General introduction
1.1 BACKGROUND

1.1.1 Health challenges as wicked problems

Health is a fundamental right for all human beings (1). A healthy population is also important for social and economic prosperity and for the wellbeing of all; for example, (chronic) diseases have major labour market impacts (2). Therefore, policy makers, health professionals and society at large have a stake at attaining the best possible state of health for all.

One way to attain good population health is delivery of adequate cure and care services for those in need. In addition, it is also necessary to prevent the development of health problems and to improve and promote health. The Ottawa Charter on Health Promotion defines health promotion as: ‘the process of enabling individuals and communities to increase control over, and to improve their health’ (3).

The promotion of health is challenging because many factors outside the realm of the health sector itself have considerable health impacts. The model of Dahlgren and Whitehead (4) is one of the most frequently used models showing how individual health is affected by people’s lifestyle factors and the social and community networks, living and working conditions and broader societal circumstances and developments.

Figure 1. Model of health and its determinants. Source: Dahlgren and Whitehead, 1991
Because of the interconnectedness of health and other policy fields, many health challenges are ‘wicked problems’. Rittel and Webber (1973) introduced the term wicked problems. Such problems are linked, in complex ways, to many other, related, problems, as well as to different interests or goals of a variety of stakeholders. Wicked problems are hard to define without, at the same time, considering possible directions to resolve them, but a ready-made solution is not available. They can only be properly addressed when there is an understanding of the complexities of their broader context. Resolution of wicked problems goes step-by-step in a trial-and-error mode and it is impossible to define exactly when the resolution is ‘good enough’ (5).

An example of a wicked problem is obesity. Although the increase of obesity rates of the past years seems to be slowing down, the rates are still a cause of concern. In 2014, 16% of adults in EU member states were obese, i.e. had a BMI of 30 or more; this was the case for 11% in 2000. In the Netherlands, in 2015, 13.7% was obese. Of youth under 20, 2.8% was obese (6).

Another wicked problem is the persisting health gap between groups with a higher and a lower socioeconomic status. In the Netherlands, of the group with lowest educational level 47% rated their health as good, while 86% of those with high education rate their health as good (volksgezondheidenzorg.info - monitor data 2012). In Europe, of the quintile of the population in the highest income group, 80% reports being in good health, while for the quintile in the lowest income group this is the case for 60%. There are also differences in important health determinants. For example, smoking is more common in low-income groups: in Europe 14% of people with high income smoke, and 20% of those with low income (OECD Health at a glance Europe 2016).

Because of the complexity of these wicked problems, single interventions are not sufficient to reduce the obesity epidemic and socioeconomic health inequalities. They cannot be addressed by a one-stop solution. So although in health promotion the focus is often on (individual or community focused) behavioural interventions, it is important to complement these with upstream policies, i.e. policies that shape living circumstances that affect health or health behaviour, like education policies, the production of foods and transport, health care, social support, employment, housing, economic and environmental policies (7-9).
1.1.2 Health in All Policies and Whole of Government approaches for health promotion

The coordinated policy approach of all different sectors to promote the health of populations or population groups is often referred to as Health in All Policies (HiAP). Sihto et al. (2006) define this as ‘a horizontal, complementary policy-related strategy contributing to improved population health. The core of HiAP is to identify and address determinants of health that can be altered to improve health but are mainly controlled by the policies of sectors other than health’ (10). The approach explicitly emphasises that the promotion of health is a (joint) responsibility of all relevant sectors (11). It thus exceeds the related concept ‘Healthy Public Policy’ (HPP) that was developed in 1988 (12). HPP means that there is a concern for health issues in policy development, but not necessarily that there is a coordinated strategy underlying this (13, 14). In 2010, sixteen countries and regions worldwide had applied HiAP (15). HiAP is a prominent element in the Health 2020 policy framework and strategy of the WHO Regional Committee for Europe (16) and in the WHO Healthy Cities network in Europe (17). The Dutch government, since the late eighties of last century, considers HiAP as an important way to address complex health issues (13). In 2011, the policy document ‘Gezondheid Dichtbij’ (Health Close By) (18) was published, which currently still constitutes the basis for the government’s public health policy, focusing on reducing chronic diseases and on closing the health gap between groups with higher or lower socioeconomic position (19).

HiAP typically requires a ‘Whole of Government’ approach (20). The ‘Whole of Government’ approach was developed to overcome the barriers to effective problem-solving posed by ‘pillarised’ policymaking. It means that public agencies develop cross-border activities, without removing the borders themselves, in order to address wicked (health and other) problems that require coordinated governmental action (21, 22).

A key tool for HiAP and the Whole of Government approach is Health Impact Assessment (HIA), a systematic way to prospectively estimate expected and unexpected –positive and negative- impacts of policies and programs on health (determinants) and their distribution across populations. HIA thus provides policy makers with information they can utilize to create healthier policies, programmes or projects (23-29). The engagement of affected population groups, for example residents living close to planned spatial developments, is advocated in HIA guidelines for reasons of democracy and transparency in decision-making (28, 30).
1.1.3 Whole of society approach for health promotion

Although coordinated governmental action is a key element for HiAP, resolving wicked problems requires more than such policy-based action. Many actors in civil society can contribute to promotion of population health, including, for example, (health promotion and other) professionals, schools, employers and entrepreneurs as well as the general public. Therefore, the Whole of Government approach by itself is insufficient; it needs to be complemented by a ‘Whole of Society’ approach that involves all relevant actors in civil society. Kickbusch and Gleicher (20) define Whole of Society approaches as ‘a form of collaborative governance that emphasizes coordination through normative values and building trust among various actors in society. The approaches usually imply steering instruments that are less prescriptive, less committed to a uniform approach and less centralized and hierarchical’ (20 p34). Thus, the Whole of Society approach moves away from a one-dimensional ‘technocratic’ approach in health promotion to an approach where different actors explore how shared goals, like ‘reducing the obesity epidemic’ or ‘closing the health gap’ should be attained. These actors can be any person or group committed to contribute to finding solutions for a problem, and their action is primarily based on this intrinsic motivation, instead of on predefined policy decisions. The Dutch National Program ‘Alles is Gezondheid’ (Everything is Health) (31), which is part of the national prevention policy mentioned before, is a typical example of a Whole of Society approach. This program, in place since 2014, aims at stimulating societal partners from different work fields to develop and connect activities to improve the health of the population or of specific population groups. One of the mechanisms applied in the program is the ‘pledge’ in which societal partners present the activities they will develop to this aim. The pledges show a large variety in topics, activities, and stakeholders. Other mechanisms include a range of communicative activities, conferences and meetings, and ‘challenges’ where societal partners can link up to a specific theme during a short time interval.

1.2 A NEW ROLE FOR COMMUNITIES IN HEALTH PROMOTION

Communities are considered as important allies in health promotion strategies, contributing to the Whole of Society approach. A community is “a group of people with diverse characteristics who are linked by social ties, share common perspectives, and engage in joint action in geographical locations or settings” (31 p1936). By partnering with communities, it becomes possible to develop tailored interventions. Moreover, engaging citizens and communities is considered as an expression of democratic values. One of the five core strategies of the Ottawa Charter for Health Promotion (3), therefore,
is to strengthen community action. In the next sections, the focus will be on community action and on new ways communities can contribute to Whole of Society processes.

Table 1. Terms relating to HiAP (10, 12, 20, 21, 28)

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tr>
<td>Health in All Policies</td>
<td>A horizontal, complementary policy-related strategy contributing to improved population health</td>
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<tr>
<td>Healthy Public Policy</td>
<td>An explicit concern for health and equity in all areas of policy and an accountability for health impact.</td>
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<tr>
<td>Whole of Government</td>
<td>Whole-of-government denotes public services agencies working across portfolio boundaries to achieve a shared goal and an integrated government response to particular issues</td>
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<tr>
<td>Whole of Society</td>
<td>A form of collaborative governance that emphasizes coordination through normative values and building trust among various actors in society</td>
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<tr>
<td>Health Impact Assessment</td>
<td>A combination of procedures, methods and tools that systematically judges the potential, and sometimes unintended, effects of a policy, plan, programme or project on the health of a population and the distribution of those effects within the population</td>
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1.2.1 Asset based approaches as a basis for community engagement

For a long time, the focus in health promotion has been on those problems that professionals identify and define. However, over the past years, new approaches were developed that were more inclusive to citizens and communities. For example, the ‘intervention mapping’ methodology, a systematic procedure to analyse a problem in order to develop or apply effective interventions, nowadays includes dialogue with the target community as part of a needs assessment. In addition, it recommends that the community remains engaged throughout the whole process (33). Inclusiveness in intervention mapping is an example of an ‘asset-based approach’. Morgan and Ziglio (2007) introduced this term. The asset-based approach “aims to redress the balance between evidence derived from the identification of problems to one which accentuates positive capability to jointly identify problems and activate solutions, which promotes the self-esteem of individuals and communities leading to less dependency on professional services” (34 p18). This does not mean that health problems or challenges are overlooked: Morgan and Ziglio present the asset-based approach as a complement to the problem-based approach. The asset-based approach draws strongly on the theoretical notion of salutogenesis, or how health, instead of disease, is being produced. The salutogenic model, developed by Antonovsky, (1996) focuses on the resources that people have to ensure their wellbeing and health. Core in this model is the Sense of Coherence (SOC), this means the extent to which people experience the world as comprehensible, meaningful and manageable. According to
the theory about salutogenesis, a higher SOC enables people to feel healthy and make healthier life choices (35, 36). Asset-based health promotion links up to these resources and tries to strengthen them. This is reflected in methods applied in health promotion, like community asset mapping, appreciative inquiry and participatory appraisal (37).

1.2.2 Asset-based approaches in the Netherlands

The asset-based approach is recently becoming particularly meaningful in the Netherlands because of two important national policy developments. Firstly, the coordination of services in the social domain is decentralised from national government to municipalities. Municipalities develop new local policies in relation to these services that link up with specific local contexts and perspectives, needs and possibilities of local communities. These policies and their implementation differ from municipality to municipality; however, enhancing citizens’ own strength is a core element in all new local policies in the social domain.

The enhancement of people’s own strength relates to the second development. Dutch policies currently promote a ‘participation society’ in which citizens rely on their own resources to retain a high level of wellbeing, albeit supported by public agencies wherever necessary (38). This requires that the abilities and qualities of citizens and communities are recognized, acknowledged, and supported by those public agencies. It also requires that there is space for citizens and communities to develop new, community based and tailor-made solutions to local challenges. One important example of how the new ‘participation society’ is implemented is new legislation on spatial planning, in which participation is mandatory. However, the abilities and capacities of local communities may vary both geographically and across, for example, socioeconomic groups. Therefore, participation procedures and methods need to be adapted to these abilities and capacities, in order to safeguard environmental equity (39).

The focus on self-reliance in Dutch policies is reflected in the use of a health concept where health is understood as “the ability to adapt and self-manage in the face of social, physical, and emotional challenges” (40). This ‘positive health’ concept, containing six dimensions (Figure 2), places a stronger focus on health than on health problems or disease. (41). Therefore, it is considered to fit in with asset-based approaches. However, it is also debated because of exactly this focus and the absence of consideration of contextual and structural societal factors affecting people’s health (42, 43).
1.2.3 Utilising communities’ knowledge

As health promotion is starting to become more inclusive towards communities and more asset-based, researchers and health promoters have also started to consider how the evidence base for health promotion can be adapted to this new paradigm. Traditionally, the evidence base for health promotion was for a large part built on epidemiological data and health researchers considered the randomised controlled trial as the ‘gold standard’ to further develop this evidence base (e.g., 44). Critics of this approach have argued, firstly, that the resources and experiential information of communities were too easily overlooked and therefore were under-utilised. Secondly, they claimed that the expert view on health problems might not be recognised as such by the target groups of health promotion. This may lead to interventions to address the problems that are less effective as compared to interventions that are based on joint views developed with the target groups. And, thirdly, critics of the ‘purely epidemiological’ approach emphasise the importance of contextual factors in health promotion and its success or failure (45-49). One of the ways to include such contextual factors is by engaging the target groups in the research process. The result is ‘socially robust’ knowledge that includes both scientific and lay, local and traditional knowledge and that is developed in dialogue with stakeholders and the public in general (50). This approach towards knowledge links up with the Whole of Society approach in health promotion discussed under 1.1.3 (20). It is also related to notions about the power of (groups of) lay people to provide accurate estimations or predictions: the wisdom of crowds (51).
However, ‘better’ or more complete knowledge, so that interventions or policies can be more effective, is not the only consideration underpinning the engagement of lay people in knowledge production. Corburn (52), discussing the arguments for inclusion of local knowledge in environmental health research argues that participation, by including the voice of underprivileged groups, also promotes democratic decision-making, equity and (environmental) justice. More generally speaking, one could add that citizen and community participation in knowledge production may promote ‘knowledge democracy’ (53) a situation where knowledge is not restricted to a scientific elite but is freely available to all.

### 1.2.4 Participation

In this thesis, citizen and community participation is a core theme. Following the World Health Organization, participation is defined as: “a process by which people are enabled to become actively and genuinely involved in defining the issues of concern to them, in making decisions about factors that affect their lives, in formulating and implementing policies, in planning, developing and delivering services and in taking action to achieve change” (54 p10).

This definition however is rather generic and in practice, participation can take different shapes. In 1969, Arnstein developed a ‘ladder’ to describe different levels of participation (55). This ladder contains different rungs that represent different levels of participation, from ‘nonparticipation’ through various degrees of ‘tokenism’ to ‘citizen power’ (Figure 3).

![Figure 3. Ladder of participation. Source: Arnstein, 1969](image)

The focus, in Arnstein’s ladder, on power suggests that only this element reflects the value of participation processes. Arnstein’s model does not address the question who exactly
is participating and how power is distributed between groups of citizens. The actual participation mechanisms and the meaning of participation for the citizens themselves also remain out of sight (56-58). In other words, in health promotion, participation entails more than including people in decision-making and it is important to look at both methods and impacts on health (behaviour), self-efficacy and empowerment of the target groups.

1.3 PURPOSE OF THIS THESIS

1.3.1 Research question
The aim of this thesis is to advance knowledge that supports the development of active engagement of citizens as partners in HiAP, employing an asset-based approach. One of the assets of citizens is their experiential knowledge. Although tapping this knowledge is common in health promotion practice in the Netherlands, for example in needs assessment, much is yet unknown about the possibilities of joint knowledge production with and by citizens themselves, or Citizen Science. The thesis therefore focuses on the main question:

“What are possible methods to engage citizens in developing the knowledge base for Health in All Policies (HiAP), and what are challenges and benefits of such engagement?”

The thesis draws on two case studies carried out in the Netherlands where the practical application of citizen engagement in developing knowledge for HiAP was studied, one case study focusing on health promotion professionals’ perceptions of neighbourhood health assets and three explorations of the literature on an international level.

1.3.2 Outline of this thesis
This thesis contains six chapters based on the six studies exploring methods, benefits and challenges of Citizen Science approaches for public health in different ways. Table 2 provides an overview, per chapter, of these studies.

Chapter 2 contains a theoretical exploration of the value, possibilities and challenges of application of Citizen Science in public health research. It describes the background of Citizen Science and presents a typology of different types of Citizen Science, illustrated with examples. The challenges for public health Citizen Science are discussed. A model of possible benefits of Citizen Science application in public health is presented.
Chapter 3 describes a case study in a low-SES neighbourhood. In this neighbourhood, citizen scientists interviewed fellow residents to gather knowledge about the community’s views on health assets in their neighbourhood. Such knowledge, as discussed under section 1.2.3, is crucial for the application of a ‘Whole of Society’ approach. The chapter focuses on the impact of participation on these citizen scientists.

Chapter 4 focuses on citizen participation in Health Impact Assessment (HIA) as a specific type of Citizen Science approach in public health. HIA is an *ex ante* assessment of the expected impacts of a project, policy or program, producing evidence to support HiAP. This chapter describes how, in scientific papers, community engagement in HIA is described and what the experiences in practice examples are. This was studied by carrying out a scoping review, including different types of scientific and grey publications.

Chapter 5 describes a case study of stakeholder engagement in a specific HIA process. The case concerned two workshops on Health Impact scoping. The study focused on the question whether the engagement of citizens and other stakeholders in health ‘scoping’, i.e. the determination of possible health impacts, can contribute to consensus-building between these different groups.

Chapter 6 describes the results of a scoping review about neighbourhood auditing, or the systematic assessment of those aspects of a neighbourhood that are important for community health and well-being. Adapting the neighbourhood to accommodate health needs of the residents requires cooperation between health and other stakeholders, for example in the field of spatial planning, housing or transport. Neighbourhood auditing provides evidence that can be used to support such local HiAP. The active participation of citizens in such audits, other than as respondents, can be considered as a Citizen Science approach. Many instruments for neighbourhood auditing are available; the scoping review was carried out to answer the question which instruments include residents or communities in the audit process and how such inclusion can be described.

Chapter 7 describes a field study of perceptions of local health promotion professionals in a low-SES neighbourhood on how they perceive the health assets for residents, present in this neighbourhood. This study was carried out in the same neighbourhood as the study described in Chapter 3.

The thesis is finalized by Chapter 8 that contains a general discussion leading to answers to the central question of this thesis. This chapter also presents a set of implications for practice, research, and policy.
Table 2. Overview of studies underlying this thesis

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Study question</th>
<th>Methods applied</th>
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<tr>
<td>2. Citizen Science for Public Health</td>
<td>What is the value of Citizen Science in public health?</td>
<td>Exploration of the literature about Citizen Science in other work fields and application of insights gathered on the field of public health.</td>
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<td>a. What approaches exist in Citizen Science?</td>
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<td>b. What are challenges for Citizen Science application in public health research?</td>
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<td>c. How could Citizen Science promote better citizen engagement in public health policies and better health?</td>
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<td>3. Public health Citizen Science; perceived impacts on citizen scientists. A case study in a low income neighbourhood in the Netherlands</td>
<td>What impacts were experienced by citizen scientists participating in a public health research project?</td>
<td>Participatory action research contributing to setup of Citizen Science project (concepts, methods and materials). Focus groups, interviews, questionnaire.</td>
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<td>4. Community participation in Health Impact Assessment. A scoping review of the literature</td>
<td>How is community participation in HIA currently perceived and how is it put to practice?</td>
<td>Scoping review in scientific and grey literature and member checking by experts.</td>
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<td>a. How do practitioners and researchers view community participation in HIA?</td>
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<td>b. What methods are used for community participation in HIA?</td>
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<td>c. What are the experiences and effects of community participation in HIA?</td>
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<td>5. We are all experts! Does stakeholder engagement in Health Impact Scoping lead to consensus? A Dutch case study</td>
<td>Did stakeholder and resident engagement in Health Impact scoping lead to consensus?</td>
<td>Participatory Action Research contributing to setup of scoping workshops (methods and concepts). Questionnaires, observation, interviews.</td>
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<td>a. In what way did the HIS workshops influence stakeholder perspectives on health and a healthy living environment?</td>
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<td>b. What level of actual and perceived consensus on these perspectives was reached at the HIS workshops?</td>
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<td>c. What were the perceived factors that contributed to or hindered the development of consensus on health and a healthy living environment?</td>
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<td>Chapter</td>
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| 6. Resident participation in neighbourhood audit tools - a scoping review| Which participative systematic neighbourhood auditing tools exist and how can these tools be characterized?  
  a. Which participative audit tools are available?  
  b. What level of resident participation is present in these audit tools?  
  c. What do these tools measure?  
  d. What (participation) methods are applied in these tools? | Scoping review in scientific and grey literature. |
| 7. Neighbourhood health assets: perceptions of local professionals in a Dutch low-SES neighbourhood. A qualitative study | What are perceptions of professionals, based in a ‘priority district’, on health, neighbourhood assets and residents’ capacities to create and maintain good health?  
  a. What is the professionals’ perception of health and of residents’ health status?  
  b. What is the professionals’ perception of available health assets in the neighbourhood and the way residents use these assets? | Interviews, Nominal Group Technique. |
REFERENCES


