Realising healthy urban areas

A Study of current Challenges in the Netherlands and Recommendations to overcome them

Tim Willem Sebastiaan de Groot

Thesis Report

MSc Management in the Built Environment

''Voor de B.V. Nederland is de gezonde mens gewoon goed.''
- HB2, 2023

Colophon

Name: T.W.S. (Tim) de Groot
Student number: 4558693

University: Technical University of Delft
Faculty: Faculty of Architecture and the Built Environment
Track: MSc Management in the Built Environment

First mentor: Dr.ir. T.A. (Tom) Daamen
Second mentor: Dr. C.J. (Clarine) van Oel

Graduation organisation: AM Gebiedsontwikkeling
Tutor (AM): Gilbert Kokenberg

Version: P5 Report
Date: 14-06-2023

Abstract

Preventive measures for a healthy population are becoming a trending topic in the Netherlands because of rising costs of care and an increasing population of elderly. Due to this, prevention methods in the built environment can help with minimising this problem. Urban area developments are ways for improving or developing new built environments. Health will need to become part of these developments. To research this, the following question was answered: ''How can actors involved in urban area (re)developments in the Netherlands realise healthy urban areas?'' The research was conducted using mixed methods of literature study, questionnaires and case studies. What was found is that actors need to collaborate following the rules of collaborative governance. Many challenges are seen such as ambiguous definitions and difficulties with monitoring. However, recommendations are found. These are: extended front-end work; digital twinning; involving medical actors; assigning an ambassador of health; introducing an after-delivery team for health; collaborating with knowledge institutes; monitoring on city level and introducing a database; investing increased returns in health interventions; clear norms set by the state; and a communal knowledge of health. These can help future healthy developments to be realised.

Keywords: urban area development, actor, health, integral, developers, collaboration, societal value

Table of contents

Introduction

The introduction of health in the built environment is important for future developments in the Netherlands. In this chapter, an introduction to the subject will be given. First, the reason for health in the urban environment will be given. Then, a problem statement will be given for this thesis. After that the scientific and societal relevance, the research questions, and the conceptual model will be discussed. The chapter ends with a reading guide for the total document.

Ageing population and increased care costs

The Netherlands has an increasingly older population. CBS (2022) says that in January 2022 , the population of 65 years and older was at 20%. In 1990 this number was 12,8%. Showing that people get older in the Netherlands. This trend is not expected to stop and CBS (2022) shows that in the coming years, this number will most likely increase to 50 percent.

With the ageing of the population, there will be more and longer need of healthcare. Zorginstituut Nederland (English: Dutch care institute) sees the total costs of care rise in the Netherlands (ZIN, 2021). They contribute this to three national demographic trends: 1. a rise in the total number of patients, mostly elderly; 2. the group of 65-plus patients is growing in comparison to the group that is younger than 65; and 3. costs per patient are most of the time higher with the group of patients of 65 or more. Trend analysis shows that nursing and care costs are higher for elderly people than younger. The group of 65 to 74 years has higher costs of around 99 euros, where the group of 85-plus pays on average more than 2.442 euros more than younger patients (ZIN, 2021).

The ageing population also puts pressure on the healthcare system in the Netherlands and its accessibility and quality (RIVM, 2017). Healthcare focus is increasingly focussed on preventing patients to use specialised and expensive care, and focussed on stimulating self management and prevention (RIVM, 2017), because this is a cheaper form of healthcare to let elderly live longer with healthy lifes. Preventive interventions are all interventions that have the goal of preventing sickness and complications of sickness as early as possible, of enhancing health and of protecting health (RIVM, n.d.)

Built environment and health

One of the ways to have influence on health is through the built environment. Almost 6% of the healthcare costs are from environmental effects and locally this can even increase to 14% (RIVM, 2022). In the Randstad and larger cities, this number is higher. It will be increasingly important to design and develop buildings and public spaces that positively contribute to the health of people (WA, n.d.). Not only environmental aspects affect health, but also promote healthy lifestyles and social well-being.

Aspects that contribute to a healthy environment are for instance: a good environmental quality (air, soil and sound); climate resilient (e.g. more green that counters the urban heat island effect); nature and water close by for pedestrians and cyclists; the design and urban planning of buildings and urban areas; social meeting places in the neighbourhoods

or urban farming; and a safe environment that enables elderly to safely go outside (RIVM, 2022).

Urban area development can contribute to healthy urban areas through taking health into account. The practice of 'gebiedsontwikkeling' (area development) is still in the making, it seems (Rooy, 2009) and with the introduction of the new 'Omgevingswet' (environmental law) poses new opportunities for municipalities and other actors to include health in new developments (GL, n.d.).

The healthy city is a topic that received noteworthy attention in the past years. In 1986, the World Health Organisation even started the Healthy Cities Programme. Towns were urged in this programme to introduce public health projects in their cities (Barton and Tsourou, 2000). Goldstein et al. (1996) gave the definition of such a healthy city: ''It will be a city that is continually creating and improving those physical and social environments and expanding those community resources which enable people to support each other in performing all the functions of life and in developing to their maximum potential.'' This definition touches on the three pillars of health that the WHO gave: physical, social and mental well-being (WHO, 1946).

Problem statement

The increasing importance of health brings this subject to the built environment and therefore to the development of new areas. This trend shows the necessity of introducing health in urban area developments. However, its implementation brings new challenges and new fields of knowledge into the fairly new practice of urban area developments. Additionally, the integration of health objectives may need new collaboration with cross-sector professionals. These stakeholders can all have different interests and ideas of what a healthy urban area is. The Omgevingswet will also give new ways of introducing health in the built environment. But, it is not certain yet what challenges this new element will bring (e.g. business case, new stakeholders, needed knowledge), what trade-offs will be needed to make and what the effective way of realising these new health concepts will be. This thesis intends to research the introduction of health objectives into the development process and explore effective ways of developing healthy and future proof urban area developments.

Societal and scientific relevance

A healthy population is a societal project. One of the goals of the government is to have a healthy population. Introducing this through the built environment can solve health issues in early stages or prevent health issues from occurring. Because of this prevention, state money can be saved and put into other projects for society. Challenges and trade-offs found in this thesis can help make this process easier and more effective for stakeholders such as developers, municipalities and more. This makes this research societal relevant.

Scientific relevance comes from connecting the fields of health and development. This connection is a trend in research and can be brought a step further to realisation. Also, a better understanding of processes and collaboration in urban area developments will be sought after. This will help the field of knowledge further.

Research questions

To be able to structure the research and to respond to the problem statement, research questions have been made. The main research question of this thesis is:

''How can actors involved in urban area (re)developments in the Netherlands realise healthy urban areas?''

To help answer this main question, several sub questions have been formulated. These are designed to piece together to be able to answer the main question as a whole. The questions will be answered with literature and empirical study. The questions are the following:

SQ1: What actors are currently/can be expected to be involved in urban area (re)developments in the Netherlands and what are their main interests related to healthy urban area development?

SQ2: What are the challenges that actors involved in urban area (re)developments in the Netherlands are facing when trying to realise healthy urban areas?

SQ3: What are lessons that can be drawn from practice on the realisation of healthy urban areas in the future?

To be able to answer all questions, various forms of research will be done. There will be a literature study, a survey which will look at experiences in practice, two case studies which will focus on two healthy development projects in the Netherlands and a session with an expert on this subject to reflect on the conclusions.

Conceptual model

The concepts of this research have been visualised in a conceptual model. The most important concepts are displayed here (figure 1).

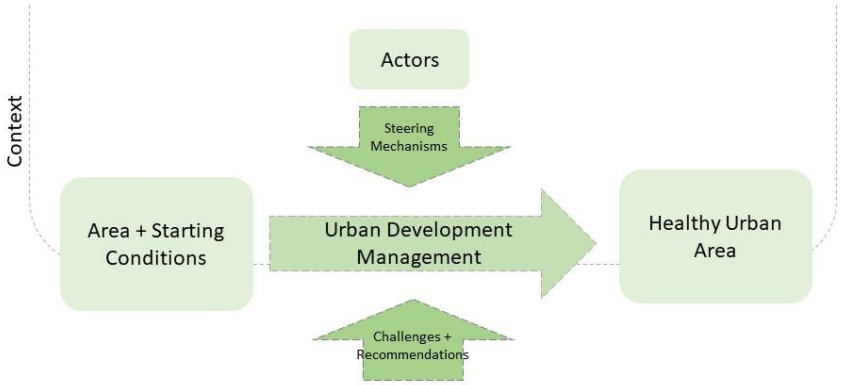

Figure 1: Conceptual framework (Own image)

Reading guide

This thesis is structured in the following way: first, there is an introduction chapter (which is above) with the problem statement, scientific and societal relevance, research

questions and conceptual model; secondly, the research methods will be described with types of study, methods and techniques, data collection, data analysis, data plan, ethical considerations and research outputs; thirdly, a literature review will be shown; fourthly, the survey results will be analysed; after that the case studies, the conclusions and the discussion and reflection will follow. The table of contents can be found at the beginning.

Research method

This chapter touches upon the methodology of research that will be conducted. Various methods of study will be used to reach the desired end goal; finding effective ways of realising healthy urban area developments in the Netherlands.

First, the type of study will be discussed, then methods and techniques connected to them. After this, the data collection, the data analysis and a data plan will be shown, and in the end, the ethical considerations related to this study will be touched upon. The research framework connected to the studies can be seen in figure 2. This framework is a visual representation of the research methods.

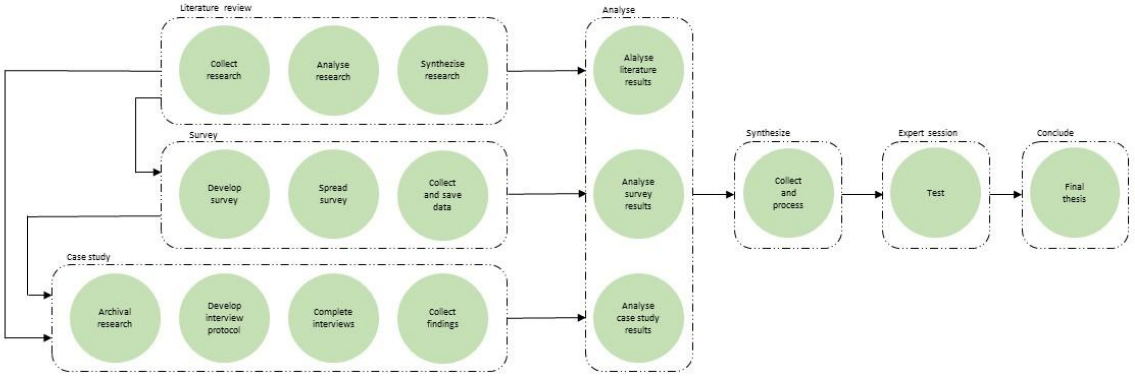

Figure 2: Research framework (Own image)

Type of study

This thesis will be a mixed-method study, combining qualitative and quantitative research to come to a conclusion. The two main types of research will be a literature study and an empirical research. Literature study will be mostly first and empirical study will be following up from literature study. Both will be touched upon.

Literature study

The literature study is used for various parts. First, it forms the basis of the problem formation. With a thorough literature study a knowledge gap was found which will be filled with this thesis. During this literature review, the main concepts connected to the subjects (e.g. healthy cities, urban area development and governance) will be looked into to form background knowledge and to introduce main concepts.

After this preliminary review, literature study will give a knowledge foundation for the empirical research to be conducted. It will be explorative. Most importantly, the literature research will give a scientific framework for the empirical study to be done. Literature will be found through trustworthy sources such as google scholar and the TU Delft library.

Methods and techniques

Looking at the empirical research part, three main techniques will be used: questionnaires, semi-structured interviews and a reflective session. The questionnaires will all be about experience from previous practice and the semi-structured interviews will be about two selected case studies and actors connected to them.

Questionnaire

The questionnaire will be in the form of a survey. In this survey, the goal is to establish an understanding of the view on healthy urban projects and their development from practitioners. This survey will need around 30 responses. The survey will be spread around to various project teams with public and private actors (developer, municipality, advisors, etc.) to give a view in the kitchen on how practice thinks about the subject. Locations to spread are the graduation company (AM) and other networks working in urban area development.

The survey will give valuable insights for the semi-structured interviews and the conclusions. The survey will consist of various questions. The questions will consist of:

- Participants general information
- Participants view on important aspects related to health
- Previous developed projects with health goals (size, stakeholders, functions, location, costs)
- Goals for health in the developments
- Implementations of the healthy aspects
- Missed implementations of healthy aspects (room for improvement)
- Challenges when introducing health
- Recommendations for future developments with health as a goal

These subjects will be part of the survey. Every separate section will have an open optional field where additional information can be entered. Also, the survey will end with the question whether the person would want to answer follow up questions.

Semi-structured interviews

With a case, an in-depth semi-structured interview will be conducted with public and private actors related to that project. These actors can be developers, government (local and regional), financing actors (also health insurance companies) and scientists, but also consultants or other parties. This has the goal to find underlying mechanisms and to deepen the results found in literature and surveying. The cases will be the backbone of the report, since practical implications will follow from the archival study and the empirical study connected to this.

The case study will need to be relevant. Together with the graduation company cases will be looked at to select one or more that fit into case criteria. The criteria are as following:

- The case needs to be a recent project (within the past 10 years)
- The case needs to have a noteworthy health focus before the design phase
- The case needs to be an urban area development in the Netherlands in city context

- The case needs to have actor involvement from public and private parties

The two cases chosen are: Hero van Breda, Breda; and Bajeskwartier, Amsterdam.

Information to find during the case studies consists of:

- General information
- Actor analysis (who entered the project when, where there hidden or other important actors)
- Timelines
- What was the initial idea vs. the end project
- What health aspects can be seen in the project
- How did the collaboration happen
- What was difficult
- What would you do different the next time
- And more aspects..

One side note with conducting studies to cases is: the phase a case study is studied in (initiative, realisation, completion) has an impact on the results given. When a case is still running and actors are actively talking, this will mean that aspects will be seen differently than when looking back (retrospective vs. prospective). A case that is still running and where actors are actively talking about concepts will be more extreme and more in the heat of the moment than a finished project.

Reflection session

After the conclusions were written, a reflective session was held with a professional from the field. This person is connected to a knowledge institute and does research on the implementation of health in the built environment. The conclusions found were tested to her knowledge to gain final insights, feedback and nuances. This strengthened the final conclusions and made practical implications more trustworthy.

Data collection

Data was collected with questionnaires and interviews. The language of these was Dutch, because of the Dutch context researched. The data was collected in the form of answer sheets and audio/video recordings of interviews. It then was transcribed to text to be able to analyse it.

The archival research related to the case studies included a range of documents: news articles, meeting notes, email documents, tender information, policy documents and more. These were provided by the graduation company or other institutions. This gave an insight into actors and their influence, and communication between actors. The reflective session was also recorded to be processed in the same way as the interviews.

Data analysis

The data collected needs to be analysed to be able to form conclusions. First, the literature study and the survey will be used to help with the protocol of the semi-structured interviews. These interviews will be recorded and when they are done,

they will be transcribed and analysed. For this the Atlas.ti software will be used since this program can help analyse qualitative data. The thematic analysis approach will be used to find patterns in data. Needed for this are themes. The surveys can be analysed more statistically and will be able to show regularities or oddities. Out of this, conclusions will be synthesised and the expert session can be done. The expert session analysis will be done the same way as the semi-structured interviews.

Data plan

The FAIR data principles will be used for all data collected (Wilkonson et al., 2016). This ensures that the data will be able to be reused for other research. It was made by a set of diverse stakeholders. FAIR stands for Finable, Accessible, Interoperable and Reusable. To ensure that the FAIR principles will be used, the data will also be uploaded to the DMP Online Pool of the TU Delft (https://dmponline.tudelft.nl/plans). The thesis will be uploaded to the repository of the TU Delft where it can be found by those interested.

The data gotten during the research will be stored locally on a laptop and on a separate hard drive with password protection. Also, it will be stored on google drive. Sensitive information (company names etc) will be anonymized. After the thesis is done, the reusable data can be found at dmponline for future researchers to be used. All references included in the thesis can also be found at the end. These are cited in APA-style.

Ethical considerations

Ethics are important for research. Blaikie and Priest (2019) say that researchers have to balance the anticipated benefits of their research with potential physical, psychological, economic or legal harm it may cause. Related to this are core ethical principles. The issues that involve participants are: voluntary participation, informed consent, freedom to withdraw, right to privacy, protection from harm and risk, avoidance of deception and avoidance of covert research (Blaikie and Priest, 2019). The issues related to the research itself include: worthiness of the project, competence and integrity of the researcher, high methodological standard and more. These have to be taken into account when designing and doing research. An HREC application will be done to ensure ethics are taken into account.

All of these issues will be taken into account. However, some are especially relevant for this research. Since there will be a lot of surveys, the issues related to participants will be of special importance. Permission will be asked with a consent form, privacy will be safeguarded and communication will be transparent. All information gathered that can be of harm will be deleted after research and will be stored securely during.

Also, there are two biases that will be needed to give special attention to. The first is the bias of success. Since people tend to tell success stories afterwards without the difficulties and challenges during the process, this could give another perspective than what happened at the moment itself. Also, there is a human factor involved. People will often tell their own objective truth, but this may not always be the real truth. This could be tried to counter with careful question selection, but will still be a difficulty.

Research outputs

This research will provide knowledge for the field and for science. In this section, the goals and objectives, the deliverables, and the dissemination and audiences will be discussed.

Goals and objectives

The main goal of this research is to showcase effective ways for healthy urban developments to be realised. This goal has some subgoals that will help reach the main goal. These are:

- Gain understanding of healthy urban area developments and their characteristics in the Netherlands
- Gain understanding of the actors that are related to these developments and their collaboration
- Find challenges when it comes to the realisations of these developments
- Find solutions for these challenges and see which recommendations can be used in practice

Deliverables

During the graduation lab, there are set moments of deliverables (this report being one of them). The P1 needed to be delivered in quarter 1 of this year and contained the first framework of the research to be done (initial research questions, introduction and a rough literature review). The P2 deadline is in January (this report) and will take the P1 deadline a step further. In this report, there will be a more elaborated and in-depth literature study, research method selection and problematization and research questions. The next report, the P3 report, will have a fixed research method for the empirical study, a set up for the interviews, first results of the survey that has been done and a finalised literature study. The P4 will finalise the empirical study and will draw conclusions on all subjects. This report will be seen as the final step, but feedback can be implemented in the last and final report and presentation, the P5 report. These deliverables can be seen in figure 3 below.

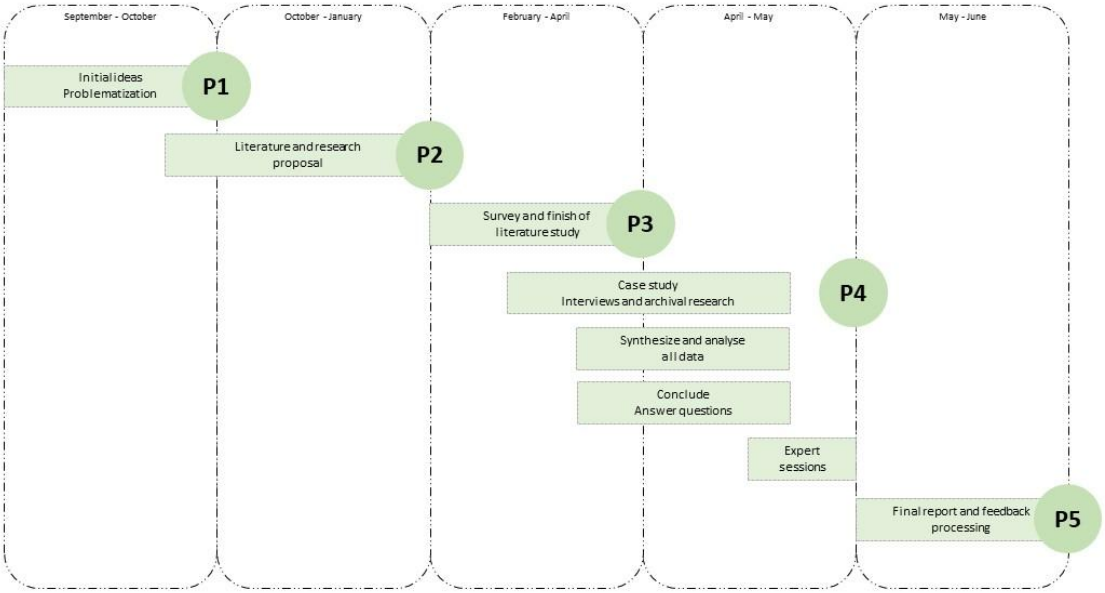

Figure 3: Deliverables (Own image)

Dissemination and audiences

This study is aimed at actors working in urban area development and who want to introduce health as an aspect in their developments. Developers can use the study to steer on this aspect and can ask for the right frameworks or compensation regarding their project. On the other hand, public parties will know what to provide and what to prioritise when wanting to implement their health goals in the urban areas. Other actors can use this to seek opportunities to also involve themselves.

The research will be spread through various media and platforms. Sites such as gebiedsontwikkeling.nu can be platforms that connect the research to the right audience. Same for the Stichting Kennis Gebiedsontwikkeling. The graduation organisation will be at the front row and can use conclusions and steer the research so that it can be used in future projects. The research will also be published online for anyone who would want to read it and for students or academia who would want to build further on this research.

Literature review

In this part of the thesis, literature will be looked at to gain an insight into the studies conducted already. First, the subject of health will be looked at. Also focussing on the healthy city and on health implementation in the built environment. Second, urban area development will be looked into with its context and steering mechanisms such as governance and planning tools. Lastly, the actors operating in urban area developments in the Netherlands will be delved into.

Health

Health is an important aspect of a healthy city. In 1946, the World Health organisation gave their definition of health. This is as following:

''a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.''

Three pillars are named here: physical, mental and social well-being. Showing that health is not only about physical well-being, but the social networks and mental stability play a role as well. If one is healthy, it is based on many determinants. These include: 1. the social and economic environment; 2. the physical environment; 3. the person's individual characteristics and behaviours (WHO, 2017). The context in which people live determines their health. Many other factors are included, such as: income and social status; education; physical environment; social support networks; genetics; health services; and gender. Some of these factors can be influenced by the built environment.

Healthy cities

In the year of 1986, the World Health Organisation started the Healthy Cities Programme. In this project they urged towns and cities to introduce public health projects (Barton and Tsourou, 2000). This showed a big step towards health implementation in cities. In 1996, Goldstein et al. gave a definition of a healthy city:

''A Healthy City is one that is continually creating and improving those physical and social environments and expanding those community resources which enable people to support each other in performing all the functions of life and in developing to their maximum potential.''

In this statement, they touch upon some of the same aspects of the definition of health given by the WHO (1946). The healthy city is about physical and social environments and community resources which help shaping social well-being. It also talks about an ongoing process of 'improving' and 'developing', showing that a healthy city will not be a fixed goal, but that it will evolve throughout time.

The Healthy Cities concept saw health as well-being and not only the absence of disease (Kenzer, 2000). Also, they saw that health is made outside of the 'health services sector' (Lipp, 2013). The public health definition is related to the definition of health. Public health is the science and art of preventing disease, prolonging life and promoting health

through the organised efforts and informed choices of society, organisations, public and private, communities and individuals (Gatseva et al., 2011).

In the Healthy Cities Programme, eleven characteristics of a Healthy City were given. These are the following (Hancock et al., 1988):

- A clean, safe physical environment of high-quality (including housing quality);
- An ecosystem that is stable now and sustainable in the long term;
- A strong, mutually supportive and non-exploitative community;
- A high degree of public participation in and control by the public over the decisions affecting their lives, health, and well-being;
- The meeting of basic needs (food, water, shelter, income, safety and work) for all the city's people;
- Access to a wide variety of experiences and resources, with the possibility of multiple contacts, interactions, and communication;
- A diverse, vital and innovative city economy;
- Encouragement of connectedness with the past, with the cultural and biological heritage, and with other groups and individuals;
- A city form that is compatible with and enhances the above parameters and behaviours;
- An optimum level of appropriate public health and sick-care services accessible to all;
- High health status (both high positive health status and low disease status)

These characteristics can be used by cities to increase health throughout the whole city. Together with these characteristics came many publications with advice for governments to introduce health in their city. However, looking at these characteristics shows that health can have multiple definitions. Health can be seen as the World Health Organisation wrote in 1946 (see above), but it can also be seen as a term to indicate a healthy economy or municipal system that is working. In this report, health is seen as social, mental and physical well-being as given by the WHO (1946). This is because this report looks at health in the built environment which has an influence on people.

Health and the urban environment

In this research, the connection between health and the urban environment will be looked at. Tonne et al. (2021) showed this connection. They did this through showing how urbanisation (change over time in size, density and heterogeneity of settlements) and urbanicity (the degree to which a given geographical area is urban) shape health. This is through quality and access to health services (Matthews et al., 2010), but also through various other factors. These areas can be influenced through urban development projects (see Urban Development Projects). Below, the other factors that shape health through the urban environment will be shown.

Factor one is 'demography and implications for health' (from Tonne et al., 2021). Through this factor, one of the things that can vary is household size and composition. These two have potential implications for physical and mental health (Grinde and Thambs, 2016). For example, the average number of members in a household is smaller in urban areas

compared to rural areas, with a much higher percentage of single member households in urban areas (United Nations Department of Economic and Social Affairs Population Division, 2018). This can result in poorer mental health (Tamminen et al., 2019) and unhealthy diets (Conklin et al., 2014; Hanna and Collins, 2015).

Factor two is 'climate change and health' (from Tonne et al., 2021). Many climate change impacts in urban areas will have a direct effect on health according to them. How we shape urban areas in the coming decade will influence the consumption practices of several billion people. These choices have influence on climate change through for instance: sources of cooking, heating and cooling; travel modes and distances; and sources of energy for transportation.

Factor three are the 'food systems, diet and health' (from Tonne et al., 2021). Under and overnutrition are challenges with urbanisation, because it poses positive and negative effects on the food environment. This may occur within households or communities, but also on an individual level (Tzioumis and Adair, 2014).

Factor four is the 'land use and transport policy, travel behaviour, and health' (from Tonne et al., 2021). Land use influences the travel behaviour through the availability and proximity of destinations. This includes policies that influence for example cycling paths or attractiveness and desirability of areas (Erwing and Cervero, 2010). Travel behaviour is known to have an effect on the health of travellers through improving cycling and walking paths or the improvement of air quality with the increase of public transport (Wee and Ettema, 2016).

Factor five is 'environmental noise and health' (from Tonne et al., 2021). Environmental noise is higher in urban areas than rural areas (Albert and Decato, 2017), increases once traffic and population density increase (Salter et al., 2015), and is higher in mixed-use areas than solely residential areas (King et al., 2012). Environmental noise has an effect on sleep, cognitive performance and more.

Factor six is 'urban greenspace and health' (from Tonne et al., 2021). Natural environment have a positive influence on mental and physical health and wellbeing and are seen as a mitigation buffer for negative health effects of living in urban environments (Nieuwenhuijsen et al., 2017). It also reduces urban temperature and has more positive side effects (see Tonne et al., 2021).

Factor seven is 'social stress and wellbeing' (from Tonne et al., 2021). Urban living increases the risk for some psychiatric diseases (Peen et al., 2010). Factors such as air and noise pollution and access to green space may be important for social wellbeing. Social interactions are also more frequent in urban areas.

These factors show that urban space has an influence on the social, mental and physical wellbeing of individuals, households and communities. Urban development can profoundly shape human health as well as progress towards sustainability, according to Tonne et al. (2021). They continue that health needs to be promoted and socioeconomic inequities need to be reduced in urban environments. The solutions according to them consist of

knowledge on critical inter-relationships between dimensions of the environment (social, food, buildings, nature), the consideration of multiple spatial scales, and the identification of optimal pathways to promote health. Also, new knowledge needs to be effectively translated to support action towards healthy urban development. Below, urban development projects are elaborated on, these projects influence the urban environment that has influence.

Healthy environments in the Netherlands

These definitions of health in the city context are internationally focussed. This research looks at the Dutch context. In this part, the Dutch context will be looked at.

The Dutch Rijksinstituut voor Volksgezondheid en Milieu (RIVM, 2015) made a framework to define, sort and value aspects of a healthy city. They invited 250 professionals to give body to the concept. The gathering produced a list of 350 aspects which were clustered to four important pillars with subsections. The pillars are: social aspects (a city where people help each other), physical environments (a city where children can play outside), policy (a city where health is the main ambition) and culture (a city to be proud of). After the clustering, values were given to the most important characteristics to be able to diversify between healthy or not healthy cities. Arcadis uses this classification to make a yearly healthy city index to show which Dutch cities are the healthiest and why. Arcadis (2022) also shows their methodology in this report. In figure 4, the five characteristics of the healthy city according to the RIVM and Arcadis can be seen.

Figure 4: Characteristics of a healthy city (Arcadis, 2022, adopted from RIVM, 2016)

The characteristics and the most important aspects per characteristic are as follows.

1. The built environment is healthy.
    a. The city is spacious
    b. The city is hygienic (or clean)
    c. The city has amenities that are reachable and useable for everybody
    d. The city has health services that are available to every citizen
2. There is healthy mobility

    a. The city provides makes cycling accessible
    b. The city makes it easy for pedestrians to move around.
    c. The city has good public transport
    d. The city has safe bicycle paths
3. Access to playing, sporting and meeting in the city
    a. The city has public green for playing (availability of green spaces)
    b. The city has playgrounds for children
    c. The city has calm places to relax (sound, green, wind)
    d. The city has greenery to look at
4. State of air quality, sound, heat and coolness in the city
    a. The city has good air quality (PM10)
    b. The city has good air quality (NO2)
    c. The city doesn't have much nuisance
    d. The city focuses on countering the urban heat island
5. The community is healthy in the city
    a. The city is safe
    b. The city provides ways to recover from stress (resting places, leisure)
    c. The city seduces you to sport/has enough and good sporting facilities
    d. The city has meeting spots in the public space

These are the characteristics and aspects that Arcadis did their research with. Looking at the characteristics of a healthy city by Hancock et al. (1988), these have many similarities. However, there is one noticeable difference. The aspects of Arcadis are easily measurable (e.g. air quality, green per citizen/person, bicycle paths) and the characteristics of Hancock et al. are more widespread and soft. A balance in these two characteristics will be needed to be sought after. Within the survey, respondents will also be asked what aspects they think are the most important aspects of health in urban area development.

Cities in the Netherlands are also introducing health in their programs. As an example, the city of Amsterdam formulated 12 principles for a healthy city (Amsterdam, 2022). These are: 1. Cyclists and pedestrians get space; 2. The healthy city is a green city; 3. The city is a playground; 4. Sport is around the corner; 5. There is space for social interaction; 6. Nuisance gets interchanged with peaceful areas; 7. Healthy food is found everywhere; 8. Neighbourhoods are attractive for elderly people; 9. The school surroundings are especially healthy; 10. There is clean air for everyone; 11. The city is resilient against climate change; 12. Buildings and public space contribute to health. And Amsterdam is not the only city, many more cities and actors are introducing health in their programs (e.g. Zwolle, Arnhem, Houten and Veenendaal). This shows that health is a topic that is playing in many cities.

In their research, RIVM (2016) found that there are many similarities on what professionals see as the healthy city. Even across professional boundaries, the important clusters were similar. One important side note here, is that the terminology that is used by different fields of work is different. So, this needs to be translated or discussed to be able to collaborate. The same view on the healthy city gives a steady foundation for collaboration.

Aspects of a healthy environment

The GGD made documents for governments and other parties. It shows how the built environment can be made healthy. To be able to have an idea of these aspects, a summary will be given in this section of this document (GGD HOR, 2021). In table 1, all themes with related aspects can be seen.

Theme	Aspects
Living environment: Children grow up in a smoke-free environment	- Smoking is reduced - Timber fires are reduced
Living environment: there are attractive places nearby and reachable for everyone	- Reducing loneliness - Reducing stress - Improving physical well-being - Improving social cohesion - Improving quality of life
Living environment: the living environment contributes to a healthy weight	- Stimulating exercise and movement - Making healthy food accessible
Living environment: Living and busy traffic are separated	- Reduce air pollution - Reduce nuisance
Living environment: Functions (living, working and amenities) are mixed	- Increase slow traffic - Increased social meetings - Increased liveliness
Mobility: Active transit (walking and cycling) is the new standard in policy, design and use	- Stimulates to move - Helps elderly to be active - Reduces sick days - Improves environmental quality - Reduces CO2 emissions - Improves reachability of amenities
Buildings: Climate inside of buildings is comfortable and healthy	- Ventilation, heating - Reduce heat in summer
Buildings: At least one side of the building is comfortable	- Reduced air pollution and nuisance - Increased greenery
Buildings: Enough fitting housing for elderly	- Increase total life housing - Elderly can live at home for longer

Table 1: Themes and aspects for health in the built environment (adapted from GGD HOR, 2021)

This table shows an extensive list of aspects that influence health in the built environment. This list provides a first inventorisation of what impact urban area developments could make on the health of inhabitants.

Urban area development

Urban area development, known in Dutch as 'gebiedsontwikkeling', refers to (Daamen, 2010):

''projects that aim to transform or improve specific areas, both within and outside of existing urban territories''

The size of the projects can differ from project to project. The reasoning behind this was 'scoping', so that project's scopes could be increased in such a way that public land development costs could be compensated by land transaction revenues paid by private parties (Daamen, 2010). An increase in size so that public parties could financially have more flexibility. This change made it that land use by governmental bodies made way for an entrepreneurial, developmental approach in spatial planning in the Netherlands, called ontwikkelingsplanologie (Needham, 2003). The Dutch 'gebiedsontwikkeling' stands for ''a way of working in which government bodies, private parties and other actors involved reach an integration of planning activities and spatial investments, eventually leading to the implementation of spatial projects (Daamen, 2010). Here, the collaborative character of urban area development is shown with the integration of actors.

Then there is the urban development project. According to Daamen (2010) an urban development project refers to:

''a framework of concrete material interventions inside a geographically distinct urban area''

This definition means that the concrete realisation of material products such as buildings, infrastructure and public space can be taken as the foundation of urban development projects (Heurkens, 2012).

Van Bueren (2019) introduces the hardware, the software and the orgware of urban development. The hardware is related to the definition of Daamen (2010). It is about land, building materials, constructions, streets, squares, roads, and technology. It forms the physical environment built by people (van Bueren, 2019). The software consists of the actors and citizens who use, in various roles and connections, the hardware of the urban environment for their individual and communal goals. The orgware is about the regulations and systems in which actors move. These three are all interconnected in urban area development. So, the built environment and systems can influence the lives of actors living in them. This shows that with urban area development and steering mechanisms, lives of persons can be changed. This concept of hardware, software and orgware can also be used for health in urban development. Kenniscentrum Sport en Bewegen (n.d.) connected this aspect to an exercise-friendly environment. Hardware can be seen as playgrounds or gym instruments, software can be seen as organised programming on this hardware and orgware can be seen as the process around the offered hardware and software, such as how will it keep being used and how will it be successful? This shows that this concept can be used for various detailed applications.

The integration of actors was mentioned briefly above. Integrated area development (Dutch: integrale gebiedsontwikkeling) is a form of area development that is often used. Here, the level of integration is related to ''the degree of functional and material changes planned for the area'' which relates to aligning different interests, disciplines and sectors involved in the intervention within an area (Daamen, 2005; Teisman & Klijn, 2002). According to Bruil et al. (2004), Peek (2004) and Franzen et al. (2011), this also means that technical, legal, political, economic, demographical, ecological and socio-cultural aspects have to be taken into account when realising urban areas. With the introduction of the new omgevingswet, soft aspects can be steered upon better than before. For this research, this means that different actors will need to be analysed and that different values and interests related to them have to be analysed too, especially focussing on health.

Heurkens (2012) mentions that urban area projects are 'means' to carry out a spatial intervention to implement policies. It is different from 'urban development' in a way that it focuses on organisations and actors who directly cooperate on and invest in an area by modifying its land use. Important to notice is that we talk on the spatial scale of the 'area'. According to Van Hoek & Wigmans (2011), cities can be studied at different levels; metropolitan, city, area, and building. ''An area consists of a collection of buildings situated within the specific urban context of the city (Heurkens, 2012). Development and spatial intervention is often done on this scale and because of this, the urban area is chosen as the scale to look at.

Management of these urban area development is important. The management of these development projects is the following according to Heurkens (2012): ''Management consists of any type of directive influencing the realisation of urban development projects.'' This management perspective will be important for this thesis, since the successful way of managing a development will be tried to be found.

Actors

Actors are key players in urban area development and urban development has evolved in a place with many stakeholders (van Bueren, 2019). In urban development there are constantly changing inter-organizational partnerships between public, private and civic actors (Van Loon 1999; Van Loon et al., 2008; Daamen, 2010). Success and delivery of health implementation in cities depends on the commitments of partners. These partners are key actors who will determine the quality of intersectoral collaboration and community engagement (WHO, 2022). WHO continues that it is important to understand their interests, responsibilities, activities, operational styles and aspirations. This combined will be a complex and continual task for a healthy city. In this section, a closer look will be given on the actors involved in Dutch urban area (re)developments.

A first distinction can be made between public and private actors. A third group can be added to this: local citizens and other parties involved in an area. These actors need to be taken into account in urban area development (Franzen et al., 2011).

Public sector

The public sector represents the public interest in urban area developments. They act on different scales: municipal, state or (inter)national. The municipalities play the biggest role in urban area development (Franzen et al., 2011). They often participate in urban area development as partners (when public interest is significant), develop land or set up development companies (mainly in the Netherlands). One thing to note with municipal actors is that they have many different departments (institutionalised). This means that there is a diverse municipal interest. Additionally, there can be differences in interest between the elected administration and the internal departments. Municipalities can collaborate in urban area development when projects go beyond municipal boundaries or when they want to share risks (Franzen et al., 2011). Local government is the most important body of the public sector. De Leeuw et al. (2015) say that they are the most receptive and suitable to both actions for health and strategies for health. Actions could be for instance community action and individual action and behaviour change) and strategies could be through policy and organisational change. Higher authorities such as state and (inter)national governments have a supra-local interest most of the time (Franzen et al., 2011). This means that they can shape developments or that they can have financial interest in development. They look at the larger scale of development in the Netherlands.

The public sector has three main roles: the framework-setting, the service-providing and the investing role (De Zeeuw et al., 2011)

The framework-setting role ('kaderstellende rol' in Dutch) makes realistic ambitions for the improvement of urban areas (from De Zeeuw et al., 2011). Within this role, the public sector can set a public program of requirements, which sets a framework to work in for urban development plans as well as choosing the designated areas where development will take place.. As tools, the public sector has public and private law (Franzen et al., 2011; De Zeeuw et al., 2011). These tools can steer development in the desired direction. The public sector could also choose to take a directing role with a focus on process management (Franzen et al., 2011)

The service-providing role ('dienstverlenende rol' in Dutch) is focussed on creating as much quality in the area as possible. Small investments can help here to activate development within a certain area (De Zeeuw et al., 2011).

The investing role ('investerende rol' in Dutch) focusses on the investments towards public interest (De Zeeuw et al., 2011). The main focus here is the quality of public space, public transport and other large urban structures. Mainly, these investments are in the connections layer and the terrain layer (Puylaert et al., 2009). This is done through for instance the development of land (Franzen et al., 2011).

Private sector

Private sector actors always have a profit as their first interest. Where the focus used to be on high production without much risk, this has now changed to a demand-oriented market. End-users set quality standards and the private sector needs to facilitate this

with their developments, especially during crisis times (De Zeeuw et al., 2011). A healthy urban environment is an example of this.

The private sector consists of many different actors (from Franzen et al., 2011). First, there are the developers. They undertake projects at their own expense and risk within the market context. Most investments are short-term and can be seen as the erection of buildings. However, more and more developers are in the project long-term (with financial risks at stake) and help shaping not only buildings, but also the context around buildings. This means they have an increased interest in integrated urban area development. Secondly, there are the investors. These are mostly financial institutions with long-term financial interest and are not focussed on realisation. They want a sound return on long-term investments. Thirdly, there are the builders. These actors mainly focus on erecting buildings and public works (e.g. roads, bridges or tunnels). Most of the time, this is ordered by private or public actors. Fourth, there are architects and urban designers. They are, most of the time, ordered as consultants of a party that wants to build, but they influence the lasting impact of urban areas through design. The fifth actors are the owners of land and buildings in the area. These need to be taken into account. SIxth, there are the estate agents. These are intermediaries for selling buildings in the realisation and property management phase. In the initial stages of urban development, they can help with showing the market potential of an area. The last group is the housing associations. These are especially relevant in the Netherlands. They provide low income housing for large groups of people in the Netherlands. Housing associations made a shift from government directed to market oriented. The private sector is highly diversified. Each actor needs to take into account the end user's demands and interest to achieve market quality (from Franzen et al., 2011).

Citizens and interest groups (Civic Societies)

The last actor category is the citizens, interest groups and civic societies group (from Franzen et al., 2011). WIthin this group there are citizens and other users or representatives of the area. Civic societies represent the interests of members and connected parties. Often they are oriented on a specific theme (De Zeeuw et al., 2011). The knowledge of these organisations can be used to connect their own interests with others. Some civic societies are able to, in addition to knowledge and action, add additional funds or find ways to add additional funds. One of the most common organisations are nature preservation organisations. These are often included in projects.

The interests of all these actors differ significantly. For instance, current users and future users can have a contradictory view of how the public space needs to be designed. Franzen et al. (2011) say: ''One of the major challenges of urban area development is to involve as many of the actors as possible, yet also to make decisions.'' Showing that this interplay between actors, interests and decisions is an important aspect of urban area development.

Nowadays, there are 'newcomers' in the context of urban area developments, which means that there will be even more actors to take into account (van Bueren, 2019). These include for instance: energy suppliers, internet providers, water authorities, nature and

environmental organisations, sportclubs, citizen initiatives, and many entrepreneurs with direct or indirect connection with the specific area.

The local government is always embedded in a network of policy configuration and coalitions and the city itself is nested in a web of relations with other cities and regions (Kazepov, 2005; Short, 2006). Because of this, various forms of coalitions are created to develop common lines for healthier communities together with (urban area) developers, housing companies, non-governmental organisations (NGO's) and other actors (Fröding et al., 2008)). This way of thinking stems from buzzwords as 'collaborative planning' (Healey, 1997). Inspired by this, alliances and partnership initiatives can be found to promote health including a broad array of public and private actors (Gillies, 1998).

(Collaborative) governance

In the chapter on urban development projects and the chapter of healthy cities, a brief note of urban development management has been made. This talks about any form of directive influence made. However, the school of urban area development at the TU Delft uses an (overarching) management perspective: governance (Heurkens, 2012; from Franzen et al., 2011). Governance is a steering mechanism in urban area development and can be used to organise collective action and to analyse processes in urban area development. Governance is seen as ''the capacity to organise collective action towards specific goals.'' (Hillier, 2002). The governance perspective has also been chosen, because urban development ''consists of different disciplines and fields of knowledge, encompasses various interrelated spatial scales and involves several interdependent actors' interests.'' Therefore, the overarching management perspective of governance encompasses (almost) all aspects related to urban area development.

Effective governance is a critical lever to realise sustainable urban development and promote human health and wellbeing (Independent Group of Scientists appointed by the Secretary-General, 2019). National governments and local authorities should promote investments that ensure access to decent, sustainable and local employment, access to basic services needed for daily living and access to key social infrastructure such as health and community services and public and green space (Tonne et al., 2021). Tonne et al. (2021) also say that equity-driven urban planning is needed to ensure that the health of all urban residents is placed at the centre of decisions related to land use, land regulations and planning of new infrastructure (all connected to urban development projects).

Geidne et al. (2012) review the concept of governance related to local health development. They argue that the focus of governance derives from a more refined understanding of the scope and nature of the welfare state. They continue to say that these governance networks consist of multiple actors which do not have the potential or legitimacy to individually implement and/or shape policy related to health, but they all need to be included in debating and resolving progress on the social issue (Raab, 2014). They also found a profound connection between governance and health (e.g. Plocgh et al., 2006; Vlahov et al., 2007; Marmot et al., 2008). Kickbusch et al. (2012) say that governance for health refers to the attempts of governments or other actors to steer

communities or countries in the pursuit of health and well-being. They continue that the implementation of health requires participatory governance that involves different sectors and partners.

Collaborative governance is a governance perspective where one public program or policy is aimed for. This policy or program could be a healthy population. Using this steering mechanism, collaboration between public and private parties will be looked for to strive for a common goal. Therefore, collaborative governance will be looked into in this section. According to Asnell and Gash (2007), collaborative governance is:

A governing arrangement where one or more public agencies directly engage non-state stakeholders in a collective decision-making process that is formal, consensus-oriented, and deliberative and that aims to make or implement public policy or manage public programs or assets.

Within this definition, there are six criteria (Asnell and Gash, 2007). These are: 1) the forum is initiated by public agencies or institutions; 2) participants in the forum include non-state actors (e.g. (urban area) developers); 3) participants engage directly in decision-making and are not merely ''consulted'' by public agencies; 4) the forum is formally organised and meets collectively; 5) the forum aims to make decisions by consensus (even if consensus is not achieved in practice) and; 6) the focus of collaboration is on public policy or public management. These criteria are closely related to integral urban development. Collaborative governance brings public and private stakeholders together in collective forums with public agencies to engage in consensus-oriented decision making (Asnell and Gash, 2007).

Figure 5 shows the model Asnell and Gash (2007) made for collaborative governance. It shows four broad variables with more fine-grained variables collected to them. They are treated as the core of this model. The four main variables are starting conditions, institutional design, leadership and collaborative process. Starting conditions are about the initial level of trust, conflict and social capital that becomes resources or liabilities during collaboration. Institutional design sets ground rules under which collaboration takes place. Leadership provides essential mediation and facilitation for the collaborative process. And lastly, the collaborative process itself is highly iterative and nonlinear. Because of this, it is presented as a circle. An in-depth explanation of these variables can be found in the appendix. These variables can be connected to urban area development. Variables need to be right to come to outcomes. The collaborative governance idea is important for this thesis.

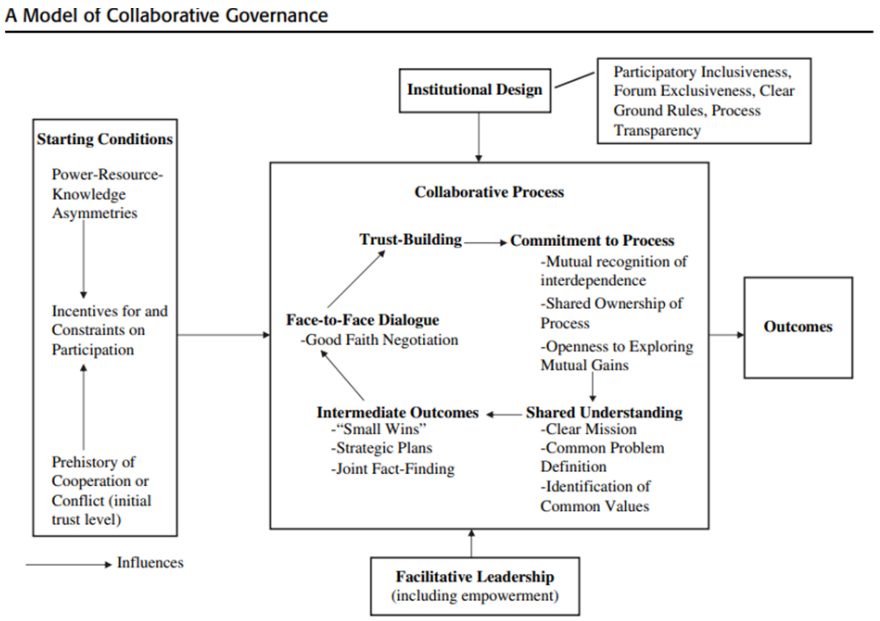

Figure 5: A model of collaborative governance (Asnell and Gash, 2007)

In addition to Asnell and Gash, Emerson et al. (2011) also made a model for collaborative governance. Combining both insides could increase understanding of the collaborative process. Emerson et al. (2011) define collaborative governance as:

> *the processes and structures of public policy decision making and management that engage people constructively across the boundaries of public agencies, levels of government, and/or the public, private and civic spheres in order to carry out a public purpose that could not otherwise be accomplished.*

This definition is broader and captures a fuller range of cross-boundary governance extending beyond the conventional focus (Emerson et al., 2011) (health in urban development). Looking at the definition, health can be seen as the public purpose. This is a management boundary crossing assignment that will need to be solved with multiple different actors. Shown in the actor section, actors in urban area development are a combination of public, private and civic. Emerson et al. (2011) made an integrative framework for collaborative governance, this framework can be seen in figure 6.

The Integrative Framework for Collaborative Governance

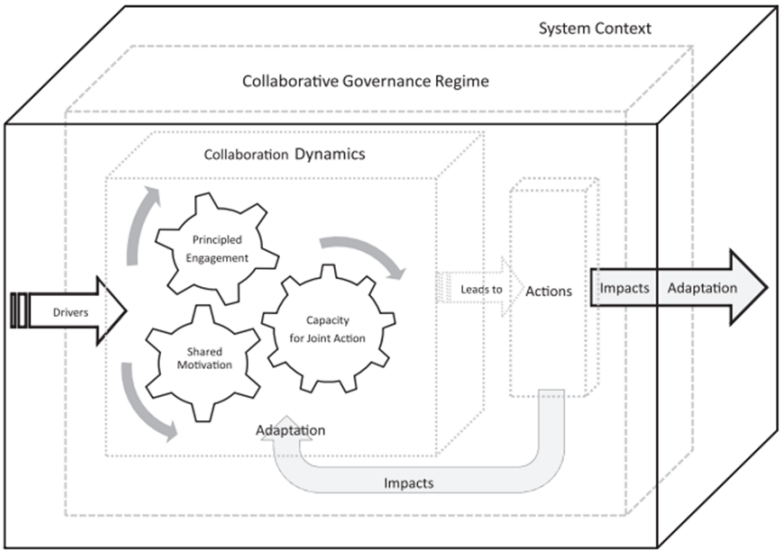

Figure 6: Integrative framework for collaborative governance (Emerson et al., 2011)

In this framework, nested dimensions can be seen. These are the system context, collaborative governance regime (CGR), collaboration dynamics and actions. The CGR concept is central in this framework. The regime term is used for a particular mode of public decision making with cross-boundary collaboration. The collaborative actions and collaboration dynamics will shape the quality and extend to which the CGR is effective. The collaborative dynamics consist of principled engagement, shared motivation and capacity for joint action. These three components together produce collaborative action to implement the purpose of the CGR (healthy urban areas). Actions can lead to results within and external to the regime: impacts (within) or adaptation (external). Figure 7 shows the elements that are connected to each of the variables in the framework. For further deepening of this subject, see the appendix.

A Diagnostic or Logic Model Approach to Collaborative Governance

Dimension and Components	The Collaborative Governance Regime						Collaborative Outcomes	
			Collaborative Dynamics			Outputs Collaborative Actions		
	System Context	Drivers	Principled Engagement	Shared Motivation	Capacity for Joint Action		Impacts	Adaptation
Elements within Component	- Resource Conditions - Policy Legal Frameworks - Prior Failure to Address Issues - Political Dynamics/ Power Relations - Network Connectedness - Levels of Conflict/Trust - Socio-economic/ Cultural Health & Diversity	- Leadership - Consequential Incentives - Interdependence - Uncertainty	- Discovery - Definition - Deliberation - Determinaton	- Mutual Trust - Mutual Understanding - Internal Legitimacy - Shared Commitment	- Procedural/ Institutional Arrangements - Leadership - Knowledge - Resources	Will depend on context and charge, but might include: - Securing Endorsements - Enacting Policy, Law, or Rule - Marshalling Resources - Deploying Staff - Siting/ Permitting - Building/ Cleaning Up - Enacting New Management Practice - Monitoring Implementation - Enforcing Compliance	Will depend on context and charge, but aim is to alter pre-existing or projected conditions in System Context	- Change in System Context - Change in the CGR - Change in Collaboration Dynamics

Figure 7: A logic model approach to collaborative governance (Emerson et al., 2011)

Collaborative governance is an important concept to look at in the practice of integrative urban area development. Joint-decision making from actors with different interests can

lead to public goals, such as health. These ideas can form the academic basis of the empirical study.

Planning tools

Governments have important tools to influence the construction market. The most important tool is planning. This steering mechanism can be used to introduce societal goals, such as health, in the construction industry, and thus, in urban area development. With planning, Tiesdell et al. (2005) talk about:

> *the intentional public/governmental interventions in the land and property development process intended to achieve desirable societal objectives. E.g. land, planning, housing, transport and regeneration policies.*

Tiesdell et al. (2005) divide the planning tools that governments can use in four typologies: market shaping, market regulation, market stimulation and capacity building. Market shaping tools provide the overarching contexts within which market actions and transactions occur and can be more or less directive. Market regulation tools seek to regulate and control market actions and transactions. Market stimulation tools do not limit choices, but simply change the contours of that opportunity space, making some strategies more (or less) advantageous to market actors. Capacity building tools build the abilities and capacity (e.g. skills knowledge networks, rules of operation, working practices) of market actors in various ways. They are seen as more facilitative than market shaping and market stimulation. Important to note is that capacity building tools work more on trust and relate to collaborative governance ideas.

Each of these planning tools has sub-types of interventions. These can be found in figure 8 below. These shaping tools are important to understand for the introduction of health in the urban area development practices, both for public and private actors. Private actors can try to change public policy or interventions to facilitate particular interests (Tiesdell et al., 2005).

	Demand for activity	Supply of activity	Confidence/risk associated with activity	Information about activity	Appraisal/decision making
Market shaping					
• Development plans	(Potentially) changes spatial incidence of demand for activity	(Potentially) changes spatial incidence of supply for activity	Authoritative information and state commitment to (say) infrastructure provision reduces 'political' risk	Provides authoritative information about activity and enables market actor to act more strategically	Assists decision making by providing (authoritative) information about interdependent decisions/ developments
• Regulatory plans	(Potentially) changes spatial incidence of demand for activity	(Potentially) changes spatial incidence of supply for activity	Authoritative information reduces 'political' risk	Provides authoritative information about activity and enables market actor to act more strategically	Assists decision making by providing (authoritative) information about interdependent decisions/developments
• Indicative plans	(Potentially) changes spatial incidence of demand for activity	(Potentially) changes spatial incidence of supply for activity	Authoritative information reduces 'political' risk	Provides authoritative information about activity and enables market actor to act more strategically	Assists decision making by providing (authoritative) information about interdependent decisions/developments
Market regulation					
• State/third party regulation	–	Where regulation is disincentive to activity, relaxing or simplifying may encourage supply of activity. Changes spatial incidence of activity (typically by prohibiting it in certain locations)	By strengthening property rights, reduces risk and increases confidence – e.g. strict regulation reduces risk of adjacent development reducing site value (i.e. regulation protects site value)	Increases availability of information about activity (i.e. what is permissible and what is not)	–

• Contractual/bi-lateral regulation	–		Reduces risk	Increases availability of information about activity (i.e. what is *permissible and* what is not)	–
Market stimulation					
• Fiscal measures	–	Improves supply of desirable activity by lowering effective costs of supply	Reduces financial risk	–	–
• Direct state actions	(Potentially) changes spatial incidence of demand for activity. May increase (or reduce) effective demand for activity	(Potentially) improves supply of desirable activity	State commitment to activity reduces development risk	–	–
Capacity building					
• Fostering actor–network relations	–	–	Reduces risk by providing opportunity to build working relationships and trust between market actors	Increases availability of information about activity	(Potentially) enlarges number of participants in appraisal
• Building social capital	–	–	Reduces risk by building trust between market actors. Joint commitments increase confidence. Provokes reconsideration of risk	Increase availability and verifiability of information	Potentially enlarges number of participants in appraisal
• Challenging cultural perspectives	–	–		Provides new information about activity	Challenges conventional appraisal approaches

Figure 8: Planning tools and market characteristics (Tiesdell et al., 2005)

These planning tools can be used to introduce health in certain ways. Market shaping tools could for instance be the new Omgevingswet. The Dutch Omgevingswet will be implemented on the 1st of July 2023 (if it does not get postponed). With this new organisation of environmental law, municipalities will have more policy freedom and opportunities to take health into account (Arcadis, 2022; GL, n.d.). Things could be the betterment of exercise in the environment or equalising health differences within the society. This is because one of the goals in the Omgevingswet is: achieving and maintaining a safe and healthy physical environment (GL, n.d.). Through market regulation, the government can intervene in urban area development through contractual arrangements. Market stimulation can be in the form of subsidies or programmes from the government that sponsor developments when trying to realise health developments. Capacity building relates to the collaborative governance steering mechanism. This is built upon actor network relations and building social capital. Building trust and relationships is needed to start a collaborative governance regime.

Developing healthy urban areas

According to Gezonde Leefomgeving (2018), there is no 'best practice' when it comes to working with health. It depends on the context what fits best for a set area or city. This needs to be analysed for every project specifically. Some steps can be taken for this:1. Map health in the local environment to help form a starting situation; 2. Assess possible health opportunities and risks; 3. Introduce health in an area; and 4. Participate with residents.

Connected to these steps, GL (2018) also formulated factors that are stimulating and factors that are challenging healthy development. This will be shown in the next sections.

Stimulating factors

The stimulating factors will help introduce health in the built environment. They can be seen in table 2 below.

Factor	Explanation
Search for stakeholders	Involve stakeholders from the beginning and take their ideas and experiences into account. A stakeholder analysis is needed for this.
Search for connection	Reducing health differences can not only be done from one perspective. This means that collaboration and connection is needed. Build relationships, make connections between different themes, have conversations and also involve internal colleagues.
Find an ambassador	It helps when there is one person who has the time to help with communal health ambitions and resources to realise plans.
Be transparent	Everyone needs to have the same expectations. Arrangements need to be made for collaboration, the process and the impact of the collaboration. Set a framework together to see where involved actors have influence. Make clear who decides in the end.
Shared ambition	Find a shared ambition to have a shared goal. The ambassador can help spread this ambition. Focus on collaboration with other domains such as mobility.

Table 2: Stimulating factors for healthy development (GL, 2018)

These stimulating factors can form a basis for effective healthy urban development. The categorisation can also be used within this research.

Challenging factors

The challenging factors will make the introduction of health in the built environment more difficult. They can be seen in table 3 below together with tips on how to tackle them. Factors are divided into process related factors and content related factors.

Factor	Explanation and mitigation
Adhering to the set norms (content)	Negative effects which are within norms still give health disadvantages. Also, the cumulative effect of these effects isn't shown. *Mitigation: try and reach for more than just the norm. Health improvement is as important as the reduction of bad effects*
Lack of norms (content)	There are no set norms yet for certain aspects related to health in the built environment. Actors say it is too 'soft' and too qualitative. *Mitigation: Map local situations related to health. Use locally determined interventions.*

Uncertainty (content)	There is not enough research to show which effects result from which interventions. *Mitigation: Be transparent in uncertainties and explain why choices are made. Let professionals help in determining a fitting approach. There is no standard process.*
Unknown subject (content)	Health is a new concept for many actors. Exploring this can be time and money consuming. *Mitigation: Show the urgency and reasons for this approach. Show what health means and how it will look like in the built environment. Connect people, use an ambassador and name the project as a pilot project.*
Complexity (process)	Integral development is complex. Health is another goal that will need to be taken into account. *Mitigation: Little steps can be the start. Create meeting opportunities with various professions. Create a binding ambassador.*
Support (process)	Actors are here from their own interest and finding a middle ground can be hard. Connecting actors can be time consuming. *Mitigation: Visualise the end result. Work with expectation management within which boundaries actors can have influence. Connect inhabitants, but also civic society.*
Collaboration (process)	Collaboration between fields can be hard and investments need to be done by a party. But, who and why>> *Mitigation: integral subjects like health need collaboration. Involve actors early by urban area developments. Connect the physical and social domain.*

Table 3: Challenging factors and their mitigation when introducing health (GL, 2018)

These challenging factors can form a basis to map challenges related to healthy urban development. The categorisation can also be used within this research.

Social Return on Investment

Urban area development is about creating value. This value can be financial, but as seen above, this value can also be societal (de Zeeuw, 2011). Soft values like health are much harder to express in euros. Soft values are hard to express and to assign. A social return on investment analysis (SROI) (Dutch: Maatschappelijke Kosten-Baten Analyse / MKBA) can help here.

A SROI is not only focusing on financial consequences of a project, but also on the estimation and valuation of hard to measure, indirect and/or direct effects (Koetse en Rietveld, 2010). Within a SROI, effects will be compared to the situation when societal

values were not taken into account. All costs and returns here will be expressed in euros. Also, the subject which is harder to express this way. If returns are higher than costs, then the project has the chance to increase welfare. This analysis can help with: positive and negative effects of the project; the ratio in costs and returns; risks and uncertainties; who will profit from the project; and who will bear the costs of the project. This makes it easier to connect goal, measure and effect (de Zeeuw, 2011). Nicholls et al. (2012) name 7 principles which are important when using this kind of analysis. These are: 1. Include stakeholders; 2. Research and understand what will change; 3. Only value what is important; 4. Only use relevant and significant parts; 5. Don't claim too much; 6. Be transparent; and 7. Verify assumptions and results. Handling these principles increases trust and credibility. This SROI analysis could help with finding the right ways of financing healthy projects and seeing which actors are profiting and which actors are bearing most (financial) risks. It could take the focus from profit to impact.

Conclusion from literature study

Health is connected to the built environment. Tonne et al. (2011) shows this connection through demography and implications for health, climate change and health, food systems, diet and health, land use and transport policy, travel behaviour, and health, environmental noise and health, urban greenspace and health, and social stress and wellbeing. The GGD (2021) further details these connections with themes in the built environment.

In urban area development, there are many actors who play a role. Franzen et al. (2011) made the division between public, private and civic actors. Actors are connected and need to be taken into account when releasing urban area developments. Actors can use steering mechanisms to manage these developments. Collaborative governance is such a steering mechanism which can be used to realise healthy urban areas since a public purpose such as health is carried out by a combination of cross-boundary actors (Emerson et al., 2011). Another steering mechanism which can be used by governments are planning tools. These instruments can be used to introduce a political problem through the construction industry. Tiesdell et al. (2005) categorise these into four typologies: market shaping, market regulation, market stimulation and capacity building.

When introducing health in urban development projects, challenges and stimulating factors can be found (GL, 2018). Stimulating factors included: searching for stakeholders; searching for connection; finding an ambassador; being transparent; and finding shared ambition. Challenging factors included: adhering to the set norms; lack of norms; uncertainty; unknown subject of health; complexity; support; and collaboration. These all need to be taken into account when realising healthy developments. A SROI-analysis can help showing societal impact that will be given back when developing healthy urban area projects.

Survey

As shown in the research methods, a survey has been conducted to get an understanding of healthy urban developments in practice. The goal of the survey is to know what practice sees as important aspects for healthy developments, to see what healthy developments are already done, to see which stakeholders are connected to healthy developments, to see how health is implemented in tangible measures, to see which challenges show up when developing healthy urban areas, and to see what recommendations practitioners have for future realisation of healthy urban area developments.

For the survey analysis and conclusion, the following steps will be taken: introduction to response group, what aspects does practise see as healthy, previous projects including stakeholders, challenges from experience, and recommendations for future developments. In the end, there will be a conclusion with key takeaways from the survey.

Participants information

Firstly, it is important to have an understanding of the survey participants to be able to connect the responses to stakeholder information. Of the 114 respondents, 97 answered questions. This results in a response rate of 85%. The average age of the participant was 43 years. The youngest person was 24 years old and the oldest person was 66 years old. The gender distribution is shown in table 4 below and the distribution of different companies in urban area development in the Netherlands where participants work is shown below in table 5.

Gender	%	Count
Male	60,19 %	65
Female	39,81 %	43
Total	100 %	108

Table 4: Gender distribution survey participants

Table 4 shows that around 60 percent of participants is male and around 40 percent are female. In the whole construction industry, this percentage is different, namely 90 percent male and 10 percent female (Banbouw, n.d.). However, this includes all construction site workers which are mainly male. This survey is completed by other kinds of employees (see table 5).

Company type	%	Count
Developer	85,85 %	91
Consultant	2,83 %	3
Municipality	1,89 %	2
Province	0,94 %	1
State	0 %	0
Investor	0,94 %	1
Housing association	0 %	0
Other ...	7,55 %	8
Total	100 %	106

Table 5: Company type distribution under survey participants

Table 5 shows that 86 percent of respondents are developers. This result is because the survey was also spread through the graduation company which is an urban area developer. The other non-developer respondents are not in as big numbers, which will make it harder to get various perspectives. The other category consists of retail, financiers, urbanists, engineers and one student. A better understanding of all actors

could have been when the spread in company types was bigger. To conclude: the respondent group is around 43 years old on average with 60 percent male and 40 percent female, and consists of mostly developers.

Aspects of healthy urban area developments

The first goal is to understand what practice sees as healthy urban developments. Specifically, aspects contributing to a healthy urban area development were asked. Different stakeholders have different views on health and through time focus can be different from the RIVM aspects of 2016 (see chapter xxx). Each respondent was asked to name the three most important aspects that contribute to health in urban area development. The following question and responses were posed and received in the questionnaire to research this topic.

Question x: Name the three aspects that, according to you, are the most important for healthy urban area developments.

Different answers were given to the question. Before the categorization, a word cloud has been made (figure xxx). Here, the words that are named more often are shown bigger and in the middle.

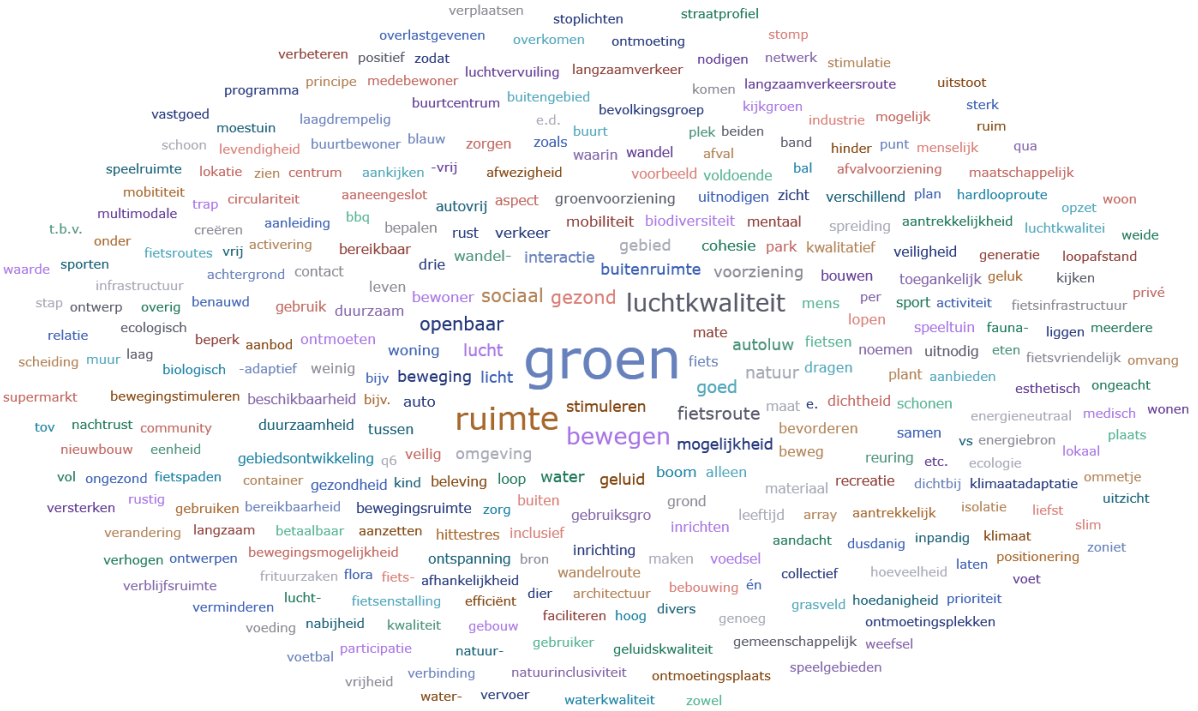

Figure 9: Word cloud frequencies of aspects (Own image)

The words named the most often are: groen (Englisch: greenery) with 77 times; ruimte (English: space) with 35 times; luchtkwaliteit (English: air quality) with 21 times; and bewegen (English: mobility) with 20 times. These show a first idea of what aspects are thought to be of essence when it comes to health in UAD. However, it does give a total picture since words such as nature, tree or strolling are not connected to these themes. It shows an oversight of all words given. For further categorisation, various themes are

made. These are ordered in the amount they are named and the specifications given are shown as well (table 6).

Theme	#	Specifications from answers
Greenery	90	Useable, reachable, reduce UHI, trees, parks, nature, street profile, nature inclusive, experience, biodiversity
Mobility	65	'Autoluw', design for cycling and walking, slow and safe traffic, routes, seducing for movement, human measurement, playgrounds, STOMP, all ages
Space	30	… for recreation, outdoor space, density and spread of built environment, tranquillity, freedom
Social cohesion	29	Societal services, participation, strong social network, meeting new people, interaction inhabitants, collective space, liveliness, multiple generations
Air quality	26	Clean, no hinder
Sustainability	10	Circularity, ecological life, design for people, plant and animal, climate positive, energy sources, materials
Water	9	Quality, preferably moving
Sound	7	Quiet spots, nightrest
Light	6	… in housing
Amenities	6	Medical, care, connection city centre, grocery store
Design	5	Architecture, program and use, experience
Food	4	Local and biological produces food, no fast food

Table 6: Themes of aspects for healthy urban developments

The main themes from the questionnaire are greenery, mobility, space, social cohesion and air quality. Showing that these were seen as most important or most known in practice. Noticeable from the analysis in Atlas.ti is that many answers connect to more than one theme. For instance, trees are named in the greenery theme, but also contribute to the air quality, sustainability and water themes. This shows that aspects can influence health (and probably multiple other goals) at the same time. An example of an answer that shows this, is the following: ''Sustainability: sustainable energy sources and efficient insulation contribute to lower emissions and better air qualities. Green street profiles also contribute to air quality, climate adaptation and biodiversity, has aesthetic value and increases social cohesion.''

Concluding, the theme of greenery is seen as most health related by practice. After greenery follow mobility, space and social cohesion. Other themes are also named and not to be discarded. Aspects also can have multiple effects other than health or focussing on a single theme.

Previous projects

Of 65 respondents that answered the question if they have experience with healthy urban area development, 42 have experience with urban area development with health as one of the goals. These respondents were asked to name actors in the project, especially focussing on health related actors. Actors such as municipalities, investors, developers, advisors and citizens were named. Within Atlas.ti a co-occurrence table analysis has been done to show which actors are especially named when it comes to health (see figure 10)

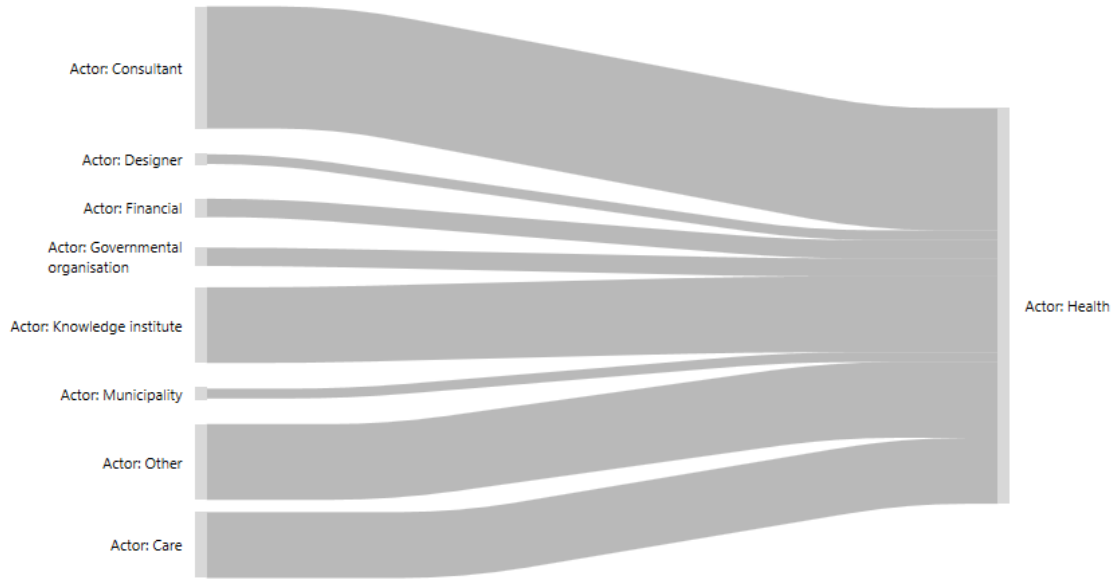

Figure 10: Sankey diagram of actors related to health in previous urban development projects (Own image)

This figure shows that consultants, knowledge institutes and care are most often named as special actors in an UAD with the focus on health. Within the group of consultants, there are parties such as WELL and Hartstichting. These give advice on health related topics. The knowledge institutes help with research, innovation and the introduction of knowledge hubs. Care parties' main focus is health for their patients. The category 'other' is relatively large as well. This category contains actors such as swimming pools, supermarkets and urban farms. These are all actors connected to health, but most are specific for the location the project is in. Additionally, the other actors that are named, but not specifically named for health, will probably also work with health. For instance, municipalities may have requirements or goals towards healthy neighbourhoods, developers need to include this into the project scope and designers need to implement the measures in their design for the buildings and public space.

Another question was asked in this section. Respondents were asked to name which kinds of functions are included in the development. This can be seen in table 7.

Function	Count

Living	41
Commercial	31
Companies	12
Societal functions	27
Care	15
Other …	4

Table 7: Functions in healthy urban area developments

Table 7 shows that housing is included in almost all urban area developments with health as a goal. Also, care and societal functions are relatively high. Other functions that are named are sports, public space and culture. Together with these questions, the goal related to health was asked. A few goals will be shown here:

- *''Healthiest neighbourhood of the Netherlands''*
- *''Healthiest neighbourhood of Breda''*
- *''2 years longer living in ~name~''*
- *''Creating a healthy environment''*
- *''Creating a holiday feeling for inhabitants''*

Most of these goals are related to living in the area. This connects to why almost all developments have some form of housing built in.

Concluding, stakeholders are an important part of introducing health in urban development projects. Consultants, knowledge institutes and care actors are named most often. Residential units are also connected with healthy neighbourhoods and their set goals towards health, such as 2 years longer living in ~name~. Care stakeholders can be connected to the function of care which is seen in part of the developments. Future care organisations are already connected in the development process. Keeping these stakeholders and functions in mind can be helpful for future healthy urban area developments.

Challenges

When a respondent has experience with health in urban area developments (read: answered 'yes' for experience with health in urban area developments), they get asked the following question:

Question x: Which challenges do you encounter when introducing health into an urban development project?

The challenges received from this question can help with finding the difficult parts of introducing health and help formulate solutions or recommendations. 32 challenges have been found in the answers through Atlas.ti and they are categorised as following: business case, practical difficulties, measurability, concept of health and communal interest. These challenge categories with specific answers are shown below in table 8.

Challenge	#	Specifications from answers
Business case	14	Actors who focus on optimisation, health is not included in business case, GREX driven choices, getting increased costs back with delivery, who pays what, is the end product worth more, exploitation of implemented measures
Practical difficulties	9	Behaviour is difficult to change, innovation is difficult, other aspects such as traffic gets priority
Measurability	4	Prove of healthy area, effects on people, healthy neighbourhood vs. 'normal' neighbourhood
Concept of health	4	Various perceptions of health, lack of knowledge
Communal interest	2	Different views and/or future vision

Table 8: Challenges from experience in health urban area developments

The business case is named the most. In the business case of urban development, lots of different variables have to be taken into account. Since health is a relatively new concept in urban area development, it is not set who will bear the costs for what and who will receive the profits of the end product. The answers also suggest that actors are only focussed on maximising profit instead of maximising quality. Also, practical difficulties are seen by respondents. They notice that behaviour is hard to change and that innovation can be scary for project teams. More known aspects such as well functioning traffic get priority over the newly introduced health. Moreover, respondents find it hard to measure if the end result is more healthy than a 'normal' neighbourhood. This is because there are no universal and known measurement methods and because people are not bound to an area and can experience effects, positive and negative, from other areas. Lastly, respondents found it hard to find a common goal and to find a common understanding of the concept of health. These five categories are seen by respondents as challenging.

Recommendations

Developers learn throughout the process of a project. Because the respondents have previous experience with health in urban area developments, they will get a question asking about this experience and their recommendations for future projects. The question asked is:

Question x: Which recommendations would you give your colleague when he/she would need to develop a healthy urban area?

The answers to this question have been analysed and categorised in Atlas.ti. Out of this analysis, themes have been formed from all recommendations. These are: collaboration, design, clear goals, business case, mindset, research, societal interest, analysis,

achievable and explainable. Specifications from answers are shown behind each theme (see table 9).

Recommendation	#	Specifications from answers
Collaboration	17	Engage with inhabitants within and close to the area, collaborate with knowledge institutes, involve fitting consultants and designers, internal collaboration, communication for draagvlak and business case, organisation for activities, close with municipality
Design	16	Design aspects such as: design for humans (of all ages and lifestyles) and future generations, introduce lots of green, create meeting places, create space for exercise, STOMP-principle, introduce programme
Clear goals	14	From start of project, on basis of local context, financial goal, stick to the (shared) vision, protect goals through the process
Business case	11	Conversation with market parties at the front-end (investors and users/operators), have courage to invest, just do it!, not all implementations are expensive, costs will return in societal benefits
Mindset	9	Define as theme and keep working on the elaboration, just do it!, discover, be creative, start with small projects, think on urban area level vs. building level, focus on lifestyle, focus on social rent (biggest gains)
Research	6	Inform about previous knowledge (intern/extern), collaborate with knowledge institute, learn from case studies, find measures that contribute to multiple goals
Societal interest	5	Healthy inhabitants is a good urban area, focus on happiness, look at low income groups
Analysis	4	Analyse the area and environment for possible improvements
Achievable	3	Achievable, concrete and makeable goals
Explainable	1	Create a tangible story

Table 9: Recommendations from experience in healthy urban area developments

Table 9 shows that collaboration is named the most. According to the responses, this is not only collaboration with external stakeholders, but also internal collaboration with colleagues who have experience with healthy developments. Collaboration with knowledge institutes can be used to build knowledge and to do research. Fitting consultants and designers are also recommended. Also, collaboration is needed throughout the whole process and even after delivery. The municipality also needs to be closely connected to the project. After collaboration, design is mentioned the most. These aspects are similar aspects as found in survey responses (table 9), literature and past research. Clear goals are also named often. This recommendation is mostly about

focussing on making a clear goal from the beginning of the project from shared vision. These goals will need to be protected throughout the process. Fourth is the business case. Here, respondents said that conversations about funds need to be made in the front-end. Inventors and users/operators need to be included here. Also, costs made will return in societal benefits. And not all health implementations are expensive. Then follow mindset, research, societal interest, analysis, achievable and explainable. Noteworthy here is that low income groups need to be looked at since they can have the most gain in health, and the analysis of the (surrounding) area is needed to decide on possible improvements.

Key takeaways and considerations from survey

The respondent group consisted of mostly developers with an average age of 43 years. Respondents found greenery the most important aspect of healthy developments, following with mobility, space and social cohesion. These are not the only themes names and other themes should not be neglected. It was found that many aspects have multiple effects other than health or focussing on a single theme.

In previous projects, respondents found that stakeholders are an important part of introducing health into projects. Actors such as consultants, knowledge institutes and care actors are named when it comes to health focus, but other stakeholders such as municipalities, provinces, state and market parties should not be discarded since they will probably have an opinion in health and are the parties that will make decisions. Care functions can be connected to care stakeholders and the inclusion of residential functions in urban area developments can be connected to the goals that are given to areas and the other way around.

Key takeaways from the challenges are: the business case can be a challenge when introducing health. This is because of profit driven actors who minimise funds for health interventions, a focus on money instead of quality for later and uncertainty about if a healthy end-product will give a higher return. Practical difficulties are also named often as challenges, because other measures will get priority over health objectives or innovation for healthy interventions is seen as difficult. Measurability of health interventions, the ambiguous concept of health and communal interest that is hard to be found, are challenges that are also named. Keeping these in mind will be helpful in future developments. Challenges arise from the interplay between various actors who all have their own interest, but will come together to create a healthy urban area development.

Key takeaways for future healthy developments can be divided in two categories which should not be seen apart. Some recommendations given by the respondents are more 'general' urban area development recommendations such as ''collaborate with inhabitants'' or ''find a shared vision at the beginning of the project.'' Other recommendations are specifically focussed on health objectives in urban area development. General recommendations which also include health objectives are: focus on collaboration from the beginning of the project till after the delivery date. This has to be done internal and external from organisations to ensure no knowledge gets lost. Here, stakeholders such as knowledge institutes and consultants can help gaining research and giving knowledge. Design aspects named as recommendations are similar to the aspect question. Business case recommendations are also given which could potentially counter the challenges experienced in practice. Key takeaways here are that conversations need to be made in the front-end and that return will not only be in direct value return, but also in societal benefits. Specific health objective focussed recommendations are: focus on greenery; take future age groups into account when designing public space and buildings; make health objectives a part of the total vision; connect with consultants, knowledge institutes, landscape architects and urbanists who have health knowledge; focus on social rent, because with these residents, the most increase in health can be accomplished; and analyse the context to find health issues that are relevant.

Concluding, throughout the process, different parties should start conversations at the beginning and continue till at least after delivery to make plans for the future. This will be about the business case, but also about goals, implementation and knowledge sharing.

Case Studies

As mentioned in the research methods chapter, two case studies will be looked into. These cases will be analysed, looking at the stakeholders involved and the timelines. Additionally, challenges, the implementation of health and various other factors following from the previous research (survey and literature study) will be shown, such as experiences with the business case and collaboration.

The following steps will be taken for the case studies: project description, program and functions, actors, timeline, interview analysis, and conclusion of the case.

Interviews are conducted with various actors connected to the case. For the first case, Hero van Breda, a total of 7/8 interviews are done. These can be seen in table xxx. For the second case, Bajeskwartier, a total of 2 interviews are done. These can be seen in table xxx. This difference is because Hero van Breda was a case study from the beginning and Bajeskwartier was added later on. Due to this, and the full agenda of municipal actors, the amounts differ.

Case study 1: Hero van Breda

Hero van Breda is an urban area development project situated in the Dutch city Breda in the province of Brabant (figure 11). It is an inner-city redevelopment of an old factory terrain of the 'HERO' company into a residential urban area. The goal is to make the hero terrain the healthiest neighbourhood of Breda. This is one of the reasons why this case was selected.

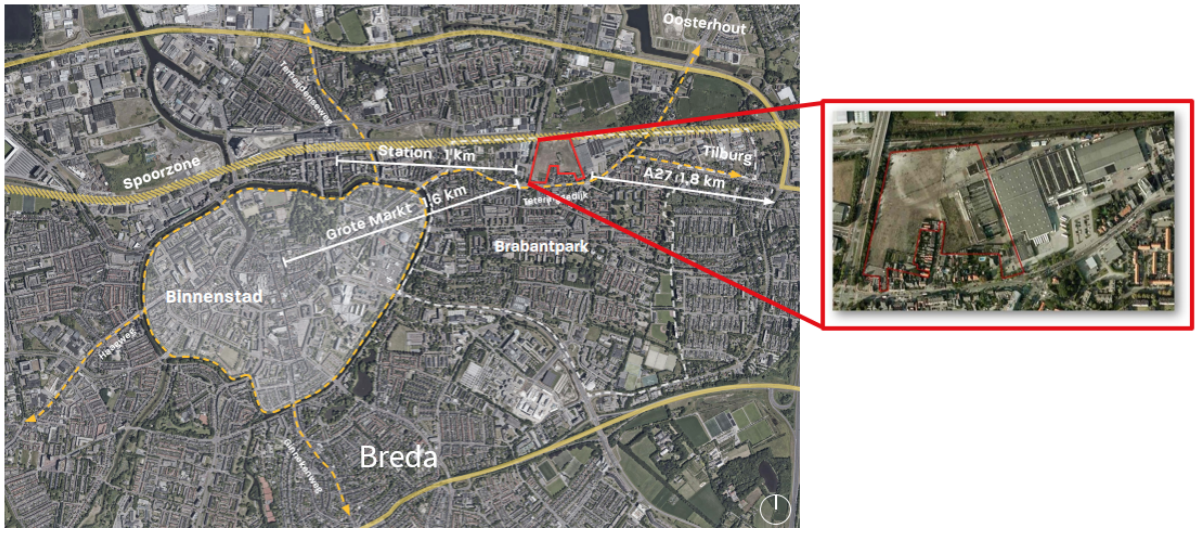

Figure 11: Situation of the terrain of Hero, Breda (AM, 2023)

The neighbourhood needs to resemble the old industrial identity of the former factory. It will be connected to the adjacent area in a natural way. The nuisance of the railway will be blocked by two apartment complexes which are situated at the boundary of the area. The neighbourhood will be fairly green and will be 'autoluw'. There will be space for playgrounds and resting areas (AM, n.d.).

Figure 12: New development of Hero, Breda (AM, n.d.)

Program and functions

To get an idea of the project, it is needed to know which functions will be included. This section will give an overview of what the area will be for programs and functions.

Within the project, there will be a total of 420 units of housing. These consist of:

- 78 social rent apartments
- 102 middle sector rent apartments
- 174 ground bound houses
- 18 'H.O.E.D.' apartments (Dutch: Huisartsen onder één dak) where care will be available for inhabitants
- Tourist building with 48 more apartments

Actors

Connected to the project, there are many different actors. The actors can be seen in table 10.

Role	Organisation
Developer	AM Gebiedsontwikkeling
Municipality	Gemeente Breda
Province	Provincie Noord-Brabant
Architect	DAT Architecten
Urban Designers	DiederenDirrex
Landscape architect	Buro Lubbers
Housing company	WonenBreburg
Consultant	Urban Matter
Consultant	BRO
Consultant	Hoekse Advies
Knowledge Institute	Kenniscentrum Sport & Bewegen
Concept designers	Conceptual residences
Municipal health organisation	GGD Breda
Health organisation	Hartstichting
Interest group	Jantje Beton

Table 10: Actor overview for Hero, Breda

Timeline

2007 till now: AM owns the land of the HERO factory

2021: First plans for the Hero terrain
March 2022: Participation sessions on idea of health
January 2023: Session with actors to give input on the plan
Q1 2023: Bestemmingsplan is définitive
March 2023: Start groundwork and construction

To get a full understanding of the case, interviews have been done. Table 11 shows the interviewees, their organisation, their function, their relation to the case and the date of the interview.

Name	Organisation	Function	Relation to case	Interview date
HB1	Developer	Project leader	Directly involved	13-04-2023
HB2	Developer	Placemaker	Directly involved	13-04-2023
HB3	Developer	Project developer	Directly involved	24-04-2023
HB4	NGO	Advisor	Directly connected	01-05-2023
HB5	Gemeente Breda	Advisor Health	Directly involved	15-05-2023
HB6	Gemeente Breda	Project leader	Directly involved	Cancelled
HB7	Knowledge institute	Researcher	Directly connected	11-05-2023
HB8	GGD Breda	Care centre	Directly connected	03-05-2023

Table 11: Interviews of Hero van Breda

Interview analysis

The interviews were transcribed and then analysed using Atlas.ti. Within the program, certain themes were used to structure the results. This section will show an analysis of the interviews conducted. This is a selection of interesting parts of the case studies. Starting with the start of the project, then aspects of health and following with process, business case, collaboration, stakeholders, after delivery, knowledge and societal value. These subjects have been chosen from the themes that became apparent during analysis.

Start of the project:

This project was chosen as a pilot project where health is going to be explored with help of external knowledge (HB1, 2023). The initiative for a healthy neighbourhood came from AM as a new way to develop urban areas. AM went to the municipality with the vision (HB3, 2023; HB5, 2023). The land was already owned by AM, so no tender was needed (HB2, 2023). How the idea came to be to develop a healthy neighbourhood is not certain, but it could result from the office sector where BREEAM and WELL are focusing on health (HB2, 2023), or it could come from the identity of the area where a fruit company used to be (HB3, 2023). The first idea was to make Hero the healthiest neighbourhood of the Netherlands. However, this challenge was too high for a learning project and the goal was changed to the healthiest neighbourhood of Breda (HB7, 2023).

Aspects of health:

For the area, the project team made their own health essentials with four main pillars: a lively neighbourhood, connecting green, healthy living and a stimulating environment. These four pillars contain ''10 golden rules'' which are: 1. Make movement visible; 2, Enhance spontaneous encounters; 3. Organise liveliness; 4. Make healthy food accessible; 5. Let the area breath; 6. Stimulate healthy movement; 7. Give nature its space; 8. Let architecture inspire; 9. Improve local business; and 10. Make the healthy choice easy (AM< n.d.). These golden rules needed to be translated to fixed aspects.

The aspects that will be introduced in Hero van Breda are scaled on the levels of area, building and behaviour (Dutch: Gebied, Gebouw en Gedrag). For each of these levels, there are measures made (HB3, 2023). Some examples of measures are: a communal living room where people can eat, where there are activities and where people can meet; car parking is moved to the boundaries of the project; stair are places in sight and elevators are moved backwards; bikes are placed in sight; playgrounds; a green environment; a central package pick up point; and more. In these measures, there is an attempt to take one step further according to AM. For instance, shared cars are something that is done in many developments, but how can you increase this concept to take health into account (HB1, 2023). Behaviour is tried to change with the built environment but as well with a behaviour booklet/ rule booklet which residents are signing to try and adhere to a set of living styles. Not forcing, but stimulating and creating awareness. Things like the use of bbq's or other outdoor fireplaces could be reduced because of health issues they cause (HB3, 2023).

Maintenance and operation after delivery prove to be difficult points. There will be a waterpoint introduced, but the municipality is doubting about the maintenance of the

object (time and money) (HB2, 2023). Another example is the introduction of smoke-free zones. No new law or regulation will be connected to this, because it is hard and the municipality doesn't want this (HB2, 2023). However, the municipality wants to communicate the smoke-free zones with markings and signs to stimulate changing behaviour (HB4, 2023). A key component is the collaboration with municipality after the project is done to ensure the effect of the measures will continue.

Process:

Health as a goal became part of the project when the project was already going after the urban planning stage This was hare, because some design decisions were taken already (HB1, 2023). It would be better to do it from the start than to add it while going (HB2, 2023). If health would be seen fundamentally from the beginning, choices like housing next to the train tracks could have been made differently (HB1, 2023). Health measures usually are cheaper when taken early in the project (HB3, 2023). For the next time, health should be more fundamentally integrated from the beginning (HB1, 2023; HB4, 2023). Together with the municipality and other parties throughout the whole process and with shared vision creation (HB4, 2023). The process of a development with health is not noticeably different from a 'normal' development. According to HB2 (2023), it feels more like an extra goal.

Business case:

Some health measures do not need much money. However, bigger investments usually lead to more return. So, it is still hard to choose which measures to take (HB3, 2023). You will only know when your investment is worth when housing gets sold at a certain price (HB3, 2023). The balance needs to be found on which aspect needs to be included and at what quality level. This same balance needs to be found between profit and time/money (HB1, 2023). Also, because of today's housing market, it is hard to keep every aspect in the project because of the affordability of housing (HB1, 2023). You need to spend your resources smart (HB3, 2023). One other uncertain point is that it is not yet known what value a healthy 'label' on a neighbourhood will generate in the end (HB1, 2023). This uncertainty and knowledge barrier makes large investments, high risks.

Some parties want to help and do research and development in the project for health products. This would be able to improve health in the project. However, these companies often don't have their own funds to do research. Resulting in the expectation that it will come out of the business case, but because the margins are small, it often can't be realised with the available money. These companies want to sell their products (HB1, 2023). The reward from including these parties in the project is also unknown from the beginning.

The new focus on health also brings opportunities for funding. Costs of care are increasing and prevention is becoming more important. The government has seen this and there are new funds coming to municipalities for preventive medicine (HB8). Through this way, new ways of financing health implementation could be possible. Also, there are research subsidies from the state for a healthy living environment. Knowledge institutes or other actors could do research in the project to tackle the problem of financing and time (HB7, 2023).

It is difficult to give priority to health in urban area development. Building housing comes first, then sustainability, then climate adaptation and then mobility. This is lower on the list than other themes. But, it will help with preventive care (HB7, 2023).

Collaboration:

Some partners within the project are partners of AM (Jantje Beton and Hartstichting), but through the municipality, this network was tried to be extended with for instance the GGD and Kenniscentrum Sport en Bewegen (HB3, 2023; HB5, 2023). These actors are contacted by the developer to help shape the project (HB8, 2023). Knowledge institutes can help with knowledge regarding health implementation. A difficulty is that all of these actors think from their own perspective, and have their own interests and knowledge. The goal is to combine these (using for instance idea forming sessions), use their expertises and create a common goal (HB1, 2023; HB2, 2023; HB3, 2023; HB5, 2023). Integral thinking needs to happen in this complex network of actors and interests (HB7, 2023).

The role of the municipality in the project is mostly advisory and connecting actors (HB5, 2023). The overall vision of the municipality of Breda is to make the healthiest choice the easiest choice. A trend within the municipal council is a focus on the subject of health. Aldermen are focusing more and more on the subject. Connected to the municipality is the VNG (Vereniging van Nederlandse Gemeenten). The steering towards health is also backed up by them (HB5, 2023). Generally the municipality uses various steering mechanisms to contribute to health. In this project, market stimulation is used with direct state actions such as the JOGG approach (Jongeren op Gezond Gewicht) or other events. But also fiscal measures are taken to improve health. Also, capacity building processes took place through the involvement of network relationships. The large goal for the municipality is a vision towards health. This is a strategic vision for the whole city and bigger scales (HB5, 2023). According to HB5 (2023), health should be a more top of mind concept.

Shared thinking was used to increase knowledge on the subject of health. Here, the question was what does health mean and how does it need to be implemented in the development (HB2, 2023)? This moment is called creating the DNA of the area (see the 10 golden rules) (HB2, 2023). The actors from multiple disciplines were invited to a workshop to give input on how health should be in the built environment (HB2, 2023; HB4, 2023). With the introduction of health, extra stakeholders need to be involved to gain the needed knowledge. However, the introduction of more actors means that there are more people and consequently, more opinions, and this means more time and money that needs to be put into the process (HB2, 2023). During the meeting in January, actors could see the plans again. Lots of elements were already decided on when this meeting took place. So, some aspects had no possibility to be changed anymore. For connected stakeholders, it would be nice to know which elements can be influenced by them (HB8, 2023). Hard during these sessions can be that there will always be a deciding actor (developer in conversation with municipality), and other actors will not be able to influence all aspects (HB3, 2023).

Collaboration can help with the thought process of implementing aspects. An example is the placement of exercise machines in public space. Together with the stakeholders it was decided that the placement next to the H.O.E.D. would be advantageous, because physiotherapists can also use these machines (HB7, 2023). Another example is: the housing association found the idea of a communal living space hard and costly. So, the communal living room in one of the apartment buildings can be split into two apartments in case the concept doesn't work. This is a plan b when this concept doesn't work and to convince the housing association of the concept (HB3, 2023).

Part of collaboration is participation with (future) inhabitants and surrounding households. In Hero this happened with the neighbourhoods around the project (the project area itself was a factory location before this). A group of representatives was formed out of these people. However, during participation sessions they only focused on the amount of parking spots and the pressure the new cars could place on their area. This could be because of lack of steering or difficult people. The goal of talking about healthy implementations was not reached because of this. Most of the time, participants are there for their own interest (HB2, 2023). Participation with the future residents is expensive since they are not yet in the project and aspects will already be decided on when they are known. However, some elements will still be able to be influenced by them. For instance, the design on the wall will be done when inhabitants have moved in for participation and making the area theirs. Practically and money wise, this would be easier done when construction takes place and scaffolding is already in place (HB1, 2023). But, to make the area their own, it was decided to postpone this.

Stakeholders:

The case connects many stakeholders (see table xxx). Some of these stakeholders have their own view on health. This will be shown in this section. When it comes to health, the GGD is a resourceful partner. They focus on preventive medicine. The GGD knows the numbers of health related factors in municipalities and can see which problems are biggest in which areas. The Brabant Scan is an example of this. It is a dashboard with information about health in Brabant. They can also give advice on tools to use when trying to tackle these. In this project, the JOGG (Jongeren Op Gezond Gewicht) method was specifically used. This method focuses on making a healthy environment for children (HB8, 2023). The Hartstichting has an advisory role and focuses on a healthy food environment, a smoke-free environment, an exercise friendly environment and clean air (HB4, 2023). The goal of the Hartstichting is to agendate health more in the (urban area) development sector and to make the Netherlands a 6-minute zone. This means that an AID is accessible in 6-minutes (HB4, 2023). Kenniscentrum Sport en Beweging was connected to the project as a knowledge partner. Their biggest focus is a movement friendly environment (HB7, 2023). (Landscape) architects and urban designers are helpful when it comes to creativity within this project and other projects (HB1, 2023). Goals of stakeholders show that not all focuses are on the same elements. It is needed to combine these to create a total picture of what is needed.

To facilitate this, it is important that somebody feels as owner of health in the project to bring health on the map throughout the whole process (HB8, 2023) and that person will need the given time to spend on this subject (HB8, 2023). In other words, there needs to

be a representative of the concept. Often actors are enthusiastic in the beginning, but when it becomes real, they become hesitant. Someone like the representative could also convince these people to take that step. In this case, the developer took the responsibility upon themselves to take the lead in health interventions.

There are other stakeholders connected to the project from the neighbouring areas. One of them is the ALDI. They are willing and open to collaborate in the process. However, one step too far for them would be getting energy drinks out of the assortment because this is one of their best selling products, but they would want to place a healthy substitute next to it (HB2). One example of their involvement is the following: their biggest cost is in the logistics of everything that is not sold. This was connected to the communal area where these products that would otherwise be thrown away, are used to make meals for the neighbourhood. A win-win situation happened here (HB2, 2023).

Some risks connected to the 'newness of health implementation' are that for instance: contractors are hesitant when it comes to installing new equipment that is better for health, but when they bear the risk (HB1, 2023). Also, what is noticed, is that consultants will use known monitoring systems, but these are fairly unadaptive and expensive. An innovation needs to be made on these topics (HB1, 2023).

After delivery:

It is uncertain what will happen with the health organisation after the project is finished. Which actor will then be responsible for the orgware of the project (HB7, 2023)? This is because the urban area developer will be gone out of the area when the project is finished. They will need to give the responsibility to another actor (HB4, 2023). Knowledge institutes such as universities could also help here with research projects (HB7, 2023). To make a clear plan for this moment, conversations with municipalities or other actors need to be made before that moment (HB7, 2023). Within Hero, AM will be active for 3 years after delivery of the project in the board of the communal space to start the activities and organise the continuation (HB1, 2023; HB3, 2023). After these 3 years, hopefully there will be volunteers or others that will continue this programming. Households will also be asked to pay a certain amount (10 eu) per month to be able to organise these activities. This is voluntary, but is needed to organise activities. This amount has been chosen, because it was a good balance between being able to organise, but not too high costs (HB3, 2023).

Also, when the project is finished, it is still unclear how to monitor if people are behaving more healthy and if people are more healthy (HB2, 2023), and how to prove that this neighbourhood is indeed healthier than other neighbourhoods (HB2, 2023). It is interesting that there will be a look at the effects of these measures, and if it leads to a healthier neighbourhood in comparison to a 'normal' neighbourhood (HB7). There are smart measuring tools, but it doesn't fit the standard procurement protocol of the municipality. So, it needs to be clear and explainable why you need certain funds to get what you want (HB1). A difficulty is that effects will probably be measurable after a certain amount of years. So, this monitoring process will need to continue (HB7, 2023).

''In the end, we need to make certain that the project is not greenwashing, or in this case: healthwashing, which makes projects claim that they are healthy, but it is just an empty claim. It needs to be made sure that there is content connected to the claim'' (HB1, 2023). This is especially difficult with aspects that affect various topics. These aspects can be used to say that the area is healthy when there is no extra done on the subject.

When monitoring is possible, it will open a new discussion: If fixed norms are needed for health in the built environment (HB7, 2023).

Knowledge:

Previous knowledge can be used in the implementation of health. A checklist could be an instrument, internal or external of the organisation, to help a new project introduce health and to start with knowledge (HB1, 2023; HB3, 2023). Throughout the process, it is important to document obtained knowledge for future developments (HB4, 2023). The difficulty here (and with urban area development) is that every area, city, region or development is different. This can be in age, where elderly need different measures than younger families, income groups or other demographic aspects. When it comes to income groups, there is a big difference between poor and rich in health and well-being. However, this will not only be fixable with bettering the built environment, and being healthy differs from person to person, which makes the conversation difficult (HB5 , 2023; HB7, 2023). As a municipality, the choice to invest money in health is dependent on this. Would you first invest in a neighbourhood with poorer individuals who will statistically need it more, or in a neighbourhood where residents are affluent and will need the help much less? (HB7). HB5 (2023) explained this with unequal investments. Investment with the funds available will be done where a certain amount of money has the most impact. This is hard because a set amount of money does not directly translate to a set amount of effects (HB5, 2023). This unequal investing is done because of unequal health chances.

Additionally, the scale level of influence differs per actor. Municipalities have influence on city level, but developers in urban area developments have influence on a smaller level of scale (HB2, 2023; HB5, 2023). An example is that there is no public transport connection in Hero van Breda. However, many health aspects are built on the combination of slow traffic and public transport. If there is no public transport in the urban area development, it would not mean that the development is not healthy (HB2, 2023). Multi-level integral thinking with various actors is needed here to connect cross-border points of interests.

Societal value:

Social return is hard to measure and hard to know where the investments will return. Investments will not result in direct profit for developers or municipalities, but will pay off in societal value. Where this value comes back is really broad. (e.g. care which will need to pay less or an employer who will have less sick days from employees) (HB5, 2023). For instance, more exercise leads to 6% to 10% higher incomes, and this makes the state better in the form of taxes. Interesting to look at (HB7). A term for this is the Social Return of Investment. It measures societal return for certain stakeholders (IPH, n.d.).

Conclusion Hero van Breda

After a look has been done into the Hero van Breda case, these are the key takeaways from this case. First, the actors and their interest related to health will be talked about, then, challenges when realising health will be summarised and after that solutions and recommendations will be given.

Below in table 12, the actors related to this project are shown with their interest towards healthy urban developments.

Actor	Interest towards health
Developer	- Research the topic - Pilot project - Increased revenues
Municipality	- Healthy inhabitants - Healthy image of Breda - Smart investment of funds
GGD	- Preventive care
Kenniscentrum Sport en Bewegen	- Movement and exercise friendly environment
Hartstichting	- 6-minute zone
Jantje Beton	- Playgrounds for children
Surrounding residents	- Nice, but no disadvantages for themself
ALDI	- Healthy image

Table 12: Actors and interests towards health in Hero, Breda

When looking at the information obtained from the interviews, challenges can be found when trying to realise an urban area development with health. These challenges were given by various actors within the interviews and are experienced by themselves. The challenges found are the following:

1. Knowledge is still not mature. It is a learning process
2. Ownership of maintenance and operation after delivery
3. Legislation for proposed measures (smoke-free zones)
4. Implementing health while the project is already in process
5. Unknown effects from measures taken (is it worth to invest this much?)
6. Unknown profit from healthy label and health implementation
7. Research and development companies do not have their own funds
8. Building housing and sustainability have priority over health
9. Actors act out of own interest
10. More actors means more opinions to take into account
11. Participations only have own interests
12. Hesitant actors when innovation needs to take place

13. Actors use old methods of assessing health
14. Unknown if the area is healthier than other areas (demographics, context, cross-boundary effects)
15. Chance of healthwashing
16. Scale of influence differs
17. Social value is not directly related to certain actors. No incentive for investments

Additionally, during the interviews, actors gave recommendations on how to realise healthy urban areas. Same as with the survey, these recommendations are focussed on health objectives or focussed on the total picture of urban area developments. The recommendations given are:

1. Stimulate behaviour with marking and signs
2. Collaborate with municipality and/or other actors for maintenance and operation (after delivery)
3. Funds from state for municipalities for preventive medicine
4. Knowledge institutes could do research on the project, facilitate knowledge or involve in the measurement after completion
5. Involve actors that have the right expertise and knowledge (GGD especially)
6. Set framework on which actors can have influence
7. Convince doubting actors with flexible concepts
8. Find opportunities to connect aspects and effects
9. Organise and make a financial plan for programmation after delivery
10. Use previous knowledge (internal and external to the organisation)
11. Integral thinking and planning across multiple levels
12. Health as a goal from the start of a project and throughout the process
13. Shared vision creation with all actors involved and combining interests
14. Ambassador of health who has time to pursuit the subject throughout the process
15. Document obtained knowledge for future developments
16. Use the social return on investment to look for increased societal value

Actors gave some other insights in the developments of healthy areas that could be interesting. These are:

1. Keeping certain design options open for when future residents are known will make the area more their own, but will be more costly.
2. Fixed norms bad and good
3. Difference between high and low income groups. Municipalities have to choose where to put their funds. Low income means more impact generally

Case study 2: Bajeskwartier, Amsterdam

Bajeskwartier is an urban area development in the south of Amsterdam. It is just inside of the ring van Amsterdam. The goal here is to make a new piece of the city of Amsterdam from a former prison area. It will be a versatile urban area with many functions and housing units. One of the main pillars of this urban area development is health. This is the reason why this project was chosen.

Figure 13: New construction of Bajeskwarier, Amsterdam (AM, n.d.)

Bajeskwartier will be a neighbourhood with much green, and it will be a lively neighbourhood. There will be 70 different gardens which will connect the area together. Living labs in the area will help with research to the city of the future. Themes that are central in the area are green, sustainable and circularity, history, architecture and health. The 'groene toren' (English: Green tower) in the middle of the project will display every aspect that makes the area special (AM, n.d.).

Figure 14: Bajeskwartier impression (AM, n.d.)

Program and functions

Within the Bajeskwartier, there will be 1350 buy and rent apartments. These vary from large to small, from luxurious to basic. So, there will be places for different income groups and lifestyles. Mixed with living will be working spaces and workshops as well as art galleries, restaurants, climbing routes, health centres and cafes.

The public space will consist of urban farming, a vertical park, sporting and playing facilities, 70 different gardens and water areas. The whole area will be split into four districts: the learning district, the design district, the central district and the Amstel district. Each having their own character within the area (AM, n.d.)

Actors

Connected to the project, there are many different actors. The actors can be seen in table 13.

Role	Organisation
Developing consortium	Bajes Kwartier Ontwikkeling C.V. (AM, Schroders Capital and AT Capital
Municipality	Gemeente Amsterdam
Province	Provincie Noord-Holland
Tender setting actor	Rijksvastgoedbedrijf
Designers	FABRICations, Lola landscape, OMA, ReArchitecture, Atelier Kempe Thill, BDG architecten, Arons en Gelauff, MH1 architecten, Moke architectuur, Studio Seven architecten, Barcode architecten, Civic public architecture
Builders	BAM, Beelen, dGmR, SkaaL, Van der Tol groep
Knowledge institutes	European Network of Living Labs, Hogeschool van Amsterdam, Wageningen Universiteit
Consultants	De Wijde Blik, DLVS
Local partners	A Beautiful Mess, Bajes Dorp, Compananny, de Alliantie, Hotel Jansen, SAG (care)

Table 13: Actor overview of Bajeskwartier, Amsterdam

The design team (Dutch: ontwerpteam) for the tender consisted of FABRICations, Lola landscape, OMA and the consortium. The consortium of Bajeskwartier is with an equity light construction. AM is the owner for 20% and the other two partners are capital partners of the project to reduce financial risks.

Timeline

Q1 2016: Rijksvastgoedbedrijf puts out the tender
Q3 2016: Vision Bajeskwartier wins the tender, where health became part of the project
Q2 2017 - Q2 2019: Plan development
Q3 2019: Demolishing started
Q2 2020: Demolishing ended and start construction on infrastructure
Q1 2021: Start construction first non-residential buildings
Q2 2022: Start sale for first buildings
Q1 2023: Start construction first residential buildings
Q3 2023: Expected delivery of first housing units (social)
Q4 2026: Expected completion of the total development

To get a full understanding of the case, interviews have been done. Table 14 shows the interviewees, their organisation, their function, their relation to the case and the date of the interview.

Name	Organisation	Function	Relation to case	Interview date
BK1	AM Gebiedsontwikkeling	Project developer (buildings)	Directly involved	24-04-2023
BK2	AM Gebiedsontwikkeling	Project developer (public space)	Directly involved	08-05-2023

Table 14: Interviews of Bajeskwartier, Amsterdam

Interview analysis

The interviews were transcribed and then analysed using Atlas.ti. Within the program, certain themes were used to structure the results. This section will show an analysis of the interviews conducted. This is a selection of interesting parts of the case studies. Starting with the start of the project, then aspects of health and following with process, business case, collaboration, after delivery, knowledge and scale. These subjects have been chosen from the themes that became apparent during analysis.

Start of the project:

The project started with a tender process. Interesting was that the tender was given out by Rijksvastgoedbedrijf, because it was a prison complex and was owned by the state. The tender asked to present a vision, not to make a plan. So, contendants were free in what they wanted to present.

During the tender process, health became a subject in the project for the consortium. This idea started because of the healthy urban living and working theme from AM and the trends that FABRICations saw in relation to healthy cities throughout Europe (BK2, 2023). The municipality of Amsterdam did not make this one of the requirements of the tender (BK1, 2023). The ambition set at this time was: '2 extra years of healthy living in the Bajeskwartier' (BK1, 2023). This goal was then translated into 10 essences of health for the area (BK1, 2023) with help from FABRICations, Lola landscape and OMA in combination with the consortium (BK2, 2023). The ambition of health was part of a larger sustainability concept (BK1, 2023).

Aspects of health:

Health implementation in Bajeskwartier was done in three different ways: the building level was looked at, the area level was looked at and living labs were looked into to monitor if implementations would work (BK2, 2023). The 10 essences or measures take these into account.

Implementation can be seen at for instance the stairs that are placed in sight. This will stimulate residents to walk instead of taking the elevator. Within the buildings, other measure examples are: material choice and light entrance in the apartments (BK2, 2023). These small choices of placing the stairs in sight and the elevator backwards and other choices, lead to adapted designs (BK1, 2023). On the scale of the area, the health goal led to the introduction of gardens, added greenery, sport facilities, parking garages placed away from buildings, and playgrounds. Within these additions, there was a tendency to search for the best form. For instance, the tree species have been chosen because they catch the most particular matter (BK2, 2023).

In the functions and programs that are added in the project after delivery, health plays a role as well. In the plinths of buildings is space for entrepreneurs who fit the concept of the area. The concept here is focused on health, but also on the supporting functions for residents. There will be a gym and personal trainer who can use the outdoor space to give classes. Both are very direct ways of health benefiting. But, there will also be a

kindergarten or restaurant which will in their own way contribute to the health of the area. So, the functions will all be connected to the ambition of a healthy area (BK1, 2023).

Implementation of health changes throughout the process. One example in this project is the sound level. From the beginning, there was a set goal for this aspect, but during the project cycle, it became known that the sound level was much higher than expected. This difference made for a new thought process and a set back from the original goals. Another example is that certain plants or trees were not possible on this location, because of the wind ballast. These changing elements make it challenging to maintain the set standard from the beginning (HB1, 2023).

What was also noticed is that aspects related to health can have a cross-boundary effect. Greenery has an effect on various aspects such as biodiversity, heat stress, water absorption, air quality and more. This shows that aspects can have combined effects on the area (BK2, 2023).

Process:

According to BK2 (2023), health needs to be a subject from the start of the project and in the first ideas of the area it needs to be included. Throughout the process it should be on the agenda continually. When organising health at the beginning of a project, it is important to take the stakeholders with whom the project has started, through the whole project (BK2, 2023).

Business case:

A healthy environment is often seen as a green environment and blue environment (plants and water). This is normally seen as an attractive environment to live in. Research shows this as well. The effect area of greenery shows a maximum increase of 20% (e.g. Bockarjova et al., 2020). This means that housing prices are generally higher than in less green areas which means most of the healthy new developments could have higher revenues (BK2, 2023). However, it is hard to pinpoint the increase in demand for these kinds of projects on healthy aspects since there are many other aspects that could have led to a higher selling price (BK2, 2023).

One thing to note is that, generally, almost every large urban area development goes through some kind of crisis since this often happens about once every 7 years. According to BK2 (2023), it is important to keep the quality in the public space during these times where aspects get made cheaper or deleted from the project. This is because the public space is what keeps the project together and helps with the selling process of houses. Buildings would be prioritised when decreasing the value of finishes for example. During the project elements will change. The key for the developer is to keep the business case controllable while still focussing on goals at hand (BK1, 2023).

Collaboration:

The goal of 2 extra years of healthy living was explored together with knowledge institutes such as the Hogeschool van Amsterdam and Wageningen Universiteit (BK1, 2023). In sessions with the Hogeschool van Amsterdam, the 10 essences of health for the

Bajeskwartier were made and Wageningen University helpt with the introduction of a healthy vegetation (BK1, 2023).

Participation is difficult in the Bajeskwartier, because the area has no inhabitants and the future inhabitants are not yet known (BK1, 2023). In this area, the developing parties focus on the housing that can be bought on the market, and they focus on the high rent apartments. This target group is easier to focus on when it comes to health aspects, since you have an idea of who is going to live here through pre-sales. Housing associations, who focus on social rent, do not have this advantage. Their residents will follow from a ranking list and can be any type of household. The healthy aspects can't be too focused on certain target groups for these actors (BK1, 2023).

After delivery:

One question that came up was on how to measure that the 2 extra years goal is met in 50 or 100 years (BK1, 2023). In 2017, there was a start in this monitoring. In that year, a HIA (Health Impact Assessment) was done by the Hogeschool van Amsterdam. This HIA looked at measures and their related effects for the future. The intention is to see if the assumed effects have taken place and what their impact on health was in a set amount of years after delivery (BK1, 2023). However, this assessment and monitoring is not top of mind. Because of the crisis period, other parts of the business case will be prioritised (BK2, 2023), such as the sale of housing and the phasing of housing to keep the project itself healthy in financial manners (BK2, 2023).

Monitoring brings a difficult side. Some aspects will be hard to monitor, but are known by many people to have positive effects (e.g. trees). However, trees can also have a negative impact on air quality, because they could trap bad air under the canopies which worsens health (BK2, 2023). Also, the influence from outside the area is hard to measure. If you have a highway or windy place close by, this will have an effect on the measurements taken (BK2, 2023). After consultation, the RIVM said that there were too many factors influencing one aspect to be able to make causal connections (BK2, 2023). What could be helpful, is that you will measure health on the city level and connect environmental aspects to changes in measurements, such as improved air quality nearby parks (BK2, 2023). The urban area level is too small to be able to connect cause and effect.

In this project, the protection of the health goals after delivery will be done through physical elements. The public space will get a maintenance society where the current design will be looked after. The buildings will be maintained by a VvE. So, the developer will be gone out of the area (BK1, 2023). No further operation or orgware is set up at the moment.

Knowledge:

What was seen is that health is a vague definition. There is no set idea of what health is. This makes it difficult to communicate (BK2, 2023). However, naming health as a part of urban area development is important (BK2, 2023). However, by looking at health, other aspects will be looked at less. This is the complexity of urban area development. It is a 'meerkoppig monster' which has an integral challenge connected to it. Essence here is to

include health from the early stages of the project and include it in the business case. It needs to be part of the DNA of the area and can't be added later on (BK2, 2023).

A final statement was that in the end, everyone is human as well. People will know intuitively what are aspects that help with your health. BK1 (2023) says that looking at yourself would be helpful when deciding on health in developments.

Scale:

A subject that resulted from these interviews is the level of scale on which you have influence and on which you monitor effects. Health is not taking into account boundaries of developments. Health effects will seep from one urban area to the next one. Developers are, however, bound to the development area they have to act in, but municipalities can look at the larger scale of the city, or provinces, or even states, can steer at even higher levels. This makes it easy for municipalities to steer on larger levels. This would help when facilities or other measures are close by. For instance, if there is a running track next to the area you are going to develop, it wouldn't make sense to build another one close by (BK2, 2023). Planning on various scales of the building, area and city is important.

Conclusion Bajeskwartier, Amsterdam

After a look has been done into the Hero van Breda case, these are the key takeaways from this case. First, the actors and their interest related to health will be talked about, then, challenges when realising health will be summarised and after that solutions and recommendations will be given.

Below in table 15, the actors related to this project are shown with their interest towards healthy urban developments.

Actor	Interest towards health
Developer	- New company goal - Trend in health
Municipality	- Unknown
FABRICations	- Trend in health

Table 15: Actors and interests towards health in Bajeskwartier, Amsterdam

When looking at the information obtained from the interviews, challenges can be found when trying to realise an urban area development with health. These challenges were given by various actors within the interviews and are experienced by themselves. The challenges found are the following:

1. Changes in scope because of external factors
2. Maintain the set goal for health though the process
3. Big urban area developments face (most of the time) one crisis
4. Housing association will have an unknown group of residents
5. Other subjects are prioritised
6. Monitoring is hard because of many affecting factors and cross-border effects
7. Health is a ambiguous definition
8. Scale levels of influence are difficult. Citywide planning and urban area level implementation. A interplay between different scale levels
9. Meerkoppig monster. Not every aspect can be perfected and it is an integral challenge

Additionally, during the interviews, actors gave recommendations on how to realise healthy urban areas. Same as with the survey, these recommendations are focussed on health objectives or focussed on the total picture of urban area developments. The recommendations given are:

1. Design opportunities to stimulate healthy behaviour
2. Research for best options
3. Pay attention to cross-theme and boundary effects of measures
4. Health needs to be included from the start of the project and should be focussed on continually (also in the business case)
5. Connect the same actors throughout the process
6. Green environment gives more profit
7. Keep the quality of public space high. First, reduce quality of buildings

8. Focus on city level monitoring with positive influential objects
9. Use own health knowledge to advantage

Expert consult

To have a second opinion on the results obtained, a session was done with an external academic from the University of Utrecht (further on named UU), who has knowledge on the topic and does research on the topic of health implementation and monitoring in the built environment. She is part of a platform that looks at healthy environments and that aims to connect various actors in this process. From developer, to municipality, to university. There were two meetings: one meeting in the middle of April to share first ideas and one meeting in the middle of May to have a second opinion on results found.

First conversation

In session one various subjects were talked about. UU said that it is needed that there will be based design principles to see which intervention has which effect. This is why monitoring is important. However, monitoring isn't happening often, but it would be possible. This would counter healthwashing and would make soft values 'harder'. Questions could be asked at residents about if they feel healthy for instance. Another aspect talked about is that there could be an introduction of laws. This would give incentive for future developments to at least think about the subject. Laws could include interventions that are proven and usable for health improvement. These proven interventions could also help win tenders in the future for instance.

UU also gave a few tips during these sessions. These are the following:

- Include care professionals in the development of a new neighbourhood. Most of the time, these people are aware of what interventions are needed and what interventions could work.
- Look at financial flows through the neighbourhood and try to organise this in a way that supports health. One example given here is Kanaleneiland in Utrecht. Here, incentives from inhabitants that contribute to health get rewarded.
- Put more time in the front-end of a project. In this phase, a lot of decisions can be made regarding health. Digital twinning could also be used to study on implementations such as wide walkways and movement patterns of cars. Make scenarios before taking the next steps.
- Try and keep the public area as undefined as possible to a later date, because future residents can be involved in the design of this part.
- Don't start from 0 every new project. Keep the knowledge and use it in future developments.

Second conversation

During the second conversation, noteworthy and interesting results from literature and the empirical studies were discussed with UU. Below, the topics discussed are shown and the points made are also included.

Topic 1: Health needs differ from person to person

What is needed to be more healthy differs from person to person. This makes it hard to know beforehand what implementations are needed to respond to these needs. UU continued that there is also a difference between housing that will be bought or social

housing. Organising participation with future home owners is easier than organising it for future social renters. It is hard to get in contact with this group and this group is often unknown till late in the development process. Also, these residents often are not involved in these kinds of processes and involving these residents in participation proves to be difficult. An incentive could be given to these residents to attract them to the meetings.

Topic 2: Influences from outside of the area while monitoring

It is too easy to say that measuring and monitoring wouldn't work. External factors will indeed be seen on the measurements, but this can be compared to the previous situation. It is about measuring what is effective and if people experience that they are healthier than before. If a neighbourhood is less healthy because it is next to a highway, this would also be viable information to know for people with breathing problems or for future developments. Also, if people would receive complaints from such locations, this could give an incentive for controlling parties to say: 'No more developments next to the highway.' So, within the context of an area, improvements can be made. This can also be monitored.

Topic 3: The level of scale and the influence of actors in these levels

This topic is about the analysing scale worked on. It is uncertain which health effects are experienced by residents and from which scale level they are. UU said that looking at activity patterns could be helpful with this subject. During the day, a person spends time at the office and on his commute. All influences during this time have an effect on this person's health. It is important to see how this neighbourhood is connected to amenities and facilities nearby. This could show connections for health that are otherwise overlooked.

Topic 4: Norms for health in the Netherlands

The idea of a healthy M.E.R. (G.E.R.) is a subject that is proposed in practice. Putting a norm on all aspects of health would be hard indeed, but the aspects that are possible to formulate rules for could start a shift towards healthy developments. There are already tools to assess this and these need to be developed further. The fact that lots of organisations are making their own standards for health means that practice is ready for these kinds of rules.

Topic 5: Social Return on Investment; Who will pay?

According to UU, this is the most important and difficult question. One thing seen is that costs and returns are not for the same actor. This makes it hard. There are however initiatives to counter this. The 'kavelmodel' is an example of this. In this project, there is a coalition of actors related to health and urban development. They start the project with a set price for health costs in the project and try to do their best to keep these as low as possible. Investments that were not needed after the project was done, will be returned back to the actors in the form of profit. This gives each actor an incentive to try and use preventive measures as much as possible. However, this is possible on a small scale. For a large scale, this wouldn't work. It is however an interesting way to look at preventive health implementation in urban area developments.

Topic 6: Introducing an ambassador

This topic is already looked at by UU. They are researching if ambassadors could be people to people ambassadors who see eachother everyday at their usual facilities. Families could inspire other families to introduce the same healthy aspects in or around their homes. This comes from the idea that behaviour is not only influenced from what happens inside the area, but also from the social environment of people. This could also be a way for preventive medicine to spread.

These topics discussed can be used as reflection and discussion on the findings from the research. This information will be used to answer the research questions.

Discussion and conclusion

In this chapter the discussion and conclusion for this thesis will be given. The results, the methods used and the execution of the research are looked at and discussed. After that, a conclusion will be drawn for all research questions. In the end, the limitations of this research will be shown as well as recommendations for practice and future research.

Discussion

Literature review

First, a reflection on the theoretical background will be done in this section. During the literature study it became clear that health has many definitions and that a healthy city does not only mean that its inhabitants have a high health standard. A healthy city could also mean that a city has a healthy political environment without corruption or that its financial situation is healthy and without debt.

Interesting is the concept of collaborative governance related to the healthy urban area developments. The collaboration dynamics such as shared commitment, knowledge, resources, definition and institutional arrangements relate to the stimulating factors and the challenging factors found during literature study. Other elements of the collaborative governance concept are also similar to what was found in the empirical study (see key). The system context can on the other hand be shaped by planning tools and regulations from the governmental actors.

Stimulating factors found and challenging factors found relate to the collaborative governance concept. These are specifically designed for health implementations, but could be used for other societal values as well.

Empirical study

In this section, findings from the empirical study will be critically looked at, and will be compared to each other and to the literature review.

The actors that are found in the studies are mostly the 'usual' actors. Specifically related to health were mostly the consultants, knowledge institutes and care stakeholders. During one of the interviews and during the expert session a brief comment was made on the introduction of health insurance organisations. However, nowhere in the other research these parties were mentioned. Van Bueren (2019) talked about newcomers in urban area development. Care organisations, the GGD and health insurance companies could be these kinds of actors. Also, said that the medical field needs to be incorporated when it comes to health in urban area development. So, this could mean that these actors will start to play roles in the future.

Actors that would be affected by health increase are the inhabitants. These are however hard to analyse for certain projects, since with social rent, the renters will be assigned by list and will not buy a house. Also, keeping options open for a later stage could be hard and costly. However, this could increase the focussed health effects and the identity of the neighbourhood.

Most of the challenges that were found, related to the factors that Gezonde Leefomgeving (2018) named in the literature review. Same for the stimulating factors relating to the recommendations found. Below, some interesting factors that were found will be discussed.

During the research, the complexity of urban area development became more clear. While looking at literature, it was shown that there are many actors, many interests, many values and much money connected to all cases. This also was a challenge found by GL (2018) when trying to introduce health in urban development projects and during the survey, case studies and expert session. During the case studies, one of the respondents called the practice the 'meerkoppige monster' of urban area development. Keeping an overview of every aspect in a project is very hard, since there are many factors involved. Because of this complexity, it is hard to pinpoint effects, costs, returns, and responsibilities to the right actors and implementations. This is something that cannot be solved and should be accepted. The complexity is a characteristic of urban area developments that makes the practice interesting and ever changing. Also, decision-making becomes harder with the introduction of more actors. Franzen et al. (2011) said: ''One of the major challenges of urban area development is to involve as many of the actors as possible, yet also to make decisions.'' This contradiction was also named in the case studies and surveys and proves to be hard when needing more actors for a new concept such as health.

Another interesting point found was that health differences are seen between income groups. Low income groups generally live shorter and less healthy lives than higher income groups. This makes it so that municipalities are investing where the most impact can be made which is with the low income groups. This was seen in the case studies, when municipalities do not have many funds to invest. This could be related to the uneven distribution of funds and these case studies being (mostly) for higher income groups.

The concept of hardware, software and orgware (Van Bueren, 2019) is interesting for the period after delivery of the project. When a project is finished, it is important that these three concepts are represented when the project is finished. What is noticed in the case studies and survey, is that orgware is the harder part. This is because developers will leave the area once the project is finished and there will be no organisation left to organise and measure activities. Conversations about this subject need to be held before the developer leaves the project. Orgware could be organised by for example municipalities, civilians (participation), societal organisations, VvE's or market parties.

Van Hoek & Wigmans (2011) explained that cities can be studied on multiple levels: building, area, city and metropolitan. This resonates with the scale levels mentioned in the goals of some of the projects. For instance, in Hero van Breda, the scale of area, building and behaviour is looked at. Research showed that it would be a good idea to see health from various scales. Measurements and implementations could be decided on city (or higher) level to give input for urban area developments which could be helpful to realise. In the expert session, this was taken one step further by also looking at the daily routine

and routing of people. This could show where problems are related to health and this could inform governmental organisations about where to act.

The SROI proves to be a tool that could bring concrete financial and social values to the conversation. It is however difficult to assign certain costs and rewards to actors since the network of actors is so large, the effects are hard to track. This makes it difficult to assign the costs of health implementation to certain parties. One way of finding funds could be the involvement of knowledge institutes (research programmes) or the municipal funds for preventive care.

Another point of discussion was the monitoring of effects from health interventions. What was said, is that health monitoring would not be possible since there are too many external factors that would influence measurements. However, monitoring could give valuable insights on larger scales. If measurements would be seen that building next to a highway is not healthy and causes problems in airways, then this information could decide where to develop future developments. These measurements could also look for positive correlation with for instance parks where air quality is better. These measurements can be used in the future to choose the right interventions for the right context.

Additionally, many of the challenges made and the recommendations made were fairly general and are generic practice (e.g. work integrally and collaborate). These things should always be done when an urban development project happens. These answers need to be separated from the specific answers related to health objectives in the project to be able to find health specific points.

In the end, urban area development is an integrated assignment with many unknowns. Health implementation needs to be connected to this assignment and proves to be hard in such a network structure. It is important to balance between scales, interests, values, disciplines and actors (Daamen, 2005; Teisman & Klijn, 2002).

Limitations

This section will talk about the limitations of this research. This will be done on various subjects.

Survey

The survey conducted had 114 respondents in total. This number is high, but there were some limitations connected to the answers. First, almost 95% percent of respondents were developers, because of this, there is no real life comparison of what all actors related to urban area development are experiencing. Also, due to the question types, respondents could enter everything they thought about. This could be a good thing, but also leaves room for interpretation of questions and answers that are not sought for. Some questions had answer suggestions, which could also lead to an increased amount of answers that are similar to those questions. Nevertheless, answers given in the survey are similar to what was found in literature and the other research part. This means that there is a connection.

Case studies

For this thesis, there were two cases chosen. The first limitation relates to the interviewees. In both cases, it was hard, if not almost impossible, to plan an interview with municipal actors, except for one interview. This gives the responses a one sided view. Also, both cases are not mature (construction is not finished yet) which means that the real effects of the implementation of health will not be able to be seen yet. Adding to that, both cases are redevelopments of non-residential areas which means that participation with inhabitants was not possible till now. This proves to be an important aspect during this research. Related to this, it was found that every case study is dependent on its context which makes the findings hard to transfer to other cases. Also, both cases have been chosen with the graduation company which could result in bias. Additionally, the second case had less interviews than the first case. The strength however, was that there were two cases with different processes which will give a more complete understanding. Because of the limited time at hand, the case studies could have been studied more in depth.

Expert consult

The expert consultation was done because of the interest of the writer. This session is not a real expert panel, because there was only one expert related. This could give answers which are one sided. Nonetheless, this session proved to be resourceful since there was a critical look done on results from the research.

Conclusion

In this chapter, the research questions will be answered with the knowledge obtained. Recommendations will be given after these answers and are based on the discussion and the conclusions. First, the sub questions will be answered and after that, the main question will be answered.

SQ1: What actors are currently/can be expected to be involved in urban area (re)developments in the Netherlands and what are their main interests related to health objectives in urban area development?

Currently, the actors involved in urban area developments can be divided into three groups: private parties, public parties and civic actors. Private parties (market parties) consist of developers, architects, urban designers, consultants, or landscape architects. Their interest towards health in the urban environment is as follows: they want to be pioneers on the subject of health for their image, they want a high quality end-product for increased and longer returns on their projects because of this quality, they want to compete in the healthy development trend, and they increasingly want to return more public value to society with their projects. Public parties consist of state, province, municipality and more. Their interest is for the public and means that they want to increase the health status of the civilians, but also increase the healthy image of the city where the project is situated. Here they seek for the least amount of resources needed for the most health benefits for the public. The improvement in health can be done through the built environment. The interest of civic actors is varying. These actors have specific focuses (some of them on health) and differ per NGO, citizen or organisation. This can for instance be an exercise friendly environment or playgrounds for children. It is found that neighbouring inhabitants have little interest in health objectives, but especially want no disadvantages for themselves resulting from the new way of developing. Newcomers will be involved in urban area developments in the future. The survey, the case studies and the expert consult showed that care professionals, medical actors, GGDs, knowledge institutes (health focus) and health insurance organisations are already being introduced in pilot-projects related to health. These actors have the same preventive care interest as the public parties, but their underlying interest can differ from increasing healthy living years to reduced care costs. Actors can steer towards healthy urban area developments using for instance collaborative governance or planning tools. The combined interest towards healthy urban areas comes from the idea that preventive action, which will become increasingly important, can be taken through the environment of people. This is a shared objective that actors agree on and can be further specified per project.

SQ2: What are the challenges that actors involved in urban area (re)developments in the Netherlands are facing when trying to realise healthy urban areas?

When introducing health objectives in urban area projects, challenges are found. Some of these challenges relate to the 'generic' practice of urban area development and show that urban area projects are complex projects where the introduction of health proves to be difficult, and some of these challenges relate to health specific objectives. Below the

challenges will be shown. This will first focus on the health specific challenges and after that on the 'generic' challenges.

- Adhering to the norms set by the government is not healthy. This is because the norms will give a maximum of health disadvantages per point and don't take cumulative effects into account. When trying to design or develop healthy areas this cumulative effect will still be able to harm (future) residents. It is hard for developers, designers and other actors involved with the development to understand these effects.
- Actors get too 'soft' and qualitative norms for aspects related to health. For the subjects of environmental damaging activities, there are already set norms, but for the improvement of health through stimulating exercise or increasing the amount of green, there is no set standard. This makes introducing these subjects hard for the initiating actors since it is based on context.
- Within the field of urban area development, there are ambiguous definitions of health in the built environment. This difference can be seen per actor, but also the same actors have other definitions and focusses. This makes it hard to communicate ambitions. For the developer, this means that he will get different input from various actors.
- The research of cause and effect is not mature enough and not known enough to connect with interventions related to health. This is challenging because it makes the choice of interventions hard for the actor financing of or the actor choosing the intervention for the project.
- Effects of interventions prove to be hard to measure. This is because there are many factors affecting certain effects and effects can be cross-boundary. Pinpointing the origin of the effect can be difficult because of this, and intervening in the cause of the effect can be hard for the project team because it is external to the area. This brings another difficult aspect: healthwashing. Projects can claim that their development is healthy without any proof to back this up.
- Actors point at each other for investment towards healthy urban areas. Developers seek the help of governmental organisations and say that it can't be financed with their budget and the government points at parties which make profit from the development. This is challenging because no one will take responsibility.
- Ownership of the health interventions and continuation of the activities after delivery is challenging, because at this point the developer leaves the project behind (most of the time). However, it is important to continue the operationalisation of the interventions in the area of financing and programming. It is challenging to decide who will have the responsibility for which aspect.
- Some interventions like smoke-free areas will need legislation to be able to control this implementation. This proves to be challenging for municipalities because this would mean more law enforcement controls which means more costs to make.
- Developers or other market parties don't know yet which extra returns will follow from healthy developments. This makes the decision to invest in the front-end of a project difficult because it is not backed up by certain returns.
- Introducing the medical field into the built environment with urban area developments is difficult and time consuming for actors attempting this. This means that nobody really wants to take responsibility on this subject.

The above challenges are specifically focussed on health objectives. However, challenges also arise when introducing the subject of health into the already complex assignment of urban area development. Challenges that were found related to this consist of the following:

- New concepts are seen as time and money consuming to actors within a busy agenda;
- It is hard to prioritise certain objectives which are lower on the priority list; actors within the project will have their own interests and goals and connecting these can be difficult and time consuming;
- It is hard to introduce health goals into a project that is already running, because of decisions that are already made and need to be changed;
- Participation is challenging because civilians are out of their own interest;
- It is difficult to combine the levels of scale in which actors act. Municipalities act on city-wide level and developers only focus on area level;
- Larger urban area projects face a (economical) crisis most of the times which makes it hard to protect health goals that are lower on the priority list;
- Including (future) residents is challenging because these people are only known in a later stage when aspects are wanted to be decided on already;
- Urban area development is an assignment that needs to be solved integrally. Adding another goal means that there will be another focus in the 'meerkoppige monster' which is difficult for developers to keep an overview

These challenges combined make the introduction of health objectives in urban area development difficult. These need to be taken into account when developing healthy areas.

SQ3: What are lessons that can be drawn from practice on the realisation of healthy urban areas in the future?

Resulting from the survey and case studies, lessons can be drawn out of the empirical data. These can again be categorised into specifically focussed on health objectives and more focussed on the total picture of urban development projects. By combining literature and empirical data, recommendations can be made for future healthy urban area projects. Below, some specific action points towards health objectives have been made actionable. These are the following:

1. Within the front-end of the project, time should be assigned to the exploration of health objectives. When (who is) deciding on health interventions at the beginning of a project, contact the local GGD. This organisation maps the health situation (e.g. the Brabant Scan) and can give valuable insights in which health aspects need attention. Interventions need to be designed specifically for the context and will need to be determined locally by …. Specific focus can be done on cross-border and cross-goal effects (e.g. sustainable interventions that also have health effects). Combining these interventions will be effective and cost-reducing. Additionally, in this stage, care and medical professionals can help developers and municipalities by determining a fitting approach to the health problems at hand. Digital twinning could help with deciding on which interventions will be made. With

this tool, tests can be done to get the best result. This could then be used to make scenarios in which interventions are tested to choose the best outcome.

2. Assigning an ambassador with the right resources can be helpful to address the health problem throughout the project. This ambassador needs to be chosen by the actor initiating health objectives in the project and who is the problem owner (often municipality and/or developer). The ambassador will focus on the realisation of shared ambitions towards health and will be able to show the urgency of health implementation to actors which could otherwise be doubtful. He/she can also be the link between the medical field and the project team if these other actors do not have enough resources at hand. This ambassador can be internal or external to the project team.
3. For the period after delivery, a team needs to be assembled to look at financial flows through the neighbourhood. This team will need a financial actor (which could be a consultant or developer), a data actor (which could be a medical institute), a learning actor (which could be a knowledge institute), a monitoring actor for the project (which could also be a knowledge institute), and an actor who manages the collaboration (which could be a consultant or the municipality). The financial flows need to be organised in a way that it supports health. The orgware part will be funded in this way (e.g. GROZUtrecht in Kanaleneiland, Utrecht). New neighbourhood jobs can be formed for social contact and support within the neighbourhood itself. This could result in a programme of activities that support health.
4. Naming the project as a 'pilot-project' can help with the exploration of new interventions. Within the pilot-project, interventions can be explored together with knowledge institutes to build research. Knowledge institutes sometimes have funds which can be used to facilitate this research. After the project is finished, this needs to be continued (see point 5).
5. Monitoring will need to become standard practice to be able to connect cause and effect. Knowledge institutes can play a role here together with public institutions. This will need to be done on a higher level than the urban area since boundary-crossing factors and causes will not take the boundaries of urban areas into account. Municipalities can monitor health effects on the city level and focus on (positive) correlations with environmental objects such as parks or water. This citywide information can then be used to decide on area specific interventions fitting to the health needs. The GGD can store this information, and monitoring should happen after delivery (10, 20, 30 years) to see the long-term effects.
6. It is important for developers to realise that healthy urban areas are expected to have greater returns. Healthy urban areas are (most of the time) green areas which are known to increase sale prices of housing. With this increased profit, the budget can be used to implement healthy interventions. Some health interventions could benefit from state funding programs for preventive medicine.
7. A clear path needs to be sketched by the state for health objectives in the built environment. With the new Omgevingswet, this takes a next step as to give a framework to municipalities in which they can make their own health related rules. This can give developers clear boundaries in which they can handle.
8. There should be a common idea of what health means and how it would look like in the built environment. This can be explored by designers. Designers can help to

find interventions with a focus on health benefits (e.g. placing the stairs before the elevator) which could improve health without investing much. Flexibility can be used for design or concepts that are not certain to work (e.g. change a communal space into an apartment).

These health specific recommendations need to be combined with the more generic recommendations. These are the following:

- Actors need to act integrally and governments need to plan across multiple scale levels to find connections between larger scale solutions and local interventions
- Actors need to be transparent in uncertainties and explain why certain choices are made to be able to bear risk together. Also, be transparent in expectations, arrangements for collaboration, frameworks for influence, and decision-making forms.
- Projects need to be adapted to the specific context at hand to be able to find the right interventions for the right problems
- Stakeholders need to be involved as early as possible in the project. A stakeholder analysis could help here.
- There need to be enough meeting opportunities throughout the project so that actors
- There needs to be set frameworks in which actors can have influence
- The physical and social domain need to be connected
- Actors need to use their previous knowledge and document obtained knowledge to not start from 0 each time a healthy development happens. This can be done internal or external to the organisation.
- Developers need to leave as much as possible open of the public space for participation with the residents when 70% of the project is sold. In this way, they can co-decide on health interventions fitting for them.

Many of these recommendations resemble the collaborative dynamics needed for collaborative governance such as principled engagement, shared motivation and capacity for joined action. Also, actions from the government such as funds for prevention, framework setting and making norms resemble planning tools such as market shaping, market regulating, market stimulation and capacity building. Showing these steering mechanisms are needed and wanted in practice.

MQ: How can actors involved in urban area (re)developments in the Netherlands realise healthy urban areas?

It can be concluded that the realisation of healthy urban areas requires a 'generic' urban area development process in combination with specific focuses on health objectives. Here, the challenges and recommendations need to be taken into account. 'Generic' urban area development processes are about actors working together towards a shared goal. This resonates and is similar to collaborative governance. Here, it is important to have principled engagement, shared motivation and capacity for joint action to create outputs. This has to be placed within system context which are area specific implementations. Challenges need to be taken into account such as: norms with health disadvantages; lack of norms; ambiguous health definitions; lack of research; difficulties to measure effect;

pointing at others for investments; ownership after delivery; resources needed for legislation; uncertainty about returns; and resources needed for the introduction of the medical field. But, the lessons learned can be used to mitigate these challenges as best as possible. Recommendations specific for realising health objectives include: extended front-end work; digital twinning; involving medical actors; assigning an ambassador of health; introducing an after-delivery team for health; collaborating with knowledge institutes; monitoring on city level and introducing a database; investing increased returns in health interventions; clear norms set by the state; and a communal knowledge of health. These recommendations can help future developments with introducing health objectives into the project. In the end, a start needs to be made to bring the subject further. Hopefully, the future will bring healthy urban areas for as many people as possible.

Recommendations

In this section, recommendations for practice and recommendations for future research will be given.

Practice

Connect relevant actors

Connecting and including relevant actors in healthy urban developments is important for the knowledge and the shared ambition formulation. This will also need to be done for the period after realisation.

Make norms and start a G.E.R.

The introduction of norms can start a shift towards putting health on the agenda of actors. Start with norms that are already known and add to this when new research is done. A G.E.R. (Gezondheidseffectenrapportage) can be introduced to show effects a development has on health.

Connect scales

Cross-scale thinking needs to be implemented on this subject. Health effects don't stop when the border of an area is reached and these effects need to be monitored on multiple scales.

Start small

Start with aspects that are known. These provide a sturdy base for further actions. When knowledge is more mature and when actors provide input, this base can be extended further.

Research

Social Return on Investment

One of the important aspects is the societal value created and how this will work within the business case, who is going to pay for what and who will get profit from the implementation of health. Research to this topic could clarify this important part of urban area development.

Kavelmodel

The Kavelmodel was named briefly. This interesting model could be researched further for broader implementation or lessons learned.

Monitoring of effects

Important for the future of health intervention is the needed knowledge. Studies need to be done to which intervention brings which effects. Decisions on intervention preferences can rely on these studies.

Develop tools

Tools can be developed to introduce health in the built environment and to build further upon knowledge from past projects.

Reflection

In this chapter, a reflection will be given on the research in this thesis. The reflection is divided in three short, but substantial parts: product, process, and planning.

Product

My end product combines interviews done with professionals, survey results and literature studies. What I noticed was that I gained a lot of understanding of the urban area development project in comparison to before. The product could have been better with an even more in-depth literature study and the connection with a wider selection of respondents and interviewees. The health aspect in the conclusion is a bit less in the picture than the urban area development aspect. This would probably be because health is part of this overarching concept of urban area development. My recommendations were influenced by different perspectives of actors. Some points prove to be discussed and this made the end result even better. The results from this project can be used for future research and for future developments. This is because the product is transferable and takes into account the variating context that a project is placed in.

Relation research with MBE

This project looks at health implementations in urban area developments. Urban area development is a way of working in the built environment on the scale of an area. So, connecting health to the built environment shows the connection of this topic with MBE.

Process

During the process of my thesis, I had regular meetings with my tutors from the faculty and meetings with my tutor from my graduation company. The tutors from the faculty helped with improving my methods such as the survey questions. They also provided valuable new insights that then could be used to elevate my subject. My other tutor from the graduation company helped with practical connections with companies and other projects for my data collection and provided valuable insights from practice. This improved my research for the better through professional languages and direct connections with interviewees. However, sometimes I noticed that the connection with the graduation company made respondents less open, which can be related to their professional connections. During the interviews I made clear that research is mainly done via the TU Delft. My research methods were the right way of doing research, however, the end result could have been more thorough. The cases could have been delved deeper. Maybe one case instead of two cases could have been the solution for this. Also, during research some ethical considerations came above. Companies would want to double check what they said and some information couldn't be shared. Because of my HREC application, this wasn't a big issue, because most of the considerations were already taken into account.

Planning

After the P2, the P3 came fairly quickly. The idea of the P3 is to present your first results, but at this moment in time, I was still swimming in my own subject. I noticed that there was a lot of information crammed up inside my head, but that the synthesising and the

step towards analysis was still lacking. Literature also showed some weaker aspects. From the P3 onwards, this changed. My mindset changed and lots of work has been done since then. Another thing that was noticed, is that the planning of interviewees is important. Many interviewees had holiday periods which were right in the middle of my planned interview period. This made the planning harder.

Personal note

From the beginning of this thesis till now, I learned a lot about the subject, about a research process and about myself. The topic of urban area development was already known, but through the connection with practice and the internship at an urban area developer, this knowledge was broadened. A personal interest is the societal values that can be added in these kinds of projects. This proves to be a difficult balance between financial value and societal value. The process of doing such a research was interesting and the subject I chose kept me interested throughout the whole way. What I learned from myself is that I like learning new information, but I'm not the best at writing this information down. At one point, my whole thesis was in my head, but what was on paper was far from the same. I really liked this discovery journey to the connection of development, the built environment, and healthy and happy people.

References

Albert, D.G., Decato, S.N., 2017. Acoustic and seismic ambient noise measurements in urban and rural areas. Appl. Acoust. 119, 135–143. https://doi.org/10.1016/j.apacoust.2016.12.015.

AM BV. (n.d.). Home - Nieuwbouw Hero Breda. Nieuwbouw Hero Breda. https://herovanbreda.nl/nl/

AM BV. (n.d.-a). City living reinvented - Bajeskwartier. Bajeskwartier. https://bajeskwartier.com/nl/bajeskwartier/het-plan/

Arcadis. (2022). Arcadis Gezonde Stad Index 2022.

Ashton, J. and Seymour, H. (1988) The New Public Health. Philadelphia , PA: Open University Press.

Ansell, C., & Gash, A. (2007). Collaborative Governance in Theory and Practice. Journal of Public Administration Research and Theory, 18(4), 543–571. https://doi.org/10.1093/jopart/mum032

Barton, H. and Tsourou, C. (2000) Healthy Urban Planning. London : Spon Press.

Beaglehole, R. and Bonita, R. (1997) Public Health at the Crossroads. Achievements and Prospects. Cambridge: Cambridge University Press.

Blaikie, N. W., & Priest, J. (2019). Designing social research: The logic of anticipation. Cambridge: Polity Press.

Bockarjova, M., Botzen, W. J. W., Van Schie, M., & Koetse, M. J. (2020). Property price effects of green interventions in cities: A meta-analysis and implications for gentrification. Environmental Science & Policy, 112, 293–304. https://doi.org/10.1016/j.envsci.2020.06.024

Bruil, A.W., F.A.M. Hobma, G.J. Peek & G. Wigmans (2004), Integrale gebiedsontwikkeling - Het stationsgebied 's-Hertogenbosch [Intergrated Area Development: The 's-Hertogenbosch Station Area]. Amsterdam: SUN

Centraal Bureau voor de Statistiek. (n.d.). Ouderen. Centraal Bureau Voor De Statistiek. https://www.cbs.nl/nl-nl/visualisaties/dashboard-bevolking/leeftijd/ouderen

Conklin, A.I., Forouhi, N.G., Surtees, P., Khaw, K.-T., Wareham, N.J., Monsivais, P., 2014. Social relationships and healthful dietary behaviour: evidence from over-50s in the EPIC cohort, UK. Soc. Sci. Med. 100, 167–175. https://doi.org/10.1016/j.socscimed.2013.08.018.

Daamen, T.A. (2005), De kost gaat voor de baat uit: Markt, middelen en ruimtelijke kwaliteit bij stedelijke gebiedsontwikkeling. Amsterdam: SUN Uitgeverij

Daamen, T.A. (2010). Strategy as Force: Towards Effective Strategies for Urban Development Projects – The Case of Rotterdam City Ports (Doctoral dissertation). Amsterdam: IOS Press.

Emerson, K., Nabatchi, T., & Balogh, S. (2011, 5 2). An Integrative Framework for Collaborative Governance. Journal of Public Administration Research and Theory, 1-29. Oxford University Press. 10.1093/jopart/mur01

Ewing, R., Cervero, R., 2010. Travel and the Built Environment. J. Am. Plan. Assoc. 76, 265–294. https://doi.org/10.1080/01944361003766766

Franzen, A., Hobma, F.A.M., Jonge, H. de, Wigmans, G. (Eds.) (2011). Management of Urban Development Processes in the Netherlands: Governance, Design, Feasibility. Amsterdam: Techne Press.

Fröding, K., Eriksson, C., & Elander, I. (2008). Partnership for Healthy Neighbourhoods: City Networking in Multilevel Context. European Urban and Regional Studies, 15(4), 317–331. https://doi.org/10.1177/0969776408095108

Gatseva, Penka D.; Argirova, Mariana (1 June 2011). "Public health: the science of promoting health". Journal of Public Health. 19 (3): 205–206. doi:10.1007/s10389-011-0412-8. ISSN 1613-2238. S2CID 1126351

Geidne J., Fröding K., Montin S., Eriksson C. (2012) Implementation structure and participation at neighbourhood level—A multiple case study of neighbourhood development in Sweden. Systemic Practice and Action Research, 25, 305–322.

Gezonde Leefomgeving. (n.d.). Belang van een gezonde leefomgeving.https://www.gezondeleefomgeving.nl/aandeslag/waarom-gezondheid/belang-van-een-gezonde-leefomgeving

Gezonde Leefomgeving. (n.d.). Waarom aandacht voor gezonde leefomgeving? https://www.gezondeleefomgeving.nl/aandeslag/waarom-gezondheid

GGD HOR. (2021). *Handreiking Gezonde leefomgeving in het omgevingsplan.* https://www.google.com/url?q=https://ggdghor.nl/wp-content/uploads/2020/01/Werkdocument-Handreiking-Planregels-gezonde-leefomgeving-v2-mei-2021-nw.pdf&sa=D&source=docs&ust=1684324970443936&usg=AOvVaw0mig994CJzaoDCrmQfd51h

Gillies, P. (1998) `Effectiveness of Alliances and Partnerships for Health Promotion', Health Promotion International 13 (2): 99-120.

Goldstein, G., & Kickbusch, I. (1996). A healthy city is a better city. World health, 49(1), 4–6. https://ci.nii.ac.jp/naid/10008425735

Gray, Barbara. (1989). Collaborating: Finding common ground for multiparty problems. San Francisco, CA: Jossey-Bass.

Grinde, B., Tambs, K., 2016. Effect of household size on mental problems in children: results from the Norwegian Mother and Child Cohort study. BMC Psychol. 4, 31. https://doi.org/10.1186/s40359-016-0136-1.

Hancock T, Duhl L. (1988). Promoting Health in the Urban Context. WHO Healthy Cities Papers No. 1. Copenhagen: FADL Publishers.

Hanna, K.L., Collins, P.F., 2015. Relationship between living alone and food and nutrient intake. Nutr. Rev. 73, 594–611. https://doi.org/10.1093/nutrit/nuv024.

Healey, P. (1997) Collaborative Planning. Shaping Places in Fragmented Societies. London: Macmillan.

Heurkens, E. (2012). Private Sector-led Urban Development Projects: Management, Partnerships & Effects in the Netherlands and the UK. CreateSpace Independent Publishing Platform.

Hillier, J. (2002). Shadows of Power: An Allegory of Prudence in Land use Planning. London: Routledge.

Hoek, M. van, & Wigmans, G. (2011). Management of urban development. In A. Franzen, F.A.M. Hobma, H. de Jonge & G. Wigmans (Eds.), Management of Urban Development Processes in the Netherlands (pp. 53-76). Amsterdam: TechnePress

Independent Group of Scientists appointed by the Secretary-General, 2019. Global Sustainable Development Report 2019: The Future is Now-Science for Achieving Sustainable Development. New York

Institute for Positive Health. (2021, June 3). Social Return On Investment - Institute for Positive Health. https://www.iph.nl/evaluatiewijzer/social-return-on-investment/

Kazepov, Y. (ed.) (2005) Cities of Europe. Changing Contexts, Local Arrangements, and the Challenge to Urban Cohesion. London: Blackwell.

Kenzer M. Healthy Cities: a guide to the literature. Public Health Rep. 2000 Mar-Jun;115(2-3):279-89. doi: 10.1093/phr/115.2.279. PMID: 10968770; PMCID: PMC1308727.

Kickbusch I, Gleicher D. Governance for health in the 21st century. Copenhagen: WHO Regional Office for Europe; 2012 (https://apps.who.int/iris/handle/10665/326429, accessed 26 October 2022).

King, G., Roland-Mieszkowski, M., Jason, T., Rainham, D.G., 2012. Noise levels associated with urban land use. J. Urban Health 89, 1017–1030. https://doi.org/10.1007/s11524-012-9721-7.

Koppenjan, Joop, and Erik-Hans Klijn. 2004. Managing uncertainty in networks: A network approach to problem solving and decision making. New York, NY: Routledge.

Evelyne de Leeuw, Ilona Kickbusch, Nicola Palmer, Lucy Spanswick, European Healthy Cities come to terms with health network governance, Health Promotion International, Volume 30, Issue suppl_1, June 2015, Pages i32–i44, https://doi.org/10.1093/heapro/dav040

Lipp A, Winters T, de Leeuw E. Evaluation of partnership working in cities in phase IV of the WHO Healthy Cities Network. J Urban Health. 2013 Oct;90 Suppl 1(Suppl 1):37-51. doi: 10.1007/s11524-011-9647-5. PMID: 22592961; PMCID: PMC3764262.

Loon, P.P.J. (1999). Interorganisational Design: A New Approach to Team Design in Architecture and Urban Planning (Doctoral dissertation). Delft: Publicatiebureau Bouwkunde.

Loon, P.P.J. van, Heurkens, E.W.T.M., & Bronkhorst, S. (2008). The Urban Decision Room: An Urban Management Instrument. Amsterdam: IOS Press

Marmot M., Friel S., Bell R., Houweling T. A., Taylor S. (2008) Closing the gap in a generation: health equity through action on the social determinants of health. The Lancet, 372, 1661–1669.

Matthews, Z., Channon, A., Neal, S., Osrin, D., Madise, N., Stones, W., 2010. Examining the "urban advantage" in maternal health care in developing countries. PLoS Med. 7, e1000327 https://doi.org/10.1371/journal.pmed.1000327.

Nationale Wetenschapsagenda. (2018, March 27). Wat zijn de effecten van de gebouwde omgeving op gezondheid en welzijn? https://vragen.wetenschapsagenda.nl/cluster/wat-zijn-de-effecten-van-de-gebouwde-omgeving-op-gezondheid-en-welzijn

Needham, B. (2003), 'Onmisbare toelatingsplanologie'. In: Stedenbouw en Ruimtelijke Ordening. No. 2, page 10-13

Jeremy Nicholls, Eilis Lawlor, Eva Neitzert & Tim Goodspeed, A guide to social return on investment, The SROI network, January 2012.

Nieuwenhuijsen, M.J., Khreis, H., Triguero-Mas, M., Gascon, M., Dadvand, P., 2017. Fifty shades of green: pathway to healthy urban living. Epidemiology 28, 63–71. https://doi.org/10.1097/EDE.0000000000000549.

Orme, J., Powell, J. , Taylor, P., Harrison, T. and Grey, M. (eds) (2003) Public Health for the 21st Century. New Perspectives on Policy, Participation and Practice. Maidenhead: Open University Press.

PBL. (2014). "Bouwen aan een gezonde stad". https://www.pbl.nl/sites/default/files/downloads/20140113_ADB_MinlenM_def.pdf

Peek. G.J. (2006). Locatiesynergie: Een participatieve start van de herontwikkeling van binnenstedelijke stationslocaties. Delft: Eburon.

Plochg T., Delnoij D. M. J., Hogervorst W. V. G., Van Dijk P., Belleman S., Klazinga N. S. (2006) Local health systems in 21st century: who cares?—an exploratory study on health system governance in Amsterdam. The European Journal of Public Health, 16, 559–564.

Puylaert, Henk, Erik Schurink en Henk Werksma (2009), Een bodem voor duurzame omgevingskwaliteit, In: Rooilijn, jaargang 42, nr. 5 blz. 350-357

Raab J. (2014) Extending our knowledge on network governance. Journal of Public Administration Research and Theory, 24, 531–535.

Rittel, Horst, and Melvin Webber.)1973). Dilemmas in a general theory of planning. Policy Sciences 4:155–69.

RIVM. (2015). Onderzoek kenmerken Gezonde Stad. https://www.rivm.nl/gezonde-stad/onderzoek-kenmerken-gezonde-stad

RIVM. (n.d.) Kosteneffectiviteit van Preventie. https://www.kosteneffectiviteitvanpreventie.nl/

RIVM (n.d.). Organisatie van de Zorg. https://www.rivm.nl/zorg/organisatie-van-zorg

Rooy, P. van (2009), NederLandBovenWater II: Praktijkboek Gebiedsontwikkeling. Den Haag: Habiforum/Nirov

Salter, C.M., Ahn, R., Yasin, F., Hines, R., Kornfield, L., Salter, E.C., Burke, T.F., 2015. Community Noise, Urbanization, and Global Health: Problems and Solutions BT - Innovating for Healthy Urbanization. In: Ahn, R., Burke, T.F., McGahan, A.M. (Eds.), Springer US, Boston, MA, pp. 165–192. https://doi.org/10.1007/978-1-4899-7597- 3_8.

Short, J.R. (2006) Urban Theory. A Critical Assessment. Houndmills, Basingstone: Palgrave Macmillan.

Tamminen, N., Kettunen, T., Martelin, T., Reinikainen, J., Solin, P., 2019. Living alone and positive mental health: a systematic review. Syst. Rev. 8, 134. https://doi.org/10.1186/s13643-019-1057-x

Teisman, G.R. & E.-H. Klijn (2002), 'Partnership Arrangements: Governmental Rhetoric of Governmental Scheme?' Public Administration Review, Vol. 62, No. 2, page 189-198

Thomson, Ann Marie., and James Perry. (2006). Collaboration processes: Inside the black box. Public Administration Review 66:20–32.

Tiesdell, S., & Allmendinger, P. (2008). Planning Tools and Markets: Towards an Extended Conceptualisation. Planning, Public Policy & Property Markets, 56–76. https://doi.org/10.1002/9780470757789.ch4dat i

Tonne, C., Adair, L., Adlakha, D., Anguelovski, I., Belesova, K., Berger, M., Brelsford, C., Dadvand, P., & van Wee, B. (2021). Defining pathways to healthy sustainable urban development. Environment International, 146, [106236]. https://doi.org/10.1016/j.envint.2020.106236

Tzioumis, E., Adair, L.S., 2014. Childhood dual burden of under- and overnutrition in low- and middle-income countries: a critical review. Food Nutr. Bull. 35, 230–243. https://doi.org/10.1177/156482651403500210.

United Nations Department of Economic and Social Affairs Population Division, 2018c. Household Size and Composition 2018 (POP/DB/PD/HSCD/2018) (Special tabulations).

van Bueren, E. (2019). Management van Stedelijke Ontwikkeling: Beleid, sturing en institutionele veranderingen voor duurzame steden. Bestuurskunde, 28(2), 15-21. https://doi.org/10.5553/Bk/092733872019029002003

van Wee, B., Ettema, D., 2016. Travel behaviour and health: A conceptual model and research agenda. J. Transp. Heal. 3, 240–248. https://doi.org/10.1016/j. jth.2016.07.003.

Verberne, R. (2021, May 18). Vrouwen in de bouw: "De combinatie mannen en vrouwen binnen de organisatie werkt heel goed" - BanBouw. BanBouw. https://banbouw.nl/vrouwen-in-de-bouw-de-combinatie-mannen-en-vrouwen-binnen-de-organisatie-werkt-heel-goed/#:~:text=Volgens%20het%20CBS%20is%20een,bouw%20een%20mannenwereld%20bij%20uitstek

Vlahov D., Freudenberg N., Proietti F., Ompad D., Quinn A., Nandi V., Galea S. (2007) Urban as a determinant of health. Journal of Urban Health, 84, 16–26.

WHO. (1946). Constitution. https://www.who.int/about/governance/constitution

Wilkinson, M., Dumontier, M., Aalbersberg, I., et. al. (2016). The FAIR Guiding Principles for scientific data management and stewardship. Sci Data 3,160018. doi:doi.org/10.1038/sdata.2016.18

World Health Organisation. (n.d.). Determinants of health. https://www.who.int/news-room/questions-and-answers/item/determinants-of-health

World Health Organisation Healthy Cities. (z.d.). HSE.ie. https://www.hse.ie/eng/services/list/5/publichealth/publichealthdepts/howweimprovehealth/who-healthy-cities.html

World Health Organization. Regional Office for Europe. (2022). How to develop and sustain healthy cities in 20 steps. World Health Organization. Regional Office for Europe. https://apps.who.int/iris/handle/10665/364675. License: CC BY-NC-SA 3.0 IGO

De Zeeuw, F. (2011). *Duurzame Gebiedsontwikkeling: Doe de tienkamp!.* http://www.ruimtexmilieu.nl/uploads/documents/Duurzame_gebiedsontwikkeling_Doe_de_tienkamp.pdf

Zorginstituut Nederland. (2021, September 6). Impact vergrijzing op zorgkosten in beeld. zorgcijfersdatabank.nl. https://www.zorgcijfersdatabank.nl/nieuws/impact-vergrijzing-op-zorgkosten-in-beeld