ERASMUS UNIVERSITY ROTTERDAM

Erasmus School of Economics

Msc thesis program Health Economics

Solidarity towards people engaging in unhealthy behaviours

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Rotterdam, July 5th, 2024

Word count: 17.302

Abstract

The health care sector is under pressure due to the rising costs. A potential solution to release some of this pressure is to implement differentiations in access to health care, meaning a change in solidarity. This thesis investigates the preferences of the Dutch population regarding these differentiations in access to health care for people engaging in unhealthy behaviours. The main research question is: "What is the opinion of the Dutch population aged 18 and older regarding differentiation in access to health care based on lifestyle behaviour?". In an online survey, participants are shown short stories detailing two patients with specific healthcare needs of which one engages in an unhealthy behaviour. Participants are then asked whether they think this person should pay a higher health care premium, a higher copayment or be placed lower on the waiting list for a treatment. This is repeated for four types of unhealthy behaviour: smoking, excessive alcohol use, unhealthy eating and not engaging in enough physical activity. In total, 147 Dutch inhabitants completed the survey. It can be concluded that there are no significant differences between the different types of access differentiations. Most respondents prefer to see a differentiation for people that smoke and for people that drink too much alcohol, but only a minority want those differentiations for people that eat unhealthy and for people that do not exercise enough. The results show no sign of in-group favouritism, meaning a difference in solidarity between people that do and people that do not engage in said unhealthy behaviours themselves. Looking at effectiveness, respondents indicate that they think the implementation of a premium increase will encourage them most to adopt healthier habits. Furthermore, most participants indicate that they think that there are external factors that might restrict an individual's ability to control their own unhealthy behaviour and that the majority of the sample size thinks that it is not completely fair to implement access differentiations for this group when they might have limited control due to external factors. Validity is tried to ensure by using randomized, valid questions from literature and via the help of health care experts who reviewed the survey. Limitations of this thesis are external validity, hypothetical bias and selection bias.

Keywords: solidarity, unhealthy behaviour, access differentiation to health care, in-group favouritism

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1. Introduction

Health care expenditures have been rising over time (Zorginstituut, 2023). Experts are expecting health care costs to rise with approximately 3.5% per year in the upcoming five years (Baltesen, 2023). It is expected that the monetary amount of health care spent per person raises from €5.100 in 2015 to €9.600 in 2040 (RIVM, 2018). These rising health care costs are reflected in the health care premium, which also increases every year (Prins, 2023). In 2023 health care premiums increased with 6.5% to an average price of €137,50 per month (Zorginstituut Nederland, 2024; Rijksoverheid, 2024) and experts expect that the health care premium will rise even more in the following years (RTL Nieuws, 2023). These rising health care costs put solidarity under pressure (Nivel, 2022). Is the way the Dutch health care system is organized still affordable with regards to these rising costs? Almost 70% of the Dutch population supports a different organization of the health care sector to maintain quality and keep it affordable and accessible (Zorginstituut Nederland, 2022). A potential solution to release some of the pressure of the health care sector is to implement differentiation in access to health care, meaning a change in solidarity.

In the Netherlands health care financing is based on solidarity among the total population since it is mandatory for every inhabitant of the Netherlands to buy basic health insurance. Solidarity means that all insured people collectively bear the financial risk of getting sick (Chadd, n.d.). Meaning that even though not all inhabitants use the same amount of health care, their monthly contribution is the same. All people contribute to finance the health care of those who need it in order to keep it affordable and therefore available for everyone (Verbond van Verzekeraars, 2021). Solidarity therefore contributes to well-being of the whole population (Gheaus, 2016). There are different types of solidarity: income solidarity and risk solidarity (Maarse, 2011). Income solidarity refers to the fact that the rich contribute more and so also partly pay for health care costs of the poor. Risk solidarity implies that healthier people also contribute to the health care costs of the sick. This can be even more specified as solidarity between sick and healthy, old and young and between those that live healthy and those that live unhealthier (Trappenburg, 2000). The latter is called lifestyle solidarity, this is the solidarity that will be the focus of this research.

This research aims to alleviate pressure by exploring the feasibility of access differentiations based on lifestyle. Previous studies have already examined solidarity distinctions among various groups, Nivel (2022) for example found lower solidarity concerning lifestyle.

Zorginstituut Nederland (2022) reported that 40% of the Dutch population believes there should be less solidarity for those leading unhealthy lives. CBS (2019) investigated preferences for health care premiums based on different unhealthy behaviours. Additionally, Stegeman et al. (2013) studied differentiations in access to health care preferences among colorectal cancer screening participants. They investigated three different access differentiations methods: higher copayments and lower waiting list priority for those engaging in unhealthy behaviour and discount in premium for those engaging in healthy behaviour. This research will investigate for different lifestyle behaviours what the preferences are of the Dutch population regarding differentiation in access to health care.

The following research question will be answered:

What is the opinion of the Dutch population aged 18 and older regarding differentiation in access to health care based on lifestyle behaviour?

This research will examine three differentiations in access to health care - premium differences, different copayments and differences in waiting times- focussing on four unhealthy behaviours – smoking, alcohol usage, eating unhealthy and doing too little exercising. These behaviours are chosen based on their assumed influenceability and their significant impact on the disease burden and healthcare expenses, totalling almost 20 percent and 9 billion euros, respectively, in 2015 (VTV, 2018). Notably, smoking is considered despite its shorter life expectancy impact, as it incurs avoidable healthcare costs, generates negative externalities, and provides an interesting comparison to opinions on other unhealthy behaviours (Hayashida et al., 2012).

The research question will be answered by investigating three sub-questions:

- *To what extent do preferences of the Dutch population differ for the different unhealthy behaviours?*
- *To what extent are there disparities in preferences between the various types of differentiation in access methods?*
- *Are people that engage in unhealthy behaviour showing more solidarity towards people with the same unhealthy habits than people that do not engage in said unhealthy behaviours?*

This research will deviate from previous research by, next to smoking, taking three different unhealthy behaviours into account. Next to this, a different target audience is investigated, namely the general Dutch population which may have different views and opinions compared to colorectal screening participants aged 50-75, who might be biased due to their own health care experiences. Lastly, instead of a premium discount, which might come with financing problems, I investigate a premium penalty for those engaging in unhealthy behaviour. Due to the different framings, gain or losses, responses might differ, adding a new layer. This research will add an interesting new dimension to the existing literature as the previous research from Stegeman, Willems, Dekker & Bosuyt (2013) is already more than 10 years old. The Dutch population and her opinion have likely changed over time. It is therefore insightful to get new information on the Dutch attitude on this matter proving the scientific relevance of this research.

As mentioned before, with the rising health care costs, solidarity will be under pressure. In order to keep a well-functioning health care system, solidarity is desired. Solidarity namely ensures affordability and therefore accessibility to the health care system for all inhabitants, also those that cannot afford to pay the health care costs on their own. It is therefore necessary to find a solution to release some of the pressure on solidarity to keep this system in place, possibly slightly different organized. This research will contribute to this by investigating how Dutch inhabitants would prefer a possible access differentiation in health care for different unhealthy behaviours. With the change, the system remains intact, solidarity remain reachable, and care remains affordable and accessible for everyone. This not only leads to personal benefits such as a longer, healthier life, but also governmental benefits such as a larger labour participation yielding more tax revenue (CPB, 2013). Proving the societal relevance of this thesis.

In the remainder of this thesis, first, an overview of the existing literature is presented. Data is collected via an online survey among the Dutch population. In the survey, participants were asked to indicate for four different unhealthy behaviour whether they would prefer a certain type of access differentiation method. Participants were also asked about their own behaviour. More details can be found in the methodology part. Results show that overall, there are no large differences in preferences between the different types of access differentiations methods, however, in some cases a premium increase is preferred. A majority of the participants wants a differentiation in access for people that smoke or that drink too much alcohol and only a

minority wants these differentiations in access for people that do not engage in enough physical activity and people that have an unhealthy diet. This thesis is concluded with a discussion, which includes a summary of the results, a policy recommendation and the limitations.

2. Literature

Growing evidence suggests that lifestyle-related risk factors contribute to an elevated susceptibility of cardiovascular diseases, diabetes, cancer, and diminished quality of life (Raad voor de Volksgezondheid en Zorg, 2002). The total direct costs of diseases caused by smoking, unhealthy eating, alcohol use and inactivity were estimated to be 4.2% of the total healthcare budget. Next to this, there are indirect costs such as social costs and absence from work (Polder, Takkern, Meerding, Kommer & Stokx, 2002). This will result in rising insurance premiums, longer waiting lists due to the increased demand and potentially to increased copayments as a solution to cover the rising expenses. These developments may influence solidarity. Worldwide, multiple health systems are said to be founded based on solidarity, meaning that through insurance systems individuals who are better of either in terms of health or wealth, take on some of the financial risk of getting sick of those who are worse-off.

Davies and Savulescu (2019) argue that health care systems founded on the principles of solidarity have the authority to impose penalties on individuals who are accountable for their own comprised health. This stems from the fact that solidarity involves both rights and obligations. The healthcare system's obligations include reciprocity, which means being willing to assist others without always receiving equivalent help in return. Additionally, there is a sense of personal responsibility, where individuals who knowingly burden the public health system with avoidable issues may fail in their solidarity obligation. Those who perform unhealthy behaviour often breach these obligations. Penalties can be imposed for those who violate the obligations, such as differentiation in access to health care, referred to as reduced solidarity.

2.1 Different forms of differentiation in access to health care

Previous research has already looked into different options for differentiations in access. Stegeman, Willems, Dekker & Bossuyt (2013) looked into three different types of access differentiation methods: discount in premium for those engaging in healthy behaviour, a higher copayment for those engaging in unhealthy behaviour and a lower priority on the waiting list. Discount in premium for individuals with a healthy lifestyle could act as a motivator for engaging in healthy behaviour, which can therefore be effective in reducing unhealthy habits. A limitation of this approach is that there needs to be adequate funding to subsidize the discounts, which might be challenging. A potential solution for this is using premium increases for those with an unhealthy lifestyle. A higher copayment and lower priority on the waiting list are both punishments that can limit engaging in unhealthy behaviours. Higher copayment can

be used to cover the costs for a specific treatment. This way, the user pays more, reducing the use of the global health care budget and lowering the pressure on solidarity. With a lower placing on the waiting list people get punished by having to wait longer for their treatment. However, it debatable whether it is ethical to purposely let people wait for treatment. Practical difficulties for all treatments are to what extent it is possible to implement access differentiations as unhealthy behaviours cannot always be observed by the insurer or the health care provider. Furthermore, a clear overview of all diseases that potentially might be influenced by unhealthy behaviour has to be made. Such that it is possible to implement access differentiations for individuals that come in with a particular disease that is potentially caused or deteriorated by their unhealthy behaviour. However, it is difficult to find a causal link between getting a particular disease and performing an unhealthy behaviour.

In their research, Stegeman, Willems, Dekker & Bossuyt (2013) investigated the opinion of colorectal cancer screening participants in the Netherlands on the three beforementioned access differentiations. Most participants favoured the discount option, and hardly any of the participants thought a differentiation based on waiting period was a good idea. This research was conducted among screening participants causing the results to be potentially different from what the general population would think as screening participants might feel different about certain health care related aspects due to own experiences. Zorginstituut Nederland (2022) also investigated other options of access differentiation. They looked into opinions on waiting time differentiation, and premium increases for those engaging in unhealthy behaviour. Followed by approximately four out of ten people agreeing with a premium increase for those engaging in unhealthy behaviour. Only a small minority believed that they should be given priority in healthcare over people with an unhealthy lifestyle.

Several countries have already implemented forms of access differentiations in practice. For instance, in many U.S. states, insurers can impose higher premiums on individuals who use tobacco (Kaplan & Kaplan, 2020). These higher premiums are popular and often used by insurers (Resnik, 2013). This trend is also evident in other nations. In India, for example, insurers have the authority to apply a premium surcharge for smokers (Bajah, 2024). Almost all smokers in India who have health insurance pay higher insurance premiums than non-smokers (Bajaj, 2024). In India, insurers collect information on unhealthy behaviours based on medical exams (Acko, 2024). Traces of for example smoking can be found in urine and blood tests. For excessive alcohol use, even stronger health regulations are found. In India, next to

imposing a premium increase for alcohol consumers, they have instituted what is known as the common health insurance alcohol exclusion (Acko, 2023). This provision specifies that any illnesses or injuries stemming from alcohol consumption will not be covered by your insurance if you are addicted to alcohol or a heavy drinker. This phenomenon is not unique to India; insurers in various countries retain the right to reject health claims arising from alcohol impairment. An example is the alcohol exclusion law in the United States which allows health insurers to deny coverage of injuries due to intoxication (Azagba, Shan, Hall, Wolfson & Chaloupka, 2022). In total, 26 U.S. states have the alcohol exclusion law, three states prohibit the exclusion of coverage for alcohol users and the other states do not have specific rules (NHTSA, 2008). Within each state, individual insurers have the possibility to choose whether to enforce the alcohol exclusion law in their health insurance contracts. Specific data on which insurers have adopted this practice is not publicly available. Impairments caused by alcohol are easy to recognize when the person is still under influence, however, it becomes more difficult when the person gets ill due to the consequences of alcohol usage as this can most of the time not be traced back.

2.2 Different unhealthy behaviours

Apart from distinguishing access differentiation methods, variations can also be made between different behaviours. Research from CBS (2019) investigated whether groups of people with certain behaviour should pay a higher, equal of lower health care premium. They found that approximately 41% of the respondents believe that a higher premium for people engaging in unhealthy behaviour is fair. These findings are in line with research from Nivel (2022) who also investigated access differentiation in terms of higher, equal or lower health care premiums. Their conclusion was that people show less solidarity towards people engaging in unhealthy behaviours such as smoking and excessive drinking. Stegeman, Willems, Dekker & Bossuyt (2013) investigated three specific behaviours, participating in a screening for colorectal cancer, having stopped smoking and participating in a smoking cessation program. The percentage of participants in favour of access differentiation varied between 20% and 58%.

Disparities exist among the four unhealthy behaviours – smoking, unhealthy eating, alcohol usage and inactivity-, not only do they differ in occurrence, but they also vary in terms of social acceptability and the level of knowledge regarding the associated risks. As an illustration, according to CBS (2015), unhealthy eating habits are prevalent among 75% of the Dutch population, and as reported by RIVM (2023), 56% of individuals fail to engage in sufficient

physical exercise. In total, 8 out of 10 Dutch inhabitants aged 18+ drink alcohol occasionally (CBS, 2014). One in every fifteen people drinks excessively and 8.3% is labelled as binge drinkers. In contrast, 19% of the Dutch population smokes (Trimbos, 2023). Indicating different prevalences of all the behaviours among the Dutch population.

Next to this, there is a lack of awareness about the negative effects of alcohol use (Market response, 2023), and people often do not know that their level of alcohol use is unhealthy (Colombia University, 2023). This is similar to unhealthy eating habits where individuals tend to perceive their diets as healthier than they are (ASN, 2022). Furthermore, there is a discrepancy between perceived and actual exercise levels, with 68% of the Dutch population believing they exercise enough, while only 44% meet the required threshold (I&O Research, 2018). This is in contrast with smoking, where most people are aware of the negative health consequences smoking can have (Oncken, McKee, Krishnan-Sarin, O'Malley & Mazure, 2005). The stigma of smoking has changed over time, research even showed that people have a negative attitude towards smoking (Dillard, Magnan, Köblitz & McCaul, 2013). Due to the normalized perception of alcohol use and the lack of awareness regarding unhealthy alcohol consumption, food intake and physical inactivity, in contrast to the acknowledged health risks associated with smoking, the level of societal acceptance and solidarity between these behaviours may vary. Increased social acceptance signifies a behaviour that is considered socially normative. Individuals may perceive penalties for these behaviours as unfair. On the contrary, higher health risk awareness might lead to fewer objections to access differentiations for these behaviours as people recognize that these behaviours contribute to health problems and may perceive it as reasonable to be held accountable for them.

The rising significance of personal lifestyle decisions in health emphasizes the increasing role of personal responsibility in healthcare delivery (Brown, 2013). The media often highlights the negative behaviour of people with lifestyle-related illnesses, and healthcare policies push for personal responsibility. This underscores the need to comprehend the extent of responsibility in this domain. In some cases, external factors may influence unhealthy habits. It is for example already known that people with a lower socioeconomic status (SES) engage more in unhealthy behaviours such as physical inactivity, smoking tobacco and poor nutrition (Pampel, Krueger & Denney, 2010). Next to this, environmental factors, such as availability of unhealthy items and advertisements, may also influence one's behaviours (Giskes, van Lenthe, Avendano-

Pabon & Brug, 2011). For instance, exposure to advertisements promoting tobacco and alcohol products can encourage consumption. Furthermore, people in your environment can also influence you to smoke or to eat unhealthy by means of peer pressure (Lazzeri, Azzolini, Pammolli, Simi, Meoni & Giacchi, 2014; Ukwayi, Eja & Unwanede, 2012). It can also be influenced by your parents via nurture or their socioeconomic status (Pearson, Atkin, Biddle, Gorely & Edwardson, 2010; Huurre, Aro & Rahkonen, 2003). Lastly, unhealthy habits are often characterized by addiction, causing a loss of control in limiting intake and the urge to search and consume the substance (Koob & Volkow, 2010). All these factors could limit the personal responsibility and may restrict an individual's ability to control their own unhealthy behaviour.

2.3 In-group favouritism

So far, it is investigated what the general Dutch public thinks about solidarity. However, it's probable that various societal groups hold differing opinions and preferences on this matter. Therefore, it's reasonable to anticipate that individuals with diverse characteristics may have varying viewpoints on access differentiations.

Research from CBS (2019) for example already noticed that women show more solidarity than men. In this study, it was found that men tended to support raising premiums for individuals with unhealthy lifestyles more frequently compared to women. The same research also investigated age differences. They concluded that younger individuals, those aged between 18-25, more often preferred a premium increase for unhealthy individuals compared to older aged individuals.

An intriguing additional aspect involves examining the level of solidarity among individuals engaging in the unhealthy behaviour themselves. It might be expected that people engaging in unhealthy behaviour themselves would not want a premium increase or other form of reduced solidarity as this would increase their own health care costs in case they need care. This is strengthened by the fact that people show more solidarity towards people that are similar to them (Kloosterman, 2011). People often evaluate members from their own group, more favourable than others (Tajfel, 1982). This is called in-group favouritism.

In the context of lifestyle solidarity, in-group favouritism can play a crucial role in shaping individuals' behaviours, attitudes and perceptions toward their own lifestyle group compared

to others. Earlier research about solidarity with lifestyle and old aged citizens in the Netherlands already found that there are differences in solidarity between people engaging in different behaviours (Bonnie, van den Akker, van Steenkiste & Vos, 2010). In their cross-sectional longitudinal study, they found that non-smokers show less solidarity towards people that smoke compared to smokers. They also found that people that adhere to the guidelines of physical activity showed less solidarity towards overweight people, hinting that these people perhaps also show less solidarity towards people that do not meet the physical activity guidelines. The results are in line with research from Nivel (2017) that found that compared to non-smokers, people that smoke every day show more solidarity towards smokers. Next to this, solidarity towards alcohol abusers is lowest under people who abstain from drinking alcohol.

Methodology

3.1 Data collection and ethical considerations

To answer the research question, data was collected through an online survey in Qualtrics (Appendix) between May 8th and May 24th, 2024. The survey is based on the study of Stegeman, Willems, Dekker & Bossuyt (2013). Both between-subject and within-subject designs are employed in this study. A between-subject design involves comparing the responses of different participants to each other. In contrast, a within-subject design entails participants filling in more than one question per person, and these responses are also compared to each other. Consent is asked of all people that participate in the survey and anonymity is guaranteed. Ethical approval is received through the ethics thesis check before data collection. Next to this, a pilot study is done among five participants by means of a think aloud interview. Through this pre-testing process, efforts are made to anticipate and mitigate difficulties, potential flaws, and/or ambiguities. Lastly, a physician has reviewed the survey to ensure the accuracy and validity of the information provided.

3.2 Experimental design

The survey consists of multiple stages. The first stage is a screening to ensure that the right target group is filling in the survey. Participants residing outside the Netherlands and those under eighteen years old are screened out due to legal restrictions. This is done because parental approval is required for participants under the age of 18.

3.2.1 Situation sketch

In the second stage, participants are shown short stories detailing patients with specific healthcare needs. Participants encounter pairs of individuals for each of the four unhealthy behaviours—one exhibiting the behaviour that increases the chance of getting a particular disease, while the other does not. For the premium increase, participants are asked to imagine two individuals of who one engages in a particular unhealthy behaviour, while the other one does not. Both know that exhibiting the unhealthy behaviour can increase the risk of getting a particular disease. Respondents are asked to indicate whether they believe that the person engaging in the unhealthy behaviour needs to pay a higher health care premium or not. For copayment and waiting list, participants are asked to imagine two individuals that are both on the waiting list for a specific treatment. One of those individuals engages in a described unhealthy behaviour which may have caused or deteriorated the disease, while the other person does not engage in this behaviour. Respondents are asked to indicate whether they believe that

the person engaging in the unhealthy behaviour should pay a higher copayment (assuming a copayment is necessary) or not and whether this person should be placed lower on the waiting list.

This process is repeated four times, once for each unhealthy behaviour. Both the type of access differentiation method and the unhealthy behaviours are randomized to prevent learning biases. Participants are asked to evaluate all situations independently. They are encouraged to respond to them separately, without considering the influence of other situations. This is tried to stimulate by separately stating all scenarios and naming the hypothetical persons differently. Each of the four unhealthy behaviours is associated with a specific disease that participants are more likely to develop when engaging in said unhealthy behaviours.

Smoking is linked to chronic obstructive pulmonary disease (COPD) as smoking is the most important causative factor (Laniado-Laborín, 2009). COPD is a condition that is characterized by a reduction in lung capacity, leading to increased difficulty in breathing (Jo, 2022). COPD is partly irreversible; however, a possible effective treatment is pulmonary rehabilitation (Troosters, Casabury, Gosselink & Decramer, 2005). Alcohol consumption is associated with liver failure, as it is one of the primary precipitating factors in the development of liver failure (Gustot & Jalan, 2019). Liver transplantation is the standard treatment for patients with liver failure (Lucey, 2014). Despite discouraging the use of alcohol with a new liver, some hospitals treat patients experiencing liver failure who continue to consume alcohol.

Physical inactivity increases the chance of cardiovascular diseases (Li & Siegrist, 2012). A potential treatment for cardiovascular disease is coronary artery bypass surgery where a new path for blood to flow to the heart is created (Leong, Joseph, McKee, Anand, Teo, Schwalm & Yusuf, 2017). Lastly, colon cancer is discussed. Colon cancer can have many sources; however, diet can be an important risk factor (Giovannucci & Willet, 1994). Research has shown that excessive energy intake, reduced fruit and vegetables intake and increased fat and sugar intake increase the chance of colon cancer. An effective treatment for colon cancer is chemotherapy (Watanabe, et al., 2001).

As the Dutch health care system often does not require a copayment for the discussed treatments, participants are asked to imagine this being the case. Treatments such as chemotherapy, coronary artery bypass surgery, liver transplantation and pulmonary

rehabilitation are covered by the basic health insurance, the patients would only be required to cover the deductible if this has not already been paid during the treatment year. Next to this, waiting list are not standard practice for all offered treatments. Chemotherapy for example usually has very short waiting periods as rapid treatment is essential. However, every hospital has waiting times for appointments, examinations or treatments causing the assumed waiting lists to be conceivable and realistic to envision.

3.2.2 Unhealthy behaviour

In the third stage, participants are asked about their unhealthy behaviour. First, it is asked whether respondents currently smoke or whether they have smoked in the past. After this, the AUDIT-C questionnaire is used to measure alcohol use (Bush, Kivlahan, McDonnel, Fihn, Bradley & Ambulatory Care Quality Improvement Project, 1988). This is a shortened version of the Alcohol Use Disorder Identification Test (AUDIT) that measures alcohol usage. The AUDIT-C questionnaire consists of three questions and is because of the shorter nature not very demanding for participants. The AUDIT-C awards points based on answers given to the three questions. Typically, a greater score suggests an increased likelihood of health risks associated with alcohol consumption. A score of 3 or higher for women, and 4 or higher for men, can be considered as excessive alcohol usage and is considered as unhealthy alcohol use in this research (Bradley, DeBenedetti, Volk, Williams, Frank & Kivlahan, 2007).

Physical activity is measured based on a validated question (Prochaska, Sallis & Long, 2001). The question is in line with the advice on new physical activity guidelines from the Dutch Health Counsil (Gezondheidsraad, 2017). Participants are categorised as active when they indicate that they engage in moderate/vigorous activities for an hour at least five times a week. If this number is not met, participants are categorised as inactive.

For measuring unhealthy eating habits, the Starting The Conversation (STC) questionnaire is used (Paxton, Strycker, Toobert, Ammerman & Glasgow, 2011). This is an eight-item food frequency instrument that is validated as measuring unhealthy food behaviours. This question is implemented as a grid-question where participants have to indicate for eight sort of food items how often they eat them, including both healthy as unhealthy items. The question is slightly adjusted according to the Dutch health guidelines from Voedingscentrum (n.d.). The left column signifies the most wholesome dietary practices, assigned a score of 0. In contrast, the center column represents less healthful practices, scored at 1, while the right column

denotes the least healthful practices with a score of 2. The individual item scores are combined to generate a summary score within the range of 0 to 16. Lower summary scores indicate a healthier diet, whereas higher scores suggest an unhealthier diet. Participants are assumed to have an unhealthy diet when they scored at least eight points, the healthy group are participants that scored a below eight points.

In the fourth stage, participants are asked about their beliefs about responsibility and control over unhealthy behaviours. This is because one's behaviour can also be influenced by other factors such as addiction, nurture and socio-economic status. First of all, it is asked whether individuals think they would adapt a healthier lifestyle when access differentiation methods are implemented. If implementing new regulations for access to health care could stimulate healthier behaviour, this could be an interesting policy implication. Next to this, it is investigated till what extent participants think that individuals have control over their unhealthy behaviours. When participants express the belief that individuals do not have complete control over their behaviour, a subsequent question is asked to explore which external factors respondents believe also influence behaviour. Lastly, a statement question is asked to measure to what extent respondents think people should be held accountable for their unhealthy behaviours regardless of external factors. In the fifth and final stage, gender, age, educational level and income are also asked as background characteristics to check if there are differences in solidarity among those groups.

3.3 Variables

A new variable is created, *opinion access differentiation*, which is the main outcome variable for this thesis. This dummy variable shows the outcomes of the choices of participants for all the type of methods and unhealthy behaviours. This is the dependent variable in this analysis indicating whether participants want a differentiation in access to health care (y). When this variable has value 1, this indicates that a participants would prefer a certain differentiation in access to health care. There are seven main independent variables. Four dummy variables represent the four different unhealthy behaviours [*smoking, drinking, inactivity, eating*]. The other three independent variables, the type of methods, are also dummy variables and encompasses the three distinct methods [*premium, copayment, waiting].*

In addition to the seven independent variables mentioned above, a number of other variables are created. The variable *smoker* is based on a categorical variable with three answer options

indicating whether a participants smoked [yes; no, but I have smoked in the past; no, I have never smoked]. *Smoker* has value 1 when a person smokes and 0 when a person does not smoke anymore of when a person has never smoked. The variable *drinker* indicates whether one consumes too much alcohol. This variable is constructed based on answers given in the AUDIT-C questions. Answers given to all three questions are worth a predetermined number of points, a total score is calculated when summing these points. Points are awarded as follows: for all questions the first answers are given zero points, the second answer is given one point, the third is given two points, etc. The only exception is question two where both the first and second answer are rewarded zero points, and the third answers starts at one point. The variable *drinker* has value 1 when the total score of the AUDIT-C questionnaire is 3 or higher for females and 4 or higher for males. If the score is below this, the variable has value 0 and a person is classified as non-abusive drinker.

Whether one meets the physical activity guidelines is displayed in the variable *inactive*. This variable has a value of 1 when the guidelines are not met, meaning that the respondent does not engage in moderate/vigorous activities for an hour at least five times a week. This person is then classified as inactive. The variable has value 0 when the guideline is met, classifying a person as active. Lastly, *unhealthy eater* indicates based on the STC questionnaire whether one's diet is considered healthy or unhealthy. When the total score of the STC questionnaire is at least eight, participants are assumed to have an unhealthy diet and the value of the variable *unhealthy eater* is set at 1. When the score is below eight, participants are assumed to have a healthy diet and the variable gets assigned value 0.

Next to this, there are three variables to get more insights into the opinions of the Dutch population. The *belief* variable indicates whether participants think that variations in access to healthcare will stimulate them to adapt a healthier lifestyle. It is assessed through three statements, one for each of the three access differentiation methods, where participants can express their opinion on whether implementing each of the three access differentiation methods will encourage them to make healthier choices. A 5-point Likert-scale is using ranging from strongly disagree to strongly agree, which has proven to be a reliable and valid scale for questions (Joshi, Kale, Chandel & Pal, 2015). It is commonly used for preference statements because it enables individuals to express the degree of preference and subtle variations within their preferences (Breffle, Morey & Thacherm 2011).

Control refers to the perceived level of influence individuals believe they have over the development of unhealthy habits. This is a categorical question with four answer alternatives [complete control, moderate control, limited control, no control]. The variable *External factors* indicates which external factors respondents think can influence that limit the control individuals have over their unhealthy habits. This question offers multiple response options derived from literature. Additionally, participants have the opportunity to provide their own answers through an open-ended response box. Concluding, the categorical variable *accountability* indicates the opinion of the target group regarding accountability regardless of external factors that can influence unhealthy habits such as socioeconomic status or addiction with levels. This question is again on a 5-point Likert-scale ranging from strongly disagree to strongly agree.

Lastly, there are four background characteristics. The variable a*ge* is a discrete numeric variable that is measured in years. *Gender* is a categorical variable with four options [male, female, non-binary, prefer not to say]. The variable is transformed into binary variable *female* for the analysis, as no AUDIT scores can be calculated for non-binary individuals or for people that do not want to state their gender causing omitted variables. For those genders, AUDIT scores are reported as missing variables. Variable *female* has value 1 when the individual is a female and 0 if the individual is a male. *Educational attainment* displays the level of education that participants have obtained. This variable has five categories [primary school, high school, secondary vocational degree (MBO), applied university degree (HBO), university degree (WO)]. Lastly, *income* displays the net monthly income of participants. This is also a categorical variable with eight categories [less than €1000, between €1000 and €2000, between €2001 and €3000, between €3001 and €4000, between €4001 and €5000, between €5001 and €6000, more than €6000, don't know/prefer not to say].

3.4 Sample

Research from Ali, et al. (2019) indicated that a minimum of 120 participants is required to achieve sufficient accuracy of fixed and random effects and to achieve sufficient statistical power. This number was reached via random sampling. The survey was distributed between May 8th and May 24th among different groups with different characteristics such as at university, at sport clubs, at work and among friends and family to try to create a representative group. By using different social environments, people with different ages, educational levels, income levels, genders and other characteristics can be found such that the sample represents the Dutch population as closely as possible.

In total, 194 people participated in the survey. Of this group, 35 were incomplete and therefore removed. Furthermore, five participants were removed because they did not live in the Netherlands and therefore did not belong to the target group. Lastly, seven respondents were deleted due to not answering the control question correctly. As their data quality cannot be guaranteed, these results are not considered in the analysis. For further data control, the open answer question and time spent in the survey were investigated. No respondents were marked as speeders, defined as those who completed the survey in less than 30% of the median completion time, and no respondents were excluded based on their open-ended responses. Leaving a total sample size of 147 participants.

Descriptive statistics are displayed in Table 1. It can be concluded that there is a broad age distribution, however, the average age (36 years) is slightly lower than the average age of the Dutch population (42 years) (AlleCijfers, 2024). Next to this, the number of high educated people in the sample is also higher compared to the average Dutch population. In the sample, in total 84.32% has obtained either an HBO or WO degree, while the average percentage of this group among the general Dutch population is 32%. A possible explanation for this is the distribution of the survey in inner circles that consists for a large part of students at the university. Income is properly distributed with peaks around average incomes. It is important to note that the female: male ratio is not completely in line with the Dutch population statistics, more females than males participated in the survey. Overall, the sample includes a diverse population with varying characteristics, however, since only a few baseline characteristics were considered, the sample may differ from the average Dutch population in terms of unobserved traits.

Looking at the unhealthy behaviours, the sample does not consist of many smokers. In the sample only 5.44% smokes while according to the Dutch statistics, this number should be around 19% (Trimbos, 2023). The number of unhealthy eaters is much lower than average according to CBS (2015). A possible explanation for these lower estimates is that respondents might lie about their unhealthy habits. Due to social desirability bias, people might feel more ashamed of their unhealthy eating habits and smoking behaviour, as these are perceived by the general public as more unhealthy compared to inactivity and excessive alcohol use. It can be concluded that a large portion on the target group is marked as inactive (68.03%). This number is slightly higher than the reported average by CBS (2014). The number of excessive alcohol

drinkers is with 55.86% also quite high. Another possible explanation for these deviations is that the sample does not perfectly represent the average Dutch population based on these characteristics, potentially limiting the external validity of the results.

Table 1: descriptive statistics

	No. Obs.	Mean (SD)/ Percentage	Min.	Max.
Age	147	35.76 (15.18)	18	89
Educational attainment				
Primary education	1	0.68%		
Secondary education	11	7.48%		
Secondary vocational degree (MBO)	11	7.48%		
Applied university degree (HBO)	47	31.97%		
University degree (WO)	77	52.38%		
Income				
less than € 1000	23	15.65%		
between € 1000 and € 2000	15	10.20%		
between € 2001 and € 3000	46	31.29 %		
between € 3001 and € 4000	28	19.05%		
between € 4001 and € 5000	11	7.48%		
between € 5001 and € 6000	4	2.72%		
more than €6000	9	6.12%		
don't know/prefer not to state	11	7.48%		
Gender				
male	52	35.37%		
female	93	63.27%		
non-binary	1	0.68%		
other/ prefer not to state	1	0.68%		
Unhealthy behaviours				
smoker	8	5.44%		
drinker	81	55.86%		
inactive	100	68.03%		
Unhealthy eater	18	12.24%		

Notes: This Table shows the descriptive statistics of the main variables. The first column shows the number of observations, the second column displays the mean with standard deviation for continuous variables and the percentage for categorical variables. Min and max present the minimal and maximum score for continuous variables. Age is displayed in years.

3.5 Analysis strategy

The goal of the analysis is to investigate the attitudes of Dutch adults about differentiation in access to health care for people engaging in unhealthy behaviour. For analyzing the results, first a few summary statistics are presented, such as percentages of people that are in favour of the access differentiation option in combination with each unhealthy behaviour, to give a clear overview of the data.

Multilevel logistic modelling is used to answer the sub-questions and research question. This is done in STATA with the help of the melogit command. This method is chosen as the outcome variable is dichotomous (yes/no) and can take the dependency of the data into account. Respondents namely fill out multiple questions about unhealthy behaviours causing the independence assumption to be violated. In order to use multilevel logistics modelling, first the data is transferred from wide to a long format. The coefficients will represent the odds-ratios.

The first sub-question examines whether the type of unhealthy behaviour affects solidarity choices is tested by investigating if access differentiation is more or less preferred for some unhealthy behaviours compared to others. The primary variable of interest for investigating sub-question 2 is the three different types of methods. With these three dummy variables it is investigated whether variations in solidarity preferences across these methods exists. Sub-question 3 regarding in-group favouritism is tested via adding an interaction term that indicates whether the respondent engages in that specific unhealthy behaviour. In this manner, it is examined whether there is a divergence in preference for access differentiation for people that engage in an unhealthy behaviour compared to people that do not. Income, educational level, age and gender are taken into account as these factors might influence one's general willingness for access differentiation to health care. Four different models are presented, each with a different set of variables. The most completed model looks as follows:

$$Yij = \text{logit (odds)} = \beta00 + (\beta10 + u_{1j}) * \text{smoking}_{ij} + (\beta11 + u_{2j}) * \text{inactivity}_{ij} + (\beta12 + u_{3j}) * \text{eating}_{ij} + (\beta13 + u_{4j}) * \text{premium}_{ij} + (\beta14 + u_{5j}) * \text{copayment}_{ij} + \beta01*\text{smoker}_j + \beta15* \text{smoking}_{ij}* \text{smoker}_j + \beta02*\text{drinker}_j + \beta03*\text{unhealthyeater}_j + \beta16* \text{eating}_{ij}* \text{unhealthyeater}_j + \beta04*\text{inactive}_j + \beta17* \text{inactivity}_{ij}* \text{inactive}_j + \beta05*\text{gender}_j + \beta06*\text{education}_j + \beta07*\text{income}_j + \beta08*\text{age}_j + u_{0j}$$

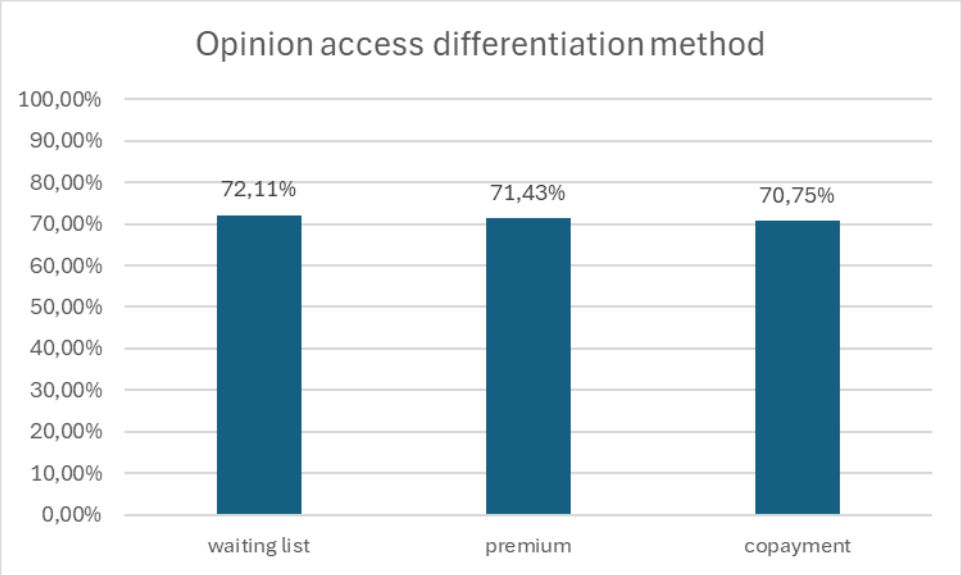
4. Results

The goal of the analysis is to study the preferences of the Dutch population for access differentiations to health care for individuals engaging in unhealthy behaviours. First, a few summary statistics are presented to give a better overview of the data. After this, multilevel logistic modelling is used to answer the different sub-questions.

4.1 summary statistics

Graph 1 shows the preferences for the different types of methods taking together all unhealthy behaviours. Premium means implementing a higher health care premium for individuals that engage in unhealthy behaviours such as smoking, excessive drinking, unhealthy eating and inactivity in this case. Copayment and waiting list were situations where an individual was in need of a treatment due to a disease that was potentially caused or deteriorated by the unhealthy behaviour that that person engaged in. The Graph shows that respondents think that a lower placing on the waiting list for individuals engaging in unhealthy behaviours is the most preferred type of access differentiation method. In total 72.11% of the surveyed individuals thinks that at least for one of the four unhealthy behaviours a differentiation in waiting period should be implemented. Looking at an increase in premium, 71.43% of the respondents would like to see a premium increase for at least one of the four unhealthy behaviours. This is closely followed by 70.75% of the participants thinking that individuals that engage in unhealthy behaviours should pay a higher copayment. After performing a t-test, it must be noted that these percentages are very close and that they are not significantly different.

Graph 1: Opinion access differentiation preferences per type



Notes: this Graph shows for each of the types of access differentiation methods the percentage of respondents that wants to implement this for at least one of the four unhealthy behaviours. The y-axis shows the percentage. The x-axis displays the different types of access differentiation methods. Number of observations is 588.

Focussing more on the unhealthy behaviours, Graph 2 shows the preferences for any differentiation in access to health care for all unhealthy habits. The Graph shows how much percent of the respondents wants at least one of the access differentiation methods implemented for that particular unhealthy behaviour. It becomes clear that most respondents want a differentiation in access to health care for individuals that smoke (85.71%). This is closely followed by implementing access restrictions for people who consume too much alcohol, which 76.59% of respondents think is a good idea. Scores for unhealthy eating and inactivity are slightly lower. Around 6 out of 10 (57.82%) surveyed individuals think that people that have an unhealthy diet should face access differentiations when accessing health care and only a small majority (51.70%) thinks that access differentiation methods should be implemented for individuals that have an inactive lifestyle. After performing a t-test is becomes clear that the percentages for both smoking and drinking are significantly higher than for eating unhealthy and inactivity at a 5% significance level. The differences in preferences between smoking and drinking and between eating and inactivity are not significantly different.

Graph 2: opinion access differentiation per unhealthy behaviour

Notes: this Graph shows for each of the four unhealthy behaviours the percentage of respondents that wants to implement an access differentiation. The y-axis shows the percentage. The x-axis displays the different unhealthy behaviours. Number of observations is 441.

Diving a bit deeper, Table 2 shows the preferences for each combination of type of method and unhealthy behaviour. From this Table it can be concluded that there is a wide variety of preferences both between and within the different type of methods and unhealthy behaviours. From the Table it becomes clear that most respondents agree with implementing either waiting list or premium differentiations for people that smoke. On the contrary, most people choose not to implement a differentiation in waiting list for people with an inactive lifestyle. In general, it can be concluded that the majority of the surveyed individuals is in favour of some sort of access differentiation for individuals that smoke or that drink too much alcohol. However, only a minority wants those access differentiations for individuals with an unhealthy diet or for those that do not engage in enough physical activity.

Table 2: type of method in combination with unhealthy behaviour

	Smoking	**Drinking**	**Inactivity**	**Eating**
Premium	66.67%	57.14%	42.86%	42.86%
Copayment	63.95%	55.78%	29.93%	35.37%
Waiting list	66.67%	58.50%	27.89%	32.65%

Notes: this Table for each combination of unhealthy behaviour and access differentiation method the percentage of respondents that wants to implement this method. Number of observations is 147.

4.2 Multilevel logistic modelling

After transforming the data from a wide to a long format, multilevel logistic modelling is used to answer the sub-questions. The coefficients from a multilevel logistic model display the log odds. In order to be able to interpret the coefficients, they need to be transformed to get the odds ratio. This is done in Stata by taking the exponential of each coefficient.

Table 3 shows four different multilevel logistic models. Opinion access differentiation is the outcome variable in all models, this is a binary variable indicating whether a respondent would like to see an access differentiation implemented or not. Column 1 shows the most basic version of the model, with different additions in other columns. In the basic model, type of unhealthy behaviour, type of method and their interaction act as independent variables. In Column 2, interaction terms are added to test if the effects are different for people engaging in said unhealthy habits themselves. In Column 3 background characteristics are added to check if, for example, people with different genders, ages, incomes and educational levels have different

preferences. Column 4 shows the most extensive model. It includes both the background characteristics as well as the interaction terms to measure in-group favouritism.

Var(constant) shows the variance of the random intercept across participants. The larger the value, the more variability in access differentiation can be attributed to differences between participants. The Likelihood ratio test versus logistic model is highly significant for all performed models allowing us to reject the null hypothesis that mixed effects and fixed logistic regression provide the same goodness of fit. Indicating that it would have been a mistake if the multilevel nature of the data was ignored.

The log-likelihood score is an indicator for the goodness-of-fit of these models. Higher values (less negative) correspond to a better fitting model. Based on this criterion, the model in Column 4 is the best and will be used as the main model for further analysis. In general, the results are robust. When changing the variables in the model, the coefficients vary slightly, however the conclusion does not change. To control for multiple testing, Bonferroni corrections are used affecting the significance levels. As four multilevel logistic tests are conducted, taking a standard 5% significance level and applying a Bonferroni correction for four tests, a p-value of 0.0125 is now needed to conclude statistically significant results.

4.2.1 Sub-question 1

First, it is investigated what the effect of the different unhealthy behaviours on the odds of wanting to implement a differentiation in access to health care is. This allows investigating sub-question 1. Following Sommet and Morselli (2017), the estimated coefficients are raised to the exponent to obtain an odds ratio (OR) in Stata. In general, the odds of being in favour of a differentiation in access to health care for inactive people are 0.127 as large compared to the odds for opinion access differentiation for people that drink too much alcohol. This means that in general, the odds of wanting to implement any form of access differentiation for individuals that do not engage in enough physical activity are predicted to be 87% ((0.127-1) * 100%) lower compared to the odds of wanting any form of access differentiation for individuals that drink too much alcohol, ceteris paribus. Compared to people that drink too much alcohol, the odds of wanting to implement any form of access differentiation for people that have an unhealthy diet are predicted to be 87% lower (0.129), ceteris paribus. Both effects are

significant at a 1% significance level after applying Bonferroni corrections and are also economically significant in terms of size.

The coefficients for unhealthy eating and excessive drinking are not significantly different from each other. For people that smoke, the odds of wanting any form of access differentiation are 2.5 times higher (a 150% predicted increase in odds), compared to the odds of wanting a differentiation in access for people that drink excessively, ceteris paribus. This effect is significant at a 10% significance level and is also economically significant. However, this effect is not significant after applying Bonferroni corrections. Based on this, one can infer that most people prefer to see an access differentiation for smokers and for people that drink too much alcohol. Secondly, people think implementing access differentiations for people that have an unhealthy diet and people that do not exercise enough are less preferred.

4.2.2 Sub-question 2

Examining the variable *type* provides deeper insight into sub-question 2, which investigates potential disparities in preferences between the various type of methods to implement a differentiation in access to health care. Column 4 in Table 3 shows that there are no significant differences between the type of methods. It can therefore be concluded that participants do not strictly favour one method over another.

To investigate if preferences for differentiation in access to health care differ for different combinations of type of method and unhealthy behaviour, interaction terms are added. Compared to the references categories (waiting list differentiation and excessive alcohol use), the odds of wanting to implement a premium increase for individuals that do not exercise enough are 3.4 times higher (the odds are predicted to increase with 240%), ceteris paribus. This effect is significant at a 5% significance level after applying Bonferroni corrections and is also economically meaningful in size. For unhealthy eating, the odds for opinion access differentiation are 2.2 times higher (a predicted increase in the odds of 120%) for a premium increase compared to the reference categories (waiting list differentiation and excessive alcohol use), ceteris paribus. This effect is significant at a 10% significance level. However, this effect loses significance after Bonferroni corrections are applied.

4.2.3 Sub-question 3

In order to investigate sub-question 3, which tests if the effects are different for people engaging in said unhealthy habits, another set of interaction terms are added to the model. These interaction terms have value 1 when the person engages in said unhealthy behaviour and answered the question regarding the unhealthy behaviour, he or she engages in. Since none of the interaction terms are significant and none of the four separate coefficients of the unhealthy behaviours are significant, it can be concluded that exhibiting the unhealthy behaviour, in general, does not influence the likelihood of wanting to implement an access differentiation method. Therefore, it can be concluded that people engaging in unhealthy behaviour show similar levels of solidarity compared to people that do not engage in unhealthy behaviours. It is important to consider that the insignificant results for smokers may be attributed to the limited sample size of smokers in the study. Next to this, there is not interaction between the situation description about excessive alcohol drinkers and individuals who drink too much alcohol themselves due to drinking being the reference category, omitting this interaction term.

Investigating the background characteristics, it become clear that looking at income, the odds of wanting to implement any form of access differentiation for people with the highest income (above €6000) are predicted to be 0.123 times as large as the odds for people with an income below €1000, ceteris paribus. This means that for people with an income above €6000 there is a predicted decrease in the odds of 88% of wanting to implement any form of access differentiation compared to people with the lowest income, ceteris paribus. This is significant at a 10% significance level and also economically significant. However, this is not significant after applying Bonferroni corrections. There are no significant differences for age, gender and educational attainment. Note that some of these insignificant results may be due to limit group size.

The intraclass correlation (ICC) for the model in Column 4 is 0.588. This indicates that there is between-subject variation, preferences for access differentiations vary between individuals. Given that the ICC is also not 1, it can also be concluded that there is within-subject variation, individual preferences can differ per situation.

Table 3: OR ratios of four different multilevel logistic models of unhealthy behaviour, type of method and their interaction on opinion access differentiation

	Opinion access differentiation (1)	Opinion access differentiation (2)	Opinion access differentiation (3)	Opinion access differentiation (4)
Unhealthy behaviour (ref. cat. = drinking)				
Inactivity	0.111***	0.140***	0.111***	0.127***
	(0.037)	(0.070)	(0.038)	(0.067)
Unhealthy eating	0.163***	0.091***	0.178***	0.129***
	(0.053)	(0.045)	(0.059)	(0.067)
Smoking	1.804*	2.918**	1.678	2.507*
	(0.568)	(1.486)	(0.542)	(1.322)
Type (ref. cat. = waiting list)				
Copayment	0.829	0.865	0.951	1.000
	(0.254)	(0.269)	(0.301)	(0.321)
Premium	0.910	0.908	1.052	1.053
	(0.279)	(0.283)	(0.333)	(0.339)
Interaction (ref. cat. = drinking & waiting list)				
Inactivity#Copayment	1.431	1.469	1.343	1.375
	(0.653)	(0.684)	(0.634)	(0.661)
Inactivity#premium	3.410**	3.634***	3.202**	3.372**
	(1.531)	(1.671)	(1.488)	(1.598)
Unhealthy eating#Copayment	1.485	1.289	1.458	1.258
	(0.660)	(0.584)	(0.667)	(0.587)
Unhealthy eating#premium	2.313*	2.263*	2.197	2.160*
	(1.021)	(1.016)	(1.000)	(1.002)
Smoking#Copayment	0.985	1.040	0.996*	1.057
	(0.435)	(0.468)	(0.454)	(0.490)
Smoking#premium	1.099	1.163	1.121	1.192
	(0.488)	(0.527)	(0.514)	(0.556)
In-group favouritism (ref. cat. = drinking & non-smoker, non-inactive, non-unhealthy eater)				
Smoker		1.029		1.277
		(1.192)		(1.517)
Smoker#smoking		-1.515		0.212
		(1.029)		(0.223)
Drinker		0.638		0.671
		(0.307)		(0.328)
Inactive		0.487		0.499
		(0.249)		(0.890)
Inactive#inactivity		0.737		0.890
		(0.308)		(0.392)
Unhealthy eater		1.490		2.216
		(1.080)		(1.752)
Unhealthy eater# Unhealthy eating		2.080		1.967
		(1.206)		(1.215)
Age			1.023	1.029
			(0.348)	(0.018)

Female (ref. cat. = male)			0.755 (0.348)	0.817 (0.386)
Income (ref. cat. = below €1000)				
between €1000 and €2000			1.911 (1.543)	1.908 (1.566)
between €2001 and €3000			0.435 (0.280)	0.479 (0.313)
between €3001 and €4000			0.647 (0.479)	0.690 (0.522)
between €4001 and €5000			1.095 (1.067)	1.145 (1.130)
between €5001 and €6000			0.524 (0.665)	0.425 (0.553)
more than €6000			0.113** (0.122)	0.123* (0.135)
Educational attainment (ref. cat.=applied university degree)				
Primary education			1.290 (2.976)	1.990 (4.680)
Secondary education			2.501 (2.416)	2.773 (2.812)
Secondary vocational degree (MBO)			0.948 (0.833)	1.030 (0.923)
University degree (WO)			1.159 (0.553)	1.265 (0.619)
Constant	1.821 (0.528)	3.588 (1.980)	1.332 (1.181)	1.702 (1.708)
Var (constant)	5.278 (0.962)	5.454 (1.006)	4.598 (0.878)	4.703 (0.910)
No. Obs.	1740 (145)	1740 (145)	1740 (145)	1740 (145)
Log-likelihood	-890.80	-860.08	-826.64	-798.69

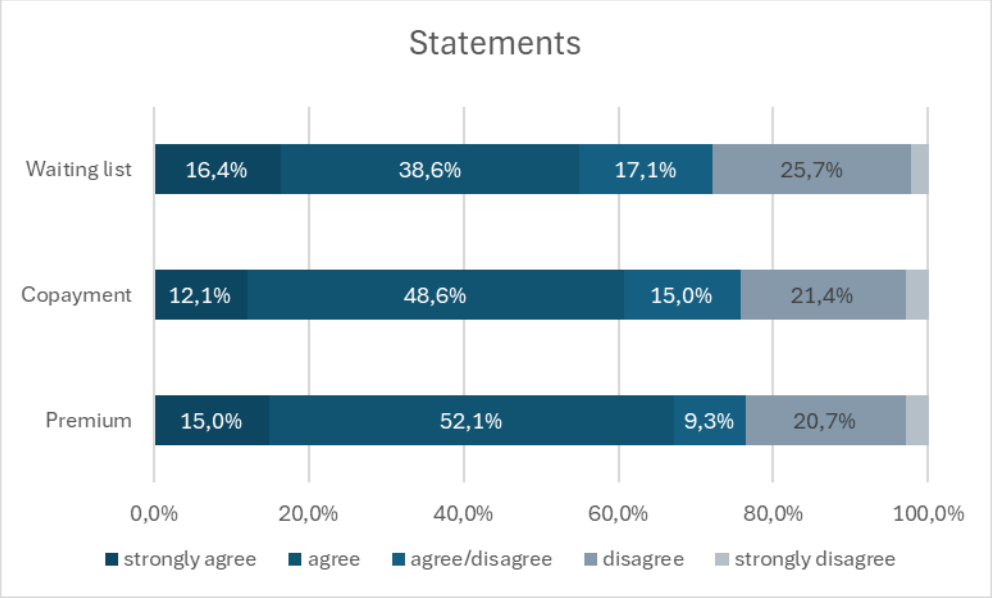
Notes: This Table displays a multilevel logistic model of access differentiation method and unhealthy behaviour on outcome variable opinion access differentiation. The reference category for unhealthy behaviour is drinking. The reference category for the type of access differentiation method is waiting list. The model also includes interaction terms between unhealthy behaviour and type, here the reference categories are also drinking and waiting list. For income, an income below €1000 is the reference category and for educational attainment the reference category is applied university degree (HBO). All references categories are displayed between brackets in the most left column of the Table. No. Obs. shows the number of data points in this model, the number between brackets displays the number of respondents. Log-likelihood displays the fit of the model. The standard errors are displayed in brackets. *** p<0.01, ** p<0.05, * p<0.1

4.3 Views on effectiveness, control and responsibility

To broaden the research by adding questions which can be used for policy implications, it is also investigated whether individuals think implementing the three different access differentiation methods will encourage them to adopt healthier habits. This is useful to investigate because if people think they will adopt their habits after implementation of such measures, this might lead to a healthier population which will lead to lower health care costs

and less pressure on solidarity. Graph 3 shows the perceived effectiveness of the different access differentiation methods. For all three access differentiation methods more than half of the respondents indicated that they think it will encourage them to adopt healthier habits, hinting at a potential positive effect on health after implementing measures. Respondents are expecting to be most encouraged to change their lifestyle when a higher premium for unhealthy behaviour is implemented (67.1%). Comparing this with implementing a higher copayment, 60.7% of the participants think they would be encouraged to adopt a healthier lifestyle. In total, 55.0% think that they will live healthier once a differentiation in waiting period is implemented. This number if significantly lower than the premium increase at a 5% significance level.

Graph 3: perceived effectiveness access differentiation methods



Notes: This Graph shows whether respondents think they will be encouraged to adopt healthier habits when the mentioned access differentiation method is implemented. The x-axis shows percentage of respondents that agree/disagree with the statement. The y-axis displays the three different statement topics.

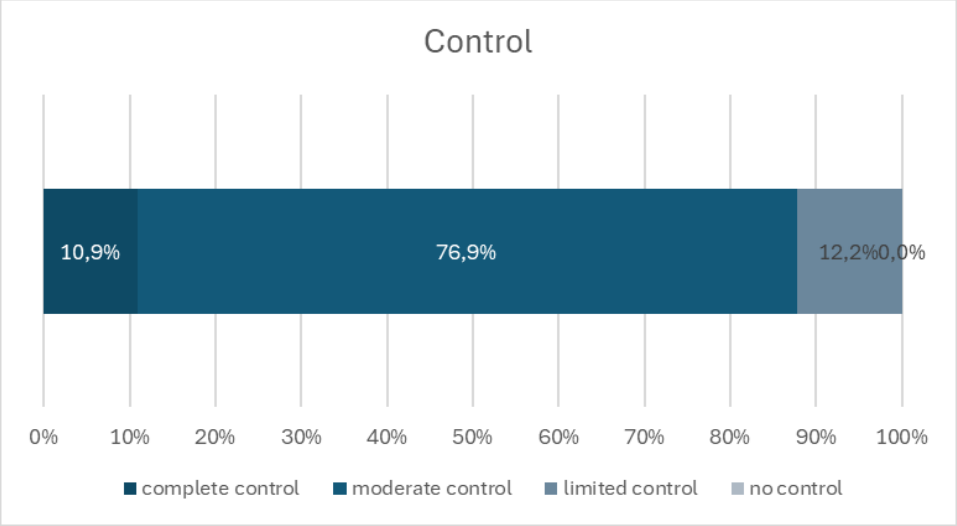
As mentioned before, unhealthy habits are not always a free choice. There might be factors that restrict an individual's ability to control their own unhealthy behaviour. Respondents are asked to what extent they think people have control over their own unhealthy habits (Graph 4). Almost all participants (89.1%) think that there are at least some external factors that influence choices regarding unhealthy behaviours. Of this group, the large majority thinks that individuals have moderate control over their own unhealthy habits, but, that there can be some external factors that can influence their habits.

When respondents indicated that they think individuals do not have full control, a follow-up question was asked where respondents could indicate which factors would limit control over

unhealthy behaviours. These results are presented in Graph 5. Participants think that most individuals unhealthy behaviours are to some extent influenced by nurture, meaning their parents influences (83.97%). Income (78.63%), social environment (77.86%) and addiction (73.28%) also for a large part influence control according to the respondents. Education and cultural factors are mentioned less often as important factors for influencing behaviours, but are still important according to more than half of the participants.

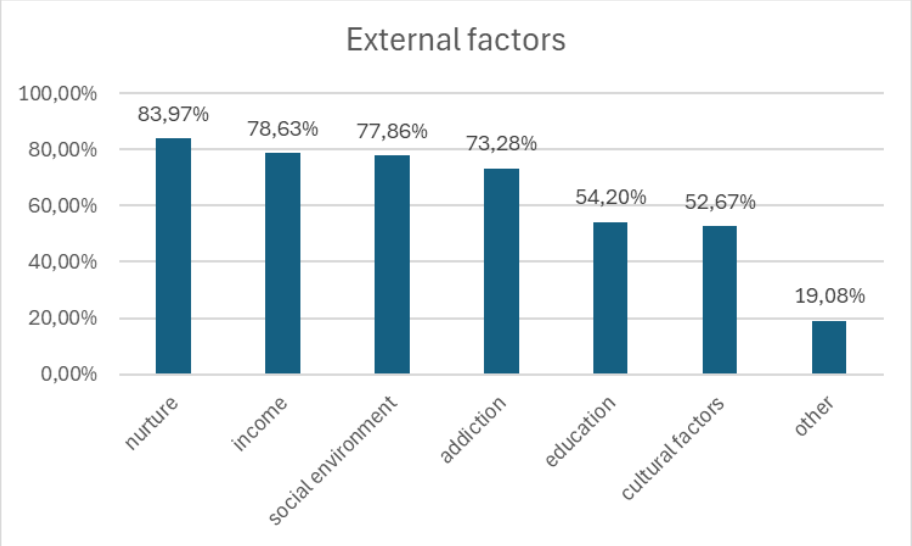
Participants also had the option to mention other factors than the options given in the survey. Even though not a lot of participants thought there would be other factors, those that did most often mentioned mental health, physical health and type of work to influence one's ability to control his or her own habits.

Graph 4: perceived control over unhealthy habits



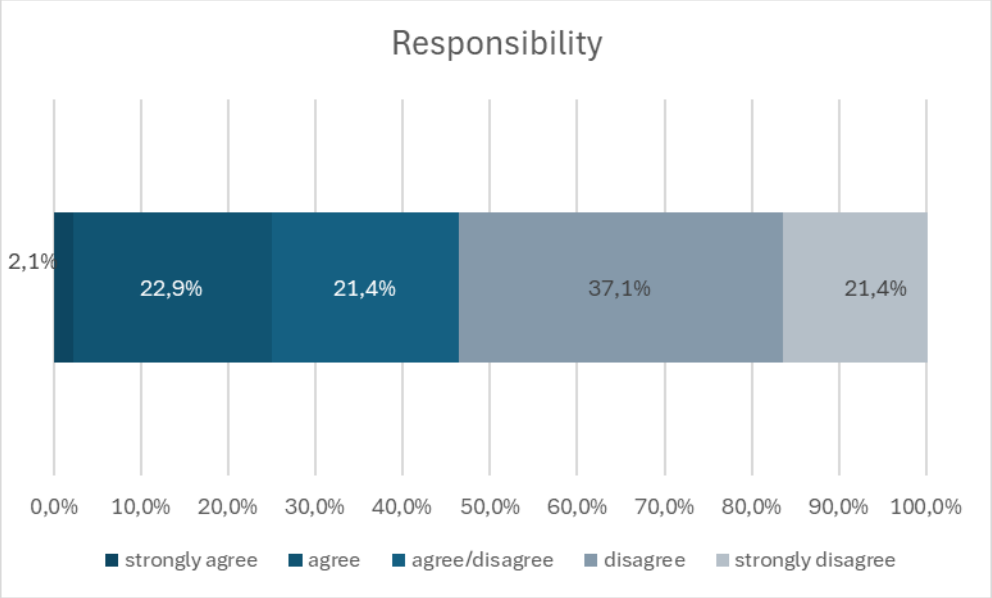
Notes: This Graph shows how much control respondents think individuals have over their unhealthy habits. The x-axis shows the percentages of people that opted for a particular control option.

Graph 5: external factors influencing unhealthy habits



Notes: This Graph shows which external factors respondents think influence an individual's unhealthy behaviour. The y-axis shows percentage of respondents that thinks this option might influence people. The x-axis shows the options that were presented to the respondents.

Lastly, it is interesting to investigate the perceived responsibility individuals ought to have despite of these external factors that might influence their behaviour. Participants were asked to indicate whether they think individuals should be held accountable for their unhealthy behaviour. A minority of participants (25%) thinks that it is fair to impose penalties, like a higher health care premium, higher copayments or lower placing on the waiting list. However, 58.5% of the sampled groups thinks that it is not completely fair to impose penalties when persons might have limited control due to external factors.



Notes: This Graph shows the perceived responsibility individuals ought to have despite external factors. The x-axis shows the percentage of people that think individuals should be held responsible (agree) or not (disagree).

5. Discussion

5.1 Conclusion

Looking at Table 2 from the results, it can be concluded that the opinion regarding a differentiation in access to health care is different for the different unhealthy behaviours and the different type of methods. Looking at sub-question 1 that stated: “To what extent do preferences of the Dutch population differ for the different unhealthy behaviours?” it can be concluded that most people prefer to see an access differentiation for people that smoke (85.7%) and for people that drink too much alcohol (79.6%). Next to this, the odds of wanting to implement any form of access differentiation are also highest for people that smoke and for people that drink too much alcohol. Implementing access differentiations for people that eat unhealthy or that engage in too little physical activity are significantly less preferred. The high preference for differentiation for smokers might be due to the negative stigma of smoking; it is commonly known that smoking is bad and that it can have negative health consequences (Oncken, McKee, Krishnan-Sarin, O’Malley & Mazure, 2005). The relatively high preference for differentiation for alcohol users might be explained by the fact that most individuals are unaware that their own level of alcohol consumption is unhealthy and considered excessive (Columbia University, 2023). This lack of awareness may lead them to perceive the portrayed alcohol use in the scenario as indicative of a drunk addict rather than a 'normal' person in their environment, making them more likely to agree with access differentiation. Lower preferences for unhealthy eating habits and inactivity were expected based on the literature. This is possibly due to the normalized perception and lack of awareness regarding unhealthy food intake and physical inactivity (ASN, 2022; I&O Research, 2018).

The second sub-question investigated disparities in preferences between the various access differentiation methods. Both Graph 2 and Table 3 from the results show no significant differences between the different type of methods for access differentiation. This is not in line with previous research from Zorginstituut Nederland (2022) who found that most people prefer a premium increase compared to waiting list differentiation. Looking at the interaction between type of method and the unhealthy behaviours, it becomes clear that a premium increase is the most preferred option for inactive people, this hints that this method might be preferred over the others. A possible explanation is that people for example find this method most fair as everyone that engages in the unhealthy behaviour pays the same monetary amount and not only those who get sick. Next to this, this option might be preferred as a differentiation in waiting period might be seen as unethical as health care gets less accessible.

Thirdly, in-group favouritism is investigated with the following sub-question: “Are people that engage in unhealthy behaviour showing more solidarity towards people with the same unhealthy habits than people that do not engage in said unhealthy behaviours?”. It can be concluded that engaging in unhealthy behaviour does not generally affect the likelihood of wanting to implement an access differentiation method. Therefore, individuals who engage in unhealthy behaviour demonstrate similar levels of solidarity compared to those who do not. This is in contrast with what was expected based on the literature from Bonnie, van den Akker, van Steenkiste & Vos (2010) for example, who found that non-smokers show less solidarity towards smokers than smokers themselves. It is also not in line with results from Nivel (2017) who found that solidarity towards alcohol abusers lowest is under people who do not drink alcohol. A potential explanation for this is that participants had limited feeling of similarity with the described individuals in the scenarios. For example, no quantitative estimates were given to indicate how unhealthy one eats, how much alcohol one consumes, how much one smokes or how often one exercises. This could potentially cause participants to perceive the portrayed individuals as much unhealthier than themselves, leading them to feel they do not belong to the same group. Another explanation is that participants did not recognize their own behaviour as unhealthy. Causing them to not feel similar to the portrayed individual. As a result, there is no in-group favouritism.

With answers to all the sub-questions, the research question can be answered. The research question was:

“What is the opinion of the Dutch population aged 18 and older regarding differentiation in access to health care based on lifestyle behaviour?”

Most people want to see a differentiation in access to health care for people that smoke and for people that consume too much alcohol, however, less people want these differentiations in access to health care for people with an unhealthy diet and for people that do not engage in enough physical activity. However, there is no strict preferred type of differentiation method. Lastly, there is no in-group favouritism, meaning that there is no difference in solidarity among people that do and people that do not engage in said unhealthy behaviours themselves.

5.2 Policy recommendation

The feasibility of an option that differentiates access to health care encompasses more than only a positive attitude of Dutch adults towards it. Other factors such as effectiveness, ethical concerns, responsibility, control and equity also play a role. Some of these factors are touched upon in the survey. Most respondents for example already indicated that implementing any of the three possible access differentiation methods will likely make them adopt healthier habits. According to them, implementing a premium increase would be the most effective strategy.

Even though no type of access differentiation method is strictly preferred, the interaction terms between the different unhealthy behaviours and type of methods hint that a premium increase for inactivity might be more preferred over the other methods. Combining this with the fact that respondents also indicated highest perceived effectiveness for this option the Dutch government could consider implementing this. This will potentially cause people to adopt healthier habits after the implementation which will lower the pressure on the health care system. There is a wide variety in preferences between the different unhealthy habits. Most participants would prefer to see a differentiation for people that smoke or that drink too much alcohol, however, only a minority wants those differentiations for people that eat unhealthy or that do not exercise enough. If the government would want to ride on the preferences of the Dutch population, then only implementing an access differentiation for smokers and excessive alcohol users would be preferred.

It is important to note that most participants think that there are external factors that restrict an individual's ability to control their own unhealthy behaviour. According to the respondents, nurture, income, social environment and addiction are the most important external factors that can have an effect on engaging in unhealthy habits. This is in line with previous literature which also hints that people with a lower socioeconomic status more often engage in unhealthy behaviours (Pampel, Krueger & Denney, 2010). Next to this, literature already suggested that unhealthy habits are often influenced by one’s social environment and via one’s parents (Ukwayi, Eja & Unwanede, 2012; Huurre, Aro & Rahkonen, 2003). Taking these external factors into accounts, a majority of the respondents also indicated that they think it is not completely fair to impose penalties, like a higher health care premium, a higher copayment or a lower placing on the waiting list, when persons might have limited control over their unhealthy habits. Therefore, it is important that these external factors are taken into account if

a differentiation in access to health care is implemented, such that low-income people for example have a lower premium increase. This is important to not enlarge the gap between the rich and the poor even more and to keep health care accessible and affordable for everyone. From an ethical perspective it is not preferred to make health care more expensive or less accessible due to higher premiums or copayments and due to longer waiting times.

Next to this, there are some other important factors regarding the implementation and feasibility that should be taken into account. The foremost problem is to determine how to measure if someone is engaging in said unhealthy behaviours. This can for example be done via questionnaires. The downside of this is that people might lie when they know that stating to participate in unhealthy behaviours might cost them money. Another option is using medical exams as traces of unhealthy substances can be found in urine and blood test. This method is used in other countries such as India (Acko, 2024). The disadvantage of this is that it is expensive and time consuming to determine for everyone. Secondly, it might go against privacy wishes of inhabitants to share this kind of information with the government.

Lastly, even though it might be known that particular people that are in need of health care engage in unhealthy behaviour. It is difficult to find causal links between disease and unhealthy habits. Even though engaging in for example smoking may increase the chances of getting COPD, it is possible that this person would have gotten this disease either way regardless of him or her smoking. It can not be proven that a disease is caused or deteriorated by particular unhealthy behaviours. Making it even more difficult as there are many diseases of which we do not know any correlation, but which might still be there for example due to a weakened immune system caused by the unhealthy habits.

It is important to after the potential implementation re-evaluate the decisions made. This experiment can in some form be repeated to measure how the Dutch population thinks about the implementations and whether their preferences have changed regarding the unhealthy behaviours and type of methods. Next to this, prevalence of the unhealthy behaviours has to be monitored to see if the implementation has had an effect on the number of people that have these unhealthy habits. And most importantly, the pressure on health care has to be measured. It can be calculated with how much the revenues will increase after the implementation of a higher health care premium by multiplying the number of smokers with the increase in premium. This extra money can be used to reduce the pressure on health care. Next to this,

when more people quit unhealthy habits, less people might suffer from disease that are caused or deteriorated by these unhealthy behaviours also reducing pressure on health care.

5.3 Limitations

It is important to note that this research's findings are specific to the Dutch population, and no conclusions can be drawn about people outside the Netherlands. This limitation arises because individuals from other countries might have different attitudes and feelings towards access differentiations for unhealthy behaviours. Future research could explore opinions in other countries to determine if the observed effects are similar or more country specific. This restricts the experiment's external validity. Even though, the background variables indicate a diverse sample, prevalences of most unhealthy behaviours are not completely in line with average Dutch population statistics. This limits the external validity of the results. However, it must be noted that the difference in occurrence of unhealthy habits between Dutch average values and the sample could also be because respondents did not want to be honest about those habits.

In addition, there is a possible selection bias as the survey is mainly distributed amongst friends and relatives. This could bias the results and could also jeopardize feelings of anonymity. Even though participants are ensured that their answers cannot be traced back to them, it is still possible that respondents did not feel completely anonymous. Both could cause participants to to state more socially desirable answers or causing them to not answer truly to the questions about their unhealthy habits. People could also for example think that it is expected of them to show solidarity towards others, potentially letting them deviate from stating their true beliefs by answering what they think is expected of them. Another possibility for selection bias is that only individuals with particular characteristics filled in the survey for example because they have very strong opinions about solidarity in health care. This could lead to sample to not be representative of the average Dutch population and limit the external validity.

Reliability is tried to ensure by applying methods consistently by clearly defining how data is analyzed and standardizing conditions of the research meaning that circumstances of data collection are tried to be kept consistent by collecting all data in the same way in the same period. The relatively large sample size and the randomization of questions contribute to a higher internal validity. With varying the sequence of questions and asking participants to approach each scenario independently, learning effects are tried to minimize. Next to this, by using validated questions, internal validity increases. However, this thesis also has some

limitations regarding the internal validity. First of all, it is possible that there are unobserved variables causing participants to agree more or less with particular combinations of unhealthy behaviours and access differentiation methods. It could for example be possible that people that already have a specific disease have a different opinion on these matters.

Secondly, there is a possibility for hypothetical bias. As the questions are not real scenarios, participants might state different answers than they would in real life scenario's. They could for example now more easily state that they want access differentiations as there are no immediate consequences, however, when deciding if people in reality should get an access differentiation, the situation might get more real possibly leading them to react differently.

Thirdly, in future research, the scenario description of the portrayed persons could be more precise. The scenario's give little information about the described individuals behaviour, such as how much alcohol they consume, how inactive they are, how much they smoke and how unhealthy their diet is. Without providing this specific information, respondents may fill in the gaps themselves. The risk is that participants might interpret the missing details differently, leading to varying perspectives and therefore potentially different answers. This might also explain the lacking in-group favouritism as it is possible that participants did not feel similar to the portrayed individuals.

Further limitations of the survey are that respondents were forced to make a decision, they either had to opt for a differentiation in access to health care or for no differentiations, leaving no possibility to be indifferent between the options. This could cause bias as people who are indifferent are not able to state their true beliefs. Combining this with the fact that it was only a yes/no questions, no differentiation can be made between strong and small preferences for access differentiations. It is possible that people very much agree with a premium increase for smokers, leading them to choose yes and at the same time only slightly agreeing with a premium increase for people that drink too much alcohol also leading them to choose yes. This limits from drawing conclusions about size of the preference. Further research could try to replicate this experiment with more answer alternatives and an indifference option to obtain more precise preferences. Further research could also investigate a third option where people might want to see a premium decrease, lower copayment and/or higher placing on the waiting list for people engaging in unhealthy behaviours to paint a more complete picture of societies preferences. Another potential area for further research would be to repeat this research among

different groups in society. This could create an overview of not only the preferences of the Dutch population but comparing this to ideas from the government, people working in health care and from insurance companies to gain a more comprehensive understanding.

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Appendix - survey

Thesis health

Start of Block: Consent

Q45 Thank you for taking time to participate in this survey, you will be done in approximately 10 minutes. With this survey, I would like to investigate the preferences of the Dutch population about access differentiation to health care for people engaging in unhealthy behaviour. If you do not wish to continue, you can quit the survey at any time. For questions and/or comments, please email: 509877md@student.eur.nl

By participating in this study, you agree that your answers may be used for scientific thesis research. Part of this survey will consist of hypothetical situation sketches where I will ask for your opinion. All situations are independent of each other, try to look at and respond to them separately, without considering the influence of other situations. Your answers will remain anonymous and can never be traced back to you. Please keep in mind that there are no wrong or right answers, I am interested in all opinions.

- ○ I agree (1)
- ○ I do not agree (2)

Skip To: End of Survey If Q45 = I do not agree

End of Block: Consent

Start of Block: Screening

Q48 What is your age?

_____

Skip To: End of Survey If Condition: What is your age? Is Less Than 18. Skip To: End of Survey.

Page Break

Q46 Are you currently living in the Netherlands?

- ○ yes (1)
- ○ no (2)

Skip To: End of Survey If Q46 = no

End of Block: Screening

Start of Block: COPD1

Q14 Smoking increases the risk of COPD (chronic obstructive pulmonary disease). This condition is characterized by reduced lung capacity, leading to increased difficulty in breathing. Suppose person A smokes, while person B does not. Both know that smoking is bad for their health and can lead to COPD. Would you consider it justified for person A, who smokes, **to pay a higher health care premium** than person B, who does not smoke?

- ○ yes (1)
- ○ no (2)

End of Block: COPD1

Start of Block: COPD2

Q15 Suppose person C and D both have COPD (chronic obstructive pulmonary disease) and as a result have increased difficulty in breathing. Both are on the waiting list for pulmonary rehabilitation. Person C still smokes, which has increased the risk of COPD, while person D does not. Imagine that pulmonary rehabilitation is not fully reimbursed. Would you consider it justified for person C, who smokes, **to pay a higher co-payment** for pulmonary rehabilitation than person D, who does not smoke.

- ○ Yes (1)
- ○ No (2)

End of Block: COPD2

Start of Block: COPD3

Q16 Suppose person E and F both have COPD (chronic obstructive pulmonary disease) which makes breathing more difficult. Both need to undergo pulmonary rehabilitation. Person E still smokes, which has increased the risk of COPD, while person F does not. Imagine that there is a waiting list for

pulmonary rehabilitation. Would you consider it justified for person E, who smokes, **to be placed lower on the waiting list** than person F, who does not smoke?

- ○ Yes (1)
- ○ No (2)

End of Block: COPD3

Start of Block: cardio vascular disease

Q26 Lots of sitting and little exercise increases the risk of cardiovascular disease. Suppose that person G does not exercise enough, while person H is very active and ensures sufficient daily exercise. Both know that little exercise is bad for your health and can lead to cardiovascular disease. Would you consider it justified for person G, who does not exercise much, **to pay a higher health care premium** than person H, who does exercise enough?

- ○ yes (1)
- ○ no (2)

End of Block: cardio vascular disease

Start of Block: Cardio2

Q27 Suppose person Q and J both have cardiovascular disease. Both have to undergo bypass surgery for this. Person Q has exercised too little in the past which has increased the risk of cardiovascular disease, while person J had an active lifestyle with lots of exercise. Imagine that the bypass surgery is not fully reimbursed. Would you consider it justified for person Q, who used to do little exercise, **to pay a higher co-payment** for the surgery than person J, who had an active lifestyle?

- ○ Yes (1)
- ○ No (2)

End of Block: Cardio2

Start of Block: Cardio3

Q28 Suppose person K and L both have cardiovascular disease. Both have to undergo bypass surgery for this. Person K has done little exercise in the past, which has increased the risk of cardiovascular disease, while person L had an active lifestyle with lots of exercise. Imagine that there is a waiting list for the surgery. Would you consider it justified for person K, who used to do too little exercise, **to be**

placed lower on the waiting list than person L, who had an active lifestyle?

- ○ Yes (1)
- ○ No (2)

End of Block: Cardio3

Start of Block: cancer

Q18 Unhealthy eating increases the chance of getting colon cancer. Suppose person M eats mostly unhealthy, while person Z eats mostly healthy. Both know that unhealthy eating is bad for their health and can lead to colon cancer. Would you consider it justified for person M, who eats mostly unhealthy, **to pay a higher health care premium** than person Z, who does eat mostly healthy?

- ○ yes (1)
- ○ no (2)

End of Block: cancer

Start of Block: cancer2

Q19 Suppose person O and P both have colon cancer. Both have to undergo chemotherapy for this. Person O eats mostly unhealthy, which has increased the risk of colon cancer, while person P eats mostly healthy. Imagine that the chemotherapy is not fully reimbursed. Would you consider it justified for person O, who eats mostly unhealthy, **to pay a higher co-payment** for the chemotherapy than person P, who eats mostly healthy?

- ○ Yes (1)
- ○ No (2)

End of Block: cancer2

Start of Block: cancer3

Q20 Suppose person Q and R both have colon cancer. Both have to undergo chemotherapy for this. Person Q eats mostly unhealthy, which has increased the risk of colon cancer, while person R eats mostly healthy. Imagine that there is a waiting list for the chemotherapy. Would you consider it justified for person Q, who eats mostly unhealthy, **to be placed lower on the waiting list** for chemo

than person R, who eats mostly healthy?

- ○ Yes (1)
- ○ No (2)

End of Block: cancer3

Start of Block: liver disease

Q22 Alcohol consumption increases the risk of liver failure. Suppose person S drinks excessive amounts of alcohol while person T only drinks alcohol in moderation. Both know that drinking a lot of alcohol is bad for their health and if consumed excessively can lead to liver failure. Would you consider it justified for person S, who drinks alcohol excessively, **to pay a higher health care premium** than person T, who drinks alcohol in moderation?

- ○ yes (1)
- ○ no (2)

End of Block: liver disease

Start of Block: liver2

Q23 Suppose person U and W both have liver failure. Both must undergo a liver transplant for this. Person U drinks excessive amounts of alcohol, which has increased the risk of liver failure, while person W drinks alcohol in moderation. Imagine that the liver transplant is not fully reimbursed. Would you consider it justified for person U, who drinks excessive amounts of alcohol, **to pay a higher co-payment** for the liver transplant than person W, who drinks alcohol in moderation?

- ○ Yes (1)
- ○ No (2)

End of Block: liver2

Start of Block: liver3

Q24 Suppose person X and Y both have liver failure. Both must undergo a liver transplant for this. Person X drinks excessive amounts of alcohol, which has increased the risk of liver failure, while Person W drinks alcohol in moderation. Imagine that there is a waiting list for liver transplantation.

Would you consider it justified for Person X, who drinks excessive amounts of alcohol, **to be placed lower on waiting list** than Person Y, who drinks alcohol in moderation?

- ○ Yes (1)
- ○ No (2)

End of Block: liver3

Start of Block: Control question

Q59 This is a control question to test if you are paying attention. Please select "disagree"

- ○ strongly agree (1)
- ○ agree (2)
- ○ neutral (3)
- ○ disagree (4)
- ○ strongly disagree (5)

End of Block: Control question

Start of Block: Smoking

Q29 Do you smoke?

- ○ yes (1)
- ○ no, but I have smoked in the past (2)
- ○ no, I have never smoked (4)

End of Block: Smoking

Start of Block: Alcohol

Q30 How often did you have a drink containing alcohol in the past year? Consider a ‘drink’ to be a can or bottle of beer, a glass of wine, a cocktail or a shot of hard liquor.

- ○ never (1)
- ○ monthly or less (2)
- ○ 2 to 4 times a month (3)
- ○ 2 to 3 times a week (4)
- ○ 4 times a week or more (5)

Q31 How many drinks did you have on a typical day when you were drinking in the past year?

- ○ 0 drinks (1)
- ○ 1 to 2 drinks (2)
- ○ 3 to 4 drinks (3)
- ○ 5 to 6 drinks (4)
- ○ 7 to 9 drinks (5)
- ○ 10 or more drinks (6)

Q32 How often did you have 6 or more drinks on one occasion in the past year?

- ○ never (1)
- ○ less than monthly (2)
- ○ monthly (3)
- ○ weekly (4)
- ○ daily or almost daily (5)

End of Block: Alcohol

Start of Block: Exercise

Q33 On average, how many days a week do you engage in moderate to vigorous physical activity such as biking, chores, gardening or sports for at least an hour a day?

- ○ 0 days a week (1)
- ○ 1-2 days a week (2)
- ○ 3-4 days a week (3)
- ○ 5-6 days a week (4)
- ○ 7 days a week (5)

End of Block: Exercise

Start of Block: Unhealthy eating

Q58 Considering an average week, please indicate

How many times a week do you eat fast food? (1)	less than 1 time (1)	1-3 times (2)	4 times or more (3)
How many times a week do you eat beans, eggs, chicken or fish (2)	less than 1 time (1)	1-2 times (2)	3 times or more (3)
How many times a week do you eat chips or crackers (3)	1 time or less (1)	2-3 times (2)	4 times or more (3)
How many times a week do you eat desserts and other sweets (4)	1 time or less (1)	2 -3 times (2)	4 times or more (3)
How many times a week do you eat 2 servings of fruit? (5)	less than 5 times (1)	5 -6 times (2)	7 times (3)
How many times a week do you eat 250 grams of vegetables (6)	less than 5 times (1)	5 - 6 times (2)	7 times (3)
How many regular soda's or sweetened drinks do you have each day? (7)	less than 1 (1)	1 -2 drinks (2)	3 or more (3)
How much margarine, butter or meat fat do you use when cooking? (8)	very little (1)	some (2)	a lot (3)

End of Block: Unhealthy eating

Start of Block: Opinion responsibility

Q56 Please indicate to what extent you agree with the following statements:

	strongly agree (1)	agree (2)	neutral (3)	disagree (4)	strongly disagree (5)
The implementation of a higher health care premium for individuals with unhealthy lifestyles will encourage me to adopt healthier habits (1)	○	○	○	○	○
The implementation of a higher copayment for individuals with unhealthy lifestyles will encourage me to adopt healthier habits (2)	○	○	○	○	○
The implementation of a lower place on the waiting list for individuals with unhealthy lifestyles will encourage me to adopt healthier habits (3)	○	○	○	○	○

Page Break

Q53 How much control do you think individuals have over developing unhealthy habits, such as smoking, drinking too much, eating unhealthy or physical inactivity?

- ○ complete control (1)
- ○ moderate control (2)
- ○ limited control (3)
- ○ no control (4)

Page Break

Display This Question:

If Q53 != complete control

Q57 What factors do you believe contribute to some individuals not having full control over unhealthy lifestyle habits?

- ☐ addiction (1)
- ☐ income (2)
- ☐ education (3)
- ☐ nurture / parental influence (4)
- ☐ cultural factors (5)
- ☐ social environment (6)
- ☐ other, namely: (7) _____

Page Break

Q55 To what extent do you agree with the following statement:
"I think that it's fair to impose penalties for an unhealthy lifestyle (such as higher health care premiums, higher copayments or lower placing on waiting lists) even when the person in question may have limited control over those habits."

- ○ strongly agree (1)
- ○ agree (2)
- ○ neutral (3)
- ○ disagree (4)
- ○ strongly disagree (5)

End of Block: Opinion responsibility

Start of Block: Block 3

Q49 Lastly, I want to ask you a few background questions.

Q11 Which gender do you identify with?

- ○ Male (1)
- ○ Female (2)
- ○ Non-binary (3)
- ○ Prefer not to say / other (4)

Q50 What is your highest level of education?

- primary school (1)
- secondary school (2)
- secondary vocational degree (MBO) (3)
- applied university degree (HBO) (4)
- university degree (WO) (5)

Q51 What is your monthly net income?

- less than €1000 (1)
- between €1000 and €2000 (2)
- between €2001 and €3000 (3)
- between €3001 and €4000 (4)
- between €4001 and €5000 (5)
- between €5001 and €6000 (6)
- more than €6000 (7)
- don't know/prefer not to state (8)

End of Block: Block 3