Perspectives on Innovative Approaches to Obesity Treatment and Prevention in Denmark

A mixed methods interview and survey study

A Master Thesis Project by Liubov Aleksandrova

Programme: MSc in Business Administration and Innovation in Healthcare

Department of Strategy and Innovation

Primary supervisor: Professor John C. Christiansen, Department of Operations Management
Secondary supervisor: Susie Ruff, MBA, External Lecturer
Student number: 91441
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I am grateful for my family and friends for bearing with me when the going got rough and when all the conversation topics mysteriously ended on obesity prevention and nutrition, and for any stranger who was brave enough to ask what my Master Thesis topic was.

I only hope that this can be one of the many steps necessary to offer understanding, recognition and care that is needed in this area!

Foreword

I believe that exploring and vocalizing challenges in this area is extremely important for the benefit of the general population. Obesity and the health complications associated with it are no longer limited to a smaller group of people in a population and beyond influencing individual quality of life also have a significant impact on the challenged healthcare budgets worldwide. In some countries, half or more of the population is overweight and a third is obese.

I have always been doing competitive sports and have taken physical fitness and health for granted. I have also coached children in Denmark (Herlev Atletikklub) almost ever since I came to Denmark and I can unfortunately see the negative development in the fitness of the children every time we recruit at the beginning of the season. It is excruciating that some people end up with poor health because of the lack of understanding and that more and more children become overweight and obese even before puberty.

Through the MSc in Business Administration and Innovation in Healthcare, I have become more and more curious of the mechanisms that govern the public health priorities, the treatments offered and the health trends in populations. This topic is of utter relevance to the Danish welfare landscape, since obesity has roots in many factors that the welfare system can control and has consequences for many budget areas, such as healthcare, early retirement and unemployment benefits.

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Summary

Overweight and obesity are defined as abnormal or excessive fat tissue accumulation that presents a risk to health. Persons with obesity and overweight are at a major risk of developing a number of comorbidities, primarily chronic diseases, including but not limited to type 2 diabetes mellitus, cardiovascular diseases and 13 common forms of cancer. PwO experience unmet need in healthcare and discrimination in everyday life. Besides the economic and societal impact of the above, obesity has implication for an individual's mental health, social interactions and labour market participation. Obesity as a chronic disease is thus a significant burden in healthcare and in the public budget in general. Once considered a problem only in high income countries, overweight and obesity are now dramatically on the rise in low- and middle-income countries, particularly in urban settings.

This project is a mixed methods interview and survey study that demonstrates the evidence for investing in prevention initiatives targeting children aged 3-13 through education on the background and consequences of obesity, nutrition, lifestyle and the human physiology – "LypoTales". This innovative approach will target the population when it is still rather vulnerable to the outside opinion and more susceptible to adopt new habits and traditions. To ensure success, the initiative will have to be nationwide politically endorsed and compulsory for any institution in Denmark. Furthermore, it is crucial to offer the nuanced, multidisciplinary, timely and early treatment for PwO already now. Finally, the project offers recommendations for the Public Health decision-makers for reducing the burden of obesity in Denmark already now and in the coming decades.

The results of the project suggest that the interventions will potentially alleviate up to 5% unemployment in the coming years and offer savings in the Danish healthcare of over DKK 8 bln by improving the health of those unemployed and chronically sick through improving their health and allowing them to return to work.

Abbreviations

PwO– Persons living with obesity	BED – Binge-eating Disorder
BMI – Body-Mass Index	
BAI – Body Adiposity Index	
WC – Waist Circumference	
HC – Healthcare	
PHCS - Primary Healthcare (Sector)	
SHCS - Secondary Healthcare (Sector)	
SES – Socio-Economic Status	
NCD – Non-Communicable Disease	
T2DM – Type 2 Diabetes Mellitus	
CBA – Cost-Benefit Analysis	
CUA – Cost-Utility Analysis	
CEA – Cost-Effectiveness Analysis	
CM – Cost Minimisation	
WTP – Willingness to Pay	
QALY/DALY – Quality/Disability Life-Years Adjusted	
CV(D) – Cardiovascular (Disease)	
COPD - Chronic Obstructive Pulmonary Disease	
WHO – World Health Organisation	
UN – United Nations	
WCRF – World Cancer Research Fund	
TFA – Triglyceride Fatty Acids	
GI – Gastrointestinal	

1. Introduction

For this project I have chosen to focus on the prevention of obesity – henceforth obesity - in Denmark. This is a mixed-methods qualitative interview and quantitative survey study with a trifold aim:

➢ Establish the burden of obesity as a disease in the Danish welfare system

➢ Explore the degree of unmet need for patients living with obesity in Denmark

➢ Identify the possible solutions to reduce the burden of obesity as a disease

Throughout my report I will use the derivatives of the word "obesity" to describe the disease, people living with it and other factors. I have considered replacing the words with severe(ly) overweight due to the magnitude of prejudice and assumptions that are potentially connected with the word and because the people living with obesity prefer not mentioning this word. However, I aim to submit a scientific professional paper that addresses the decision-makers and professionals in the area. In the majority of papers, both medical and economic, I read, obesity is addressed as "obesity" and not obesity. This can both be a reflection of the archaic terminology and the quest for factual representation. I do accept criticism of my choice but deem necessary to justify it.

There are grounds to believe that the quality of prevention initiatives in Denmark can be improved: the numbers of persons living with obesity (PwO) and overweight are steadily increasing, the representation of foods in supermarkets and in public institutions remains largely uncontrolled, the patients report unmet needs, the public perception is still widely based on an individual's lack of will power/personal lifestyle choices and more and more children become obese every year. Moreover, the treatment options available in Denmark are few and symptomatic – lifestyle intervention and bariatric surgery. While they might offer simultaneous relief, these are often a fixed-time or one-time interventions that seem to ignore the need for long-term care and to recognize a serious health concern that goes beyond personal preferences. This is corroborated by the statistics of long-term success of such

interventions, where a significant number of subjects regains weight they previously shed within 5-10 years post intervention. It is thus imperative for improving the public health in Denmark that overweight is recognized as a serious pre-cursor to future obesity, which is a chronic health condition.

First of all, I will present an overview of the burden of obesity as a disease in the Danish Health Care (costs of treatments, cost of and amount of physician visits, presence of T2DM, days at work lost, QALY etc.) and welfare system through a literature review by using a correlation between one's weight and employment status, controlled by gender. I will suggest the possible savings from reducing the burden of obesity.

Secondly, I will present a qualitative thematic analysis of the interviews with recognized professionals in the treatment and prevention of obesity. Based on the qualitative analysis I will present an overview of areas of most concern for obesity prevention and management.

Thirdly, I will conduct an online survey of the municipal workers across several departments in 60 municipalities in Denmark. I will then collect the information on the prevention and treatment options available in those municipalities. Based on the quantitative and qualitative analysis of the survey results and the correlation between the survey responses and the factual situation, I will suggest the status of the Danish municipalities with regards to improving the prevention of obesity.

Fourthly, I will use the ADKAR change management model to identify the readiness and possible resistance to change. Finally, I will suggest a solution to improving the prevention of obesity in Denmark in the coming years, as well as provide recommendations for further initiatives.

In addition to and as a reason for the inadequate treatment and prevention of obesity in Denmark, I believe that there exists considerable stigma and judgement towards persons with obesity. This is evident in both the lack of political backing of the issue, the lack of appropriate long-term care, as well as growing evidence that those persons face discrimination in the domains of employment, social

activities and education. This stigma and judgement are in themselves an impediment to efficient public policy and in my project I will explore the evidence for the above claims and argue that reducing this stigma is paramount to reducing the numbers of PwO in Denmark. I will also suggest solutions to reducing the stigma towards PwO in Denmark and explore the counterarguments in the area.

Much of the debate on public involvement in treating and preventing obesity uses lifestyle (LS) interventions as the preferred method of prevention and treatment of obesity, arguing that it should be sufficient to prevent obesity in a population, unless binge-eating disorder (BED) is apparent. While LS adjustments and solid nutrition, exercise and work-life (WL) balance habits undeniably help preventing overweight where no other risk factors are present, they might offer scarce value to those, whose overweight is caused by Socio-Economic Status (SES) factors, hereditary factors or binge-eating disorder (BED), who constitute a majority of those, living with obesity.

Furthermore, one needs to acknowledge the presence of obesogenic environment in Denmark, which is constituted by easy access to energy-dense and "cheap"/easy meals, apple opportunities for using cars or public transport as preferred commute and the abundant presence of unhealthy foods in the supermarkets and public institutions. By choosing to focus on LS interventions as the preferred and frankly only method for treating one's obesity (bariatric surgery is only available to individuals with a BMI lower than 35 if they have type2 diabetes or a small number of other complications), suggests that there exists a fundamental difference between the individuals' power of will and preferences, which causes them to choose the more calorific proviant. Such approach not only reinforces the said guilt, but also completely strips the legislators, public space administrators, food producers and restaurant owners of their responsibility to limit the display and availability of products that are known to be unnaturally sweet and fatty and do not produce the long-term feeling of fullness.

1.1 Obesity: Background

1.1.1 What is obesity and why is this disease a concern for public health?

WHO defines overweight and obesity as abnormal or excessive fat tissue accumulation that presents a risk to health. A crude population measure of obesity is the body mass index (BMI), a person's weight (in kilograms) divided by the square of his or her height (in metres). A person with a BMI of 30 or more is generally considered obese. A person with a BMI equal to or more than 25 is considered overweight.(WHO, n.d.) It is estimated that app. 650 million persons – 8,4 % of the world's population - live with obesity. According to the above definition, in Denmark, 17,1% men and 16,7% women are obese with the above average percentages present in the age group 16-74 y.o. (Sundhedsstyrelsen, 2018) When added with the number of persons who are overweight, over half of Danish population struggles with attaining healthy weight. Additionally, waist circumference (WC) can be used to determine the relative percentage of health tissue and the associated health risk. Significantly, 15,6 % of males and 29,3 % of females in Denmark are in the risk zone (WC of >102 cm and >88 cm respectively) (Bonke & Greve, 2010)

Table 1. Relative Risks of Waist Circumference Increase, correlated with BMI.

			Health risks	Waist, cm	
				Men < 102 Women < 88	Men ⩾ 102 Women ⩾ 88
				Not overweight	Overweight
Heath risks					Risk for development of T2DM and cardiovascular diseases
BMI	BMI < 18,5	Underweight	Depends on the cause		
	18,5 ⩾ BMI ⩽ 24,5	Normal weight	Normal		Increased health risks
	25,0 ⩾ BMI ⩽ 29,9	Moderate overweight	Slightly increased	Slightly increased health risks	High health risks
	BMI ⩾ 30,0	Very overweight / obesity	Slightly to increased health risks	High health risks	Very high health risks

Source: (Kjøller, Juel, & Kamper-Jørgensen, 2007; WHO, 2000)

Overweight and obesity are major risk factors for over 130 chronic diseases, including diabetes, cardiovascular diseases and 13 types of cancer. Once considered a problem only in high income countries, overweight and obesity are now dramatically on the rise in low- and middle-income countries, particularly in urban settings.(WHO, 2018b) WHO indicates that Noncommunicable Diseases, NCDs or chronic diseases, are directly responsible for 7 out of 10 deaths globally. (WHO, 2018a) A World Cancer Research Fund (WCRF, 2016) report emphasizes the direct connection between obesity and 13 types of common cancers, such as colorectal, ovarian and esophageal cancers. Significantly, 85% of diabetics are overweight or obese, and at least 30% of obese persons has developed T2DM. Diabetes has been highlighted numerous times as one of the handful diseases that pose the largest burden on healthcare systems worldwide. Obesity and overweight are hence a significant burden to the health care system and ought to be considered a public health priority.

In addition to posing direct health risks, obesity is associated with mental health issues, such as depression and anxiety and reduced market labour contribution due to discrimination, i.e. stigma and bullying, and physiological reasons, such as health complications arthritis and hypertension.

1.1.2 Lipogenesis and evolution: Mechanism and Rationale

Adipose tissue (fat depots) in humans is composed mainly of adipocytes/lipocytes. Depending on the type of tissue and henceforth function – white, brown or marrow fat cells – store varying quantities of lipids containing triglycerides, including fatty acids. They are a natural and crucial component in human physiology, responsible for insulation, temperature regulation and energy storage. (Muriel, 2017)

The preferred mechanism of adipose tissue creation is metabolizing dietary fat rather than from other macronutrients (carbohydrates or proteins), as it requires less energy. We consume triglycerides with many foods and some of them are stored for future use to account for times of food shortage, such as famine, and periods of colder weather where our energy needs increase. The preferred method of

acquiring energy for immediate needs and daily activities is metabolizing carbohydrates.

Our bodies aim to achieve an energy surplus, where the amount of carbohydrates (through i.e. blood glucose) is kept constant and available for metabolizing and there is a sufficient storage of adipocytes. To maintain the balance our bodies source the energy from the available foods by signaling hunger to the brain and hence the gastrointestinal system through an intricate network of hormone and enzyme signals. Hence the commonly known cravings for sugary foods during peak pressure periods.

However, if there is a temporary shortage of food that is long enough for the body to experience a calorie deficit, our physiology might resort to breaking the fat depots for additional energy. The adipocytes can be broken down by a hormone sensitive enzyme – lipase, which responds to adrenaline. In addition, our bodies actually have some mechanisms to prevent excess weight, such as detection of fat content by the tongue taste glands and physical discomfort of growing. However, they are not nearly as robust and are easily corroded by unhealthy lifestyle as the mechanisms that are created to ensure that we do not starve to death.

The ability to digest and store triglycerides as well as other macronutrients, and the process of accumulation of fat storage is indeed an evolutionary advantage. Historically, only very few people in populations had constant access to abundant food reserves. Most people lived on scarce rations, had demanding physical jobs and thus rarely achieved an energy surplus enough to generate excess adipose tissue. As a result, it was only the privileged few that achieved overweight or obesity as a result of their lifestyle. It was therefore crucial for our bodies to learn to create adipose tissue rapidly and efficiently to guarantee the sufficient reserves during the times of shortages and famine. Henceforth, excess weight has been and in some cultures still is seen as a sign of prosperity and privilege – it was something to strive for. Until recently, most people have thus not been confronted with a requirement to control their desire for food with will power, since food supply was unstable and inconstant.

However, nowadays these powerful mechanisms are superfluous for many people living both in developed and developing world (Add the facts on the prosperity). Many of us have constant access to energy-efficient food (e.g. food that has a high caloric concentration per gram and is easy to prepare and consumer or requires no preparation), lead a sedentary lifestyle and convenient commute to work – we live in an obesogenic environment. We no longer need to preserve energy and store it in the form of adipose tissue to the extent that we needed it in the past.

Obesity thus is a quite complicated matter: we need food to survive, but our bodies were never in the situation where the better health depended on controlling the food consumption. We thus only have our will power, our upbringing and personal convictions to regulate our health when it comes to food and nutrition. Considering that food and drink are essential for survival, and that our brains crave for the foods that best suit our nutritional needs and require least energy exertion, as well as the weakness of mechanisms that would control our appetite and cravings, we are left with quite a bad hand when it comes to staying slim.

1.1.3 What are the symptoms of obesity?

Excess weight is often mistaken for the symptom of obesity. One of the main symptoms of obesity are unsatiety and inability of the persons to regulate their calorie intake as compared to their energy expenditure – they never feel completely full.(Abdalla, 2017) PwO will also generally desire foods that are more calorie-dense and thus can deliver the most calories per gram and per kcal of energy expenditure, as they have higher metabolism due to the higher weight. Thus, obesity begins as a disease before the BMI of the person reaches the levels high enough to be defined as clinically obese and the diagnosis is often delayed. Using WC and BAI, as well as longitudinal behavioral and weight gain patterns in conjunction with a diagnosis is crucial to create an accurate disease profile.

Currently, the diagnosing of obesity is often delayed to the stage, where the person is already experiencing a number of adverse health effects. Excess appetite can be a symptom of other conditions and the guilt and stigma that PwO experience

when attempting to discuss their weight and appearance often deter them from seeking help again. Efforts are being done to discover a biomarker of obesity to allow for a more accurate and early diagnosis. One of the promising compounds is leptin – a hormone secreted by the adipose tissue. The concentration of leptin is higher in persons who have more adipose tissue, so it can potentially display a chemical disbalance and irregularities in the lipolysis process. On the other hand, presence of adipose tissue is not a symptom of obesity on itself, and it cannot be used as a clinical diagnose measure.

Each additional kilogram of excess weight and additional centimeter on the waist is directly associated with an increased health risk. Unhealthy eating patterns can be triggered by multiple genetical and environmental factors, such as upbringing, physical and psychological abuse etc. It is thus important to turn attention to the unhealthy eating behaviors before the person becomes clinically obese, as early intervention can potentially alleviate the progression of the disease and the associated co-morbidities, as well as reduce the need for conducting costly, dangerous and irreversible procedures, such as bariatric surgery.

1.1.4 What are stages of obesity?

Obesity, excess body weight resulting in a Body-Mass Index (BMI) of over 30 kg/m2, is typically a result of a progressive weight gain over the years. That is, even a person whose BMI is relatively healthy during a period of time, can become obese if exposed to certain factors. The patterns of weight gain – steadily progressive, sudden large weight gain or inability to lose weight upon the weight gain - depend on the background factors (See Section 1.2).

There are a number of methods that are used to support the visual assessment as to whether the person is obese or not or the stage of obesity. Upon the newer definition of obesity and overweight adopted in the late 1990's, BMI is commonly used as a crude measure to define whether a person is obese or not. It has been criticized as an inaccurate measure of assessing adiposity (fat percentage in the body) and the health complications that are associated with excess weight(Shah &

Braverman, 2012). Hence, Body Adiposity Index (BAI) and Waist Circumference (WC) and even Body Conductivity(BC) are used as supporting measures to identify the false negative BMI indications due to the correlation between adiposity (Hip to Height ratio), the excess abdominal adipose tissue (WC), inflammation, cancer and other health complications. However, not all methods are accessible at any location, and though they are a valuable addition in diagnosing the condition, they offer limited value for early detection and identifying persons at risk.

To support the need for early intervention, studies conducted on children demonstrate that despite overweight and obese children of losing weight, the development of co-morbidities persists and they will continue being at a higher risk of developing chronic and dangerous conditions as compared to the general population. (Baker Jennifer L., Olsen Lina W., 2013)

1.1.5 Importance of appearance, ethics and body positivity

Historically, humans have been concerned with superficial appearance and one's appearance was often used as means of determining fertility, social status and even subjective intelligence. This is documented by the numerous graphic and sculptural displays of the appearance ideals throughout human history. More attractive people, who fit with the contemporary standards of appearance, often enjoyed social and economic advantages, such as better marriage contracts, higher status and lucrative job offers. Many studies have shown that people believe that more attractive people are more intelligent, even if there are no other pre-cursors to back those assumptions.

Our appearance is thus an important part of our identity as citizens and individuals. Hence, when someone is critical to our appearance, it not only hurts our self-esteem but also can have more serious implications for one's ability to get a job or start a relationship. People of normal weight were always more privileged in that sense, however people who deviate are practically prosecuted. It is unclear when the present hit of extreme thinness and utmost fitness emerged, but it has infiltrated many mainstream media and is reportedly causing many young people to develop

eating disorders. Moreover, many people, who do not conform with the mainstream image are bullied throughout their childhood or excluded from social events.

1.2 Causes of obesity

1.2.1 Why do persons become obese?

A number of factors can pre-dispose a person to becoming obese:

- Hereditary, e.g. genetic, including mother's gestational obesity – not explored properly and often confused with SES-factors

- Mutational, e.g. Prader-Willi Syndrome (< 1% of cases)

- Socio-economic status (SES), such as level of education and income, family, social circle, traditions, institutional factors

- Psychiatric traumas (mostly in childhood, but also in adult life) and the resulting eating disorders (in particular, bullying and psychological and physical abuse) (roughly a third of cases). It is important to note that a significant share of those were also overweight or obese in childhood

- Pharmaceutical interventions (certain medications for mental ilnesses and contraception methods induce weight gain)

- Critical injury

- Gestational (pregnancy-related)

Furthermore, to support the SES-origin, there is a strong correlation between lower level of education or income. It has been assumed that the lower SES results in obesity. However, more recent studies suggest reverse causality, i.e. obesity reduces the quality of life and subsequently the income and the SES of the person. (Kim & Knesebeck, 2018; Pickett, Kelly, Brunner, Lobstein, & Wilkinson, 2005) As described in Section 1.1.3, historically, only the privileged few had the means to achieve the energy surplus required to gain weight.

Interestingly, a study published in 2018 (Bentley, Ormerod, & Ruck, 2018) suggests that the correlation between income and obesity only began to appear in the

1990s. This suggests that changes happened in our environment and infrastructure that reinforce the calorie surplus in our lifestyles. This development might indicate the development of the so-called obesogenic environment. One of the factors highlighted in the study is the explosion in the availability of highly-calorific foods following the expansion in the use of corn syrup as it became cheaper to acquire it from genetically modified crops.

1.2.2 Can obesity be cured?

Obesity is a chronic disease and can currently not be cured. The available treatments for symptomatic relief include lifestyle interventions, bariatric surgery, behavioral therapy and pharmacotherapy. Many of them are expensive and are thus not cost-effective, do not offer life-long relief and most importantly, few of those treatments alleviate the cause of obesity: inability to control the behaviours that lead to excess calorie consumption as compared to the energy expenditure.

1.2.3 Can obesity be prevented, when and how?

When detected early and treated properly excessive weight gain can be successfully prevented and managed, especially in childhood. Except for the rare cases of hereditary or mutational obesity, there is evidence suggesting that the disease can be prevented in adults with effective management in childhood, awareness and availability of specific and multidimensional health care interventions, tailored to target the specific reason behind a persons condition.

Studies that explored the SES-dependent obesity by observing the baseline health and BMIs of persons from the same family and even twins and their social environment. The studies suggest that more than the hereditary factors, obesity is influenced by one's environment and social norms, such as whether it is considered acceptable and/or prestigious to be overweight, food and alcohol habits, active vs. passive lifestyle, work commute etc.

In the instance of children, it is crucial to consider the lifestyle of parents and their institutional environment. Children are directly dependent on the parents to provide and prepare food and learn their habits from home. That is, if the parents lead

an unhealthy and inactive lifestyle, children will "inherit" the patterns from them and likely be at an increased risk of having unhealthy weight as adults.

Figure 2. Correlation Between the wellbeing of Parents and Children.
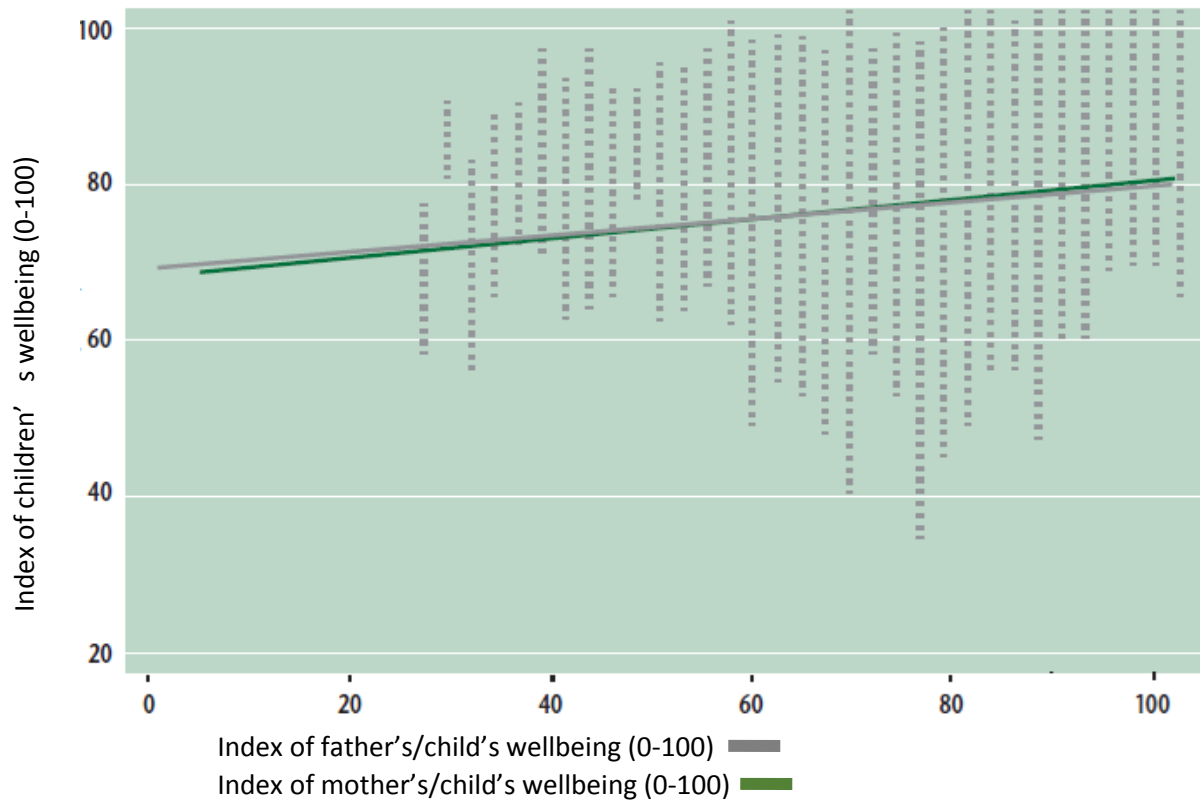
Source: (Bonke & Greve, 2010)

1.2.4 Reasons for the increase in the number of persons with obesity despite the evidence of adverse health effects

Several researchers and patient/professional organisations have recently used the term "obesogenic environment" to describe the many aspects that influence our impulse control, reward patterns and the difficulties that one would face if trying to avoid leading an unhealthy lifestyle, such as type and availability of foods, mode of transportation, occupation and culture, that can pre-dispose an individual to obesity. Obesogenic environment is a useful concept to describe the many stakeholders that influence our health, such as food industry companies, restaurant, car producers, leisure industry etc. It is interesting that those stakeholders simultaneously are not formally a part of the policy-making but have potential influence on the agenda and

budget distribution, as well as the restrictions and regulations applicable to the industries through political lobbying.

1.3 Consequences for individuals

1.3.1 Who is at risk of obesity?

Children and adults alike, as well as pets have theoretically equal chances of becoming obese, if they have genetic pre-disposition or are exposed to SES-dependent risk factors, such as lifestyle, habits, traditional foods and pastimes. Some nationalities and age groups, as well as persons with pre-existing conditions, such as T2DM, have higher chances of becoming obese. We have already established the importance of the SES factors in determining the pre-disposition to obesity. In short, anyone, who is exposed to obesogenic environment are at risk of developing overweight that can later develop into obesity. While men are more often overweight than women, there are more women that progress to becoming obese.

1.3.2 What are co-morbidities associated with obesity?

Obesity is a multifaceted disease: it can have complex reasons and results in many chronic conditions. There are above 200 diagnosis in medicine that can be directly attributed to excess weight in patients. Common complications associated with obesity include, but are not limited to(Nyberg et al., 2018):
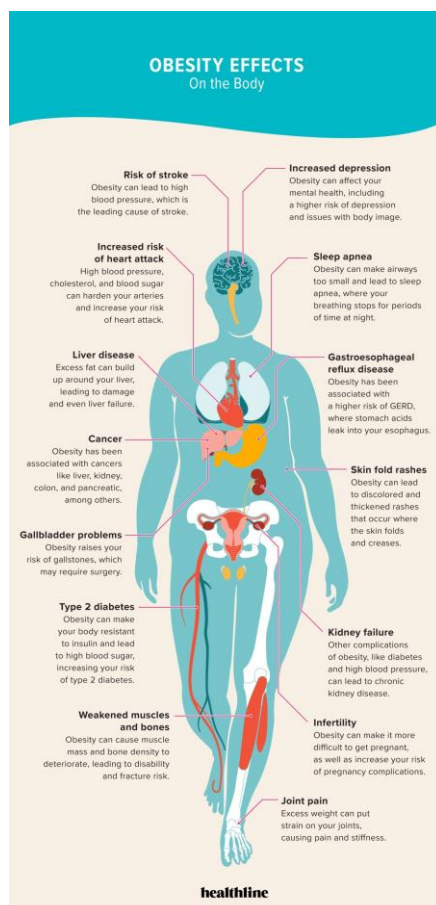
- 13 common forms of cancer, including esophageal, ovarian and colorectal cancer (WCRF, 2016)

- Hypertension

- Atherosclerosis

- Arthritis and other joint related issues

- Cardiovascular events (Stroke, MI)

OBESITY EFFECTS
On the Body

Risk of stroke
Obesity can lead to high blood pressure, which is the leading cause of stroke.

Increased risk of heart attack
High blood pressure, cholesterol, and blood sugar can harden your arteries and increase your risk of heart attack.

Liver disease
Excess fat can build up around your liver, leading to damage and even liver failure.

Cancer
Obesity has been associated with cancers like liver, kidney, colon, and pancreatic, among others.

Gallbladder problems
Obesity raises your risk of gallstones, which may require surgery.

Type 2 diabetes
Obesity can make your body resistant to insulin and lead to high blood sugar, increasing your risk of type 2 diabetes.

Weakened muscles and bones
Obesity can cause muscle mass and bone density to deteriorate, leading to disability and fracture risk.

Increased depression
Obesity can affect your mental health, including a higher risk of depression and issues with body image.

Sleep apnea
Obesity can make airways too small and lead to sleep apnea, where your breathing stops for periods of time at night.

Gastroesophageal reflux disease
Obesity has been associated with a higher risk of GERD, where stomach acids leak into your esophagus.

Skin fold rashes
Obesity can lead to discolored and thickened rashes that occur where the skin folds and creases.

Kidney failure
Other complications of obesity, like diabetes and high blood pressure, can lead to chronic kidney disease.

Infertility
Obesity can make it more difficult to get pregnant, as well as increase your risk of pregnancy complications.

Joint pain
Excess weight can put strain on your joints, causing pain and stiffness.

healthline

- Gastrointestinal complications (Digestion problems, ulcers, high acidity, reflux etc.)

- Sleep apnea

- Mental Health issues (Depression and Anxiety) (Tyrrell et al., 2019)

- Skin conditions (i.e. chafing, contact dermatitis)

- Development of Type 2 Diabetes Mellitus

Figure 2. A Representation of Obesity Co-morbidities

Source: (Healthline, 2019)

Living with obesity presents a more than two-fold increase in a relative risk of developing co-morbidities at some stage. Moreover, childhood obesity is associated with a lifetime elevated health risk, even if the person attains a healthy weight as an adult.

b. Social

PwO face a lot of judgement and stigma in all areas of their life and women are feeling the consequences more than men. Many people misunderstand the underlying reasons for obesity, assuming a number of labels, such as lazy, unmotivated, uneducated and low-class. It is especially women and children that experience the social consequences of their excess weight. Until recently, it was only a small group of people that was affected by obesity and it is still seen as abnormal or strange to be obese. Our societies are focused on youth and physical attractiveness as the measurement of one's physique, rather than other qualities. PwO face many issues in daily life due to the stigma and blame associated with their disease – much like lung cancer patients or T2DM patients did a couple of decades ago. This stigma provides an excuse for judgment, discrimination, bullying etc. and can have serious consequences on the individual's social interactions and network, mental health and employability. In

addition to the physiological and psychiatric conditions, obesity often results in social stigma, discrimination and isolation.

c. Psychological and Psychiatric aspects

Obesity, overweight and binge-eating has been linked numerous times to mental health. Whether it is the trauma and/or stress that provoke binge-eating and subsequent obesity, or the fact of being obese and the adjacent consequences result in anxiety and depression, or the medication for certain conditions, such as schizophrenia, that causes individuals to gain weight, excess weight and the physiological implications thereof are intricately connected with our psyche.

d. Employment and labour market participation

Studies find that women are especially affected by the discrimination they face for being obese, especially in the context of professional employment. Several studies finds that women have a harder time becoming employed when they are obese, they stay unemployed longer as well as will more likely be seen as the "weaker link" in the company during the layoffs. Obesity and the lack of treatment options in Denmark thus contribute to the inequality that men and women face in the labour market. (Härkönen, Räsänen, & Näsi, 2015; Hughes & Kumari, 2017; Hughes, Kumari, McMunn, & Bartley, 2017; Monsivais, Martin, Suhrcke, Forouhi, & Wareham, 2015) In Denmark women of working age constitute up to 50% of the potential labour force and 16,8% of them are obese. Obesity is strongly associated with T2DM and other debilitating co-morbidities that often result in withdrawal from the labour market. Even by reducing the number of obese women by third, we could potentially alleviate from 1,5% of unemployment. At present, bariatric surgery does not offer patients a significant benefit in terms of increased labour market participation or income.

e. Correlation between obesity and T2DM

One of the more serious consequences of becoming obese is Type 2 Diabetes Mellitus – over 30% of persons with obesity develop T2DM over time and 85% of diabetics are overweight and obese. T2DM is a well-document public health

item, proven to be a significant and preventable burden on the health care systems worldwide. There are numerous studies on the benefit of prevention and early intervention of T2DM, as well as the economic consequences and loss of labour market force as a result of inadequate management, late intervention etc.

1.4 Consequences for society

1.4.1 High cost in HC and public budgets

Obesity is a progressive chronic disease and implies life-long care commitment. Many PwO will require medical assistance throughout their lifetime. HC costs associated with obesity span services across primary (physician visits, specialist visits, lab tests such as biopsies, blood tests etc., prescriptions) and secondary (bariatric surgery, hospitalisations due to complications from i.e. T2DM, hypertension CV events) HC sectors, as well as fringe into the municipal financial obligations to take care for the disabled, long-term sick leave patients, elderly, and demented. The strong correlation between obesity, unemployment and depression can further escalate the avoidable costs of obese persons in the society.

There is strong evidence that obesity can be inherited – genetically, but more significantly through the SES of the parents, family and friends, as well as generally the environment of the person during childhood and adulthood. Hence, the more persons that are overweight and obese in the society, the higher the propensity that their children, relatives and friends will also become overweight and obese. The excess weight has a trickle effect on the population.

Implications for unemployment

Unemployment is a natural occurrence in any society. Unemployment is the state of not having a job, but being available for employment. Unemployment is not dangerous for the public budget, unless it is a result of chronic mental or physical illness. In that case, the person unemployed might eventually exit the labour market and no longer be available for employment. Many cases of exiting the labour market prematurely, i.e. before the retirement age, can be prevented, if the cause of the sickness is addressed properly and on time.

Moreover unemployment, especially long-term unemployment, and premature labour market exit have been linked to depression, anxiety, low self-esteem and weight gain, making it harder or impossible for persons to return to the labour market.

Denmark has a social welfare system financed through taxes. The services include healthcare, education, unemployment benefit and income transfers. Income transfers are financed through taxes and are not subject to taxation, that the person receiving them is contributing less to the state treasury. Income transfers are usually reserved for those, who have a serious impediment that is preventing them from being able to take on a job at all or without assistance, such as mental illness, physical disability, long-term illness.

In Denmark, those, who have a chronic disease, such as Type 2 Diabetes, have a 75,5% chance of not participating in the labour market, e.g. being unemployed for a long time and unable to participate in a job. Hence, prevention and early detection of chronic diseases could be a tool to increase labour market participation of the vulnerable groups. (Sundhedsdatastyrelsen, 2018) Considering that some of the diseases accounted for in the analysis are strongly if not directly linked to excess weight and obesity (Type 2 Diabetes, arthritis etc.), some very specific savings could be made by alleviating the complications and engaging the persons in the labour market again.

Women, appearance and employment

We use judgement and stereotypes to make conclusions about the world. Many minority groups, based on the ethnicity, age, sexual preferences, appearance, religion etc. experience discrimination in the context of labour market, financial relationships, purchases etc. Women are generally more often discriminated against in the labour market due to their appearance and age. Studies exploring the relationship between obesity, overweight and employment found a significantly larger correlation in the female cohort of the study than male, meaning that women experienced up to 60% more biased opinions of their professional qualifications based on their weight

and appearance. Moreover, due to the more prevalent judgement, women are more susceptible to develop depression and anxiety due to their overweight and obesity.

Type 2 Diabetes Mellitus and Obesity

T2DM has been identified as one of the most significant burdens on the healthcare system, alongside certain cancers and cardiovascular disease.

1.5 Treatment options

The main treatments available for obesity include behavioral therapy, baritatric surgery, pharmacology (subject to GPs or specialist approval) and lifestyle interventions (alone or through support groups, i.e. Weight Watchers). They have different impact on different patient groups and thus highlight the need to tailored and multi-faceted treatment. Bariatric surgery is an expensive, irreversible and invasive procedure, which, while offering a rapid and effective short-term result, can induce complications and does not guarantee a long-term result. Support groups, cognitive therapy and other lifestyle interventions have been identified as a valuable supplement to other therapies, but are rarely effective on their own in the long-term. With the recent developments in the development of GLP-1-RAs (Receptor Agonists) it is now possible to receive effective and long-term pharmacological treatment with few, but serious risks or side-effects. While all of these therapies attempt at manipulating the impulse control through physical, mental or physiological restraints, so far, only the pharmacological treatment has been able to offer less invasive, but effective treatment. In short, while there are options to treat obesity, all of them come with a caveat and rarely promise a life-long relief.

A report published by KORA in 2018 examined the costs and savings associated with performing bariatric surgery on obese patients. Among other things, they considered the hospital care and readmissions expenses, drug-related expenses, social payment transfers and income and compared the costs to the projected costs of not performing surgery. While some parameters were positively affected (diabetes-related drug-costs), income and number of physician visits did not change significantly.

1.6 Evaluation of Health Care Interventions

1.6.1 Cost-Benefit and Cost-Effectiveness Analyses in Public Health Policy Decision Making

In order to understand, how a treatment of a certain ailment impacts the costs and how much benefit it provides, e.g. how healthy the person becomes and how quickly, as well as how permanent the results are, public policy decision makers within health care often turn to Cost-Benefit analysis or CBA. CBA is a measure of the extent to which the intervention is "worth" being offered to the population when compared to the health benefit it provides. For instance, if an intervention is quite expensive, but it provides a lifetime free of the disease and related side-effects, it is "worth" more than a remedy that only partially and/or temporarily solves the problem, but costs less. (M. Drummond, 2013; M. F. Drummond, Sculpher, Torrance, O'Brien, & Stoddart, 2005)

Cost-effectiveness analysis

Cost-effectiveness analysis (CEA) is one of a number of measures used in Health Care to assess whether it is worth to adopt, change or abandon a certain procedure. Cost-Effectiveness Analysis helps compare various treatment alternatives, including no treatment, with regards to whether the cost of one of the treatments is justified by its (increased) effects on a certain condition. For instance, in the case o Type 2 Diabetes, lowering long-term blood sugar levels or the number of hypoglycemia events could be relevant effects to measure. In the end, CEA tells us, whether a certain intervention is worthwhile from a perspective of replacing a present treatment method, justified by its Costs to Effects ratio.

Unlike Cost Minimisation (CM) and Cost-Benefit Analysis (CBA), which focus on reducing the costs for a procedure and estimating cost per procedure respectively, Cost-Effectiveness analysis focuses extensively on the potential efficacy of the treatment. CEA is argued to be more appropriate for the use in health care due to several factors that are listed below.

Firstly, CBA assumes unlimited resources available to be distributed between the projects. It is unrealistic in the context of most (and especially Public) Health Care systems to prioritize one project (or intervention) over the other. Moreover, most of the times, one cannot directly profit from curing or treating a certain disease, because the benefactor of the treatment – the patient – seldomly carries the direct costs of the intervention. The broad effects of treating or curing patients on the society are often even more tenuous to point out. Attempts are made at summarizing the effects of better health care and what better health care is, but the conclusions, clearly indicating the benefits, are difficult to apply in the governance context.

Because Denmark has a tax-funded Beveridge-model HC system, it is not valuable to consider the Willingness-to-Pay (WTP), which is one of the tools in CBA. WTP is an assessment of how much a consumer, in our case – the patient, is willing to pay for a certain intervention considering the potential effects of improvements. Since the patients do not pay for an intervention directly and do not have the influence on the distribution of the budgets, we do not consider this to be a valuable measure of the appropriateness of a certain medical treatment within a public or national health care system.

Secondly, the CBA is not concerned with the effects of the treatment as such, but rather on the economic savings that those effects can lead to. This can contribute to misleading results of a treatment analysis, concluding that the treatment should not be approved if it is not reducing the expenditure on the treatment, while CEA focuses more on the actual improvement of a certain aspect of the patient's health state. This is more appropriate to assess in the Health Care context because it is often not possible to save money on treatment options, but they can improve the

long-term health of the patient and the society.

Thirdly, CBA essentially measures health effects using a monetary equivalent, which can be difficult to define, depending on the kind of intervention or the longterm effects and their individual impact. On the contrary, CEA uses natural

units such as blood pressure, HbA1c (blood glucose levels), temperature etc. eventually leading to the Quality-Adjusted Life Years (QALYs) assessment.

CEA, however is not always the best solution for conducting an economic evaluation of a certain intervention. To start with, several effects and their interdependency cannot be combined in a CEA. As a consequence, CEA does not allow to assess the overall effect of a certain intervention on the society as a whole. It also omits to include the indirect costs of the health care intervention and the budgets that are available for other areas. Lastly, the possibilities for discounting for either the exchange rate or the irrational individual choice are not included in this analysis method. (Bergmo, 2015; Jolly et al., 2011; Martin, White, & Lindstrom, 1998; Mathar, Horstmann, Pleger, Villringer, & Neumann, 2016; Milliken & Ellis, 2018; Oster, Thompson, Edelsberg, Bird, & Colditz, 1999; Sankaranarayanan, Viswanathan, Bharmal, Shah, & Murawski, 2011; Svensson & Hultkrantz, 2017; Torrance et al., 2002; Walker, Sculpher, & Drummond, 2012)

1.7 Structure and Financing of the Danish Health Care System

The financing of the Danish HC system comes from two sources: taxes paid to the state and municipalities respectively. In turn, these are distributed between primary HC (GPs, homecare, rehabilitation, specialists, etc.) and secondary HC through regions (hospital and emergency care administration). (Økonomi og Inderigsministeriet, 2019)The Ministry of Internal Affairs in Denmark, governs the distribution of funds and the shares that the state and municipalities commit(Sundhedsstyrelsen, 2018). Figure 4 illustrates that over 70% of the 111,82 billion DKK that was spent on HC in 2017 resides in the SHC.

Figure 4. Disease Expenditure per Health Care Sector in 2017

Department	Health care systems expenses, DKK billion
Hospitals	83
General Practice	9
Drugs	6
Specialist Practice	4
Central Administration of HC	3
Centrally Shared Funds	3
Dentistry	2
Physiotherapy	0,4
Other expenses	0,3
Hearing aids	0,2
Psychotherapy	0,2
Nutrition	0,2
Chiropractor	0,1
Foot therapist	0,1
Children Exams	0,1
Prophylactic Fertility Exams	0,1
Specialist Dentistry	0,05
Vaccinations	0,05
Amortisation etc.	0,02

(Danish Health Authority & The Danish Cancer Society, 2016; Danske Regioner, 2016; Kocemba, 2015; Regioner & Regioner, 2018; Sundhedsstyrelsen, 2018)

1.7.1 Burden of diseases in Denmark

Figure 5 below illustrates the disease burden of some of the most significant diseases that affect the Danish Healthcare:

Figure 5. Disease Expenditure by Disease Area

Disease expenditure of the regions

Department	Health care systems expenses, DKK billion
Cancer	9,6
Psychiatry	8,7
Cardiovascular diseases	6,8
Diseases of the bones, muscles and connective tissue	5,5
Respiratory Diseases	5,1
Digestive Diseases	4,3
Symptoms and Abnormal Findings	4,0
Lesions, poisonings and certain others consequences of external influences	3,3
Diseases in urinary and genital organs	3,2
Nervous system disorders	2,4
Diseases of the eye, eye environment, ear and process mastoid	2,1
Endocrine Diseases	1,9
Cancer / diseases of blood and blood forming organs	1,8
Lesions, poisonings and certain others consequences of external influences	1,7
Infectious and parasitic diseases	1,6
Skin and subcutaneous tissue disorders	1,0
Congenital malformations and chromosome abnormalities	0,6
Certain diseases that occur at the end of a pregnancy or shortly after birth	0,4
Mental illnesses	0,4

Note: Pregnancy, childbirth and maternity costs DKK 2.1 billion. In the category "Factors that are important for contact with health care", the expenses amount to DKK 10.1 billion. The hospitals' expenses in this table amount to approx. DKK 76 billion and thus not quite the DKK 83 billion from the table above. The difference is due to different sources and calculation methods.

Source: Danske Regioner homepage & Sundhedsdatastyrelsen, 2017

2. Mission of the thesis

With this thesis project I aim to explore the economic evidence for introducing prevention initiatives in Denmark to tackle the burden of obesity and for offering better, nuanced and early treatment for obesity in a setting of Danish HC system.

2.1 Problem Formulation

I have embarked on this project with a set of assumptions about the state of the Danish healthcare and what burden obesity constitutes in the healthcare and state budget. During the background check and desk research, I was surprised to discover the high numbers of PwO in Denmark, despite the relatively high living standard. Patients in Denmark report high levels of unmet need and there has been a steady decrease in the number of general practitioners, especially in the rural areas. Despite much of media attention and advertising efforts being focused on attaining a

healthy weight and become fit, they numbers of PwO are rising. I am set to explore, what those reasons are, as well as to suggest strategies to preventing obesity in future generations and reducing the burden of obesity in Denmark. I will employ the below problem formulation and the following research questions to guide my research.

What is the burden of obesity in Denmark and what innovation is needed to reduce the burden of obesity as a disease and improve prevention in Denmark in the years to come?

2.2 Research Questions

I will be working on the following research questions:

RQ1: What impact does obesity and chronic diseases have on healthcare expenditure and income transfers?

RQ2: What are the main obstacles to efficient obesity treatment and prevention in Denmark in terms of knowledge and awareness?

RQ3: Is there awareness and knowledge of the specific challenges that persons living with obesity experience in everyday life among employees in the municipalities?

RQ4: How to improve prevention of obesity and Denmark?

RQ5: How to ensure the success of the initiatives in Danish healthcare?

3. Materials and Methods

In this section I will describe the main literature, research and methods that guided my research. The aim of a Master Thesis Project is to develop a research problem in order to connect the research literature and available data to an existing Health Care challenge (described on CBS's kursuskatalog.cbs.dk). To perform an analysis it is necessary to select and adapt theories from the relevant scientific fields. I will account for the strengths and weaknesses of the methods chosen at the end of each Research Questions's results section. For this Master Thesis project, I have chosen to explore the area of obesity management and prevention in Denmark in order to discern

what innovation is needed to improve the quality of obesity management and to prevent more persons from becoming obese in the future.

3.1 Important literature

To back up my research and provide structure to my analysis I have guided my literature search based on the following key books:

2. Oxford Handbook of Health Economics – the cornerstone of our programme that covers many topics

3. Economic Evaluation of Healthcare Intervention Programmes – politicians and public workers often use CBA and especially CEA when determining whether they can prioritize the intervention/treatment/procedure on the public budget. Since this measure is important, I have chosen to offer a brief and simplistic CBA in this paper

4. ADKAR Change Management – I am convinced that any change needs to be managed, especially when the dimensions of the change orchestrated encompass a whole country. Through the content of my exploratory interviews, I have often encountered the theme of the lack of knowledge or lack of awareness. This model list those as being crucial to the beginning of the change process. I have thus based my survey topic on this model.

5. Oxford Handbook of stigma, discrimination and health – this book describes the effect of stigma and discrimination on the quality, amount and extent of healthcare offered.

6. Fat Economics – this popular book has a holistic and systematic view of the society and the economics and behaviours that govern us.

3.2 Methodology

Methodology is a crucial part of academic research. Methodology describes the choices one makes when collecting data, reviewing literature, testing

hypotheses, choosing theory and its place in research, It is how one can secure the three tenets of research and resulting knowledge: **reliability, replicability and validity.**

The below text and choices are guided by several internationally renowned authors within social and other research, including Alan Bryman (, Steinar Kvale, Svend Brinkmann

Below is a quick overview of my research design elements, which together constitute the research paradigm, or ""the set of common beliefs and agreements shared between scientists about how problems should be understood and addressed" (Kuhn, 1962)":

- Research philosophy: positivism with triangulation through mixed methods and samples

- Research approach: deductive (theory is central to the research questions)

- Ontology: constructivist "believe that there is no single reality or truth, and therefore reality needs to be interpreted, and therefore they are more likely to use qualitative methods to get those multiple realities".

- Epistemology: critical realism, supported by phenomenology

Below is a graph representing the relationship between the above elements.

Ontology	Epistemology	Theoretical perspective	Methodology	Methods	Sources
What is reality?	What and how can I know reality/ knowledge?	What approach can we use to get knowledge?	What procedure can we use to acquire knowledge?	What tools can we use to acquire knowledge?	What data can we collect?

Adapted from Hay (2002) pg. 64 and Crotty (1998)

An outline of the main steps of qualitative research

1. General research question(s)
2. Selection of relevant site(s) and subjects
3. Collection of relevant data
4. Interpretation of data
5. Conceptual and theoretical work
5a. Tighter specification of the research question(s)
5b. Collection of further data
6. Writing up findings/conclusions

Some common contrasts between quantitative and qualitative research

Quantitative	Qualitative
Numbers	Words
Point of view of researcher	Points of view of participants
Researcher distant	Researcher close
Theory testing	Theory emergent
Static	Process
Structured	Unstructured
Generalization	Contextual understanding
Hard, reliable data	Rich, deep data
Macro	Micro
Behaviour	Meaning
Artificial settings	Natural settings

Through deductive research methodology, I have explored theories from the areas of medical obesity management, (economic) evaluation of healthcare interventions, decision-making in healthcare, management of healthcare, preventative medicine and innovation and change management. I observed the high number of PwO in Denmark, despite the relatively high economic wellbeing in the country, especially among children and wondered what the reasons were for that.

My project has a significant medical and biological foundation. In order to perform an objective and scientifically relevant research, I assumed a positivist method in that I looked at the objective data rather than considered individual opinions. To ensure the reliability of the results of the analysis it is crucial to objectively assess strong and weak points of the chosen methods and research design. I have consulted a number of meta-studies and literature reviews on the above topics in order to gain a broader understanding of the commonly used theories and their relationship with each other.

I conducted a deductive (maybe abductive?) mixed methods interview and survey study with a purpose of measuring the awareness and knowledge of the impact of obesity as disease on personal life, as well as reasons for the current obesity epidemic and the main areas for effective prevention and treatment of obesity. I have sent the survey to the various departments of the largest 60 Danish municipalities by number of inhabitants. I have chosen to send the survey to the Citizen service (in most cases the general reception and mayor's office),Employment&Integration, Education,

Family, Youth&Children, Health & Care, Psychiatry and Social Welfare departments, since employees in those departments have direct responsibility for and contact with the persons who might experience adverse effects of their chronic illness.

Qualitative data: Prior to the survey I conducted 5 exploratory interviews with persons, who have vast experience with public, political and scientific work that concerns improving the situation from various angles, such as medical information, treatment, prevention and information. The interviews indicated the significance of obesogenic environment and awareness and knowledge of the disease on the effectiveness of prevention and treatment in the societies. I conducted the survey for the purpose of measuring the awareness, general sentiment and knowledge of the subject.

Quantitative and qualitative data: I sent the survey out between November 26th and 28th using the Danish service E-boks, as many municipalities can only be contacted through the so-called Digital Post. It is a secure encrypted service and thus I also believed that it would provide me with more credibility and will increase trust towards my good intentions. I have chosen to conduct the survey online instead of sending the survey by physical post or as an attachment to the mail in order to reduce the environmental impact, reduce the chance of mistakes and missing data, shorten the turnover and results collection time. I have assumed that since most employees work with some kind of a computer system on a daily basis and considering the high digital literacy in Denmark (most services are now provided or at least booked online), the online survey would not be a barrier.

The survey contained 17 questions, out of which 6 were checkbox questions,1 - open-ended questions, 1 - validated question (age, 19XX or 20XX), 5 - multiple choice questions and 4 - Likert scale questions. I have chosen a 7-point Likert scale that displayed options from "Completely Disagree" to "Completely Agree". I have chosen the Likert scale as it is reported to yield most honest, intuitive results. I have attempted to create an anonymous survey that would collect meaningful but unidentifiable results. Due to the controversial nature of the topic, I have attempted to maintain a neutral, non-judgmental language. Where possible, I have added an option

to write a free question in addition to the checkboxes. Questions spanned topics of chronic disease in general and its effect on everyday life, needs of persons l.w.o., personal experiences with obesity and using the municipal health improvement offers, suggestions for the areas and ages for treatment and prevention and the possible reasons for the further development of the obesity prevalence in Denmark.

After receiving the responses, I have collected the data on the various healthcare offers in the areas to create an idea of how adequate and sufficient the number and nature of those offers is in relation to the number of employees in the municipality, number of citizens, the adults vs. children ratio (if the offers only were for minors), the number of persons unemployed and the estimated number of persons with obesity. The assumption is that where there were many adequate offers, more understanding is exhibited to the specific problems of living with obesity and thus the number of PwO is lower.

Finally, I calculated the approximate costs of interventions, the gains and losses of the state etc.

It is crucial to provide consistency and coherence in the relationships between problem statement, analysis and conclusion. Through literature search, I have thoroughly explored the causal relationships between the various factors that influence the prevalence of obesity in population and the reasons for why it is an increasing burden on healthcare and social welfare systems worldwide.

Finally, the project explains and discusses what implications the results of the project have for the existing practices and problems in Health Care in relation to the business practices within the programme's field of study, such as Health Care Management, Health Care Processes, IT in Healh Care and Economics of Health Care.

3.3 Literature search

For the literature search I partly used network approach and keyword approach. Regarding the network approach, I searched the articles recommended to me through my network and then explored the references in those sources. As for the

keyword approach. I conducted searches in the CBS Library Search Function, as it has broad access to a multitude of databases on specific topics, as well as through PubMed for the medicine and physiology-specific articles and Google search for random queries as well as Danish newspaper and website articles, publications and national registry data. Where possible, I limited the searches to latest 20 years ago. The last literature search was performed on January 2nd 2020.

3.4 Interviews

For this project I have performed 5 semi-structured qualitative interviews with experts within obesity management, prevention, public policy and obesity treatments (The transcripts are in the appendices). The purpose of those interviews was to explore the trends and the latest medical discoveries, as well as the largest obstacles that exist to efficient obesity management and prevention.

Name	Organisation	Credentials	Reason
Nicholas Finer	Novo Nordisk, Senior Principal Clinical Scientist	Hon. Clinical Professor, National Centre for Cardiovascular Prevention and Outcomes, UCL Institute of Cardiovascular Science, London, UK	Nicholas Finer has solid research and practitioner experience within medicine and specifically metabolic diseases, such as obesity. Nicholas is a strong advocate for the recognition of obesity as a disease and participated in several studies exploring the improvement of prevention and treatment of obesity.
Pernille Auerbach	Novo Nordisk, Global Medical Affairs	MD, PhD and Associate Global Medical Director in Novo Nordisk A/S, Copenhagen, Denmark	Pernille has vast experience with studying treatment and prevention of obesity. She participated in several trials and studies (such as ACTION IO) that explore the issues in obesity management in depth.
Gitte Laub Hansen	Kræftens Bekæmpelse Patient Organisation (Cancer Prevention)	Ph.d. in human nutrition and epidemiology, Project Leader for Physical Activity and Diet at Kræftens Bekæmpelse (KB), a Danish Patient Organisation for the Fight against Cancer.	Gitte specialises in consulting the public authorities and general public on the research within human nutrition and cancer occurrence. KB is the largest patient organization in Denmark.
Bjarne Lynderup	Adipositas Foreningen (Adiposity	Secretariat leader at Adipositasforeningen, has MSc in Human	Bjarne is one of the prolific members of the Adipositasforening, which is the only patient and advocacy organization in

	Patient Organisation)	Resource Management and Labour Market Regulation from Aalborg University.	Denmark that is concerned entirely with representation of persons with overweight in the public debate and spreading knowledge about the causes, risk factors and co-morbidities of excess weight. Bjarn is also involved with Novo Nordisk, and is one of the titular persons in the Changing Obesity™ promotion.
Lene Kring	Novo Nordisk, Changing Obesity™	M. A. of Arts in Communicarion from Copenhagen University; Director of Corporate Branding and Reputation, Novo Nordisk A/S	Lene Kring heads up the Changing Obesity™: Novo Nordisk's initiative to spearhead and guide the improvement of quality of life of persons living with obesity, identifying and changing the conditions of the cities that promote obesity in populations and finally offer guidance to the municipalities and decision-makers.

4. Analysis

4.1 Treatment options and costs

On Aleris-Hamlet private hospital homepage, the **bariatric surgery** is listed for DKK 60000 excluding the referral interview and the follow-up care. Moreover, less than 10% bariatric patients do not regain the weight 5 years post surgery, which means that the surgery is only effective at eliminating the immediate health risk and not the long-term adverse effects of the diasease.

A visit to a physician will cost the state DKK 142,1 kroner excluding any exams or additional procedures (from DKK 50 to DKK 500 per item). A report (Add source) that analysed the medical histories of persons who underwent a bariatric surgery reported no reduction in the physician visits and contacts with the healthcare professionals, as well as no increase in labour market participation.

A 12 week course of 3mg daily Liraglutide injections will set the state back DKK 7443,-. Since it is not reimbursed, the whole cost needs to be covered by the

patient. Not considering the invasiveness of the procedure, the cost of bariatric surgery is equal to 3 years of liraglutide therapy.

The indication for Liraglutide is valid for either persons with BMI over 30 or BMI over 27 with complications.

Figure 6. Geographic Spread of Offers for Overweight, Obesity and Bariatric Surgeries Across Denmark in 2017
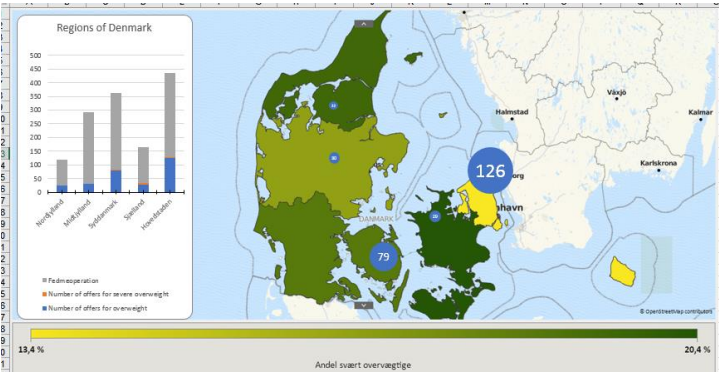
Region of Denmark	Number of PwO	Percentage of PwO	Percentage of women with obesity	Percentage of men with obesity	Number of offers for severe overweight					Number of offers for overweight					Number of bariatric surgeries (2018)	Number of respondents
					total	for adults	without referral	for children	without referral	total	for adults	without referral	for children	without referral		
Nordjylland	22340	19.5	19	19.9	2	1	1	2	2	23	18	10	6	4	95	2
Midtjylland	32990	16.8	16.9	16.7	1	1	1	0	0	30	12	7	18	18	260	24
Syddanmark	39170	18.7	18.5	18.9	2	2	1	0	0	79	38	26	41	35	280	24
Sjælland	19230	20.4	20.8	20.1	6	6	0	3	0	29	19	13	10	9	130	21
Hovedstaden	57400	13.4	13.1	13.7	3	3	3	2	2	126	33	12	95	92	305	29
	171130	17.76	17.66	17.86	14	13	6	7	4	287	120	68	170	158	1070	100

Region of Denmark	Number of PwO	Percentage of PwO	Percentage of women with obesity	Percentage of men with obesity	Total ppl/operations	Number of PwO per operation	Number of persons with excess weight per operation	Persons per offers for overweight	Number of PwO per offer for overweight	Number of persons with excess weight per number of offers for overweight
Nordjylland	22340	19.5	19	19.9	6182	235	3431	25536	971	14173
Midtjylland	32990	16.8	16.9	16.7	260861	127	2543	43475	1100	22042
Syddanmark	39170	18.7	18.5	18.9	4347	140	2382	15408	496	8444
Sjælland	19230	20.4	20.8	20.1	6404	148	3606	28709	663	16163
Hovedstaden	57400	13.4	13.1	13.7	5926	188	2673	14344	456	6489
	171130	17.76	17.66	17.86						

4.2 CBA - Evaluation of HC Interventions

According to a study performed by Jens Bonke and Jane Greve in 2009, with the support of the Rockwool Fund, 8,7 % and 2% of Danes aged 18-64 rated their health as worse or bad respectively. (Bonke & Greve, 2010) While the indices for health and wellbeing do not necessarily correlate, children's (ages 7-17) well-being is also directly correlated with the both parents' wellbeing. This leads to an assumption

that there is a significant group in the Danish population that experiences unmet need in healthcare. The results are corroborated by the analysis of the groups that cost most money per patient to the Danish state as per 2017. The analysis was performed by Sundhedsdatastyrelsen, which is a national Health Data Institute. They perform analyses based on the registry data available in Denmark. Below is the analysis of the cost of those patients to the Danish state.

DK has 5,8 million residents with a roughly equal division between men and women, of those there are 3.645.046 persons of working age (16-64 y.o.). In 2017, 76,4% were employed and 23,6% were either temporarily or permanently unemployed. Of those that are unemployed, most persons are either early retired or receive a sickness income transfer. 568.304 persons in Denmark received income transfers in Denmark, of those 377.712 received the sickness income transfer.

Figure 7. The proportion of persons in Denmark that receive income transfers.
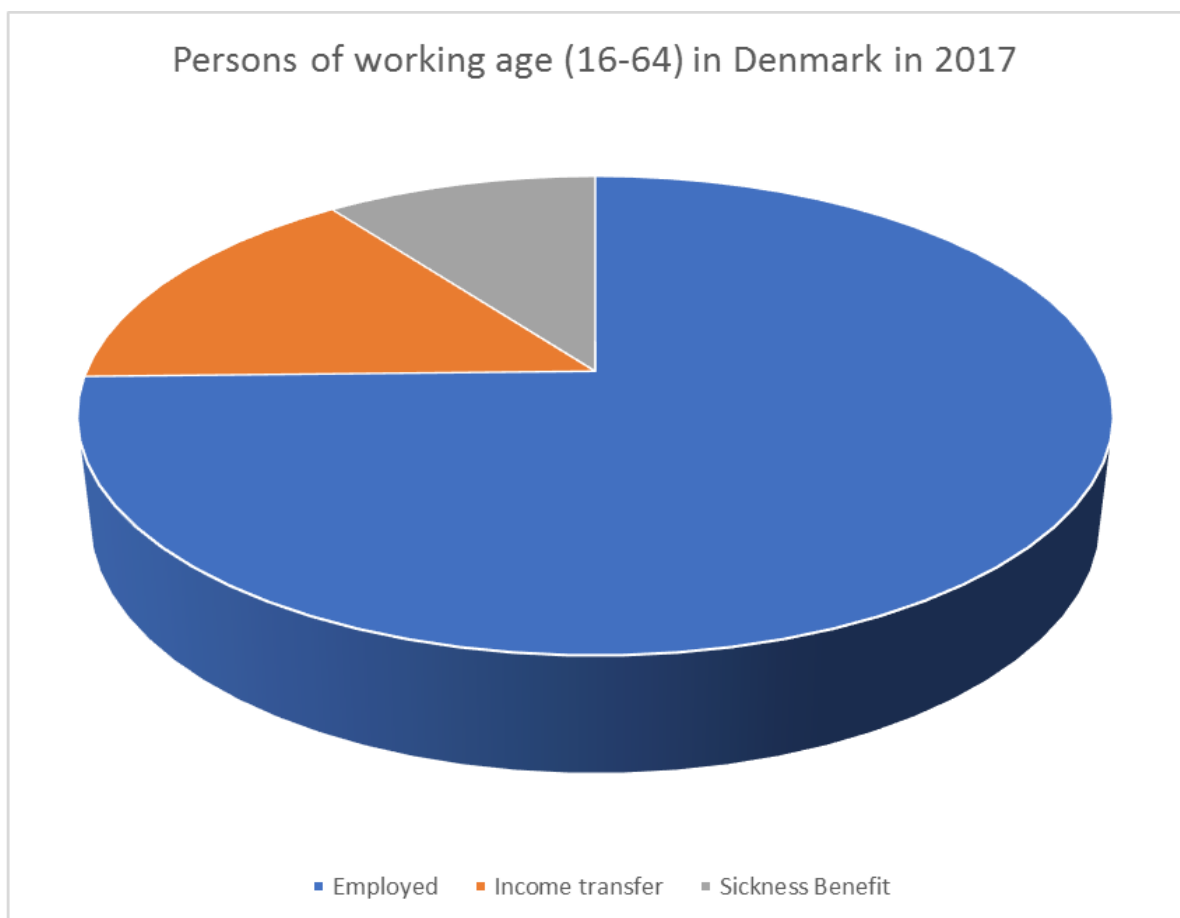
In order to arrive at the total expenditure for the most expensive patients in the Danish healthcare and the potential savings in healthcare if those persons were not as ill, as they are, I will perform the following analysis based on the findings of the aforementioned report from Sundhedsdatastyrelsen. The reason for why this analysis is interesting is because majority of the patients in groups 3 and 4 have Type 2 Diabates, which, as described before is strongly correllated with obesity (85% of patients with T2DM also are obese). Below is a schematic representation of the process I employed to arrive at the final number.

Cost summary of expenditure for people with chronic diseases, permanently or temporarily outside of the workforce, in Denmark 2017 (Yearly cost of healthcare is 84 billion DKK (the total costs, including administration amounted to 109,6 billion DKK in 2017))

Four groups of patients (10% of patients or 9,2% of total population) using the most resources in the health sector. (71% of the expenditure or 61 billion DKK)

Group 1

The usually healthy citizen

Group 2

Citizens with least contacts

Split on persons of working age (16-64) and beyond working age (64+). Consequently, identify the number of persons of working age that are permanently or temporarily not participating in the labour force.

92% of the Danish population has been in contact with the healthcare system in 2017. 10% of those, or 9.2% of the Danish population, claim 71% - 60 billion DKK - of the total expenditure in the Danish healthcare (84 billion DKK). The average cost per patient in those 9.2% of the Danish citizens is 112400,- compared to a mere 5160,- DKK per citizen in the other 82.8% of citizens in contact with HC. Of those 9.2%, 230000 have a chronic condition and are in regular, but infrequent contact with the HC(2 times a year on average), while 35.000 also have a chronic condition, but are in frequent contact with the HC system (7 timers a year on average). In both groups, over half of the patients have multiple chronic conditions.

Group 3:

47% of the 230.000 are of working age = 108.100

59% do not participate in the labour force = 63.779

Group 4:

46% of the 35.000 are of working age = 16.100

92% do not participate in the labour force = 14.812

The persons of working age in those two groups make up 3,4% of the Danish population. A total of 78.591 persons (2,2% of the total population of working age in DK) with chronic diseases, who simultaneously constitute a group with the highest per capita HC expenditure, are not in the labour market. In addition to the savings derived from engaging those persons in a job, it is expected that annual savings of 78.591 x 112.400 = 8.833.628.400, which is 10% of the annual health care expenditure in Denmark in 2017!

Of course, a person who was previously ill will not become completely healthy, but it is expected that the expenditure will

Figure 8. Share of persons of working age with chronic disease in Denmark that are also not participating in the labour market.

■ Employed ■ Income transfer ▪ Sickness Benefit
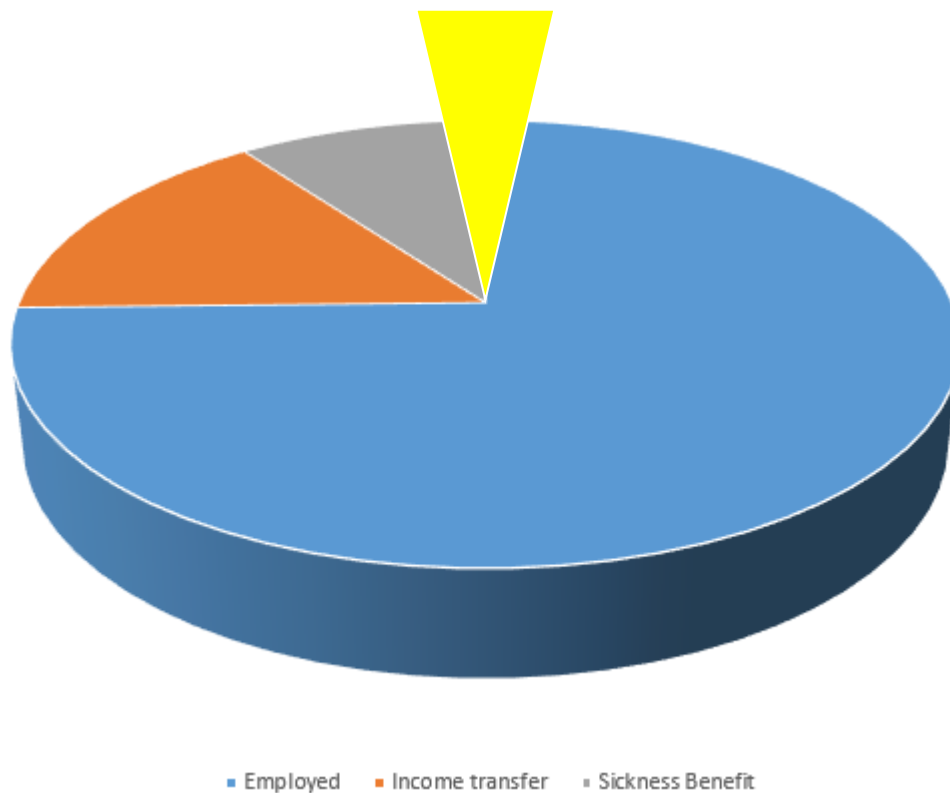
4.3 Interviews (Awareness): titles, relationship to obesity

Below is a word cloud, where the largest words represent the most frequently occurring words. I initially attempted to perform a qualitative coding analysis of the interviews using the NVivo 12 licensed software and I have included questions in the analysis, which allowed for a margin of uncertainty in the decoding of the interviews (The list of words and criteria can be found in the Appendix). For instance, I used the word "obesity" in my questions, while one of the respondents insisted on instead calling the disease "severe overweight", as in her experience, the word is associated with considerable stigma and prejudice.

Figure 9. Word Cloud from the Interviews.

4.4 Survey results

The questionnaire was sent to 60 largest municipalities (per number of residents) in Denmark. In 2016, 494000 worked for the Danish municipalities in the different functions. Based on the history of the falling numbers of persons employed in the municipalities, it is reasonable to expect that there are now between 475.000 and 485000 employees on the municipalities' payroll. In total, 824.600 employees worked in the state, municipal and the regional institutions. That is, municipal employees constitute roughly half of all public employees in Denmark and almost 8,5% of the Danish population. In addition to performing an instrumental job of running the day-to-day and strategic local and regional functions, they constitute a considerable part of the Danish population.

I have received a 100 responses from 40 municipalities (40,81% of total and 66,67% of the municipalities contacted) to my survey in the period between November 26th and December 9th. Most respondents were from Employment (30%), Healthcare (26%) and Family, Youth & Children (22%) departments. The question permitted for multiple answers, which 14 of the participants made use of. The 60 municipalities inhabit 4.803.928 citizens and I have received a response from 40 municipalities, which take care of 2.868.970 citizens as of 2019 (51,23% of the total

population and 59,72% of the population of the contacted municipalities). In 23 municipalities I only received one answer and the average number of responses per municipality is equal to 2.45 with minimum 1 and maximum 18 (median = 1). 89% of respondents were women and the average age is 48 years old (median 4, range from 23 to 74 y.o.), which is quite consistent with the country average (75% are women and the average age is 45 years old).

In order to analyse the results, I transferred the spreadsheet to the IBM SPSS licensed software and coded some of the string values to numeric values. There were some questions that proved to be difficult to code and to analyze. For instance, the questions 1, 12, 13, 14 and 15 permitted multiple response options, which made the results of the queries quite dissolved and disparate. It furthermore did not allow me to make solid conclusions on the nature of correlation between the responses in those questions. Furthermore, I have excluded questions 10 and 11 from the final analysis for two reasons: they implicated the shift between the professional and personal realm and some respondents perceived it as an infringement of their privacy, and they touched upon a sensitive topic. The answer to a question was mandatory so I cannot see the rate of respondents that would have preferred not to answer the question.

The demographics and geographic location of the survey respondents can be seen in Appendices. For the final analysis, I performed the correlation testing between the age and the answers in the questions, compared the medians of answers in each question group (Question 6-9) and

5. Results

5.1 Treatment cost (table)

Treatment is expensive, invasive and ineffective. Childhood education would be more effective in the long-run.

5.2 Survey results

6. Hvorvidt er du enig i følgende udsagn:

   More Details

   ■ Meget uenig   ■ Delvist uenig   ■ Kun lidt uenig   ■ Hverken enig eller uenig   ■ Kun lidt enig   ■ Delvist enig
   ■ Meget enig

   Kronisk sygdom påvirker ens livskvalitet

   Personer med en kronisk sygdom oplever forbehold mod deres evne til at gennemføre en uddannelse eli...

   Kronisk sygdom påvirker ens muligheder for at få eller fastholde et arbejde

   Personer med kronisk sygdom oplever udfordringer i forbindelse med social samvær

   Personer med kronisk sygdom har behov for specialiserede tilbud fra det kommunen

   Personer med kronisk sygdom har behov for specialiserede tilbud fra sundhedssektoren

7. Hvorvidt er du enig i følgende udsagn:

   More Details

   ■ Er helt uenig   ■ Delvist uenig   ■ Kun lidt uenig   ■ Hverken enig eller uenig   ■ Kun lidt enig   ■ Delvist enig
   ■ Meget enig

   Personer med kroniske sygdomme har gavn af et forum, hvor de kan dele deres erfaringer

   Der bliver tilbudt tilstrækkelig hjælp til personer med kroniske sygdomme i din kommune

   De tilbud, der bliver tilbudt i din kommune gør en betydelig forskel for folk med vægtudfordringer og...

   Ens udseende påvirker ens liv

8. Hvorvidt er du enig i følgende udsagn:

   More Details

   ■ Meget uenig   ■ Delvist uenig   ■ Kun lidt uenig   ■ Hverken enig eller uenig   ■ Kun lidt enig   ■ Delvist enig
   ■ Meget enig

   Personer med vægtudfordringer har behov for specialiserede tilbud fra det offentlige for at undgå a...

   Personer med vægtudfordringer har behov for specialiserede tilbud fra sundhedsvæsenet for at...

   Personer med vægtudfordringer har behov for psykologisk hjælp

   Personer med vægtudfordringer har behov for psykiatrisk hjælp

   Fedme er årsagen til en række kroniske lidelser, såsom forhøjet blodtryk, kræft, sukkersyge og...

9. Hvorvidt er du enig i følgende udsagn:

   More Details

   ■ Meget uenig   ■ Delvist uenig   ■ Kun lidt uenig   ■ Hverken enig eller uenig   ■ Kun lidt enig   ■ Delvist enig
   ■ Meget enig

   Svær overvægt/fedme er en kronisk sygdom

   Svær overvægt er en stigende udfordring for det offentlige sektor

   Personer med fedme bliver svært overvægtige på grund af deres livsstil

12. Nedenunder er der eksempler for de offentlige indsatsområder. Vælg venligst de områder, du vil mene er relevante i forbindelse med bekæmpelse af fedme som sygdom lokalt.

    More Details

●	Børn og Unge	91
●	Social	56
●	Sundhed	89
●	Arbejdsmarked og Beskæftige...	46
●	Psykiatri	46
●	Kultur og Fritid	50
●	Familie	67
●	Omsorg	47
●	Uddannelse	45
●	Other	1

13. Af de samme områder, hvilke områder vil du mene er relevante i forbindelse med forebyggelse af fedme som sygdom?

More Details

Børn og Unge	91
Social	50
Sundhed	83
Arbejdsmarked og Beskæftige...	36
Psykiatri	40
Kultur og Fritid	49
Familie	67
Omsorg	44
Uddannelse	42
Other	3

14. Efter din mening, i hvilken alder kan man mest effektivt behandle fedme som sygdom?

More Details

0-6 år	46
7-13 år	60
14-20 år	54
21-35 år	52
Efter 36 år	29

15. Efter din mening, i hvilken alder kan man mest effektivt forebygge fedme som sygdom?

More Details

0-6 år	57
7-13 år	75
14-20 år	53
21-35 år	24
Efter 36 år	20
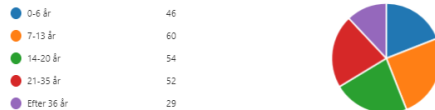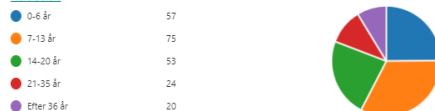
6. Innovation in Obesity Treatments

6.1 Innovation

Innovation is a new or improved product and/or process that is significantly different from the organisation's previous products or processes and that is being made available for the potential users or implemented in the organization for the benefit of either the users or organization. (OECD Publishing, 2018)

Both product and process innovation offer organisations a competitive advantage and have been identified as a source of growth and improving business processes in organisations. Below is a representation of the reasons for why innovation is crucial in Health Care organizations (Boustani, Alder, & Solid, 2018)(Hjortshøj, 2016)(Geroski, 1995):
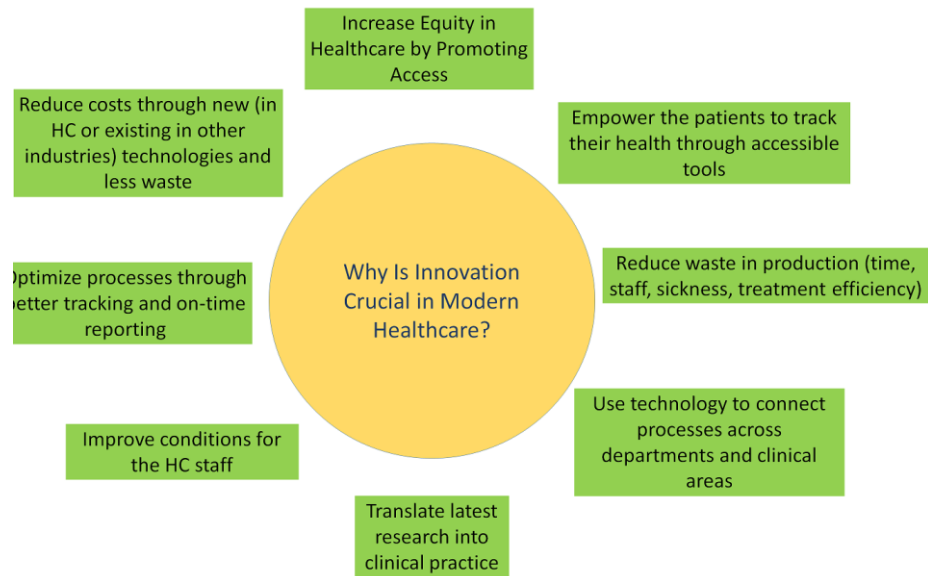
There are four main types of innovation differing by the impact they have on the organization, how much investment they require and how difficult it is for other's to replicate the new product or service.

Figure 6. 4 Types of Innovation
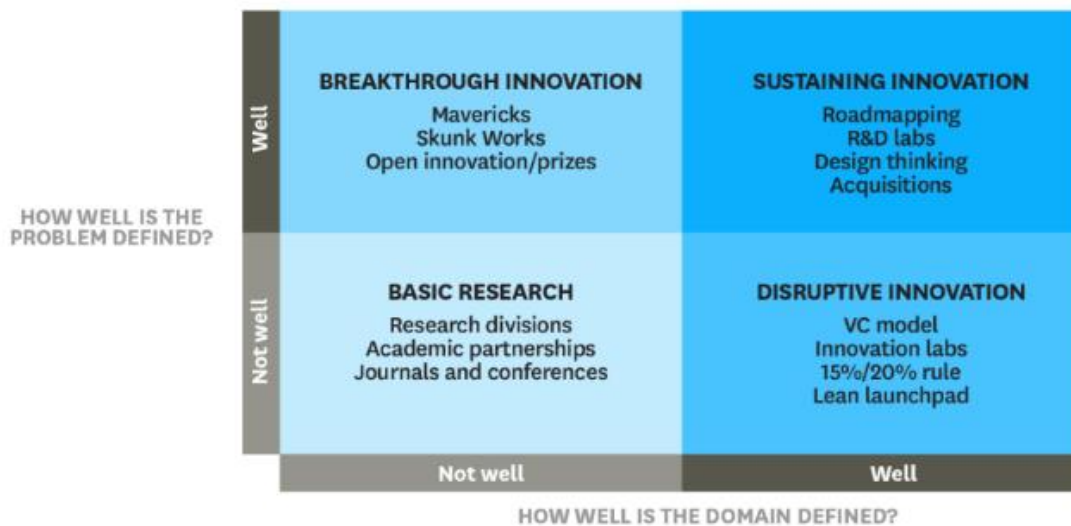
Source: (Satell, 2017)

6.2 Change Management in Healthcare

In his book "Organizational Change and Leadership", Edgar Schein explores the way organizations face inevitable change and how successful they are in

adapting to it by implementing internal changes. He emphasizes that change needs to be managed in order to be successful. (Schein, 2016)

One of the main obstacles to successful change implementation is the personal resistance to change, i.e. employees that are not agreeing with and/or do not understand the change and what consequences it has for them. They often attempt to sabotage the change and prevent it from happening even if it logically is the best outcome for the organization.

To explain, why employees or members of an organization might be against what is best for the organization, Schein identifies Learning Anxiety and Survival Anxiety as the main mechanisms that are exhibited in those, who oppose change. Those mechanisms are simultaneously the influence opportunities for those, who manage change. By understanding the different rationales behind those anxieties can help empathizing with the opposition and enable the leaders of change to explain the advantages of change to them.

Below is a comparison of the different theories applicable to Change Management in Health Care.

Figure 10. Overview of Change Management Theories

Lewin	Bullock and Batten	Kotter	Lippitt
Unfreezing	*Phase 1 - Exploration*: The organization has to make a decision on the need for change	*Step 1*: Establish a sense of urgency	*Phase 1*: Diagnose the problem
			Phase 2: Assess motivation and capacity for change
	Phase 2 - Planning: Understand the problem	*Step 2*: Create a guiding coalition	*Phase 3*: Assess change agent's motivation and resources
		Step 3: Develop a vision and strategy	
Moving	*Phase 3 - Action*: Changes identified are agreed upon and implemented	*Step 4*: Communicate the change vision	*Phase 4*: Select a progressive change objective
		Step 5: Empower employees for broad-based action	
		Step 6: Generate short-term wins	*Phase 5*: Choose appropriate role of the change agent
		Step 7: Consolidate gains and produce more change	
Refreezing	*Phase 4 - Integration*: Stabilize and embed change	*Step 8*: Anchor new approaches in the culture	*Phase 6*: Maintain change
			Phase 7: Terminate the helping relationship

6.3 "LypoTales"

It is important that the innovation is politically endorsed and transpires through multiple aspects of the obesogenic environment. Multidisciplinary approach is required to influence the children through natural sciences, nutrition lectures, canteen food, in order to reduce the burden of obesity in Denmark. To further reinforce the learning of children, I suggest creating a universe of characters that will explain the physiology of lypolisis to children – "LypoTales". This will help them relate to the characters and reduce the stigma of obesity. In addition, an app and a game can be created to familiarize children with the characters and interdependencies. Children respond well to the gamification and cartoonification of the reality and it helps to reduce the judgement from the characters.

Figure 11. "LypoTales" Concept
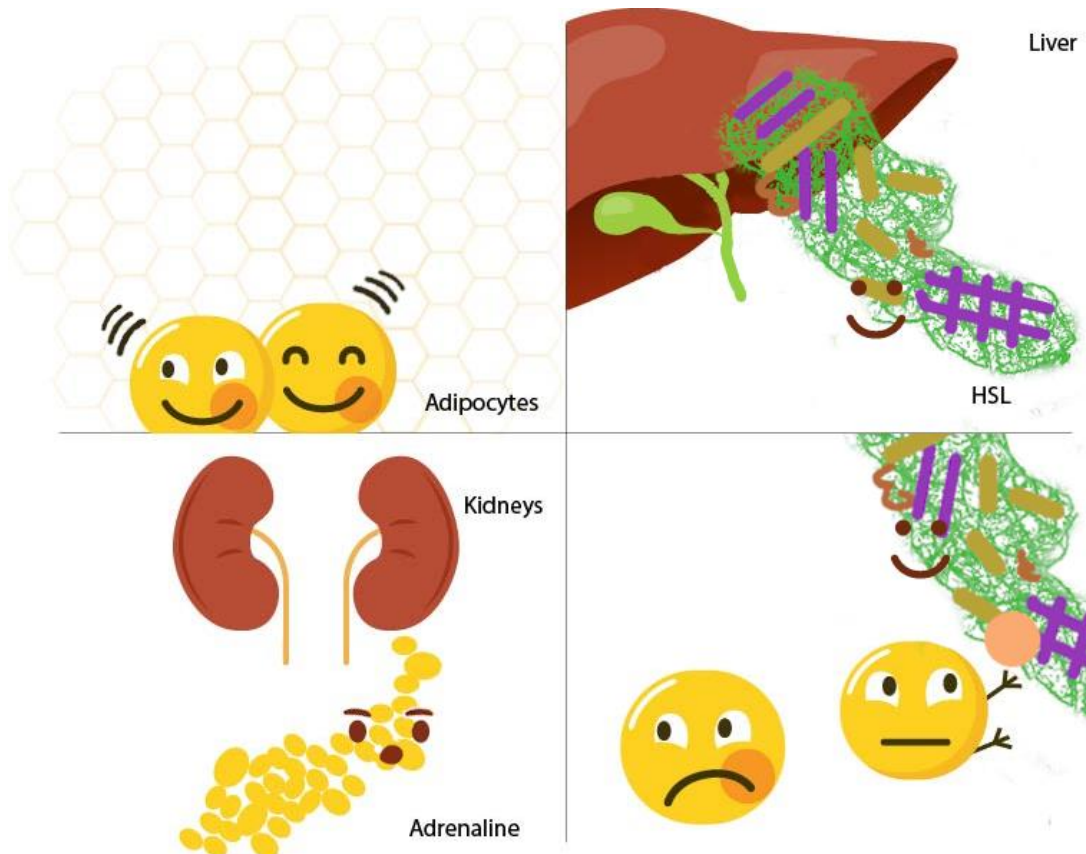
Discussion

The 2013 AMA Decision and Implications for Public Health

Obesity is a chronic progressive hereditary disease with multiple co-morbidities. In 2013 the American Medical Association demanded worldwide recognition of obesity as disease to acknowledge the complex nature, the many aspects of health and life of the patient that it affects and the significant healthcare costs that it imposes worldwide. With this decision they hoped to facilitate and improve the prevention, early and correct diagnosis and appropriate treatment to ensure the best outcomes for the patient, reduce the stigma and re-distribute the healthcare costs. As of now, however, very few nations have comprehensive programmes that target the growing obesity epidemic. Moreover the obesity still has not received an official disease classification number.

Nevertheless, obesity presents an ever-growing risk factor to the national economies and healthcare budgets worldwide. It impacts both the physical and mental

health of individuals, thus impacting their ability to contribute to the labour market. Income transfers to those who are chronically ill constitute a growing expense post in the public budgets and offer little returns. In my analysis, I have considered expenses in the primary and secondary healthcare sectors (by type of intervention or disease group), as well as expenses for unemployment benefits, the numbers of physician visits per annum and type of procedures undertaken (where available) and their relationship to the person's BMI. My analysis could be expanded with the considerations of time of retirement, their level of education and correlation with the income transfer, time spent away from the labour market, percentage of fallout from the labour market, as well as the specific profiles of persons who suffer from obesity and their contact with the healthcare in Denmark. I estimate that adding those more nuanced and accurate factors would increase the estimated potential impact on the healthcare expenditure and the prevention of obesity would thus offer ever larger savings. (Hill, Catenacci, & Wyatt, 2005; Rosen, 2015)

Value-based Health Care

In his book, "The Strategy that w", Michael Porter explains the need for and reasoning behind aiming to have a healthcare where success of health interventions is based on the benefit to the individual patient, as well as on population level. (Porter & Lee, 2013)

Public Health Care goals and value

Below is an overview of the general goals of the National Health Insurance and the Public Health Care System. It presents the goals of maintaining population health seen from the economic, ethical, evidence-based and population health perspectives.

- Insurance must protect against the risk of unforeseen large health care expenses.
- Competition can be used to promote quality and efficiency.
- Government should address market failures that result in incomplete or excessively costly insurance options.
- Incentives may be useful to promote high-value services.

Economics

- Decisions about the distribution of societal resources must be done fairly and transparently.
- There is a duty to protect society's most vulnerable.
- The stewardship of limited resources requires attention to maximizing health benefits.
  - Shared responsibility for improving health should be promoted among consumers, employers, insurers, providers, and government.

Ethics

Evidence-Based Practice

- EBP provides a systematic way to apply the best scientific evidence to clinical decision making.
- EBP clarifies the contribution of scientific evidence to value-based decisions.
- EBP integrates clinical expertise, patient values, and best research evidence into patient care decision making.

Population Health

- Insurance should facilitate efforts to improve population health.
- Primary, secondary, and tertiary prevention need attention.
- Access for the vulnerable must be assured.
- Disparities should be eliminated.

Source: (Ulmer, McGlynn, & Bel Hamdounia, 2012)

Below is a graphic summary of the various goals and the parties that are interested in achieving those when it comes to reforming or adjusting elements of health care, such as number of providers, service delivery and the cost/frequency of offered treatments. The model, however, does not include the interdependencies between those goals, such as, if the hospital wants to reduce the costs per patient and increase the number of patients that are being seen per day, the quality of visits might decrease, as the physicians will aim to spend as little time with the patient as possible. On the other hand, if the hospital has an aim of reducing the total costs, they might reduce the number of physicians or then not offer preventive lab tests, if there is no acute need.

	Service goals/consumer	Public health goals/patient
Less institutional pressure	- Ease of access (travel especially on admission) - Cheap access for relatives - Convenience in movement along pathways of care	- Absolute health gain - Relative health gain e.g. between areas, income groups - Health melioration: Improved treatment outcomes, operational survival rates, improved hygiene etc.
	Political goals/voter	**Economic goals/taxpayer**
Greater institutional pressure	- Community - Accountability to recognised jurisdiction - Amenability to political and regulatory control	- Cost benefit improvement - Efficient use of given resources, crude productivity - Cheap for administration, finance, personnel functions
	Informal/popularly measured goals	Technical/expert measured goals

Source: Spurgeon et al. (2010)

While some of these measures rely on the traditional to economics financial metrics and the proportionate distribution to define the quality and sufficiency of health care services, they might not be the most appropriate measure when it comes to evaluating individual and population well-being. Besides being subjective to an individual, their knowledge, socioeconomic status and lifestyle, higher spending and higher prices for a health care service are not necessarily an indicator of higher quality. Moreover, in many of the health care system models listed above the health care systems are not-for-profit organisations, thus making the financial profit inappropriate and obsolete as a measure of successful operation. Their mission is not to earn money on treating people, but to actually free them of their illness and enable them to return to their normal lives. This is not to say that the Health Care providers and organisations should not have a healthy economy and have efficient processes with as little waste as possible.

Beveridge-model specifics: public and centralized tax-sponsored funding, lack of insight into local issues

Health Care System Models

Health care systems differ by the ways the health care services are financed, how the residents gain access to those (mandatory, via employment, voluntary) and to which extent (universal coverage/co-payment/per service payment), who owns the facilities and employs the staff (private vs. public ownership and employment) and thus makes the decisions. There are four types of health care models that describe, how the services are financed and offered, to which extent (e.g. what treatments are reimbursed or are eligible for co-payment), who owns the facilities, employs the staff and takes the decisions and who is responsible for the quality assurance. The types are listed below:

Social Insurance or Bismarck-model: all working residents are eligible to the health care services. Both the employer and the employee contribute to the so-called "sickness funds" akin paying to the retirement fund. The decision-making can happen at various levels, since the institutions can both be privately and publicly owned and staff is privately employed. It is named after the chancellor of Germany in late 19th century, who introduced the welfare system in the country. Countries: Germany, The Netherlands, France, Japan.

Tax-financed, universal coverage insurance or Beveridge-model: all residents are signed up for the mandatory national health insurance and are eligible to receive ambulatory and emergency care, as well as general practitioner services, sometimes for a small co-payment (physiotherapy, some surgeries, prescription drugs). Government is the sole payer and the main decision-maker, facilities are owned by the government and most staff are public sector employees. The model is named after a notable social reformer in the UK, who promoted centralized supply of government services and protection of socialist welfare. Countries: United Kingdom, Denmark, New Zealand, Cuba.

National Health Insurance model describes a fusion of the Bismarck and Beveridge models, where the government is a sole payer that contracts private service

providers and negotiates the prices. Government has considerable power and collects the contribution through taxation. Countries: Canada, Taiwan, South Korea.

Out-of-pocket model exists mostly in developing countries or rural areas of the poor countries. There is no insurance coverage and strictly speaking no system: if one wants to see a doctor, they need to seek them out and pay the market value for the service. United States has a notoriously complex health care sector, which combines several models of Health Care supply. About 15 % of the US population are not eligible for either the Social Insurance or the Universal Coverage (Native Indian, veterans, senior citizens or very poor) and have to pay themselves – out-of-pocket – for any health care service. Countries: some citizens in the US, rural areas in Latin America, Africa and Asia.

Despite the structural differences, the level of centralization, the hierarchy and the relationship between the taxpayers, service providers and the payer(s), most health care systems comprise similar elements.

Challenges of modern health care

Medicine is an ever-evolving field, involving several scientific areas. In line with the above goals of healthcare, the modern healthcare organizations are facing the challenges that can roughly be divided into 3 categories:

Economic constraint: ageing population, lack of ressources, lack of qualified staff

Dependency on the political situation

High expectations from the side of consumers and funders.

Below is a detailed Overview of the modern health care challenges:

1. Lack of resources and funding, inefficient spending, shortage of supply, high demands to the standard of service. (Douw, Nielsen, & Pedersen, 2015) (DiMaggio & Powell, 1983; Maynard, 2013; Or et al., 2010)

2. Less employees in the public sector due to higher wages in the private sector and fewer persons wanting long education. In many EU countries, the GPs are getting older and fewer, especially in the remote areas.

GPs are gatekeepers to the secondary Health Care Sector, but they are often overwhelmed with having to be familiar with many areas of medicine in order to refer to a specialist. Instead, they choose to focus on the diseases and symptoms that they are familiar with and know the treatment options for.

Prevention is an important but under prioritized part of health care. It as the potential of increasing the early detection of serious diseases, but it is also costly and requires a comprehensive effort. Preventative measures are often carried out by the already overwhelmed GP clinics, which do not see their efforts as substantial or having a nation-wide impact.

The pressure to shorten the bed days of the in-patients due to the high cost of the facilities as well as the evidence for the faster recovery when not in the hospital.

Decision making is extremely political and intertwines with the interests of consumer goods and other firms. It is not unknown that the food industry and their lobby have significant vested interests in how, what and how often people consume. At the same time they would prefer taking the production costs down as much as they can by using cheaper ingredients that gain the same taste and consistency (examples: corn sirup, soy as an emulgator etc, GMO produce).

Ageing population, chronic and hereditary disease management and the burden of offering free health care. In many cases, people died earlier because of the inexistent or too expensive/exclusive treatment options. Nowadays, thanks to advances in medical and pharmacological sciences, we are able to treat many acute diseases, such as cancers, infectious diseases and to alleviate the effect of hereditary and chronic diseases and conditions, such as diabetes, high blood pressure and and COPD (chronic obstructive pulmonary disease).

Health Care is seen as a service and the standards of quality demanded by the users are constantly rising. Moreover, the standards vary depending on the tradition, geography, habits, presence of hereditary diseases and other personal factors, e.g. person living in a remote area, whose family always struggled with overweight might be less likely to seek a medical advice, since their situation is seen as a status quo.

Personal freedom: people want to decide themselves how to live their life, but are rarely their own best counsel. It is easier to stick to bad habits than to acquire good healthy habits, besides, many "healthy" or harmless habits at some point or when enjoyed in excess become "unhealthy". Moreover, the food industry often misleads the consumer by offer fruit juice and conveying the message that it has the same nutritional value as consuming the amount of fruit it contains, conveniently eluding the fact that the juice is stripped of almost all fiber that the fruit contains.

Health care institutions were often optimized to function best from processes and financial points of view. Efforts were made to shorten the time and ressources spent per patient and while such approach could impact the bottomline positively, it often eluded the people aspect from the evaluations: both seen from the point of view of staff and the patients. Moreover, despite best efforts, the quality of health care was not assessed as being higher.

This is where grassroots of user centered design sprung in the health care sector through the concept of Value-Based Healthcare introduced by Michael Porter. His main argument was that the innovations and optimizations carried less value, when they did not take the needs and experience of the receivers of health care – namely, patients, - into account. The health care governance bodies needed to pay more attention and understand the unmet needs and challenges in access to health care, communication and the number of staff per patient from the patient perspective in order to improve the reputation and performance of health care sector.

What is health and why is it important?

Health and health care are a sensitive issue. In many countries, access to basic and life-saving health care is written in constitution and WHO even defines the highest attainable standard of health as a human right.[1] Criticism of health care services and the access to health care is a popular topic to raise during electoral campaigns and public debates. Both in countries that have compulsory, centralized health care insurance system and in the countries that have a free health care market, citizens feel entitled to the best health care standard. There are many factors that factor in iMoreover, many countries still struggle with the equity of providing health care as opposed to equality. (Porter & Lee, 2013).

Numerous reports and studies attempt to evaluate the importance of health and well-being in our lives and the factors that influence our welfare. The general consensus is that feeling healthy is important and it is both affected by life and the sense of fulfillment and can affect how we feel about the rest of our life. Nevertheless, the definition of health is subjective, which is why the public health authorities attempt to standardize the evaluations through i.e. EQ-5d (European Quality of Life – 5 Dimensions) form. It was developed to provide a reference for residents to evaluate their physical and mental well-being based on 5 dimensions: Mobility, Self-Care, Usual Activities, Pain/Discomfort, Anxiety/Depression. Additionally, EQ form provides a Visual Analogue Scale (VAS) to assess the general state of health on a scale of 100, where 100 is the best health a person can imagine and 0 is the worst health one can imagine.

In addition to being highly subjective, the official definition of health is often distorted to signify the simple absence of an illness, while WHO defines health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." One of the ways to align on the impact and effectiveness of health care is to use concepts, such as QALYs, DALYs and CUA, which attempt to evaluate the utility and surplus that a person with a certain ailment experiences.

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[1] https://www.who.int/news-room/fact-sheets/detail/human-rights-and-health

Furthermore, Michael Porter, a renowned economist, has emphasized the importance of shifting towards the value-based health care, which measures the degree to which the treatment achieves treatment objectives and returns the person to the previous state of health. Some of the sub-measures include re-hospitalisation, as well as the previously mentioned QALYs, DALYs as well as burden on relatives etc.

RoI of prevention

Obesity needs to be a nation-wide health care priority in Denmark with full endorsement from the state Healthcare, Educational and Nutritional authorities to ensure uncompromised compliance with the standards of healthy living for children and adults of all ages. Moreover, the multidisciplinary and wholesome treatment options should be readily available and reinforced in all municipalities in Denmark. Obesity presents a growing health care treat, as it can become hereditary and is strongly dependent on the SES-factors in the environment.

Children are to be the primary target group of education on obesity, nutrition and medical consequences. Through a comprehensive curricula, children's perception of the disease, nutrition and food can be changed. As shown earlier, many of our habits are influenced by our surroundings and traditions – SES-factors. By changing the normality of those factors early on it is possible to change the course of the development of obesity both in childhood and adulthood. Some spillover effect can be expected into their surroundings to i.e. their families and friends. Directly targeting the future patient group instead of the present patients offers an innovative and arguably more effective prevention approach, as it has a longer time horizon to reinforce the message and the persons have not experienced the adverse effects of the disease yet.

Without a firm political strategy that involves healthcare, work and school environment, public institutions, awareness bodies and patient organisations, food industry, restaurants and supermarkets, the initiative is bound to fail, as one can argue for the free choice of the consumer's in the market economy. The

unprecedentedly high economic impact of obesity as a disease on the multiple aspects of the public budget makes no excuse for the lack of intervention today.

Conclusions

Since its recognition as a disease in 2013 by the American public health authority, the discussion on whether to offer reimbursed treatment for obesity or not, has intensified. The majority of those living with obesity are still socially disadvantaged, either through their Socio-Economic Status or through being socially isolated at a later stage in life as a consequence of not being able to participate in social activities or getting a job. Obesity and the stigma associated with being obese thus reflects in several aspects of individual's life, as well as robs the society of the social, labour market contribution and adds to the the imbalance of the person's use of HC services vs. their contribution to covering them through taxes. By being offered treatment and understanding in the HC sector and society, the obese persons can regain access to contributing to the society and tax funds actively, thus reducing their burden on the public funds expenditure through health care costs and unemployment benefits. Examples: diabetes, cancer.

I have attempted at performing a mixed-methods qualitative and quantitative study. Unfortunately, I was not able to complete the analysis to the point where my results would suggest a significant proof of the general literature approach to the prevention of obesity and discrimination of PwO.

The person born with obesity will never be able to become 100% healthy and thus will always require assistance from the HC sector. Excess weight is associated with many comorbidities. However, early intervention and adequate control can help alleviate severity of some of the comorbidities and provide persons living with obesity with a healthier, socially richer life. Reducing their body weight and striving for a healthier body mass composition has been proven to offer significant improvement and relieve the burden of comorbidities.

Limitations

1. I have not achieved the aim of this project and did not succeed in answering all of my research questions.

2. The research design could have been more thorough.

3. I could have chosen a different or a more focused sample for the survey. I could have also received more respondents by for instance contacting the communes directly.

Recommendations for Decision-Making

Based on the present project, I suggest a number of actions that are necessary to reduce the burden of obesity as a disease in Denmark.

1. Introduce nutrition as a subject in primary and secondary education curricula. Children's lifestyle and habits are immensely dependent on their environment. Through providing the knowledge and detailed advice on the dependence between the nutrition and health.

2. Increase awareness of obesity by introducing obesity as a topic on the national political agenda to improve population health. Without political endorsement, decision-making on the local level will be impeded by the competing interests of the stakeholders.

3. Involve and educate physicians on the causes, consequences and available treatments in universities and continuing medical education courses. If the healthcare professionals are not aware of the effective and available treatments for obesity, they will unlikely offer obesity management to their patients.

4. Establish obesity care clinics and enable General Practitioners to prescribe dedicated obesity management to the PwO.

5. Increase disease awareness on the population level. Educate wider population on the causes and symptoms of obesity and remove the guilt and stigma from PwOs.

6. Educate physicians on the risk factors for obesity and enforce early detection and treatment. Earlier detection shows better life-long results in obesity management.

7. Restrict availability of unhealthy food and drinks (with exaggerated amount of sugar and corn sirup) from public spaces, such as schools, kindergartens, work places, universities etc. We have already shown that will-power is not enough to resist the many temptations that we exposed to on a daily basis and in the context of obesogenic environment.

8. Restrict display of unhealthy goods in supermarkets etc.
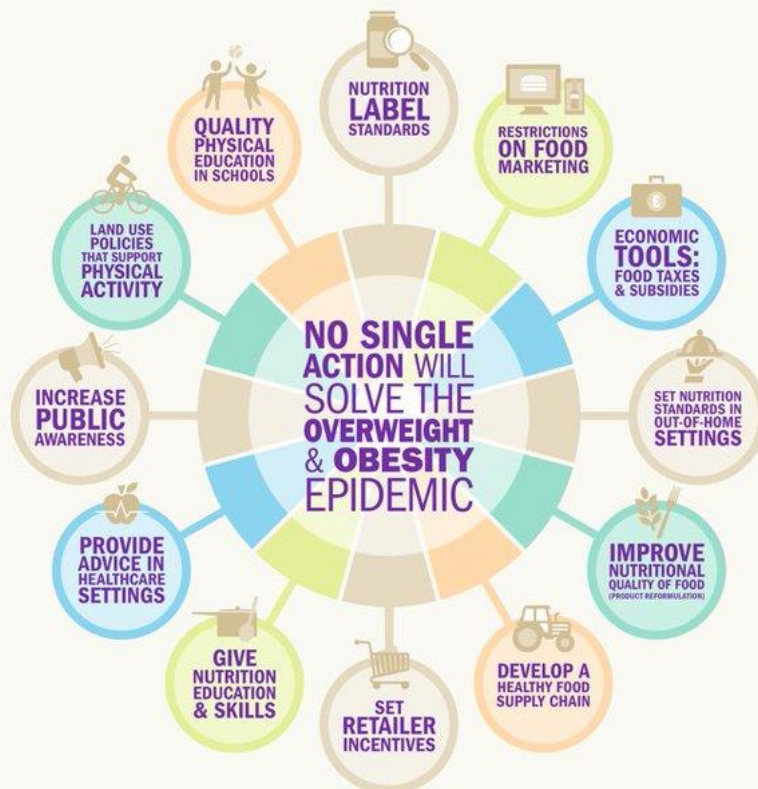
Inforgraphic. Source: WCRF (World Cancer Research Fund) Twitter Post on June 30th 2017

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Supplementary Materials/Appendices

Appendix 1. Interview with Prof. Nick Finer, Novo Nordisk Principal Scientist.

Interview was performed in person on January 11th 2019, lasted 1 hour and 15 minutes and was transcribed by hand simultaneously.

Q: Why is obesity considered a self-inflicted problem and not a disease?

A: Obesity is not caused by a single agent – e.g. a certain food. Some people will eat a lot and not gain weight. Some will gain weight and won't be able to lose it.

Q: How did the development happen for alcohol, smoking, cholesterol etc.?

A: For smoking it was possible to establish a direct link between smoking and certain types of cancer and cardiovascular disease. It was an easier public health care issue to communicate.

Q: Why are we organised in societies?

Societies take care of their members, by providing safety, lodging, nutrition and health.

Fat tax might not be a great idea for limiting consumption. Taxing the agriculture will impact the earnings of those, who are breeding animals and producing the meat and dairy that will object

Q: Is obesity a disease? "What if I want to be overweight?"

A: Yes, it is. It has causes, symptoms, signs, can be treated, co-morbidities that are associated with it. Cause of obesity is insatiety and it's mechanism is protracted energy surplus. It is important to ask "Do you eat, because you are hungry?". Most people will eat because the food is there, because of the social context and/or a schedule, such as lunch being served at specific time. We have moved away from eating, when we are hungry, to eating when we can.

Q: How sick do you need to be to be diseased from a Public Health Care Perspective?

A: Public health authorities need a direct link between the cause and the disease in order to apply it as a policy/punishment measure.

Q: So why is obesity not treated as a disease yet? Is it because it is not a high enough priority on the Public Health Care agenda?

A: Only partly. Medical professionals do not enjoy being faced with issues that they cannot treat, as the conversation on the disease becomes futile if there are no treatment options on the market. Moreover, there is a lack of a biomarker that would identify obesity with a high degree of certainty.

Q: So, do physicians acknowledge that it is a disease?

A: Some do, however most of the medschool curriculum is about the deficiency diseases or infectious diseases. The cause of the disease is relatively easily identified and the treatment is the correction of the deficiency or antibiotics and vaccines.

Q: How can obesity be diagnosed today?

A: There is no lab test or exam that diagnoses obesity and thus the physicians can only rely on measures such as Body-Mass Index, Waist Circumference or Adiposity – Fat Percentage, but all of those are subjective to individual situation and offer many uncertainties. In the end, the patient might be diagnosed, but as there are no treatment options or the available ones are not reimbursed, the physician won't be able to do much for the patient, but initiate a lifestyle conversation.

Q: What other challenges are there in diagnosing obesity?

A: There is a lack of typology of persons living with obesity (with regards to age and rate of becoming obese, pregnancy, waist circumference). However, there is little evidence that the distinction would make a difference in treatment efficiency, as all of the cases require multidisciplinary approach that targets all aspects of a person's life.

Q: How is it possible to accumulate to so much weight? Do persons, who become obese, have a lower metabolic rate and thus store the energy more efficiently?

A: Metabolic rate is 70% basic (resting) energy consumption plus 30% excess activity. The heavier you are, the higher the metabolic rate, thus no, the persons with obesity actually have a relatively high metabolic rate.

Typical weight gain consists of 2 parts fat and 1 part non-fat tissue accumulation. It is an evolutionary advantage to account for times of famine and food (energy intake) shortage.

Q: Why is it generally more difficult to loose weight than to put it on?
A: Adipose tissue is inert, so more difficult to shed off.

Q: What are the next steps in obesity research?

A: There are definitely high hopes associated with leptin research. Leptin is a hormone that is secreted by adipose tissue. Some rodents have a mutation where the leptin is not produced or the receptor in the brain that responds to leptin is inactive. Obese patients are often leptin resistant, that is their bodies do not react to leptin surplus, even when they do not have a mutation of the receptor.

Q: What is the future of treating obesity? Are the treatments cost-effective?

A: Not yet, and with more clinical trials required to prove cardiovascular safety and cardiovascular benefit, the less likely it will be. However, Novo Nordisk is making efforts to bring the costs of production down.

Appendix 2. Interview with Lene Kring, in Director of Corporate Branding and Reputation in Novo Nordisk and Project Leader of Changing Obesity™.

Interview was performed on phone on May 29th 2019, lasted 30 minutes and was transcribed by hand simultaneously.

Q: How did it go with stating up Changing Obesity (NB in January 2019)?

A: It has been going quite well. Internally the initiative is meant to create the momentum and signal the strategic commitment to obesity care.

Give obesity a voice through corporate content, brand, messages

Market development at the affiliates: what works for you?

Externally: to create the visibility for NNs Commitment to Obesity Care.

The Danish affiliate received some materials with subtitles and translations

Q: What is your relationship with Changing Diabetes?

A: Learn to create a framework around the holistic treatment and prevention of chronic diseases.

This has been transferred to the Changing Obesity mindset.

The mindset of initiating the change management and changing the awareness

New partners and stakeholders in comparison to the Changing Diabetes

Q: What is your mission?

A: Spread awareness about the obesity and why it needs to be recognized as a disease

Introduce NN as a new player, and a new trustworthy partner within obesity management.

Unbranded content to drive the partnerships

Engage the stakeholders and partners locally that can drive the change in mentality. Make them take ownership of the battle

Appendix 3. Interview with Pernille Auerbach, MD, PhD, Associate Global Medical Director in Global Medical Affairs in Novo Nordisk.

Interview was performed in person on June 6th 2019, lasted 45 minutes and was transcribed by hand simultaneously.

Q: What is the treatment of obesity in Denmark and what have you experienced during your own practice?

A: One of the biggest problems is that patients suffering from severe overweight experience misunderstanding and stigma in healthcare systems.

There is often a misunderstanding between doctors and patients. Doctors largely believe that patients take offence when conversation is about weight as a main problem. This is confirmed by the results of the ACTION IO study. The study may seem very forceful to patients, but most are actually very motivated.

Furthermore, doctors sometimes have unrealistic expectations about how much weight patients can lose. Patients also have exaggerated expectations of how much weight they can lose over a period of time.

There is also a lack of physicians on the outskirts of Denmark due to the fact that the older general practitioners, who have retired, have not been replaced by a new doctor.

Treatment of severe overweight should not be symptomatic and more systematic. There are no national offers in Denmark for the treatment of severe overweight other than surgical procedures for those with a BMI of at least 35, and for most treatments you have to pay yourself.

When it comes to surgical procedures, a physician must first document specific interventions over the last 3 years before a patient can be considered for surgery. About one third of patients who undergo surgical procedures to treat severe overweight do not get good results enough. There is disagreement about what defines the success of treatment and many patients gain the weight again.

We have to acknowledge that severe overweight is a disease in order to become better at advocating for better treatment. Treatment should be structured depending on the root cause of overweight and how weight has developed in retrospective (rapid weight gain, pregnancy, steady weight)

The situation is complicated because it is difficult to point what causes obesity on the population level: genetics, socio-economic factors, family / friends and traditions, pregnancy, etc.

Q: What could make people more empathetic with people with obesity?

A: Change the positioning of overweight and severe overweight people in media, instead of making them appear lazy and disorganized.

We must teach people that severe overweight is not a disease that results from lifestyle, but a result of errors in controlling appetite and regulating food intake.

Media and the food industry must take responsibility for marketing of their products. We also need to become better at showing the connection between the serious fatal illnesses and severe overweight.

Appendix 4. Interview with Gitte Laub Hansen, PhD, Project Leader of Physical Activity and Diet at Kræftens Bekæmpelse.

Interview was performed on phone on August 6th 2019, lasted 20 minutes and was transcribed by hand simultaneously.

Q: What challenges do you see in preventing obesity at the moment?

A: There are many challenges in spreading the knowledge about the role of obesity in public health and the health risks that it poses to the individuals.

At the moment, one of the biggest challenges is making people acknowledge the association between obesity/severe overweight and cancer. Currently, there are 15 forms of cancer that are directly associated with the excess weight and fat percentage in the body composition. Future research promises more connections, when appropriate biomarkers are discovered.

Q: How do you measure and is it possible at all to measure the effect of campaigns?

A: In general, it is difficult to measure the impact of the campaigns. KB has secured funds for a 2-year awareness campaign to be initiated in Autumn 2019. Results from previous campaigns show some exposure metrics, but due to the long time between the cause (lifestyle, diseases etc.) and effect (sickness and death), there are limitations to measuring the impact of those campaigns.

Q: Do you have an idea of how to reduce the stigma of people living with obesity?

A: In order to reduce stigma associated with obesity and those, who have to live with excess weight, we need to realise that we live in a fat-promoting and overeating encouraging society. Especially in the developed/high-income countries, few people do not have access to food for more than 24 hours. Realistically, we rarely spend more than an hour without being exposed to food: there are food courts, fast food restaurants, gas stations, 7-eleven's everywhere and food is served at various meetings.

For centuries, access to food was seen as a sign of privilege. There would be periodical famines, so people always tried to live in the moment and consume the food they could, when they could. Excess weight was and is still in some regions/society layers seen as a sign of prosperity and wealth.

Different people see "normal" weight and health level differently: it depends on upbringing, socioeconomic factors and income/education.

Obesity is going to cost society a lot of money, if we do not stop treating it as an individual issue. It is a serious problem that requires an cross-sectoral and unified approach, where both those, who produce, provide and consume the food take the responsibility.

Appendix 5. Interview with Bjarne Lynderup, MSc, Secreatariat Leader at Adipositasforeningen.

Interview was performed on phone on August 15th 2019, lasted 45 minutes and was transcribed by hand simultaneously.

Q: Why do you think obesity is not yet recognized as a disease?

A: If it is recognized as a disease, then there will be a lot of additional spending in the public sector.

Q: What are the biggest challenges in treating obesity in Denmark?

A: One of the biggest challenges is that it is not widely recognized in the health sector as a disease. It is a multidimensional disease that can be caused by things other than lifestyle.

237 diseases can be directly linked to overweight and severe overweight.

The health care system does not spend enough time teaching doctors about severe overweight, causes and treatment options. Other countries, such as Portugal, have been successful in recognizing the disease and promoting better treatment.

Q: What are the biggest challenges related to obesity prevention in Denmark?

A: People want to decide for themselves what they eat and drink, as well as how much exercise they do. They do not want the state to keep an eye on and control them.

But it is difficult to call it free choice, as companies have an increasing influence on what we are exposed to and what we want. We are nudged daily to make unhealthy decisions and choose unhealthy food based on convenience, advertising and merchandising of products in stores.

Q: There was a case where the municipality wanted to remove sweets and soda vending machines from schools, but it was voted down by the student council? What problem do you see here? Does it reflect the general approach?

A: Those who do not have a problem with weight do not think that they need to do anything about it, as they do not understand what the disease is and what consequences it has. One puts personal freedom above well-being of a steadily growing group of people and children. The (vending) machines are cheap and easy to install, so the food industry so to say takes advantage of people's preferences.

Q: What are the goals of the Adipositasforeningen (AF)? http://adipositasforeningen.dk/

A: The goal of AF is to establish dedicated treatment centers that offer a wider range of treatments other than lifestyle interventions, and to strengthen prevention initiatives to avoid new cases.

Q: What prevents people from making better decisions?

A: The food industry plays a big role and makes a lot of money, especially from high sugar, low cost products.

Carl Roberts, a researcher at Liverpool University, looked at, among other things, relationships between food, our behaviour and areas of the brain that are being stimulated. When we have to resist a temptation in the form of food, it is not just a wil-lpower exercise. Other centers of the brain are also activated, such as reward mechanisms.

Q: Which concrete initiatives could improve the situation, promote understanding and stop the obesity epidemic?

A: Since it is a complex illness, complex actions need to be taken as well. Access to information and educational level is not necessarily conducive to making better decisions. Traditions and family, on the other hand, have stronger connections to lifestyle.

Restrictions and bans are not the best political tools. If you look at historical evidence, then there is limited evidence of effect. If anything, Denmark has had an increased tax on sugar and fat and there are still more and more people who are becoming overweight and obese. If anything, most prohibition initiatives have created opposite reactions and underground movements.

You have to make it cheaper and easier to be healthy, to buy healthier, fresher and greener produce, to use other transport methods.

We have to adjust our environment and the many possibilities without adding guilt to the experience.

CBS **COPENHAGEN BUSINESS SCHOOL** HANDELSHØJSKOLEN

Participant Name, Title, Organisation
Name: _____
Title: _____
Organisation: _____

Title: Innovative Approaches to Obesity Treatment and Prevention in Denmark

Consent Form for Qualitative Interviews and Use of Material as Reference

Thank you for your time during the interview and your valuable insights! If you are happy to have your answers included, then please complete and sign the form below. Please tick the boxes below to confirm that you agree with each statement:

I confirm that I have been informed about the purpose of the interview and that I provided answers that are in accordance with my professional position.

I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason and without there being any negative consequences.

I agree that the contents of the interview will be available in the CBS Thesis Library as part of the thesis project. If you do not tick off, the interview will be removed from appendices but still used as a reference in the text.

I have agreed to take part in this interview and to have my opinion displayed as a part of empirical data collection for this thesis project.

_____   _____   _____
Name of participant   Date   Signature

Best regards,
Liubov Aleksandrova
MSc in Business Administration and Innovation in Health Care
Copenhagen Business School

Appendix 7. Coding of the Interviews.

Word	Length	Count	Weighted Percentage (%)	Similar Words
Obesity	7	35	2,83	obese, obesity
Disease	7	23	1,86	disease, diseased, diseases
Food	4	18	1,45	Food
Treatment	9	17	1,37	treatment, treatments
weight	6	17	1,37	Weight
overweight	10	16	1,29	Overweight
people	6	15	1,21	People
patients	8	12	0,97	patient, patients
make	4	11	0,89	make, makes, making
severe	6	11	0,89	Severe
cause	5	10	0,81	cause, caused, causes
health	6	10	0,81	Health
changing	8	8	0,65	change, changing
care	4	7	0,57	Care
fat	3	7	0,57	Fat
initiatives	11	7	0,57	initiate, initiated, initiating, initiative, initiatives
need	4	7	0,57	need, needs
treating	8	7	0,57	treat, treated, treating
become	6	6	0,48	become, becomes, becoming
better	6	6	0,48	better
challenges	10	6	0,48	challenges
denmark	7	6	0,48	denmark
eat	3	6	0,48	eat, eating
high	4	6	0,48	high
leptin	6	6	0,48	leptin
lifestyle	9	6	0,48	lifestyle
one	3	6	0,48	one, ones
problem	7	6	0,48	problem, problems
public	6	6	0,48	public
take	4	6	0,48	take, takes
associated	10	5	0,40	associated, association
biggest	7	5	0,40	biggest
difficult	9	5	0,40	difficult
doctors	7	5	0,40	doctor, doctors
gain	4	5	0,40	gain
much	4	5	0,40	much
new	3	5	0,40	new
persons	7	5	0,40	person, personal, persons
physicians	10	5	0,40	physician, physicians
rate	4	5	0,40	rate
recognized	10	5	0,40	recognized, recognizing
results	7	5	0,40	result, results
society	7	5	0,40	societies, society
time	4	5	0,40	time, times
campaigns	9	4	0,32	campaign, campaigns
cost	4	4	0,32	cost, costs
create	6	4	0,32	create, created
developed	9	4	0,32	developed, development

diagnosed	9	4	0,32	diagnosed, diagnoses, diagnosing
direct	6	4	0,32	direct, directly
energy	6	4	0,32	energy
excess	6	4	0,32	excess
general	7	4	0,32	general, generally
live	4	4	0,32	live, living
lot	3	4	0,32	lot
many	4	4	0,32	many
measure	7	4	0,32	measure, measures, measuring
metabolic	9	4	0,32	metabolic
prevention	10	4	0,32	prevention, prevents
produce	7	4	0,32	produce, produced, producing
products	8	4	0,32	production, products
research	8	4	0,32	research, researcher
want	4	4	0,32	want
well	4	4	0,32	well
access	6	3	0,24	access
acknowledge	11	3	0,24	acknowledge
adipose	7	3	0,24	adipose, adiposity
also	4	3	0,24	also
anything	8	3	0,24	anything
approach	8	3	0,24	approach
awareness	9	3	0,24	awareness
body	4	3	0,24	bodies, body
brain	5	3	0,24	brain
cancer	6	3	0,24	cancer
cardiovascular	14	3	0,24	cardiovascular
cases	5	3	0,24	case, cases
connections	11	3	0,24	connection, connections
conversation	12	3	0,24	conversation
decisions	9	3	0,24	decisions
difference	10	3	0,24	difference, different, differently
effect	6	3	0,24	effect, effective
enough	6	3	0,24	enough
etc	3	3	0,24	etc
evidence	8	3	0,24	evidence
however	7	3	0,24	however
impact	6	3	0,24	impact
individual	10	3	0,24	individual, individuals
industry	8	3	0,24	industry
issue	5	3	0,24	issue, issues
lack	4	3	0,24	lack
level	5	3	0,24	level
link	4	3	0,24	link, linked
lose	4	3	0,24	lose
market	6	3	0,24	market, marketing
must	4	3	0,24	must
offer	5	3	0,24	offer, offers
options	7	3	0,24	options
order	5	3	0,24	order
part	4	3	0,24	part, partly, parts
partners	8	3	0,24	partner, partners
possible	8	3	0,24	possibilities, possible
pregnancy	9	3	0,24	pregnancy

procedures	10	3	0,24		procedures
promoting	9	3	0,24		promote, promoting
relatively	10	3	0,24		related, relatively
require	7	3	0,24		require, required, requires
sector	6	3	0,24		sector, sectoral
sign	4	3	0,24		sign, signs
situation	9	3	0,24		situation
smoking	7	3	0,24		smoking
spend	5	3	0,24		spend, spending
surgical	8	3	0,24		surgical
tax	3	3	0,24		tax, taxing
thus	4	3	0,24		thus
tissue	6	3	0,24		tissue
yet	3	3	0,24		yet
2019	4	2	0,16		2019
able	4	2	0,16		able
accumulate	10	2	0,16		accumulate, accumulation
action	6	2	0,16		action, actions
activated	9	2	0,16		activated, activity
actually	8	2	0,16		actually
adipositasforeningen	20	2	0,16		adipositasforeningen
advantage	9	2	0,16		advantage
affiliate	9	2	0,16		affiliate, affiliates
biomarker	9	2	0,16		biomarker, biomarkers
centers	7	2	0,16		centers
certain	7	2	0,16		certain
circumference	13	2	0,16		circumference
commitment	10	2	0,16		commitment
complex	7	2	0,16		complex
considered	10	2	0,16		considered
consume	7	2	0,16		consume
content	7	2	0,16		content
control	7	2	0,16		control, controlling
countries	9	2	0,16		countries
deficiency	10	2	0,16		deficiency
depending	9	2	0,16		depending, depends
diabetes	8	2	0,16		diabetes
drive	5	2	0,16		drive
due	3	2	0,16		due
easier	6	2	0,16		easier
education	9	2	0,16		education, educational
efficiency	10	2	0,16		efficiency, efficiently
especially	10	2	0,16		especially
establish	9	2	0,16		establish
exercise	8	2	0,16		exercise
expectations	12	2	0,16		expectations
experience	10	2	0,16		experience
exposed	7	2	0,16		exposed
factors	7	2	0,16		factors
family	6	2	0,16		family
famine	6	2	0,16		famine, famines
form	4	2	0,16		form, forms
future	6	2	0,16		future

goal	4	2	0,16	goal, goals
going	5	2	0,16	going
hour	4	2	0,16	hour, hours
hungry	6	2	0,16	hungry
identified	10	2	0,16	identified, identify
illness	7	2	0,16	illness, illnesses
income	6	2	0,16	income
increased	9	2	0,16	increased, increasing
intake	6	2	0,16	intake
interventions	13	2	0,16	interventions
limitations	11	2	0,16	limitations, limited
look	4	2	0,16	look, looked
machines	8	2	0,16	machines
management	10	2	0,16	management
mechanism	9	2	0,16	mechanism, mechanisms
media	5	2	0,16	media
mindset	7	2	0,16	mindset
misunderstanding	16	2	0,16	misunderstanding
moment	6	2	0,16	moment
money	5	2	0,16	money
mutation	8	2	0,16	mutation
often	5	2	0,16	often
percentage	10	2	0,16	percentage
period	6	2	0,16	period, periodical
provide	7	2	0,16	provide, providing
put	3	2	0,16	put, puts
receptor	8	2	0,16	receptor
relationship	12	2	0,16	relationship, relationships
resist	6	2	0,16	resist, resistant
responsibility	14	2	0,16	responsibility
role	4	2	0,16	role
safety	6	2	0,16	safety
see	3	2	0,16	see
seen	4	2	0,16	seen
serious	7	2	0,16	serious
served	6	2	0,16	served
show	4	2	0,16	show, showing
sick	4	2	0,16	sick, sickness
specific	8	2	0,16	specific
spread	6	2	0,16	spread, spreading
stakeholders	12	2	0,16	stakeholders
state	5	2	0,16	state, stating
stigma	6	2	0,16	stigma
still	5	2	0,16	still
stop	4	2	0,16	stop
store	5	2	0,16	store, stores
study	5	2	0,16	study
success	7	2	0,16	success, successful
sugar	5	2	0,16	sugar
surplus	7	2	0,16	surplus
system	6	2	0,16	system, systems
teach	5	2	0,16	teach, teaching
things	6	2	0,16	things

think	5	2	0,16	think
traditions	10	2	0,16	traditions
understand	10	2	0,16	understand, understanding
unhealthy	9	2	0,16	unhealthy
vending	7	2	0,16	vending
waist	5	2	0,16	waist
without	7	2	0,16	without
year	4	2	0,16	year, years
11th	4	1	0,08	11th
18th	4	1	0,08	18th
237	3	1	0,08	237
account	7	1	0,08	account
adding	6	1	0,08	adding
additional	10	1	0,08	additional
adjust	6	1	0,08	adjust
advertising	11	1	0,08	advertising
advocating	10	1	0,08	advocating
age	3	1	0,08	age
agenda	6	1	0,08	agenda
agent	5	1	0,08	agent
agriculture	11	1	0,08	agriculture
alcohol	7	1	0,08	alcohol
always	6	1	0,08	always
among	5	1	0,08	among
animals	7	1	0,08	animals
antibiotics	11	1	0,08	antibiotics
appear	6	1	0,08	appear
appetite	8	1	0,08	appetite
apply	5	1	0,08	apply
appropriate	11	1	0,08	appropriate
areas	5	1	0,08	areas
around	6	1	0,08	around
ask	3	1	0,08	ask
aspects	7	1	0,08	aspects
authorities	11	1	0,08	authorities
autumn	6	1	0,08	autumn
available	9	1	0,08	available
avoid	5	1	0,08	avoid
away	4	1	0,08	away
bans	4	1	0,08	bans
based	5	1	0,08	based
basic	5	1	0,08	basic
battle	6	1	0,08	battle
behaviour	9	1	0,08	behaviour
bekæmpelse	10	1	0,08	bekæmpelse
believe	7	1	0,08	believe
benefit	7	1	0,08	benefit
best	4	1	0,08	best
big	3	1	0,08	big
bmi	3	1	0,08	bmi
brand	5	1	0,08	brand
breeding	8	1	0,08	breeding
bring	5	1	0,08	bring
buy	3	1	0,08	buy

call	4	1	0,08		call
carl	4	1	0,08		carl
centuries	9	1	0,08		centuries
certainty	9	1	0,08		certainty
cheap	5	1	0,08		cheap
cheaper	7	1	0,08		cheaper
children	8	1	0,08		children
choice	6	1	0,08		choice
cholesterol	11	1	0,08		cholesterol
choose	6	1	0,08		choose
chronic	7	1	0,08		chronic
clinical	8	1	0,08		clinical
comes	5	1	0,08		comes
communicate	11	1	0,08		communicate
companies	9	1	0,08		companies
comparison	10	1	0,08		comparison
complicated	11	1	0,08		complicated
composition	11	1	0,08		composition
concrete	8	1	0,08		concrete
conducive	9	1	0,08		conducive
confirmed	9	1	0,08		confirmed
consequences	12	1	0,08		consequences
consists	8	1	0,08		consists
consumption	11	1	0,08		consumption
context	7	1	0,08		context
convenience	11	1	0,08		convenience
corporate	9	1	0,08		corporate
correction	10	1	0,08		correction
council	7	1	0,08		council
courts	6	1	0,08		courts
cross	5	1	0,08		cross
currently	9	1	0,08		currently
curriculum	10	1	0,08		curriculum
daily	5	1	0,08		daily
dairy	5	1	0,08		dairy
danish	6	1	0,08		danish
death	5	1	0,08		death
decide	6	1	0,08		decide
dedicated	9	1	0,08		dedicated
defines	7	1	0,08		defines
definitely	10	1	0,08		definitely
degree	6	1	0,08		degree
disagreement	12	1	0,08		disagreement
discovered	10	1	0,08		discovered
disorganized	12	1	0,08		disorganized
distinction	11	1	0,08		distinction
document	8	1	0,08		document
drink	5	1	0,08		drink
earnings	8	1	0,08		earnings
easily	6	1	0,08		easily
easy	4	1	0,08		easy
economic	8	1	0,08		economic
efforts	7	1	0,08		efforts
eleven	6	1	0,08		eleven

empathetic	10	1	0,08		empathetic
encouraging	11	1	0,08		encouraging
end	3	1	0,08		end
engage	6	1	0,08		engage
enjoy	5	1	0,08		enjoy
environment	11	1	0,08		environment
epidemic	8	1	0,08		epidemic
errors	6	1	0,08		errors
even	4	1	0,08		even
everywhere	10	1	0,08		everywhere
evolutionary	12	1	0,08		evolutionary
exaggerated	11	1	0,08		exaggerated
exam	4	1	0,08		exam
experienced	11	1	0,08		experienced
exposure	8	1	0,08		exposure
externally	10	1	0,08		externally
eye	3	1	0,08		eye
faced	5	1	0,08		faced
fact	4	1	0,08		fact
fast	4	1	0,08		fast
fatal	5	1	0,08		fatal
finer	5	1	0,08		finer
first	5	1	0,08		first
forceful	8	1	0,08		forceful
framework	9	1	0,08		framework
free	4	1	0,08		free
freedom	7	1	0,08		freedom
fresher	7	1	0,08		fresher
friends	7	1	0,08		friends
funds	5	1	0,08		funds
furthermore	11	1	0,08		furthermore
futile	6	1	0,08		futile
gas	3	1	0,08		gas
genetics	8	1	0,08		genetics
get	3	1	0,08		get
gitte	5	1	0,08		gitte
give	4	1	0,08		give
good	4	1	0,08		good
greener	7	1	0,08		greener
group	5	1	0,08		group
growing	7	1	0,08		growing
guilt	5	1	0,08		guilt
hand	4	1	0,08		hand
hansen	6	1	0,08		hansen
happen	6	1	0,08		happen
healthcare	10	1	0,08		healthcare
healthier	9	1	0,08		healthier
healthy	7	1	0,08		healthy
heavier	7	1	0,08		heavier
higher	6	1	0,08		higher
historical	10	1	0,08		historical
holistic	8	1	0,08		holistic
hopes	5	1	0,08		hopes
hormone	7	1	0,08		hormone

http	4	1	0,08	http
important	9	1	0,08	important
improve	7	1	0,08	improve
inactive	8	1	0,08	inactive
index	5	1	0,08	index
inert	5	1	0,08	inert
infectious	10	1	0,08	infectious
inflicted	9	1	0,08	inflicted
influence	9	1	0,08	influence
information	11	1	0,08	information
insatiety	9	1	0,08	insatiety
install	7	1	0,08	install
instead	7	1	0,08	instead
internally	10	1	0,08	internally
interview	9	1	0,08	interview
introduce	9	1	0,08	introduce
january	7	1	0,08	january
june	4	1	0,08	june
just	4	1	0,08	just
keep	4	1	0,08	keep
knowledge	9	1	0,08	knowledge
kræftens	8	1	0,08	kræftens
lab	3	1	0,08	lab
largely	7	1	0,08	largely
last	4	1	0,08	last
layers	6	1	0,08	layers
lazy	4	1	0,08	lazy
learn	5	1	0,08	learn
least	5	1	0,08	least
less	4	1	0,08	less
life	4	1	0,08	life
likely	6	1	0,08	likely
little	6	1	0,08	little
liverpool	9	1	0,08	liverpool
locally	7	1	0,08	locally
lodging	7	1	0,08	lodging
long	4	1	0,08	long
loose	5	1	0,08	loose
low	3	1	0,08	low
lower	5	1	0,08	lower
lpower	6	1	0,08	lpower
lunch	5	1	0,08	lunch
lund	4	1	0,08	lund
main	4	1	0,08	main
mass	4	1	0,08	mass
materials	9	1	0,08	materials
may	3	1	0,08	may
meant	5	1	0,08	meant
meat	4	1	0,08	meat
medical	7	1	0,08	medical
medschool	9	1	0,08	medschool
meetings	8	1	0,08	meetings
members	7	1	0,08	members
mentality	9	1	0,08	mentality

merchandising	13	1	0,08	merchandising
messages	8	1	0,08	messages
methods	7	1	0,08	methods
metrics	7	1	0,08	metrics
might	5	1	0,08	might
mission	7	1	0,08	mission
momentum	8	1	0,08	momentum
morbidities	11	1	0,08	morbidities
moreover	8	1	0,08	moreover
motivated	9	1	0,08	motivated
moved	5	1	0,08	moved
movements	9	1	0,08	movements
multidimensional	16	1	0,08	multidimensional
multidisciplinary	17	1	0,08	multidisciplinary
municipality	12	1	0,08	municipality
national	8	1	0,08	national
necessarily	11	1	0,08	necessarily
next	4	1	0,08	next
nick	4	1	0,08	nick
nns	3	1	0,08	nns
non	3	1	0,08	non
nordisk	7	1	0,08	nordisk
normal	6	1	0,08	normal
novo	4	1	0,08	novo
nudged	6	1	0,08	nudged
nutrition	9	1	0,08	nutrition
object	6	1	0,08	object
offence	7	1	0,08	offence
older	5	1	0,08	older
opposite	8	1	0,08	opposite
organised	9	1	0,08	organised
outskirts	9	1	0,08	outskirts
overeating	10	1	0,08	overeating
ownership	9	1	0,08	ownership
partnerships	12	1	0,08	partnerships
pay	3	1	0,08	pay
perspective	11	1	0,08	perspective
phone	5	1	0,08	phone
player	6	1	0,08	player
plays	5	1	0,08	plays
plus	4	1	0,08	plus
point	5	1	0,08	point
policy	6	1	0,08	policy
political	9	1	0,08	political
population	10	1	0,08	population
portugal	8	1	0,08	portugal
poses	5	1	0,08	poses
positioning	11	1	0,08	positioning
practice	8	1	0,08	practice
practitioners	13	1	0,08	practitioners
preferences	11	1	0,08	preferences
previous	8	1	0,08	previous

priority	8	1	0,08	priority
privilege	9	1	0,08	privilege
professionals	13	1	0,08	professionals
prohibition	11	1	0,08	prohibition
promises	8	1	0,08	promises
prosperity	10	1	0,08	prosperity
protracted	10	1	0,08	protracted
prove	5	1	0,08	prove
punishment	10	1	0,08	punishment
quite	5	1	0,08	quite
range	5	1	0,08	range
rapid	5	1	0,08	rapid
rarely	6	1	0,08	rarely
react	5	1	0,08	react
reactions	9	1	0,08	reactions
realise	7	1	0,08	realise
realistically	13	1	0,08	realistically
received	8	1	0,08	received
reduce	6	1	0,08	reduce
reflect	7	1	0,08	reflect
regards	7	1	0,08	regards
regions	7	1	0,08	regions
regulating	10	1	0,08	regulating
reimbursed	10	1	0,08	reimbursed
rely	4	1	0,08	rely
remove	6	1	0,08	remove
replaced	8	1	0,08	replaced
responds	8	1	0,08	responds
restaurants	11	1	0,08	restaurants
resting	7	1	0,08	resting
restrictions	12	1	0,08	restrictions
retired	7	1	0,08	retired
retrospective	13	1	0,08	retrospective
reward	6	1	0,08	reward
risks	5	1	0,08	risks
roberts	7	1	0,08	roberts
rodents	7	1	0,08	rodents
root	4	1	0,08	root
schedule	8	1	0,08	schedule
schools	7	1	0,08	schools
secreted	8	1	0,08	secreted
secured	7	1	0,08	secured
seem	4	1	0,08	seem
self	4	1	0,08	self
shed	4	1	0,08	shed
shortage	8	1	0,08	shortage
signal	6	1	0,08	signal
since	5	1	0,08	Since
single	6	1	0,08	Single
skype	5	1	0,08	Skype
social	6	1	0,08	Social
socio	5	1	0,08	Socio
socioeconomic	13	1	0,08	Socioeconomic
soda	4	1	0,08	Soda

sometimes	9	1	0,08	sometimes
stations	8	1	0,08	stations
steadily	8	1	0,08	steadily
steady	6	1	0,08	steady
steps	5	1	0,08	steps
stimulated	10	1	0,08	stimulated
strategic	9	1	0,08	strategic
strengthen	10	1	0,08	strengthen
stronger	8	1	0,08	stronger
structured	10	1	0,08	structured
student	7	1	0,08	student
subjective	10	1	0,08	subjective
subtitles	9	1	0,08	subtitles
suffering	9	1	0,08	suffering
surgery	7	1	0,08	surgery
sweets	6	1	0,08	sweets
symptomatic	11	1	0,08	symptomatic
symptoms	8	1	0,08	symptoms
systematic	10	1	0,08	systematic
taken	5	1	0,08	taken
talk	4	1	0,08	talk
targets	7	1	0,08	targets
temptation	10	1	0,08	temptation
test	4	1	0,08	test
third	5	1	0,08	third
today	5	1	0,08	today
tools	5	1	0,08	tools
transferred	11	1	0,08	transferred
translations	12	1	0,08	translations
transport	9	1	0,08	transport
trials	6	1	0,08	trials
tried	5	1	0,08	tried
trustworthy	11	1	0,08	trustworthy
tuesday	7	1	0,08	tuesday
types	5	1	0,08	types
typical	7	1	0,08	typical
typology	8	1	0,08	typology
unbranded	9	1	0,08	unbranded
uncertainties	13	1	0,08	uncertainties
undergo	7	1	0,08	undergo
underground	11	1	0,08	underground
unified	7	1	0,08	unified
university	10	1	0,08	university
unrealistic	11	1	0,08	unrealistic
upbringing	10	1	0,08	upbringing
use	3	1	0,08	use
vaccines	8	1	0,08	vaccines
various	7	1	0,08	various
visibility	10	1	0,08	visibility
voice	5	1	0,08	voice
voted	5	1	0,08	voted
wealth	6	1	0,08	wealth
widely	6	1	0,08	widely
Wider	5	1	0,08	wider

Wil	3	1	0,08	Wil
Within	6	1	0,08	Within
Works	5	1	0,08	Works
Yes	3	1	0,08	Yes

Query Final

obesity, treatment, patients, health, need, eat, problem, recogni, gain, develop, diagnos, direct, energy, excess, genera
treating, high, take, results, much, live, lot, many, measur, metabo, preven
weight, severe, changing, produc, acces, ackno, adipos, also, anythi, appro
become, leptin, society, new, aware, cases, conne, conve, decisi, differe
disease, produc, body, effect, howev, impac, individ, indust
overweight, make, care, better, lifestyle, doctors, time, rate, brain, enoug, issue, link, lose, marke
fat, campaig, challenge, public, persons, biggest, want, cance, etc, lack, must, option, order
food, people, cause, initiatives, denmark, one, physicia, difficult, cost, create, well, cardio, eviden, level, offer, part, partne

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Appendix 8. Summary of the survey questionnaire (In Danish)

Undersøgelse af effekter af øget forekomst af svær overvægt på den offentlige sektor i DK

INDLEDNING

Dette spørgeskema består af 16 spørgsmål opdelt i 3 sektioner. Undersøgelsen er anonym og dine oplysninger bliver ikke delt. Det burde tage mellem 5 og 10 minutter at besvare alle spørgsmål i spørgeskemaet.

I de seneste årtier har der på tværs af Danmark været en vedvarende stigning i antallet af personer, der lider af svær overvægt. Svær overvægt defineres som en kropsmasse indeks (BMI) på ≥ 30 kg/m2. Kropsmasseindeks beregnes ved at dividere kropsvægt (i kilogram) med højde i anden (i meter) og gælder for både mænd og kvinder. For at styrke diagnosticeringen og tage højde for muskelmassen, bruger man taljemål og fedtprocent for at afgøre hvor overvægtig en person er. Generelt kan man sige, at en person med en højde på 1,75 m og en vægt på ≥ 77 kg er overvægtig, og en person på 1,75 m som vejer ≥ 92 kg - svært overvægtig og lider af fedme.

Fedme omtales oftere og oftere som en sygdom, der både påvirker éns krop og sind. I 2013 har det Amerikanske Medicinske Forbund søgt om at få godkendt fedme som sygdom. Fedme karaktireseres med en manglende mæthedsfornemmelse, der eventuelt resulterer i svær overvægt. Fedme udgør stor belastning på både individuelt og samfundsmæssigt plan.

I tilfælde af spøgsmål, er du velkommen til at kontakte Luba Aleksandrova på lial14ad@student.cbs.dk.

Med venlig hilsen,
Liubov Aleksandrova, på vegne af Handelshøjskolen København - Copenhagen Business School

1. Om dig

Det vil gavne analysen, hvis du oplyser lidt mere om dig selv. Vi deler ikke dine informationer og du har til enhver tid ret til at bede om at få slettet dine besvarelser.

1. Hvilken afdeling arbejder du på? (Du må gerne vælge flere, da der er forskellige opdelinger på tværs af kommuner) *
   - Social
   - Psykiatri
   - Sundhed
   - Familie, Børn og Unge
   - Arbejdsmarked og Beskæftigelse
   - Omsorg
   - Uddannelse
   - Other

2. Hvilken kommune er du ansat i? *
   Enter your answer

3. Hvad er dit køn? *
   - Foretrækker ikke at oplyse
   - Kvinde
   - Mand
   - Andet
   - Other

4. Hvilket år er du født i? (Venligst skriv i formattet 19XX eller 20XX) *
   The value must be a number

Next

2. Kroniske sygdomme

Her vil vi gerne vide mere om din erfaring med og viden om de kroniske sygdomme i enten professionel eller personlig medfør. Med kronisk sygdom forstås en livsvarig sygdom, der ikke nødvendigvis er medfødt. Denne undersøgelse omfatter primært fysiologiske kroniske sygdomme, såsom sukkersyge, forhøjet blodtryk og gigt, men du er velkommen til at drage på dine erfaringer fra arbejde med folk med kroniske lidelser (dvs. psykiske lidelser).

5. Hvad kendetegner en kronisk sygdom? (Vælg én) *

○ En sygdom man er født med

☒ En sygdom der varer resten af livet

○ En psykisk sygdom

6. Hvorvidt er du enig i følgende udsagn: *

	Meget uenig	Delvist uenig	Kun lidt uenig	Hverken enig eller uenig	Kun lidt enig	Delvist enig	Meget enig
Kronisk sygdom påvirker ens livskvalitet	○	○	○	○	○	○	○
Personer med en kronisk sygdom oplever forbehold mod deres evne til at gennemføre en uddannelse eller påtage sig et arbejde	○	○	○	○	○	○	○
Kronisk sygdom påvirker ens muligheder for at få eller fastholde et arbejde	○	○	○	○	○	○	○
Personer med kronisk sygdom oplever udfordringer i forbindelse med social samvær	○	○	○	○	○	○	○
Personer med kronisk sygdom har behov for specialiserede tilbud fra det kommunen	○	○	○	○	○	○	○
Personer med kronisk sygdom har behov for specialiserede tilbud fra sundhedssektoren	○	○	○	○	○	○	○

7. Hvorvidt er du enig i følgende udsagn: *

	Er helt uenig	Delvist uenig	Kun lidt uenig	Hverken enig eller uenig	Kun lidt enig	Delvist enig	Meget enig
Personer med kroniske sygdomme har gavn af et forum, hvor de kan dele deres erfaringer	○	○	○	○	○	○	○
Der bliver tilbudt tilstrækkelig hjælp til personer med kroniske sygdomme i din kommune	○	○	○	○	○	○	○
De tilbud, der bliver tilbudt i din kommune gør en betydelig forskel for folk med vægtudfordringer og deres pårørende	○	○	○	○	○	○	○
Ens udseende påvirker ens liv	○	○	○	○	○	○	○

8. Hvorvidt er du enig i følgende udsagn: *

	Meget uenig	Delvist uenig	Kun lidt uenig	Hverken enig eller uenig	Kun lidt enig	Delvist enig	Meget enig
Personer med vægtudfordringer har behov for specialiserede tilbud fra det offentlige for at undgå at de udvikler fedme	○	○	○	○	○	○	○
Personer med vægtudfordringer har behov for specialiserede tilbud fra sundhedsvæsenet for at undgå at de udvikler fedme	○	○	○	○	○	○	○
Personer med vægtudfordringer har behov for psykologisk hjælp	○	○	○	○	○	○	○
Personer med vægtudfordringer har behov for psykiatrisk hjælp	○	○	○	○	○	○	○
Fedme er årsagen til en række kroniske lidelser, såsom forhøjet blodtryk, kræft, sukkersyge og leversygdomme	○	○	○	○	○	○	○

9. Hvorvidt er du enig i følgende udsagn: *

	Meget uenig	Delvist uenig	Kun lidt uenig	Hverken enig eller uenig	Kun lidt enig	Delvist enig	Meget enig
Svær overvægt/fedme er en kronisk sygdom	○	○	○	○	○	○	○
Svær overvægt er en stigende udfordring for det offentlige sektor	○	○	○	○	○	○	○
Personer med fedme bliver svært overvægtige på grund af deres livsstil	○	○	○	○	○	○	○

10. Kender du, i privat eller professionel medfør, en person, der er svært overvægtig eller lever med fedme? *

○ Ja, personligt

○ Ja, igennem bekendte

○ Nej, det gør jeg ikke

○ Jeg er selv svært overvægtig eller lever med fedme

11. Kender du, i privat eller professionel medfør, en person, der har benyttet sig af de kommunale tilbud om kost, motion og overvægt? *

○ Ja, personligt

○ Nej, det gør jeg ikke

○ Ja, igennem arbejde

○ Jeg har selv benyttet mig af de ovennævnte tilbud

○ Other [_____]

[Back]   [Next]

3. Handlingsområder

Vi vil gerne vide, hvilke områder du mener er mest relevante i forbindelse med bekæmpelse og forebyggelse af fedme som sygdom på nationalplan.

12. Nedenunder er der eksempler for de offentlige indsatsområder. Vælg venligst de områder, du vil mene er relevante i forbindelse med bekæmpelse af fedme som sygdom lokalt. *

- Børn og Unge
- Social
- Sundhed
- Arbejdsmarked og Beskæftigelse
- Psykiatri
- Kultur og Fritid
- Familie
- Omsorg
- Uddannelse
- Other

13. Af de samme områder, hvilke områder vil du mene er relevante i forbindelse med forebyggelse af fedme som sygdom? *

- Børn og Unge
- Social
- Sundhed
- Arbejdsmarked og Beskæftigelse
- Psykiatri
- Kultur og Fritid
- Familie
- Omsorg
- Uddannelse
- Other

14. Efter din mening, i hvilken alder kan man mest effektivt behandle fedme som sygdom? *

- 0-6 år
- 7-13 år
- 14-20 år
- 21-35 år
- Efter 36 år

15. Efter din mening, i hvilken alder kan man mest effektivt forebygge fedme som sygdom? *

- 0-6 år
- 7-13 år
- 14-20 år
- 21-35 år
- Efter 36 år

16. Efter din mening, hvilke faktorer er mest skyld i den voksende problematik af svær overvægt og fedme i Danmark? *

- Traditioner og kultur
- Udvalg af madvarer i supermarkeder
- Let tilgængeligt fast food
- Indflydelse fra USA og Storbritanien
- Overvægt anses som tegn på velstand
- Kage og wienerbrød på arbejde
- Folks egne vaner og præferencer
- Automater med sodavand, slik og andet på skoler og institutioner
- Automater med sodavand, slik og andet på arbejdspladser
- Manglende uddannelse og viden
- "Skjult" sukker i mange madvarer og retter, hvor den ikke hører til
- Manglende regler for hvor usund maden må være på spisesteder, såsom restauranter og fast food kæder
- Other

17. Godt klaret! Har du nogle kommentarer eller bemærkninger til enten emnet eller selve spørgeskemaet?

Enter your answer

Back   Submit

<Må gerne videresendes>

Kære medarbejdere i i Kommune,

Jeg vil bede jer at bruge 5-10 minutter på at besvare den vedhæftede anonyme spørgeskema. Jeg er studerende ved CBS og forsker på folkesundhedsområdet, helt konkret indenfor kroniske sygdomme og forekomst af svær overvægt i Danmark.

Selve spørgeskemaet finder de her: https://forms.office.com/Pages/ResponsePage.aspx?id=TkFchwBd20y3et6uXWqyAfCkt3Oa3Z dFjKUlWptIxkpUQ1hQSTgzWkI2VUVVTVgwVzdTTkVFTldTMi4u

Jeg vil sætte stor pris på jeres besvarelser og I er velkomne til at videresende spørgeskemaet til de andre afdelinger, som I mener er relevante for undersøgelsen. Skulle der være nogle spørgsmål til spørgeskemaet, står mine kontaktdetaljer nedenunder. Spørgeskemaet kan besvares inden den 11 december kl 11.59.

Med venlig hilsen,
Liubov Aleksandrova
Copenhagen Business School

Tlf.: 50487751
E-mail: lial14ad@student.cbs.dk

Appendix 10. Demographics of the survey respondents.

Age.

Statistics

AgeGroups

N	Valid	100
	Missing	0
Mean		3,74
Median		4,00
Std. Deviation		1,211
Variance		1,467
Percentiles	25	3,00
	50	4,00
	75	5,00

Statistics

Age

N	Valid	100
	Missing	0
Mean		47,95
Median		47,50
Std. Deviation		11,855
Variance		140,533
Range		51
Minimum		23
Maximum		74
Percentiles	25	39,00
	50	47,50
	75	57,00
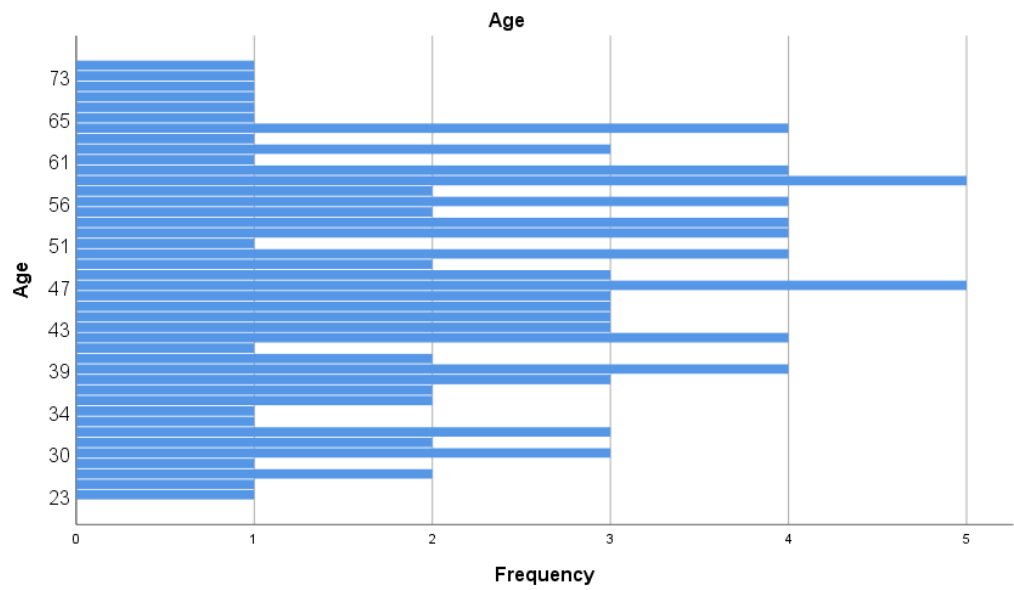
AgeGroups

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<25	4	4,0	4,0	4,0
	26-35	11	11,0	11,0	15,0
	36-45	27	27,0	27,0	42,0
	46-55	28	28,0	28,0	70,0
	56-65	25	25,0	25,0	95,0
	>66	5	5,0	5,0	100,0
	Total	100	100,0	100,0	

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	23	1	1,0	1,0	1,0
	24	1	1,0	1,0	2,0
	25	2	2,0	2,0	4,0
	26	1	1,0	1,0	5,0
	30	3	3,0	3,0	8,0
	31	2	2,0	2,0	10,0
	32	3	3,0	3,0	13,0
	33	1	1,0	1,0	14,0
	34	1	1,0	1,0	15,0
	36	2	2,0	2,0	17,0
	37	2	2,0	2,0	19,0
	38	3	3,0	3,0	22,0
	39	4	4,0	4,0	26,0
	40	2	2,0	2,0	28,0
	41	1	1,0	1,0	29,0
	42	4	4,0	4,0	33,0
	43	3	3,0	3,0	36,0
	44	3	3,0	3,0	39,0
	45	3	3,0	3,0	42,0
	46	3	3,0	3,0	45,0
	47	5	5,0	5,0	50,0
	48	3	3,0	3,0	53,0
	49	2	2,0	2,0	55,0
	50	4	4,0	4,0	59,0
	51	1	1,0	1,0	60,0
	52	4	4,0	4,0	64,0
	54	4	4,0	4,0	68,0
	55	2	2,0	2,0	70,0
	56	4	4,0	4,0	74,0
	57	2	2,0	2,0	76,0
	59	5	5,0	5,0	81,0
	60	4	4,0	4,0	85,0
	61	1	1,0	1,0	86,0
	62	3	3,0	3,0	89,0
	63	1	1,0	1,0	90,0
	64	4	4,0	4,0	94,0
	65	1	1,0	1,0	95,0
	66	1	1,0	1,0	96,0
	67	1	1,0	1,0	97,0
	72	1	1,0	1,0	98,0
	73	1	1,0	1,0	99,0

	Frequency	Percent	Valid Percent	Cumulative Percent
74	1	1,0	1,0	100,0
Total	100	100,0	100,0	

AgeGroups
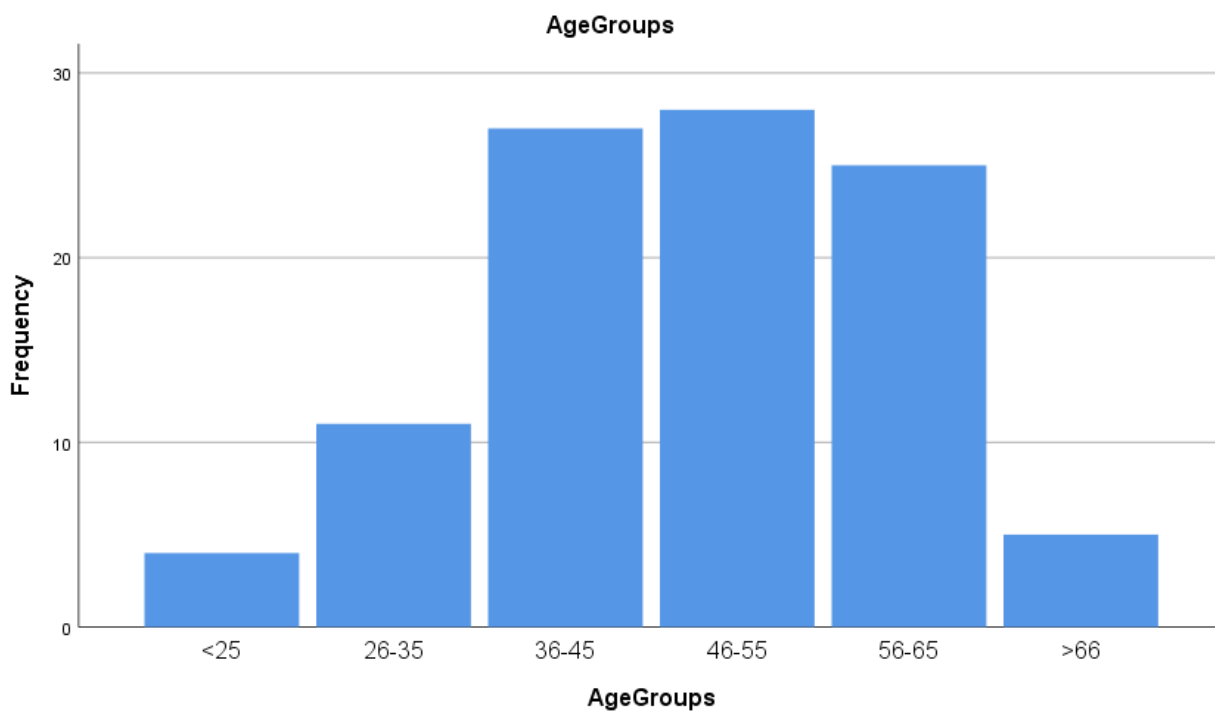
Gender

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	89	89,0	89,0	89,0
	0	11	11,0	11,0	100,0
	Total	100	100,0	100,0	

Geographic placement

Region

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Hovedstaden	29	29,0	29,0	29,0
	Midtjylland	24	24,0	24,0	53,0
	Nordjylland	2	2,0	2,0	55,0
	Sjælland	21	21,0	21,0	76,0
	Syddanmark	24	24,0	24,0	100,0
	Total	100	100,0	100,0	

Region
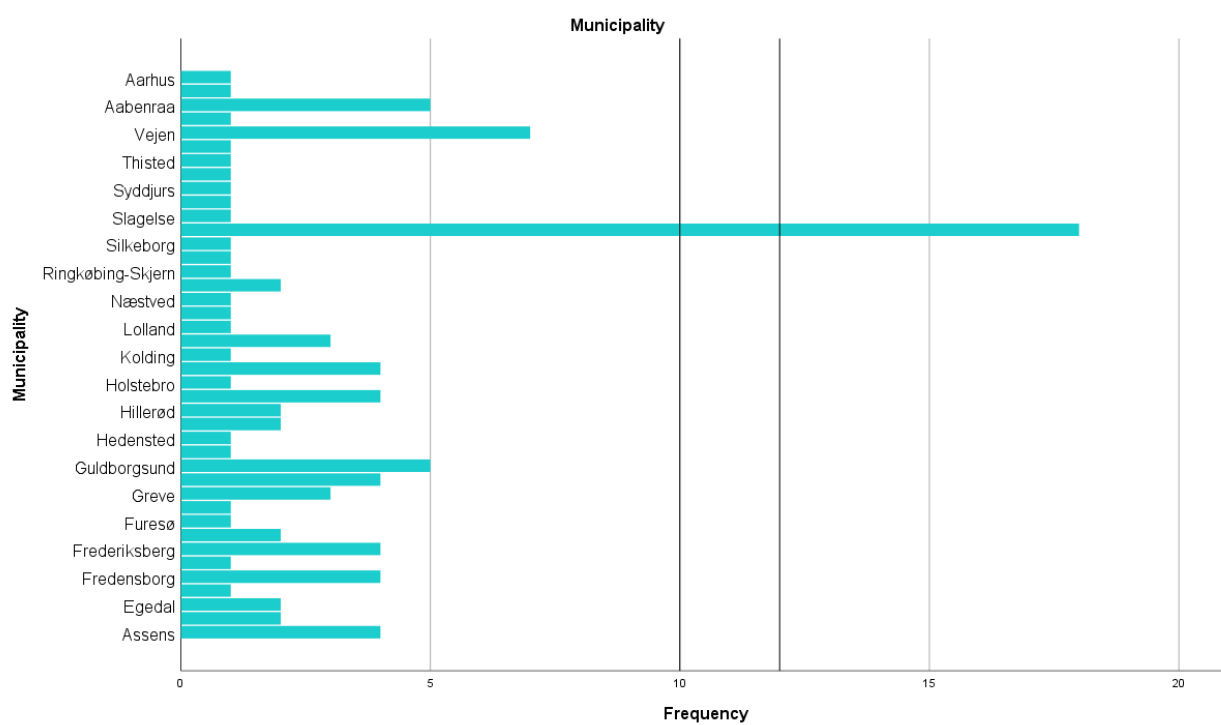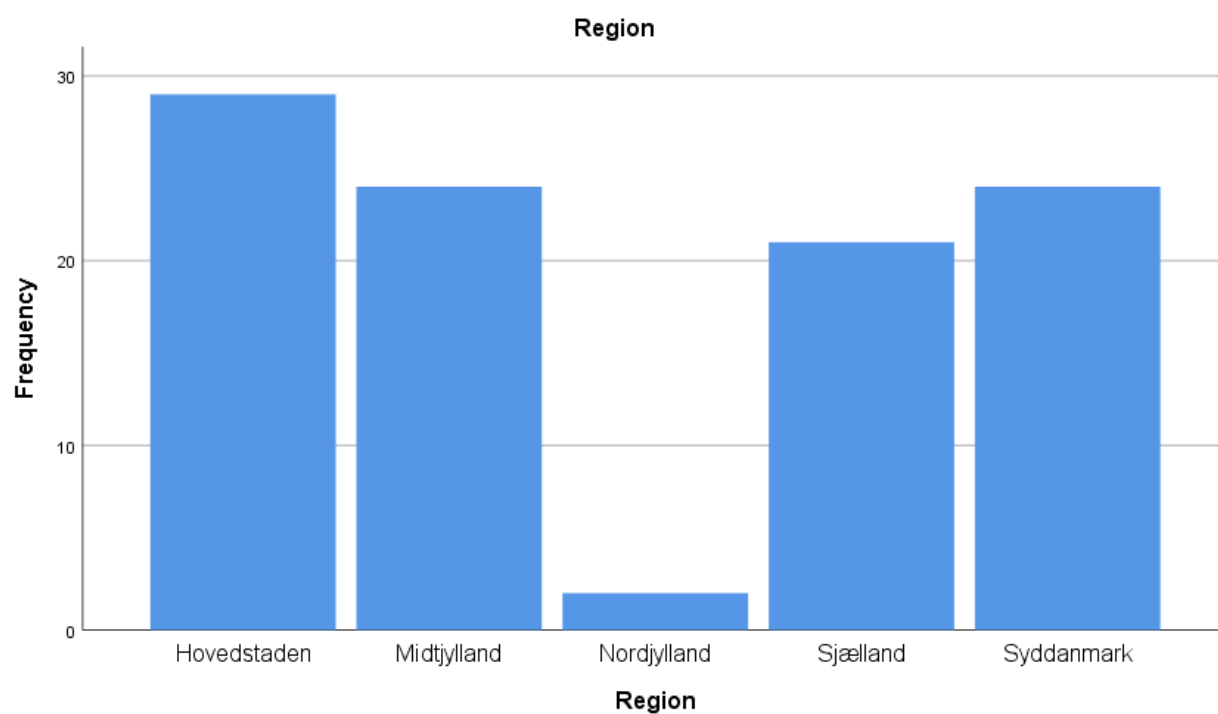
Municipality

Municipality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Assens	4	4,0	4,0	4,0
	Bornholms Regionskommune	2	2,0	2,0	6,0
	Egedal	2	2,0	2,0	8,0

Faxe	1	1,0	1,0	9,0
Fredensborg	4	4,0	4,0	13,0
Fredericia	1	1,0	1,0	14,0
Frederiksberg	4	4,0	4,0	18,0
Frederikssund	2	2,0	2,0	20,0
Furesø	1	1,0	1,0	21,0
Faaborg-Midtfyn	1	1,0	1,0	22,0
Greve	3	3,0	3,0	25,0
Gribskov	4	4,0	4,0	29,0
Guldborgsund	5	5,0	5,0	34,0
Haderslev	1	1,0	1,0	35,0
Hedensted	1	1,0	1,0	36,0
Helsingør	2	2,0	2,0	38,0
Hillerød	2	2,0	2,0	40,0
Holbæk	4	4,0	4,0	44,0
Holstebro	1	1,0	1,0	45,0
Hvidovre	4	4,0	4,0	49,0
Kolding	1	1,0	1,0	50,0
Køge	3	3,0	3,0	53,0
Lolland	1	1,0	1,0	54,0
Lyngby-Taarbæk	1	1,0	1,0	55,0
Næstved	1	1,0	1,0	56,0
Odense	2	2,0	2,0	58,0
Ringkøbing-Skjern	1	1,0	1,0	59,0
Roskilde	1	1,0	1,0	60,0
Silkeborg	1	1,0	1,0	61,0
Skive	18	18,0	18,0	79,0
Slagelse	1	1,0	1,0	80,0
Svendborg	1	1,0	1,0	81,0
Syddjurs	1	1,0	1,0	82,0
Sønderborg	1	1,0	1,0	83,0
Thisted	1	1,0	1,0	84,0
Tårnby	1	1,0	1,0	85,0
Vejen	7	7,0	7,0	92,0
Vordingborg	1	1,0	1,0	93,0
Aabenraa	5	5,0	5,0	98,0
Aalborg	1	1,0	1,0	99,0
Aarhus	1	1,0	1,0	100,0
Total	100	100,0	100,0	

Descriptive Statistics

Q6.1 Chronic disease affects one's quality of life

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Completely disagree	4	4,0	4,0	4,0
	Partially disagree	3	3,0	3,0	7,0
	Slightly disagree	1	1,0	1,0	8,0
	Neither agree nor disagree	13	13,0	13,0	21,0
	Slightly agree	8	8,0	8,0	29,0
	Partially agree	41	41,0	41,0	70,0
	Completely agree	30	30,0	30,0	100,0
	Total	100	100,0	100,0	

Statistics

Q6.2 Persons with chronic diseases experience reservations toward their abilities to complete an education or take a job

N	Valid	100
	Missing	0
Mean		4,54
Std. Error of Mean		,160
Median		5,00
Mode		4
Std. Deviation		1,604
Variance		2,574
Skewness		-,605
Std. Error of Skewness		,241
Kurtosis		-,305
Std. Error of Kurtosis		,478
Range		6
Minimum		1
Maximum		7
Percentiles	25	4,00
	50	5,00
	75	6,00

Q6.1 Chronic disease affects one's quality of life

Q6.2

Statistics

Q6.2 Persons with chronic diseases experience reservations toward their abilities to complete an education or take a job

N	Valid	100
	Missing	0
Mean		4,54
Std. Error of Mean		,160
Median		5,00
Mode		4
Std. Deviation		1,604
Variance		2,574
Skewness		-,605
Std. Error of Skewness		,241
Kurtosis		-,305
Std. Error of Kurtosis		,478
Range		6
Minimum		1
Maximum		7
Percentiles	25	4,00
	50	5,00
	75	6,00

Q6.2 Persons with chronic diseases experience reservations toward their abilities to complete an education or take a job

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Completely disagree	6	6,0	6,0	6,0
	Partially disagree	9	9,0	9,0	15,0
	Slightly disagree	4	4,0	4,0	19,0
	Neither agree nor disagree	28	28,0	28,0	47,0
	Slightly agree	19	19,0	19,0	66,0
	Partially agree	27	27,0	27,0	93,0
	Completely agree	7	7,0	7,0	100,0
	Total	100	100,0	100,0	
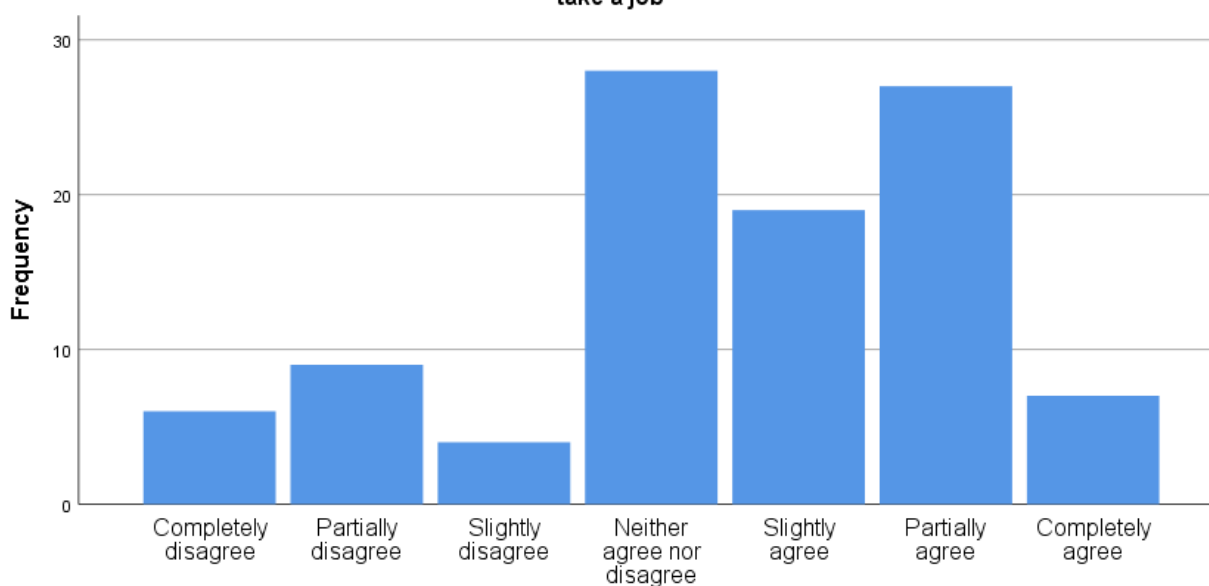
Q6.2 Persons with chronic diseases experience reservations toward their abilities to complete an education or take a job

Q6.3

Statistics

Q6.3 Chronic disease affects one's ability
to obtain and/or retain a job

N	Valid	100
	Missing	0
Mean		4,61
Std. Error of Mean		,154
Median		5,00
Mode		4
Std. Deviation		1,537
Variance		2,362
Skewness		-,629
Std. Error of Skewness		,241
Kurtosis		-,022
Std. Error of Kurtosis		,478
Range		6
Minimum		1
Maximum		7
Percentiles	25	4,00
	50	5,00
	75	6,00

Q6.3 Chronic disease affects one's ability to obtain and/or retain a job

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Completely disagree	5	5,0	5,0	5,0
	Partially disagree	8	8,0	8,0	13,0
	Slightly disagree	3	3,0	3,0	16,0
	Neither agree nor disagree	29	29,0	29,0	45,0
	Slightly agree	23	23,0	23,0	68,0
	Partially agree	24	24,0	24,0	92,0
	Completely agree	8	8,0	8,0	100,0
	Total	100	100,0	100,0	

Q6.3 Chronic disease affects one's ability to obtain and/or retain a job

Q6.3 Chronic disease affects one's ability to obtain and/or retain a job
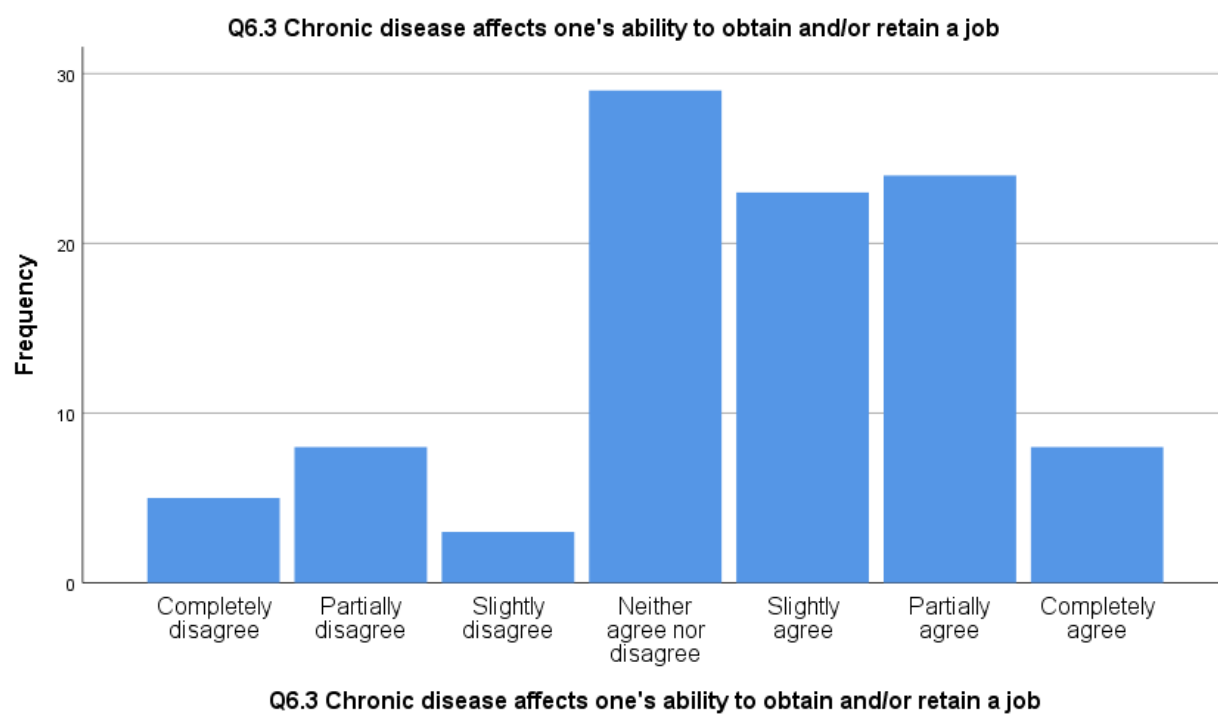
Q6.4

Statistics

Q6.4 Persons with chronic diseases
experience challenges while socialising

N	Valid	100
	Missing	0
Mean		4,38
Std. Error of Mean		,140
Median		4,00
Mode		4
Std. Deviation		1,398
Variance		1,955
Skewness		-,506
Std. Error of Skewness		,241
Kurtosis		-,021
Std. Error of Kurtosis		,478
Range		6
Minimum		1
Maximum		7
Percentiles	25	4,00
	50	4,00
	75	5,00

Q6.4 Persons with chronic diseases experience challenges while socialising

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Completely disagree	3	3,0	3,0	3,0
	Partially disagree	12	12,0	12,0	15,0
	Slightly disagree	2	2,0	2,0	17,0
	Neither agree nor disagree	35	35,0	35,0	52,0
	Slightly agree	27	27,0	27,0	79,0
	Partially agree	17	17,0	17,0	96,0
	Completely agree	4	4,0	4,0	100,0
	Total	100	100,0	100,0	
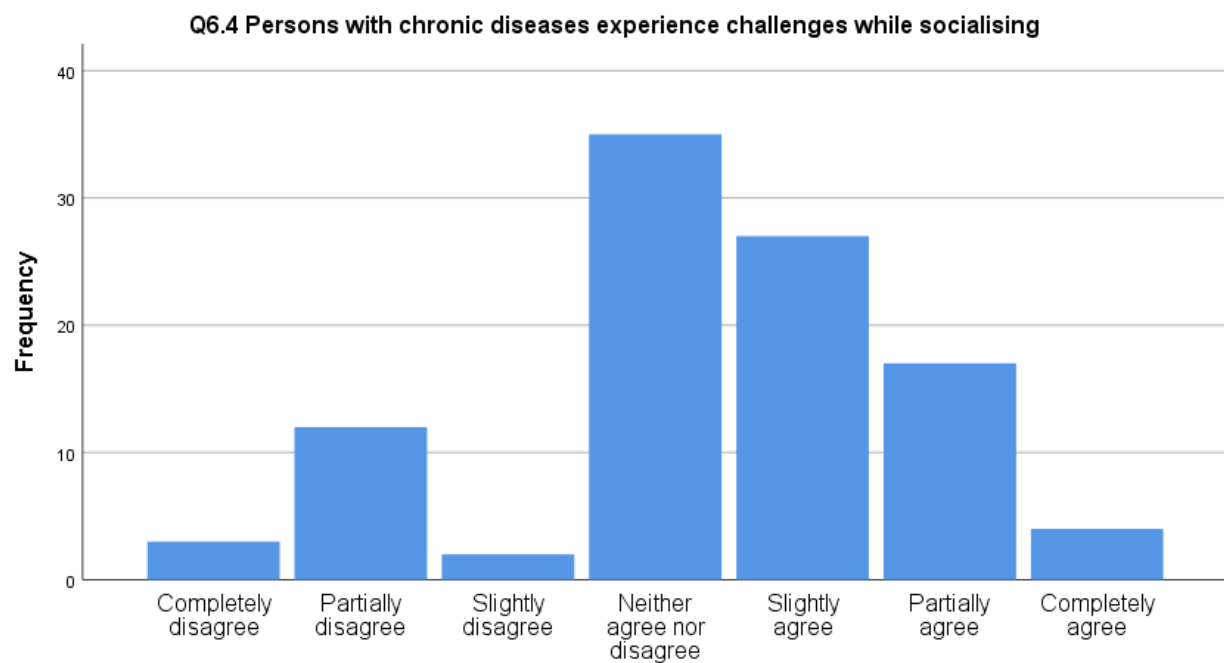
Q6.4 Persons with chronic diseases experience challenges while socialising

Q6.5

Statistics

Q6.5 Persons with a chronic disease need specialised offers from the municipality

N	Valid	100
	Missing	0
Mean		4,69
Std. Error of Mean		,148
Median		5,00
Mode		4
Std. Deviation		1,475
Variance		2,176
Skewness		-,333
Std. Error of Skewness		,241
Kurtosis		-,437
Std. Error of Kurtosis		,478
Range		6
Minimum		1
Maximum		7
Percentiles	25	4,00
	50	5,00
	75	6,00

Q6.5 Persons with a chronic disease need specialised offers from the municipality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Completely disagree	1	1,0	1,0	1,0
	Partially disagree	11	11,0	11,0	12,0
	Slightly disagree	3	3,0	3,0	15,0
	Neither agree nor disagree	32	32,0	32,0	47,0
	Slightly agree	20	20,0	20,0	67,0
	Partially agree	22	22,0	22,0	89,0
	Completely agree	11	11,0	11,0	100,0
	Total	100	100,0	100,0	

Q6.5 Persons with a chronic disease need specialised offers from the municipality

Q6.5 Persons with a chronic disease need specialised offers from the municipality
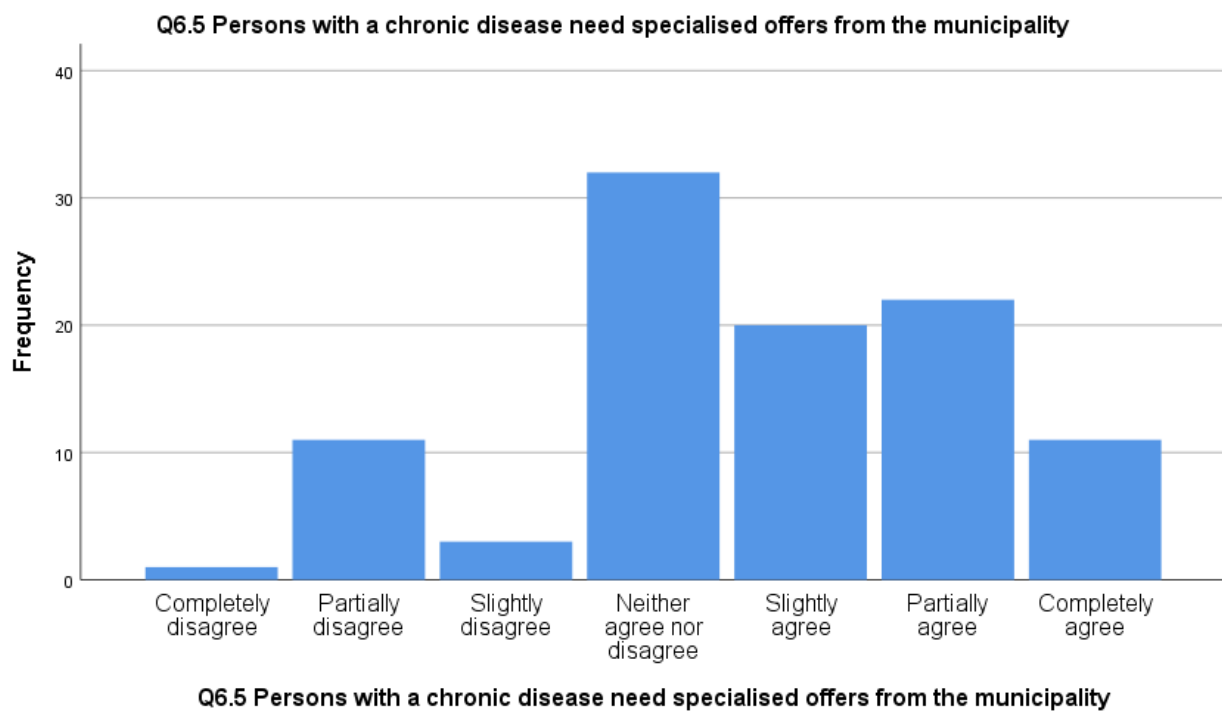
Q6.6

Statistics

Q6.6 Persons with a chronic disease need specialised offers from healthcare sector

N	Valid	100
	Missing	0
Mean		5,14
Std. Error of Mean		,143
Median		5,00
Mode		6
Std. Deviation		1,429
Variance		2,041
Skewness		-,803
Std. Error of Skewness		,241
Kurtosis		,173
Std. Error of Kurtosis		,478
Range		6
Minimum		1
Maximum		7
Percentiles	25	4,00
	50	5,00
	75	6,00

Q6.6 Persons with a chronic disease need specialised offers from healthcare sector

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Completely disagree	1	1,0	1,0	1,0
	Partially disagree	7	7,0	7,0	8,0
	Slightly disagree	3	3,0	3,0	11,0
	Neither agree nor disagree	19	19,0	19,0	30,0
	Slightly agree	21	21,0	21,0	51,0
	Partially agree	34	34,0	34,0	85,0
	Completely agree	15	15,0	15,0	100,0
	Total	100	100,0	100,0	
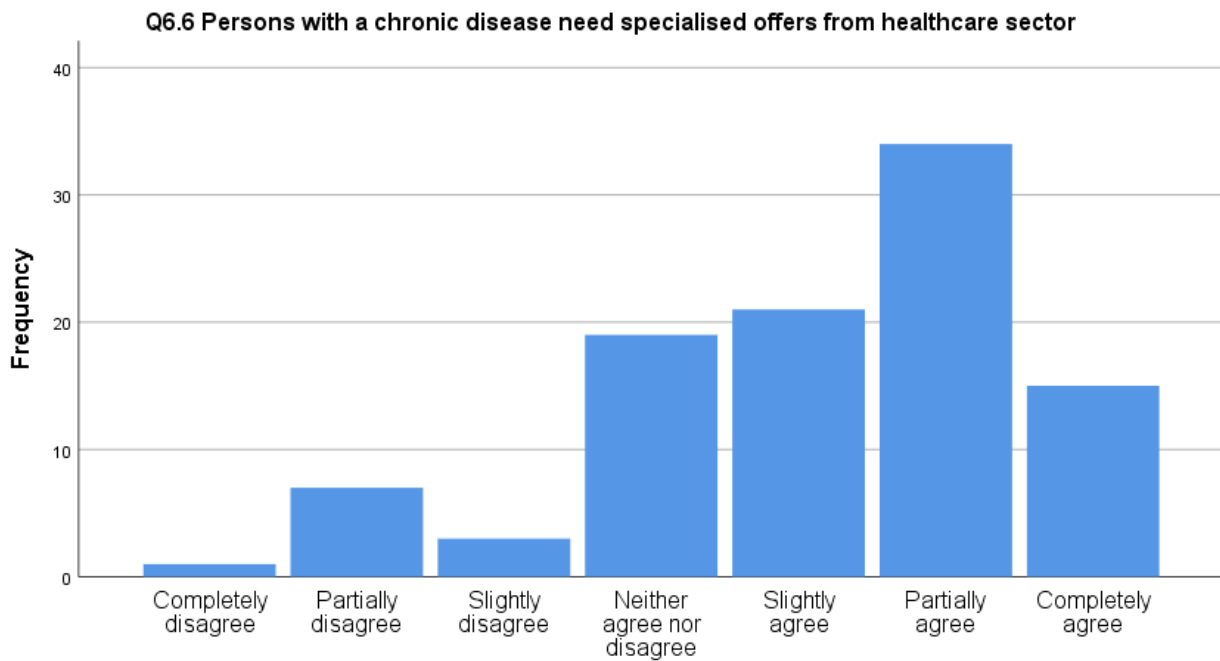
Q6.6 Persons with a chronic disease need specialised offers from healthcare sector

Median of answers in Q6

Statistics

Median of all answers in Q6

N	Valid	100
	Missing	0
Mean		4,72
Std. Error of Mean		,136
Median		5,00
Mode		4
Std. Deviation		1,356
Variance		1,840
Skewness		-,689
Std. Error of Skewness		,241
Kurtosis		,257
Std. Error of Kurtosis		,478
Range		6
Minimum		1
Maximum		7
Percentiles	25	4,00
	50	5,00
	75	6,00

Median of all answers in Q6

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Completely disagree	2	2,0	2,0	2,0
	Partially disagree	8	8,0	8,0	10,0
	Slightly disagree	2	2,0	2,0	12,0
	Neither agree nor disagree	30	30,0	30,0	42,0
	Slightly agree	25	25,0	25,0	67,0
	Partially agree	28	28,0	28,0	95,0
	Completely agree	5	5,0	5,0	100,0
	Total	100	100,0	100,0	

Median of all answers in Q6

Median of all answers in Q6
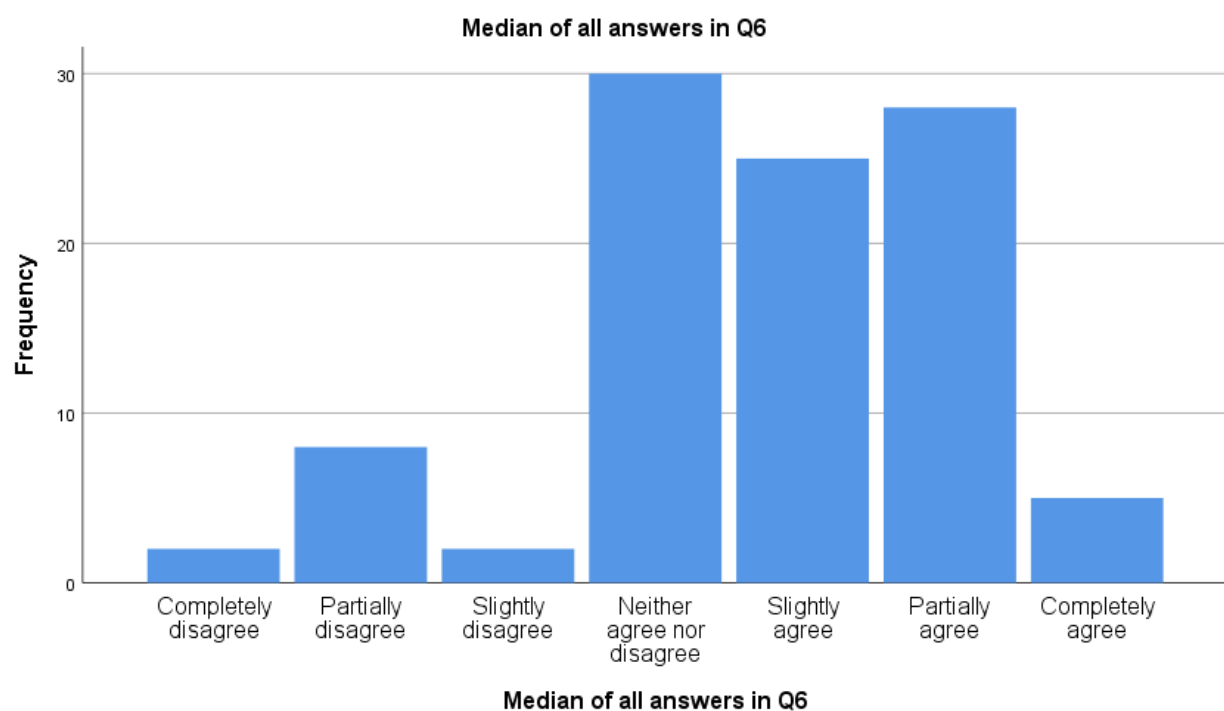
Q7.1

Statistics

Q7.1 Persons with a chronic disease benefit from a forum where they can share their experiences

N	Valid		99
	Missing		1
Mean			5,79
Std. Error of Mean			,123
Median			6,00
Mode			7
Std. Deviation			1,223
Variance			1,495
Skewness			-,745
Std. Error of Skewness			,243
Kurtosis			-,415
Std. Error of Kurtosis			,481
Range			5
Minimum			2
Maximum			7
Percentiles	25		5,00
	50		6,00
	75		7,00

Q7.1 Persons with a chronic disease benefit from a forum where they can share their experiences

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Partially disagree	1	1,0	1,0	1,0
	Slightly disagree	1	1,0	1,0	2,0
	Neither agree nor disagree	20	20,0	20,2	22,2
	Slightly agree	10	10,0	10,1	32,3
	Partially agree	31	31,0	31,3	63,6
	Completely agree	36	36,0	36,4	100,0
	Total	99	99,0	100,0	
Missing	System	1	1,0		
Total		100	100,0		
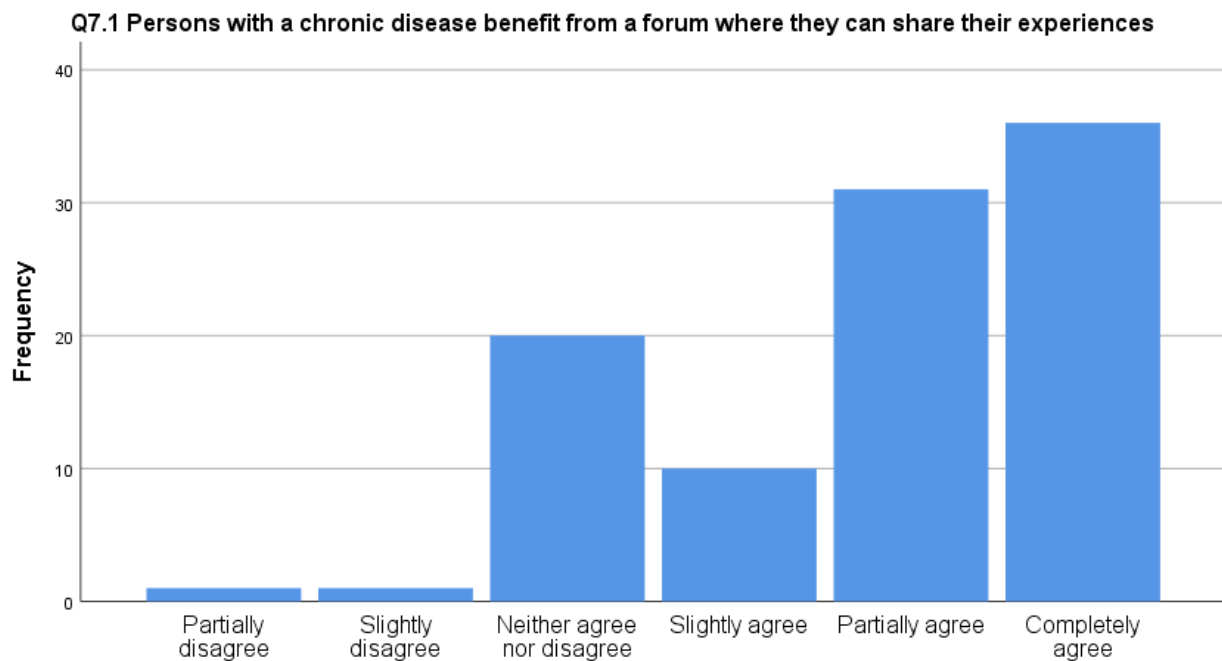
Q7.1 Persons with a chronic disease benefit from a forum where they can share their experiences

Q7.2

Statistics

Q7.2 There are enough offers to persons
with chronic diseases in your municipality

N	Valid	95
	Missing	5
Mean		4,54
Std. Error of Mean		,135
Median		4,00
Mode		4
Std. Deviation		1,319
Variance		1,741
Skewness		,004
Std. Error of Skewness		,247
Kurtosis		-,334
Std. Error of Kurtosis		,490
Range		5
Minimum		2
Maximum		7
Percentiles	25	4,00
	50	4,00
	75	6,00

Q7.2 There are enough offers to persons with chronic diseases in your municipality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Partially disagree	9	9,0	9,5	9,5
	Slightly disagree	3	3,0	3,2	12,6
	Neither agree nor disagree	44	44,0	46,3	58,9
	Slightly agree	13	13,0	13,7	72,6
	Partially agree	19	19,0	20,0	92,6
	Completely agree	7	7,0	7,4	100,0
	Total	95	95,0	100,0	
Missing	System	5	5,0		
Total		100	100,0		

Q7.2 There are enough offers to persons with chronic diseases in your municipality

Q7.2 There are enough offers to persons with chronic diseases in your municipality
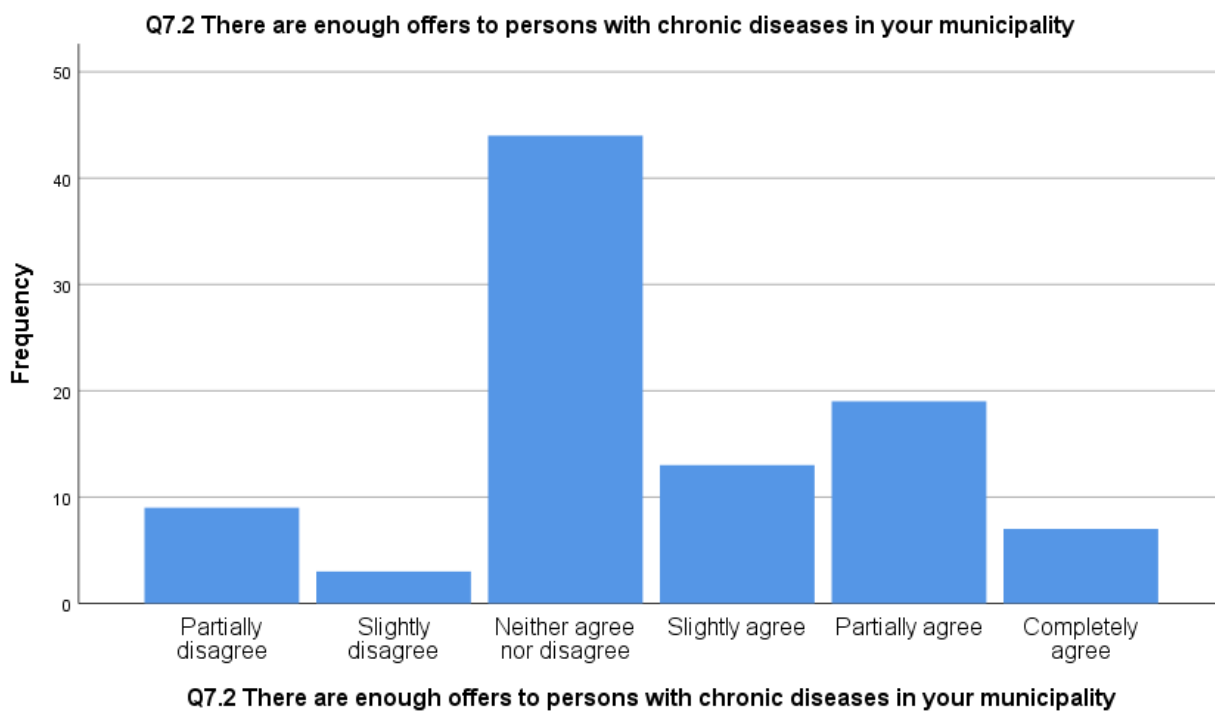
Q7.3

Statistics

Q7.3 The offers that are offered in your municipality make a significant difference to the persons with weight challenges

N	Valid	94
	Missing	6
Mean		4,32
Std. Error of Mean		,133
Median		4,00
Mode		4
Std. Deviation		1,289
Variance		1,660
Skewness		-,035
Std. Error of Skewness		,249
Kurtosis		-,331
Std. Error of Kurtosis		,493
Range		5
Minimum		2
Maximum		7
Percentiles	25	4,00
	50	4,00
	75	5,00

Q7.3 The offers that are offered in your municipality make a significant difference to the persons with weight challenges

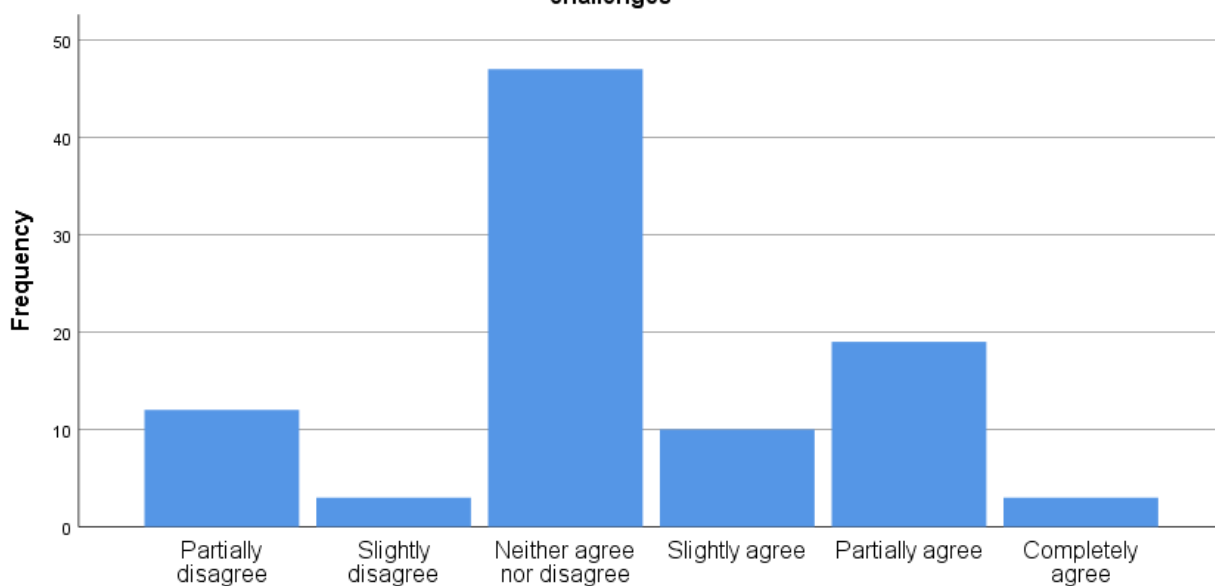|		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Partially disagree	12	12,0	12,8	12,8
	Slightly disagree	3	3,0	3,2	16,0
	Neither agree nor disagree	47	47,0	50,0	66,0
	Slightly agree	10	10,0	10,6	76,6
	Partially agree	19	19,0	20,2	96,8
	Completely agree	3	3,0	3,2	100,0
	Total	94	94,0	100,0	
Missing	System	6	6,0		
Total		100	100,0		

Q7.3 The offers that are offered in your municipality make a significant difference to the persons with weight challenges

Q7.4

Statistics

Q7.4 One's appearance affects one's life

N	Valid	97
	Missing	3
Mean		5,36
Std. Error of Mean		,133
Median		6,00
Mode		6
Std. Deviation		1,309
Variance		1,712
Skewness		-,472
Std. Error of Skewness		,245
Kurtosis		-,469
Std. Error of Kurtosis		,485
Range		5
Minimum		2
Maximum		7
Percentiles	25	4,00
	50	6,00
	75	6,00

Q7.4 One's appearance affects one's life

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Partially disagree	3	3,0	3,1	3,1
	Slightly disagree	2	2,0	2,1	5,2
	Neither agree nor disagree	25	25,0	25,8	30,9
	Slightly agree	16	16,0	16,5	47,4
	Partially agree	29	29,0	29,9	77,3
	Completely agree	22	22,0	22,7	100,0
	Total	97	97,0	100,0	
Missing	System	3	3,0		
Total		100	100,0		

Q7.4 One's appearance affects one's life
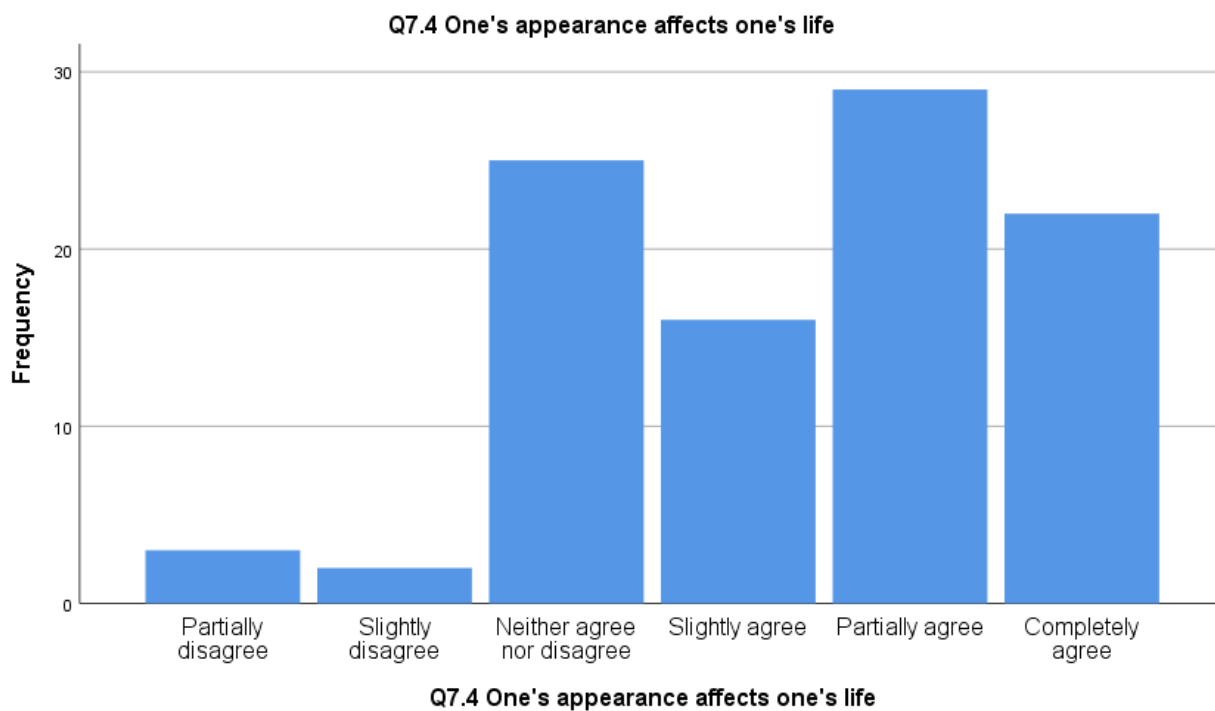
Median of answers in Q7

Statistics

Median of all answers in Q7

N	Valid	100
	Missing	0
Mean		5,17
Std. Error of Mean		,100
Median		5,00
Mode		5
Std. Deviation		,995
Variance		,991
Skewness		,089
Std. Error of Skewness		,241
Kurtosis		-,797
Std. Error of Kurtosis		,478
Range		4
Minimum		3
Maximum		7
Percentiles	25	4,00
	50	5,00
	75	6,00

Median of all answers in Q7

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Slightly disagree	2	2,0	2,0	2,0
	Neither agree nor disagree	27	27,0	27,0	29,0
	Slightly agree	32	32,0	32,0	61,0
	Partially agree	30	30,0	30,0	91,0
	Completely agree	9	9,0	9,0	100,0
	Total	100	100,0	100,0	

Median of all answers in Q7

Median of all answers in Q7

s
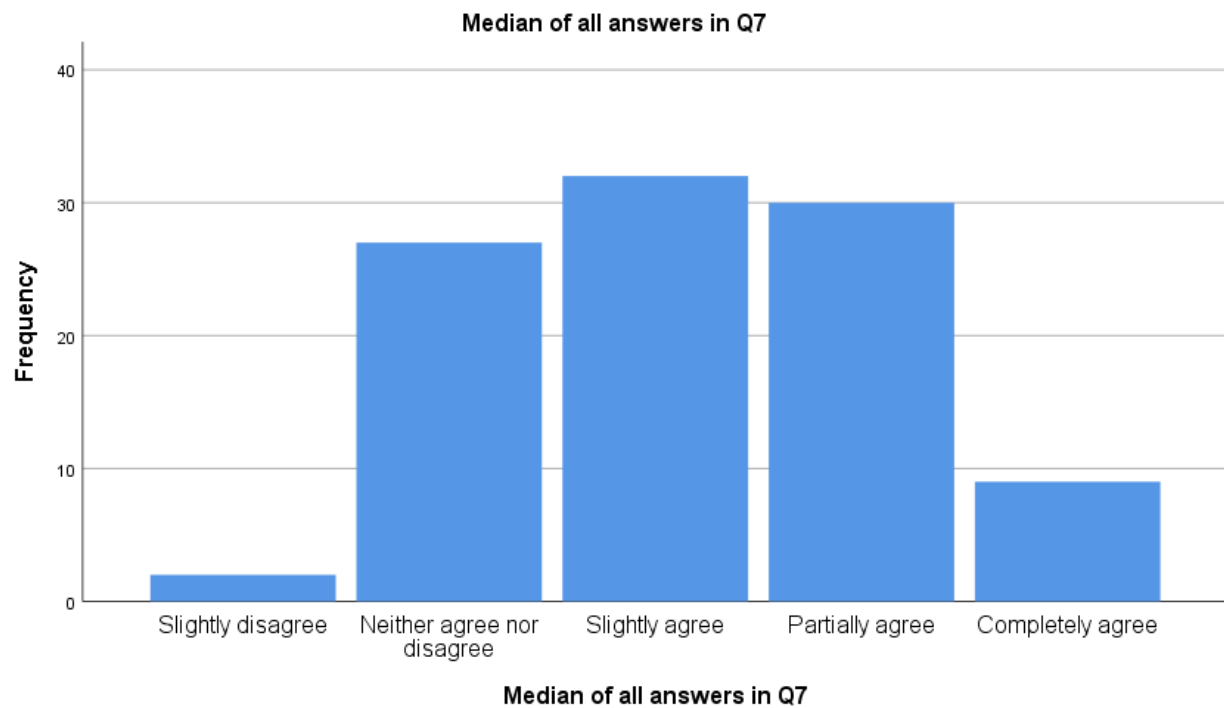
Q8.1

Statistics

Q8.1 Person's with weight challenges need specialised offers from the state to avoid developing obesity

N	Valid	100
	Missing	0
Mean		4,99
Std. Error of Mean		,134
Median		5,00
Mode		6
Std. Deviation		1,345
Variance		1,808
Skewness		-,770
Std. Error of Skewness		,241
Kurtosis		,662
Std. Error of Kurtosis		,478
Range		6
Minimum		1
Maximum		7
Percentiles	25	4,00
	50	5,00
	75	6,00

Q8.1 Person's with weight challenges need specialised offers from the state to avoid developing obesity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Completely disagree	2	2,0	2,0	2,0
	Partially disagree	5	5,0	5,0	7,0
	Slightly disagree	1	1,0	1,0	8,0
	Neither agree nor disagree	27	27,0	27,0	35,0
	Slightly agree	24	24,0	24,0	59,0
	Partially agree	31	31,0	31,0	90,0
	Completely agree	10	10,0	10,0	100,0
	Total	100	100,0	100,0	

Q8.1 Person's with weight challenges need specialised offers from the state to avoid developing obesity
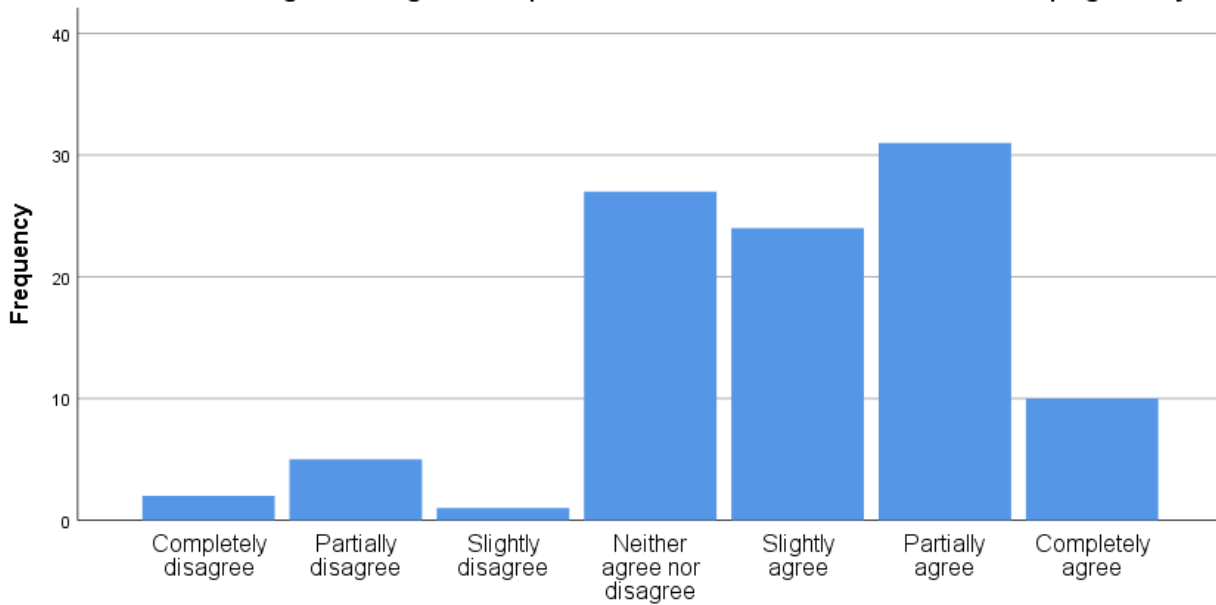
Q8.1 Person's with weight challenges need specialised offers from the state to avoid developing obesity

Q8.2

Statistics

Q8.2 Person's with weight challenges need specialised offers from the healthcare to avoid developing obesity

N	Valid	100
	Missing	0
Mean		5,16
Std. Error of Mean		,133
Median		5,00
Mode		6
Std. Deviation		1,331
Variance		1,772
Skewness		-,850
Std. Error of Skewness		,241
Kurtosis		,678
Std. Error of Kurtosis		,478
Range		6
Minimum		1
Maximum		7
Percentiles	25	4,00
	50	5,00
	75	6,00

Q8.2 Person's with weight challenges need specialised offers from the healthcare to avoid developing obesity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Completely disagree	1	1,0	1,0	1,0
	Partially disagree	6	6,0	6,0	7,0
	Neither agree nor disagree	22	22,0	22,0	29,0
	Slightly agree	24	24,0	24,0	53,0
	Partially agree	34	34,0	34,0	87,0
	Completely agree	13	13,0	13,0	100,0
	Total	100	100,0	100,0	
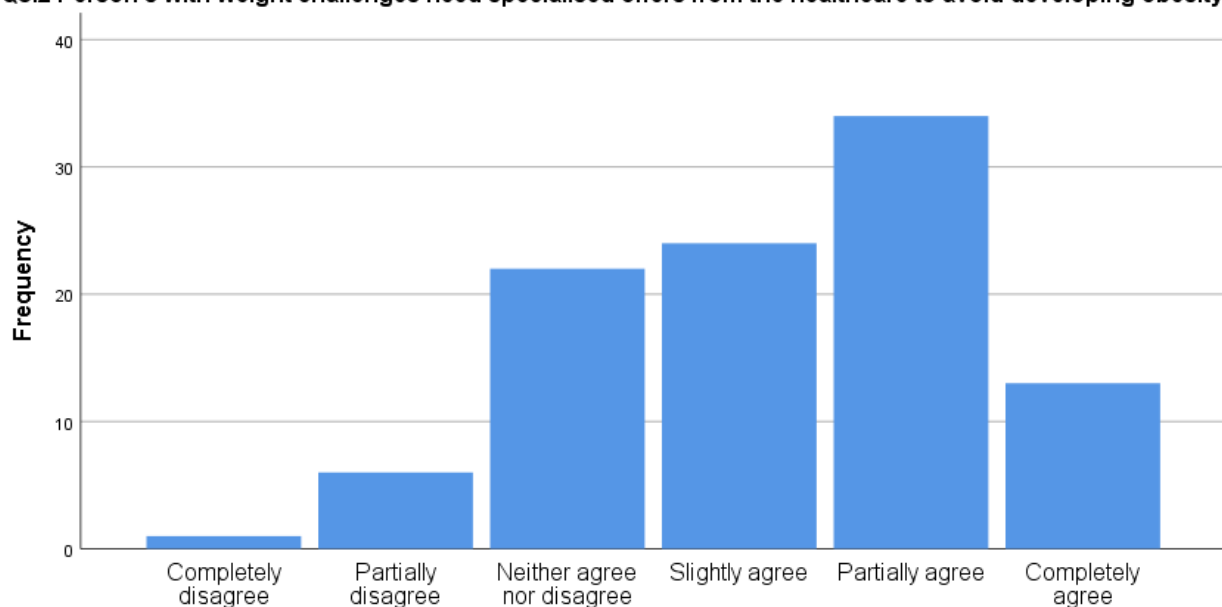
Q8.2 Person's with weight challenges need specialised offers from the healthcare to avoid developing obesity

Q8.3

Statistics

Q8.3 Person's with weight challenges need psychological help

N	Valid	100
	Missing	0
Mean		4,78
Std. Error of Mean		,153
Median		5,00
Mode		4
Std. Deviation		1,535
Variance		2,355
Skewness		-,647
Std. Error of Skewness		,241
Kurtosis		,193
Std. Error of Kurtosis		,478
Range		6
Minimum		1
Maximum		7
Percentiles	25	4,00
	50	5,00
	75	6,00

Q8.3 Person's with weight challenges need psychological help

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Completely disagree	5	5,0	5,0	5,0
	Partially disagree	5	5,0	5,0	10,0
	Slightly disagree	2	2,0	2,0	12,0
	Neither agree nor disagree	32	32,0	32,0	44,0
	Slightly agree	19	19,0	19,0	63,0
	Partially agree	25	25,0	25,0	88,0
	Completely agree	12	12,0	12,0	100,0
	Total	100	100,0	100,0	

Q8.3 Person's with weight challenges need psychological help

Q8.3 Person's with weight challenges need psychological help
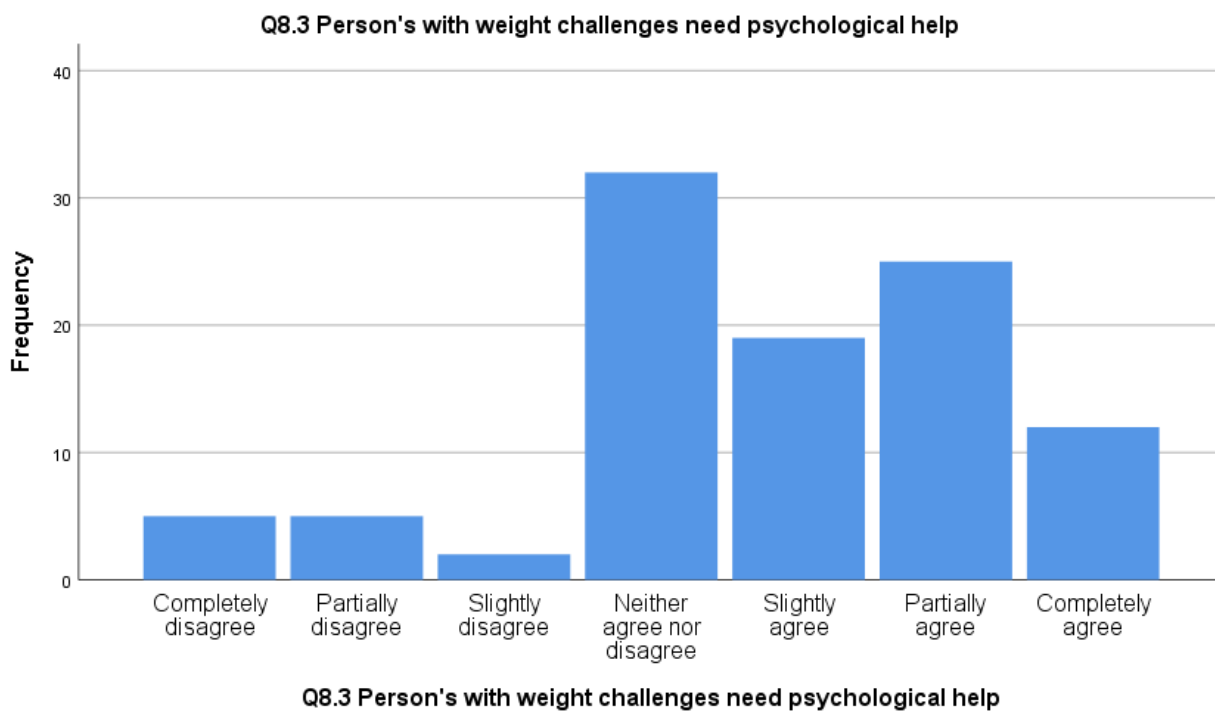
Q8.4

Statistics

Q8.4 Person's with weight challenges need psychiatric help

N	Valid	100
	Missing	0
Mean		3,42
Std. Error of Mean		,167
Median		4,00
Mode		4
Std. Deviation		1,671
Variance		2,792
Skewness		-,096
Std. Error of Skewness		,241
Kurtosis		-,862
Std. Error of Kurtosis		,478
Range		6
Minimum		1
Maximum		7
Percentiles	25	2,00
	50	4,00
	75	4,00

Q8.4 Person's with weight challenges need psychiatric help

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Completely disagree	22	22,0	22,0	22,0
	Partially disagree	11	11,0	11,0	33,0
	Slightly disagree	3	3,0	3,0	36,0
	Neither agree nor disagree	45	45,0	45,0	81,0
	Slightly agree	7	7,0	7,0	88,0
	Partially agree	10	10,0	10,0	98,0
	Completely agree	2	2,0	2,0	100,0
	Total	100	100,0	100,0	
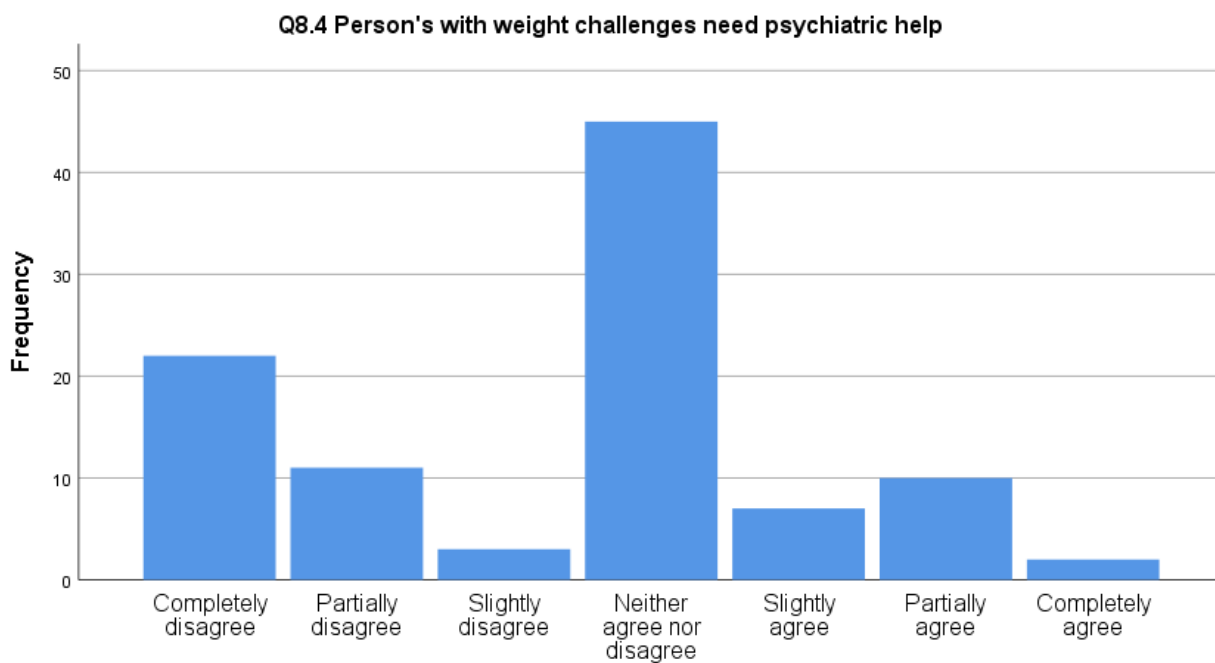
Q8.4 Person's with weight challenges need psychiatric help

Q8.5

Statistics

Q8.5 Obesity is a reason for a range of chronic conditions, such as elevated blood pressure, cancer, diabetes and liver diseases

N	Valid	100
	Missing	0
Mean		6,16
Std. Error of Mean		,123
Median		7,00
Mode		7
Std. Deviation		1,229
Variance		1,509
Skewness		-1,913
Std. Error of Skewness		,241
Kurtosis		4,091
Std. Error of Kurtosis		,478
Range		6
Minimum		1
Maximum		7
Percentiles	25	6,00
	50	7,00
	75	7,00

Q8.5 Obesity is a reason for a range of chronic conditions, such as elevated blood pressure, cancer, diabetes and liver diseases

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Completely disagree	1	1,0	1,0	1,0
	Partially disagree	2	2,0	2,0	3,0
	Neither agree nor disagree	8	8,0	8,0	11,0
	Slightly agree	9	9,0	9,0	20,0
	Partially agree	26	26,0	26,0	46,0
	Completely agree	54	54,0	54,0	100,0
	Total	100	100,0	100,0	

Q8.5 Obesity is a reason for a range of chronic conditions, such as elevated blood pressure, cancer, diabetes and liver diseases
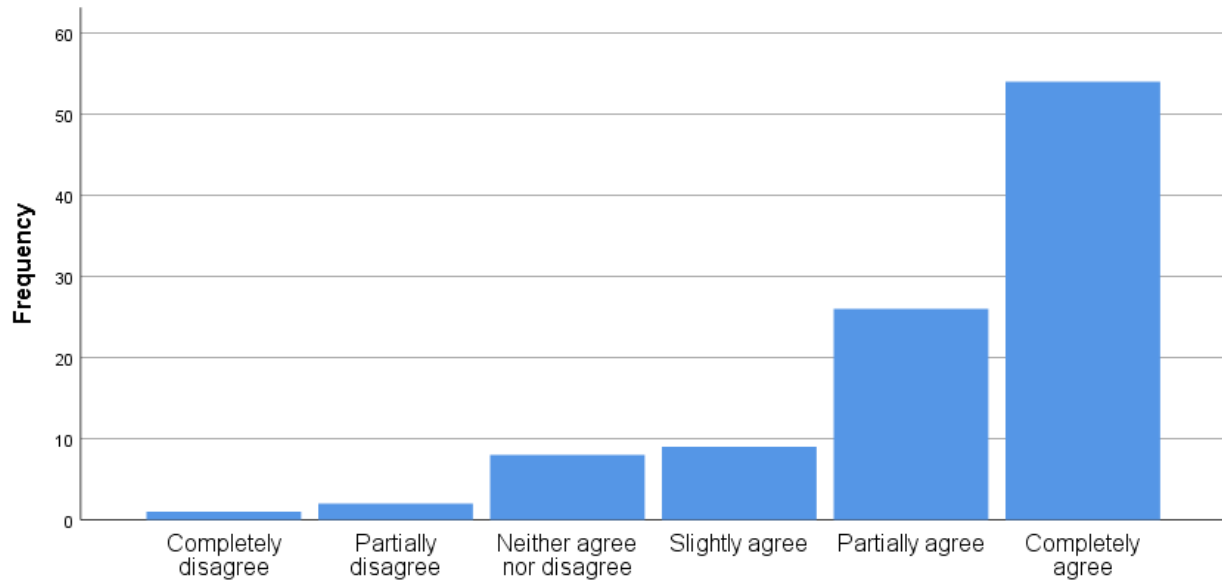

Q8.5 Obesity is a reason for a range of chronic conditions, such as elevated blood pressure, cancer, diabetes and liver diseases

Median of all answers in Q8

Statistics

N	Valid	100
	Missing	0
Mean		4,98
Std. Error of Mean		,132
Median		5,00
Mode		6
Std. Deviation		1,318
Variance		1,737
Skewness		-,881
Std. Error of Skewness		,241
Kurtosis		1,218
Std. Error of Kurtosis		,478
Range		6
Minimum		1
Maximum		7
Percentiles	25	4,00
	50	5,00
	75	6,00

Median of all answers in Q8

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Completely disagree	3	3,0	3,0	3,0
	Partially disagree	3	3,0	3,0	6,0
	Slightly disagree	1	1,0	1,0	7,0
	Neither agree nor disagree	27	27,0	27,0	34,0
	Slightly agree	27	27,0	27,0	61,0
	Partially agree	30	30,0	30,0	91,0
	Completely agree	9	9,0	9,0	100,0
	Total	100	100,0	100,0	

Median of all answers in Q8
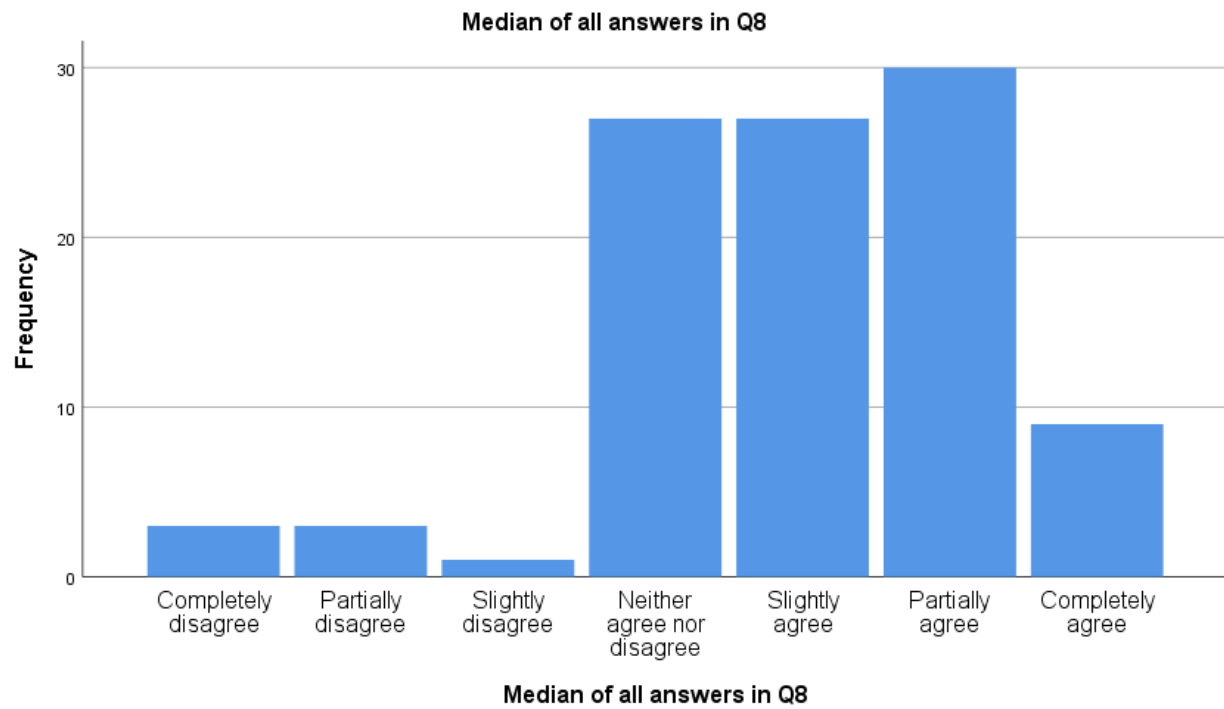
Q9.1

Statistics

Q9.1 Severe overweight/obesity is a chronic disease

N	Valid	100
	Missing	0
Mean		4,15
Std. Error of Mean		,184
Median		4,00
Mode		4ª
Std. Deviation		1,839
Variance		3,381
Skewness		-,385
Std. Error of Skewness		,241
Kurtosis		-,954
Std. Error of Kurtosis		,478
Range		6
Minimum		1
Maximum		7
Percentiles	25	3,00
	50	4,00
	75	6,00

a. Multiple modes exist. The smallest value is shown

Q9.1 Severe overweight/obesity is a chronic disease

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Completely disagree	14	14,0	14,0	14,0
	Partially disagree	9	9,0	9,0	23,0
	Slightly disagree	7	7,0	7,0	30,0
	Neither agree nor disagree	25	25,0	25,0	55,0
	Slightly agree	14	14,0	14,0	69,0
	Partially agree	25	25,0	25,0	94,0
	Completely agree	6	6,0	6,0	100,0
	Total	100	100,0	100,0	

Q9.1 Severe overweight/obesity is a chronic disease

Q9.1 Severe overweight/obesity is a chronic disease
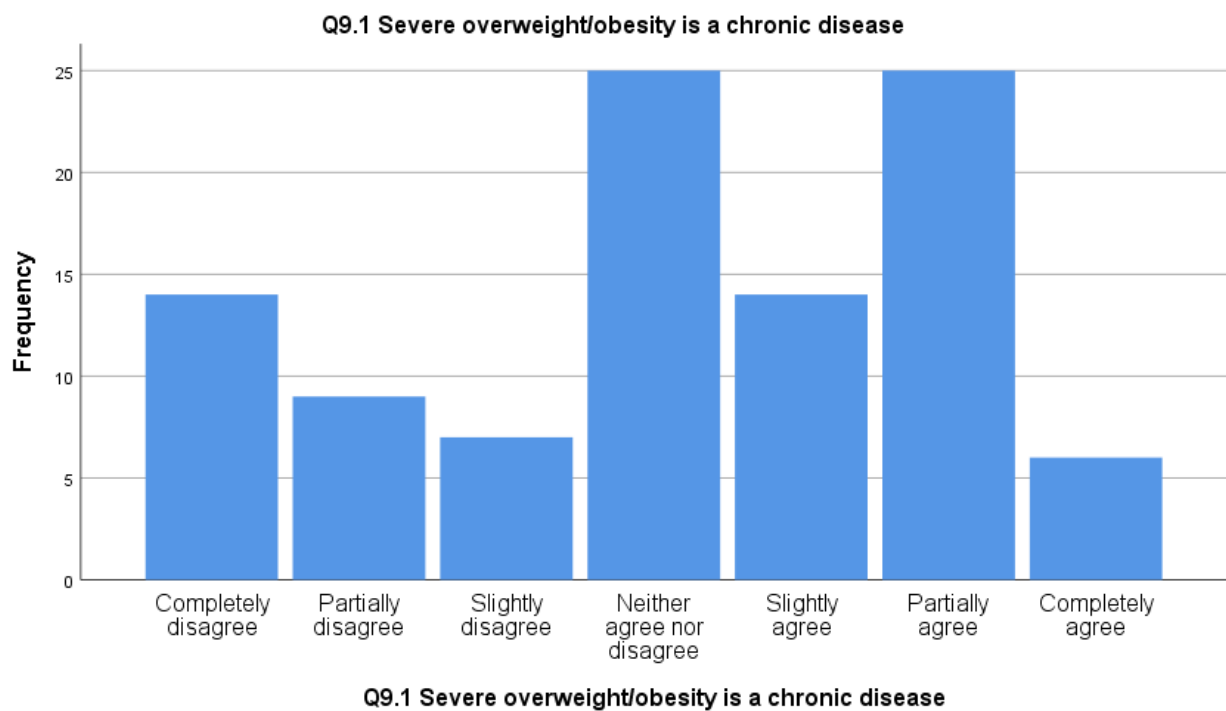
Q9.2

Statistics

Q9.2 Severe overweight is an increasing
challenge for the public sector

N	Valid	100
	Missing	0
Mean		6,11
Std. Error of Mean		,132
Median		7,00
Mode		7
Std. Deviation		1,325
Variance		1,755
Skewness		-1,908
Std. Error of Skewness		,241
Kurtosis		3,816
Std. Error of Kurtosis		,478
Range		6
Minimum		1
Maximum		7
Percentiles	25	6,00
	50	7,00
	75	7,00

Q9.2 Severe overweight is an increasing challenge for the public sector

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Completely disagree	2	2,0	2,0	2,0
	Partially disagree	1	1,0	1,0	3,0
	Slightly disagree	1	1,0	1,0	4,0
	Neither agree nor disagree	10	10,0	10,0	14,0
	Slightly agree	6	6,0	6,0	20,0
	Partially agree	26	26,0	26,0	46,0
	Completely agree	54	54,0	54,0	100,0
	Total	100	100,0	100,0	
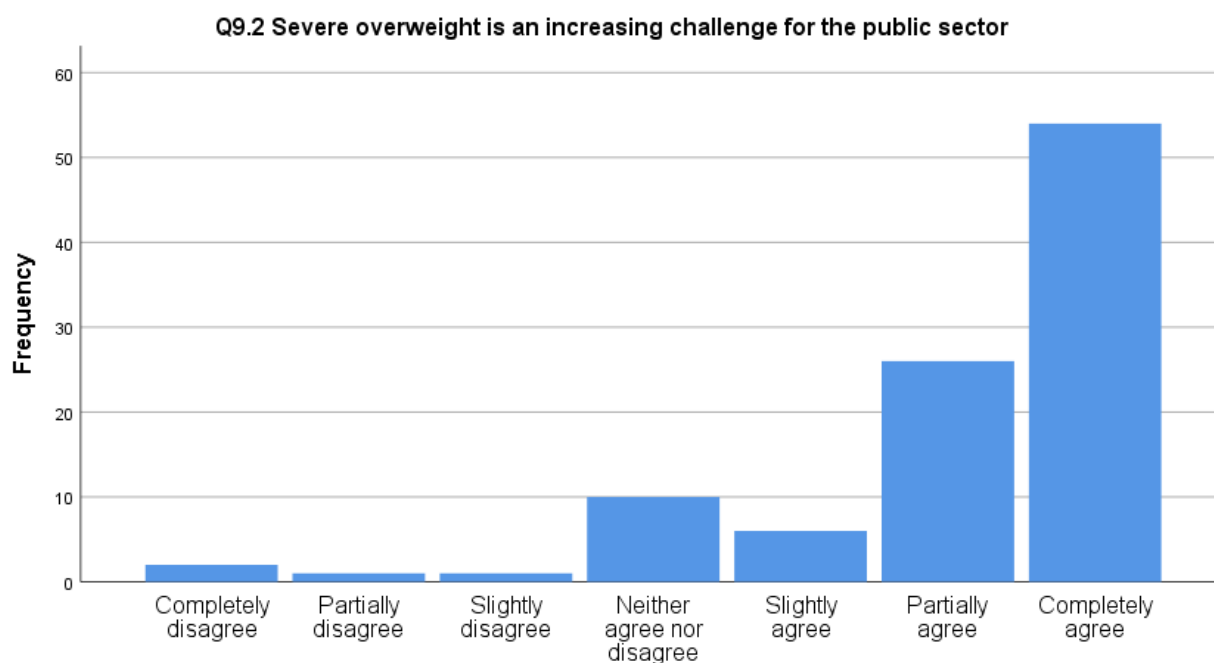
Q9.2 Severe overweight is an increasing challenge for the public sector

Q9.3

Statistics

Q9.3 Person's living with obesity become severely overweight because of their lifestyle

N	Valid	100
	Missing	0
Mean		5,13
Std. Error of Mean		,139
Median		6,00
Mode		6
Std. Deviation		1,390
Variance		1,932
Skewness		-,790
Std. Error of Skewness		,241
Kurtosis		,127
Std. Error of Kurtosis		,478
Range		6
Minimum		1
Maximum		7
Percentiles	25	4,00
	50	6,00
	75	6,00

Q9.3 Person's living with obesity become severely overweight because of their lifestyle

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Completely disagree	1	1,0	1,0	1,0
	Partially disagree	6	6,0	6,0	7,0
	Slightly disagree	2	2,0	2,0	9,0
	Neither agree nor disagree	26	26,0	26,0	35,0
	Slightly agree	12	12,0	12,0	47,0
	Partially agree	41	41,0	41,0	88,0
	Completely agree	12	12,0	12,0	100,0
	Total	100	100,0	100,0	

Q9.3 Person's living with obesity become severely overweight because of their lifestyle
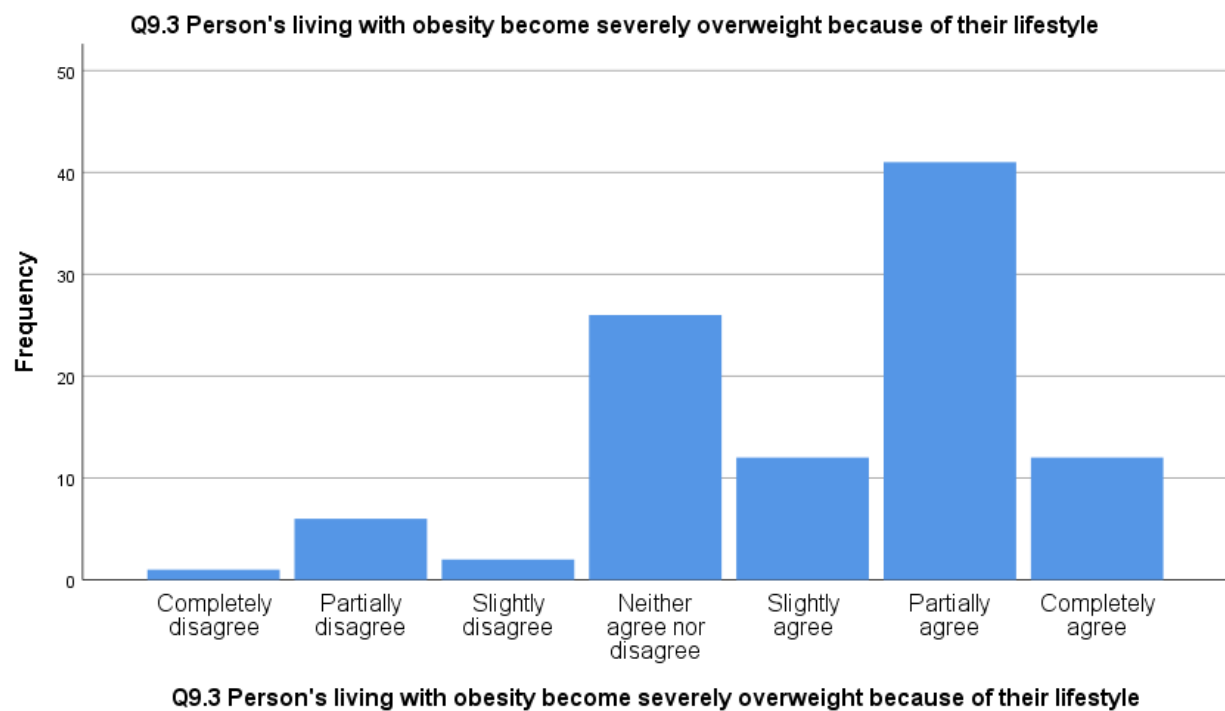
Median of all answers in Q9

Statistics

Median of all answers in Q9

N	Valid	100
	Missing	0
Mean		5,34
Std. Error of Mean		,122
Median		6,00
Mode		6
Std. Deviation		1,224
Variance		1,499
Skewness		-,715
Std. Error of Skewness		,241
Kurtosis		,463
Std. Error of Kurtosis		,478
Range		6
Minimum		1
Maximum		7
Percentiles	25	4,00
	50	6,00
	75	6,00

Median of all answers in Q9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Completely disagree	1	1,0	1,0	1,0
	Partially disagree	1	1,0	1,0	2,0
	Slightly disagree	2	2,0	2,0	4,0
	Neither agree nor disagree	26	26,0	26,0	30,0
	Slightly agree	14	14,0	14,0	44,0
	Partially agree	41	41,0	41,0	85,0
	Completely agree	15	15,0	15,0	100,0
	Total	100	100,0	100,0	
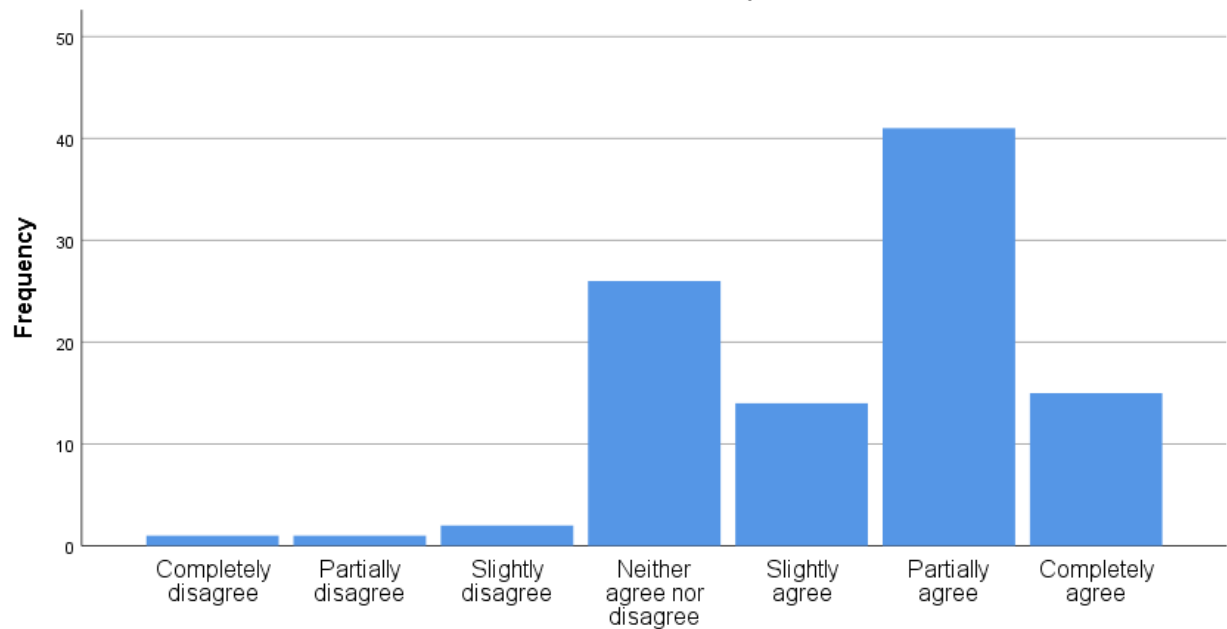
Median of all answers in Q9

Appendix 12. Correlation testing (Pearson's R)

Inter-question correlations

Descriptive Statistics

	Mean	Std. Deviation	N
Q6.1 Chronic disease affects one's quality of life	5,61	1,530	100
Q6.2 Persons with chronic diseases experience reservations toward their abilities to complete an education or take a job	4,54	1,604	100
Q6.3 Chronic disease affects one's ability to obtain and/or retain a job	4,61	1,537	100
Q6.4 Persons with chronic diseases experience challenges while socialising	4,38	1,398	100
Q6.5 Persons with a chronic disease need specialised offers from the municipality	4,69	1,475	100
Q6.6 Persons with a chronic disease need specialised offers from healthcare sector	5,14	1,429	100

Correlations

		Q6.1 Chronic disease affects one's quality of life	Q6.2 Persons with chronic diseases experience reservations toward their abilities to complete an education or take a job	Q6.3 Chronic disease affects one's ability to obtain and/or retain a job	Q6.4 Persons with chronic diseases experience challenges while socialising	Q6.5 Persons with a chronic disease need specialised offers from the municipality	Q6.6 Persons with a chronic disease need specialised offers from healthcare sector
Q6.1 Chronic	Pearson Correlation	1	,523**		,162	,363**	,250*	,326**

disease affects one's quality of life	Sig. (2-tailed)		,000	,107	,000	,012	,001
	N	100	100	100	100	100	100
Q6.2 Persons with chronic diseases experience reservations toward their abilities to complete an education or take a job	Pearson Correlation	,523**	1	,680**	,642**	,306**	,297**
	Sig. (2-tailed)	,000		,000	,000	,002	,003
	N	100	100	100	100	100	100
Q6.3 Chronic disease affects one's ability to obtain and/or retain a job	Pearson Correlation	,162	,680**	1	,620**	,325**	,301**
	Sig. (2-tailed)	,107	,000		,000	,001	,002
	N	100	100	100	100	100	100
Q6.4 Persons with chronic diseases experience challenges while socialising	Pearson Correlation	,363**	,642**	,620**	1	,547**	,514**
	Sig. (2-tailed)	,000	,000	,000		,000	,000
	N	100	100	100	100	100	100

Q6.5 Persons with a chronic disease need specialised offers from the municipality	Pearson Correlation	,250*	,306**		,325**	,547**	1	,711**
	Sig. (2-tailed)	,012	,002		,001	,000		,000
	N	100	100		100	100	100	100
Q6.6 Persons with a chronic disease need specialised offers from healthcare sector	Pearson Correlation	,326**	,297**		,301**	,514**	,711**	1
	Sig. (2-tailed)	,001	,003		,002	,000	,000	
	N	100	100		100	100	100	100

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Descriptive Statistics

	Mean	Std. Deviation	N
Q7.1 Persons with a chronic disease benefit from a forum where they can share their experiences	5,79	1,223	99
Q7.2 There are enough offers to persons with chronic diseases in your municipality	4,54	1,319	95
Q7.3 The offers that are offered in your municipality make a significant difference to the persons with weight challenges	4,32	1,289	94

Q7.4 One's appearance affects one's life	5,36	1,309	97

Correlations

		Q7.1 Persons with a chronic disease benefit from a forum where they can share their experiences	Q7.2 There are enough offers to persons with chronic diseases in your municipality	Q7.3 The offers that are offered in your municipality make a significant difference to the persons with weight challenges	Q7.4 One's appearance affects one's life
Q7.1 Persons with a chronic disease benefit from a forum where they can share their experiences	Pearson Correlation	1	,123	,030	,149
	Sig. (2-tailed)		,239	,772	,146
	N	99	94	94	96
Q7.2 There are enough offers to persons with chronic diseases in your municipality	Pearson Correlation	,123	1	,368**	-,016
	Sig. (2-tailed)	,239		,000	,881
	N	94	95	91	93
Q7.3 The offers that are offered in your municipality make a significant difference to the persons with weight challenges	Pearson Correlation	,030	,368**	1	,008
	Sig. (2-tailed)	,772	,000		,940
	N	94	91	94	92
Q7.4 One's appearance affects one's life	Pearson Correlation	,149	-,016	,008	1
	Sig. (2-tailed)	,146	,881	,940	
	N	96	93	92	97

**. Correlation is significant at the 0.01 level (2-tailed).

Descriptive Statistics

	Mean	Std. Deviation	N
Q8.1 Person's with weight challenges need specialised offers from the state to avoid developing obesity	4,99	1,345	100

Q8.2 Person's with weight challenges need specialised offers from the healthcare to avoid developing obesity	5,16	1,331	100
Q8.3 Person's with weight challenges need psychological help	4,78	1,535	100
Q8.4 Person's with weight challenges need psychiatric help	3,42	1,671	100
Q8.5 Obesity is a reason for a range of chronic conditions, such as elevated blood pressure, cancer, diabetes and liver diseases	6,16	1,229	100

Correlations

		Q8.1 Person's with weight challenges need specialised offers from the state to avoid developing obesity	Q8.2 Person's with weight challenges need specialised offers from the healthcare to avoid developing obesity	Q8.3 Person's with weight challenges need psychological help	Q8.4 Person's with weight challenges need psychiatric help	Q8.5 Obesity is a reason for a range of chronic conditions, such as elevated blood pressure, cancer, diabetes and liver diseases
Q8.1 Person's with weight challenges need specialised offers from the state to avoid developing obesity	Pearson Correlation	1	,661**	,474**	,317**	,294**
	Sig. (2-tailed)		,000	,000	,001	,003
	N	100	100	100	100	100
Q8.2 Person's with weight challenges	Pearson Correlation	,661**	1	,388**	,274**	,349**
	Sig. (2-tailed)	,000		,000	,006	,000

need specialised offers from the healthcare to avoid developing obesity	N	100	100	100	100	100
Q8.3 Person's with weight challenges need psychological help	Pearson Correlation	,474**	,388**	1	,493**	,249*
	Sig. (2-tailed)	,000	,000		,000	,012
	N	100	100	100	100	100
Q8.4 Person's with weight challenges need psychiatric help	Pearson Correlation	,317**	,274**	,493**	1	,090
	Sig. (2-tailed)	,001	,006	,000		,373
	N	100	100	100	100	100
Q8.5 Obesity is a reason for a range of chronic conditions, such as elevated blood pressure, cancer, diabetes and liver diseases	Pearson Correlation	,294**	,349**	,249*	,090	1
	Sig. (2-tailed)	,003	,000	,012	,373	
	N	100	100	100	100	100

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Descriptive Statistics

	Mean	Std. Deviation	N
Q9.1 Severe overweight/obesity is a chronic disease	4,15	1,839	100
Q9.2 Severe overweight is an increasing challenge for the public sector	6,11	1,325	100

Q9.3 Person's living with obesity become severely overweight because of their lifestyle	5,13	1,390	100	

Correlations

		Q9.1 Severe overweight/obesity is a chronic disease	Q9.2 Severe overweight is an increasing challenge for the public sector	Q9.3 Person's living with obesity become severely overweight because of their lifestyle
Q9.1 Severe overweight/obesity is a chronic disease	Pearson Correlation	1	,312**	,004
	Sig. (2-tailed)		,002	,967
	N	100	100	100
Q9.2 Severe overweight is an increasing challenge for the public sector	Pearson Correlation	,312**	1	,283**
	Sig. (2-tailed)	,002		,004
	N	100	100	100
Q9.3 Person's living with obesity become severely overweight because of their lifestyle	Pearson Correlation	,004	,283**	1
	Sig. (2-tailed)	,967	,004	
	N	100	100	100

**. Correlation is significant at the 0.01 level (2-tailed).

Question Medians Correlations

Descriptive Statistics

	Mean	Std. Deviation	N
Median of all answers in Q6	4,72	1,356	100
Median of all answers in Q7	4,99	,917	100
Median of all answers in Q8	4,98	1,318	100
Median of all answers in Q9	5,34	1,224	100

Correlations

	Median of all answers in Q6	Median of all answers in Q7	Median of all answers in Q8	Median of all answers in Q9

Median of all answers in Q6	Pearson Correlation	1	,110	,178	,210*
	Sig. (2-tailed)		,275	,077	,036
	N	100	100	100	100
Median of all answers in Q7	Pearson Correlation	,110	1	,246*	,203*
	Sig. (2-tailed)	,275		,013	,043
	N	100	100	100	100
Median of all answers in Q8	Pearson Correlation	,178	,246*	1	,492**
	Sig. (2-tailed)	,077	,013		,000
	N	100	100	100	100
Median of all answers in Q9	Pearson Correlation	,210*	,203*	,492**	1
	Sig. (2-tailed)	,036	,043	,000	
	N	100	100	100	100

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Questions and Age Correlations

Descriptive Statistics

	Mean	Std. Deviation	N
Age	47,95	11,855	100
Median of all answers in Q6	4,72	1,356	100
Median of all answers in Q7	4,99	,917	100
Median of all answers in Q8	4,98	1,318	100
Median of all answers in Q9	5,34	1,224	100

Correlations

		Age	Median of all answers in Q6	Median of all answers in Q7	Median of all answers in Q8	Median of all answers in Q9
Age	Pearson Correlation	1	,005	-,195	,081	,164
	Sig. (2-tailed)		,957	,052	,424	,103
	N	100	100	100	100	100
Median of all answers in Q6	Pearson Correlation	,005	1	,110	,178	,210*
	Sig. (2-tailed)	,957		,275	,077	,036
	N	100	100	100	100	100
Median of all	Pearson Correlation	-,195	,110	1	,246*	,203*
	Sig. (2-tailed)	,052	,275		,013	,043

answers in Q7	N	100	100	100	100	100
Median of all	Pearson Correlation	,081	,178	,246*	1	,492**
	Sig. (2-tailed)	,424	,077	,013		,000
answers in Q8	N	100	100	100	100	100
Median of all	Pearson Correlation	,164	,210*	,203*	,492**	1
	Sig. (2-tailed)	,103	,036	,043	,000	
answers in Q9	N	100	100	100	100	100

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).