic downturn), and working in partnership with Sheffield City Council, this project aimed to identify indicators that support community resilience across different neighbourhoods in the city (50,51). Drawing on the work of Magis (17), neighbourhood resilience was defined as “the existence, development and engagement of local resources by community members to thrive in an environment characterized by change, uncertainty, unpredictability, and surprise” (50).

The first stage involved developing a method to identify resilient communities using available neighbourhood-level datasets. Key stressors were socioeconomic deprivation, unemployment and low income. Outcomes (and the respective

### Case study 3. (contd)

indicators) were community safety and cohesion (crime rates, antisocial behaviour), health and well-being (life expectancy, premature mortality, mental health admissions) and inclusion (voting, truancy, educational attainment). The analysis ranked the 100 neighbourhoods according to whether their outcomes were better or worse than expected.

Follow-up fieldwork in four neighbourhoods that were positive outliers (i.e. had better than expected outcomes) found that three had higher levels of socioeconomic stress and one was more affluent with lower levels of stress. More than 50 local stakeholders (including ward councillors, faith leaders, community activists, health professionals and housing and police officers) were interviewed about what made a resilient community. Overall, the project identified three main causes of the variations in resilience between areas (50,51):

- who lives there – individual resources, age profile, capacity to engage, population stability, diversity and difference;
- the social and physical context – physical environment, facilities and amenities, service provision, active citizenship, media and communications, links to power and influence, housing, and crime and antisocial behaviour; and
- the nature of community – shared notion of belonging and identity, and inclusive communities.

This case study illustrates that a good understanding of what makes a resilient neighbourhood can be obtained by combining routinely collected quantitative data with qualitative interviews focused on community strengths.

### 2.3.2 Evaluating impact

Three mixed methods approaches to measuring community resilience were associated with programme evaluation. The Framework for Community Resilience, developed by the International Federation of Red Cross and Red Crescent Societies (IFRC), is a generic measurement framework designed to support national Red Cross and Red Crescent societies in assessing community resilience and understanding the contribution and impact of their activities (58). The framework comprises six objectives, which include “improving the knowledge and health of communities”. In acknowledgement that community resilience is built through action from global to local levels, there is a strong emphasis on people-centred approaches; active



engagement of community members is advocated in the assessment of community resilience. The Framework recommends a mixed methodology using available population-level data (e.g. percentage with access to health services) combined with qualitative data from communities and practitioners. Cross-cultural application is a strength: the Framework was developed from a previous community safety and resilience framework by extensive consultation across 64 national societies and 42 international zones. A later publication provides guidance on a step-by-step approach to engagement, assessment and planning (73).

Examples of mixed methods evaluation approaches on a smaller scale are the Capacity for Change (C4C) hybrid (i.e. mixed methods) community evaluation model (59,60) and the Manor House Development Trust's social impact assessment (61), both from the United Kingdom. Case study 4 describes how the C4C project provides a distinctive approach for assessing the impact of community resilience interventions. This is the only example of designing a new survey instrument for measuring community resilience (59,60). Although the questionnaire has not been validated, there was extensive community involvement in its development. The Manor House Development Trust's social impact assessment includes six outcomes that can be measured at a neighbourhood level using both quantitative (survey) and qualitative (focus group) methods.

#### Case study 4. Using mixed methods to assess individual and community resilience: the C4C evaluation model

Within the Scottish Rural Network's LEADER programme, the C4C project aimed to help to build stronger rural communities in south-western Scotland. The project targeted small, rural and poorly resourced communities in a two-year project to enhance their resilience and capacity. A mixed methods evaluation model was developed to measure community resilience and evaluate the C4C project (59,60). Four resilience components formed the measurement framework (59):

- social individual resilience
- social community resilience
- economic individual resilience
- economic community resilience.

Over 150 face-to-face interviews were then carried out to find out how rural communities viewed community resilience. These informed the design of a

#### Case study 4. (contd)

questionnaire with 20 questions for collecting quantitative self-reported data (on a 10-point scale) across all four resilience components and 12 open-ended questions for gathering qualitative data (59,60). Using a longitudinal approach, the questionnaire was used to collect data from 10% of the population in six villages at baseline and after the intervention. The mean scores for all four components and overall community resilience were compared for three villages that had completed the C4C project and three non-completer villages. Villages that had completed the C4C project had higher resilience scores compared with non-completer villages (60).


In this way, a community capacity-building programme can be evaluated by scoring resilience across individual/community levels and social/economic domains.

## 2.4 Quantitative measurement strategies

Review findings show that measurement strategies need to take account of the multidimensional nature of community resilience. Quantitative assessment frameworks tend to measure community resilience across multiple domains: crime and community safety, economic, education, environmental, health and well-being, political, and social (Table 1) (39,43,46,48,49,54,59,61). These domains, which are also included in conceptual/methodological frameworks (7,9–11), map well to the social determinants of health and well-being (39), which have a strong evidence base (27,74,75). The social determinants of health are markers of risks in populations and also of supportive environments that enable communities to adapt and flourish; as such, they are critical to the development of individual and community resilience (22,26).

The mapping analysis of assessment frameworks highlighted that the social and economic domains are of most relevance to health-related community resilience (Table 1). The key domain for health and well-being appears to be the social domain (39,43,48,52–54,56–58,61), which covers aspects of family support, access to social networks and civic participation. These are, of course, components of social capital, which has a body of literature linked to health and well-being outcomes and inequalities (29,76,77). Several publications highlighted the critical role of social capital in interlinking other community resilience domains (6,25,64,66). For example, the Institute for Sustainable Communities concluded: “In our estimation, focusing





effort to build social capital is the single most important means to advance the efforts of those working to build economic, social and environmental resilience, three critical aspects of community resilience” (57).

The e-Frame project has shown that appropriate national and local indicators can be drawn from European data sources (42). However, given the early stage of its methodological development, the available evidence is insufficient to recommend national indicators for health-related community resilience. Some frameworks include indicators of the related concept of empowerment (3), such as individual confidence or political participation (43,49,58,63), reflecting links between control, resilience and health (27) and the importance of communities in determining local actions (63,66). Several frameworks also include economic indicators, such as employment/unemployment and income/financial situation (43,48,54,58,59). The evidence indicates that there is not a strong case for developing new indicators.

## 2.5 Qualitative and participatory approaches

A strong theme in the identified literature was the value of qualitative research to explore resilience and its determinants at a community level. Poortinga argued that, “Indeed quantitative methods can be misunderstood if the interpretation is devoid of social context” (53). In line with this, several assessment frameworks supplemented quantitative data with qualitative findings (42,45,47,50). Community perspectives, gained through active participation of community members, were integral to all qualitative measurement strategies for community resilience included in the review.

### 2.5.1 Qualitative case studies

Five single-site case studies demonstrated the longitudinal assessment of community resilience in different local contexts (6,60–66). These used a variety of qualitative methods, including interviews, focus groups and community workshops. Qualitative data were often supplemented with survey (6,65,66) or routinely collected data (63) to enrich the understanding of processes that built resilience and their impacts. The interrelationship between different determinants of community resilience (social, economic and environmental) was explored in some cases (6,62,66) and it was possible to identify mechanisms of change, such as improving social connections (65), on which to focus action. All case studies were of rural areas (four in Europe and one in Australia) in which communities were facing economic or environmental threats. The case study of promoting community resilience with the Inuit community in Paamiut, Greenland, was the only one that explored

the impact of social exclusionary forces within a specific ethnic community (63). Methods included interviews, focus groups, life story research and a survey to identify cultural values in this community. Changes in resilience were captured across three themes: “breaking the culture of silence”, sense of belonging, and action (by the community). A collective learning process was initiated to plan and evaluate a community-based programme to build resilience.

Qualitative case study research is usually small in scale and can be difficult to scale up to produce transferable results for decision-makers. All five case studies considered the local context and used coherent conceptual frameworks, often drawn from the community disaster resilience literature (9,17,71), to guide data collection and analysis, thereby strengthening the rigour and transferability of results. Case study 5 is an example of this in a fishing community in northern Norway (62).

#### Case study 5. Exploring community resilience in a Norwegian village: a qualitative case study


The coastal village of Senja in the Arctic region of northern Norway has suffered a number of challenges, mostly related to climate change and a fall in population numbers. A qualitative case study examined the community response to change and the role of community resilience in the Arctic context. Drawing on three resilience frameworks that all focused on social sustainability (6,17,78), community resilience was defined as “the ability of a community to cope and adjust to stresses caused by social, political, and environmental change and to engage community resources to overcome adversity and take advantage of opportunities in response to change” (62).

A mixed methods approach involved collecting qualitative data from interviews, participant observation, document analysis and media searches. Six domains of community resilience were identified in the village (62).

**Community resources.** Senja was seen to be “resourceful” (human and natural resources) but the population decrease was a threat to increasing community resilience.

**Community networks.** The residents of the village were strongly engaged in activities to maintain and improve community networks.

**Institutions and funding.** “Dugnad” is the contribution of community volunteering to the maintenance of services and institutions. Active contribution from local government and the community was seen as critical.



### Case study 5. (contd)

**People–place connection.** Many initiatives to develop the village focused on instilling well-being and a sense of place/belonging.

**Active agents (people who make things happen).** Both informal/formal leaders and facilitators of the process were identified in the community.

**Learning.** Continued learning was regarded as vital in responding to future unpredictable challenges.

This case study shows that qualitative methods can provide an in-depth understanding of how social resources can strengthen community resilience and well-being in a small rural community experiencing change.

All case studies incorporated participatory research methods to engage and empower communities in understanding local problems and building on local assets. The Good Life project in York (United Kingdom) used participatory action research to develop a more environmentally sustainable community (64,65). The main methods were participatory community events and social network mapping to capture changes in engagement and social connections, and the use of individual narratives (significant change stories) to illuminate processes and outcomes at an individual level.

Two case studies, one based in a southern Italian village (66) and the other from rural Australia (6), emphasized the importance of engaging with different sectors (commercial, farming, education, health) as well as with residents (including school students) in identifying local assets and the most important aspects of community resilience in those contexts, and then planning action and evaluating change. Using a conceptual framework based on types of capital, the Australian case study aimed to increase psychological wellness for individuals as well as community resilience (6). A toolkit for practice was developed from this project based on extensive community engagement (67). This was one of the few studies to demonstrate how community voices can be incorporated into a reporting framework (instead of qualitative findings from researcher-led analysis).

### 2.5.2 Participatory tools

A common theme across the review was the importance of stakeholder engagement, including encouraging community members to participate in assessing community resilience and developing local actions (6,39,57,58,65). Two specific participatory

frameworks were identified: Community Compass (United Kingdom) (68) and EnRiCH (Canada) (28).

Community Compass is a practical community assessment tool designed after extensive consultation and engagement with a number of communities across the United Kingdom (68). The tool is based on a simple framework of four domains of community resilience: (i) healthy people (physical and psychological well-being); (ii) inclusive creative culture (including stimulating a sense of place/belonging); (iii) localized economy (community stewardship of local assets); and (iv) cross-country links (supportive connections between communities). This method was one of the few attempts to capture adaptive community resilience using transferable methods, and three scenarios were used to help communities to self-assess where they are:

- break down – in which shocks have a big impact and communities might need external help;
- break even – in which communities bounce back and act together to deal with risks; and
- break through – in which communities anticipate and respond to changes positively.

Community members decide together which category best represents their situation for each community resilience domain and then use the Compass to plot visually where they feel their community is on a simple spidergram (with a four-point axis).

The EnRiCH Community Resilience Framework used community-based participatory research techniques to assess and mobilize assets in high-risk populations (28). The focus was on prevention of risks, upstream promotion of population health and identification of adaptive capacities. The Framework is structured around three domains as core drivers of adaptive capacities: empowerment, innovation and collaboration (focused on social networks). Structured facilitation methods were used to engage community members in identifying the community's needs and assets and in working together to decide where action and investment should be focused. Qualitative data were collected and analysed during this process. Although EnRiCH is primarily a participatory tool, the report suggested that indicators could be developed based on the three adaptive capacities, such as asset literacy, social connectedness and openness to innovation.



## 3. DISCUSSION

### 3.1 Strengths and limitations of the review

Health-related community resilience is a relatively new field for health policy and practice. This review has identified the best available evidence as a starting point for selecting measurement strategies in the WHO European Region. The use of rapid review rather than systematic review methodology limited the comprehensiveness of the search and selection processes, as well as the extent to which results could be synthesized in the time available. Most evidence on community resilience related to the disaster response, with very little specifically addressing health. Therefore, wider evidence on community resilience that incorporated a health and well-being element was included in the review. This approach yielded a good range of examples with some common characteristics and lessons for transferability. The measurement of linked concepts such as social capital was only included where publications explicitly discussed community resilience. Therefore, relevant methodological literature might have been missed.

Almost all evidence on measurement of health-related community resilience was at the subnational or local level rather than the national level. This may be because community resilience has only recently become a major focus for population health and well-being. Most publications were relatively recent, with 26 (79%) dating from 2012 onwards. Many publications included literature reviews as part of developing measurement frameworks (6,25,40,47,50,54,55,59,62). There was a degree of convergence about key conceptual and methodological papers, often drawn from broader resilience literature. Nonetheless, there is a body of knowledge that could be applied to develop robust measurement strategies for health-related community resilience at a national and at a local level.

A strength of the review is that worldwide literature was considered, although priority was given to studies from the WHO European Region in order to select the most relevant studies for review (see Annex 1). Towards this, the literature was searched in English, French, German and Russian.

A search of Russian language literature was undertaken independently using search terms in Russian. No literature was found on community resilience, although studies on sustainable development were identified. This probably reflects a lack of common terminology (7,8,12,25) and the use of alternative terms as organizing concepts. A small set of articles of borderline relevance were rescreened to provide

additional literature from outside the WHO European Region. Despite the search being carried out in English, French, German and Russian, most of the literature was in English and mainly from the United Kingdom.


### 3.2 Methodological challenges

The review identified a range of measurement strategies but also a number of methodological challenges that need to be taken into account when measuring health-related community resilience. One major issue relates to aggregating data obtained from either individual or community-level indicators. Measurement strategies for community resilience generally assess indicators at the community level (in a neighbourhood or city), even if the unit of analysis may be higher. However, since context is the key to understanding community-level vulnerabilities, protective factors and assets, aggregating such data (i.e. in scaling up) can be problematic (79) and may not yield helpful information for national policy-makers (10). Similarly, the issue of measuring a community/collective phenomenon with individual-level data is recognized in literature on social capital (77) and well-being (80). Insufficient evidence is currently available on the scalability of measurement strategies.

Another important issue is the cross-cultural aspect of measuring community resilience. As resilience is strongly influenced by sociocultural determinants, measures and outcomes may not be applicable across cultures, including those with marginalized groups (81,82) or with diverse groups that have differing resilience pathways. Most studies in this review considered a community or area defined by geographical boundaries, thus a community of place rather than a specified community (defined by shared identity and social bonds). Moreover, measurement frameworks, despite often involving stakeholders in the assessment, did not always account for differences between groups (e.g. age, sex and ethnicity) or explain how distributions of resilience within a community could be measured. Even so, several frameworks included indicators on social belonging, identity and bonding/bridging capital (51,53,54).

The review highlighted a number of other methodological challenges in measuring health-related community resilience associated with its complexity and contextual nature.

**No agreed definition.** There was a lack of consensus on the meaning of community resilience and how it relates to the measurement of population health. Many studies first highlighted the variety of existing conceptual frameworks and then developed



their own (6,47,59). This made comparison and synthesis difficult, especially where the main focus was not on health and well-being but rather on resilience to disasters or economic adversity (25).

**Insufficient knowledge about the main determinants.** A better understanding is needed of the main determinants of community resilience and how they interrelate (57,66). This would help in the selection of indicator sets. Although qualitative studies highlighted the importance of social relationships and networks (6,62,64–66), only a few epidemiological studies in this review explored these associations (51,53).

**No agreement on indicators/domains.** A wide range of domains relating to community resilience may need to be measured. There is no consensus on priority areas for measurement and certainly no widely accepted indicator set. A related issue may be data variability and accessibility across multiple sectors (43,47).

**Lack of validated measures and composite indicators.** Most transferable frameworks (e.g. City Resilience Index (48), WARM (43), THRIVE (39) and the IFRC Framework for Community Resilience (58)) did not specify quantitative indicators except as examples, with the suggestion that these should be selected locally according to data availability. Preliminary work on composite indicators has been done through WARM (42) and in the United States (54).

**Context.** The importance of local determinants of community resilience makes comparison and benchmarking difficult.

Similar challenges are found for other complex constructs: for example, in developing measures for social capital (83) and in aggregating data at a national level and reconciling diverse methodologies in the assessment of community empowerment (41).

### 3.3 Contextualization: qualitative and participatory methods

This review identified a clear need to contextualize quantitative measurements of community resilience. Qualitative case studies add a valuable dimension to measurement tools for community resilience by (i) considering the sociocultural aspects of community resilience and (ii) seeking the active participation of communities in assessment. Reviewed studies incorporated case studies with longitudinal designs, drew on a variety of data sources and used transparent analytical frameworks (6,62,63,65,66), which increases rigour. In addition to the two

participatory tools (Community Compass (68) and EnRiCH (28)), all case studies used participatory methods to engage communities in study design, data collection or result interpretation.

Based on this evidence, the use of qualitative case studies combined with participatory methods to measure community resilience can be justified as follows.

- It allows communities to identify what aspects of community resilience are important for them (6,62). This has value because a common definition and conceptual framework for health-related community resilience is lacking.
- It helps to build an evidence base by unpacking the social connections and mechanisms of change between the wider determinants of health and individual/community resilience (25,53,66).
- Participatory methods help in identifying vulnerabilities and assets in a local context so that people can build joint actions over time. This relates to the purpose of research (often a first stage in building programmes to improve community resilience) and to the importance of empowering people living and working in a locality. This approach was exemplified in several case studies (6,63,66,67) and recommended in other frameworks (28,39,68). In itself, participatory action research, as illustrated by the Canadian framework EnRiCH (28), can support the creation of stronger networks and development of common vision.
- Qualitative studies have a clear role in rural areas facing adversity due to changing economic and social circumstances or environmental threats (62,66). The assets and vulnerabilities in villages (or, indeed, in urban neighbourhoods) may be hidden in larger scale analyses.

Research is currently lacking on community resilience within marginalized communities, which may not be defined by a geographical boundary. Only two publications considered equity in measuring community resilience (39,63). Ensuring community voices are heard, including from those groups who are seldom heard, is critical. There is scope to develop further participatory case studies focusing on equity to explore how vulnerabilities are assessed and assets mobilized for communities affected by social exclusion, such as sex workers or refugee communities.

### 3.4 Translating knowledge into policy and action

A key theme in the review was that the purpose of measurement should be to inform action that strengthens resilience at the personal, community and system





levels. Most measurement frameworks were specifically developed to support system-level planning and action to build resilience, rather than to simply describe a population profile. For example, both WARM (43) and THRIVE (39) set out a phased approach to data gathering, analysis, planning and action. The methodological challenges in scaling up measurement strategies developed for the purpose of local planning have been discussed. Although more primary research on health-related community resilience is undoubtedly needed, the evidence supports a core principle that measurement frameworks must be embedded within broader planning frameworks to strengthen community resilience and improve health and well-being. Developing an understanding of vulnerabilities and community capacities, alongside monitoring actions, could form part of a reporting strategy for health-related community resilience.

A further cross-cutting theme was the inclusion of local assets and community capacities when measuring community resilience with either quantitative or qualitative methods (25,28,39,40,55). A focus on capacities is coherent with an understanding of adaptive and transformative community resilience (9,22). This fits with asset-based public health evidence models and a focus on protective indicators for health (34,56). The science of measuring health assets is still developing (33,40); nonetheless, the evidence shows that it is helpful for measurement strategies to be framed in terms of capacities or capitals (social, human, cultural, environmental and economic).

### 3.4.1 Developing frameworks for knowledge exchange in the WHO European Region

The review highlighted the value of quantitative population-level data and mixed methods frameworks, the latter requiring stakeholder engagement and gathering information across multiple sectors. Almost all the reviewed frameworks were recommended for use at a local, regional or city level. While this may be useful for municipalities and city planners, it presents challenges for measurement at a national level (10,25) and, therefore, for increasing understanding of community resilience in the WHO European Region. Feedback from stakeholders during the development of the City Resilience Index suggests it is unhelpful to rank cities and areas (47).

However, two measurement strategies were identified that could help knowledge exchange between different countries as part of Health 2020. The first is a comprehensive cross-sectoral mixed methods assessment to gain an understanding of risks, protective indicators and change mechanisms at national or subnational


level, essentially a high-level stock-take of community resilience. This strategy is best exemplified by Case study 3 of Maricopa County (Arizona, United States) (57). The second strategy is to collate information from districts and cities that are measuring community resilience. Promoting the use of available measurement frameworks, some of which have undergone considerable testing and development (43,46,48,58,67), will improve the consistency of measurement in local contexts and, moreover, may aid comparison between Member States. Given the range of European examples and pilot studies uncovered through the review, there are opportunities to share current learning on community resilience measurement and outcomes. In terms of feasibility, developing a network of areas and organizations currently engaged in measuring community resilience would be a pragmatic approach to build on best practice. Outputs could include an agreed set of common indicators and a collection of case studies from different European Member States. The latter should include examples of measuring community resilience in particular groups, such as youth, and in communities where cultural boundaries are shifting through migration, globalization, economic shocks or demographic change (8,79,84).

Based on this review, three developmental levels are suggested in order to create a comprehensive measurement framework for health-related community resilience at a national level.

**Level 1.** Select a set of four to five key indicators to measure the social and economic domains of community resilience and use data that are already collected routinely. Domains could include access to social networks, family support and civic participation (social domain) and measures of unemployment and poverty/financial insecurity (economic domain). Additional domains could include crime and safety, participation, education and skills, and quality of the built environment.

**Level 2.** Incorporate good practice by contributing to a learning network with outputs that include a set of core indicators, national and local case studies, and shared tools.

**Level 3.** Develop a comprehensive measurement framework across the key domains of community capacity: social, health, political, economic, education and the environment. Analysis of metadata across these domains needs to be supplemented by qualitative methods (case studies and participatory tools) to support the engagement of communities facing marginalization or high levels of adversity.



Taking a staged approach would enable Member States across the WHO European Region to build a comprehensive measurement strategy aligned to their information needs, routinely collected data, available funding and current best practice. Development of a new European measurement framework for health-related community resilience would support action to strengthen communities in line with Health 2020; however, this would require significant investment in a research programme, along with stakeholder engagement and testing.

### 3.4.2 Areas for future research

There is a clear need to develop robust measurement strategies for health-related community resilience and related fields at national and local levels. This requires defining a minimum indicator set mapped to agreed domains that Member States could use to provide metadata on health-related community resilience. Johansen and colleagues have suggested that any metrics for community resilience need to have breadth (i.e. cover a number of domains), utility (i.e. usable by communities) and scientific merit (10). There is scope to build a transferable framework for measuring health-related community resilience in accordance with Health 2020 to enable policy-makers to assess whether policies and programmes are helping to strengthen community resilience or increasing vulnerabilities. Given the importance of social capital and collective control, measurement of resilience could be linked to measurement of community empowerment. Literature on community disaster resilience suggests that a long-term research programme would need to map existing data, identify validated measures, develop an index with appropriate weighting and test this through expert input, fieldwork and community involvement (4,47,54,85). A first stage could be a comprehensive systematic review encompassing all global literature on health-related community resilience, with a concept mapping exercise as a critical preparatory stage (86).

Specific areas for future research are to:

- test the validity and transferability of existing community resilience measurement frameworks and their relevance to health policy-makers and practitioners, with a focus on mapping data accessibility and evaluating whether frameworks provide useful information to inform health strategies;
- investigate the determinants of health-related community resilience and how community-level indicators relate to individual and system-level resilience with the aim of linking measurement frameworks to the social determinants of health;

- use concept mapping and other approaches to identify the most relevant indicators for protective factors and community assets; and
- use participatory research to engage communities in defining health-related community resilience and developing local actions to strengthen community capacities.

### 3.5 Policy considerations

The review found evidence that is widely applicable for monitoring and evaluating public health strategies to build resilient communities at the national or local level. Local and socioeconomic contexts need to be considered, and the main objectives for measuring community resilience should be to inform planning, build local action and evaluate outcomes. Many European cities and neighbourhoods have started to focus on community resilience and the measurement of vulnerabilities and assets.

Based on the review findings, three levels of policy development on community resilience can be considered by Member States: (i) a minimum dataset with key social and economic indicators; (ii) combining the minimum indicator set with national/local case studies and contributing data to a learning network with shared tools; and (iii) long-term development of a comprehensive measurement framework integrating qualitative approaches. Taking a staged approach would enable Member States to build a national measurement strategy aligned to their information needs, routinely collected data, available funding and current best practice. The main policy considerations proposed to Member States that wish to measure health-related community resilience at a national level are to:

- ensure that measurement of resilience (at national or subnational level) is embedded within public health planning frameworks and linked to actions to strengthen communities and build on existing assets to protect and promote health and well-being;
- collect data across multiple domains based on the social determinants of health, giving priority to social and economic indicators that measure population vulnerabilities and supportive environments;
- frame measurement strategies in terms of capacities or capitals (social, human, cultural, environmental and economic) because these are the fundamental resources for building resilience for individuals and communities;



- contextualize quantitative population-level data by including case studies that examine how community resilience is built in localities in response to specific stressors;
- develop a whole-system approach to measuring common domains of resilience by promoting intersectoral collaboration among the health, emergency planning, economic development and education sectors and civil society organizations;
- engage citizens in assessment and use participatory methods to promote collective action and develop a shared understanding of community resilience within marginalized communities;
- produce a high-level summary of vulnerabilities and assets at a population level as a “strategic lens” to guide public health action on community resilience; and
- share with other countries knowledge and practice from effective interventions and case studies that have measured and empowered resilient communities.

## 4. CONCLUSIONS

Measuring community resilience is challenging and requires a holistic approach that takes account of local capacities, community assets and vulnerabilities. Health and well-being were seldom the primary focus of community resilience studies and no validated indicator set is available for immediate implementation at the national scale. Despite this, this review identified a range of measurement strategies and key principles to guide national and local assessments of health-related community resilience. These include to:

- measure across multiple domains related to the wider determinants of health;
- identify community strengths or types of capital;
- contextualize knowledge, taking account of the diversity between and within communities;
- use qualitative research to supplement quantitative population-level data;
- incorporate stakeholder views, including community voices, in any assessment; and
- link assessment to action planning to build community resilience.

Much evidence from related fields could be applied in measuring health-related community resilience as part of Health 2020. The review also identified useful examples from both urban and rural areas within the WHO European Region, creating the potential for shared learning. Although this review has identified the best available evidence on measurement strategies, including those used in the WHO European Region, there is scope for developing a comprehensive assessment framework for health-related community resilience.




## REFERENCES


1. Resilience for public health: supporting transformation in people and communities. Glasgow: Glasgow Centre for Population Health; 2014 (Concepts Series 12).
2. Friedli, L. Mental health, resilience and inequalities. Copenhagen: WHO Regional Office for Europe; 2009 ([http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0012/100821/E92227.pdf](http://www.euro.who.int/__data/assets/pdf_file/0012/100821/E92227.pdf), accessed 27 August 2018).
3. Brodsky AE, Cattaneo LB. A transconceptual model of empowerment and resilience: divergence, convergence and interactions in kindred community concepts. *Am J Community Psychol.* 2013;52:333–46.
4. Asadzadeh A, Kötter T, Salehi P, Birkmann J. Operationalizing a concept: the systematic review of composite indicator building for measuring community disaster resilience. *Int J Disaster Risk Reduct.* 2017;25:147–62.
5. Wille N, Ravens-Sieberer U. How to assess resilience: reflections on a measurement model. In: *Health assets in a global context: theory, methods, action.* New York: Springer; 2010:117–43.
6. Buikstra E, Ross H, King CA, Baker PG, Hegney D, McLachlan K et al. The components of resilience: perceptions of an Australian rural community. *J Community Psychol.* 2010;38(8): 975–91.
7. Pfefferbaum B, Van Horn R, Pfefferbaum R. A conceptual framework to enhance community resilience using social capital. *Clin Soc Work J.* 2017;45(2):102–10.
8. Reeves A, McKee M, Gunnell D, Chang SS, Basu S, Barr B et al. Economic shocks, resilience, and male suicides in the Great Recession: cross-national analysis of 20 EU countries. *Eur J Public Health.* 2014;25(3):404–9.
9. Cutter SL. The landscape of disaster resilience indicators in the USA. *Nat Hazards.* 2016;80(2):741–58.
10. Johansen C, Horney J, Tien I. Metrics for evaluating and improving community resilience. *J Infrastruct Syst.* 2017;23(2):04016032.
11. Ostadtaghizadeh A, Ardalan A, Paton D, Jabbari H, Khankeh HR. Community disaster resilience: a systematic review on assessment models and tools. *PLOS Curr.* 2015;7:e-publication, doi: 10.1371/currents.dis.f224ef8efbdfcfid508ddode4d8210ed.
12. Vaneekhaute LE, Vanwing T, Jacquet W, Abelshausen B, Meurs P. Community resilience 2.0: toward a comprehensive conception of community-level resilience. *Community Dev J.* 2017;48(5):735–51.

13. Zautra A, Hall J, Murray K. Community development and community resilience: an integrative approach. *Community Dev J.* 2008;39(3):130–47.
14. Definitions of community resilience: an analysis. A CARRI Report. Washington (DC): Community and Regional Resilience Institute; 2013.
15. Patel S, Rogers MB, Amlôt R, Rubin GJ. What do we mean by “community resilience”? A systematic literature review of how it is defined in the literature. *PLOS Curr.* 2017;9:e-publication, doi: 10.1371/currents.dis.db775aff25efc5ac4f0660ad9cf7db2.
16. Ross H, Berkes F. Research approaches for understanding, enhancing, and monitoring community resilience. *Soc Natur Resour.* 2014;27(8):787–804.
17. Magis K. Community resilience: an indicator of social sustainability. *Soc Natur Resour.* 2010;23(5):401–16.
18. Health 2020: a European policy framework supporting action across government and society for health and well-being. Copenhagen: WHO Regional Office for Europe; 2012 ([http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0006/199536/Health2020-Short.pdf?ua=1](http://www.euro.who.int/__data/assets/pdf_file/0006/199536/Health2020-Short.pdf?ua=1), accessed 27 August 2018).
19. Health 2020: a European policy framework and strategy for the 21st century. Copenhagen: WHO Regional Office for Europe; 2012 ([http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0011/199532/Health2020-Long.pdf?ua=1](http://www.euro.who.int/__data/assets/pdf_file/0011/199532/Health2020-Long.pdf?ua=1), accessed 27 August 2018).
20. Health in all policies. Helsinki statement. Framework for country action. Geneva: World Health Organization; 2014 (<http://www.ngos4healthpromotion.net/wordpressa4hp/wp-content/uploads/2016/11/helsinki.pdf>, accessed 27 August 2018).
21. Building resilience: a key pillar of Health 2020 and the Sustainable Development Goals – examples from the WHO Small Countries Initiative. Copenhagen: WHO Regional Office for Europe; 2017 ([http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0020/341075/resilience-report-050617-h1550-print.pdf?ua=1](http://www.euro.who.int/__data/assets/pdf_file/0020/341075/resilience-report-050617-h1550-print.pdf?ua=1), accessed 27 August 2018).
22. Ziglio, E. Strengthening resilience: a priority shared by Health 2020 and the Sustainable Development Goals. Copenhagen: WHO Regional Office for Europe; 2017 ([http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0005/351284/resilience-report-20171004-h1635.pdf](http://www.euro.who.int/__data/assets/pdf_file/0005/351284/resilience-report-20171004-h1635.pdf), accessed 27 August 2018).
23. Bartley M, Schoon I, Mitchell R, Blane D. Resilience as an asset for healthy development. In: Morgan A, Davies M, Ziglio E, editors. *Health assets in a global context.* New York: Springer; 2010:101–15.




- 
24. What is resilience and how to operationalise it? Paris: Organisation for Economic Co-operation and Development; 2018 (<http://www.oecd.org/dac/conflict-fragility-resilience/risk-resilience/>, accessed 20 March 2018).
  25. Seaman P, McNeice V, Yates G, McLean J. Resilience for public health: supporting transformation in people and communities. Glasgow: Glasgow Centre for Population Health; 2014.
  26. Liebenberg L, Joubert N, Foucault M. Understanding core resilience elements and indicators: a comprehensive review of the literature. Ottawa: Public Health Agency of Canada; 2017.
  27. University College London Institute of Equity. Review of social determinants and the health divide in the WHO European Region: executive summary. Copenhagen: WHO Regional Office for Europe; 2013 (<http://www.instituteofhealthequity.org/resources-reports/review-of-social-determinants-and-the-health-divide-in-the-who-european-region-final-report/who-european-review-exec-summary.pdf>, accessed 27 August 2018).
  28. O'Sullivan T, Kuziemyky CE, Corneil W, Lemyre L, Franco Z. The EnRiCH community resilience framework for high-risk populations. PLOS Curr. 2014;6:e-publication, doi: 10.1371/currents.dis.11381147bd5e89e38e78434a732f17db.
  29. Ferlander S. The importance of different forms of social capital for health. Acta Sociol. 2007;50(2):115–28.
  30. Wallerstein N. Empowerment to reduce health disparities. Scand J Public Health. 2002;30(59):72–7.
  31. Foot J, Hopkins T. A glass half full: how an asset approach can improve community health and well-being. London: Improvement and Development Agency; 2010.
  32. Public Health England and NHS England. A guide to community-centred approaches for health and well-being. London: Public Health England; 2015.
  33. Morgan A. Revisiting the asset model: a clarification of ideas and terms. Glob Health Promot. 2014;21(3):2–6.
  34. Morgan A, Ziglio E. Revitalising the evidence base for public health: an assets model. Promot Educ. 2007;14(Suppl 2):17–22.
  35. Addressing the social determinants of health: the urban dimension and the role of local government. Copenhagen: WHO Regional Office for Europe; 2012 ([http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0005/166136/UrbanDimensions.pdf](http://www.euro.who.int/__data/assets/pdf_file/0005/166136/UrbanDimensions.pdf), accessed 27 August 2018).

36. Bagnall A-M, South J, Mitchell B, Pilkington G, Newton R, Di Martino S. Systematic scoping review of indicators of community well-being. London: What Works Well-being; 2017.
37. Mguni N, Bacon N, Brown J. The well-being and resilience paradox. London: The Young Foundation; 2012.
38. Public Health England, Institute of Health Equity. Local action on health inequalities: building children and young people's resilience in schools. London: Public Health England; 2014.
39. Davis R, Rivera D, Fujie Parks L. Moving from understanding to action on health equity: social determinants of health frameworks and THRIVE. Oakland (CA): Prevention Institute; 2015.
40. Rippon S, South J. Promoting asset based approaches for health and well-being: exploring a theory of change and challenges in evaluation. Leeds: Leeds Beckett University; 2017.
41. Laverack G, Pratley P. What quantitative and qualitative methods have been developed to measure community empowerment at a national level? Copenhagen: WHO Regional Office for Europe; 2018 (Health Evidence Network synthesis report 59).
42. Mguni N, Caistor-Arendar L. Report on conceptual framework to measure social progress at the local level and case studies. Brussels: European Commission European Research Area; 2013.
43. Mguni N, Bacon N. The Wellbeing and Resilience Measure (WARM): taking the temperature of local communities. London; The Young Foundation; 2010.
44. Mguni N, Caistor-Arendar L. Rowing against the tide: making the case for community resilience. London: The Young Foundation; 2012.
45. Norman W. Adapting to change: the role of community resilience. London: The Young Foundation; 2012.
46. City Resilience Framework. London: Arup International Development; 2014.
47. City Resilience Index. Research Report Volume 4: measuring city resilience. London: Arup International Development; 2016.
48. City Resilience Index. Understanding and measuring city resilience. London: Arup International Development; 2015.
49. Our resilient Glasgow: a city strategy. Glasgow: Glasgow City Council; 2016 (<https://www.glasgow.gov.uk/index.aspx?articleid=17668>, accessed 18 October 2017).

- 
50. Platts-Fowler D, Robinson D. Neighbourhood resilience in Sheffield: getting by in hard times. Sheffield: Centre for Regional Economic and Social Research, Sheffield Hallam University; 2013.
  51. Platts-Fowler D, Robinson D. Community resilience: a policy tool for local government? *Local Gov Stud.* 2016;42(5):762–84.
  52. Comber A, Boeck T, Hardman J, Jarvis C, Kraftl P. Methods for the spatial analysis of community well-being, resilience and vulnerability. In: Proceedings of the 15th AGILE Conference on Geographic Information Science, Avignon, France 2012.
  53. Poortinga W. Community resilience and health: the role of bonding, bridging, and linking aspects of social capital. *Health Place.* 2011;18:286–95.
  54. Sherrieb K, Norris F, Galea S. Measuring capacities for community resilience. *Soc Indic Res.* 2010;99(2):227–47.
  55. Foot J. What makes us healthy. The asset approach in practice: evidence, action, evaluation. Jane Foot; 2012 (e-publication; <http://janefoot.com/downloads/files/healthy%20FINAL%20FINAL.pdf>, accessed 15 June 2018).
  56. Cooke A, Stansfield J. Improving mental well-being through impact assessment: a summary of the development and application of a mental well-being impact assessment tool. London: National Mental Health Development Unit; 2009.
  57. Building community resilience in Maricopa County. Montpelier (VT): Institute for Sustainable Communities; 2016.
  58. IFRC framework for community resilience. Geneva: International Federation of Red Cross and Red Crescent Societies; 2014.
  59. Steiner A, Markantoni M. Unpacking community resilience through capacity for change. *Community Dev J.* 2014;49(3):407–25.
  60. Steiner A, Woolvin M, Skerratt S. Measuring community resilience: developing and applying “hybrid evaluation” approach. *Community Dev J.* 2016;53(1):99–118.
  61. Social impact report: Manor House Development Trust 2009–2015. London: Manor House Development Trust; 2015 (<http://www.mhdt.org.uk/wp-content/uploads/2015/08/MHDT-Social-Impact-Report-2009-2015.pdf>, accessed 15 June 2018).
  62. Amundsen H. Illusions of resilience? An analysis of community responses to change in northern Norway. *Ecol Soc.* 2012;17(4):46.

63. Berliner P, Larsen L, de Casas Soberón E. Case study: promoting community resilience with local values – Greenland’s Paamiut Asasara. In: Unger M, editor. *The social ecology of resilience: a handbook of theory and practice*. New York: Springer; 2012:387–97.
64. Cinderby S, Haq G, Cambridge H, Lock K. *Practical action to build community resilience: the Good Life Initiative in New Earswick*. York: Joseph Rowntree Foundation; 2014.
65. Cinderby S, Haq G, Cambridge H, Lock K. Building community resilience: can everyone enjoy a good life? *Local Environ*. 2016;21(10):1252–70.
66. Salvia R, Quaranta G. Place-based rural development and resilience: a lesson from a small community. *Sustainability*. 2017;9(6):889.
67. Hegney D, Ross H, Baker P, Rogers-Clark C, King C, Bulkstr E. *Building resilience in rural communities: toolkit*. Toowoomba (Queensland): University of Queensland and University of Southern Queensland; 2008.
68. Wilding N. *Exploring community resilience in times of rapid change*. Dunfermline: Carnegie United Kingdom Trust; 2011.
69. City profiles. In: *City Resilience Index [website]*. London: Arup International Development; 2018 (<https://join.cityresilienceindex.org/#/city-profiles>, accessed 15 June 2018).
70. Selected cities: explore the member cities in the 100 Resilient Cities Network. In: *100 Resilient Cities [website]*. New York: The Rockefeller Foundation; 2018 (<http://www.100resilientcities.org/cities/>, accessed 15 June 2018).
71. Norris F, Stevens SP, Pfefferbaum B, Wyche KF, Pfefferbaum RL. Community resilience as a metaphor, theory, set of capacities, and strategy for disaster readiness. *Am J Community Psychol*. 2008;41(1–2):127–50.
72. Cooke A, Friedli L, Coggins T, Edmonds N, O’Hara K, Snowden L et al. *Mental Well-being Impact Assessment: a toolkit for well-being, third edition*. London: National MWIA Collaborative; 2011.
73. *Roadmap to community resilience: operationalizing the framework for community resilience*. Geneva: International Federation of Red Cross and Red Crescent Societies; 2016.
74. Marmot M. *Fair society, healthy lives: the Marmot review*. London: University College London Institute of Health Equity; 2010.
75. World Health Organization, Calouste Gulbenkian Foundation. *Social determinants of mental health*. Geneva: World Health Organization; 2014.

- 
76. Hunter BD, Neiger B, West J. The importance of addressing social determinants of health at the local level: the case for social capital. *Health Soc Care Community*. 2011;19(5):522–30.
  77. Uphoff EP, Pickett KE, Cabieses B, Small N, Wright J. A systematic review of the relationships between social capital and socioeconomic inequalities in health: a contribution to understanding the psychosocial pathway of health inequalities. *Int J Equity Health*. 2013;12:54.
  78. Ross H, Berkes F. Research approaches for understanding, enhancing, and monitoring community resilience. *Soc Nat Resour*. 2014;27(8):787–804.
  79. Wilson G. Community resilience, globalization, and transitional pathways of decision-making. *Geoforum*. 2012;43(6):1218–31.
  80. Atkinson S, Bagnall A-M, Corcoran R, South J, Curtis S, di Martino S et al. What is community well-being? Conceptual review. London: What Works Well-being; 2017.
  81. Paton D, Sagala S, Okada N, Jang L-J, Bürgelt PT Gregg CE. Making sense of natural hazard mitigation: personal, social and cultural influences. *Environ Hazards*. 2010;9(2):183–96.
  82. Ungar M. Resilience across cultures. *Br J Soc Work*. 2008;38(2):218–35.
  83. Carrillo Álvarez E, Riera Romani J. Measuring social capital: further insights. *Gac Sanit*. 2017;31;57–61.
  84. Strategy and action plan for refugee and migrant health in the WHO European Region. Copenhagen: WHO Regional Office for Europe; 2016 ([http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0004/314725/66wdo8e\\_MigrantHealthStrategyActionPlan\\_160424.pdf?ua=1](http://www.euro.who.int/__data/assets/pdf_file/0004/314725/66wdo8e_MigrantHealthStrategyActionPlan_160424.pdf?ua=1), accessed 23 August 2018).
  85. DARWIN. Deliverable 1.2. Evaluation and selection of resilience concepts and approaches. In: Horizon 2020: secure societies. European Union Framework Programme for Research and Innovation; 2016 ([https://h2020darwin.eu/wp-content/uploads/2017/10/DARWIN\\_D1.2\\_Evaluation\\_and\\_selection\\_of\\_resilience\\_concepts\\_and\\_approaches.pdf](https://h2020darwin.eu/wp-content/uploads/2017/10/DARWIN_D1.2_Evaluation_and_selection_of_resilience_concepts_and_approaches.pdf), accessed 15 June 2018).
  86. Pawson R, Greenhalgh T, Harvey G, Walshe K. Realist review: a new method of systematic review designed for complex policy interventions. *J Health Serv Res Policy*. 2005;10(Suppl 1):21–34.

## ANNEX 1. SEARCH STRATEGY

### Methodological approach

A rapid review methodology was chosen based on the HEN resource for producing an evidence report (1). Rapid reviews are streamlined/accelerated forms of systematic review that normally combine published and grey literature (2) and are appropriate for scoping a range of approaches to inform policy-makers (3,4).

The search strategy combined key terms and synonyms for community resilience and terms for measurement and evaluation. Pilot searches were run to ensure the search identified a manageable amount of the most relevant publications. Searches were conducted on 13 November 2017 for publications between 1 January 2007 and 30 November 2017 in English, French, German and Russian within the peer-reviewed (Academic Search Complete, Campbell Collaboration, Centers for Disease Control and Prevention Guide to Community Preventive Services, Cumulative Index to Nursing and Allied Health Literature, Cochrane Database of Systematic Reviews/Evidence Aid, DARE Database of Abstracts of Reviews of Effects, Database of Promoting Health Effectiveness Reviews, PubMed, Social Policy and Practice, and Scopus) and grey (Ethos (British Library Catalogue of PhD theses)), Google and Google Scholar, OpenSIGLE and OpenGrey) literature. These were complemented by search of 73 websites to identify other grey literature, including the websites of government, non-government, academic and collaborative organizations at local, national, international and global levels.

Supplementary citation searching was carried out using reference lists of recent reviews and key documents (5–14).

### Inclusion criteria

Articles were selected for inclusion in the review in a two-stage process: screening of titles and abstracts, followed by screening of full text articles. Inclusion criteria were applied by one reviewer, with decisions checked by a second reviewer. Any areas of uncertainty were discussed with the whole team and project advisors.

In the first screening, only articles from Member States of the WHO European Region in English, French, German and Russian were selected. However, as European data were limited, global data were selected in a second screening. Studies related



to all population groups in community/neighbourhood/city, country/regional, health service and school/educational settings were eligible for inclusion if they:

- evaluated or measured community resilience or related concepts;
- were methodological studies on developing measures or identifying barriers and facilitators to measurement of community resilience or related concepts;
- were conceptual or theoretical papers about measuring community resilience or related concepts; or
- were guidelines/guidance on measuring community resilience and related concepts.

These included any studies reporting national- or regional-level measurement/indicators or area-/programme-level measurement/indicators with the potential to be scaled up, particularly those using quantitative, qualitative and mixed methodology.

Studies that did not specify the measurement of health and well-being or determinants of health or were about individual or system-level resilience were excluded.

Decisions on inclusion of small-scale studies, mostly qualitative, were discussed within the team; only those that reported a framework or methods that had the potential to be scaled up or applied in other contexts were included.

## Search terms

**Search 1. Core concepts and synonyms:** (community N2 (resilience OR “disaster resilience” OR asset OR strengths OR capabilities)) OR (“community adaptation” N2 adversity) OR ((resilient OR strong) N2 communities) OR “social resilience” OR “health assets” OR (bounce N2 (back OR forward)) OR “disaster recovery” OR hardiness

**String 2. Measurement and evaluation:** ((evaluation OR assessment OR outcome OR thematic OR logic\* OR measurement OR evidence) N2 (framework OR model OR tool OR resource)) OR domain\* OR scale OR (tool N2 (box or kit)) OR dashboard OR “case study” OR indicator\* OR measure\*

**String 3. Measurement and evaluation II (keywords):** methodology OR model OR questionnaire OR survey OR outcome\* OR indicator\* OR measure\*

**String 4. Related concepts:** (social N2 (networks OR support OR capital)) OR (community N2 (capacity OR resources)) OR connectedness OR (healthy N2

((communities OR cities)) OR “active citizenship” OR ((community OR collective)  
N2 control) OR empowerment

The same search strategy was used for all databases:

- Strings 1 AND 2 – core search
- Strings 1 AND (Strings 2 OR 3) – included if not many papers on measurement were identified
- String 4 – only included if little relevant literature was identified.

## Data extraction

The literature searches identified a total of 3753 records (3629 from database searches and 124 from website and supplementary searches) after removal of duplicates. A small set of “borderline” papers were rescreened to provide additional literature from outside the WHO European Region. After screening of full text articles, 33 publications were included in the review, all reporting on methodologies for measuring community resilience that explicitly cover health and well-being. Of these, 27 reported on work developed or applied within the WHO European Region and six were from outside the Region (Fig. A1.1).

Data extraction fields on country, setting, population, study design, type of measurement, conceptual framework and indicators were mapped using a ladder of measurement (Table A1.1), originally developed for a review of asset-based measurement, to aid mapping (10,11). First, tables with summaries of the data extraction fields were produced. Findings were then summarized in a narrative synthesis, grouped by type of methodological approach and areas of measurement, and used to inform policy considerations.



Fig. A1.1. Prisma flow diagram for the review

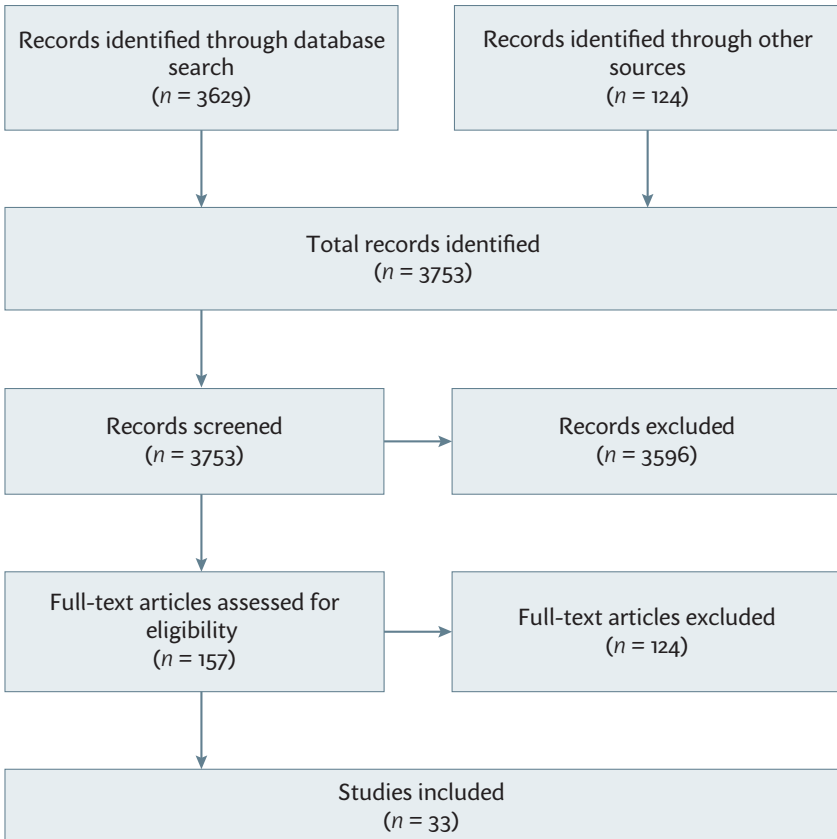


Table A1.1. Ladder of measurement

Ladder of measurement	What do they do?
1. Conceptual frameworks	<ul style="list-style-type: none"> <li>· Unpack complex constructs into different concepts/ domains</li> <li>· Provide definitions and may link to validated tools</li> </ul>
2. Measurement and evaluation frameworks	<ul style="list-style-type: none"> <li>· Provide guidance on what can be measured and how</li> <li>· Often provide domains of measurement</li> <li>· Can be used to guide data collection and report outcomes</li> </ul>
3. Logic models/ logical frameworks/ theory of change/ evaluation plans	<ul style="list-style-type: none"> <li>· Articulate causal pathways</li> <li>· Identify the expected outcomes (short, medium and long term) of specific interventions or types of intervention</li> </ul>
4. Indicator sets or frameworks	<ul style="list-style-type: none"> <li>· Specify indicators that can be measured quantitatively, usually at a population level</li> <li>· Public health indicator sets typically cover a range of measures: health (including mortality and morbidity), economic, social and service data</li> </ul>
5. Measures, indicators and scales	<ul style="list-style-type: none"> <li>· Indicators specify attributes or outcomes that can be measured quantitatively</li> <li>· A single indicator can be broken down to a series of (validated) measures or variables</li> <li>· Indicators at population level assess trends in health or health systems</li> <li>· Proxy indicators show change in a related outcome that is easier to measure than the actual phenomenon</li> </ul>
6. Validated tools or questionnaires	<ul style="list-style-type: none"> <li>· Consist of questions that operationalize indicators</li> <li>· Usually administered through surveys</li> </ul>

Source: Rippon & South, 2017 (11).



## References

1. Karlsson L, Takahashi R. A resource for developing an evidence synthesis report for policy-making. Copenhagen: WHO Regional Office for Europe; 2017 (Health Evidence Network synthesis report 50; [http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0008/347930/HEN50-Web.pdf](http://www.euro.who.int/__data/assets/pdf_file/0008/347930/HEN50-Web.pdf), accessed 12 September 2018).
2. Thomas J, Newman M, Oliver S. Rapid evidence assessments of research to inform social policy: taking stock and moving forward. *Evid Policy*. 2013;9(1):5–27.
3. Gough D, Elbourne D. Systematic research synthesis to inform policy, practice and democratic debate. *Social Policy Society*. 2002;1(3):225–36.
4. Tricco AC, Langlois EV, Straus SE, editors. Rapid reviews to strengthen health policy and systems: a practical guide. Geneva: World Health Organization; 2017.
5. Building resilience: a key pillar of Health 2020 and the Sustainable Development Goals – examples from the WHO Small Countries Initiative. Copenhagen: WHO Regional Office for Europe; 2017 ([http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0020/341075/resilience-report-050617-h1550-print.pdf?ua=1](http://www.euro.who.int/__data/assets/pdf_file/0020/341075/resilience-report-050617-h1550-print.pdf?ua=1), accessed 27 August 2018).
6. Seaman P, McNeice V, Yates G, McLean J. Resilience for public health: supporting transformation in people and communities. Glasgow: Glasgow Centre for Population Health; 2014.
7. Asadzadeh A, Kötter T, Salehi P, Birkmann J. Operationalizing a concept: the systematic review of composite indicator building for measuring community disaster resilience. *Int J Disaster Risk Reduct*. 2017;25:147–62.
8. Ostadtaghizadeh A, Ardalan A, Paton D, Jabbari H, Khankeh HR. Community disaster resilience: a systematic review on assessment models and tools. *PLOS Curr*. 2015;7:e-publication, doi: 10.1371/currents.dis.f224ef8efbdfcfid508ddode4d8210ed.
9. Public Health England and NHS England. A guide to community-centred approaches for health and well-being. London: Public Health England; 2015.
10. Bagnall A-M, South J, Mitchell B, Pilkington G, Newton R, Di Martino S. Systematic scoping review of indicators of community well-being. London: What Works Well-being; 2017.
11. Rippon S, South J. Promoting asset based approaches for health and well-being: exploring a theory of change and challenges in evaluation. Leeds: Leeds Beckett University; 2017.

12. Atkinson S, Bagnall A-M, Corcoran R, South J, Curtis S, di Martino S et al. What is community well-being? Conceptual review. London: What Works Well-being; 2017.
13. Khalili S, Harre M, Morley P. A temporal framework of social resilience indicators of communities to flood, case studies: Wagga Wagga and Kempsey, NSW, Australia. *Int J Disaster Risk Reduct.* 2015;13:248–54.
14. Linnell M, Johansson C. A literature review on community approaches that involve the public in crisis management. Fostering community resilience through coproduction by response organizations and citizens. Jyväskylä: Public Empowerment Policies for Crisis Management, University of Jyväskylä; 2014 (FP7-284927).



**World Health Organization**

**Regional Office for Europe**

UN City, Marmorvej 51, DK-2100 Copenhagen Ø, Denmark

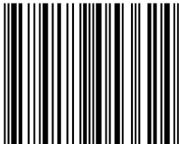
Tel.: +45 45 33 70 00

Fax: +45 45 33 70 01

Email: [eurocontact@who.int](mailto:eurocontact@who.int)

Website: [www.euro.who.int](http://www.euro.who.int)

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