

Master Thesis

Strategies in the National Preventive Agreement concerning the problem of overweight and obesity

Research report

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Preface

Dear reader,

Ever since high school, I have been intrigued with health. To what extent a healthy lifestyle can influence our mental state and how these two factors are interdependent fascinates me. Even while writing this thesis and trying to understand the problem of obesity, I became more conscious of my eating habits, especially of the comfort foods normally consumed while writing a master's final project. To me, it emphasized how difficult it can be to make the healthy choice over and over, especially when stressed and surrounded by unhealthy food, (falsely) promising me to re-energise myself.

I want to thank Karen and Claudia from "*Partnerschap Overgewicht Nederland*" for giving me the opportunity to write this thesis, their enthusiasm and motivation. I want to thank Marc and Marten for their critical thinking and for helping me realize this paper. The passion my supervisors, and many others I met during this journey, expressed for creating a healthy Netherlands has stunned me. It was eye-opening to meet so many people working diligently towards tackling the problem of obesity.

I hope this paper can contribute to previous efforts of others in creating a healthy Netherlands, where every individual can fulfil their social, physical, and personal goals.

With regards,

Daniël

Abstract

Problem analysis

Excess body fat harms an individual's health, as both overweight and obesity are major risk factors for various types of non-communicable diseases. In the Netherlands, direct and indirect costs of overweight and obesity are estimated to be 500 million and 2 billion euros per year, respectively. At the present rate, prospects predict that more than 60% of Dutch adults will suffer from overweight in 2040. Therefore, the Dutch government signed the National Prevention Agreement (NPA) in 2018, a treaty aimed towards achieving a healthier Netherlands. However, in the first evaluation of the NPA, the Dutch Minister of Health already concluded that more needs to be done. The central aim of this thesis is to evaluate whether the overweight strategies presented in the NPA reflect the underlying causes of (severe) overweight. Additionally, alternative strategies will be proposed, in order to compose an effective strategy to tackle the growing burden obesity and overweight pose to society.

Methods

A literature search will be performed to answer what is driving overweight in the Netherlands. Next, a comprehensive breakdown of the NPA will be presented. Here, individual measures are labelled and analysed in a framework which includes a conceptual model. An overview of measures of the three (severe) overweight pillars making up the NPA will then be compared to the causes of this problem, to determine whether the emphasis and expenditure put on the strategies currently used in the NPA reflect these underlying causes. Lastly, a literature review based on the gaps between the causes and the NPA preventive strategies will show these gaps leading to advice for optimizing the agreement.

Results

The NPA fails to implement coercive interventions that target systemic drivers of overweight and obesity. Ambitions and goals in all pillars are translated into objectives that are easily evaluable. In total, 27 million euros have been allocated to the NPA strategies concerning (severe) overweight for a three-year period. On exploration of pillar one, healthy eating, we find a mismatch between the core problem of overweight and the mechanism most used in interventions. Regarding pillar two, sports and exercise, it can be concluded that there are no ambitions nor interventions that target the increasing amount of time we spent sedentary, although it is an important contributor to overweight. In pillar three, environment and healthcare, little measures effectively improve the general environment of society but do contain various effective strategies for treating (severe) overweight.

Conclusion

Although important steps are taken in the NPA to provide healthy alternatives to battle the problem of (severe) overweight in collective prevention, in my opinion it is currently not the optimal approach to realize the ambitious goals. Most interventions used non-coercive mechanisms that rely on the individual to make the healthy choice, whereas more coercive yet effective measures that can prevent the choice altogether, are absent. In individual prevention strategies do reflect the underlying causes.

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CHAPTER 1: INTRODUCTION

1.1 Problem analysis

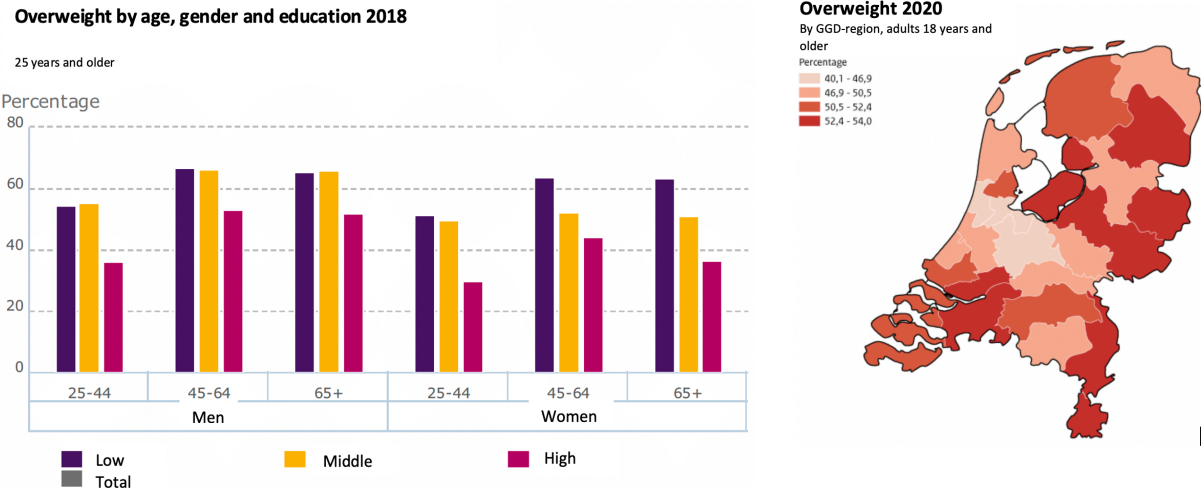
When bodyweight is greater than what is considered to be normal for a certain height, it implies overweight. A simple indicator, commonly used to indicate healthy body weight, is the Body Mass Index (BMI). BMI is calculated by dividing a person's weight in kilograms by the square of height in meters (1). Being overweight is defined as having a BMI of 25-29 kg/m². A worsened stage of overweight is obesity, defined as having a BMI of 30kg/m² or higher. Overweight is generally due to extra body fat. However, a shortcoming in BMI, due to its calculation, is that high BMI may be caused by extra muscle, bone, or water, rather than fat mass alone. Although a primitive measurement, BMI is widely used and a tool in determining public health policies (2).

Excess body fat harms an individual's health. Both overweight and obesity are major risk factors for various types of non-communicable diseases such as type II diabetes, cancer, cardiovascular diseases, and depression, which are the leading causes of death worldwide (3). Importantly, obesity is also associated with higher susceptibility for, and mortality from, infectious diseases, which has been reported for example during the 2020 COVID-19 pandemic (4). Here, people with obesity who contracted the coronavirus were 113% more likely than people of healthy weight to be submitted to hospital, 74% more likely to be admitted to an ICU, and 48% more likely to die (4). Although there are several different hypotheses on what underlying mechanism is causing the damage, it is certain that excessive amounts of adipose tissue in obesity actively dysregulate physiological and immunological processes, bringing the body in a chronic, low-grade inflamed state (5).

Moreover, obesity has a significant negative impact when viewed using a societal perspective by utilizing public resources. Two types of costs are associated with overweight and obesity: direct and indirect costs (6). Direct costs are reflected in the 11% of healthcare budget that is currently spent in the Netherlands to provide treatment for overweight-related diseases, an estimated 500 million euros (7,8). Indirect costs are defined as "resources forgone as a result of a health condition". Here, overweight and obesity are linked to reduced labour force productivity, absenteeism from work and unemployment (7). Moreover, compared to children with a healthy weight, overweight children perform less well at school. This is demonstrated by lower marks and a higher probability of missing school (7). Moreover, children with overweight have a lower level of educational attainment and a higher probability of not completing higher education (7). Indirect costs are estimated to be a staggering 2 billion euros per year in the Netherlands (8). A simulation model based in the Netherlands concluded that effective obesity prevention will likely lead to increased direct healthcare expenditure due to a prolonged lifespan (9). However, it can reduce indirect costs and may be an important and cost-effective way of improving public health (7).

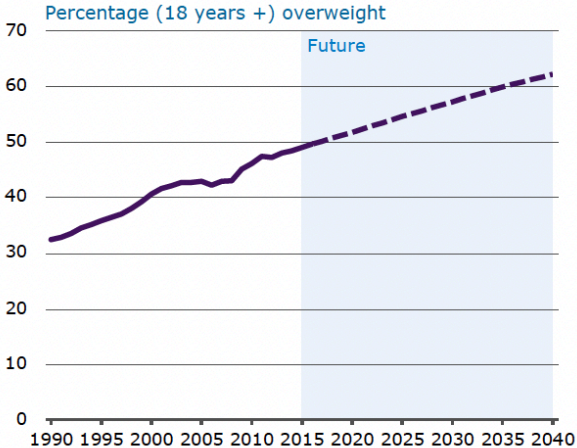
Amongst adults in the Netherlands in 2020, 50.0% of the population was overweight, of which 13.7% obese (10). In children between the age of 4 and 17, 14.7% was overweight, of which 2.5% obese. Ageing is associated with overweight. A low educational level is associated with a higher chance of being overweight in all age groups, as shown in Figure 1. Additionally, Figure 1 shows that overweight is more concentrated in peripheral areas of the Netherlands.

Figure 1: Dutch overweight and obesity prevalence in adults (10).



The past trends and future prospects of overweight are presented in Figure 2. In 1990, 31.1% of Dutch adults suffered from overweight. Currently, the prevalence is 50%, and at the present rate future prospects show that more than 60% will suffer from overweight in 2040 (11). This expectation applies to all educational levels and sexes alike.

Figure 2: Past trends and future prospects of overweight and obesity prevalence (11).



The combination of the incremental increase in the prevalence of obesity, the additional health hazards, and high healthcare expenditure to treat it, forms a major public health challenge worldwide. This demands a call for action. Despite tremendous efforts however, presently no country has successfully implemented an effective public health strategy to reverse the current obesity trends (7).

In 2018, the Dutch government signed the “National Prevention Agreement” (NPA), a treaty aimed towards achieving a healthier Netherlands (11). The aims of the treaty are threefold, in which reducing overweight and obesity is one of the three themes. The other two themes comprise of reducing smoking and problematic alcohol consumption. The treaty regarding (severe) overweight, signed by 32 different organizations, has the ambition to reduce overweight and obesity levels to where they were 22 years ago (1995) in the next 22 years (by 2040). This makes the NPA the most ambitious project the Dutch government has started to tackle overweight and obesity. The NPA is built upon three pillars, with aims of

- 1) promoting healthy eating;
- 2) making it more appealing to do sports and engage in more physical activities, in a better way;
- 3) creating a healthier environment and providing accessible and appropriate support and care for those who need it.

The agreement acknowledges the importance of focusing on the youth and on areas and neighbourhoods where the problems are greatest (11). Moreover, the agreement claims to place emphasis upon health gains for the people who need them the most, and on reducing disadvantages for those groups of people who have the highest risk of becoming overweight or obese (11).

However, in the first evaluation of the NPA, performed in 2018, the Dutch Minister of Health already concluded that more needs to be done (12). The evaluation revealed that goals regarding reducing overweight are too vaguely stated and are not ambitious enough. Fifty of the 52 OECD countries have comparable national policies in place to tackle obesity, and 45 countries have strategies targeting childhood obesity. The majority of these countries also have national dietary and physical activity guidelines. However, growing obesity rates show that more needs to be done to curb its growing prevalence (7). Moreover, monetary resources are given to over 30 various organizations that all must work together. A report by NICE made an appeal to fuse similar organizations, whereas in the NPA, multiple different organizations are separately funded for reaching the same overall goal (13).

In conclusion, overweight and obesity harm the individual’s health and pose a great burden to society. The prevalence of obesity has been increasing over the past years and will keep increasing if nothing is done to bring halt to the causes of the rising prevalence of obesity. The first evaluations of the NPA predict that more needs to be done in order to achieve its’ ambitious goals. It is for these reasons a proper evaluation is of utter importance to understand whether the agreement tackles the causes of obesity, and what needs to be done to reverse the observed trend.

1.2 Objective

The aim of this research is to evaluate whether the strategies presented in the NPA have the potential to achieve the goals stated within it, of reducing overweight, by comparing the interventions to the underlying drivers of overweight and obesity. The underlying aim of this thesis will be to provide the Dutch government with advice for improvement of the strategies mentioned in the NPA, in order to compose an effective strategy to tackle the growing burden obesity and overweight pose to society.

1.3 Research questions

The following main research question was formulated to answer the aim of this research:

Is the National Preventive Agreement the optimal approach to decrease the prevalence and incidence of overweight and obesity in The Netherlands?

To give a comprehensive answer to this main research question, the following sub questions arise:

- 1) What are the underlying causes of the increase of (severe) overweight seen in The Netherlands over the past decades and how can these drivers be countered?
- 2) Does the emphasis and expenditure put on the strategies currently used in the NPA reflect these underlying causes?
- 3) Based on the gaps between the drivers behind (severe) overweight and the measures in the National Preventive Agreement, what interventions are still missing and what is the evidence of their effectiveness?

1.4 Societal relevance

The current situation of growing overweight and obesity rates, the negative impact it has on a person's health and wellbeing, and the high healthcare expenditure to treat it are not sustainable. Therefore, the societal relevance of this research is to help find solutions to the pressing problem of overweight and obesity.

1.5 Scientific relevance

The scientific relevance is that early experiences with the NPA so far raise the question of whether the NPA, in its current form, is the most effective strategy to revert the negative trend. Moreover, currently no other OECD country has successfully implemented a national policy to curb the growing prevalence of overweight and obesity. Therefore, it is of great interest to thoroughly analyse the NPA.

CHAPTER 2: BACKGROUND

2.1 Previous efforts in the Netherlands to curb overweight and obesity's prevalence

Obesity prevention was put on the political agenda in 2003 when the Dutch Health Council acknowledged obesity as a chronic disease and warned for its increasing prevalence and health risks (14). This initiated the development of the first Dutch evidence-based directive for the diagnostic process and treatment of obesity, which was published in 2008 (15). 2008 was also the founding year of the Overweight Partnership in the Netherlands, in which, with funding from the Ministry of Health, Welfare and Sport, professional organisations, insurers and patients came together to discuss what good care for children and adults with obesity should encompass (16). In 2010, this led to the first Dutch Obesity Care Standard, which contains scientific-based agreements on the diagnosis and treatment of obesity and national multidisciplinary consensus (17).

Meanwhile, there was increasing attention for preventive strategies in chronic diseases. In 2005, the Covenant Overweight was signed by 20 parties, including representatives of the food industry, catering, employers, health insurers, sports organizations, and the government, which committed to reversing the rising trend of overweight and obesity into a decline (18). In 2009, all parties decided to enter a follow-up agreement: the Healthy Weight Covenant, which was concluded for the period 2010 - 2015. That too was a partnership of national and local governments, the business community, and social organisations. This covenant consisted of sub-covenants for work, schools, consumers, leisure time, and "Youth on a Healthy Weight" (JOGG). As of 1 January 2015, the Healthy Weight Covenant was abolished and continued solely as JOGG.

This foundation is committed to reducing the percentage of (severe) overweight children in the Netherlands and its program is still running today with success (19). Neighbourhoods in municipalities that use the JOGG approach report that the measured percentage of overweight children and young people is 9 percent lower than in other neighbourhoods without this approach (20). The approach consists of creating a healthy living environment for young people and children, and helping municipalities, companies, and organizations to formulate policy for healthier food, more exercise and sufficient sleep.

The NPA has been compiled on the basis of these developments. In contrast to previous covenants, the NPA is the first agreement with quantitative goals for prevention of obesity.

2.2 Preconditions for effective prevention

To understand basic criteria for successful preventive policy, we can use the fundamentals of the JOGG approach. The JOGG approach was partially based on the preconditions for effective prevention as proposed by the Dutch Health Council. Based on this approach, future promising prevention should meet the following conditions (14):

- 1) preventive policy should aim at both a reduction of energy intake and an increase of usual daily physical activity.
- 2) programs should combine universal prevention with selective and targeted prevention (a population strategy and a high-risk approach)
- 3) Interventions must be a combination of information, the creation of facilities and regulations
- 4) This combination of activities must be geared to a good analysis of the specific behavioural determinants and environmental factors underlying risk behaviour characterized by eating too much and exercising too little.

An optimal strategy requires both universal prevention and selective prevention in populations with an increased risk, to prevent new cases of (severe) overweight, as well as targeted prevention in people who are already moderately overweight to decrease the current prevalence.

2.5 Ethics of prevention

Obesity prevention and healthy eating efforts raise a range of ethical issues. The first pitfall is that of respecting autonomy. The medical ethical principle of respecting autonomy states that the patient has autonomy of thought, intention and action when making decisions regarding health care procedures (21). When governments regulate the food industry by paternalistic measures through taxes, restrictions of food marketing or control available settlement areas of new fast-food restaurants, consumer autonomy is undermined, although the argument could be made that the food industry themselves also undermines consumer autonomy by misleading and manipulative marketing strategies. From a government's perspective, the ethical principle of respecting autonomy clashes with the principle of beneficence. However, paternalistic policies can be ethically justifiable although they violate the principle of respecting autonomy: such policies respect the person by helping one accomplish long-term goals of staying healthy and living a long life, goals that virtually everyone has. Autonomy must be distinguished from unfettered choice since unfettered choice does not necessary enforce autonomy. In fact, it can undermine autonomy in the long run, such as when people choose unhealthy lifestyles. To proficiently live a free life, and have control over it, requires some level of good health. Thus, choice-limiting public health policies can promote long-term autonomy or self-determination in the long haul.

The second pitfall discussed here is that of justice. The medical ethical principle of justice states that the burdens and benefits of new treatments must be distributed equally among all groups in society (21). As previously noted, low socioeconomic status groups in the Netherlands suffer from higher rates of overweight, have insufficient diets and are surrounded by an overwhelming obesogenic environment. Thus, there is a justice-based ethical reason to focus preventive efforts on these groups. However, efforts to reduce obesity, that restrict or disincentivize obesogenic options raise a paradox. Financial disincentives, such as taxes on sugary drinks, will disproportionately benefit low socioeconomic groups regarding obesity outcomes, but can also be seen as unfair since it will take a relatively larger percentage of their income when compared to high socioeconomic groups.

CHAPTER 3: RESEARCH METHODS

3.1 Study design

This study will evaluate whether the current strategies presented in the NPA have the potential to achieve the goal of reducing overweight and obesity rates. To achieve this goal, it must first be understood what is driving overweight in the Netherlands. A literature search will be performed to answer this question. Next, a comprehensive breakdown of the NPA will be presented. Here, a framework is made to understand the preventive strategies and technical aspects of the interventions and label them accordingly. An overview of measures of the three pillars concerning (severe) overweight in the NPA will then be compared to the causes of (severe) overweight, to determine whether the emphasis and expenditure put on the strategies currently used in the NPA reflect these underlying causes. Last, a literature review based on the gaps between the causes and the NPA preventive strategies will show these gaps leading to advice for optimizing the agreement.

3.2 The organizations that will be approached

I will be working closely with “Partnerschap Overgewicht Nederland” (PON). PON is an umbrella organization representing various unions, including medical, paramedical, patients, public health and health insurers organizations. Together, they are working on an optimal approach to treating overweight and obesity for adults and advises, among others, the government on overweight and obesity policy in the Netherlands. Through this organization, I will have contact with the Ministry of Health, Welfare and Sport, which is the ministry in charge of the NPA.

3.3 Data collection method and analysis

3.3.1 Literature search

To answer sub-question one, literature on the drivers behind obesity in the Netherlands will be sought through systematic searches including, but not limited to, PubMed and Google Scholar. Search terms will include a combination of obesity, overweight, drivers, causes, the Netherlands. Papers that do not concern western countries will be excluded.

Moreover, documents will be obtained from RIVM-experts on overweight and obesity prevention.

The literature to fill in the gaps between the causes of obesity and the NPA for sub-question three will also be sought through systematic searches in the databases as mentioned above. The respective gaps, found through examination of the framework, will be used as search terms.

3.3.2 General conceptual model on obesity and its prevention

To help answer sub-question three, a conceptual model has been made. It consists of two parts, the first of which is a framework that helps to understand how different factors affect and influence obesity, as shown in Figure 3. The upper bar divides the framework into “environment”, “behaviour” and “physiology”. The accompanying white boxes suggest a directional effect: the environment directly affects behaviour; behaviour directly affects physiology.

The third row provides examples of possible public health interventions. Measures scaled left, like restrictions, regulations, or taxes, are directed at the environment and have a national effect, thus can be seen as collective prevention. Measures on the right side like drugs and surgery, however, are focused on individuals and can be viewed as individual prevention.

This blue triangle in this framework shows that policy interventions scaled left have a greater possible impact, as they affect the entire population and aim to reverse some important drivers behind obesity (22). These measures are more intrusive, thus can face a higher degree of political difficulty to implement.

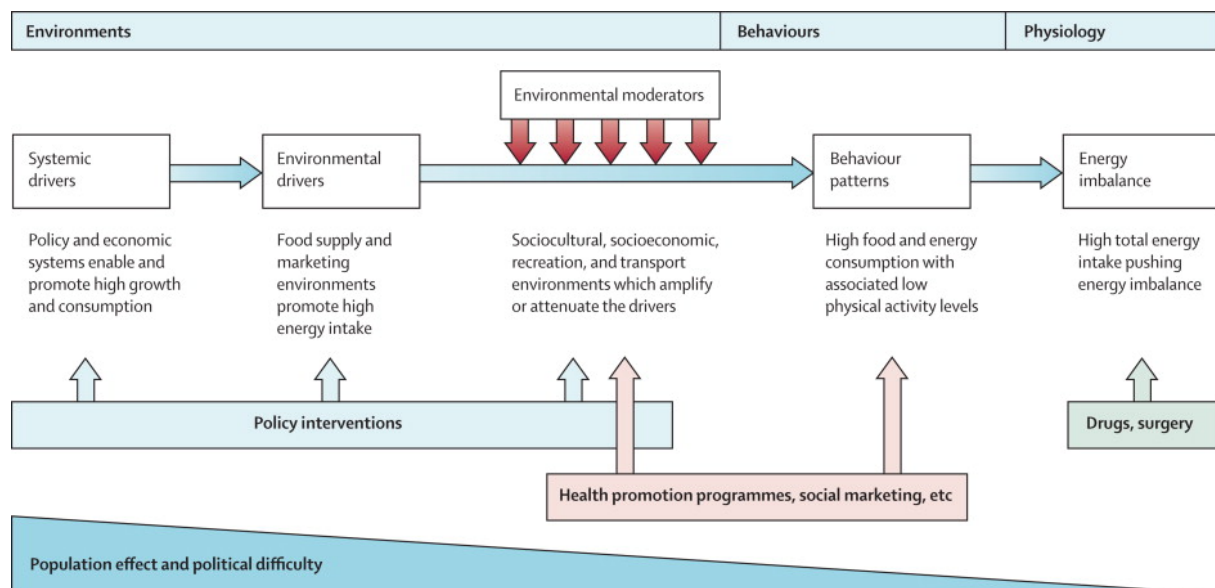


Figure 3: A framework to categorize obesity determinants and possible solutions, derived from *The global obesity pandemic: shaped by global drivers and local environments* (22).

A second part of the conceptual model is the so-called intervention ladder, presented in Figure 4, which can complete the blue triangle in Figure 3. It presents the scope of possible strategies in preventive policy interventions that can be used. The ladder shows that more intrusive measures can achieve greater results regarding preventive policy interventions. However, since they have a greater impact on freedom, the higher the rank on the ladder at which the policymaker intervenes, the stronger the justification must be.

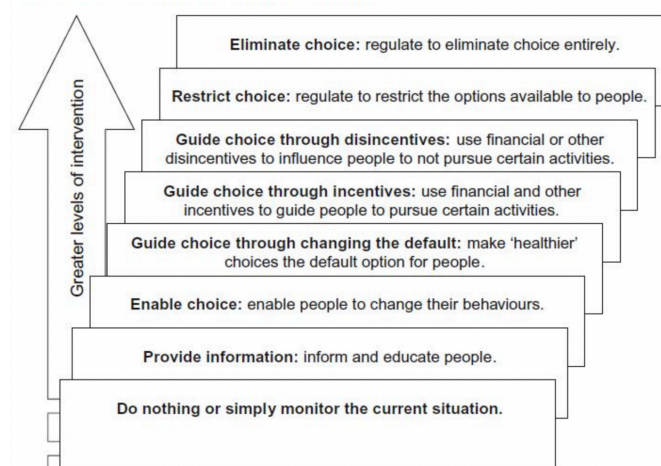


Figure 4: The intervention ladder, derived from The Nuffield Council on Bioethics (23).

The terminology for prevention that will be used for this research distinguishes four types of prevention: universal, selective, indicated and care-related and are explained in Table 1 (24,25). Note that universal and selective prevention are bundled under “collective prevention”, whereas indicated and care-related prevention are labelled as “individual prevention”. Regarding national health care policy in the former, measures are aimed at the general public (or large subgroups thereof) and are funded by the government. In the latter, interventions are aimed at groups of individuals who already show signs of overweight or are diagnosed with obesity, interventions are funded by the municipality or insurance companies.

Table 1: Types of prevention

Collective prevention	Universal prevention	
	Description	Universal prevention programs are directed to the general public without taking into account risk groups and aim to reduce risk factors or increase protective factors.
	Funded by	Government (24).
	Goal	Primarily to reduce the number of new cases of obesity, secondarily to delay the onset of obesity.
	Selective prevention	
	Description	Selective prevention programs are directed toward a subgroup of the population whose risk of developing the disorder is above average or high. In the Netherlands, a low-education, youth with an immigrational background, the elderly population and ex-smokers have a higher risk of being obese (25).
Funded by	Government (24).	
Goal	Primarily to reduce the number of new cases of obesity, secondarily to delay the onset of obesity.	
Individual prevention	Indicated prevention	
	Description	Indicated preventive interventions are targeted to high-risk individuals identified as having minimal but detectable signs or symptoms that foreshadow the disorder who do not meet the full diagnostic criteria for the disorder itself..
	Funded by	Municipality or insurance company (24).
	Goal	To reduce the length of time in weight gain and curbing its progression before diagnostic criteria for obesity are met. Even if obesity is eventually developed, the prior preventive intervention may still have had an effect by reducing the duration or severity of the disorder.
	Care-related prevention	
	Description	Care-related prevention focuses on individuals with a disease or condition already present.
Funded by	Insurance company (24).	
Goal	To prevent an existing condition from leading to complications, limitations, lower quality of life or death.	

Together with Figures 3 and 4, this depicts the general conceptual model on obesity prevention used in this thesis.

3.3.3 Specific framework to analyse policy interventions

The framework that will be used for analysing individual measures from the NPA and the additional measures as proposed by the RIVM is presented in Table 2. Its base lies in the article from the World Health Organization (WHO) “Good practice appraisal tool for obesity prevention programs, projects, initiatives and interventions” (26). The tool is used by the WHO to review and assess the quality of policies and actions in the area of nutrition, physical activity and obesity prevention in Europe. The tool was developed through a literature review on evaluation criteria for determining the effectiveness of interventions, assessment tools for obesity and public health interventions. After a consultation round, the tool was tested in three pilot rounds to identify gaps and review the feasibility, user friendliness and relevance of the tool. The final product was then examined by various independent experts.

Programmes or interventions that had a clearly defined design, were closely monitored and evaluated, and measured the implementation progress were considered good practice.

The tool is edited to meet the requirements for this specific NPA evaluation and designed to understand individual measures and give a deeper insight in how the act helps to prevent obesity. The upper part, preventive strategy analysis, refers to an analysis of the policy interventions regarding the used strategies and is based on the general conceptual model in combination with types of prevention. The lower part, technical characteristics, comprehends the technical aspects of measures and is based on the WHO article.

Table 2: Specific framework for analysing policy interventions

Measure:

<p>Preventive strategy analysis</p> <ul style="list-style-type: none"> Public health strategy <ul style="list-style-type: none"> Systemic drivers Environmental drivers Behaviour patterns Energy imbalance Intervention ladder <ul style="list-style-type: none"> Provide information Enable choice Guide choice by changing the default Guide choice by (dis)incentives Restrict choice Limit choice Type of prevention <ul style="list-style-type: none"> Universal Selective Indicated Care-related 	<p>Finding</p>
<p>Technical characteristics</p> <ul style="list-style-type: none"> Main goal Specificity Timeframe Costs of the intervention Stakeholders Implementation 	<p>Finding</p>

Next, individual factors will be explained.

Specificity and Timeframe

Specificity comprises that objectives should clearly specify what is to be achieved and are unambiguous. Timeframe means that objectives should relate to a clearly stated time frame and have follow-up goals for when initial goals are achieved. These two factors respectively are the S and T in SMART formulated goals, a commonly used appraisal tool for evaluation. The remaining letters, Measurable, Achievable, and Realistic, are already assessed or performed by the RIVM and are therefore not of interest for this thesis.

Costs of the intervention, Stakeholders and Implementation

Costs of the intervention represents the direct costs of this intervention, if any. Data regarding costs and the NPA budget required for comprehensive NPA analysis of sub-question one will be acquired through contact with professionals from the Ministry of public health, well-being and sports, as mentioned above. They can access the budget overview and costs of all individual parts of the NPA and what sum of money sub-organizations were given in order to implement it.

Stakeholders embody the organization that is responsible for carrying out this measure and what group the intervention is aimed at.

Implementation examines the implementation progress of the measure, as published by the RIVM.

3.3.4 Presentation of results of policy interventions

To visualize results from the preventive strategy analysis, Figure 5 is made. This represents a visual representation of the general conceptual model, consisting of Figure 3 on the y-axis and Figure 4 on the x-axis. Additionality, “research” and “not specified” are added on the x-axis to complete the used strategies. Policy interventions will be placed on to the graph according to their results. Colours will indicate what type of prevention is used, red: universal, blue: selective, yellow: indicated, grey: care-related, black: not specified.

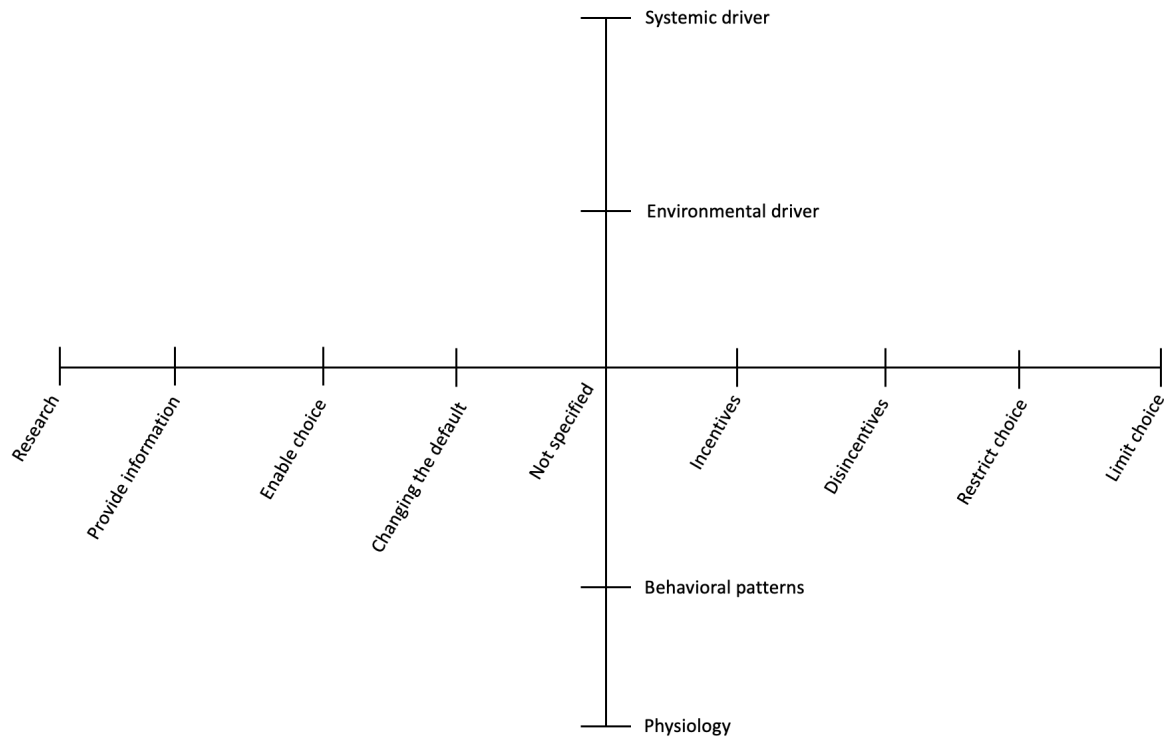


Figure 5: Visual tool to present findings in preventive strategy analysis

3.4 Validity and reliability

A pitfall of this research is that it might be too early for a complete evaluation. Since the treaty was signed in 2018, not all measures have been implemented yet and the effect of the implemented measures in the population is still largely unmeasured. This makes a complete assessment of its cost-effectiveness unfeasible. However, because this evaluation study is relatively close to the ratification of the treaty, it remains possible to identify mistakes in the taken approach and correct them for the most optimal outcome in the future.

CHAPTER 4: RESULTS

This chapter presents the findings needed to answer the sub-questions. First, the core problem of obesity will be explained and what influence the obesogenic environment has on it. Then, the NPA will be analysed with help of the framework as shown in chapter 3. Here, an in-depth analysis of objectives is presented for each pillar in the NPA regarding the preventive strategy and technical aspects of the interventions. Next, the interventions in the agreement will be compared to the drivers behind obesity, and gaps between the problem of obesity and the strategy will be identified. Lastly, these gaps will be filled with recommendations based on literature and a report published by the RIVM.

4.1 Key drivers behind overweight and obesity increase

4.1.1 Understanding the core problem

Before key points in collective or individual obesity prevention can be identified, it is essential to understand the core problem of obesity. Among the various functions of healthy adipose tissue, the main function of fat cells is the storage of energy (27). It functions as a survival mechanism of the body, storing extra energy in times when food is plentiful and utilize it later for trying circumstances. Thus, when energy intake exceeds energy expenditure, excess energy is converted into fat mass. Obesity carries the social stigmata of lacking willpower, sloth, and gluttony as the gross “cure” for obesity is reducing the caloric intake below the caloric expenditure (28). However, these stigmata do not resemble the reality of the problem, nor the solution, as both the former and the latter are a lot more complex

Apart from energy storage, adipose tissue fabricates hormones. An increase in fat mass stimulates the secretion of leptin into the bloodstream. Leptin is a hormone that passes the blood-brain barrier and increases the satiety level (30). This in turn reduces the overarching drive to eat, leading to a period of negative energy balance, and a reduction in the secretion of leptin from fat. In this way, the system returns to equilibrium.

Historically, this system worked well for humans and other animals, as it used by all mammals. However, the modern world evolved faster than the human body can adapt, in which societal development exceeds evolutionary mechanisms. Sensory factors of food, for example the sight, smell, palatability, and availability can increase appetite to such an extent that it overwhelms innate control mechanisms, which is described as ‘hedonic’ hunger (31). In nature, calory dense foods, high in sugar and fat, is rare, so when the opportunity arises to eat it, you must, because, evolutionarily, one cannot be sure when the opportunity to eat such a meal will present itself again. This is called the “asymmetry of appetite paradox”: it is easy to overeat, whereas there are no situations where energy intake is spontaneously lower than energy expenditure (32). This asymmetry of appetite begins to explain why it is so easy to put on weight and so difficult to lose it thereafter. Thus, the primal human instinct aided us during survival but seems to be counterproductive in modern times.

Here lies the core of the obesity problem: our bodies, designed to survive in a world of relative food scarcity, now live in a time where food is overabundant, calory-dense, and overwhelmingly appetizing, resulting in increased energy intake. This influences human behaviour, although historically considered a product of free will, is now increasingly recognized as being constrained by individual and environmental circumstances (33). In addition, labour-saving technologies made it possible to live a sedentary lifestyle, leading to decreased energy expenditure. Therefore, there is no single simple solution to obesity prevention, a multifactorial approach is needed to counteract this human impulse to consume.

4.1.2 The problem of nutrition

Nutrition is one of the two factors influencing energy equilibrium and is an important factor contributing to the problem of obesity. Over the past fifty years, the average calorie intake of OECD countries increased from 2700 kcal/capita/day in 1961 to a little more than 3200 kcal/capita/day in 2013 (7). Regarding Dutch eating habits, the usual Dutchman consumes 3 kilos of food per day on average (34). Most of our energy intake comes from bread, fat, and bakery. Compared to other Europeans, Dutch adults consume more unhealthy foods like alcoholic and non-alcoholic beverages, dairy products, snacks & desserts, sugar & bakery, and saturated fats. In contrast, consumption of healthy foods like eggs, legumes, fish, and fruit is relatively less common on the Netherlands compared to other OECD countries. What has become the typical Western diet-frequent, large meals high in refined grains, red meat, unhealthy fats, and sugary drinks-plays one of the largest roles in obesity (35). Due to low-protein and high sugar levels, meals do not induce a sense of satiety, which can lead to overeating.

Although it is impossible to say consumers buy their food on price alone, price does frame the context in which consumer decisions are made. Cheaper food sources tend to be more energy-dense and nutrient-poor. They often provide abundant calories, especially in the form of fats and sugars, but contain relatively low levels of fibres, vitamins and minerals (31). Research findings suggest that, in the Netherlands, food costs are an obstacle to increasing consumption of nutrient-dense foods such as whole grains, fruits, and vegetables (36). When food budgets are constricted, people tend to select cheaper, more energy-dense foods to meet their energy needs and prevent hunger. Although some nutrient-dense foods may be purchased inexpensively, these food products tend to be less palatable and often require much time for preparation (34). A systematic review and meta-analysis show that, on average, healthier diets cost more than unhealthy diets (37). This especially affects the low socioeconomic status groups.

Unhealthy food is also more readily available, now more than ever. The distribution of food retailers across a determined geographical area environment is an important aspect of the food environment (38). Food environments providing a great number of opportunities to obtaining unhealthy foods may be classified as an obesogenic environment, which contributes to population weight gain (38). Over the past 14 years in the Netherlands, a remarkable 35% increase was found in the availability of convenience and ready-to-eat foods accompanied by a 24% decrease of local food shops, especially in urbanised and low socioeconomic status areas (39). This may be a contributing factor to the poorer diets in low socioeconomic areas.

Unhealthy foods are heavily advertised which especially negatively affects children (40). Home-delivery services have seen a surge in growth over the past years, having binominal negative effects: firstly, home-delivery services mostly offer fast-food and secondly, no energy is needed to obtain a meal, as it is delivered to the doorstep (41).

The problem of unhealthy nutrition bears a striking resemblance to cigarette smoking in the 20th century (42). Similar to cigarette smoking in the 20th century, fast food is readily available, cheap, heavily promoted, and unregulated. And like smoking is the consumption of unhealthy foods rewarded with dopamine release in the brain (32). But unlike smoking, where enforceable and coercive policies now directly affect behaviour, there are no regulations that will require people to eat, or not eat, certain foods. Strategies against smoking, including educational programs on the harms of smoking, health warnings on product packaging, mass-media campaigns, price increases through taxation, restricting possibilities to consume or buy tobacco, have proven to be effective (43). Of course, it is an oversimplification to directly compare smoking to an unhealthy diet, as, for example, we do not need cigarette smoke to survive, whereas we do need nutrition to survive. Moreover, unhealthy eating behaviour is difficult to separate from healthy eating behaviour, but the resemblance is evident, and the hard-won lessons after decades of struggling can be used to our advantage.

To summarize, an important component of the core problem is the fact that our primal survival mechanism is not prepared to withstand the present-day obesogenic environment, shaped by multiple systemic and environmental drivers. Unless one consciously plans what and when meals will be consumed, it is easy to overeat. To properly counter this improper imbalance between physiology and environment, it is necessary to reduce the influence of the obesogenic environment through restrictions of hedonic hunger triggers, improving an individual's decision-making through education and guide choice by financial incentives.

4.1.3 The problem of reduced energy expenditure

In addition to the core problem of nutrition discussed above, 4.1.1 also discussed the problem of reduction in energy expenditure over the last decades. During the entire human history, humans have had to perform hard physical labour to sustain themselves. Today, labour-saving technologies enabled us to live a sedentary lifestyle, leading to decreased energy intake, opening a gap between our body's capacities formed by evolution and our environment.

Over the past 20 years, the number of people who met physical activity guidelines, which advises 2.5 hours of moderately intense and 2 hours of bone-strengthening activity per week, has been gradually increasing (44). In 2020, however, still only 49% of the Dutch population met these recommendations. Young people between the ages of 12 and 18 and people aged 65 and over are less likely to meet these guidelines.

Apart from psychical activity regarding being active, it is also generally accepted that a sedentary lifestyle is increasingly more accessible. There have been systematic reductions in energy expenditure because of fewer manual jobs, increases in car ownership and the rise of labour-saving devices for use at home and work. Over the past 30 years, occupational time increased 4.7 hours per week, and data from the U.S. have suggested that jobs have become increasingly sedentary (45,46). Between 2002 and 2017, the prevalence of sedentary behaviour (more than 4.5 hours per day) increased from 66.5% to 82.0% in men and from 52.4% to 77.6% in women (47). In the Netherlands, 8.0 hours (61.1%) of daily waking non-occupational time is spent on sedentary activities and more than 87% of leisure time is spent sedentary (48). There is a lot of potential to improve in this area, as 32.1% of our population is sitting more than 7.5 hours per day on average, the highest percentage when compared to the rest of Europe (49). In Germany, France, or the United Kingdom, for example, these numbers are 18.3%, 18.3%, and 19.3%, respectively. There is a strong correlation between TV and screen exposure and overweight in children and young people (50). Research suggests that this is not alone by watching inactive TV instead of being active, but because children are exposed to advertisements about unhealthy food and other marketing tactics.

However, unlike the previous problem, where people almost always have freedom in choosing their diets, most people do not always have freedom in choosing how to perform their work. Technology made it necessary to sit behind computers in office jobs, youth study behind computers and books in a sitting manner at schools, and long-distance travelling by car or train is performed mostly in an inactive manner, for example. These systemic and environmental drivers of overweight and obesity have to be addressed for improving the energy expenditure in the Netherlands. Moreover, incentivization and stimulation is needed to improve compliance to the physical guidelines.

2.1.4 The problem in individuals with overweight or obesity

In contrast to collective prevention as discussed above, in individual prevention people already show signs of or already are overweight. The goal is therefore to minimize time spend in an overweight state or prevent complications associated with overweight.

As described above, increased energy consumption, decreased energy expenditure and the obesogenic environment are main identifiable causes of the obesity pandemic. However, at the individual level, there may be several reasons why a person has an increased caloric intake or decreased energy expenditure. Moreover, obesity can be the direct effect of medication use with weight gain as an adverse effect and underlying genetic, endocrine, or hypothalamic disorders (51). Currently, care professionals overlook these underlying causes and focus on direct treatment of the consequences of overweight. Individuals with overweight suffer from a complex interplay of multiple social, psychological, and biological factors, altogether resulting in an imbalance of energy need. To help illustrate the complex interplay maintaining obesity levels, the “weight gain train” is presented in Figure 6.

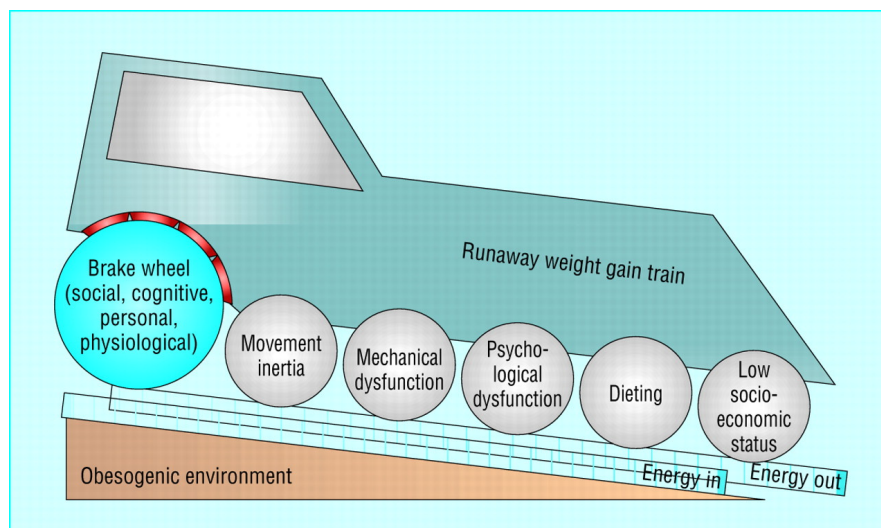


Figure 6: The weight gain train, from *The runaway weight gain train: too many accelerators, not enough brakes* (52).

The train already has high momentum due to the downward slope, representing the obesogenic environment as discussed above. The brake wheels, referring to social stigmata against overweight, the physical discomfort from being overweight and the physiologic equilibrium explained in 2.3.1, are strong enough in lean individuals to slow down the train, but apparently cannot stop weight gain in overweight individuals.

Additionally, the 5 wheels represent vicious cycles, accelerating weight gain. A vicious cycle is a positive feedback loop in which the problem (in this case, weight gain) becomes self-perpetuating. Moment inertia means that heavy bodyweight is a disincentive for movement and physical activity, resulting in decreased activity levels and thus further weight gain. Mechanical dysfunction, like arthritis, arthralgia, and low back pain, is associated with obesity, which again limits physical activity. Psychological dysfunctions means that in obesity, individuals suffer from low self-esteem, bodily dissatisfaction, and negative social stigmata,

which can trigger anxiety or depression. Some cope with binge-eating comfort food or excess alcohol, which increases energy intake. Lethargy and lack of motivation can, on the other hand, reduce physical activity and thus energy expenditure. Moreover, some medication prescribed to manage these symptoms can promote weight gain. The dieting cycle refers to very hypocaloric diets that are most often unsustainable. Here, the bodily metabolic response to such diets is to preserve energy, leading to a weight increase that is disproportionately higher in fat after initial weight loss (also known as the yoyo effect). Moreover, the sense of failure may contribute to the depression and psychological problems described in the previous cycle. Lastly, low socioeconomic status suggests the bidirectional effect it has on overweight. As explained in previous paragraphs, low socioeconomic status is associated with higher obesity prevalence, poorer diets, and an obesogenic environment. Obesity, on the other hand, is associated with reduced opportunities for jobs, education, marriage, and social inclusion, making it difficult to rise out of poverty, resulting in a positive feedback loop. There is a lot of potential gains to be made in understanding the background of an individual and strengthening the brakes or weaken the accelerators driving weight gain.

To break these vicious cycles, a multifactorial approach is needed. The first step is to reduce the influence of the obesogenic environment, which consists of tackling systemic and environmental drivers. Aspects of this strategy are already discussed in the paragraphs above. The second step is to break the vicious cycles plaguing obesity is to provide access to support and care for individuals with overweight, which can be addressed to drivers in behavioural patterns. One solution for this problem can be found in the comprehensive chain approach. The comprehensive chain approach is a form of indicated prevention and integrates the medical domain with the social domain. When overweight is worsening, a combined lifestyle intervention (CLI) is prescribed. CLI consists of learning healthy eating habits and diets, healthy exercise and how to incorporate this into daily life, and in later stages combined with cognitive behavioural therapy to realize behavioural change that is necessary to maintain a healthy lifestyle (53).

This multifactorial approach emphasizes improving the break mechanism, stopping the accelerators and, in combination with the measures of collective prevention, curbs the downward slope of the obesogenic environment. The comprehensive chain approach, in combination with adequate diagnostics of individuals (severe) overweight by care professionals to detect underlying causes, are necessary tools to improve behavioural patterns in the treatment of overweight and obesity.

4.2 Break-down analysis of NPA measures

4.2.1 Healthy nutrition

The first pillar in the NPA, healthy nutrition, functions to fulfil the ambition that by 2040, all residents in the Netherlands eat and drink in a way that contributes to a healthy weight and a healthy diet. Two subsequent goals were agreed upon to realize said ambition. First, all residents will have to have a diet following the Wheel of Five and, second, will consume the number of kilocalories appropriate for height, age, gender, and a healthy lifestyle. The 24 measures in pillar one are focused on accomplishing this ambition and its subsequent goals specifically, although all three pillars have a congruent effect. These measures must have the potential and focus to realize the enormous ambitions. A complete analysis of measures in pillar one can be found under Appendix A.

The results of the preventive strategy analysis for pillar one are presented in Figure 7. Although no interventions were aimed at systemic drivers of overweight and obesity, more than half of measures were focused on environmental drivers. Moreover, almost all policy interventions could be classified as universal prevention. Strengths of this approach is that the majority of measures target the whole population and aim to reverse environmental causes of obesity. However, interventions for healthy nutrition are predominantly non-coercive and still rely on the individuals' decision making instead of changing the obesogenic environment. Notable outliers are four measures in the upper-right quadrant, which restrict choice and focus on environmental drivers. An example of this is intervention A13, which states that additional undertakings will be made to reduce the calorie content for product groups that make a relatively large contribution to energy intake (sugary soft drinks, biscuits and sweets and sugary dairy products).

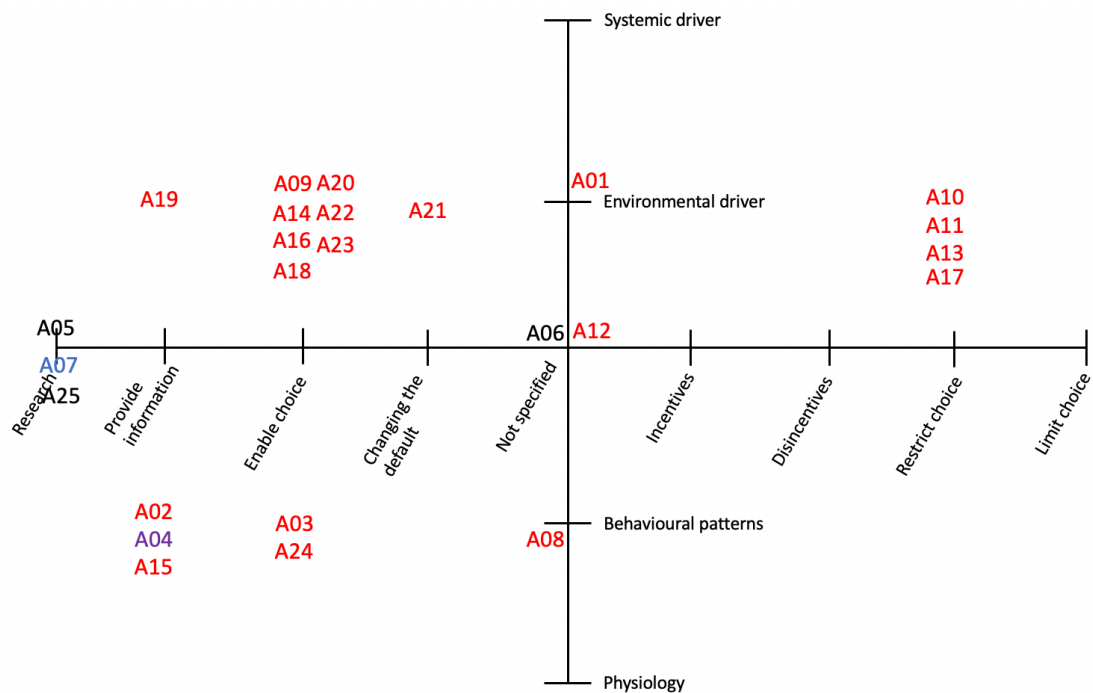


Figure 7: preventive strategy analysis for pillar one. A detailed description of abbreviations can be found in Appendix A. Red: universal prevention, blue: selective prevention, black: not specified. Interventions placed on the axis had no clear description on which driver or intervention mechanism was used.

The results of the technical aspects of interventions under pillar one are presented in Table 3 in appendix A. First, it is important that objectives of preventive measures are specific in what is to be achieved for whom in and when it should be accomplished. It is a fundamental component for evaluation, obtaining observable evidence of accomplishments or progress achieved (54). The ambition that by 2040 all Dutch citizens eat and drink following the Wheel of Five, for example, explicitly states what, when, to what extent and to whom the objective is relevant. Table 3 presents a summary of the technical aspects of this pillar and shows that regarding the 24 objectives in this pillar, 9 had a well-defined goal incorporated in the measure and 11 measures had a specified time frame, merely 6 goals (24%) were specific as well as time bound. This is a strong indication that the ambitious goals for pillar one are translated into vaguely defined and difficult to evaluate goals.

Concerning the NPA's resilience to future challenges in healthy nutrition, in the 11 objectives that have specified a timeframe are almost all interventions are carried out before or during 2022. Only 3 measures have follow-up goals for when initial ones are achieved, the most far away planned will be executed in 2030. In practice, this means that although the accord has ambitions set for 2040, almost all objectives are set within the first 3 years of implementation.

Table 3 also breaks down into specific target groups. We see that most measures target supermarkets, children and youth, and the general population. Lastly, the complete budget of pillar one is 6.6 million euros, which is reserved for 2019-2021.

11 parties participated during the construction of this pillar, varying from the Ministry of Health and Well-Being to food and beverage business representatives like Central Food Trade Office (CBL) or Royal Catering Netherlands (KHN), and are responsible for either achieving or carrying out individual measures. VWS is responsible for the largest number of interventions, followed by CBL, KHN and Dutch Olympic Committee*Dutch Sports Federation (NOC*NSF).

4.2.2 More sports and exercise

The second pillar's main ambition is that 75% of the residents of the Netherlands exercise according to the Dutch Exercise Guidelines in 2040. Remarkably, this pillar has 7 objectives to achieve this ambition, whereas pillars 1 and 2 have 24 and 27 objectives respectively. The complete analysis of measures in pillar two can be found under Appendix B.

Figure 8 presents the results from the preventive strategy analysis of pillar two. Most notable is the fact that the upper-right quadrant is empty, signifying that no coercive interventions target the systemic and environmental drivers of reduced energy expenditure. In fact, the majority of interventions are placed in the opposite quadrant, mostly offering healthy alternatives to the current obesogenic environment and targeting behavioural patterns. Lastly, we find that measures are mostly split between universal and selective prevention.

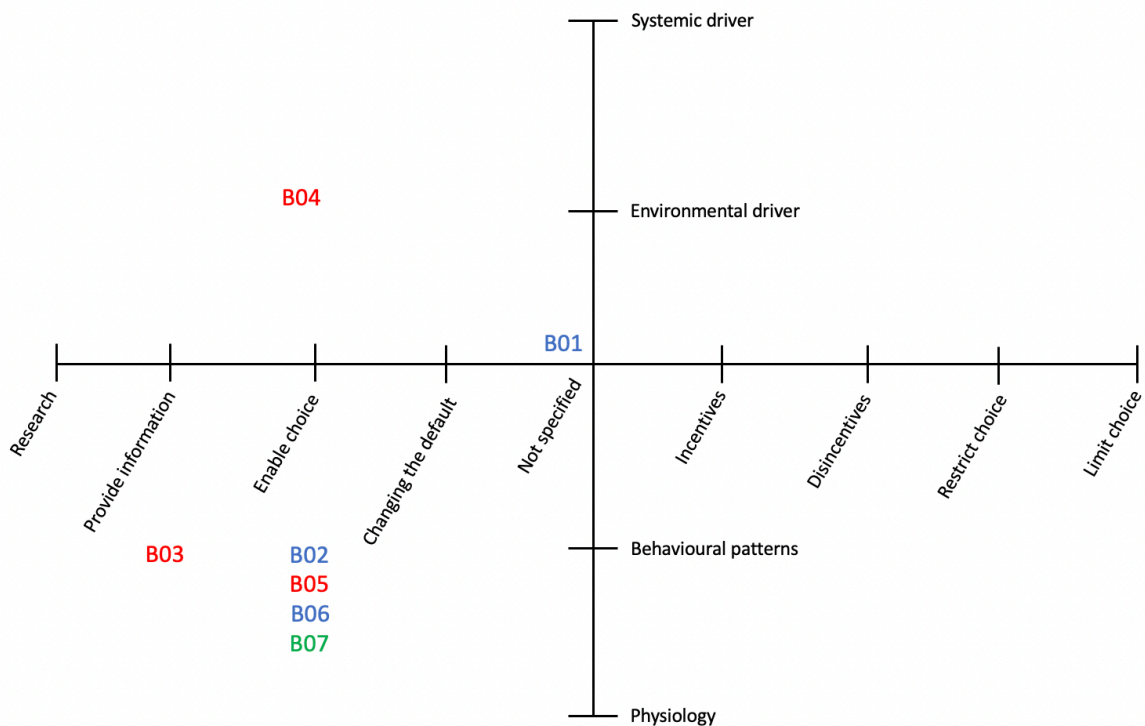


Figure 8: preventive strategy analysis for pillar two. A detailed description of abbreviations can be found in Appendix B. Red: universal prevention, blue: selective prevention, black: not specified. Interventions placed on the axis had no clear description on which driver or intervention mechanism that was used.

The results of the technical aspects of interventions under pillar two are presented in Table 4 in appendix B. Only 1 objective had defined a specific and time-bound goal, which was set for 2020. The remaining measures had no well-defined goals, deadlines nor time frames. None of the measures had follow-up goals for when initial goals were achieved. Most interventions target children specifically. Three projects under this pillar were admitted an estimated €6.500.000 over a three-year period. Here, 5 parties took part in constructing this pillar. None, however, were business representatives, all parties involved were health-promoting organisations.

4.2.3 A healthy environment and healthcare

The last pillar of obesity prevention in the NPA, a healthy environment and healthcare, is constructed to achieve two ambitions. First, the ambition that all residents of the Netherlands have a healthy social, economic, and physical environment that promotes healthy living. Second, the ambition that all people who are overweight or obese have access to suitable sports and exercise facilities and appropriate support, guidance, and care. The complete analysis of measures in pillar three can be found under Appendix C.

When looking at the preventive strategy analysis for pillar three, as presented in Figure 8, we find that almost all of the interventions use non-coercive strategies. These are split between tackling environmental drivers and behavioural patterns and between collective and individual prevention. Again, the upper-right quadrant remains empty.

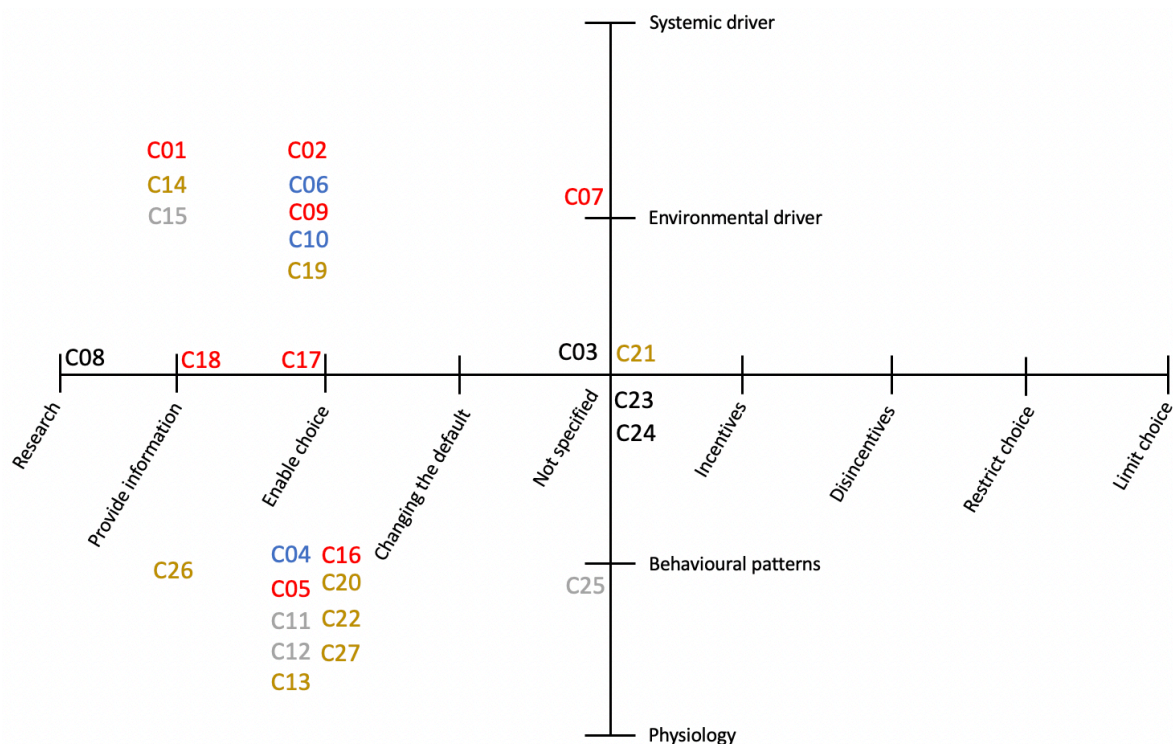


Figure 9: preventive strategy analysis for pillar three. A detailed description of abbreviations can be found in Appendix C. Red: universal prevention, blue: selective prevention, black: not specified. Interventions placed on the axis had no clear description on which driver or intervention mechanism that was used.

The results of the technical aspects of interventions under pillar three are presented in Table 5 in appendix C. When looking at the exact formulation of these measures, 12 objectives were specific as well as timebound. In measures that specified time limits, 8 were still set in 2021, 4 in 2030 and 1 in 2040. None of the measures had follow-up goals for when initial goals were achieved. When target groups are observed in more detail, most measures are focused on individuals with obesity, children and youth, and hospitals. Fourteen projects in a healthy environment and healthcare have a total estimated budget of €13.900.000 over a three-year period. 10 parties joined together to compose this pillar, which resulted in 27 objectives to achieve these two goals. All parties were health-promoting organisations.

4.2.4 Examination of the preventive strategy and technical aspects in measures

Preventive strategy

When examining the preventive strategy used for policy interventions in the NPA, the most notable finding is that the upper-right quadrant in the visual tool remains mostly empty. Interventions placed here tend to be sustainable, affect the whole population (which includes those difficult to reach), become systemic over a longer period of time (thus affect default behaviours), and can potentially reverse environmental drivers. No interventions are aimed at the systemic drivers behind obesity, and except for four measures in pillar one, those that were targeting environmental drivers mostly used non-coercive strategies.

The intervention mechanism predominantly used in all pillars was enabling healthy choice, which provides new healthy options as alternatives to the current unhealthy options in the obesogenic environment, but still rely on the decision-making process of the individual. There are few efforts made to reduce the obesogenic environment influence by more coercive options although these measures are known to be more effective

When looking at to whom most measures are directed to, we find that all measures composed for healthy nutrition are classified as collective prevention. Measures that target individuals with overweight or that are obese specifically are neglected in this pillar, while this group has theoretically the most need for improvement. In pillar two, promoting sport and exercise, some measures do specifically focus on the inactive or people run the risk of being inactive. Here, however, there is no attention or ambition to improve time spent in sedentary occupational and leisure time. Only one measure targets the general public. Lastly, in a healthy environment and healthcare, interventions are globally divided between collective and individual prevention. However, contradictory to the pillar's name is the mundane environment of the general public is neglected here. A positive outcome is that treatment options are improved upon and made accessible for risk groups and those who already are overweight or obese.

Technical aspects

After a thorough analysis of the interventions and what is aimed to be achieved by implementing them, we find that the ambitions and goals in all pillars are translated into ambiguously defined and difficult to evaluate objectives, as only 18 interventions in the entire agreement were specific and time bound. For the majority of interventions, it remains vague what exactly wants to be accomplished or achieved, for whom, and when it needs to be done. We discussed earlier that the problem of overweight and obesity is pressing and growing, therefore it is of great importance to acting strikingly and precise.

In addition to this argument, for the NPA to be effective in the future in obesity and overweight prevention, not only is it of importance that interventions are clear and specific but it also of great significance to have a sustainable approach. Most of the measures are implemented by 2021, with some exceptions for 2030 and one in 2040. That means that in this accord between now and 2040, only a handful of extra measures will be implemented, while new and better measures should be implemented during the decades when society is

accustomed to earlier measures. This is seconded by monetary resources. Here, financial support is assured for 2019, 2020 and 2021. After that, new discussions and negotiations will have to take place.

It must be noted that, in total, that 16 measures focus specifically on children or youth. Of course, the importance of this group cannot be understated as it is our future generation and in a vulnerable position. However, as discussed in chapter 3, are risk groups for overweight and obesity the elderly population, youth with an immigrant background, a low-educational level and ex-smokers. None of 59 measures these risk groups specifically. It is true that the NPA's introductory remarks that they concentrate on pursuing health gains for those who need them the most and reducing disadvantages for those who have the highest risk of becoming overweight or obese, but it is never detailed which groups are meant. The implementation report, too, does not mention that some measures are implemented quicker in low-SES areas.

4.3 Comparison to underlying causes of obesity

4.3.1 Comparison of pillar one to the problem of nutrition

Now that this particular underlying driver of obesity has been contemplated and possible intervention options are identified, we can compare it to the strategies presented in the NPA. Pillar one, healthy nutrition, is the pillar designated to counter this problem since its goals fit the solution sketched earlier. The name of pillar 3, healthy environment and healthcare, indicates it could contribute to a healthy surrounding but 4.3.1 will show that it mainly focuses on the treatment of people with overweight.

The first strategy discussed in 4.1.2 is to induce health promotion through educating and warning the public on the benefits and harm of various diets. Here, the NPA contains various measures classified as providing information that can therefore contribute to this solution. The first is a pledge of supermarkets that they will persuade customers to buy more products in the Wheel of Five. Although it was initially not stated how this goal was going to be achieved, it became clear during evaluation moments that their advertising brochures will pay attention to the Wheel of Five and that some supermarket chains bought radio or TV commercials to promote fruit and vegetables. It is debatable how many customers look in advertising brochures, but commercials will have a far-reaching public. It is not stated, however, if this promotion was a one-time event or a constructive new media approach.

Next, the government started to inform children and adults on healthy and tasty food and drink possibilities with the promotion of the Wheel of Five through multiple media platforms in 2019. This is a great start to promote healthy behaviour, as an earlier campaign from the Nutrition Centre in 2007 slightly raised awareness and motivation to prevent weight gain (55). However, the media campaign will only last for two years thus is not a constructive solution. Moreover, it neglects to provide information on the harm of consuming unhealthy foods. Then, extra attention will be given to healthy nutrition through the Healthy Schools and Healthy Childcare programme. As today's children are tomorrow's society, this is an effective move for the long term. To summarize health promotion through education and campaigns, is there a good start but a lot of room for improvement. Currently, there is no attention to the dangers of unhealthy diets and are to strategies that specifically target people with overweight, although they can potentially benefit most in this area.

Regarding food labelling, a new front-of-pack food-choice label will be introduced to enable consumers in making conscious healthy choices, called Nutriscore as presented in Figure 7. Its design is a green A, pictured left to indicate very healthy food, and a red E pictured right to indicate very unhealthy food. It is based on the Wheel of Five and proven to be a simple yet very effective indicator to help consumers to make health-conscious food choices (56). However, presenting the Nutriscore on food packaging by the producer is currently on a voluntary basis, as the European Union does not allow its member states to implement mandatory front-of-pack labels (57). Since the research body behind this label is extensive and effective, numerous experts on nutrition call for a European-wide mandatory implementation of this label (58).



Figure 7: Nutriscore

The next possible intervention strategy is reducing initiators of hedonic hunger. Here, the NPA has five measures that restrict choice and thereby reduce these triggers. Two measures restrict direct familiar cartoon placement on food advertisements aimed at children. Previous research recognizes that familiar media character branding has a powerful influence on children's food preferences, choices and intake, especially for energy-dense and nutrient-poor foods (59). Although this a step in the right direction, food marketers are increasingly using sophisticated digital marketing techniques to target youth across a host of platforms, including cell phones, video games, social media, and immersive “virtual worlds” (60). The NPA currently contains no goals or ambitions to regulate this area of advertisements.

Next, the product composition of foods that make a relatively large contribution to energy intake (sugary soft drinks, biscuits and sweets and sugary dairy products) will be improved to reduce the calorie content. This is a great step forward and can only be encouraged. However, sugary drinks pledge to reduce calories sold instead of cutting sugar and proposed that they can also achieve this reduction through increased selling of diet products, portion size decrease or innovation, all of which are shallow ways of achieving the set goal (61). Diet sodas, however, are also associated with adverse health outcomes (62). The remaining two interventions restricting choice target sports events from the NOC*NSF and encourage caterers to serve smaller portion sizes, both of which are steps in the right direction. However, since sports events are occasional and encouragement without incentives is relatively easy to ignore, the expected effect is debatable.

Lastly, the 6.6 million euros allocated are split between interventions to targeted at the youth, promotion of the Wheel of Five and research or development. Although the budget is a marginal amount, it does focus on important target groups.

4.3.2 Comparison of pillar two to the problem of reduced energy expenditure

As the name of pillar two suggests, is this pillar destined to increase energy expenditure in the Netherlands. However, its only goal is that 75% of the residents of the Netherlands exercise according to the Dutch Exercise Guidelines in 2040. To successfully comply with the guidelines, adults have to engage in physical activity of moderate intensity for at least 150 minutes every week and do muscles and bones strengthening exercise at least twice a week, for children these numbers are one hour per day and three times per week, respectively (63). Although the guide does mention to avoid long periods of sitting down, there are no limits placed to comply to. However, as shown in 4.1.3, the Netherlands can improve when it comes to lowering sedentary time, but the NPA contains no measures to discourage it. Moreover, research suggests that reduction of sedentary behaviour is not an inevitable consequence of effective activity-promotion interventions, it is therefore important to treat sedentary behaviour as independent from psychical activity (64). To complete approach the problem of decreased energy expenditure causing obesity, the NPA could not only have the ambition to increase activity but also decrease time spent in a passive manner.

At first sight, it stands out that pillar two is the smallest out of the three pillars, containing 7 interventions. Only one measure promotes exercise and healthy behaviour. Here, the Working in Motion encourages employees and employers to go to and from work more actively. Although important and a good initial step, it remains unclear how many employers or employees will be or are wanted to be reached during this promotion. There are no government-regulated, health-promoting media campaigns that focus on the benefits of exercise, try to increase overall activity, or warn of the adverse effects of an inactive lifestyle.

Although it prioritises children above adults, only one intervention is directed at the general population. It wants to create healthy and safe neighbourhoods so that everyone can lead a healthy life and to especially enable children to cycle and walk safely to school. It is not stated this ambition is to be fulfilled, and although it is important to be able to cycle safely, the Netherlands is among the lowest countries in the world concerning cycle accidents per kilometre (65). The expected usefulness of this measure therefore debatable.

The remaining 5 measures are more concentrated on subgroups of people. One measure agreed to train sports coaches for people with intellectual disabilities, one measure complied to improve motor skills in all children and one in children with motor disorders. These measures can be classified as enabling choice, two of which in, although small, vulnerable groups. Lastly, one measure actively focuses on the inactive population, and one focuses on the inactive population who run the risk of being or already are overweight. Here, more easy access sporting facilities will be made available that are suitable for people unfamiliar with exercise. This form of selective and indicated prevention offer help these groups to participate in an active lifestyle.

Lastly, 6.5 million euros were allocated for pillar two. However, almost the whole budget is meant to improve mobility in children. Although not useless, it is debatable why little to no money has been freed up to improve exercise in the general society.

4.3.3 Comparison of pillar three to obesity treatment and the obesogenic environment

Regarding the strategies presented in pillar three to create a healthy environment, two measures focus on the surrounding of the general population. In the first, municipalities are encouraged to make local or regional agreements that include the approach to obesity. It remains unclear what is meant with encouragement or what will be done to realize an environment that promotes health. The other measure complied to making 12 healthy neighbourhoods in the Netherlands, serving as an example for the others. But this country counts over 12.000 different neighbourhoods, therefore the expected effect of this measure is debatable (66). Remarkably, no other intervention in this pillar targets the daily environment of society or remove or restrict unhealthy choices people are daily exposed to.

However, 6 interventions create a healthy environment for the youth. 2 Interventions target creating a healthy school environment, where children spend most of their week, through efforts of Gezonde School. BMI in children goes down in municipalities that run the Jongeren op Gezond Gewicht (JOGG) program, so this program is intensified in two interventions, one of which abroad to the islands of Bonaire, Sint Eustatius, and Saba. One intervention targets the youngest children still in day-care and one to breast-fed babies. This complete approach to the environment of children is noteworthy and encouraging.

When we look at the strategies presented in this pillar with regards to the treatment of overweight and obesity, we find that three interventions focus on developing, implementing, and increasing accessibility of the comprehensive chain approach for children and adults with overweight in all municipalities. Two other measures improve decision-making through developing a toolkit that includes best practices of CLI. As explained above, is this multifactorial approach an effective way of treating various stages of overweight and it is good that there is so much focus on this. Awareness of the possibility of CLI could be improved, however, as in April of 2020, only 7062 individuals participated in the program (67).

Next, four interventions target the healthcare system and healthcare professionals. Here, education on the problem of obesity, its related treatment, underlying causes are emphasized upon, and that after a diagnosis with obesity people with more actively referred to primary care and social services, so that doctors and other professionals are more deployable against obesity.

The remaining measures had a broader variety of attention: one was from the eight Sports Colleges in the Netherlands who promised to fulfil the ambition to reduce obesity, although it was not stated how. One will help children with disabilities in special education by providing an effective intervention and one will increase the number of social workers.

Lastly, pillar three has a budget of 13.9 million euros, more than the other pillars combined. The financial resources are divided between interventions for youth, the development and implementation of the comprehensive chain approach, and attention to overweight and obesity in healthcare professionals. Although the budget is a minuscule amount when compared to the total costs, it does reflect important causes. However, no financial resources are allocated for creating a healthy environment for the general society.

4.3.4 Additional measures

The RIVM was commissioned by the VWS to examine what additional measures are necessary to further reduce overweight and obesity, as the quick scan performed in 2018 by the RIVM already concluded that the current interventions would not be sufficient to achieve the set targets (12). The report was published on the 6th of April 2021, in which the RIVM gave recommendations for improvement for measures currently in the NPA and developed an inventory of additional measures that will most likely have a positive impact on overweight, based on a literature review (68). These measures were then graded by 27 experts on overweight to select a top 10 of additional measures that could improve the NPA. In general, the RIVM stressed the importance of measurable goals to improve monitoring and evaluation. It also acknowledges the significance of having sufficient financial resources, not only for implementation but also for long-term initiatives. Lastly, the RIVM underlined that the responsibility of solving the obesity problem lies more with the (food) industry than with its customers. The complete analysis of the additional measures one can be found under Appendix D.

In total, the RIVM gave recommendations for further improvement in 11 measures in the agreement, 8 interventions in pillar one, 1 in pillar two, and 2 in pillar three. Most recommendations can be interpreted as expanding the measure to a broader area of impact, to reach more people or make intervention stricter. It also included advice to make goals more specific or practical recommendations during implementation.

The top 10 recommendations for additional measures were compared to the framework used for regular measures in the NPA as presented in Figure 8, various themes stood out. First, 9 of these 10 interventions are classified as universal prevention. But more importantly, interventions mostly target systemic or environmental drivers of obesity and the mechanisms used in this top 10 are more coercive than the mechanism used in the original agreement.

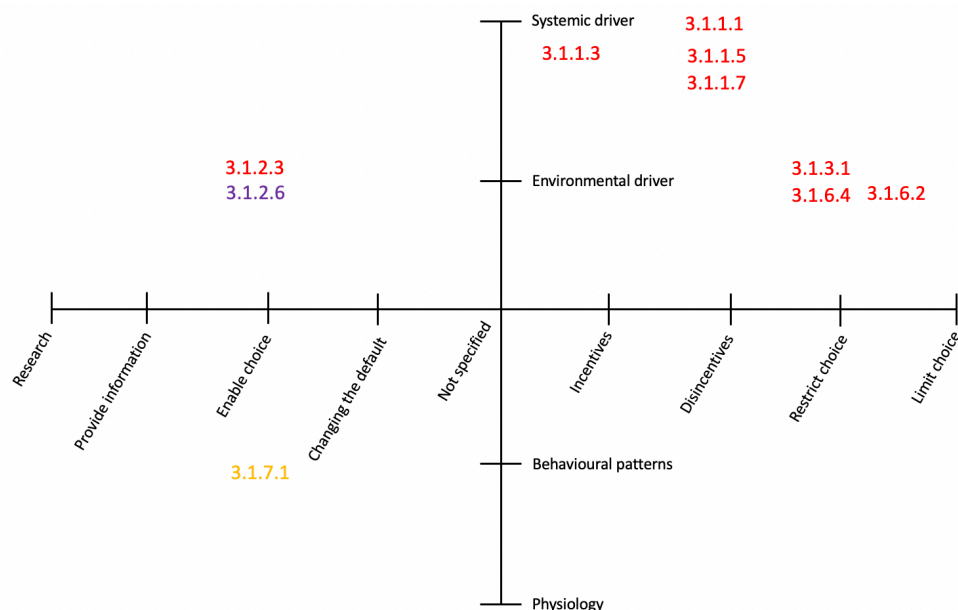


Figure 10: preventive strategy analysis for the additional measures. A detailed description of abbreviations can be found in Appendix D. Red: universal prevention, blue: selective prevention, black: not specified.

Four measures stress the importance of financial incentives or disincentives in food prices. An extra tax for sugary beverages or tax benefits for vegetables or fruits, for example, are not proposed in the NPA but price does influence the choices people make in their consumption behaviour (69). Four measures eliminate or restrict unhealthy choices, such as restricting the number of sales points of fast-food restaurants or restricting the advertisements of products outside the Wheel of Five the RIVM. Thus, the literature review and experts on obesity also emphasize the conclusion that not only do we need to enable healthy choices, but the systemic and environmental drivers of overweight and obesity also itself needs to be restricted. The remaining two measures focus on enabling healthy choices. Interestingly, new interventions are predominantly additions to pillar 1 one, healthy nutrition (72.7%). Since these proposed interventions are recommendations, they are not formulated as specific and timebound goals for implementation.

4.4 Areas for improvement in the NPA

Up to here, missing strategies in the NPA have been identified based on the mismatch between the key-points that drive obesity and the interventions presented to counteract them. In this paragraph, recommendations for these missing strategies will be presented, based on literature and advice from the additional measures published by the RIVM.

4.4.1 Fiscal measures to (dis)incentive choice

We concluded that the NPA contains no financial measures to incentivise healthy choice or disincentivise unhealthy ones, although food prices vastly influence consumer choice and changing food price through policies is an effective way of guiding behaviour (57,69). Moreover, taxation of unhealthy foods is extremely cost-effective thus raise revenue for the government, which can be reinvested in other health-promoting activities (69).

An intervention growing in popularity and proposed in the additional measures is the sugar-sweetened beverage tax, which includes any drinks with caloric sweeteners. In the Netherlands, the average consumption of these beverages is 292 grams per day, especially popular among adolescent (70). Its adverse health effects are evident, as consumption increases the risk of weight gain, cardiovascular disease, and type 2 diabetes. Worldwide, 39 countries have already implemented some form of this legislation, of which 10 European countries (70). Although there are many variants of implementing this tax, experts advise taxing grams of sugar per drink and not the amount of liquid, because it is the sugar that causes harm (71). Benefits of scaling the tax to the amount of sugar a drink contains include a decrease in consumption and manufacturers are stimulated to lower the amount of sugar to avoid the tax, making the offer healthier. Evidence of the former suggests that a 10% increase in tax was related to a 10% decrease in consumption and purchases of these beverages (72). An example of the latter is found in the United Kingdom, which in 2018 implemented a sugar-sweetened beverage tax and found that 50% of available soft drinks had their sugar content reduced (73).

Another form of financial disincentives can be found in Denmark, which in 2011 implemented a fat tax, a fiscal measure of €2.15 per kg of saturated fat, with the taxable base including all foods containing saturated fat. Over a one-year period, it was estimated that this intervention raised around 134 million euros, the short-term consumption of some included products dropped by 10% to 15%, and that portion sizes of some products like chocolate and butter decreased. However, one year after implementation, the tax was abandoned due to industry associations that claimed the intervention negatively affected the economy in general and the labour market (74). However, to date, no academic evidence has been released to validate these points. It remains therefore interesting to investigate the potential for this measure.

Implementing food-related taxes have a greater financial burden on low-income consumers because they spend a larger share of their income on food (75). The impact is, therefore, greater on low socio-economic groups and since they have poorer health, can thus improve health inequalities. However, care needs to be taken not to increase socio-economic differences themselves. This increased financial burden can be partially covered, however, by accompanying tax reductions for healthy foods like fruits and vegetables. A social cost-benefit

analysis of fruit and vegetable subsidy specifically for the Netherlands estimated that a 10% subsidy could lead to a net benefit to society of €1800–3300 million (76). Although there is little evidence on countries that have implemented a nation-wide tax reduction for fruit and vegetables, one randomized controlled trial in the Netherlands concluded that it resulted in substantially higher purchases for these respective products in supermarkets for 6 months, especially when combined with an educational program on the benefits (77).

Given the evident effectiveness of the sugar-sweetened beverage tax and the potential of other forms of taxation, it is vital that the Netherlands will implement the former and investigate the possibility of other price policies.

4.4.2 Health warnings for junk food

The beginning of this chapter showed the similarities between the problem of smoking in the previous century and the current problem of obesity, and how we should apply the valuable lessons from that era to make effective obesity legislation. Besides price policy interventions, front-of-pack warning labels on cigarette containers were an effective measure for educating consumers about the health risks of tobacco (78). Currently, there is no country that has implemented nationwide similar measures on food. However, this new strategy is gaining awareness and recently Canadian doctors urged their government to implement warning labels on junk food, that is energy-dense food with little to no nutritional value, illustrating the toll obesity takes on the body (79). Lessons from tobacco warning labels can be applied to sugary beverages to make these labels more effective. Based on empirical evidence, warning labels should cover no less than 30% of the primary display area of the package, should be rotated frequently to keep them novel and should appear on the package and on advertisements (78).

Although evidence is limited, there are some experimental studies that point to a positive effect. In the United Kingdom, an online survey was performed to investigate consumer behaviour to various labelling scenarios and compared them to current products without health warnings (80). They found that energy-dense snack selection decreased the most in image and text warnings. Next, one study researched to what extent warning labels influence adolescents' beliefs and hypothetical choices regarding junk food (81). Here, fewer adolescents chose sugar-sweetened beverages when confronted with choice and believed that sugar-sweetened beverages were less likely to help them lead a healthy life.

Although the evidence is still limited and more research is needed on public acceptability and adverse effects of this measure, its potential should not be overlooked and investigated upon.

4.4.3 Strategies to decrease sedentary behaviour

Currently, the NPA and, strikingly, the additional measures recommended by the RIVM contain little to no strategies to reduce sedentary time, although it is a driver of overweight and obesity. Current evidence shows that the most effective interventions focus primarily on reducing sedentary behaviour, rather than physical activity (64). Specifically, interventions based on environmental restructuring to maximise opportunities to spend time more actively, persuasion of spending time actively, or education on the adverse effects of sitting are effective strategies to reduce sedentary time (64). Multiple systematic reviews find that the greatest reduction in sitting time can be addressed to environmental interventions (82).

The first strategy being discussed here, however, is mass media campaigns. Research on this intervention is inconclusive: one meta-analysis of studies based in OECD countries found indications of the promotion of walking but no significant reductions in sedentary behaviour. Campaigns that promoted physical activity as a 'social norm', however, seemed to be more effective in reducing sedentary behaviour (83).

Next, as explained at the beginning of this chapter, the occupational time has increased in the Netherlands over the past 30 years and, due to rapid technological advances and computerized tasks, is mostly performed in a passive manner. Apparent interventions would therefore be to decrease occupational time in employees or modify the labour system to alternate office jobs with physical labour. Although simple in theory, to realize this a radical transformation of our economic system is required. One possibility that could achieve this transformation be found in universal basic income, which is an unconditional income granted to each citizen, also proposed in the additional measures by the RIVM. Experimental studies indicate that universal basic income can decrease childhood obesity, close healthy inequities and increase parttime work (84,85). However, there too many consequences, adverse effects, and other benefits associated with this intervention to properly elaborate on in this section, more research is needed to give a realistic estimation of implementation.

A more pragmatic view on the short term would be to investigate how inactivity can be decreased during occupational time. One systematic review of 26 studies based on reducing sitting time in the workplace showed that a multi-component approach, composed of installation of sit-stand workstations and educational programs, resulted in a 1.5-hour decrease of sitting down during an 8-hour workday (86).

Regarding sedentary time in non-occupational time in adults, there is less research available. One systematic review based on 19 studies found that interventions could reduce sitting time during leisure time by 30 minutes per day, but only for the short term (87). The studies were of low quality, however, and no reductions were found in transport time, leisure-time computer use or longer-term outcomes. There is a need for new high-quality research investigating how to reduce sitting leisure time.

Lastly, research shows that interventions aimed to reduce sedentary time in children are mainly carried out within schools, due to ease of access to the target population and because a large proportion of their weekdays is spent there (82). Multicomponent interventions, incorporating both behavioural and environmental components, resulted in a reduction in

sitting time during school days (82). However, these effects were not translated into out-of-school activity and leisure time.

In conclusion, environmental changes that maximise opportunities to spend time more actively are the optimal approach to reduce sedentary behaviour, especially in combination with education and persuasion. The possibility of radical transformation of our labour market must be investigated. One of the simplest yet effective is to promote the use of sit-stand workstations in office workers, it is therefore advisable for the government to investigate if it can subsidize these workstations to promote an active work style. More research needs to be done on how to reduce sedentary behaviour in leisure time.

4.4.4 Mass media campaigns

The NPA currently contains one mass media campaign on the promotion of the Wheel of Five but lacks a likewise intervention for exercise. However, mass media campaigns are gathered under the most effective measures by the OECD, since they have the potential to reach many people (7). It is important to include traditional media, like newspaper or television, as well as new media like social media or online marketing. In contrast to non-effective media campaigns to reduce sedentary behaviour, mass media campaigns that promote activity are shown to be effective, as for example, in Italy, where it results in a 60% increase in the number of people who are considered at least moderately active after one month of implementation. It is therefore important that the governments consider starting a media campaign on promoting exercise, and repeats it for longer than two years, which also counts for the promotion of the Wheel of Five.

4.4.5 Creating a healthy environment

Lastly, we found that no measures under pillar three targeted the general environment of society. As explained, the number of fast-food outlets has increased over the past years. To stop the accessibility to consume unhealthy food these outlets should be restricted. The additional measures give a valuable recommendation to reduce the number of fast-food outlets within a municipality and to give its government the option to ban new fast-food outlets from entering it. Moreover, the recommendations also suggest putting a ban on vending machines in public places such as (high) schools, universities, and hospitals. Both interventions can be seen as paternalistic, undermining the ethical principle of autonomy. This ethical principle clashes with the principle of beneficence, as seen from the governments perspective. However, as explained in chapter 2.5, paternalistic policies can be ethically justifiable, even though they violate autonomy since they respect the individual by helping to accomplish staying healthy.

Although the earlier mentioned interventions influencing lifestyles are important, they may not be sufficient if the local environment presents limited opportunities to engage in healthy lifestyles. The additional measures as proposed by the RIVM claim that the NPA has planned to realize healthy environments, and although it is true that two measures mention it, one only affects 12 neighbourhoods, and the other one has no concrete points of action on how to realize it. The former should be intensified so that it can help the other 12.000 living areas and the latter be more specific on how it should be realized. Regarding the latter, clarification can

be found in a large number of studies that have shown positive effects of different aspects of the built environment on population-based physical activity behaviour (88).

The following are recommended in particular (88):

- 1: Geographical proximity land use mix and connectivity of residential, commercial, and school/work zones;
- 2: Traffic-calmed, safe and aesthetically appealing zones in the residential environment;
- 3: Sports and leisure facilities and parks near home and accessible for the whole population;
- 4: An infrastructure of cycling and walking paths that is as extensive as possible.

However, actions to modify the urban setting are even more difficult to identify and review in a systematic fashion as many of the relevant interventions in this category fall under the responsibility of local administration, rather than the national government.

CHAPTER 5: CONCLUSION

What are the underlying causes of the increase of (severe) overweight seen in The Netherlands over the past decades and how can these drivers be countered?

At the core of the overweight and obesity problem lies the mismatch between the design of the human body and the obesogenic environment. Our bodies, evolved in a world of food-scarcity and nature's trying circumstances, treat nutrition like a scarce good. For this reason, sensory factors of food overrule control mechanisms in the brain, as in nature high palatability and energy-dense foods are rare. In addition, humans historically had to perform hard physical labour to survive. In the current obesogenic environment, food is overabundant, easily accessible, calory-dense, and overwhelmingly appetizing, resulting in increased energy intake. Labour-saving technologies made it possible to live a sedentary lifestyle, leading to decreased energy expenditure. This disturbance in the energy equilibrium gradually leads to overweight.

Regarding increased energy intake through nutrition, we saw that energy intake increased over the past five decades (7). The average Dutch diet contains low-protein and high sugar levels, which do not induce a sense of satiety, leading to overeating. When compared to the rest of Europe, the Netherlands consume relatively more unhealthy foods and less healthy foods (7). Energy-dense foods with low nutritional value are cheaper than nutrient-dense foods, which makes them more appealing for constricted budgets (36). Moreover, in the Netherlands there is an increase in convenience and ready-to-eat foods accompanied by a decrease of local food shops over the past 14 years, making unhealthy food more readily available, especially in low-socioeconomic areas (39).

Like smoking in the previous century, energy-dense foods with low-nutritional value are heavily advertised, readily available, cheap, and trigger the dopamine reward mechanisms. It is for these reasons we can apply the lessons learned from this era, including educational programs, health warnings, mass-media campaigns, price increases through taxation, or restricting possibilities to consume or buy unhealthy foods.

Concerning decreased energy expenditure, we find that currently only 49% of the Dutch population met physical activity guidelines, although this number has been increasing over the past two decades. More importantly, the sedentary time has increased over the past decades. Currently, the Netherlands has the highest percentage of people sitting more than 7.5 hours per day. Most leisure time is spent in a sedentary manner.

The government can promote energy expenditure through the promotion of exercise and healthy behaviour, educate people on the health benefits of an active lifestyle, and warn about the adverse effects of being inactive. However, where people almost always are free in choosing their diets, most people are not always free in choosing how to perform their work. It is for this reason creative possibilities must be sought to incorporate activity in the mundane tasks individuals face in everyday life.

Lastly, in individual prevention, a complex interplay of multiple social, psychological, and biological factors play a role in overweight. These factors are often overlooked by GP's and other healthcare professionals. Various positive feedback loops accelerate the condition,

while the control mechanism, normally sufficient to prevent weight gain in lean individuals, is insufficient in individuals with overweight. Here, adequate diagnostics prior to treatment and a multifactorial approach is needed to properly help individuals with overweight. The comprehensive chain approach, a form of individual prevention, integrates the medical domain with the social domain. Different treatment options can be offered to varying risk groups, among them are lifestyle advice, a combined lifestyle intervention, medication, or bariatric surgery.

Does the emphasis and expenditure put on the strategies currently used in the NPA reflect these underlying causes?

The pillars forming the NPA, healthy nutrition, more sports, and environment and healthcare, do reflect the underlying causes of overweight and obesity as explained above. The set goals for 2040 are ambitious and if realized, will successfully aid in the battle against overweight and obesity. They emphasise the multifactorial approach needed to successfully curb the growing prevalence of obesity. To improve clarity, it would be better to split pillar three, environment and healthcare, into separate pillars, one focusing on the environment and one on the treatment of individuals with obesity.

Regarding the preventive strategy used for public health interventions in the NPA, the accord fails to implement coercive interventions that target systemic drivers of overweight and obesity. Although more politically difficult to implement, these measures the greatest potential for improving the current situation. Most measures are focused on environmental drivers or behavioural patterns and use non-coercive mechanisms.

Upon closer examination of the technical aspects, we find that the ambitions and goals in all pillars are translated into ambiguously defined and difficult to evaluate objectives, thus it remains vague what exactly wants to be accomplished or achieved, for whom, and when. The NPA's budget of 27 million euros is a drop in the ocean when compared to the burden obesity has on society. Most measures will go into effect within 5 years after the NPA's start, without follow-up goals, although it would be better to gradually intensify measures over the decades when society is accustomed to earlier interventions. None of the measures are focused on obesity in the elderly population, youth with an immigrant background, a low-educational level and ex-smokers, which are all risk groups for overweight. Children and youth, however, are targeted extensively, from the environment to restriction in media.

On critical exploration of pillar one, we find a mismatch between the core problem of overweight and the mechanism most used in interventions. On the one hand, are the physical and physiological drivers inherent in human biology predisposing us to prefer energy-dense, low nutritional food. On the other hand, is the most used intervention mechanism to enable healthy choice. Although increasing the opportunities to eat and live healthily are incredibly important steps needed to be taken to realize change, the overabundance of opportunities to eat unhealthy food need to be restricted and disincentivised as well. Coercive measures that aim to reverse the drivers of obesity can be effective tools in the battle against overweight, and the fact that these are missing can, at least partially, be addressed to the fact that lobbies from the food industry had the opportunity to influence the negotiations. They actively antagonized implementing fiscal measures and made sure that their own initiatives were the

starting points for interventions. Measures that target children, however, are more coercive, banning familiar cartoon placement on front-of-pack labels, for example.

When examining pillar two, we find that there are no ambitions nor interventions that target the increasing amount of time we spent sedentary, although it is an important contributor to overweight. Furthermore, this pillar contains a small number of measures to realize the set ambition, most of which are focused on children and youth. Although these vulnerable groups are important and should not be overlooked, more attention needs to be paid to universal prevention interventions to increase activity and decrease sedentary time.

Upon close inspection of pillar three, we find that, although the pillar is called environment, little measures effectively improve the general environment of society. On a positive note, a lot of attention is being paid to schools and the everyday environment of children. The implementation and development of the comprehensive chain approach in combination with the attention now being paid to overweight among healthcare professionals is progress to realize an environment where overweight can be treated properly.

Lastly, the RIVM published a report with recommendations for further improvement of current measures and additional new measures to better the NPA. Most notable was that the top 10 suggested interventions targeted mostly systemic and environmental drivers, were more coercive, and are predominantly additions for pillar one.

Based on the gaps between the drivers behind (severe) overweight and the measures in the National Preventive Agreement, what interventions are still missing and what is the evidence of their effectiveness?

This thesis showed that the NPA is mostly focused on enabling healthy options to people, which relies on their own individual responsibility to resolve the obesity problem. However, this responsibility should also be placed on corporate industries, since the human body cannot compete with the temptations society poses. Furthermore, as both the evidence for financial incentives or disincentives of food products and the RIVM show that these measures are (cost)effective, the Netherlands should implement a sugar tax. These measures are extra effective in low socioeconomic area, which can decrease the health gap between high and low. To not increase the financial gap, a subsidy should be given to make healthy foods cheaper. Further research should be done on the potential of other financial disincentives, like the fat tax.

Like smoking, people should be warned off of the adverse effects that energy-dense, low nutritional value food has on their body. Although the evidence is limited, the potential of these warnings should be explored and experimented with.

Evidence shows that maximising opportunities, persuasion, and education can reduce sedentary time. Increasing opportunities to decrease sedentary have shown to be effective in office jobs, especially when combined with educational programs. The government should investigate if subsidies can be given to realize sit-standing workstations to promote activity. More research needs to be done on how to decrease sedentary behaviour in leisure time.

Since mass media campaigns are effective tools to create awareness for healthy living, these programs should be intensified and repeated for longer than two years, for both nutrition and activity.

More emphasis needs to be placed on creating a healthy environment. Here, the RIVM suggest reducing the number of fast-food outlets within a municipality, enable its government to ban new fast-food outlets from entering it, and putting a ban on vending machines in public places such as schools, universities and hospitals are effective ways for creating a healthy environment. Moreover, recommendations are given to clarify how to create a healthy mundane environment that motivates people to be more active.

[Is the National Preventive Agreement the optimal approach to decrease the prevalence and incidence of overweight and obesity in The Netherlands?](#)

People in the Netherlands today don't have less willpower nor are more gluttonous than previous generations. Their biology and psychology are not significantly different to that of their ancestors. Society, however, has radically altered over the past decades, with major changes in the contents we consume, the way we work, and the design of our communities.

Although important steps have been taken in the NPA to provide healthy alternatives to battle the obesogenic environment in collective prevention, it is currently not the optimal approach to realize its' ambitious goals. The presented preventive strategy neglects systemic drivers of overweight and obesity. Most proposed interventions were based on non-coercive mechanisms that rely on the individual to make the healthy choice, whereas more coercive yet effective measures that can prevent the choice altogether, are absent. This call for more far-reaching interventions is supported by a report published by the RIVM and experts on overweight. In individual prevention, strategies such as the implementation of the comprehensive chain approach and attention to (severe) overweight in healthcare professionals do reflect the underlying causes.

There is no sole or distinct solution to a complex problem like that of overweight and obesity. Decades of gradual change resulted in an obesogenic environment and people adapted to the status quo. The burden overweight and obesity have on the well-being of the individual and society in general demand for more radical change to transform society into a health-promoting environment.

CHAPTER 6: DISCUSSION

6.1 Discussion

One of the main findings of this thesis is that the mechanism used for preventive interventions in the NPA are non-coercive: they mostly provide healthy alternatives in situations where there previously were none. As discussed, these are important steps for creating a healthy environment, but in the end, the final decision remains the responsibility of the individual. This raises the question “who is responsible for health?”. The individual or the government? The current agreement implies that the responsibility lies with the individual, and that merely offering healthy alternatives will allow them to make the right decision. In essence, this reflects that the ethical principle of respecting autonomy is still the superior value when it comes to policymaking. This could be due to 10 years of government led by a liberal party. However, this thesis has also shown that the problems the individual and society face in the battle against overweight and obesity reach farther than the decision-making process within the individual. Many ‘decisions’ are in fact heavily constrained: either by budget, the environmental factors, biology and numerous other variables. It is therefore too simplistic to solely focus on enabling healthy choice and hope that the individual makes the right decision. This is not to say the government can restrict freedom and autonomy unnecessarily, but it has the responsibility to create an environment where people have a fair chance of leading a healthy life.

Next, it is interesting to compare interventions targeting children to those targeting adults. Out of the four interventions in pillar one that target environmental drivers and used more coercive intervention mechanisms, two were aimed at children. In addition, most interventions under pillar two were targeting children and in pillar three, little to no collective prevention interventions aimed to improve the daily environment for the general public, although it has a lot of various measures to improve the one of children. This is partly because children are more susceptible to external influences and have limited control to make genuine choices (21). Apparently, in children, using more coercive intervention mechanisms and targeting environmental drivers is ethically justifiable, since the ethical principle of autonomy is restricted and is predominated by the ethical principle of beneficence.

In addition, this thesis showed that there is little to no attention for the increase of time spent sedentary. There are no ambitions or goals regarding this topic in the NPA, and the additional measures as proposed by the RIVM show little efforts as well. I have recommended starting points for new interventions to tackle this driver of obesity, but also showed that research on this area is limited and still in its initial stages. The primary issue is that it seems, from a governmental perspective, the time we spent sedentary is fixed and nothing can be done to improve it, or that our society has simply become dependent on this organisation. I have no clear answer on why this is the case.

Then, 27 million euros have been allocated to the NPA for a three-year period in total. The total direct and indirect costs of overweight and obesity are estimated to be 2.5 billion euros per year. The allocated budget is a marginal amount when compared to the total burden of overweight and obesity. Although effective obesity prevention may lead to raised healthcare expenditure due to prolonged lifespan, it has the potential to decrease the productivity loss

associated with it. It is worth wondering why so little money has been allocated to a problem of this scale.

Lastly, a report published by Follow the Money revealed that lobbies from the food producers, supermarkets, hospitality, and caterer sector actively antagonized the inclusion of effective interventions against obesity (89). Via the Freedom of Information Act, documents recorded during the construction of the NPA were brought to public which exposed that in initial stages of the NPA more coercive measures like tax measures were included in the first draft (90). However, these were then vetoed by the respective lobbies.

The Follow the Money report explained that a letter from the corporate industry lobby, VNO-NCW, addressed to the inquirer during the government formation in 2017, proposed the idea of a national preventive agreement signed by with business and social partners, health care and welfare, health insurers, patient organizations, educational institutions, municipalities and more (89). This proposal was then almost literally adopted in the coalition agreement of 2017, which established the birth of the NPA (91). At first sight, it seems that the corporate industry wrote the letter without personal gain in mind since they initiated the agreement. However, since the NPA now had to be mutually agreed upon by all parties involved, the business lobby could actively oppose effective measures against obesity. This is not the first time lobbies from the food industry antagonized effective overweight and obesity preventive legislation. In the Covenant Overweight and Health Weight, too, these lobbies had influence (92).

When we compare strategies in the NPA against obesity to the strategies presented against smoking, a notable difference is that the latter measures are more coercive and tackle systemic drivers: multiple compulsory smoke-free areas, advertisement will no longer be permitted and packaging for tobacco products must have a neutral dark-green, brown colour instead of their own designs, and the prices of a pack of cigarettes increased from 7 to 10 euros in 2023 (11). In contrast to the construction of interventions against obesity, it is forbidden for smoking lobbies to influence policy regarding smoking (93).

Like the approach used in smoking, it is of great importance to make policy against overweight without the influence of food industry lobbies. René Héman, chairman of the KNMG, wrote a letter to the new inquirers of the government formation in 2021 in which he stressed the importance of legally binding ambitions against overweight, similar to the climate legislation in the Netherlands have (94). He advises setting new specific, long-term goals for 2040 that domain transcending, influencing all aspects of society.

It is important to note that the most important goal of businesses is to increase profits, and not to increase public health. They should therefore have no place in making preventive legislation. Since the problem of overweight is so urgent and the influence of food industry evident, this construction is vital for realizing a curb in overweight prevalence.

6.2 Limitations

The first limitation of this study is due to the fact most goals are ambiguously defined. This has limited proper classification of the proposed interventions. The implementation reports could clarify some uncertainties later on.

Next, sub questions needed to be rewritten after the publication of the additional measures by the RIVM. In the original thesis proposal, I had planned to investigate effective measures used in other countries to prevent obesity. However, this was already done by the RIVM. I resolved this problem by analysing the additional measures as well and used it, in combination with a literature search, to fill in the gaps the NPA was still missing.

Due to the COVID-19 pandemic, radical measures were needed to limit further transmission of the virus, which lead to an overall increase in weight (95). The effects of the lockdown on the implementation and the effectiveness of measures in NPA has not been investigated yet, but it most likely negatively affected measures. For example, in sports and exercise, which are performed outdoors, and the healthy school program, since schools were closed. It is for these reasons even more important to consistently evaluate and improve the NPA.

Furthermore, one limitation of this research is that the quality of life was not considered. Although it is known that overweight and obesity itself negatively impact this factor, the effect of current interventions is unknown. Without this, a cost-effectiveness analysis is not feasible.

Lastly, as no country has yet succeeded in curbing the obesity trend, it remains hard to propose realistic interventions that can realize change but do not have an intolerable effect on society. A lot of research is descriptive, as it is impossible to make randomized controlled with entire societies. This makes the causation harder to investigate. The problem of obesity and the corresponding solutions are so complex, a new thesis could be written about each paragraph.

6.3 Link to scientific literature

As explained in in the introduction, to this date has no country successfully curbed the increasing prevalence of overweight and obesity. This thesis has shown that the preventive strategy used for the NPA neglects coercive measures that aim to reverse systemic drivers. This finding, although in a Dutch context, is applicable to other nations as well, since the drivers of overweight in the Netherlands are plaguing other countries too (7). Preventive strategies fail to address the obesogenic environment that has been gradually created over the past decades. This can partially be addressed to the fact of high political difficulty when implemented these coercive measures. Leaders during elections in democratic countries do not make themselves popular when promoting to reduce freedom in order to improve the current situation.

6.4 Recommendations for future practice

Throughout the results and conclusion section of this thesis, various concrete points for improvement have been given. In short, I recommend for future practice to make the minister of Health responsible for a concrete goal in the distant future. This goal should be legally binding, similar to the climate accord. Goals and interventions must be formulated precisely and are timebound. Business representatives have no place at the table for negotiation. Moreover, interventions must aim to reverse the drivers of obesity as explained earlier in this thesis, and the use of more coercive measures to achieve this is highly advisable. Lastly, it is important to have a policy that is resilient for future challenges. Therefore, interventions should have follow-up goals that gradually become more coercive once society becomes accustomed to the initial stages.

6.5 Recommendations for research

Various recommendations for research have been given in this research. Above all, I want to highlight the importance of creating political support for implementing more coercive public health strategies that target systemic drivers of overweight and obesity. More research is needed on how to decrease sedentary behaviour during occupational and leisure time and on how to radically change society towards a more general active lifestyle. Furthermore, I recommend the use of warning labels on junk food. As proven to be effective during the smoking campaign, the value of warning labels on low nutritional, energy-dense foods can be an effective tool to improve health. Lastly, new research should investigate what impact the interventions have on the quality of life of people.

Literature

- 1) *Defining Adult Overweight & Obesity | Overweight & Obesity | CDC.* (n.d.). Retrieved June 21, 2021, from <https://www.cdc.gov/obesity/adult/defining.html>
- 2) Nuttall, F. Q. (2015). Body mass index: Obesity, BMI, and health: A critical review. In *Nutrition Today* (Vol. 50, Issue 3, pp. 117–128). Lippincott Williams and Wilkins. <https://doi.org/10.1097/NT.0000000000000092>
- 3) Obesity. (n.d.). Retrieved June 21, 2021, from https://www.who.int/health-topics/obesity#tab=tab_2
- 4) Popkin, B. M., Du, S., Green, W. D., Beck, M. A., Algaith, T., Herbst, C. H., Alsukait, R. F., Alluhidan, M., Alazemi, N., & Shekar, M. (2020). Individuals with obesity and COVID-19: A global perspective on the epidemiology and biological relationships. *Obesity Reviews*, 21(11), e13128. <https://doi.org/10.1111/obr.13128>
- 5) Lee, H., Lee, I. S., & Choue, R. (2013). Obesity, inflammation and diet. In *Pediatric Gastroenterology, Hepatology and Nutrition* (Vol. 16, Issue 3, pp. 143–152). Korean Society of Pediatric Gastroenterology, Hepatology and Nutrition. <https://doi.org/10.5223/pghn.2013.16.3.143>
- 6) Dee, A., Kearns, K., O'Neill, C., Sharp, L., Staines, A., O'Dwyer, V., Fitzgerald, S., & Perry, I. J. (2014). The direct and indirect costs of both overweight and obesity: A systematic review. *BMC Research Notes*, 7(1), 242. <https://doi.org/10.1186/1756-0500-7-242>
- 7) *The Heavy Burden of Obesity : The Economics of Prevention | OECD iLibrary.* (n.d.). Retrieved June 21, 2021, from <https://www-oecd-ilibrary.org.eur.idm.oclc.org/sites/67450d67en/index.html?itemId=/content/publication/67450d67-en>
- 8) *Wat bereikt u met de inzet op overgewicht? | Loketgezondleven.nl.* (n.d.). Retrieved June 21, 2021, from <https://www.loketgezondleven.nl/gezondheidsthema/overgewicht/wat-bereikt-u>
- 9) Van Baal, P. H. M., Polder, J. J., De Wit, G. A., Hoogenveen, R. T., Feenstra, T. L., Boshuizen, H. C., Engelfriet, P. M., & Brouwer, W. B. F. (2008). Lifetime medical costs of obesity: Prevention no cure for increasing health expenditure. *PLoS Medicine*, 5(2), 0242–0249. <https://doi.org/10.1371/journal.pmed.0050029>
- 10) *Overgewicht | Cijfers & Context | Huidige situatie | Volksgezondheidszorg.info.* (n.d.). Retrieved June 21, 2021, from <https://www.volksgezondheidszorg.info/onderwerp/overgewicht/cijfers-context/huidige-situatie#!node-overgewicht-naar-opleiding>
- 11) *Nationaal Preventieakkoord | Convenant | Rijksoverheid.nl.* (n.d.). Retrieved June 21, 2021, from <https://www.rijksoverheid.nl/documenten/convenanten/2018/11/23/nationaal-preventieakkoord>
- 12) *Quickscan mogelijke impact Nationaal Preventieakkoord | RIVM.* (n.d.). Retrieved June 21, 2021, from <https://www.rivm.nl/documenten/quickscan-mogelijke-impact-nationaal-preventieakkoord>
- 13) *Obesity: working with local communities Public health guideline.* (2012). www.nice.org.uk/guidance/ph42

- 14) *Overgewicht en obesitas | Advies | Gezondheidsraad.* (n.d.). Retrieved June 21, 2021, From <https://www.gezondheidsraad.nl/documenten/adviezen/2003/04/28/overgewicht-en-obesitas>
- 15) Seidell J.C. et al. (2008). *Diagnostiek en behandeling van obesitas bij volwassen en kinderen.* Retrieved June 21, 2021, from [https://beta.vu.nl/nl/Images/CBO-richtlijn Diagnostiek en behandeling van obesitas bij volwassen tcm235-928605.pdf](https://beta.vu.nl/nl/Images/CBO-richtlijn_Diagnostiek_en_behandeling_van_obesitas_bij_volwassen_tcm235-928605.pdf)
- 16) Partnerschap Overgewicht Nederland. Retrieved June 21, 2021, from <https://www.partnerschapovergewicht.nl/>
- 17) Seidell J.C. et al. (2010). *Zorg standaard obesitas.* Retrieved June 21, 2021, from [https://beta.vu.nl/nl/Images/PON Zorgstandaard Obesitas definitief 2011 tcm235-928603.pdf](https://beta.vu.nl/nl/Images/PON_Zorgstandaard_Obesitas_definitief_2011_tcm235-928603.pdf)
- 18) *Convenant overgewicht – Mulier Instituut.* (n.d.). Retrieved June 21, 2021, from <https://www.mulierinstituut.nl/publicaties/2604/convenant-overgewicht/>
- 19) JOGG — *Samen maken we gezond gewoon.* (n.d.). Retrieved June 21, 2021, from <https://jogg.nl/>
- 20) *Daling overgewicht in JOGG-buurtten | RIVM.* (n.d.). Retrieved June 21, 2021, from <https://www.rivm.nl/nieuws/daling-overgewicht-in-jogg-buurtten>
- 21) *Principles of Bioethics | UW Department of Bioethics & Humanities.* (n.d.). Retrieved June 21, 2021, from <https://depts.washington.edu/bhdept/ethics-medicine/bioethics-topics/articles/principles-bioethics>
- 22) Swinburn, B. A., Sacks, G., Hall, K. D., McPherson, K., Finegood, D. T., Moodie, M. L., & Gortmaker, S. L. (2011). The global obesity pandemic: Shaped by global drivers and local environments. In *The Lancet* (Vol. 378, Issue 9793, pp. 804–814). Elsevier B.V. [https://doi.org/10.1016/S0140-6736\(11\)60813-1](https://doi.org/10.1016/S0140-6736(11)60813-1)
- 23) *Council cited in White Paper on public health - The Nuffield Council on Bioethics.* (n.d.). Retrieved June 21, 2021, from <https://www.nuffieldbioethics.org/news/council-cited-in-white-paper-on-public-health>
- 24) *Wat is preventie? | Loketgezondleven.nl.* (n.d.). Retrieved June 21, 2021, from <https://www.loketgezondleven.nl/integraal-werken/wettelijk-en-beleidskader-publieke-gezondheid/wat-is-preventie>
- 25) *Cijfers en feiten overgewicht | Loketgezondleven.nl.* (n.d.). Retrieved June 21, 2021, from <https://www.loketgezondleven.nl/gezondheidsthema/overgewicht/cijfers-en-feiten-overgewicht>
- 26) *Good practice appraisal tool for obesity prevention programmes, projects, initiatives and interventions.* (2017). <https://www.euro.who.int/en/health-topics/disease-prevention/nutrition/publications/guidance-and-tools/nutrition-and-diet-related-noncommunicable-diseases/good-practice-appraisal-tool-for-obesity-prevention-programmes,-projects,-initiatives-and-interventions>
- 27) Cohena, P., & Spiegelmanb, B. M. (2016). Cell biology of fat storage. In *Molecular Biology of the Cell* (Vol. 27, Issue 16, pp. 2523–2527). American Society for Cell Biology. <https://doi.org/10.1091/mbc.E15-10-0749>
- 28) Puhl, R., & Brownell, K. D. (2001). Bias, discrimination, and obesity. In *Obesity Research* (Vol. 9, Issue 12, pp. 788–805). North American Assoc. for the Study of Obesity. <https://doi.org/10.1038/oby.2001.108>

- 30) Ahima, R. S., & Antwi, D. A. (2008). Brain Regulation of Appetite and Satiety. In *Endocrinology and Metabolism Clinics of North America* (Vol. 37, Issue 4, pp. 811–823). NIH Public Access. <https://doi.org/10.1016/j.ecl.2008.08.005>
- 31) Butland, B., Jebb, S., Kopelman, P., & Mcpherson, K. (n.d.). *Tackling Obesities: Future Choices-Project Report 2 nd Edition Government Office for Science Foresight Tackling Obesities: Future Choices-Project report*. Retrieved June 21, 2021, from www.foresight.gov.uk
- 32) Zheng, H., Lenard, N. R., Shin, A. C., & Berthoud, H. R. (2009). Appetite control and energy balance regulation in the modern world: Reward-driven brain overrides repletion signals. *International Journal of Obesity*, 33(Suppl 2), S8–S13. <https://doi.org/10.1038/ijo.2009.65>
- 33) Burke, N. J., Joseph, G., Pasick, R. J., & Barker, J. C. (2009). Theorizing Social Context: Rethinking Behavioral Theory. *Health Education and Behavior*, 36(5_suppl), 55S-70S. <https://doi.org/10.1177/1090198109335338>
- 34) *Committed to health and sustainability Food consumption in the Netherlands and its determinants*. (2017). www.rivm.nl/en
- 35) *Food and Diet | Obesity Prevention Source | Harvard T.H. Chan School of Public Health*. (n.d.). Retrieved June 21, 2021, from <https://www.hsph.harvard.edu/obesity-prevention-source/obesity-causes/diet-and-weight/>
- 36) Darmon, N., & Drewnowski, A. (2015). Contribution of food prices and diet cost to socioeconomic disparities in diet quality and health: A systematic review and analysis. *Nutrition Reviews*, 73(10), 643–660. <https://doi.org/10.1093/nutrit/nuv027>
- 37) Rao, M., Afshin, A., Singh, G., & Mozaffarian, D. (2013). Do healthier foods and diet patterns cost more than less healthy options? A systematic review and meta-analysis. In *BMJ Open* (Vol. 3, Issue 12, p. 4277). British Medical Journal Publishing Group. <https://doi.org/10.1136/bmjopen-2013-004277>
- 38) Swinburn, B., Egger, G., & Raza, F. (1999). Dissecting obesogenic environments: The development and application of a framework for identifying and prioritizing environmental interventions for obesity. *Preventive Medicine*, 29(6 I), 563–570. <https://doi.org/10.1006/pmed.1999.0585>
- 39) Pinho, M. G. M., Mackenbach, J. D., Den Braver, N. R., Beulens, J. J. W., Brug, J., & Lakerveld, J. (2020). Recent changes in the Dutch foodscape: Socioeconomic and urban-rural differences. *International Journal of Behavioral Nutrition and Physical Activity*, 17(1), 1–11. <https://doi.org/10.1186/s12966-020-00944-5>
- 40) Aznar, C., Macgregor, A., Rosenberg, G., Porter, L., & Lepps, H. (n.d.). *AD BRAKE PRIMARY SCHOOL CHILDREN'S PERCEPTIONS OF UNHEALTHY FOOD ADVERTISING ON TV REFERENCE AUTHOR INFORMATION ACKNOWLEDGEMENTS*. Retrieved June 21, 2021, from www.natcen.ac.uk
- 41) Stephens, J., Miller, H., & Militello, L. (2020). Food Delivery Apps and the Negative Health Impacts for Americans. *Frontiers in Nutrition*, 7. <https://doi.org/10.3389/fnut.2020.00014>
- 42) Eriksen, M. (2005). *Lessons Learned from Public Health Efforts and Their Relevance to Preventing Childhood Obesity*. <https://www.ncbi.nlm.nih.gov.eur.idm.oclc.org/books/NBK83816/>

- 43) Golechha, M. (2016). Health promotion methods for smoking prevention and cessation: A comprehensive review of effectiveness and the way forward. In *International Journal of Preventive Medicine* (Vols. 2016-January). Isfahan University of Medical Sciences(IUMS). <https://doi.org/10.4103/2008-7802.173797>
- 44) *Half of Dutch population meet physical activity guidelines*. (n.d.). Retrieved June 21, 2021, from <https://www.cbs.nl/en-gb/news/2020/17/half-of-dutch-population-meet-physical-activity-guidelines>
- 45) Church, T. S., Thomas, D. M., Tudor-Locke, C., Katzmarzyk, P. T., Earnest, C. P., Rodarte, R. Q., Martin, C. K., Blair, S. N., & Bouchard, C. (2011). Trends over 5 decades in U.S. occupation-related physical activity and their associations with obesity. *PLoS ONE*, 6(5), e19657. <https://doi.org/10.1371/journal.pone.0019657>
- 46) Van Der Ploeg, H. P., Venugopal, K., Chau, J. Y., Van Poppel, M. N. M., Breedveld, K., Merom, D., & Bauman, A. E. (2013). Non-occupational sedentary behaviors population changes in the Netherlands, 1975-2005. *American Journal of Preventive Medicine*, 44(4), 382–387. <https://doi.org/10.1016/j.amepre.2012.11.034>
- 47) López-Valenciano, A., Mayo, X., Liguori, G., Copeland, R. J., Lamb, M., & Jimenez, A. (2020). Changes in sedentary behaviour in European Union adults between 2002 and 2017. *BMC Public Health*, 20(1), 1–10. <https://doi.org/10.1186/s12889-020-09293-1>
- 48) Loyen, A., Chau, J. Y., Jelsma, J. G. M., Van Nassau, F., & Van Der Ploeg, H. P. (2019). Prevalence and correlates of domain-specific sedentary time of adults in the Netherlands: Findings from the 2006 Dutch time use survey. In *BMC Public Health* (Vol. 19, Issue 2, pp. 1–12). BioMed Central Ltd. <https://doi.org/10.1186/s12889-019-6764-7>
- 49) *Factsheet zitgedrag*. (n.d.). Retrieved June 21, 2021, from <https://www.kennisbanksportenbewegen.nl/?file=7782&m=1495008847&action=file.download>
- 50) *EU Action Plan on Childhood*. (n.d.). Retrieved June 21, 2021, from http://www.who.int/dietphysicalactivity/childhood_consequences/en.
- 51) van der Valk, E. S., van den Akker, E. L. T., Savas, M., Kleinendorst, L., Visser, J. A., Van Haelst, M. M., Sharma, A. M., & van Rossum, E. F. C. (2019). A comprehensive diagnostic approach to detect underlying causes of obesity in adults. In *Obesity Reviews* (Vol. 20, Issue 6, pp. 795–804). Blackwell Publishing Ltd. <https://doi.org/10.1111/obr.12836>
- 52) Swinburn, B., & Egger, G. (2004). The runaway weight gain train: Too many accelerators, not enough brakes. In *British Medical Journal* (Vol. 329, Issue 7468, pp. 736–739). BMJ Publishing Group. <https://doi.org/10.1136/bmj.329.7468.736>
- 53) *Gecombineerde leefstijlinterventie | Loketgezondleven.nl*. (n.d.). Retrieved June 21, 2021, from <https://www.loketgezondleven.nl/zorgstelsel/gecombineerde-leefstijlinterventie>
- 54) Mormann, S., & Dakota, N. (n.d.). *Evaluation Evaluation Guide Guide Writing SMART Objectives Department of Health and Human Services Centers for Disease Control and Prevention National Center for Chronic Disease Prevention and Health Promotion Acknowledgements Heart Disease and Stroke Prevention Program Evaluation Guides*.
- 55) Wammes, B., Oenema, A., & Brug, J. (2007). The evaluation of a mass media campaign aimed at weight gain prevention among young Dutch adults. *Obesity*, 15(11), 2780–2789. <https://doi.org/10.1038/oby.2007.330>

- 56) Julia Chantal. (n.d.). *Development of a new front-of-pack nutrition label*. Retrieved June 21, 2021, from https://www.euro.who.int/_data/assets/pdf_file/0008/357308/PHP-1122-NutriScore-eng.pdf
- 57) Djojoseparto, S., Kamphuis, C., Sciensano, S. V., Dr, B., Harrington, J., & Poelman, M. (2020). *The Healthy Food Environment Policy Index (Food-EPI): European Union An overview of EU-level policies influencing food environments in EU Member States Partners*.
- 58) *Call from European scientists to implement Nutri-Score in Europe, – NUTRI-SCORE*. (n.d.). Retrieved June 21, 2021, from <https://nutriscore.blog/2021/03/16/call-from-european-scientists-to-implement-nutri-score-in-europe-a-simple-and-transparent-front-of-pack-food-label-with-rigorous-scientific-support-intended-to-guide-dietary-choices-and-thus-contrib/>
- 59) Kraak, V. I., & Story, M. (2015). Influence of food companies' brand mascots and entertainment companies' cartoon media characters on children's diet and health: A systematic review and research needs. *Obesity Reviews*, 16(2), 107–126. <https://doi.org/10.1111/obr.12237>
- 60) Dorfman, L. (n.d.). The New Threat of Digital Marketing. *Pediatric Clinics of North America*. Retrieved June 21, 2021, from [https://www.academia.edu/38425084/The New Threat of Digital Marketing](https://www.academia.edu/38425084/The_New_Threat_of_Digital_Marketing)
- 61) *Frisdranken | Akkoord Verbetering Productsamenstelling*. (n.d.). Retrieved June 21, 2021, from <https://www.akkoordverbeteringproductsamenstelling.nl/afspraken-en-resultaten/overzicht-productgroep/frisdranken>
- 62) Vartanian, L. R., Schwartz, M. B., & Brownell, K. D. (2007). Effects of soft drink consumption on nutrition and health: A systematic review and meta-analysis. In *American Journal of Public Health* (Vol. 97, Issue 4, pp. 667–675). American Public Health Association. <https://doi.org/10.2105/AJPH.2005.083782>
- 63) *Physical activity guidelines*. (n.d.). Retrieved June 21, 2021, from <https://www.cbs.nl/en-gb/news/2020/17/half-of-dutch-population-meet-physical-activity-guidelines/physical-activity-guidelines>
- 64) Gardner, B., Smith, L., Lorencatto, F., Hamer, M., & Biddle, S. J. H. (2016). How to reduce sitting time? A review of behaviour change strategies used in sedentary behaviour reduction interventions among adults. *Health Psychology Review*, 10(1), 89–112. <https://doi.org/10.1080/17437199.2015.1082146>
- 65) Castro, A., Kahlmeier, S., & Gotschi, T. (n.d.). *Corporate Partnership Board CPB Exposure-Adjusted Road Fatality Rates for Cycling and Walking in European Countries Discussion Paper*. Retrieved June 21, 2021, from www.itf-oecd.org
- 66) *Wijk- en buurtstatistieken*. (n.d.). Retrieved June 21, 2021, from <https://www.cbs.nl/nl-nl/dossier/nederland-regionaal/wijk-en-buurtstatistieken>
- 67) *Gecombineerde leefstijlinterventie 2020: ontwikkeling in volle gang*. (n.d.). Retrieved June 21, 2021, from <https://www.vektis.nl/over-vektis/datawarehouse>.
- 68) *Inventarisatie aanvullende maatregelen Nationaal Preventieakkoord | Rapport | Rijksoverheid.nl*. (n.d.). Retrieved June 21, 2021, from <https://www.rijksoverheid.nl/documenten/rapporten/2021/04/06/inventarisatie-aanvullende-maatregelen-nationaal-preventieakkoord>
- 69) Health Organization Regional Office for Europe, W. (2015). *AK Using price policies to promote healthier diets*. <http://www.euro.who.int/pubrequest>

- 70) *Suikerhoudende dranken | Voedselconsumptiepeiling*. (n.d.). Retrieved June 21, 2021, from <https://wateetnederland.nl/resultaten/voedingsmiddelen/richtlijnen/suikerhoudende-dranken>
- 71) Allcott, H., Lockwood, B. B., & Taubinsky, D. (2019). Should we tax sugar-sweetened beverages? An overview of theory and evidence. In *Journal of Economic Perspectives* (Vol. 33, Issue 3, pp. 202–227). American Economic Association. <https://doi.org/10.1257/jep.33.3.202>
- 72) Teng, A. M., Jones, A. C., Mizdrak, A., Signal, L., Genç, M., & Wilson, N. (2019). Impact of sugar-sweetened beverage taxes on purchases and dietary intake: Systematic review and meta-analysis. In *Obesity Reviews* (Vol. 20, Issue 9, pp. 1187–1204). Blackwell Publishing Ltd. <https://doi.org/10.1111/obr.12868>
- 73) Azzolini, E., et al. | *2019 Quarterly of the European Observatory on Health Systems and Policies* (Vol. 25). Retrieved June 21, 2021, from <http://www.lse.ac.uk/lsehealthandsocialcare/publications/eurohealth/eurohealth.aspx><http://www.healthobservatory.eu><http://www.lse.ac.uk/lse-health><http://tinyurl.com/eurohealth>
- 74) *WPHNA World Public Health Nutrition Association*. (n.d.). Retrieved June 21, 2021, from http://www.wphna.org/htdocs/2012_aug_wn3_govt.htm
- 75) Miao, Z., Beghin, J. C., & Jensen, H. H. (2012). Taxing sweets: Sweetener input tax or final consumption tax? *Contemporary Economic Policy*, 30(3), 344–361. <https://doi.org/10.1111/j.1465-7287.2011.00278.x>
- 76) Broeks, M. J., Biesbroek, S., Over, E. A. B., Van Gils, P. F., Toxopeus, I., Beukers, M. H., & Temme, E. H. M. (n.d.). *A social cost-benefit analysis of meat taxation and a fruit and vegetables subsidy for a healthy and sustainable food consumption in the Netherlands*. <https://doi.org/10.1186/s12889-020-08590-z>
- 77) Waterlander, W. E., De Boer, M. R., Schuit, A. J., Seidell, J. C., & Steenhuis, I. H. M. (2013). Price discounts significantly enhance fruit and vegetable purchases when combined with nutrition education: A randomized controlled supermarket trial. *American Journal of Clinical Nutrition*, 97(4), 886–895. <https://doi.org/10.3945/ajcn.112.041632>
- 78) Popova, L. (2016). Sugar-Sweetened Beverage Warning Labels: Lessons Learned From the Tobacco Industry. *Journal of the California Dental Association*, 44(10), 633–640. <http://www.ncbi.nlm.nih.gov/pubmed/28190943>
- 79) *Ontario doctors urge junk food warning labels and taxes | CBC News*. (n.d.). Retrieved June 21, 2021, from <https://www.cbc.ca/news/health/ontario-doctors-urge-junk-food-warning-labels-and-taxes-1.1134148>
- 80) Clarke, N., Pechey, E., Mantzari, E., Blackwell, A. K. M., De-loyde, K., Morris, R. W., Munafò, M. R., Marteau, T. M., & Hollands, G. J. (2020). Impact of health warning labels on snack selection: An online experimental study. *Appetite*, 154, 104744. <https://doi.org/10.1016/j.appet.2020.104744>
- 81) VanEpps, E. M., & Roberto, C. A. (2016). The Influence of Sugar-Sweetened Beverage Warnings: A Randomized Trial of Adolescents' Choices and Beliefs. *American Journal of Preventive Medicine*, 51(5), 664–672. <https://doi.org/10.1016/j.amepre.2016.07.010>

- 82) Blackburn, N. E., Wilson, J. J., McMullan, I. I., Caserotti, P., Giné-Garriga, M., Wirth, K., Coll-Planas, L., Alias, S. B., Roqué, M., Deidda, M., Kunzmann, A. T., Dallmeier, D., & Tully, M. A. (2020). The effectiveness and complexity of interventions targeting sedentary behaviour across the lifespan: A systematic review and meta-analysis. *International Journal of Behavioral Nutrition and Physical Activity*, 17(1), 1–18. <https://doi.org/10.1186/s12966-020-00957-0>
- 83) Abioye, A. I., Hajifathalian, K., & Danaei, G. (2013). Do mass media campaigns improve physical activity? a systematic review and meta-analysis. *Archives of Public Health*, 71(1). <https://doi.org/10.1186/0778-7367-71-20>
- 84) *Can a Universal Basic Income Reduce Childhood Obesity? - Scientific American Blog Network*. (n.d.). Retrieved June 21, 2021, from <https://blogs.scientificamerican.com/observations/can-a-universal-basic-income-reduce-childhood-obesity/>
- 85) *Universal Basic Income - Home*. (n.d.). Retrieved June 21, 2021, from <https://drexel.edu/hunger-free-center/research/briefs-and-reports/universal-basic-income/>
- 86) Chu, A. H. Y., Ng, S. H. X., Tan, C. S., Win, A. M., Koh, D., & Müller-Riemenschneider, F. (2016). A systematic review and meta-analysis of workplace intervention strategies to reduce sedentary time in white-collar workers. *Obesity Reviews*, 17(5), 467–481. <https://doi.org/10.1111/obr.12388>
- 87) Shrestha, N., Grgic, J., Wiesner, G., Parker, A., Podnar, H., Bennie, J. A., Biddle, S. J. H., & Pedisic, Z. (2019). Effectiveness of interventions for reducing non-occupational sedentary behaviour in adults and older adults: a systematic review and meta-analysis. *British Journal of Sports Medicine*, 53(19), 1206–1213. <https://doi.org/10.1136/bjsports-2017-098270>
- 88) *National Recommendations for Physical Activity and Physical Activity Promotion*. (n.d.). Retrieved June 21, 2021, from <https://www.sport.fau.de/files/2015/05/National-Recommendations-for-Physical-Activity-and-Physical-Activity-Promotion.pdf>
- 89) *Hoe de voedsellobby de halfzachte aanpak van overgewicht naar haar hand kon zetten – Follow the Money - Platform voor onderzoeksjournalistiek*. (n.d.). Retrieved June 21, 2021, from <https://www-ftm-nl.eur.idm.oclc.org/artikelen/voedsellobby-halfzachte-aanpak-overgewicht-naar-hand-zetten?share=qZyktKU9cFz40ARmUA730SARzr9QNfUuMkeG8jz3MgcsTS8EiwIXH%252BvDX%252Ff6b1c%253D>
- 90) *Besluit Wob-verzoek over het Nationaal Preventieakkoord, thematafel Overgewicht | Wob-verzoek | Rijksoverheid.nl*. (n.d.). Retrieved June 21, 2021, from <https://www.rijksoverheid.nl/documenten/wob-verzoeken/2020/06/03/besluit-wob-verzoek-over-het-nationaal-preventieakkoord-thematafel-overgewicht>
- 91) *Regeerakkoord 2017: “Vertrouwen in de toekomst” | Publicatie | Rijksoverheid.nl*. (n.d.). Retrieved June 21, 2021, from <https://www.rijksoverheid.nl/documenten/publicaties/2017/10/10/regeerakkoord-2017-vertrouwen-in-de-toekomst>
- 92) *Convenanten genoeg, allemaal zonder effect - NRC*. (n.d.). Retrieved June 21, 2021, from <https://www.nrc.nl/nieuws/2011/05/07/convenanten-genoege-allemaal-zonder-effect-12014428-a259869>
- 93) Saloojee, Y., & Dagli, E. (n.d.). *Tobacco industry tactics for resisting public policy on health*

- 94) *Een 'klimaatwet' voor preventie* | KNMG. (n.d.). Retrieved June 21, 2021, from <https://www.knmg.nl/actualiteit-opinie/columns/column/een-klimaatwet-voor-preventie-1.htm>
- 95) *"Mijn broeken zitten strakker"; we eten en zitten meer in coronatijd* | NOS. (n.d.). Retrieved June 21, 2021, from <https://nos.nl/artikel/2358318-mijn-broeken-zitten-strakker-we-eten-en-zitten-meer-in-coronatijd>

Appendix A

Table 3: Technical aspects of pillar one

Goal specificity	Number of measures
Specific	9
Timebound	11
Specific and time bound	7
Target groups¹	Number of measures
Supermarkets	7
Children and youth	5
General population	4
Catering industry	4
Sports events	3
Hospitals	1
Monetary resources	Total (x € 1.000.000)
Total	6.6

1: Measures do not add up to 24 due to multiple attention points used in one intervention

Summary pillar one											
What percentage of measures have a set timeframe or deadline? (and, if so, when is it due)						Public health strategy					
No set timeframe or deadline: A.01 A.04 A.07 A.17 A.23 A.02 A.05 A.09 A.21 A.25 A.03 A.06 A.11 A.22						With set timeframe or deadline: A.08 2022 A.13 2025 A.16 2020 A.20 2021 A.10 2020 A.14 2020 A.18 2030 A.24 2030 A.12 2019 A.15 2020 A.19 2020					
How many measures have a specific goal?											
No specific goal A.01 A.06 A.14 A.21 A.25 A.02 A.08 A.16 A.22 A.04 A.09 A.17 A.23 A.05 A.11 A.19 A.24						Have a specific goal A.03 A.13 A.20 A.07 A.15 A.10 A.16 A.12 A.18					
How many measures have a follow-up goal when the initial goal is achieved?											
No follow-up goal A.01 A.04 A.07 A.10 A.14 A.16 A.20 A.23 A.02 A.05 A.08 A.11 A.15 A.17 A.21 A.25 A.03 A.06 A.09 A.12 A.16 A.19 A.22						With follow-up goals: A.13: Cutting the number of calories sold in A-brand soft drinks by 25% in 2020 and by 30% in 2030 A.18: In 2020, sporting events aimed at children comply with healthy sports sponsorship. In 2030, all sporting events comply A.24: 50% of hospitals will offer a healthy diet in 2025; no later than 2030, all of them will					
What level of prevention is most targeted?						Targeted groups					
Universal A.01 A.06 A.11 A.14 A.18 A.19 A.04 A.02 A.08 A.12 A.15 A.20 A.24 A.03 A.09 A.13 A.16 A.21 A.04 A.10 A.14 A.17 A.22						General society A.04 A.09 A.14 A.23 Children/youth A.09 A.10 A.11 A.18 A.19 Customers in supermarkets A.01 A.13 A.02 A.15 A.03 A.05 A.06 Catering A.01 A.08 A.09 A.21 Sports associations/evenements A.16 A.17 A.18 Hospitals A.24					
Prevention ladder											
Do nothing/monitor the situation A.04 A.15 A.19						Provide information A.02 A.04 A.15 A.19					
						Enable choice A.03 A.24 A.09 A.14 A.16 A.18 A.20 A.22 A.23					
						Guide choice through changing the default policy A.21					
						Guide choice through incentives -					
						Guide choice through disincentives -					
						Restrict choice A.10 A.11 A.13 A.17					
						Eliminate choice -					
						Research A.05 A.07 A.25					
						Not stated A.01 A.06 A.08 A.12					
Responsible stakeholders											
CBL A.01 A.02 A.03 A.05						KHN A.01 A.09 A.21					
						FNLI A.10 A.13					
						NAGF A.06					
						JOGG A.16 A.18 A.22					
						NOC*NSF A.16 A.17 A.18					
						VWS A.04 A.12 A.24 A.05 A.14 A.06 A.15 A.07 A.19					
						Veneca A.08					
						FWS A.19					
						Gezonde school A.19					
						Club van Elf A.22					
Budget						Additional measures					
Measure Amount Remark						A.01: make the goal more specific & expansion of the measure					
A.04/A.05 € 1.100.000,00						A.09: make the goal more specific					
A.07/A.14/A.16 € 2.500.000,00						A.10: expansion of the measure					
A.16 € 500.000,00						A.13: make the goal more specific, expansion of the measure					
A.19 € 300.000,00 For Healthy Childcare € 600.000,00 was admitted. Since it is mentioned for two rules in two separate pillars (C.05), each gets €300.000,00						A.15: expansion of the measure					
A.19 € 1.000.000,00 For Healthy School € 2.000.000,00 was admitted. Since it is mentioned for two rules in two separate pillars (C.01), each gets €1.000.000,00						A.16: expansion of the measure					
A.19 € 1.200.000,00						A.19: expansion of the measure					
Total € 6.600.000,00											

Measure: A.01	
Factor	Finding
Main goal	An annual increase in consumption of products from the Wheel of Five in supermarkets and catering
Preventive strategy	
Public health strategy	Environmental driver
Intervention ladder	Not stated how increased consumption will be achieved
Type of prevention	Universal prevention
Technical analysis	
Specificity	No, it remains unclear what percentage increase of consumption is ambitioned
Timeframe	An annual increase, no enddate or end goal is specified
Costs of the intervention	None
Stakeholders	Centraal Bureau Logistiek (CBL), Koninkrijk Horeca Nederland (KHN), customers
Implementation	In preparation: by 2019, no figures were available on the consumption growth these products. KHN and DutchCuisine organised 5 sessions to inspire entrepreneurs and their chefs to work on a more sustainable and healthier catering industry.
Additional measures	Formulate the goals on the supply rather than on consumption or purchases. Also ensure a decrease in consumption of products outside the Wheel of Five.

Measure: A.04	
Factor	Finding
Main goal	To inform children and adults on healthy and tasty food and drink possibilities. This will be done through promotion of the Wheel of Five by the government. Multiple media platforms will be used for communication.
Preventive strategy	
Public health strategy	Behavioural patterns
Intervention ladder	Provide information
Type of prevention	Universal and selective. Although the information is meant for all children and adults, it focuses on various target groups varying from age, sex and socioeconomic status.
Technical analysis	
Specificity	No, it remains unclear how many individuals are wanted to reach
Timeframe	Starts in 2019, no enddate or goal is specified
Costs of the intervention	The Wheel of Five got admitted €1.100.000 over a two year period
Stakeholders	VWS, general society
Implementation	In progress: a mass media campaign was conducted in 2019, called 'letswissel' good for yourself and the environment'. The effect on name recognition is yet to be evaluated.
Additional measures	None

Measure: A.07	
Factor	Finding
Main goal	A study will be done on how excessive consumption can be prevented among specific target groups that are not reached effectively by other measures. If the study research provides enough data, it will form the basis for an initiative to reach these
Preventive strategy	
Public health strategy	N/a
Intervention ladder	Research
Type of prevention	Selective prevention, as gathered data will be used to target excessive consumption, a risk factor for overweight
Technical analysis	
Specificity	Yes
Timeframe	No enddate is specified
Costs of the intervention	This project, together with A.14 and A.15, was admitted €2.500.000
Stakeholders	VWS
Implementation	Finished: the results were made public in the first quarter of 2020. They concluded that it is not possible to establish a definition for excessive consumption. Remarkably, the paper investigated the definition "excessive consumption" in depth, but neglected how it can be prevented among specific target groups that are not reached effectively by other measures.
Additional measures	None

Measure: A.02	
Factor	Finding
Main goal	Supermarkets persuade consumers to buy more products that belong in the Wheel of Five
Preventive strategy	
Public health strategy	Behavioural patterns
Intervention ladder	Provide information
Type of prevention	Universal prevention
Technical analysis	
Specificity	No, it is not stated how many products more need to be bought or how this will be achieved
Timeframe	Not specified
Costs of the intervention	Not specified
Stakeholders	Central Bureau for Food Trade (CBL), VWS, customers
Implementation	In progress: in 2019, the supermarket chose the following strategies to persuade consumers: - Consumer magazines and advertising brochures pay attention to the Wheel of Five and link offers to it - Every supermarket chain has paid extra attention to the vegetable assortment - A number of supermarket chains use radio or TV commercials or sponsoring a TV program on the theme of fruit and vegetables. - The thousands of employees are encouraged to live a healthy life through training, games in the canteen or tips in a staff app.
Additional measures	None

Measure: A.05	
Factor	Finding
Main goal	Research will be done on how a shift can be made to provide more marketing and information in shops on products from the Wheel of Five
Preventive strategy	
Public health strategy	N/a
Intervention ladder	Research
Type of prevention	N/a
Technical analysis	
Specificity	No, what type of research will be conducted? What is meant by more marketing and information?
Timeframe	The research will take place in 2019
Costs of the intervention	None
Stakeholders	Ministry of Health, Welfare and Sport and the Central Bureau for the Food Trade (VWS), CBL
Implementation	In preparation: VWS and CBL agreed in 2019 to first wait for the choice of a food choice logo. Now that Nutri-Score has been chosen, the Ministry of Health, Welfare and Sport will again discuss possibilities for marketing on the shop floor of products
Additional measures	None

Measure: A.08	
Factor	Finding
Main goal	The range of products on offer in catering will be made healthier by making it more accessible to eat in accordance with the Wheel of Five in catering locations.
Preventive strategy	
Public health strategy	Behaviour patterns
Intervention ladder	Not stated, as there are many strategies a caterer can use
Type of prevention	Universal prevention
Technical analysis	
Specificity	No, it remains unclear in what way accessibility will be increased. And, what is "more" accessible?
Timeframe	No later than 2022, all locations associated with Veneca ensured to have adjusted to the renewed offering
Costs of the intervention	None
Stakeholders	Veneca, catering customers
Implementation	In progress: by the end of 2019, 75% of the Veneca members will comply with at least one of the strategies they presented. Caterers and clients have free choice in the use of the different strategies. Veneca sent an email to the members asking how many percent of the restaurants comply with the strategies. These results will be interesting since a significant amount of possible strategies do not have potential to give a significant effect.
Additional measures	None

Measure: A.03	
Factor	Finding
Main goal	Annually, 750 employees of the fresh departments in the supermarkets will be trained with a specific training module on healthy food to help consumers who have questions on topics such as how to read nutrition panels and other labels
Preventive strategy	
Public health strategy	Behavioural patterns
Intervention ladder	Enable choice
Type of prevention	Universal prevention
Technical analysis	
Specificity	Yes, the number of employees that will be trained (although there is no deadline)
Timeframe	Annually 750 new employees. Time frame or end goal is not specified.
Costs of the intervention	None
Stakeholders	CBL, employees of fresh departments, customers of supermarkets
Implementation	In progress: A new e-learning module was presented in 2019 to train employees. In 2019, 76 employees made the e-learning
Additional measures	None

Measure: A.06	
Factor	Finding
Main goal	Under the National Fruit and Vegetables Action Plan (NAGF), accelerated steps will be taken to bring about a year-on-year increase in the consumption of fruit and vegetables through the various sales channels
Preventive strategy	
Public health strategy	Not stated
Intervention ladder	Not stated
Type of prevention	Universal prevention
Technical analysis	
Specificity	No, what is meant with accelerated steps?
Timeframe	A year on year increase. No enddate or specific percentage increase is mentioned
Costs of the intervention	None
Stakeholders	CBL, the Association of Dutch Catering Organisations (Veneca) and the Fresh Produce Centre, in cooperation with the government, customers
Implementation	In progress: in 2019, the (NAGF) conducted several successful experiments in supermarkets. The purchase figures for 2019 show that in 2019 3.4% more vegetables and 0.2% less fruit were sold than in 2018.
Additional measures	None

Measure: A.09	
Factor	Finding
Main goal	Encouragement will be offered to make drinking water more readily available in people's surroundings. KHN will encourage its members to encourage the drinking of water and sugar-free drinks rather than regular soft drinks.
Preventive strategy	
Public health strategy	Environmental drivers
Intervention ladder	Enable choice
Type of prevention	Universal
Technical analysis	
Specificity	No, what is meant with "encouragement"? How will drinking water be more readily available? How many members of KHN are wanted to offer water?
Timeframe	No specific goal or end date is specified
Costs of the intervention	Schools got 2000€ assigned per tapwater point
Stakeholders	KHN, society, customers
Implementation	In progress: soft-drink producers will stop selling traditional, sugary soft drinks to secondary schools, and will advise caterers at secondary schools to sell only water and low-calorie or calorie-free soft drinks. It is not known what percentage of secondary schools will still receive sugary soft drinks from 1 January through an intermediary, such as a wholesaler or caterer. In 2019, 470 schools applied for a fund to build new tapwater points. In 2019, the KHN conducted a small research found that 84% of catering entrepreneurs was prepared to serve tap water for free. To raise this number, KHN put an inspiring post online on their social. Concretely state what "people's surroundings are": in public places, in the catering industry, on the work floor and in education.
Additional measures	

Measure: A.10

Factor	Finding
Main goal	The use of licensed media characters aimed at children under 13 years of age on product packaging and point-of-sale materials will be restricted on the basis of nutritional criteria
Preventive strategy	
Public health strategy	Environmental driver
Intervention ladder	Restrict choice
Type of prevention	Universal prevention
Technical analysis	
Specificity	Yes
Timeframe	In July 2020 the transition period ended, no follow-up goal is specified
Costs of the intervention	None
Stakeholders	VWS, FNLI, children under 13 years of age
Implementation	Implementation was finished by July 2020
Additional measures	Expanded the restriction to a ban on the use of licensed media characters to include social media. Prohibit all forms of advertising (Article 1 of the Dutch Advertising Code) aimed at children under the age of 18 for foods that fall outside the Wheel of Five

Measure: A.13

Factor	Finding
Main goal	Additional undertakings will be made in the National Agreement to improve Product Composition to reduce the calorie content for product groups that make a relatively large contribution to energy intake (sugary soft drinks, biscuits and sweets and sugary dairy products).
Preventive strategy	
Public health strategy	Environmental driver
Intervention ladder	Restrict choice
Type of prevention	Universal prevention
Technical analysis	
Specificity	Yes
Timeframe	1) 5% more sugar will be taken out of sugary dairy products, no specific enddate was specified 2) Undertakings on portion sizes will be made for branded products in the biscuit, sweets and chocolate aisle, the aim being to cover 70% of A-brand products. No enddate is specified. 3) To cut the number of calories sold in A-brand soft drinks by 25% in 2020. By 2025, 30% fewer calories will be sold in A-brand soft drinks. Supermarkets are committed to making a substantial cut in calories from their own brand soft drinks, and will flesh this out in more detail before March 2019.
Costs of the intervention	None
Stakeholders	VWS, FNLI, customers
Implementation	1) 5-18% less added sugar in sugary dairy products in 2020 in addition to the National Agreement to improve Product Composition. 2) By 2020, <5% of biscuits, <10% of snacks and <5% of chocolate products contain >200kcal per portion. 3) By 2021, supermarkets ensured to have cut sugar by 10% in their own brand soft drinks. By 2025, 30% less calories are sold from A-brand soft drinks.
Additional measures	Decrease the energy content of dairy desserts per serving and concretize how much this decreases. Don't just focus on A-brand products. Make supermarkets commit to a substantial reduction of sugar in private labels instead of just the calories in soft drinks. Also let the price change with the portion size so that it becomes more attractive to buy a smaller portion.

Measure: A.16

Factor	Finding
Main goal	To provide a healthier range of food products in 2500 sports canteens, 40% at least level bronze
Preventive strategy	
Public health strategy	Environmental driver
Intervention ladder	Enable choice
Type of prevention	Universal
Technical analysis	
Specificity	Yes
Timeframe	By 2020, 2500 sports canteens will be working on improving their product offering, 40% of these will be at least at Bronze level under the Nutrition Centre's criteria.
Costs of the intervention	€500,000 over three years was admitted to make sports canteens healthy
Stakeholders	IOGG, NOC*NSF members of sportsassociations
Implementation	In progress: in 2019, 1663 sports associations were improving their canteens. 171 canteens met criteria for bronze level
Additional measures	Make sure that many products from the Wheel of Five are offered in sports canteens. Provide clear indication of healthy products. And make the unhealthy products less attractive by, for example, placing them at the bottom, offering them separately and using them twice.

Measure: A.11

Factor	Finding
Main goal	Supermarkets will limit the use of branded characters on packaging materials for their own brands of children's products
Preventive strategy	
Public health strategy	Environmental driver
Intervention ladder	Restrict choice
Type of prevention	Universal prevention
Technical analysis	
Specificity	No, by how much will branded characters be limited? What
Timeframe	No deadline or endgoal was specified
Costs of the intervention	None
Stakeholders	Children
Implementation	Almost finished: in 2019, all most all supermarket chains removed characters that are attractive to children from unhealthy products
Additional measures	None

Measure: A.14

Factor	Finding
Main goal	A new national product-improvement system will be published, which should lead to a healthier food supply across all channels. This should help businesses improve their product range.
Preventive strategy	
Public health strategy	Environmental driver
Intervention ladder	Enable choice
Type of prevention	Universal intervention
Technical analysis	
Specificity	No, how many businesses are wanted to improve their product range? How many points of action will this new system have?
Timeframe	By 2020 the system was promised to be published
Costs of the intervention	This project, together with A.15 and A.07, was admitted €2,500,000
Stakeholders	VWS in consultation with the relevant stakeholders, business, general society
Implementation	In progress: currently, the official government website promises to publish the new national product improvement system in 2021.
Additional measures	None

Measure: A.17

Factor	Finding
Main goal	To make sporting environments healthier by healthy sport sponsorships. Organizations will promote information about the Advertising Code for Food and motivate food manufacturers to follow it.
Preventive strategy	
Public health strategy	Environmental driver
Intervention ladder	Restrict choice
Type of prevention	Universal prevention
Technical analysis	
Specificity	No, not stated how information will be promoted
Timeframe	No deadline or endgoal is specified.
Costs of the intervention	None
Stakeholders	The Dutch Federation of the Food Industry (FNLI) and the Dutch Olympic Committee/Dutch Sports Federation (NOC*NSF), advertisers, participants of sporting
Implementation	In progress: in 2019, an external organisation was hired to investigate what earnings come from alcohol and unhealthy foods in the sport industry. In addition, NOC*NSF made a first proposal for communication about the Advertising Code for the supporters their supporters of NOC*NSF (sports federations and sports associations). In 2020 this proposal was elaborated on
Additional measures	None

Measure: A.12

Factor	Finding
Main goal	The Covenant on Sponsoring at Schools will be evaluated, the undertakings in the covenant will be tightened in consultation, if necessary.
Preventive strategy	
Public health strategy	Not stated
Intervention ladder	Not stated
Type of prevention	Universal prevention
Technical analysis	
Specificity	Yes
Timeframe	The evaluation took place in 2019, no follow-up moments are specified
Costs of the intervention	None
Stakeholders	VWS, schools
Implementation	Finished: The covenant was evaluated in 2019, and concluded that the covenant is in principle satisfactory.
Additional measures	None

Measure: A.15

Factor	Finding
Main goal	To enable consumers in making conscious healthy choices themselves, a new food choice logo will be introduced. The criteria from the Wheel of Five will be explicitly incorporated into the development of the new logo.
Preventive strategy	
Public health strategy	Behavioural patterns
Intervention ladder	Provide information
Type of prevention	Universal prevention
Technical analysis	
Specificity	Yes
Timeframe	The new logo will be introduced in 2020
Costs of the intervention	This project, together with A.14 and A.07, was admitted €2,500,000
Stakeholders	VWS, supermarkets, food manufacturers, customers
Implementation	In progress: in 2020 the multi-score was introduced and it will be nationally implemented in 2021. It works with a scale from A (in green), a healthy choice, to D (in red), a unhealthy choice.
Additional measures	Base the food choice logo on recent nutritional science. Match the food choice logo with the Wheel of Five. Encourage the introduction of a (preferably mandatory, if this is possible under EU legislation) food choice logo on all foods in the Netherlands (ie on packaged and unpackaged, and processed and unprocessed products). Implement a clear system for food choice logos for menus in quick service restaurants and catering (including a normative health message) that is in line with the Wheel of Five

Measure: A.18

Factor	Finding
Main goal	To start a movement to link sports to a healthy lifestyle, a covenant on healthy sporting events will be concluded. The covenant will contribute to this by focusing on the availability of healthy food choices at sporting events and on stopping advertising aimed at children under the age of 13 for products that do not concur with the principles of the Wheel of Five.
Preventive strategy	
Public health strategy	Environmental drivers
Intervention ladder	Enable choice
Type of prevention	Universal prevention
Technical analysis	
Specificity	Yes
Timeframe	In 2020, sporting events aimed at children comply with healthy sports sponsorship, and a range of food and drink that meets the ratio of 80% healthy food choice and 20% exceptional choice in accordance with the Gold level of the Guidelines of the Netherlands Nutrition Center.
Costs of the intervention	None
Stakeholders	IOGG, Municipalities of Amsterdam, Rotterdam, Utrecht, The Hague, Eindhoven, sportsmarketing agencies, and the Programme for Young People at a Healthy Weight
Implementation	In progress: by 2018, the covenant was signed by above mentioned municipalities. Since then, Heerenveen and Almarai also joined.
Additional measures	None

Measure: A.19	
Factor	Finding
Main goal	To promote a healthy diet, sports and exercise among schoolchildren, extra attention will be given to healthy nutrition through the Healthy Schools and Healthy Childcare programme. Soft-drink producers will stop selling traditional, sugary soft drinks to secondary schools, and will advise caterers at secondary schools to sell only water, and low-calorie and calorie-free soft drinks.
Preventive strategy	
Public health strategy	Environmental drivers
Intervention ladder	Provide information/restrict choice
Type of prevention	Universal prevention.
Technical analysis	
Specificity	No, unclear what "extra information" means and how many schoolchildren are wanted to be reached
Timeframe	In 2020, 950 secondary schools canteen were promised to reach at least Silver level under the Nutrition Centre's criteria. Soft drinks will not be sold from 1 January 2019 on.
Costs of the intervention	Healthy Childcare has a budget of €0.6 million over three years (same financial plan as C.05). Healthy School has a budget of €2 million over three years (same financial plan as C.01). Healthy Canteens was admitted €1.2 million over three years.
Stakeholders	VWS, Fris water sap (FWS), schools, Healthy Schools and Healthy Childcare programme, children
Implementation	In progress: 32% of school canteens was healthy by 2019 and soft-drinks producers stopped selling to schools: 2019.
Additional measures	Expand not selling soft drinks to universities, colleges, vocational education and hospitals.

Measure: A.20	
Factor	Finding
Main goal	To make the central government's company restaurants healthy
Preventive strategy	
Public health strategy	Environmental drivers
Intervention ladder	Enable choice
Type of prevention	Universal prevention
Technical analysis	
Specificity	Yes
Timeframe	By 2021 at the latest, all restaurants were promised to be healthy (at least Silver level under the Nutrition Centre's criteria)
Costs of the intervention	None
Stakeholders	Central government, its catering
Implementation	By 2020, all 12 of the central government's company restaurants reached the silver level.
Additional measures	None

Measure: A.21	
Factor	Finding
Main goal	Encouraging catering to serve smaller portions so that people will eat more healthily
Preventive strategy	
Public health strategy	Environmental drivers
Intervention ladder	Changing the default
Type of prevention	Universal
Technical analysis	
Specificity	No, not clear what is meant with encouraging or smaller portions
Timeframe	No deadline or specific endgoal was specified
Costs of the intervention	None
Stakeholders	KHN, catering customers
Implementation	In progress: in 2019, KHN posted an animation on healthy portion size on their communication channels. It is unclear if further steps will be taken
Additional measures	None

Measure: A.22	
Factor	Finding
Main goal	Dutch Amusement Parks will focus on providing a healthier and more responsible food supply
Preventive strategy	
Public health strategy	Environmental drivers
Intervention ladder	Enable choice
Type of prevention	Universal
Technical analysis	
Specificity	No, remains unambiguous what how many amusement parks are participating and what they will do exactly to be healthier
Timeframe	Starting in 2020, a investigation starts on how they can make a step-by-step contribution in this direction. No specific deadline or endgoal was specified
Costs of the intervention	None
Stakeholders	Amusement park, JOGG, the Club van Elf, in cooperation with the Dutch Nutrition Centre, amusement park visitors
Implementation	In preparation: In 2019, JOGG and the Nutrition Center, started drawing up a guideline. This guideline is primarily intended to provide employees and managers with uniform information. There is no insight yet into how many theme parks already have a healthy offer in 2019.
Additional measures	None

Measure: A.23	
Factor	Finding
Main goal	To eat more healthily on the go, a healthier food supply along motorways and in and around public transport facilities is needed
Preventive strategy	
Public health strategy	Environmental driver
Intervention ladder	Enable choice
Type of prevention	Universal prevention
Technical analysis	
Specificity	No, not specified how many facilities are wanted to be changed or in what way a the supply will be healthy
Timeframe	No specific deadline or endgoal is specified
Costs of the intervention	None
Stakeholders	Central government and "relevant stakeholders"
Implementation	In progress: in 2019, action plans were made in two areas, namely petrol stations and trainstations. Opportunities for improvement lie in customization per location, discussions with suppliers and exchanging good examples. The possibilities for improvement vary per location. A picture was formed of the product offering at petrol stations and railway stations.
Additional measures	None

Measure: A.24	
Factor	Finding
Main goal	To promote healthy eating in patients, visitors and staff inside hospitals
Preventive strategy	
Public health strategy	Behaviour patterns
Intervention ladder	Enable choice
Type of prevention	Universal (does not specify target overweight patients)
Technical analysis	
Specificity	No
Timeframe	No later than 2025, 50% of hospitals will offer a healthy diet; no later than 2030, all of them will
Costs of the intervention	None
Stakeholders	Hospitals
Implementation	In progress: in 2019, a questionnaire was developed and distributed among hospitals to investigate the current situation. The ambition remains that 50% of hospitals offer healthy food in 2025 and all hospitals in 2030.
Additional measures	None

Measure: A.25	
Factor	Finding
Main goal	To research new innovations that help prevent and reduce overweight
Preventive strategy	
Public health strategy	N/a
Intervention ladder	Research
Type of prevention	N/a
Technical analysis	
Specificity	No
Timeframe	Research starts in 2019. No deadline or endgoal is specified
Costs of the intervention	€10 million in public funds from the budgets made available by various ministries and €10 million from private industries
Stakeholders	Ministry of Agriculture, Nature and Food Quality, the Ministry of Health, Welfare and Sport, the Ministry of Economic Affairs and Climate, Business from agriculture and horticulture, the food industry, the retail sector, catering, hospitality, ICT and technology
Implementation	In progress: at the end of 2019, there were 78 public-private partnership projects with a public budget of 13.2 million euros on the themes of food, sustainability and health.
Additional measures	None

Measure: A.26	
Factor	Finding
Main goal	
Preventive strategy	
Public health strategy	
Intervention ladder	
Type of prevention	
Technical analysis	
Specificity	
Timeframe	
Costs of the intervention	
Stakeholders	
Implementation	
Additional measures	

Measure: A.27	
Factor	Finding
Main goal	
Preventive strategy	
Public health strategy	
Intervention ladder	
Type of prevention	
Technical analysis	
Specificity	
Timeframe	
Costs of the intervention	
Stakeholders	
Implementation	
Additional measures	

Appendix B

Table 4: Technical aspects of pillar two

Goal specificity	Number of measures
Specific	1
Timebound	1
Specific and time bound	1
Target groups¹	Number of measures
Children and youth	4
Inactive population	2
General population	1
Employers and employees	1
Individuals with intellectual disabilities	1
Monetary resources	Total (x € 1.000.000)
Total	6.5
1: Measures do not add up to 7 due to multiple attention points used in one intervention	

Summary pillar two											
What percentage of measures have a set timeframe or deadline? (and, if so, when is it due)					Public health strategy						
No set timeframe or deadline: B.01 B.06		With set timeframe or deadline: B.07: 2020			Systemic drivers	Environmental drivers B.04	Behavioural patterns B.02 B.03 B.05 B.06 B.07	Energy imbalance	Not stated/not applicable B.01		
B.02											
B.03											
B.04											
B.05											
How many measures have a specific goal?											
No specific goal B.01 B.05		Have a specific goal B.07									
B.02 B.06											
B.03											
B.04											
How many measures have a follow-up goal when the initial goal is achieved?											
No follow-up goal B.01 B.06		With follow-up goals: -									
B.02 B.07											
B.03											
B.04											
B.05											
What level of prevention is most targeted?											
Universal B.03 B.04 B.05		Selective B.01 B.02 B.06 B.07	Indicated B.02	Care related -	Targeted groups General society B.04		Children/youth B.02 B.04 B.05 B.06	Employees/employers B.03	Sports associations/evenements -	Inactive B.01 B.02	Intellectual disability B.07
Prevention ladder											
Do nothing/monitor the situation		Provide information B.03	Enable choice B.02 B.06 B.04 B.05 B.06	Guide choice through changing the default policy	Guide choice through incentives -	Guide choice through disincentives -	Restrict choice -	Eliminate choice -	Research -	Not stated B.01	
Budget					Responsible stakeholders						
Measure(s)	Amount	Remark	NOC*NSF B.01 B.02	VSG B.01 B.04	Fietsersbond B.03 B.04	JOGG B.04	VWS B.05 B.06 B.07				
B.03	€ 500.000,00										
B.05/B.06	€ 6.000.000,00										
Total	€ 6.500.000,00										

Measure: B.01	
Factor	Finding
Main goal	In order to make training programmes and exercise facilities more suitable for people who are inactive, sports and exercise providers will be supported with the knowledge and encouragement they need to establish links with local parties.
Preventive strategy	
Public health strategy	Not stated
Intervention ladder	Not stated
Type of prevention	Selective prevention
Technical analysis	
Specificity	No, not stated how many sports and exercise providers or local parties will be contacted
Timeframe	No deadlines or endgoals are specified
Costs of the intervention	None
Stakeholders	Sports associations and the Association of Sports and Municipalities (VSG), NOC*NSF
Implementation	In preparation: first meeting were held in 2019, in 2020 the first support from sports and exercise providers started
Additional measures	None

Measure: B.02	
Factor	Finding
Main goal	To get inactive people and children who are or who run the risk of being overweight to start exercising, sports providers will offer easy access to sports facilities, which easily develop into participation in regular sports activities
Preventive strategy	
Public health strategy	Behavioural patterns
Intervention ladder	Enable choice
Type of prevention	Selective and indicated prevention
Technical analysis	
Specificity	No, unclear what easy access means, how many individuals will be reached or how many sports providers ideally participate
Timeframe	No deadline or endgoal was specified
Costs of the intervention	None
Stakeholders	Sports providers will be supported in this by sports associations, commercial sports providers, the eight Dutch Sports Colleges and their teaching staff, community sports coaches, and other local partners, NOC*NSF
Implementation	In preparation: in 2019, "various" sports federations have improved and expanded their sports offer for inactive or overweight individuals. The RIVM rapport did not mention a specific number. Give children, especially low-income families, free access to sports facilities. Place participation over winning, because this is an important element in the easily accessible offering of sports. Provide more recreational forms of sport as opposed to the (standard) competitive form.
Additional measures	

Measure: B.03	
Factor	Finding
Main goal	To encourage employees and employers to go to and from work more actively, the Working in Motion Alliance will be set up. The Alliance will inspire employers and employees to take the most effective measures they can in the area of working healthy and will offer tips on how they can present themselves and their active policies in this area.
Preventive strategy	
Public health strategy	Behavioural patterns
Intervention ladder	Provide information
Type of prevention	Universal prevention
Technical analysis	
Specificity	No, unclear how employers and employees will be inspired, or how many
Timeframe	No deadline or endgoal is specified
Costs of the intervention	The Working in Motion Alliance got admitted €500.000 over a three year period
Stakeholders	The alliance consists of the Dutch Union of Cyclists (Fietzersbond) and Wandelnet, employers, employees
Implementation	In progress: a new website is online and functioning https://werkenibeweging.nl/
Additional measures	None

Measure: B.04	
Factor	Finding
Main goal	To enable children to cycle and walk safely and healthily to school, local and regional agreements are being made. Additionally, various organizations will develop and disseminate knowledge to foster healthy neighbourhoods in the Netherlands.
Preventive strategy	
Public health strategy	Environmental drivers
Intervention ladder	Enable choice
Type of prevention	Universal prevention
Technical analysis	
Specificity	No, not stated sort of agreements will be made, how many schools or municipalities participate
Timeframe	No deadline or endgoal was specified
Costs of the intervention	None
Stakeholders	Local agreements are made by municipalities with local and regional stakeholders, knowledge development and dissemination by VNG, VSG, JOGG, Sportzucht 12 ("Sports Power 12"), the Dutch Cycling Federation, the walking and hiking foundation Wandelnet, the educational councils via the Healthy Schools programme, the Dutch National General Practitioners Association (LHV), and the sports federations
Implementation	In preparation: in 2019, the JOGG developed an approach to improve the safety of school environment. No municipality adopted this approach yet.
Additional measures	None

Measure: B.05	
Factor	Finding
Main goal	To provide children with an appropriate range of activities to help develop their motor skills.
Preventive strategy	
Public health strategy	Behavioural patterns
Intervention ladder	Enable choice
Type of prevention	Universal
Technical analysis	
Specificity	No, unclear what the activities are or how many children are wanted to be reached
Timeframe	No deadline or specific endgoal is specified
Costs of the intervention	Development of motor skills got admitted €6.000.000 over a three year period
Stakeholders	VWS, community sports coaches, care providers and sports and exercise providers will work together, children
Implementation	In progress: community sports coaches were already commonly used among municipalities and are now even more deployed. There is no update on other sports providers.
Additional measures	None

Measure: B.06	
Factor	Finding
Main goal	To support children with motor problems, based on movement problems or motor disorders
Preventive strategy	
Public health strategy	Behavioural patterns
Intervention ladder	Enable choice
Type of prevention	Selective prevention
Technical analysis	
Specificity	No, unclear how children will be supported or how many are wanted to be reached
Timeframe	No deadline or endgoal was specified
Costs of the intervention	Development of motor skills got admitted €6.000.000 over a three year period
Stakeholders	VWS, children with motor problems
Implementation	Progression unknown: by 2019 it was still unclear how many schools offered extra support to children with motor problems
Additional measures	None

Measure: B.07	
Factor	Finding
Main goal	For people with intellectual disabilities who have an unhealthy-than-average lifestyle and poorer access to healthcare, sporters and coaches will be trained
Preventive strategy	
Public health strategy	Behavioural patterns
Intervention ladder	Enable choice
Type of prevention	Selective preventions
Technical analysis	
Specificity	Yes
Timeframe	In 2019 and 2020 the Healthy Athletes programme of the Special Olympics will offer training to 750 coaches and 2,000 athletes
Costs of the intervention	None
Stakeholders	VWS, Healthy Athletes programme, Special Olympics, people with intellectual disabilities
Implementation	In progress: by 2019, 300 coaches were trained in total
Additional measures	None

Appendix C

Table 5: Technical aspects of pillar three

Goal specificity	Number of measures
Specific	17
Timebound	14
Specific and timebound	12
Target groups¹	Number of measures
Individuals with obesity	9
Children and youth	7
Hospitals	4
Individuals with high risk of overweight	2
General population	2
Sports events	1
Monetary resources	Total (x € 1.000.000)
Total	13.9

1: Measures do not add up to 27 due to multiple attention points used in one intervention

Summary pillar three

What percentage of measures have a set timeframe or deadline? (and, if so, when is it due)				Public health strategy								
No set timeframe or deadline:		With set timeframe or deadline:		Systemic drivers	Environmental drivers	Behavioural patterns	Energy imbalance	Not stated/not applicable				
C:03 C:21		C:01: 2020	C:14: 2030		C:01	C:04		C:03				
C:07 C:22		C:02: 2040	C:16: 2030		C:02	C:05		C:08				
C:08 C:23		C:04 2030	C:19: 2021		C:06	C:11		C:17				
C:11 C:24		C:05: 2020	C:26: 2019		C:07	C:12		C:18				
C:15 C:25		C:06: 2021	C:27: 2021		C:09	C:13		C:21				
C:17		C:09: 2020			C:10	C:16		C:23				
C:18		C:10: 2025			C:14	C:20		C:24				
C:20		C:12: 2020			C:15	C:22						
					C:19	C:25						
						C:26						
						C:27						
How many measures have a specific goal?												
No specific goal		Have a specific goal										
C:03 C:15		C:01 C:08 C:17 C:26										
C:07 C:18		C:02 C:09 C:19 C:27										
C:10 C:23		C:04 C:12 C:20										
C:11 C:24		C:05 C:13 C:21										
How many measures have a follow-up goal when the initial goal is achieved?												
No follow-up goal		With follow-up goals:										
All		None										
What level of prevention is most targeted?				Targeted groups								
Universal	Selective	Indicated	Care related	General society	Children/youth	People with overweight/obesity	High risk groups	Sports associations/evenements	Hospitals			
C:01	C:04	C:13 C:14	C:11 C:27	C:06	C:01 C:17	C:11 C:21	C:04	C:24	C:14			
C:02	C:06	C:19	C:12 C:25	C:07	C:02	C:12 C:22	C:04		C:15			
C:05	C:10	C:20	C:13 C:26		C:05	C:13 C:25	C:16		C:19			
C:07		C:21	C:15 C:14		C:09	C:20 C:26			C:23			
C:09		C:22	C:19		C:10							
C:16		C:26	C:20		C:12	C:20 C:27						
C:17		C:27	C:21									
What determinant of obesity are most measures aimed at?												
Do nothing/monitor the situation	Provide information	Enable choice:	Guide choice through changing the default policy	Guide choice through incentives	Guide choice through disincentives	Restrict choice	Eliminate choice	Research	Not stated			
C:01	C:04	C:04 C:12 C:19 C:02	C:04 C:12 C:19 C:02	-	-	-	-	C:08	C:03 C:25			
C:14	C:15	C:05 C:13 C:20 C:10	C:05 C:13 C:20 C:10	-	-	-	-		C:07			
C:15	C:18	C:06 C:14 C:22	C:06 C:14 C:22	-	-	-	-		C:21			
		C:09 C:16 C:27	C:09 C:16 C:27	-	-	-	-		C:23			
		C:11 C:17 C:01	C:11 C:17 C:01	-	-	-	-					
Budget												
Measure(s)	Amount	Remark										
C:01	€ 1.000.000,00	For Healthy Schools € 2.000.000,00 was admitted. Since it is mentioned for two rules in two separate pillars (A.19), each gets €1.000.000,00										
C:02	€ 200.000,00											
C:04	€ 400.000,00											
C:05	€ 300.000,00	For Healthy Childcare € 600.000,00 was admitted. Since it is mentioned for two rules in two separate pillars (A.19), each gets €300.000,00										
C:08/C:09/C:	€ 3.400.000,00											
C:12	€ 4.300.000,00											
C:14/C:15	€ 800.000,00											
C:14/C:15	€ 1.300.000,00											
C:23	€ 200.000,00											
C:26	€ 200.000,00											
C:19/C:27	€ 1.400.000,00											
C:27	€ 400.000,00											
Total	€ 13.900.000,00											
Additional measures												
Responsible stakeholders												
C:05: expansion of the measure	Gezonde school			Special Heroes	PON	IVN	JOGG	SWN	VWS	ZN	NOC*NSF	NDF
C:12: make the goal more specific & practical advice	C:01			C:04	C:11	C:02	C:08	C:16	C:05 C:22	C:20	C:24	C:25
C:13: expansion of the measure	C:02				C:19	C:06	C:09		C:14 C:23			C:26
C:23: make the goal more specific					C:27		C:10		C:17			
C:24: expansion of the measure							C:12		C:18			
C:26: expansion of the measure												
C:27: expansion of the measure												

Measure: C.01	
Factor	Finding
Main goal	To create a healthier school environment, schools in primary, secondary and secondary vocational education will use parts or all of the Healthy Schools Support programme. This programme focuses on education, healthy surroundings, monitoring, and policy in and around schools.
Preventive strategy	
Public health strategy	Environmental drivers
Intervention ladder	Providing informing, enabling choice
Type of prevention	Universal prevention
Technical analysis	
Specificity	Yes
Timeframe	By 2020, a quarter of all schools in above mentioned grades make use of the programme. No follow-up goals are mentioned.
Costs of the intervention	Healthy School has a budget of 2 million euro's over three years (same financial plan as A.19)
Stakeholders	Central government, Healthy Schools, children, youth
Implementation	In progress: by end 2019, 17% of all schools had implemented the Healthy Schools programme
Additional measures	None

Measure: C.02	
Factor	Finding
Main goal	To create a healthier school environment, schools in primary, secondary and secondary vocational education will have a working coordinator who is the point of contact, organiser and facilitator of the implementation of the Healthy Schools programme. In addition, municipalities and schools in all provinces will be supported with the knowledge and expertise to create healthy school playgrounds at
Preventive strategy	
Public health strategy	Environmental drivers
Intervention ladder	Enable choice
Type of prevention	Universal prevention
Technical analysis	
Specificity	Yes
Timeframe	All schools in above mentioned educational levels will have a coordinator by 2040 Knowledge on health school playgrounds will be no later than 2020 and at
Costs of the intervention	Healthy school playgrounds got 200.00 admitted €200.000 over two years
Stakeholders	Healthy School, the Councils on Primary Education, Secondary Education and Senior Secondary Vocational Education and Healthy Schools In progress: in 2018 the first coordinators were hired in various schools.
Implementation	Regarding play grounds, a support plan was made in 2019 and implementation started in 2020
Additional measures	None

Measure: C.03	
Factor	Finding
Main goal	The eight Sports Colleges in the Netherlands promised to fulfill the ambition to reduce obesity
Preventive strategy	
Public health strategy	Not stated
Intervention ladder	Not stated
Type of prevention	Not stated
Technical analysis	
Specificity	No, unclear how they will help fulfill the ambition
Timeframe	No deadline or endgoal was specified
Costs of the intervention	None
Stakeholders	The eight Sports Colleges
Implementation	In progress: in 2019, 'overweight' received attention within 5 of the 8 Sports Science programs in relation to the composition of exercise and training programs.
Additional measures	None

Measure: C.04	
Factor	Finding
Main goal	To help children with disabilities in special education, an effective intervention in accordance with the standards of the Healthy Living Desk for the Healthy School programme will be developed.
Preventive strategy	
Public health strategy	Behavioural patterns
Intervention ladder	Enable choice
Type of prevention	Selective prevention
Technical analysis	
Specificity	Yes
Timeframe	The goal is to eventually reach 160,000 children in special education and educate them on healthy lifestyles. It is not specified when this number will be reached in total. 30% of people with disabilities will be reached by 2030.
Costs of the intervention	€400,000,00 over two years was admitted for this intervention
Stakeholders	Special Heroes, Healthy Schools, children with disabilities in special education
Implementation	In progress: in 2019, Special Heroes was developing two strategies. One is a lifestyle intervention suited for this specific group and one is adjusting current methods.
Additional measures	None

Measure: C.05	
Factor	Finding
Main goal	To ensure that even the youngest children in childcare get a healthy start, childcare organisations will have a pedagogical professional trained in Healthy Childcare
Preventive strategy	
Public health strategy	Behavioural patterns
Intervention ladder	Enable choice
Type of prevention	Universal prevention (preschoolers who go to childcare)
Technical analysis	
Specificity	Yes
Timeframe	In 2020, 50% of all childcare organisations will have a trained professional. No follow-up goal is specified
Costs of the intervention	Healthy Childcare has a budget of 0.6 million euro's over three years (same financial plan as A.19)
Stakeholders	VWS
Implementation	In progress: by the end of 2019, 15.9% of all childcare organisations had hired a trained professional
Additional measures	In addition to childcare organisations, let this agreement also apply to childminders.

Measure: C.06	
Factor	Finding
Main goal	To make the environment healthier, Healthy Neighbourhoods will be created in the Netherlands. These neighbourhoods will serve as examples to be emulated further.
Preventive strategy	
Public health strategy	Environmental drivers
Intervention ladder	Enable choice
Type of prevention	Universal
Technical analysis	
Specificity	Yes
Timeframe	In the period up to 2021, 12 Healthy Neighbourhoods will be created
Costs of the intervention	None
Stakeholders	The Institute for Nature Education and Sustainability (IVN) and Janije Beton, with the close involvement of relevant partners from this National Prevention Agreement, local residents, and local stakeholders, general society
Implementation	In progress: end 2019, 6 healthy neighbourhoods were implemented
Additional measures	None

Measure: C.07	
Factor	Finding
Main goal	To make the environment healthier, municipalities are encouraged to make local or regional agreements that include the approach to obesity, as formulated in this sub-
Preventive strategy	
Public health strategy	Environmental drivers
Intervention ladder	Not stated
Type of prevention	Universal
Technical analysis	
Specificity	No, unclear how many municipalities are wanted to participate or what agreements should be made
Timeframe	No deadline or endgoal is specified
Costs of the intervention	None
Stakeholders	VNG, municipalities, general population
Implementation	In progress: in 2019, the VNG organized meetings in each province about the integrated approach of a local / regional prevention agreement.
Additional measures	None

Measure: C.08	
Factor	Finding
Main goal	To increase the effectiveness of regular activities by the JOGG, scientific research will take place to learn about the contribution made by JOGG to the health and well-being of children and the
Preventive strategy	
Public health strategy	N/a
Intervention ladder	Research
Type of prevention	Not stated
Technical analysis	
Specificity	Yes
Timeframe	The research starts in 2019, no deadline is specified
Costs of the intervention	The JOGG, its research and further development were admitted €3,400,000 over a three year period in total
Stakeholders	JOGG
Implementation	In progress: an agency office was hired in 2019 to coordinate the investigation
Additional measures	None

Measure: C.09	
Factor	Finding
Main goal	BMI in children goes down in all municipalities that are running JOGG. Thus, JOGG programs are intensified.
Preventive strategy	
Public health strategy	Environmental drivers
Intervention ladder	Enable choice
Type of prevention	Universal prevention
Technical analysis	
Specificity	Yes
Timeframe	In 2020, half of all the municipalities will be running JOGG, and the social environment will be healthier for 2 million children.
Costs of the intervention	The JOGG, its research and further development were admitted €3,400,000 over a three year period in total
Stakeholders	JOGG, municipalities
Implementation	In progress: by the end of 2019, 40% of all municipalities was running JOGG. The increase in the percentage of JOGG municipalities is partly because the total number of municipalities in the Netherlands has decreased.
Additional measures	None

Measure: C.10

Factor	Finding
Main goal	To support the islands of Bonaire, Sint Eustatius and Saba in their efforts to get young people to a healthy weight, intensification and customisation will take place from within
Preventive strategy	
Public health strategy	Environmental drivers
Intervention ladder	Enable choice
Type of prevention	Selective prevention/indicated prevention (children/youth on the islands have higher risk of obesity)
Technical analysis	
Specificity	No, it remains vague how many young people will participate in the program or what results are wanted to be seen
Timeframe	In 2025, concrete results are promised in terms of overweight and obesity.
Costs of the intervention	The JOGG, its research and further development were admitted €3.400.000 over a three year period in total
Stakeholders	JOGG
Implementation	In progress: By 2019, JOGG started with full-time support for the BES islands. A senior advisor works on Bonaire and from there will also support Saba and St. Eustatius to implement the JOGG approach on the islands.
Additional measures	None

Measure: C.11

Factor	Finding
Main goal	To guide and treat children, families and adults after obesity has been identified, there will be a more active referral made to primary care and social services and referrals to collective activities organised within
Preventive strategy	
Public health strategy	Behavioural patterns
Intervention ladder	Enable choice
Type of prevention	Care-related prevention (after obesity has been diagnosed)
Technical analysis	
Specificity	No, unclear what more active means or how many more referrals are expected
Timeframe	No specific deadline or endgoal is specified
Costs of the intervention	None
Stakeholders	Municipalities, JOGG, VU/CAO, NLI, NCJ, RVM, PON, individuals and families with obesity
Implementation	In progress: In 2019, for children, 35 municipalities offered a comprehensive chain approach against obesity. For adults, Rotterdam started an experiment with this new approach.
Additional measures	None

Measure: C.12

Factor	Finding
Main goal	To treat children with overweight or obesity, a comprehensive chain approach will be developed based on the current national model chain approach for adults.
Preventive strategy	
Public health strategy	Behavioural patterns
Intervention ladder	Enable choice
Type of prevention	Indicated and care-related prevention (children with overweight or obesity)
Technical analysis	
Specificity	Yes
Timeframe	In 2020, 35 municipalities will have started their comprehensive chain approach
Costs of the intervention	This project was admitted €4.300.000 over a three year period
Stakeholders	JOGG, municipalities
Implementation	In progress: in 2019, 25 municipalities started offering the comprehensive chain approach to children. 1 municipality is running experiment for adults.
Additional measures	Develop the chain approach for children who grow up in a family with both high and low socio-economic status. Let municipalities pay for setting up and organizing local activities for overweight and obese children.

Measure: C.13

Factor	Finding
Main goal	To treat every child, family and adult with weight problems, an appropriate set of options to bring about healthy behavioural change will be offered to them. Additionally, a comprehensive chain approach will have been implemented in all the municipalities.
Preventive strategy	
Public health strategy	Behavioural patterns
Intervention ladder	Enable choice
Type of prevention	Indicated and care-related prevention (adults with overweight or obesity)
Technical analysis	
Specificity	Yes
Timeframe	No later than 2030 will every municipality have a comprehensive chain approach. It is not defined what an
Costs of the intervention	None
Stakeholders	JOGG, municipality, individuals with obesity
Implementation	In progress: in 2019, 25 municipalities started offering the comprehensive chain approach to children. 1 municipality is running experiment for adults. New include early warning signals. You can see early on whether children deviate from their growth curve, even if they are not yet (just) not overweight. Deploy youth health care more actively and anchor the chain
Additional measures	

Measure: C.14

Factor	Finding
Main goal	Across education for healthcare and welfare professionals, extra attention will be paid to healthy nutrition, sports and exercise, a healthy lifestyle and a broad view of the underlying problems of obesity
Preventive strategy	
Public health strategy	Environmental drivers
Intervention ladder	Provide information
Type of prevention	Indicated/care related
Technical analysis	
Specificity	No, not stated how much more attention will be paid (hours/pages), in what professions
Timeframe	By 2030 latest
Costs of the intervention	Food and lifestyle in healthcare has a budget of €1.300.000 over three years
Stakeholders	VWS, hospitals
Implementation	In progress: various initiatives are running in medicine and nursing studies.
Additional measures	None

Measure: C.15

Factor	Finding
Main goal	To make healthcare professionals more deployable against obesity, there will be more focus on prevention (including nutrition, sports and exercise, and lifestyle), taking a broad view of underlying factors of obesity, and on multidisciplinary cooperation in the training of paediatric and other nurses, junior doctors and further training as GPs
Preventive strategy	
Public health strategy	Environmental drivers
Intervention ladder	Provide information
Type of prevention	Care-related prevention
Technical analysis	
Specificity	No, goal is not specific. It remains unclear how "more focus" will be achieved
Timeframe	Not specified
Costs of the intervention	Food and lifestyle in healthcare has a budget of €1.300.000 over three years Prevention in healthcare was admitted €800.000 over a three year period
Stakeholders	Not specified
Implementation	New goals were made in 2018: in 2021, more attention to above mentioned points will be given in at least 4 medicine studies and 20% of the nursing studies. Currently there is no extra attention for lifestyle in the basic curriculum
Additional measures	None

Measure: C.16

Factor	Finding
Main goal	To raise the number of members of Sociaal Werk Nederland, the sector for social workers who are active in social care and which actively offers sports and exercise
Preventive strategy	
Public health strategy	Behavioural patterns
Intervention ladder	Enable choice
Type of prevention	Universal - selective
Technical analysis	
Specificity	Yes
Timeframe	In 2030, the number is raised to 400
Costs of the intervention	None
Stakeholders	Sociaal Werk Nederland, high risk groups overweight
Implementation	In progress: in 2019, the number of social workers increased from 200 to 250
Additional measures	None

Measure: C.17

Factor	Finding
Main goal	To help professionals in the care of the youngest children, a screening instrument for the support and care of children from birth to four years old will be developed on various themes
Preventive strategy	
Public health strategy	N/a
Intervention ladder	Enable choice
Type of prevention	Universal prevention
Technical analysis	
Specificity	Yes
Timeframe	In 2020 the development was promised to start
Costs of the intervention	None
Stakeholders	Not specified
Implementation	In progress: the Erasmus MC got allocated a subsidy to develop this new tool and is expected to be delivered in 2022
Additional measures	None

Measure: C.18

Factor	Finding
Main goal	Since breastfeeding contributes to the health of mother and child, and a healthy weight, study of the e-learning module Breastfeeding, which helps professionals to support mothers in the field of breastfeeding, will be encouraged.
Preventive strategy	
Public health strategy	N/a
Intervention ladder	Provide information
Type of prevention	Universal prevention
Technical analysis	
Specificity	No, it remains unclear how many professionals are wanted to participate
Timeframe	No deadline or endgoal is specified
Costs of the intervention	None
Stakeholders	Not specified
Implementation	In progress: by 2019, 9135 participants studied the e-learning module
Additional measures	None

Measure: C.19	
Factor	Finding
Main goal	The multidisciplinary guideline and the standard of care for overweight and obesity will be revised from an integrated
Preventive strategy	
Public health strategy	Environmental driver
Intervention ladder	Enable choice
Type of prevention	Indicated/care-related prevention (Individuals with overweight and obesity)
Technical analysis	
Specificity	Yes
Timeframe	The multidisciplinary guideline will be revised in 2020 and the standard of care for overweight and obesity in 2021.
Costs of the intervention	€1.400.000 over three years, in the same financial plan with C-27
Stakeholders	PON
Implementation	In progress: in 2019, first meetings were held with stakeholders and subsidy was allocated for this project
Additional measures	None

Measure: C.20	
Factor	Finding
Main goal	A toolkit will be developed that includes the best practices for carrying out the combined lifestyle intervention.
Preventive strategy	
Public health strategy	Behavioural patterns
Intervention ladder	Enable choice
Type of prevention	Indicated/care-related prevention
Technical analysis	
Specificity	Yes
Timeframe	No deadline or endgoal was specified
Costs of the intervention	None
Stakeholders	The Dutch Health Insurers Association (ZN) in collaboration with the VNG
Implementation	In progress: in 2019 a meeting was organised between community sport coaches to exchange ideas and best practices.
Additional measures	None

Measure: C.21	
Factor	Finding
Main goal	The Care Institute will give a concrete description of the position and financing of the central care provider for overweight and obese children compared to the current
Preventive strategy	
Public health strategy	N/a
Intervention ladder	Not stated
Type of prevention	Indicated/care related prevention
Technical analysis	
Specificity	Yes
Timeframe	No deadline is specified
Costs of the intervention	None
Stakeholders	The Care Institute
Implementation	In progress: various meeting with stakeholders have taken place
Additional measures	None

Measure: C.22	
Factor	Finding
Main goal	To improve effective interventions against overweight and obesity, the database of the Healthy Living Desk will provide insights into which effective approaches, including combined
Preventive strategy	
Public health strategy	Behavioural patterns
Intervention ladder	Enable choice
Type of prevention	Indicated/care-related prevention
Technical analysis	
Specificity	Yes
Timeframe	The database should be updated from 2019 and on
Costs of the intervention	None
Stakeholders	Healthy Living Desk
Implementation	In progress: in 2018, the Healthy Living Desk published the database with the current three providers of CLI
Additional measures	None

Measure: C.23	
Factor	Finding
Main goal	To improve the role of the hospital addressing prevention and a healthy lifestyle, the experience and expertise of leading hospitals will be disseminated further.
Preventive strategy	
Public health strategy	N/a
Intervention ladder	Not stated
Type of prevention	Not stated
Technical analysis	
Specificity	Yes, unclear how many hospitals will participate or how dissemination will be done
Timeframe	No deadline or endgoal is specified
Costs of the intervention	This project got admitted a one time €200.000 reimbursement
Stakeholders	NVZ
Implementation	In progress: in 2019, various projects were started regarding healthy food in hospitals
Additional measures	Define a healthier food offer in terms of composition and portion size. Require the presence of a trained pedagogical professional.

Measure: C.24	
Factor	Finding
Main goal	To improve on the connection between sports and exercise facilities in the public domain and healthcare, local professionals will be supported in their efforts to make these connections.
Preventive strategy	
Public health strategy	N/a
Intervention ladder	Not stated
Type of prevention	Not stated
Technical analysis	
Specificity	Yes, not stated how many local professionals are wanted to participate or how
Timeframe	No specific deadline or endgoal is specified
Costs of the intervention	None
Stakeholders	NOC*NSF, VSG, sports federations, the eight Sports Colleges
Implementation	In progress: NOC*NSF made plans and spoke to national parties. In 2020, support of local parties starts
Additional measures	Also focus on a more diverse range of exercise in healthcare institutions. Encourage healthcare institutions to integrate more sport and exercise into the offer.

Measure: C.25	
Factor	Finding
Main goal	To reduce the number of people with type-2 diabetes mellitus, efforts must be made to improve compliance with existing guidelines and standards of care, and to move from care and disease to health and healthy behaviour. More attention can also be given to the importance of supportive
Preventive strategy	
Public health strategy	Behavioural patterns
Intervention ladder	Not stated
Type of prevention	Indicated prevention (Individuals with diabetes)
Technical analysis	
Specificity	No, not specified what "efforts" or "more attention" are, or how many patients will be contacted
Timeframe	No deadline or endgoal is specified
Costs of the intervention	None
Stakeholders	Dutch Diabetic Federation (NDF), patients with diabetes type 2
Implementation	In progress: the NDF organised working groups on how the goal can be attained in the long run
Additional measures	None

Measure: C.26	
Factor	Finding
Main goal	To improve compliance with current guidelines and achieve a broadly supported, integrated approach to a healthy lifestyle for people with overweight or obesity and type-2 diabetes mellitus, a coordinator will be selected.
Preventive strategy	
Public health strategy	Behavioural patterns
Intervention ladder	Provide information
Type of prevention	Indicated/care-related prevention
Technical analysis	
Specificity	Yes
Timeframe	In 2019 the coordinator will be selected
Costs of the intervention	This project was admitted €200.000 over 1 year
Stakeholders	NDF
Implementation	In progress: in 2019 there were three meetings between stakeholders
Additional measures	Deploy a coordinator (neighborhood sports coach with the right care background) in each region to connect the medical and social domain. Focus more on propagating the guidelines from all relevant organizations. The local parties must be able to get started. Provide one broad (by all partners) guideline instead of multiple guidelines. Expand the role of neighborhood sports coach. In each neighborhood, make room for liaison officers who can connect individual and collective solutions and who can guide people from the GP

Measure: C.27	
Factor	Finding
Main goal	The current comprehensive chain approach to overweight and obesity, which has been developed for young people, will be developed further. In addition, a comprehensive chain approach to obesity will be developed for adults with obesity and/or type-2 diabetes mellitus. Here, too, on the initiative of Special Heroes Netherlands, extra attention will be given to adults with a disability.
Preventive strategy	
Public health strategy	Behavioural patterns
Intervention ladder	Enable choice
Type of prevention	Indicated/care-related prevention
Technical analysis	
Specificity	Yes
Timeframe	The further development will continue in the period up to and including 2021.
Costs of the intervention	Development of a comprehensive chain approach for adults with a disability was admitted €400.000 over two years. Further development of the comprehensive chain approach for all adults was admitted
Stakeholders	PON
Implementation	In progress: in 2019, 25 municipalities started offering the comprehensive chain approach to children. 1 municipality is running experiment for adults.
Additional measures	Facilitate the conditions for participation and reimbursement of the GLI. Reimburse the GLI and the commitment of the central care provider for overweight children with risk factors or co-morbidity or obesity under the Health Insurance Act. Obligate insurers and municipalities to reimburse all GLIs and coordination costs to properly set up the system and keep it going, while keeping an eye on other types of problems that hinder lifestyle changes. Make the role / collaboration of / with the neighborhood sports coach part of the GLI. This offers guidance in finding a connection with the exercise possibilities in your own environment. This will work on sustainable sports and physical activity outside of

Appendix D

Summary Top 10 additional measures										
Top 10 additional measures experts										
Level of intervention										
Universal 3.1.1.1 3.1.3.1 3.1.1.3 3.1.6.2 3.1.1.5 3.1.6.4 3.1.1.7 3.1.2.3 3.1.2.6	Selective 3.1.2.6	Indicated 3.1.7.1	Care-related -							
Intervention ladder										
Do nothing/monitor the situation -	Provide information -	Enable choice 3.1.2.3 3.1.2.6 3.1.7.1	Guide choice through changing the default policy -	Guide choice through incentives 3.1.1.3	Guide choice through disincentives 3.1.1.1 3.1.1.5 3.1.1.7	Restrict choice 3.1.3.1 3.1.6.2 3.1.6.4	Eliminate choice 3.1.6.2	Research -	Not stated -	
Pillar NPA										
Healthy nutrition 3.1.1.1 3.1.2.3 3.1.1.3 3.1.2.6 3.1.1.5 3.1.3.1 3.1.1.7 3.1.6.4	More sports and exercise 3.1.2.6	Healthy environment 3.1.6.2 3.1.7.1	Public health strategy			Environmental drivers 3.1.2.3 3.1.2.6 3.1.3.1 3.1.6.2 3.1.6.4	Behavioural patterns 3.1.7.1	Energy imbalance	Not stated/not applicable	

Price regulation							
3.1.1.1		3.1.1.2		3.1.1.3			
Factor	Finding	Factor	Finding	Factor	Finding		
<i>Main goal</i>	The sugar tax is introduced on soft drinks and other products with added sugars. A limit is set on the amount of sugar that is allowed,	<i>Main goal</i>	Price discounts on products outside the Wheel of Five are no longer permitted.	<i>Main goal</i>	Healthy food becomes cheaper, for example by not levying VAT on the Disk of Five products. The		
<i>Level of intervention</i>	Universal prevention	<i>Level of intervention</i>	Universal prevention	<i>Level of intervention</i>	Universal prevention		
<i>Public health strategy</i>	Systemic drivers	<i>Intervention ladder</i>	Guide choice through disincentives	<i>Public health strategy</i>	Systemic drivers		
<i>Intervention ladder</i>	Guide choice through disincentives	<i>Pillar NPA</i>	Healthy nutrition	<i>Intervention ladder</i>	Guide choice through incentives		
<i>Pillar NPA</i>	Healthy Nutrition	<i>Top 10</i>	No	<i>Pillar NPA</i>	Healthy nutrition		
<i>Top 10</i>	Yes			<i>Top 10</i>	Yes		
3.1.1.4		3.1.1.5		3.1.1.6			
Factor	Finding	Factor	Finding	Factor	Finding		
<i>Main goal</i>	Prices of soft drinks are adjusted based on calories; X% more calories means that the product becomes Y% more expensive.	<i>Main goal</i>	True pricing is applied, which means that costs related to health and the environment are passed	<i>Main goal</i>	The consumption of red and processed meat is discouraged, for example by a ban on discounts or a		
<i>Level of intervention</i>	Universal prevention	<i>Level of intervention</i>	Universal prevention	<i>Level of intervention</i>	Universal prevention		
<i>Intervention ladder</i>	Guide choice through disincentives	<i>Public health strategy</i>	Systemic drivers	<i>Intervention ladder</i>	Guide choice through disincentive		
<i>Pillar NPA</i>	Healthy nutrition	<i>Intervention ladder</i>	Guide choice through disincentive	<i>Pillar NPA</i>	Healthy nutrition		
<i>Top 10</i>	No	<i>Pillar NPA</i>	Healthy nutrition	<i>Top 10</i>	No		
		<i>Top 10</i>	Yes				
3.1.1.7		3.1.1.8					
Factor	Finding	Factor	Finding				
<i>Main goal</i>	Taxes are imposed on ultra-processed foods. The reason for the tax is stated on the products.	<i>Main goal</i>	There will be a ban on quantity discounts for unhealthy products.				
<i>Level of intervention</i>	Universal prevention	<i>Level of intervention</i>	Universal prevention				
<i>Public health strategy</i>	Systemic drivers	<i>Intervention ladder</i>	Restrict choice				
<i>Intervention ladder</i>	Guide choice through disincentives	<i>Pillar NPA</i>	Healthy nutrition				
<i>Pillar NPA</i>	Healthy nutrition	<i>Top 10</i>	No				
<i>Top 10</i>	Yes						

Supply					
3.1.2.1		3.1.2.2		3.1.2.3	
Factor	Finding	Factor	Finding	Factor	Finding
Main goal	There will be a maximum percentage of unhealthy foods from the total product range in retail, catering and the hotel and catering	Main goal	Supermarkets are obliged to use a larger portion of the shelves for healthy products and to no longer	Main goal	Water is served for free everywhere (in restaurants and canteens).
Level of intervention	Universal prevention	Level of intervention	Universal prevention	Level of intervention	Universal prevention
Intervention ladder	Restrict choice	Intervention ladder	Guide choice through changing the default policy	Intervention ladder	Enable choice
Pillar NPA	Healthy nutrition	Pillar NPA	Healthy nutrition	Pillar NPA	Healthy nutrition
Top 10	No	Top 10	No	Top 10	Yes
3.1.2.4		3.1.2.5		3.1.2.6	
Factor	Finding	Factor	Finding	Factor	Finding
Main goal	The supply of products outside the Wheel of Five is no longer permitted in public institutions and in public spaces. For meals, use is made of the Guidelines for Healthier Canteens of the Netherlands Nutrition Center.	Main goal	Food aid is provided to people below a certain income threshold by providing free healthy foods or fruit and vegetable packages (for example with vouchers).	Main goal	Agreements about the food supply in the workplace are made with employers on the basis of the 'Guidelines for Healthier Canteens' of the Netherlands Nutrition Center. In addition, agreements are made about exercise in the workplace. For company canteens in workplaces where many people with a lower socio-economic
Level of intervention	Universal prevention	Level of intervention	Universal prevention	Level of intervention	Universal/selective prevention
Intervention ladder	Restrict choice	Intervention ladder	Enable choice	Intervention ladder	Enable choice
Pillar NPA	Healthy nutrition	Pillar NPA	Healthy nutrition	Pillar NPA	Healthy nutrition/ More sports and exercise
Top 10	No	Top 10	No	Top 10	Yes
3.1.2.7		3.1.2.8		3.1.2.9	
Factor	Finding	Factor	Finding	Factor	Finding
Main goal	Hospitality and catering reduce the portion sizes of products outside the Wheel of Five.	Main goal	Make sure that 80% of the supply of catering organizations comes from the Wheel of Five. For	Main goal	Municipalities are supported in the development and implementation of preventive measures aimed
Level of intervention	Universal prevention	Level of intervention	Universal prevention	Level of intervention	Universal prevention
Intervention ladder	Restrict choice	Intervention ladder	Restrict choice	Intervention ladder	Not stated
Pillar NPA	Healthy nutrition	Pillar NPA	Healthy nutrition	Pillar NPA	Healthy nutrition
Top 10	No	Top 10	No	Top 10	No
3.1.2.10					
Factor	Finding				
Main goal	Within the (home) work environment, more attention is paid to movement and posture, for example by making adjustable desks				
Level of intervention	Universal prevention				
Intervention ladder	Enable choice				
Pillar NPA	More sports and exercise				
Top 10	No				

Marketing							
3.1.3.1		3.1.3.2		3.1.3.3			
Factor	Finding	Factor	Finding	Factor	Finding		
<i>Main goal</i>	The share of the Wheel of Five products in advertisements will be increased and the marketing of products outside the Wheel of Five will be prohibited (also in supermarkets).	<i>Main goal</i>	Kilocalories per 100 grams are mandatory in advertising for all products.	<i>Main goal</i>	Sports sponsorship by food producers who have unhealthy foods in their product portfolio will be banned. As well as sponsorship of unhealthy foods in schools, hospitals, company canteens, government funded institutions, sports canteens		
<i>Level of intervention</i>	Universal prevention	<i>Level of intervention</i>	Universal prevention	<i>Level of intervention</i>	Universal prevention		
<i>Public health strategy</i>	Environmental drivers	<i>Intervention ladder</i>	Provide information	<i>Intervention ladder</i>	Restrict choice		
<i>Intervention ladder</i>	Restrict choice	<i>Pillar NPA</i>	Healthy nutrition	<i>Pillar NPA</i>	Healthy nutrition		
<i>Pillar NPA</i>	Healthy nutrition	<i>Top 10</i>	No	<i>Top 10</i>	No		
<i>Top 10</i>	Yes						
Product regulation							
3.1.4.1		3.1.4.2		3.1.4.3			
Factor	Finding	Factor	Finding	Factor	Finding		
<i>Main goal</i>	There will be legal agreements on smaller portion sizes and packaging units for all products.	<i>Main goal</i>	It is required by law to state on the packaging how many added sugars the products contain.	<i>Main goal</i>	High-fructose corn syrup and palm oil are banned in foods.		
<i>Level of intervention</i>	Universal prevention	<i>Level of intervention</i>	Universal prevention	<i>Level of intervention</i>	Universal prevention		
<i>Intervention ladder</i>	Restrict choice	<i>Intervention ladder</i>	Provide information	<i>Intervention ladder</i>	Eliminate choice		
<i>Pillar NPA</i>	Healthy nutrition	<i>Pillar NPA</i>	Healthy nutrition	<i>Pillar NPA</i>	Healthy nutrition		
<i>Top 10</i>	No	<i>Top 10</i>	No	<i>Top 10</i>	No		
3.1.4.4							
Factor	Finding						
<i>Main goal</i>	In the catering industry, an indication is given of the number of calories and nutrients such as fat, sugar, salt and fiber that dishes						
<i>Level of intervention</i>	Universal prevention						
<i>Intervention ladder</i>	Provide information						
<i>Pillar NPA</i>	Healthy nutrition						
<i>Top 10</i>	No						

Information and education					
3.1.5.1		3.1.5.2		3.1.5.3	
Factor	Finding	Factor	Finding	Factor	Finding
<i>Main goal</i>	Healthy behavior is supported by national government media campaigns that are in line with practice and that pay attention to the	<i>Main goal</i>	The stigma of overweight people is counteracted by means of a national SIRE campaign.	<i>Main goal</i>	Campaigns and education bring about a change in norms, transforming the social and policy
<i>Level of intervention</i>	Universal prevention	<i>Level of intervention</i>	Care-related prevention	<i>Level of intervention</i>	Universal prevention
<i>Intervention ladder</i>	Provide information	<i>Intervention ladder</i>	Provide information	<i>Intervention ladder</i>	Provide information
<i>Pillar NPA</i>	Healthy environment	<i>Pillar NPA</i>	Healthy environment	<i>Pillar NPA</i>	Healthy environment
<i>Top 10</i>	No	<i>Top 10</i>	No	<i>Top 10</i>	No
Environment					
3.1.6.1		3.1.6.2		3.1.6.3	
Factor	Finding	Factor	Finding	Factor	Finding
<i>Main goal</i>	The environment will be more exercise-friendly and residents will be involved. For example, 10% of roads in municipalities will only be accessible to cyclists or walkers and a minimal number of play and sports areas will be created.	<i>Main goal</i>	The number of fast food outlets will be reduced within municipalities. This can be done, for example, by means of zoning around school, transport and work environments, or by setting a	<i>Main goal</i>	People who cannot afford a bicycle can get one, if necessary supplemented with free cycling lessons.
<i>Level of intervention</i>	Universal prevention	<i>Level of intervention</i>	Universal prevention	<i>Level of intervention</i>	Selective prevention
<i>Intervention ladder</i>	Enable choice	<i>Public health strategy</i>	Environmental drivers	<i>Intervention ladder</i>	Enable choice
<i>Pillar NPA</i>	Healthy environment	<i>Intervention ladder</i>	Restrict choice/eliminate choice	<i>Pillar NPA</i>	More sports and exercise
<i>Top 10</i>	No	<i>Pillar NPA</i>	Healthy environment	<i>Top 10</i>	No
3.1.6.4		<i>Top 10</i>	Yes	3.1.6.5	
Factor	Finding	Factor	Finding	Factor	Finding
<i>Main goal</i>	There will be a ban on vending machines in public places such as (high) schools, universities and hospitals.	<i>Main goal</i>	All companies encourage bicycle use for commuting by providing financial incentives, for example by	<i>Main goal</i>	There will be extra money for the use of the Neighborhood Sports Coaches. They have an eye for
<i>Level of intervention</i>	Universal prevention	<i>Level of intervention</i>	Universal prevention	<i>Level of intervention</i>	Universal prevention
<i>Public health strategy</i>	Environmental drivers	<i>Intervention ladder</i>	Guide choice through financial incentives	<i>Intervention ladder</i>	Enable choice
<i>Intervention ladder</i>	Restrict choice	<i>Pillar NPA</i>	More sports and exercise	<i>Pillar NPA</i>	More sports and exercise
<i>Pillar NPA</i>	Healthy nutrition	<i>Top 10</i>	No	<i>Top 10</i>	No
<i>Top 10</i>	Yes				

Healthcare interventions					
3.1.7.1		3.1.7.2		3.1.7.3	
Factor	Finding	Factor	Finding	Factor	Finding
Main goal	The exercise part of the Combined Lifestyle Intervention (GLI) is funded for everyone, at least for people with a minimum income. After people have participated in the GLI, they are guided towards sustainable sports and exercise. Municipalities provide an up-to-date and accessible overview of exercise options.	Main goal	Everywhere in the Netherlands there is access to education to become a central care provider. Central healthcare providers are available in each region. Guidance to the central care providers and GLI are organized in the form of a comprehensive chain approach that is part of a local integrated	Main goal	Administrative work for GLI providers will be facilitated. Agreements with health insurers are uniform and long-term.
Level of intervention	Indicated revention	Level of intervention	Indicated prevention prevention	Level of intervention	Indicated prevention
Public health strategy	Behavioural patterns	Intervention ladder	Enable choice	Intervention ladder	Enable choicie
Intervention ladder	Enable choice	Pillar NPA	Healthy environment	Pillar NPA	Healthy environment
Pillar NPA	Healthy environment	Top 10	No	Top 10	No
Top 10	Yes				
3.1.7.4		3.1.7.5		3.1.7.6	
Factor	Finding	Factor	Finding	Factor	Finding
Main goal	Support will be provided in the upscaling and embedding of recognized interventions treatment aimed at people in debt.	Main goal	GPs receive interprofessional training to be an active link in the approach to overweight and	Main goal	Professional and understandable nutritional and exercise advice of high and unambiguous quality is
Level of intervention	Selective prevention	Level of intervention	Indicated prevention	Level of intervention	Selective prevention
Intervention ladder	Enable choice	Intervention ladder	Enable choice	Intervention ladder	Provide information
Pillar NPA	Healthy environment	Pillar NPA	Healthy environment	Pillar NPA	Healthy nutrition
Top 10	No	Top 10	No	Top 10	No
Research					
3.1.8.1		3.1.8.2		3.1.8.3	
Factor	Finding	Factor	Finding	Factor	Finding
Main goal	There will be a national research agenda for knowledge development about the prevention of overweight in various target groups (including	Main goal	It needs to be investigated how the environmental law can be used to create healthy food and exercise	Main goal	The implementation of programs, interventions and chain approaches are better monitored and
Level of intervention	n/a	Level of intervention	n/a	Level of intervention	n/a
Intervention ladder	Research	Intervention ladder	Research	Intervention ladder	Research
Pillar NPA	All three	Pillar NPA	Healthy environment	Pillar NPA	Healthy environment
Top 10	No	Top 10	No	Top 10	No
3.1.8.4		3.1.8.5		3.1.8.6	
Factor	Finding	Factor	Finding	Factor	Finding
Main goal	A health effect measurement (including attention to the effects on quality of life and social participation) will be introduced, so that the	Main goal	Research is being conducted into how an "obesogenic" environment can be transformed into	Main goal	Research is being conducted into reaching vulnerable groups and what additional measures
Level of intervention	n/a	Level of intervention	n/a	Level of intervention	n/a
Intervention ladder	Research	Intervention ladder	Research	Intervention ladder	Research
Pillar NPA	Healthy environment	Pillar NPA	Healthy environment	Pillar NPA	Healthy environment
Top 10	No	Top 10	No	Top 10	No
3.1.8.7					
Factor	Finding				
Main goal	Research needs to be conducted into which reward systems do work. A distinction is made between the various actors in the food chain.				
Level of intervention	n/a				
Intervention ladder	Research				
Pillar NPA	Healthy environment				
Top 10	No				

Other									
3.1.9.1				3.1.9.2				3.1.9.3	
Factor	Finding			Factor	Finding			Factor	Finding
<i>Main goal</i>	Health interests are included in policy development. For example, by testing policy measures for their health impact and preventing or			<i>Main goal</i>	Develop an intersectoral health policy with joint ambitions, concrete goals and multi-year plans and			<i>Main goal</i>	Every Dutch person receives a basic income that can provide for (healthy) basic necessities of life. This is
<i>Level of intervention</i>	Universal			<i>Level of intervention</i>	Universal			<i>Level of intervention</i>	Universal
<i>Intervention ladder</i>	n/a			<i>Intervention ladder</i>	n/a			<i>Intervention ladder</i>	n/a
<i>Pillar NPA</i>	n/a			<i>Pillar NPA</i>	n/a			<i>Pillar NPA</i>	n/a
<i>Top 10</i>	No			<i>Top 10</i>	No			<i>Top 10</i>	No
3.1.9.4				3.1.9.5					
Factor	Finding			Factor	Finding				
<i>Main goal</i>	Health aspects of novel foods are tested before they can be placed on the market.			<i>Main goal</i>	At local and regional level, efforts are made to address all relevant factors of obesity among				
<i>Level of intervention</i>	Universal			<i>Level of intervention</i>	Selective				
<i>Intervention ladder</i>	n/a			<i>Intervention ladder</i>	n/a				
<i>Pillar NPA</i>	Healthy nutrition			<i>Pillar NPA</i>	n/a				
<i>Top 10</i>	No			<i>Top 10</i>	No				