The proportion of spending on prevention in the GP care within the Netherlands

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In partial fulfillment of the requirements for the degree of
Master of Science (MSc)
in Operations Management and Logistics for Healthcare

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Series Master Thesis Operations Management and Logistics (For Healthcare)

Subjects headings:
Prevention, Costs, Spending, Dutch Healthcare, Curative care, GP care, Primary care, Health Insurance Act, Health Insurer, Netherlands, Privacy legislation, Personal data
Abstract

The subject of this study is the proportion of prevention in Dutch curative care, which is limited to the GP care. The literature describes some aspects that are classified as prevention within GP care. However, there is never an estimation of the prevention part given despite the increasing regularity demanded by the House of Representatives from the health insurers. Though health insurers consider to do a lot of prevention, but these forms of prevention are not obvious. In this study, an estimation is made with a bandwidth. This is done on the basis of declarations of performance code lists. Using an own written piece of software, the ambiguously prevention part is filtered. The performances where a portion is devoted on prevention, have been investigated by means of a Delphi study. By combining these two methods, the prevention percentage is obtained. An estimated amount around €350 million is spent on prevention, which is 13% of the total expenditure in the GP care. In the extreme case the amount is between €124 and €740 million, which is a percentage between 4,5% and 25,2%. Over the last couple of years there is no remarkable difference observed in the proportion of prevention.

It is expected that this report as a tool will serve the perception of prevention in the GP care and will be used for further research into prevention in the curative care.

‘It is a wise man’s part, rather to avoid sickness, than to wish for medicines’

Sir Thomas More

(Utopia, Book 11, Chapter 6)
Preface and Acknowledgements

This master thesis is the result of my graduation project executed in partial fulfillment of the requirements for the degree of Master of Science in Operations Management & Logistics for Healthcare and is conducted at ‘Zorgverzekeraars Nederland’.

My desire to graduate with a health insurer was different than I imagined, but in a positive sense. After having contact with health insurers I got the reference to check with ZN, an unknown party for me until that moment. After reading the aims and motto of the association, I had profound interest immediately.

I was glad, that after a good conversation, the contact continued and we could work towards a problem definition. After some struggles by Christmas, the die was cast to make me an intern. I could not wish for a better start of the new year.

From the beginning, I felt very welcome on the communications department where I settled. But actually, it was the entire company where I felt the positive approach. It was beyond my thesis also very instructive to be able to go to board meetings and other appointments like the AIM conference about prevention.

Thanks for the fun and very instructive months. Starting with the literature study about what is meant by prevention that resulted in a 9 as mark and ending with this report. My special thanks goes to René who guided me from beginning to end and was always available to briefly evaluate the day or week. Thanks also to Pieter, my first mentor from the university. He has always been critical at my work and has thereby brought the report to a higher standard. Nevertheless, he gave me the chance to go further with the thesis. Also my second supervisor helped me by giving advice and by checking the report very thoroughly.

Thanks also to all those interviewed. They have the validity of this report brought high and have been an important part.

Finally, I would like to thank my girlfriend. She was there for me in good times, but more important also in difficult times. She gave me the strength and motivation always to go on. Also, she was always available to go into discussion on the study and gave a neutral view on the report. Nina, thanks for the input that you have contributed to the result.

Now at the end of my time as a student, my Master Thesis is in front of me and I can tell you with great pleasure that I finished my master Operations Management and Logistics for Healthcare.

Thanks again.

Perry Maas

Eindhoven, August 2016
Management Summary

Findings
Each year from 2013 to 2015, of the in total €2,7 billion spent in the GP care in the Netherlands, an estimated amount around €350 million is spent on prevention, which is 13% of the total expenditure in the GP care. In the extreme case the amount is between €124 and €740 million, which is a percentage between 4,5% and 25,2%. Over the last couple of years there is no remarkable difference observed in the proportion of prevention.

Introduction
This research was done by The Dutch branch organization of Health Insurers. There is a lack of knowledge about how much money and time is spent on prevention in the curative care. Nevertheless, it is important to know the proportion of spending, because the House of Representatives is tightening and hammering on prevention repeatedly. Thereby they want greater involvement of health insurers to provide prevention in the form of reimbursements. However, health insurers consider to do a lot of prevention, but these forms of prevention are not obvious. The goal of this thesis is to get this underlying prevention on the table. Thereby the goal is to make a computer model so that with a different insight about prevention, a new result can quickly be generated. Because prevention is difficult to ascertain, it was decided to deepen the study into the GP care. The reason chosen for this part is further explained in the remainder of the report.

Above leads to the following research question:

Can a proportion be given of the spending on prevention in the GP care within the Netherlands?

Method
Two steps of research have been done to determine the percentage spent on prevention in the GP care. First, an investigation on the performance codes was done. Data analysis was used to determine the performance codes that needed further investigation. On these results, a Delphi Study was conducted. In this study, experts are involved to reach a consensus on how to reduce the range of what is spent on prevention. Because prevention is an elastic concept, a tool is created that can be customized to your liking. The tool can help to calculate a percentage based on each individual opinion of what is seen as prevention.

Recommendations
A percentage has been established by combining data analysis and expert opinion in the form of a Delphi Study. However, to get more out of the results, an in-depth research into the control of values has to be executed. The computer model is designed so that it is possible to adapt the figures. The recommendation is to further analyze other elements of curative care in order to get a complete picture of curative care and to show that there are more preventive measures than the general opinion suggests beside the GP care.
Dutch Management Summary

Bevindingen
In de jaren 2013 tot en met 2015 wordt er jaarlijks van de in totaal €2,7 miljard naar schatting €350 miljoen aan preventie besteed. Dit is op de totale uitgaven in de huisartsenzorg een percentage van ongeveer 13%. In het uiterste geval zal het aandeel tussen de €124 en €740 miljoen liggen, dit is tussen de 4,5% en 25,2%. De laatste jaren is er geen opmerkelijk verschil waargenomen in het aandeel preventie.

Introductie
Dit onderzoek is gedaan bij Zorgverzekeraars Nederland in Zeist. Er is grote onwetendheid over hoeveel geld en tijd er naar preventie gaat in de curatieve zorg. Dit is van belang om te weten omdat de Tweede Kamer met een steeds grotere regelmaat dit onderwerp aanhaalt en hamert op meer betrokkenheid van zorgverzekeraars bij het bieden van preventie in de vorm van vergoedingen. Echter zijn de zorgverzekeraars van mening al veel aan preventie te doen, maar dat deze vormen onderliggend zijn. Om deze onderliggende preventie boven tafel te krijgen, is dit onderzoek ingesteld. Omdat preventie moeilijk te achterhalen is, is er gekozen om een deel nauwkeurig te onderzoeken. De reden dat voor de huisartsenzorg gekozen is, is in de rest van het rapport verder toegelicht.

Voorgaande leidt tot de volgende onderzoeksvraag:

Kan het aandeel worden gegeven van de bestedingen aan preventie in de Huisartsenzorg binnen Nederland?

Methode
Er is in twee stappen onderzoek gedaan om het percentage besteed aan preventie in de huisartsenzorg te achterhalen. Begonnen is met data-analyse om de nader te onderzoeken prestatiecodes te achterhalen. Hierna is er door middel van een Delphi Study, waarin experts betrokken worden om tot een consensus te komen, de reikwijdte verklein. Omdat preventie een rekbaar begrip is, is er ook een tool gemaakt die naar eigen wens aangepast kan worden. Hiermee kan er naar eigen inzicht het percentage besteed aan preventie berekend worden.

Aanbevelingen
Er is nu een percentage vastgesteld middels een combinatie van data-analyse en expert opinion in de vorm van een Delphi Study. Echter om meer uit het resultaat te halen, zal er verdiepend onderzoek gedaan moeten worden naar de zeggenschap van de waardes. Het computermodel is dusdanig gemaakt dat aanpassing mogelijk is. Oftewel met aanpassen van de parameters zal alles opnieuw doorgerekend worden. Aanbeveling is om ook andere delen van de curatieve zorg uitgebreider onder de loep te nemen. Zo kan het totaalplaatje van de curatieve zorg betrouwbaarder worden gemaakt en kan aangetoond worden dat naast de huisartsenzorg er meer preventieve handelingen plaatsvinden dan de algemene opinie doet vermoeden.
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1 Introduction
This chapter starts with describing the relevance and continues with the state of the art. Also, the meaning of prevention will be discussed with regard to GP care to continue with the reasons why GP care is chosen. After the reason for the GP care is motivated, there is assessed which party is needed to collect the required data. Thereafter, sub questions arising from the research question will be discussed. To go on with an abstract methodology and a scope and ending with a sum up what this means for the structure of the report in a report outline.

1.1 Relevance
This research is conducted at Health Insurers Netherlands Zeist. This is the branch association of the nine Dutch health insurers. There is a great lack of knowledge about how much money and time is spent to prevention in the curative care. Apparent from the policy document "being healthy, staying healthy", it is clear that the government gives priority at preventing, delaying and avoiding deterioration of diseases by measures in the field of lifestyle, diet and exercise. The Ministry of Health has indicated that prevention should become a more natural part of the mainstream care. The threshold for people to go to the first line care, including the GP, is low and therefore GPs can play an important role in the early identification of people with a risk. However, the insurers believe that they are already active on the field of prevention, but just that the concept of prevention makes the difference in thought. Also the insurers claim that there is a lot of prevention which is not recognized as prevention at first sight. The goal of this investigation is to get this not clearly visible prevention on the table. Thereby, a computer model was made so that, with every different view on prevention, a new result can be quickly generated. Because prevention is difficult to ascertain, it was decided to further investigate the GP care. The reason chosen for this part, is further explained in the remainder of the report.

1.2 State of the art
In the literature, the responsibilities within the four core acts of health care that form the foundation of the Dutch healthcare system are described. The Health Insurance Act is one of them, shown in Figure 1.1.

Figure 1.1: The four core acts with their responsibilities (De Vries & Kossen, 2016)
These four acts each focus on a different area of healthcare. The Health Insurance Act (ZvW) focuses on curative care, the Long-Term Care Act (WLZ) governs the most high-level and insensitive care, while the Social Support Act (WMO) concerns support for people with disabilities. The Youth Act regulates youth services (De Vries & Kossen, 2016).

The focus of this report is on the upper block (green part) of Figure 1.1. This represents the curative care and is important because it represents the Health Insurance Act (ZvW). The responsibility for this law is assigned to the health insurers. The combination of responsibility with the public opinion that they do little with prevention within their framework (Meijerink, et al., 2011), makes it important to investigate if this is really the case.

Now that the laws are clear, it is important to know which parties are responsible for these acts. It is what the preventive measures are attached here for this investigation. This is displayed in Figure 1.2.

---

*Figure 1.2: Schematic representation of groups and preventive measures, laws and responsible clients in Netherlands (Heijink & Struijs, 2016)*
The ZVW is directly responsible for individuals with a higher health risk (green circled) and for individuals with health issues (red circled). The responsible principals are the Health Insurers and Care Administration Office (Zorgkantoor).

The next step is to see if something is written about prevention in the GP care. The most subsequent study is called "Prevention is more effective" (NIVEL, 2012). Here can be read what forms of prevention are written about. This is used as a part to put together the ontology. The ontology is further explained in the remainder of this report.

In the literature, it is not defined what is spent on prevention. Prevention is a difficult topic which does not have one clear definition. To define what is spent on prevention, a definition of prevention has to be formulated first so that the boundaries of this study are clearly defined.

Another thing that is missing is a clear overview of what is meant by prevention. Therefore, a pre study is done on this topic. A summary of the findings in the pre study is given below.

The kind of definitions of prevention that were mentioned in the existing literature were investigated. To get a clear overview of all the definitions, a timeline was made to show when and where what definitions were used.

In the timeline, that is shown in Figure 1.3, can be seen when some leading concepts have emerged. Such a timeline illustrates how the definition has developed and what concepts emerged when.

---

Figure 1.3: Timeline of changes in the concept of prevention (Maas, 2016)
It has been found in the literature that there are several ways to divide prevention. This results in the enumeration of ways to organize as can be seen in Table 1.1 (Maas, 2016).

**Table 1.1: Ways to organize prevention**

<table>
<thead>
<tr>
<th>Organization of prevention</th>
<th>Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disease category</td>
<td>Prevention of heart disease, AIDS prevention etc.</td>
</tr>
<tr>
<td>Risk Factor</td>
<td>Smoking prevention, safety promotion, nutrition, etc.</td>
</tr>
<tr>
<td>Type</td>
<td>Health protection, health promotion, disease prevention</td>
</tr>
<tr>
<td>Method</td>
<td>Vaccinations, screening, health education etc.</td>
</tr>
<tr>
<td>Target Group</td>
<td>Pregnant women, infants, schoolchildren, travelers etc.</td>
</tr>
<tr>
<td>Scale</td>
<td>Collective prevention, individual prevention</td>
</tr>
<tr>
<td>Stage</td>
<td>Primary, secondary, tertiary</td>
</tr>
</tbody>
</table>

The most common ways are primary, secondary and tertiary and universal, selective and indicated. A combination of these common ways are shown in the diagram (Figure 1.4). Care focused prevention is also processed, because in the second mentioned classification tertiary prevention is not counted without this segment.

![Figure 1.4: Scheme of category combinations (Maas, 2016)](image)

Because this literature study is about prevention in general, all categories where included. In the next paragraph the focus is laid on the GP care, which results in leaving out several categories of prevention.
1.3 What is meant by prevention in GP care?

As mentioned, the GP care are only using a part of the prevention categories. For the GP there is no declaration code for a non-selective group of people. The part that refers to the GP care is given in Table 1.2.

Table 1.2: GP part of prevention

<table>
<thead>
<tr>
<th>Concept Combination</th>
<th>Example</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secondary + Selective</td>
<td>Evoke patient population</td>
<td>Selective group to detect early disease on people with a higher risk.</td>
</tr>
<tr>
<td>Secondary + Indicated</td>
<td>Older people with increased risk of falling</td>
<td>Individuals with a reason for concern. High risk but no diagnoses. It is possible that they already receive care.</td>
</tr>
<tr>
<td></td>
<td>People at high risk of getting depression</td>
<td></td>
</tr>
<tr>
<td>Tertiary + Care focused</td>
<td>Control of blood pressure, cholesterol</td>
<td>Individuals with diagnoses and care needed (already patients).</td>
</tr>
<tr>
<td></td>
<td>Diabetes control on sugar level</td>
<td></td>
</tr>
</tbody>
</table>

In the first column of Table 1.2, the concept combination is given. The scales are derived from Figure 1.4. The second column shows an example of the concepts and the last column shows an explanation of which persons are within a concept group. When this table was conducted, the boundaries were consequently made clear. This is also the framework given to the experts in the Delphi Study.
1.4 Why the focus on the GP care?

The reason that the focus is laid on GP care is a combination of different factors. The first reason is that the threshold for people to go to the first line care, including the GP, is low and therefore GPs can play an important role in the early identification of people with a risk (Wildt, Leusink, & Pop, 2007). Secondly, Table 1.3 shows the importance of GP care above the other curative care elements.

Table 1.3 is designed to weigh what elements have to be investigated first. This is determined on the basis of three influences: the budget size, the chance of prevention and the level of complexity to extract the prevention part. The budget size is determined by the state budget. The chance of prevention is determined on the basis of a previously performed literature study (Maas, 2016). The level of complexity to extract is determined on the basis of type of care (1st line and 2nd line) in combination with further expertise.

<table>
<thead>
<tr>
<th>Curative care element</th>
<th>% of Curative care costs</th>
<th>Chance of prevention</th>
<th>Level of complexity to extract prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td>GP</td>
<td>7,5%</td>
<td>Present</td>
<td>Good</td>
</tr>
<tr>
<td>Dental care</td>
<td>1,9%</td>
<td>Present</td>
<td>Good</td>
</tr>
<tr>
<td>Devices</td>
<td>4,0%</td>
<td>Probably</td>
<td>Hard</td>
</tr>
<tr>
<td>Medicines</td>
<td>12,1%</td>
<td>Present</td>
<td>Hard</td>
</tr>
<tr>
<td>Paramedical care</td>
<td>1,8%</td>
<td>Probably</td>
<td>Doable</td>
</tr>
<tr>
<td>Obstetrics</td>
<td>0,5%</td>
<td>Present</td>
<td>Doable</td>
</tr>
<tr>
<td>Maternity care</td>
<td>0,8%</td>
<td>Present</td>
<td>Doable</td>
</tr>
<tr>
<td>Mental Health care</td>
<td>9,7%</td>
<td>Present</td>
<td>Hard</td>
</tr>
<tr>
<td>Hospital care</td>
<td>57,2%</td>
<td>Probably</td>
<td>Hard</td>
</tr>
<tr>
<td>Remaining</td>
<td>4,7%</td>
<td>Probably</td>
<td>Hard</td>
</tr>
</tbody>
</table>

In Table 1.3 there are three gradations in the chance of prevention, namely: Present, Probably and No. If the label “Present” is given it means that it is known that there is a form of prevention in this element. The label “Probably” is given when it is not certain that prevention can be found in this element. With the label “No”, there is negligible to no prevention in the element. The level of complexity to extract prevention, also has three gradations. “Good” means that it is relatively easy to extract the prevention out of the performance codes. When the “Doable” label is given, it is a little bit harder to extract prevention and there will be multiple entanglements in the performance codes. When the label “Hard” is assigned, it is not possible to extract the prevention part out of performance codes. There will, and should, be looked in a very different way at these elements. A long-term study is necessary to find possibilities to extract the prevention part.
1.5 Which party can deliver the data requirements best?

To answer this question, the origin of the data and the parties involved are examined. In Figure 1.5, a scheme is made to illustrate the processing of the data. The data is generated by all the Health policyholders of the Netherlands. These policyholders are insured by a Health insurer. These Health insurers are storing the data and send this to the gathering party, named Vektis. As an information center for the care, Vektis is the only party that has an information system to collect and analyze information about healthcare in the Netherlands (Volksgezondheidenzorg.info, 2016). This data is available for some parties. For example, the Statistics Netherlands (CBS) has the option to request everything, but has the data not in own management and has to ask Vektis for data (van Gorp, 2016).

![Figure 1.5: Healthcare data process](image)

Vektis provides information on declared care, not only on the level of care provider or health insurer, but also disease-oriented and population. Vektis distinguishes supply chain information through the boundaries of the first, second and third line and on the borders of the Health Insurance Act and the Exceptional Medical Expenses Act. Together with its partners, Vektis is able to offer a comprehensive picture of the curative and long-term care (Vektis C.V, 2016).

The information, provided by Vektis, helps to keep good care affordable. They analyze the use, costs and quality of care on the basis of all healthcare claims and insurance information. This gives the decision makers in health care support in making choices to maintain the quality and affordability of care.
With collecting and analyzing data on the cost and quality of healthcare in the Netherlands, they supply information which makes decision-making and implementation within the healthcare market effectively and efficiently.

Vektis offers current and comprehensive databases. These include, for example, data on a national scale about the cost of medication, medical devices and hospital care. This kind of information is important not only for insurers but also for healthcare providers, government and insured.

They have various products and services to support the electronic exchange of messages. For all the products and services, they develop and maintain standards in consultation with health insurers, care agencies, health care providers and software vendors. Vektis also develops and manages various reference systems.

Some of the data is accessible freely, but the main part of the relevant data for this thesis is not. This is, for example, documented in ZorgPrisma, an important pillar for health information. ZorgPrisma parties have information about health care costs, health care providers and policyholders. As mentioned before, the information on zorgprisma.nl is not accessible freely. This has to do with the shielding of competitive information. Only authorized employees have access to the reports (Vektis CV, 2009). There is also the possibility to ask for a customized database. The restrictions are explained in chapter 3.3. The hypothesis that a dataset of Vektis is sufficient to answer the main question is assumed.
1.6 Research questions
The above paragraphs result in a main question. The main research question of the Master Thesis is:

Can a proportion be given of spending on prevention in the GP care within the Netherlands?

The main research question brings up a couple of sub questions. Altogether, the main question is answered by addressing following sub questions:

- What are the costs in the GP care?
- Which part of the GP care is prevention?
- Is there a noticeable trend in prevention costs in the GP care?

1.7 Abstract methodology
Two steps of investigation were done to determine the percentage spent on prevention in the GP care. Before the two steps, an investigation was done on the performance codes. Performance codes are so-called codes which contain certain operations. Caregivers, like GP’s, can declare the costs made while treating patients. This declaration is categorized in performance codes. For almost every action, a code is available. When a code does not exist yet, a caregiver can submit a request to add a code. When using data, the assumption is made that looking at how much money is spent on prevention is equal to analyzing the time spent on prevention. All assumptions are listed in Appendix B. The first step is data analysis, which was used to determine the performance codes that needed to be further investigated. On the results of the first step, a Delphi Study was conducted where experts are involved to reach a consensus to reduce the range of what is spent on prevention. Because prevention is an elastic concept, a tool is created that can be customized to your liking. The tool can help to calculate a percentage based on each individual opinion of what is seen as prevention. There is a determinations structure made to graphically display the determinations that are made. The first part is to work towards the sub questions, to continue the determination structure with a part to answer the sub questions, which are necessary for answering the main question.
1.8 Scope

The scope explains what is examined in this report and what is left out. Ideally an exact percentage of prevention in the curative care was given in this thesis. However, because prevention is not always easy to extract, the focus of this report was laid on the prevention in the GP care. A scheme was made which motivates why GP care was chosen. The remaining healthcare elements are left out of the scope. Before this study, a literature study was done on what is meant by prevention in the Netherlands and internationally. This study is published (Maas, 2016), the most important results are in this thesis as well.

A decision is made on what is the best way to get the required data. Research presented that the performance codes of Vektis was the best option to use. With these codes, the amounts declared are examined, not the time. In some performance codes, it was suspected that prevention was interwoven. To get a clear image of the prevention part, expert opinion was used to determine the percentage of prevention in these codes. Further data analysis has not occurred. This decision was taken after an examination of the possibilities. While examining the possibilities, a stumbling block was found, namely privacy of sensitive data. This is the reason data mining or other data analysis methods are not used.

To be able to respond quickly to changes in the means of prevention and not give an answer for only this moment, a tool is made. This tool is designed so that the user can include the prevention part of their own wish.

All in all, a percentage of prevention in the GP care is given with a range. This range is made by analysing the minimal and maximums of the expert opinions and includes also a boxplot to see the difference in probability of occurrence. For another interpretation of the range, a sensitivity analysis is also made.

In Table 1.4, the ins and outs of the scope are summed for an overview.

Table 1.4: Overview of elements within and beyond the scope of this master thesis

<table>
<thead>
<tr>
<th>Within scope</th>
<th>Out of scope</th>
</tr>
</thead>
<tbody>
<tr>
<td>GP Care</td>
<td>Rest of curative care</td>
</tr>
<tr>
<td>Amount declared by health insurers</td>
<td>Time declared by health insurers</td>
</tr>
<tr>
<td>Interval estimation by boxplots</td>
<td>Other interval estimation techniques</td>
</tr>
<tr>
<td>Delphi Study</td>
<td>Data mining</td>
</tr>
<tr>
<td>Literature review about prevention</td>
<td></td>
</tr>
<tr>
<td>Performance codes of Vektis</td>
<td></td>
</tr>
<tr>
<td>Sensitivity analysis</td>
<td></td>
</tr>
<tr>
<td>Tool to recalculate prevention proportion</td>
<td></td>
</tr>
</tbody>
</table>
1.9 Report outline

The remainder of this report is structured as follows.

Chapter 2 – Research design and methodology: In this chapter a decision roadmap is made with subsequent an explanation of the method and a scope.

Chapter 3 – Detailed design: Includes all work been done in order to obtain the results. It contains the Delphi study, the computer model and the explanation of the privacy structure.

Chapter 4 - Results: The results contains the answers on the sub questions.

Chapter 5 - Discussion: This is the chapter that describes how this relates to what we knew before this report. In addition, the strengths and weaknesses are discussed.

Chapter 6 - Conclusion: The conclusion will briefly describe what can be taken from the sub-questions and what this report is adding on the knowledge.

Chapter 7 – Future work: After this report, there is still plenty to do and explore. This chapter will be a set-up to what is still to be investigated and what the pitfalls are.

Bibliography: All the literature used, is summed up in this chapter.

Appendix: In this chapter, the attachments can be found. These attachments contain larger earlier displayed tables or deepening attachments. But also contains all abbreviations and assumptions.
2 Research design and methodology

The design of this study is summarized in Figure 2.1 and will be explained in this chapter. Within this determination structure, the methodology is described. The part in the Figure above the red line is explained in Chapter 2.1 and the part below the red line is explained in Chapter 2.2. Because the text is not clear readable in Figure 2.1, an enlarged copy is placed in Appendix C.

Figure 2.1: Sub question determination structure

2.1 Methodology before the sub questions

In this paragraph, the structure above the red line is explained which can be seen in Figure 2.1. The structure begins with the main question. After the main question in Figure 2.1, the question what others have already done on this subject is discussed. This is resolved on the basis of literature study. In the literature, all the information about the healthcare system is found in the Health Insurance Act. The literature on prevention itself is mainly about the responsibilities and the tasks that are defined in the law on this subject. In the literature is also found what is meant by prevention, there is a report written on this subject (Maas, 2016). One of the results from this report is a better overview of the prevention categories. This overview in combination with the tasks, forms a basis to a simple ontology. The last step was to explain why the focus is laid on the GP care. This is done by selecting statements that have been made about the importance of prevention in primary care in combination with the weight of factors.
2.2 Decision Roadmap

There are many steps to go through when making decisions, as to whether or not to carry out certain analyses. Explaining this process is important, because it gives insight why the more obvious choices were not conducted. The idea behind this process is part of the realization of the steps taken and therefore affecting the end result.

2.2.1 How to determine the costs within the GP care?

It was decided to collect the costs within the GP care from the open Vektis data. For verification, the costs from the Vektis are checked by the National Budget (Rijksoverheid, 2016). The costs in GP care are determined on the basis of the declarations in the performance code lists. Performance codes are codes that caregivers can use to categorize their declarations. The performance code lists contain all the possible performance codes and a caregiver can choose one of those codes. In a later state of the research, the percentage on prevention is calculated from the same source used to collect the costs within GP care.

2.2.2 How to determine the percentage on prevention?

There are several ways to determine the percentage on prevention. The two ways that are investigated are data analysis and expert opinion. In Table 2.1, an overview is given of the possible analysis techniques.

Table 2.1: Overview of analysis techniques

<table>
<thead>
<tr>
<th></th>
<th>Data analysis</th>
<th>Expert opinion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Limits</strong></td>
<td>Relatively easy to reproduce</td>
<td>Relatively hard to reproduce</td>
</tr>
<tr>
<td></td>
<td>Privacy</td>
<td>Willingness</td>
</tr>
<tr>
<td><strong>Method</strong></td>
<td>Mining</td>
<td>Delphi Study</td>
</tr>
<tr>
<td></td>
<td>Select factors manually</td>
<td>One survey (big sample size)</td>
</tr>
<tr>
<td></td>
<td>Ontology</td>
<td>Interviews</td>
</tr>
</tbody>
</table>

Because of the higher reproducibility, data analysis is preferred. However, because of the limits in the law concerning privacy it is hard to execute the Data analysis. In chapter 3.3, this is further explained. The limit of expert opinion is that the researcher is depending on willingness of the participants. Ways to increase this willingness are explained later. The second comparison that is made in the table is the method. A possible method, when Data analysis would be selected, is Data mining. Data mining is the targeted search for (statistical) relations in datasets. By searching for these relations, factors that have relation with prevention can be automatically selected with an algorithm. Concerning the privacy, data mining is not possible at the moment. A secondary option is to extract some factors manually. This is tried, as can be seen in Table 2.2.
Table 2.2: Manual factor selection

<table>
<thead>
<tr>
<th>Combination factors</th>
<th>Consult Amount Declarations</th>
<th>Number of persons</th>
<th>Multidisciplinary Amount Declarations</th>
<th>Number of persons</th>
<th>Integrated care Amount Declarations</th>
<th>Number of persons</th>
</tr>
</thead>
<tbody>
<tr>
<td>AASCNNNGHL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AASCNNNGHL</td>
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<td>AASCNNNGHL</td>
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<td>AASCNNNGHL</td>
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<td></td>
</tr>
</tbody>
</table>

There is a problem with the manual factor selection approach. It should be determined what the link with prevention is. This requires expert opinion again. Because in both cases expert opinion is needed, the hypothesis is made that manual factor selection is not an improvement. When using expert opinion, either one big survey with a high sample size or an interview with a small sample size can be used. In both forms of using expert opinion, the disadvantage is a chance that there will be a large spread in answers and therefore a conclusive claim cannot be made. Because of this, a Delphi Study is done where several rounds were held to come to a consensus. This method is preferred because the respondents are then able to respond to a second round in which the results of the first round are revealed as well. In this case there is a choice between a large group or a small group of participants. The advantage of a big group is that there will always be a respondent, but the disadvantage appears in the case of a second questionnaire. It is expected that there will be less willingness and feeling of responsibility to fill in the second questionnaire (Groves, Cialdini, & Couper, 2015). The key component to a Delphi Study is executing multiple rounds of questionnaires with in each questionnaire the same amount of respondents. Otherwise the results of the Delphi Study are less useful. Therefore, a smaller and specific selected group of people is chosen to participate in the Delphi Study. In that way, a more personal approach can be given throughout personal feedback after the first questionnaire. The length of the survey is also an important factor in the willingness to participate (Glass, et al., 2015). It is important to keep the survey as short as possible to increase the willingness, because it does not take long to fill in the survey. The content of the survey is based on a preselection using a simple form of ontology, this ontology is made out of expertize and automatic relation finding (Kol, 2016). An ontology was chosen, because an ontology has the characteristics that it categorizes word relations. By grouping through links, relevant words for the research can be filtered (Lopez de Vergara, Villagra, & Berrocal, 2003). The making of the ontology is explained in chapter 3.2.1.
This ontology divides the performance codes into three categories: prevention, doubtful prevention and non-prevention. The prevention words are selected from the synonyms and forms. If a word can have multiple forms like “Test”, it is taken as a doubt word. The other doubtful words are selected by considering if the forms are underlying in the code. Like the performance code “Consult”, where it is likely that there is given advice and creating awareness. Only the performance codes related to the doubt words are included in the survey. By doing this, the survey only takes 5 minutes to fill in and immediately picks up the core underlying prevention in the performance codes. All in all, a data analysis in combination with expert opinion is done as shown in Figure 2.2.
2.2.3 How to create a representative group?

By having a small sample size, it is important to create a representative group (Fitch, et al., 2001). The sample size of 12 interviewees is not a problem, this is done in other studies as well (Valentijn, et al., 2015). The 12 interviewees were chosen according to criteria. These criteria create multiple groups: a group engaged in prevention in general, a group engaged in GP care, a group that is in between general prevention and GP care and also a group that is not specifically concerned with this topic. By defining these different groups, research is done to find the right groups and within the groups the right persons. The groups that are in line with the criteria, mentioned above, are respectively: scientists, GPs, medical advisors and patients. However, the Dutch National Patient Organization believes, after contacting different persons, that they can say too little about prevention and that their time is better spent on other projects. For this reason, the patients group is excluded in this survey. There has been chosen not to ask patients randomly, because they cannot be considered as experts. This makes the chances considerably that they cannot give justified responses that will be representable for the whole patients group. The next step is to find the right persons within the rest of the groups. These persons have to meet certain criteria as well. The three scientists are selected by influence of their papers about prevention. The GPs are selected on variety: a practicing GP, an unexperienced GP, an experienced GP and an article writing GP. The medical advisors are situated in the primary care of the health insurers. The following experts were chosen: a former GP, a specialist in GP care and three experts advised by a policy advisor of the GP care. On the basis of this approach, the 12 respondents have been selected from the first three groups that meet the criteria of not only the group but also the persons within the group.

2.2.4 Anticipate on the results of the 1st survey

In the 2nd round of the survey, an anticipation is made on the results of the 1st round. The dispersion found inside the groups are relatively small. Therefore, only feedback was given on the averages. It was not considered necessary to also provide feedback on the modus which shows the most given value or the median, which is the middle answer given. When more feedback is provided, confusion can appear which gives participants a reason to not look at the feedback at all. It is assumed that they find it too complicated, so no attention is paid to the feedback. This is why it was chosen to keep the provided feedback as simple as possible. Giving feedback is important, this increase the willingness to participate for the second questionnaire (Groves, Cialdini, & Couper, 2015).
2.2.5 How to handle spreading?

In a Delphi Study, it is likely that a spreading space remains. Interval estimation is a solution to handle this spreading. First, the method of interval estimation is explained. Interval estimation is used to calculate an interval of possible values of an unknown population parameter. The interval is contrary to a single number, which results out of a point estimation. There was a need for estimations with a plus-or-minus deviation. The most common forms of interval estimation are confidence intervals and credible intervals (Watkins, 2016). Other forms are: tolerance interval, prediction intervals and likelihood intervals (Hamada, Johnson, Moore, & Wendelberger, 2012).

These forms all include statistical inference. The method that does not include statistical inference that leads to interval estimates is, among others, fuzzy logic (Encoder, 2016).

Interval estimation is used in statistical analysis. For this research, statistical analysis was required and this is why a form of interval estimate was used. Other types of statistical analysis that were not conducted in this research are point estimates and decisions, because point estimates give a precise value. This is in the case of prevention not the case. It cannot be said that it contains an exact value. Thus, there is an interval needed where the probability occurs that it is inside that range.

Each form of interval estimation has certain rules that must be conducted, otherwise it cannot be called this certain interval estimation, which forms a problem in this research. The reason will now be explained. First the confidence estimate, where the rule is that a sample has to be taken on a certain division, is evaluated in usefulness. The sample has a chance to fall within the interval. This chance is calculated before the sample was taken. However, no sampling is used in this study. The participants of the survey were not randomly chosen, in fact the best experts in this field where asked to participate. This makes confidence estimate not usable for this study. Also with credible estimate a sample is required, which forms the same problem with confidence estimate.

To use tolerance interval and to make it count, it must have a certain distribution. But with the Delphi Study, there was no distribution present. A graph is made to visualize the distribution, but the answers of the participants deviated too much.

For prediction interval regression analysis is primarily used, which requires a correlation between parameters. The parameters in this study do not have such a correlation.

With the likelihood interval a probability distribution is required. As mentioned before, a distribution is not present in this study.

Now that all the interval estimation forms with statistical inference are discussed, it can be concluded that either a sample or a distribution is required to execute a form of interval estimation. Both are not present or cannot be created in this study, which is why these forms of interval estimation were not used.

The remaining interval estimate is fuzzy logic, which does not include statistical inference. Fuzzy logic can be seen as an extension of Boolean logic. The principle of Boolean logic is that the idea of true and
false is thrown out. Instead, truth values are used between 0 (false) and 1 (true). In this way, there is more than only true and false. The discrete nature of traditional logic is thus also thrown out, for example, something may be true for third or 'a little' true which has a more continuous nature. The basis of this logic and of Boolean logic is the true and false dimensions and this study is not talking about true and false. The fuzziness comes to light when there is either no transparency in a research, or it is highly depended on subjectivity, which is also not the case in this study. It can be argued that prevention is a fuzzy concept, but what falls within prevention in this research is clearly defined and therefore not fuzzy. Another point of discussion is the answers in the Delphi Study, which are opinions and consequently subjective. But the fuzziness of the answers is reduced to a minimum because the answers were given in percentages. If the answers were, for example, a lot, very much or nothing, the term fuzzy would be appropriate. All in all, fuzzy logic and Boolean logic are not suitable for this research because of the arguments mentioned above.

Because these discussed interval estimations are not usable for this study, it was chosen to use a simple and standard form of interval estimation. In this method, a standard bandwidth is given and the extremes and averages but also boxplots within the graph to see the likely are given. As addition, a sensitivity interval is displayed in the form of a graph. This graph shows how the interval changes when there is more reliability. The reason for selecting this option is because it is hard to give an analysis out of a survey of 12 persons. It is hard to conclude it has a specific distribution what is needed, for example, for a confidence interval. When a sample is taken, for example a 13th expert, it is highly unlikely that his or her answers will not pass the extremes that were filled in by the other 12 experts. The extremes that resulted out of the 12 experts form the boundaries that ensure a kind of confidence.

2.2.6 Choice of design computer model

As an addition on the report, a computer model is created that should be easy to handle, this is evaluated by several testers. Therefore, it was decided to create the model in a spreadsheet program, because most people are familiar with spreadsheets and a kind of spreadsheet program is already installed on most computers (Bakker, 2010). The design of the model should not be too complicated and the user must also have the possibility to change the model to their own liking without having to understand the code itself. For this reason, there are only three buttons on the main screen. The model itself is further explained in a later part of the report.

2.2.7 Is there a noticeable trend in prevention costs in the GP care?

The decisions that have to be made here are mainly made after answering the previous sub questions, namely how to display a trend. Five categories were created, namely: the absolute extremes (upper limit and lower limit), the likely extremes (upper limit and lower limit) and the average. The decision made in advance is the period of time used to determine a trend. This period of time consists of the years 2010, 2011, 2012, 2013, 2014 and 2015. The reason why these six years were chosen is because these are the most recent years and with the computer model it is easy to add or adjust years if it is considered necessary (Audit IT, 2011). Thereby, over time, new and more recent data will be available. The motivation is found by using a combination of sources (Wenning, 2016). For analyzing there are no custom trend analysis techniques used.
3 Detailed design

This chapter contains all the parts that have been created for this research. The parts are the Delphi Study, the computer model in the spreadsheet and the data schema procedure.

3.1 Delphi Study method

Delphi Study may be characterized as a method for structuring a group communication process. This is done in a way that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem. The Delphi Study method was chosen because of two main reasons. The first reason is the structuring method. The second reason is the benefits from subjective judgements on a collective basis, because the problem does not lend itself to precise analytical techniques (Linstone & Turoff, 2002).

A comprehensive roadmap can be found in Figure 3.1. Because the limited format of the paper, a larger but split copy is placed in Appendix D. The roadmap is explained step by step below.

Selecting experts is done by creating groups with different perspectives. The persons chosen within the groups must have different expertise. With this approach of selecting participants, an analysis is done on the whole group but also on individual level. In this way, a representative set is created. In total there are three scientists, five medical advisors and four GPs involved. The response rate is 100%.

The next step is to approach these experts. This is done by contacting them by email, face to face or via an instance. During the approach, the study is explained and the experts were asked if they would like to fill in the survey. The explanation consisted of an introduction of already done research and where their commitment is needed. Then the design of the survey is explained, which consisted of two questionnaires and one meeting if needed. At the end, they could give an indication if they can participate the whole process or only a part of it. When the participant indicated that he/she will only fill in a part of the survey, action was undertaken to convince them to participate in the whole process. The minimum participation requires participation in the two surveys. When the participant agreed on the minimum participation terms, the first questionnaire was sent.
The first questionnaire existed of an explanation about what belongs to the domain of prevention in our case. Thereafter, the questionnaire itself began. This involves questions about the doubtful performance codes extracted by the ontology. Only the performance codes related to the doubt words are included in the survey. The first questionnaire is displayed in Appendix F.

When the first questionnaire is filled in by the interviewees, the answers were explored. By exploring them, a decision was made on what to include in the second questionnaire. Per question, there are two scenarios. The answers of a question are similar, within a small margin of deviation, or the answers deviate too much. There is an assumption made of what margin is small or too much, shown in Appendix B. When the first scenario occurs, the question will not be repeated in the second questionnaire. In the second scenario, there are two options that determine whether the question should be repeated or not. The first option is to read the remarks behind the question, which might explain the deviation. When the remark does not explain the deviation, the question is repeated in the second questionnaire.

The second questionnaire will, as previously stated, only contain questions which contain answers that are questionable after the first questionnaire. In this questionnaire, the view of all participants were implemented and their own answer was added to compare. The interviewees can change their percentage or stick to their old percentage if they think it is the good percentage. The second questionnaire is displayed in Appendix G.

After the second questionnaire, the answers were explored again. If there is rapprochement in the answers, the interviewee who deviates from the average answer were asked for their motivation behind their answer. If there is no rapprochement within the groups or in total, a face to face meeting was held to discuss the answers of the interviewees.

After the face to face meeting or receiving the motivation of the deviating interviewee, concept percentages were deviated out of the answers given. The last feedback was implemented and a consensus is generated out of the answers. There still will be a margin per question, therefore an interval estimation is used.
3.2 Computer Model

This chapter explains the computer model that is written in a spreadsheet and a programming program. First, the basis of the ontology, that can be changed by the user, is explained. Thereafter, the programming code will be explained. Finally, the computer model itself will be explained with all the possibilities for adapting, but also the underlying macros.

3.2.1 Ontology

When making the ontology, the guide called "A guide to creating your first ontology" is used (Noy & McGuinness, 2000). In this guide, there is a step by step explanation how the structure of the ontology can be made. It is recommended, where possible, to use an existing ontology. However, there is no existing prevention ontology available in the literature. This was concluded after a search in the databases. Also an expert was consulted about prevention ontology, but he was not aware of any ontology in this field (Goossen, 2016). With no existing ontology, the only option was to create an ontology because this ontology is essential for this thesis. A website was consulted that displays the relationships between words (Kol, 2016). When a word is filled in, there is a possibility to click on other words linked to the word that is central in the diagram. These other words are either synonyms or are words with matching word properties. The diagram is shown in Figure 3.2. The green circle is the central word. The purple circles are the words with direct connection and the yellow circles are indirect connected to the central word.

![Figure 3.2: Word relation webs with legend](image-url)
In addition to these synonyms, experts are also consulted to identify the links (Heijink & Struijs, 2016) and forms of prevention (NIVEL, 2012). The combination has resulted in Figure 3.3.

Figure 3.3: Standard words in ontology

Out of this, a standard list is created and implemented in the computer model. This wordlist that can be filled by the user of the computer model. In Figure 3.4, this list is displayed. By giving them a label (prevention or doubt), the word is placed in a category. As an extra, there are three columns to give the user the chance to change the standard percentages of the model. By having an ontology, the user can simply add words and change percentages. Therefore, this model can be used also for other elements than the GP care. The labels of the standard input of the model are chosen by online research. It is not needed to sort the “Doubt” and “Prevention” words as done in Figure 3.4, the used algorithm in the code solve this.

Figure 3.4: Wordlist
3.2.2 Programming code

There is a code programmed to let the, in the previous section explained, ontology work. In addition, this code ensures that the prevention and the doubt words are split and filtered. By storing these filtrations, nothing in this code has to be adjusted. To import other data and calculate different results, the model, explained in the next paragraph, can be used. No knowledge of programming is required to use the model which results in a low threshold for using this system.

The broad steps that the code realizes are as follows. The code starts with loading the ontology and the databases into the program. For every database the performance codes that are not used are left out. Thereafter the ontology is filtered and grouped in prevention or doubt. The code for one year is shown in Figure 3.5 and below is explained what the code is doing step by step and how it transforms the lack of input to useful input for the computer model.

**Figure 3.5: Pseudo Code**

The first part will empty the “global environment”, this is the environment where all parameters are stored with the corresponding values. Emptying this spacy is necessary when the wordlist will be shorter than before. Otherwise the old values of the extra words will not be overwritten and the values will be taken into account in the new calculation which will give an incorrect picture. The next step in the code is to load the files needed. This will be the performance code list and the ontology file. In the performance code, the empty codes will be filtered to reduce unneeded calculations. The ontology is used to filter the prevention and doubt words out of the performance code list. Thereafter a “for loop” is made to generate the right files for the spreadsheet computer model. The first doubt word is not named after its own name, but will be named “Doubtyear1”. For example, when the first doubt word is “consult” and the data is from the year 2013, the codename will be “Doubt131”. With this codename, the spreadsheet can recognize the order. The codename will then be transformed in a file which will be saved in a folder. The last step is to execute a code that can calculate the prevention percentage. Therefore, the total spending in a year has to be stored, which is done in an csv file. The exact code over different years, which can be copied, is given in Appendix E.
3.2.3 Design

The interface of the computer model is shown in Figure 3.6. There are three buttons that can be used. Further, all calculations will be generated in the model itself and these calculations cannot be changed. This makes that the model cannot be made unserviceable, which is seen as an advantage. The underlying code can be found in Appendix I.

[Image of the computer model interface with buttons and data tables]

Figure 3.6: Computer Model Interface

Should the user wish to make a change, then it is advisable to start at "Change Input". When pressed, this button will open a file containing the words that contains prevention or partly prevention (the “Doubt” words). In this file, the words can be changed at own discretion. Also, the percentages of the “Doubt” words may be adjusted as well. When blank, the standard rates are used, otherwise the changed percentages are used. The standard percentages are based on the Delphi Study. The words that were not included in this study, are given the percentages of 0, 50 and 100 for respectively minimal, expected and maximum.

After the input is changed at own discretion, the preparation can commence to start the recalculation. This can be done by pressing the "Prepare" button. By pressing this button the folder where the files with declarations per word are stored, will be emptied. Thereafter, the code will be opened. Due to the complexity, this process can take some time. After everything has been loaded, the user only needs to run the code by pressing the “RUN” button in the computer model. This will launch the recalculation, which leads to a table and graphs that are adjusted to the new input.

In the sensitivity analysis it can be seen which “Doubt” words have the greatest influence on the proportion of prevention. The steepest line has the most influence. As all words will stay by the Basis, the expected prevention part does not deviate from the already calculated value. If, for example, a line is crossing the 20% when looked to the maximum, this means that only change this value to the maximum will increase the calculated prevention with 20%. The same is the case with -20%. Only changing the factor which represents this line to the minimum, will descend the expected prevention with 20%. The same occurs with other percentages. When taking all factors with the given percentage, this will lead to the minimum.

The "Spending on prevention" graph shows the minimum, maximum and expected rate and amount of prevention. Based on the percentages given as input. The horizontal axis shows from which years the data originated from, in this case 2013 to 2015.
3.3 What are the possibilities concerning data analysis?

First, there is looked at the overall legislation. In response, the definition of personal data and the meaning of processing data are explained. Finally, the following possibilities and limitations are discussed. The whole Personal Data Protection Act (PDPA) can be found on the website: www.overheid.nl (Minister van Justitie, 2016).

3.3.1 General legislation

The Dutch Data Protection Authority (PDPA) monitors compliance with the PDPA. Any processing of personal data should be reported at the PDPA (Rijksoverheid, 2016). PDPA puts these messages in a public register.

The Personal Data Protection Act sets out some general rules for the processing of personal data. Thus, personal data may only be processed for certain predetermined purposes. Use of the data is allowed only in the context of the original target (Nictiz, 2013).

3.3.2 Meaning of personal data and processing data

First, it must be clear what exactly is meant by personal data. It is defined in the law as any data about an identified or identifiable natural person (Minister van Justitie, 2016). This is divided into different categories, as shown in Table 3.1. The first column is the anonymous data category, the second and third column are the personal data. In the second column the two indirectly identifiable categories are displayed and in the last column the directly identifiable category. From left to right it becomes easier to link a person to the data.

Table 3.1: Type of Data

<table>
<thead>
<tr>
<th>Anonymous data</th>
<th>Personal data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completely anonymous (A)</td>
<td>Indirectly identifiable (B)</td>
</tr>
<tr>
<td></td>
<td>Immediately identifiable (D)</td>
</tr>
<tr>
<td></td>
<td>Indirectly identifiable and encrypted (C)</td>
</tr>
</tbody>
</table>

The group of identifiable indirect encrypted data can carry out the encoding in two ways: unilateral or bilateral.

Unilateral means that the personal information of those involved in the investigation are converted to a unique number. Here, the person cannot be ascertained, even by those who used the encryption mechanism. There is also bilateral, hereby conversion is possible by those who have the encryption mechanism. This may be the message source, but also a person mandated.

Data that is linked to prevention without direct information about an individual that is retrieved from a database with data specified per individual, is falling in category C. It is not directly identifiable and encrypted for the user, but by having the data of an individual in combination with factors, the specific person can be traced (FMWV, 2003). For a long time, this was a debatable point. Therefore, in June 2016
a statement about category C is made by the Dutch Healthcare Authority (NZA). In a letter sent to the ZN Board on June 21st of this year this position was further clarified. It states that all Vektis information must be characterized as personal data (Zorgautoriteit, 2016). This means that also data that is encrypted at an early stage is personal data.

It is also important to know how the law defines the term processing, because this is a very broad concept. According to the law, processing of personal data contains any operation or set of operations performed upon personal data, including at least the collection, recording, organization, storage, adaptation or alteration, retrieval, consultation, use, disclosure by transmission, dissemination or other form of posting, assembling, alignment or combination, blocking, erasure or destruction (Minister van Justitie, 2016).

3.3.3 Interpretation and procedure

Now the Personal Data Protection Act is interpreted. It has become clear that the act is open for interpretation. This is the reason that Vektis has a strict procedure concerning the provision of data. There are three access levels and Vektis has a procedure per access level. Figure 3.7 shows these levels. The first so called “Open Data” is the data available for everyone and it is not registered who views this data. The next level is “Zorgprisma”, besides a public area there is also a private area. The private area is only accessible for people with an account accepted by Vektis (Vektis CV, 2009). So, Vektis knows the account holders but does not know what is done with the information. The parties who qualify for getting access are:

- Health insurers
- Ministry of Health, wellbeing and sports
- Hospitals
- Authorized GPs
- Miletus Foundation
- Mental health care institutes

In the last step of controlled access, it is possible to ask for datasets not available in “Zorgprisma” (van Gorp, 2016). The dataset can be generated by Vektis. The procedure is illustrated in Figure 3.8.
If a request comes from an external party, first there will be evaluated if it meets the standard requirements. The first requirement is that it is a care related enterprise who is making the request. The second requirement is that the enterprise has no commercial purposes. If at least one of the two is not the case, the request will be rejected. If this standard is met, there will be looked at the feasibility. This is based on priority and possibility. The priority means that some clients have priority because of rules and previous orders. The possibility concerns the time and budget that is expected to take up. In addition, it is checked whether it is possible to meet the request. If one of these cannot be granted, the request will be rejected. If everything meets the conditions and the enterprise and Vektis can reach a base agreement, the mandates will be viewed. Mandates are previously made agreements with the responsible parties of the data, which includes health insurers. If these agreements are sufficient, an offer can directly be made. If not, there is a monthly meeting of the BCVU, who will judge the proposal. If the proposal is blocked by one or more members of the BCVU, the request will be rejected. If the request passes the meeting, there should be compliance with the laws and the additional requirements of the responsible parties. The data is handled extremely carefully, because of the interpretation of the law. There is a possibility that additional restrictions are made. For example, data is made only available on location (Headquarters Vektis). Besides the location limitations, the time perspective and budget of the project is given in the contract offer as an additional restriction.

### 3.3.4 Possibilities and limitations

When processing the data, each individual insurer must be asked for permission. However, ZN has the power to give permission, because all health insurance companies are connected by this branch organization (Koninkrijk der Nederlanden, 2012). Besides this permission, the processing of data should also be reported to the Dutch Data Protection Authority as mentioned in article 28 of the PDPA (Minister van Justitie, 2016). The notification shall include a statement of various things ranging from the name and address of the controller to a general description. This allows a preliminary assessment of the appropriateness of the measures envisaged, to ensure the security of processing.
4 Results

In this chapter, the sub questions are discussed and elaborated.

- What are the costs in the GP care?
- Which part of the GP is prevention?
- Is there a noticeable trend in prevention costs in the GP care?

With answering these sub questions, the main question if a proportion can be given of the spending on prevention in the GP care within the Netherlands is answered.

4.1 What are the costs within the GP care?

The costs per element can be investigated. This is done by using open Vektis data (Vetkis.C.V., 2015). The circle diagram is displayed in Figure 4.1 and as addition, a deeper look was taken in the GP care. This data is calculated on the basis of the performance codes.

![Circle Diagram of spending in the Curative care and the biggest declarations within GP care (Vetkis.C.V., 2015)](image)

Now the percentages are given, which was translated into an amount. The total amount spent in the curative care is around € 36 billion. So, the 7,5% of GP care represents € 2,7 billion.

The biggest cost within the GP care are in the subscription fee. This is a base that the GP is allowed to claim for each patient. This amount is spent on administration and to accommodate the lower revenues from other services. This means that it is a flat fee system that is used. The second biggest cost is for consultations. These include regular physical consultations but also e-mail consultations. Visits are not taken on board, because this group entails in itself a significant percentage. This also applies to the practice assistant of the GP (POH), the consultations that are housed within this group are in a separate section as well. The multidisciplinary care includes the following parts: DM2, CVRM and COPD. What in that order means Diabetes, Cardiovascular and Chronic Obstructive Pulmonary Disease. The more detailed explanation of these abbreviations are explained in Appendix A.
4.2 Which part of the GP care is prevention?

As mentioned before, the focus is on the GP care. There was started with the raw performance codes and ended with an expected percentage. The questionnaire includes questions that have to do with the biggest doubt words out of the ontology. The questions are divided into different types. The first seven questions are about the regular consultations or the consultations in the evening, night and weekend. Then there were five questions about the POH GGZ. Followed by three questions of the integrated care type. The last two questions contain module questions. The module questions are about all declarations for elderly and POH somatiek. The first questionnaire can be found in Appendix F.

On the basis of the replies on the questionnaire, boxplots are made. A boxplot is made per group per question. Than the boxplots per group are combined in a boxplot with the total per question. A boxplot gives a range by quartiles. The so-called box (the filled in section) represents the middle half of the responses. Above and beneath the box, lines can be seen. These lines represent the highest 25% and the lowest 25% of the responses. On the horizontal axis, the questions are plotted and each bar is a question. On the vertical axis, the percentage is plotted. This percentage is the response on the question how prevention is done within the specified performance is displayed.

After the first questionnaire, the following is notable. Within the group of the Scientists there is only one question with more than 25 percentage point difference in the response. This concerns the question about the percentage of prevention in a telephone POH mental health consultation. In the group of the Medical Advisors, there are 6 questions with more than 25 percentage point difference. However, this is again the question on telephone POH mental health and further the three questions on integrated care and the two questions about the modules. The GPs do have only a 25 percentage point spread in all the questions about integrated care and modules. The results are graphically shown in the boxplot that is given in Figure 4.2. The boxplot of the groups together is shown in the right side of Figure 4.2.
In general, there is more consistency within the groups than in total. Hence it is chosen to give personal feedback to the average per group and also their own score of the first questionnaire. A part of the feedback one of the participants received is shown in Figure 4.3. Every person received the same questionnaire but with personal feedback attached. What is shown in Figure 4.3 is a part of personal feedback for one participant on the questions about Regular Consultation. The second row shows the personnel input of the respondent in the first questionnaire. The columns display the average estimated by the three groups. The third row are the Scientists, the fourth row are the Medical Advisors and the last row are the GP’s. The given values are estimated percentages spent on prevention.
After implementing the feedback and processing the personal data in the questionnaire, the participants were again asked to fill in the questionnaire. The entire second questionnaire can be found in Appendix G and had a respond rate of 100%. The results per group and the shift in estimation is shown as boxplots in Figure 4.4 to 4.6. The horizontal axis contains the questions and the vertical axis contains the percentages.

Figure 4.4: Scientists 1st and 2nd questionnaire

Figure 4.5: Medical Advisors 1st and 2nd questionnaire

Figure 4.6: GPs 1st and 2nd questionnaire

After the second questionnaire, there is difference amended by the scientists. Now there is a greater spread arisen in the questioning about the integrated care and the modules. About the other questions a consensus is almost reached, this shift can be seen in Figure 4.4. The medical advisors have become somewhat more united on all questions. Only the answers on the integrated care and modules remain spread. The same is true for the GPs. They have an even greater spread than before. However, it does
show that it really matters where you draw the line with regard to prevention and care. This is especially true for the integrated care and modules.

A boxplot is also made in the same way as the 1st questionnaire. This boxplot is shown in Figure 4.7. If the groups are put together, the right side boxplot is the result. As mentioned before in the group comparisons, the main difference is in interpretation of where prevention ends. The decision was made to let this range exist and measure the impact of this range on the prevention percentage.

Figure 4.7: Boxplots per group and total after the 2nd Questionnaire
To measure the impact of these ranges, a sensitivity analysis is done. The sensitivity analysis is shown in Figure 4.8. From this analysis it can be concluded that the margin of “DM2” causes the biggest impact on the total prevention. After “DM2” follows the “Regular Physical Consultation” and modules “POH somatiek”. Those three questions could be investigated first when the margin that is given should be reduced.

*Figure 4.8: Sensitivity analysis GP Care*

The percentages in Figure 4.8 are showing how much percentage point overall spending would increase to prevent or decrease with increase or decrease of a specific question. For example, when the physical regular consultation would go to the expected maximum, total prevention expenditure would increase by about 10%. In case this would go to the expected minimum, the total prevention expenditure would fall by 8%. The explanation of expected and absolute minimum and maximums is explained in the next paragraph about trends.
Now that the boxplots and sensitivity analysis are displayed, the boxplots and sensitivity analysis are placed in the perspective of the overall GP care. In Table 4.1 are the values shown, the corresponding Figure is 4.9. As can be seen, the percentages are precise and slightly differ from the values because of other total spending per year. There is a column which calculates the percentage when the subscription fee is excluded. Because this is more than a third of the spending, the percentage increases with 60.6 percentage point. The values after the first questionnaire are given in Appendix H. By comparing the results of the two questionnaires, it can be seen that by means of the second questionnaire the minimum is increased by 82 to 91 percent and the maximum is decreased by 5 percent.

Table 4.1: Calculated spending per group and total

<table>
<thead>
<tr>
<th></th>
<th>Min 2013</th>
<th>Excl Inschrijf %</th>
<th>Max Value 2013</th>
<th>Max 2013</th>
<th>Excl Inschrijf %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>€ 124.108.025,35</td>
<td>4,59%</td>
<td>€ 680.256.977,00</td>
<td>25,18%</td>
<td>40,39%</td>
</tr>
<tr>
<td>Sc</td>
<td>€ 149.215.327,20</td>
<td>5,52%</td>
<td>€ 350.956.722,15</td>
<td>12,99%</td>
<td>20,84%</td>
</tr>
<tr>
<td>Ma</td>
<td>€ 133.808.388,81</td>
<td>4,95%</td>
<td>€ 464.328.874,25</td>
<td>17,19%</td>
<td>27,57%</td>
</tr>
<tr>
<td>Ep</td>
<td>€ 269.583.337,95</td>
<td>9,98%</td>
<td>€ 658.783.656,60</td>
<td>24,38%</td>
<td>39,12%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Min 2014</th>
<th>Excl Inschrijf %</th>
<th>Max Value 2014</th>
<th>Max 2014</th>
<th>Excl Inschrijf %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>€ 133.051.614,92</td>
<td>4,54%</td>
<td>€ 740.362.676,75</td>
<td>25,24%</td>
<td>39,44%</td>
</tr>
<tr>
<td>Sc</td>
<td>€ 164.740.296,95</td>
<td>5,62%</td>
<td>€ 382.751.015,50</td>
<td>13,05%</td>
<td>20,39%</td>
</tr>
<tr>
<td>Ma</td>
<td>€ 145.278.528,85</td>
<td>4,95%</td>
<td>€ 506.460.870,20</td>
<td>17,27%</td>
<td>26,98%</td>
</tr>
<tr>
<td>Ep</td>
<td>€ 289.094.566,78</td>
<td>9,86%</td>
<td>€ 716.513.856,75</td>
<td>24,43%</td>
<td>38,17%</td>
</tr>
</tbody>
</table>

The expected spending is shown in Table 4.2. The Element professionals which are the GPs have estimated the prevention part higher than the other participants of the survey. Out the comments that they make, can be seen that the GPs assign more to care focused prevention and later move on to care in comparison with the scientists and medical advisors.

Table 4.2: Expected spending

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>€ 356.999.772</td>
<td>13,2%</td>
<td>€ 388.993.793</td>
<td>13,3%</td>
<td>€ 359.544.164</td>
<td>12,7%</td>
</tr>
<tr>
<td>Sc</td>
<td>€ 252.953.635</td>
<td>9,4%</td>
<td>€ 276.828.405</td>
<td>9,4%</td>
<td>€ 258.931.896</td>
<td>9,1%</td>
</tr>
<tr>
<td>Ma</td>
<td>€ 283.285.307</td>
<td>10,5%</td>
<td>€ 309.858.109</td>
<td>10,6%</td>
<td>€ 287.487.386</td>
<td>10,1%</td>
</tr>
<tr>
<td>Ep</td>
<td>€ 503.918.040</td>
<td>18,7%</td>
<td>€ 546.892.321</td>
<td>18,6%</td>
<td>€ 496.320.169</td>
<td>17,5%</td>
</tr>
</tbody>
</table>

The corresponding figure for Table 4.1 is Figure 4.9. As can be seen by comparing the table with the figure, the percentages are precise and slightly differ from the values because of variation in the total spending per year.
In Figure 4.9, there is only looked to the extreme responses per question per year, with on the horizontal axis the separate groups and all the groups combined in “Total”. As with the boxplots and the individual responses were the case, the dispersion at the scientists is the smallest. They estimate the lowest in the proportion of prevention. Following are the medical advisers and the share of the highest prevention is estimated at GPs. The total takes the extremes per question. Therefore, the minimum falls even lower and the maximum higher than that of the individual groups. Figure 4.9 is creating a higher bandwidth than an individual has given. Therefore, there is also looked at what all individuals estimate as value for prevention, which is shown in Figure 4.10. By giving these different views, a value judgment can be made on the extremes. In addition, it can be said that the values that lie outside of the individual estimates are unlikely.
With the results of the Delphi Study can be concluded that 50% of the experts think that the prevention part is between €209 and €471 million based on the data of 2013, this is shown in Figure 4.10. In this Figure, the 100% prevention is excluded, because there were no questions present about this subject in the surveys. The added value of these words is around €4 million. In this Figure can also be seen that the extreme two individuals think the prevention part is between €160 and €589 million.
4.3 Is there a noticeable trend in prevention costs in the GP care?

To answer this sub question, the period of 2010-2015 is examined. In Figure 4.11 the amount of spending on prevention is given.

![Figure 4.11: Spending on prevention with odds ratios](image)

Different levels of probability of occurrence are examined. The absolutes are calculated by taking the extremes per question out of the survey. So, this is not filled in by a single person but it is a combination of all respondents. Therefore, it is very unlikely that an individual passes the extremes that were composed by 12 others. Since this individual has to fill every question to the absolute maximum/minimum value that was entered by the 12 other participants in the survey to pass the extremes. As addition, the taken experts are the best on this field. This makes it more unlikely that the extremes of the 12 experts will be passed by adding an individual. Thereby, if this is the case, the chance is present this is an outlier. The “Average of Total” is calculated by taking the average of all interviewees, which is the same way the boxplots are made. The boxplots are determined by calculating the amount every individual think is spent on prevention. The box represents 50% of the interviewees. The middle line in the box is the median, which means that 50% is below and 50% is above this amount. There can be conclude that the chance is getting smaller when there is more moved to the extremes.

Figure 4.11 shows that there is an increase in the absolute prevention proportion over time, since 2010. It reaches its peak in 2014. Now this absolute increase is made visible, it is useful to know whether this is just because of the higher spending, or that the increasing is also in perceptual terms in this period. This is displayed in Figure 4.12.
In Figure 4.12, the difference is smaller and the line flatter. There is no trend visible after 2011. The reason the prevention part is increasing in Figure 4.11 and is not in Figure 4.12 is due to the increased amount spent in the GP care. In Figure 4.12 can be seen that the absolute minimum is flat over the whole period and between lies 3.8% and 4.5%. The expected minimum in the first two analyzed years is between 4.1% and 5.7%, where it is between 5.7% and 6.2% in the other years. When there is looked at the average over years it can be seen that in the first two years the average lies between 9.9% and 11.5%, and in the other years between 12.6% and 13%. The expected maximum is in the first two years lies between 17.4% and 19.1% and in the other years between 21.6 and 21.9%. The absolute maximum in 2010 and 2011 is respectively 19.9% and 22.8%, in 2013 and 2014 around 25.2% and 23.3% in 2015.

Out of this analysis is concluded that the prevention percentage was increasing in the first two analyzed years, but since 2012 there is no significant difference observable. There is no immediate cause for the increase from 2010 to 2012. The change of government and the policies associated does not prove a definite answer.
5 Discussion

The first discussion issue is the limitation to GP care. The choice for this is described earlier with reference to Table 1.2. In my view, it is more important to lay a good foundation. To facilitate later examination, it was chosen to put together an ontology. Also, since the forms of prevention have to be taken into account, the choice is made to use a list of words that can be customized by the user. To make the complete computer model for the determination of the percentages, a Delphi Study was chosen. The considerations are given in the chapter called Delphi Study. Discussion can arise with reference to the number of rounds and the missing personal face to face meeting. There have been two rounds. The addition of some questions of the Delphi Study are discussable too. The influence of the questions on the total prevention is only viewed afterwards. It would have been better if this was done in an earlier stage of the research. A number of questions that have little impact were then made less extensive and some more. There was too little incentive to plan a face to face meeting. Therefore, the meeting has not occurred. An essential result is estimated unrealistic because of a small group. The created computer model could be improved by having a direct link between the spreadsheet and the program code, but this would take a long time and now only needs a small additional step to get the result. Concerning interval estimation, a very standard method was used. It is assumed that no other interval in a difficult analysis will say more than the chosen interval. The method is also very understandable that ratified the choice. Thereby, the extremes give a good rendering of the limits. The experts are very carefully chosen and to change these extremes an additional expert has to fill in the maximum of all the 12 experts in every single question. An improvement would be if different extreme cases were included to see the change on the expectation and the 50% intervals.

As penultimate point of discussion I call privacy. The privacy issues were discovered in a late stadium, which resulted into less use of the possibilities of data than expected at the beginning of this research. The last point of discussion is the subscription fee. This is labelled as not preventative. However, this part is a basic and is used to compensate for the lower revenues from the other declarations. A part can therefore probably be attributed to prevention.
6 Conclusion

The main question of this research was: “Can a proportion be given of the spending on prevention in the GP care within the Netherlands?”. The answer on this question is yes. Despite the difficulties of making prevention unambiguous, a solution was found for this by only giving categories which can be attributed to in the literature. When confined to GP care, some categories fall away, but it remains a matter of interpretation. The ambiguousness of prevention is a reason that a computer model was made. In this model it is simple to add your own view of prevention by adding and removing words, or change percentages. After the changes the new percentage of prevention can be calculated with a single button. In addition to the prevention issue, there is also a privacy issue. Obtaining sensitive data is in fact limited by legislation and internal ancillary restrictions. In order to get data various steps are required. GP care is 7,5% of total curative care, which represents € 2,7 billion. The largest claims are the subscription fees and consultations. This is already about 66% of the amount declared. The Delphi Study has shown that the different groups make different estimations, but the margin in totality is reduced by this study. By means of the second questionnaire, it can be seen that the minimum is increased by 82 to 91 percent and the maximum is decreased by 5 percent.

The expected prevention part in GP care is around 13%, which is around € 0,35 billion. In the absolute case, the range is between 0,12 and 0,75 billion. When we look at the total curative care, 13% in GP care already takes care of 1,0% prevention in the total curative care. When looking to a trend, there was a relatively low percentage spent on prevention in 2010 and 2011, but it remains substantially the same in the following years.

Another conclusion is that there is still a lot of work to do and a lot to discover about spending on prevention. This is the reason for a “Future work” chapter.
7 Future work

An estimated percentage of 13% is established on the basis of two methods. However, to get more out of the result, an in-depth research into the control of values will have to be done. The computer model is designed so that adaptation is possible. For example, by adjusting the parameters, a recalculation is done which presents new results. The Future work is to include other parts of curative care, in order to get the total picture of curative care and to show that there are more preventive measures than the general opinion suggests beside the GP care. The recommendation concerning privacy is to make agreements with the data provider before starting a research. Data cannot just be provided and the procedure takes a lot of time. This also calls for attention to write a report about how privacy can be guaranteed, in combination with using data analysis in an easy way. The expectation is that in the near future data mining and big data will become increasingly important. Therefore, it is important that further possibilities will be considered here, so that the law can make an adjustment on the use of personal data for research goals. At the moment it is not possible to get completely anonymous data as mentioned in the privacy part.

The elements of the Curative care are demonstrated in Figure 7.1. The green element has the highest priority and is already investigated in this thesis. The orange and green elements together contain the primary care. The (partly) red element(s) are secondary care. The purple elements are used both in the primary and secondary care.

![Curative Care Elements](image)

*Figure 7.1: Curative care elements*

Table 1.2 is designed to consider what elements are hard to investigate or are not interesting to do further research on in the perspective of prevention. As discussed previously, this is determined by the influence, assuming that there is prevention and complexity to extract. The influence is determined by
the state budget. The probability of prevention in an element is determined on the basis of a previously performed literature study and the possibility to extract prevention out of the element is determined on the basis of type of care (1st line and 2nd line) in combination with further expertise.

To give a start, Table 7.1 shows how much each element has spent in million euros and in percentage, this is determined on the basis of the national budget of 2013 (Rijksoverheid, 2016). The prevention column displays the estimated amount that is spent on prevention. Column “% Element” then shows the representative percentage of this amount. After Table 7.1 will be discussed how any amount or percentage was established. The “Reliable” column displays the reliability of the calculation of the prevention part. The reliability has four gradations, namely: Very, Moderate, Hardly and Not. On this order it goes respectively from reliable to unreliable. The last column shows the prevention part as a percentage of the total amount spent on curative care.

Table 7.1: Perspective of prevention in the Curative care

<table>
<thead>
<tr>
<th>Curative care part</th>
<th>Million €</th>
<th>% Total</th>
<th>Prevention €</th>
<th>% Element</th>
<th>Reliable</th>
<th>% prevention Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>GP</td>
<td>2702</td>
<td>7,5%</td>
<td>350</td>
<td>12,9%</td>
<td>Very</td>
<td>1,0%</td>
</tr>
<tr>
<td>Dental care</td>
<td>687</td>
<td>1,9%</td>
<td>108</td>
<td>15,7%</td>
<td>Very</td>
<td>0,3%</td>
</tr>
<tr>
<td>Devices</td>
<td>1437</td>
<td>4,0%</td>
<td>108</td>
<td>7,5%</td>
<td>Moderate</td>
<td>0,3%</td>
</tr>
<tr>
<td>Medicines</td>
<td>4349</td>
<td>12,1%</td>
<td>357</td>
<td>8,2%</td>
<td>Moderate</td>
<td>1,0%</td>
</tr>
<tr>
<td>Paramedical care</td>
<td>636</td>
<td>1,8%</td>
<td>509</td>
<td>80%</td>
<td>Not</td>
<td>1,4%</td>
</tr>
<tr>
<td>Mental Health care</td>
<td>3493</td>
<td>9,7%</td>
<td>2794</td>
<td>80%</td>
<td>Not</td>
<td>7,7%</td>
</tr>
<tr>
<td>Obstetrics</td>
<td>195</td>
<td>0,5%</td>
<td>156</td>
<td>80%</td>
<td>Not</td>
<td>0,4%</td>
</tr>
<tr>
<td>Maternity care</td>
<td>279</td>
<td>0,8%</td>
<td>223</td>
<td>80%</td>
<td>Not</td>
<td>0,6%</td>
</tr>
<tr>
<td>Specialist Medical care</td>
<td>20616</td>
<td>57,2%</td>
<td>3092</td>
<td>15%</td>
<td>Hardly</td>
<td>8,6%</td>
</tr>
<tr>
<td>Remaining</td>
<td>1679</td>
<td>4,7%</td>
<td>84</td>
<td>5%</td>
<td>Not</td>
<td>0,2%</td>
</tr>
<tr>
<td>Total Curative care</td>
<td>36073</td>
<td>100%</td>
<td>7832</td>
<td></td>
<td></td>
<td>22%</td>
</tr>
</tbody>
</table>

To start with the GP care, this approximate percentage is determined on 12,9%, based on the survey of GPs and the extensively researched. Because of these investigations, it is noted as very reliable. Dental care is established by a requested data file from Vektis. In dental care, there is a split in performance codes and a category of prevention, this is this a highly reliable measurement (van Gorp, 2016). The devices and medicines are like the previous established through a database (Zorginstituut Nederland, 2016). However, in these two GIP databases, a manual selection by board category that falls under prevention was used. This percentage is not precise and further investigation is relatively easy to execute. This relatively easy calculation is in contrast to the other elements. Little is to find about the other elements. The rates are therefore determined from minimal resources. Thereby, these resources are not specifically about an amount or percentage. For this reason, Paramedical (MijnFysiopraktijk, 2016), Mental Health (GGZ Nederland, 2013), Obstetrics (Merkx & Korstjens, 2012) and Maternity (Nijkamp, 2015) care is estimated to be 80%. The specialist medical care is estimated at 15% based on short evaluation of expenditure by section. Of each department in a hospital it is determined if it contains prevention. This percentage is a very rough estimation. The remaining costs are, for example,
patient transport. It is assumed that there is little prevention in this part. The assumption is labelled with a percentage of 5%, as can be seen in Appendix B.

An estimation of the other curative care sharing is also made. This rough estimation results in a share of ±22% prevention in the total curative care. Again some of the estimations are very rough and further research is needed to make this percentage more valid. This can also be seen in the sensitivity analysis in Figure 7.2.

It is good to know the amount of prevention per element, but the need of investigating a specific part better depends on the size of this specific part in combination with the reliability. To measure this, a sensitivity analysis is made, as shown in Figure 7.2. The two elements that are most decisive on prevention in the curative care are the Specialist Medical care and the Mental Health care. The reason Mental Health care is flatter on the “Maximal” size in comparison with the “Minimal” size, is the basis of 80%. In theory it can be 80% lower but it can only raise with 20%.

![Sensitivity Analysis](image)

*Figure 7.2: Sensitivity analysis of the curative care*

It can be concluded that there is still much work to do to create a good overall picture of prevention in curative care. The privacy restrictions hinder the rapid and automatic analysis and this depends on how easy other parts of curative care can be explored.
Bibliography


De Vries, M., & Kossen, J. (2016). *This is how Dutch Healthcare works*. Amsterdam: De Argumentenfabriek.


# Appendix

## A) List of Abbreviations

<table>
<thead>
<tr>
<th>English Translation</th>
<th>Concept</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Insurers Netherlands</td>
<td>Zorgverzekeraars Nederland</td>
<td>ZN</td>
</tr>
<tr>
<td>Health Insurance Act</td>
<td>Zorgverzekeringswet</td>
<td>ZvW</td>
</tr>
<tr>
<td>Public Health Collective Prevention Act</td>
<td>Wet collectieve preventie volksgezondheid</td>
<td>WCPV</td>
</tr>
<tr>
<td>Rural General Practitioners association</td>
<td>Landelijke Huisartsen Vereniging</td>
<td>LHV</td>
</tr>
<tr>
<td>Dutch College of General Practitioners</td>
<td>Nederlandse Huisartsen Genootschap</td>
<td>NHG</td>
</tr>
<tr>
<td>Health Care Insurance Board</td>
<td>College voor Zorgverzekeringen</td>
<td>CVZ</td>
</tr>
<tr>
<td>Public health, Welfare and Sport</td>
<td>Volksgezondheid, Welzijn en Sport</td>
<td>VWS</td>
</tr>
<tr>
<td>Social Support Act</td>
<td>Wet Maatschappelijke Ondersteuning</td>
<td>WMO</td>
</tr>
<tr>
<td>Exceptional Medical Expenses Act</td>
<td>Algemene Wet Bijzondere Ziektekosten</td>
<td>EMEA</td>
</tr>
<tr>
<td>Disease prevention</td>
<td>Ziektepreventie</td>
<td>ZP</td>
</tr>
<tr>
<td>Health promotion</td>
<td>Gezondheids bevordering</td>
<td>GB</td>
</tr>
<tr>
<td>Health protection</td>
<td>Gezondheids bescherming</td>
<td>GBS</td>
</tr>
<tr>
<td>Personal Data Protection Act</td>
<td>Wet bescherming persoonsgegevens (WBP)</td>
<td>PDPA</td>
</tr>
<tr>
<td>The Dutch Data Protection Authority</td>
<td>College Bescherming Persoonsgegevens</td>
<td>CBP</td>
</tr>
<tr>
<td>Board Committee Insurance &amp; Backoffice</td>
<td>BestuursCommissie Verzekeringen &amp; Uitvoering</td>
<td>BCVU</td>
</tr>
<tr>
<td>Statistics Netherlands</td>
<td>Centraal Bureau voor de Statistiek</td>
<td>CBS</td>
</tr>
<tr>
<td>Practice assistant GP</td>
<td>Praktijkondersteuner Huisarts</td>
<td>POH</td>
</tr>
<tr>
<td>Diabetes Mellitus 2</td>
<td>Diabetes Mellitus 2</td>
<td>DM2</td>
</tr>
<tr>
<td>Cardiovascular risk management</td>
<td>Cardiovasculair risicomanagement</td>
<td>CVRM</td>
</tr>
<tr>
<td>Chronic Obstructive Pulmonary Disease</td>
<td>COPD</td>
<td>COPD</td>
</tr>
</tbody>
</table>
## B) List of Assumptions

<table>
<thead>
<tr>
<th># Assumption</th>
<th>Assumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Looking at how much money is spent on prevention is equal to watching the time.</td>
</tr>
<tr>
<td>2</td>
<td>The performance codes are entered correctly by GPs and therefore the Vektis data is valid</td>
</tr>
<tr>
<td>3</td>
<td>Health Insurers do prevention by reimburse preventive operations</td>
</tr>
<tr>
<td>4</td>
<td>The results of the Delphi Study are representative and valid.</td>
</tr>
<tr>
<td>5</td>
<td>Subscription fee is not used for prevention</td>
</tr>
<tr>
<td>6</td>
<td>A small margin is a margin smaller than 25 percentage point difference. An answer that deviate to much has a spreading bigger than 25 percentage point.</td>
</tr>
<tr>
<td>7</td>
<td>When there is assumed little prevention in an element, this means 5% is taken</td>
</tr>
</tbody>
</table>
C) Determination Structure
D) Delphi Study process
E) Programming code (R language)

# Cleaning Global Environment
rm(list = ls())

## Until interruption the loading and filtering performance code lists

# GP care 2013
# Load CSV performance code list
GP13<-read.csv("G:\Huisartsenzorg13.csv",header=T,sep=";")
attach(GP13)
names(GP13)
GP13[,2]<-as.numeric(as.character(GP13[,2]))

# Load CSV Ontology words
Ontology<-read.csv("G:\Ontology.csv",header=T,sep=";")
attach(Ontology)
names(Ontology)

# Filtering Zeros
GP13no0<-GP13[apply(GP13[c(2:ncol(GP13))],1,function(z) any(z!=0)),]

#For loop filter
for(i in 1:nrow(Ontology)){
  assign(paste(Ontology[i,1],13,sep=""),subset(GP13no0,grepl(Ontology[i,1],Code,ignore.case=TRUE)) )
}

# GP care 2014
# Load CSV performance code list
GP14<-read.csv("G:\Huisartsenzorg14.csv",header=T,sep=";")
attach(GP14)
names(GP14)
GP14[,2]<-as.numeric(as.character(GP14[,2]))

# Load CSV Ontology words
Ontology<-read.csv("G:\Ontology.csv",header=T,sep=";")
attach(Ontology)
names(Ontology)

# Filtering Zeros
GP14no0<-GP14[apply(GP14[c(2:ncol(GP14))],1,function(z) any(z!=0)),]

#For loop filter
for(i in 1:nrow(Ontology)){
  assign(paste(Ontology[i,1],14,sep=""),subset(GP14no0,grepl(Ontology[i,1],Code,ignore.case=TRUE)) )
}

# GP care 2015
# Load CSV performance code list
GP15<-read.csv("G:\Huisartsenzorg15.csv",header=T,sep=";")
attach(GP15)
names(GP15)
GP15[,2]<-as.numeric(as.character(GP15[,2]))

# Load CSV Ontology words
Ontology<-read.csv("G:\Ontology.csv",header=T,sep=";")
attach(Ontology)
names(Ontology)

# Filtering Zeros
GP15no0<-GP15[apply(GP15[c(2:ncol(GP15))],1,function(z) any(z!=0)),]

#For loop filter
for(i in 1:nrow(Ontology)){
  assign(paste(Ontology[i,1],15,sep=""),subset(GP15no0,grepl(Ontology[i,1],Code,ignore.case=TRUE)) )
}
# Until interruption Generating Database for preparing the Model

## For loop and file making 2013

```r
j=1
k=1
for(i in 1:nrow(Ontology)){
  if (Ontology[i,2]=="Prevention"){
    assign(paste("Prevent13",j,sep=""),subset(GP13no0,grepl(Ontology[i,1],Code,ignore.case=TRUE)));(j=j+1))
  else {assign(paste("Doubt13",k,sep=""),sum(subset(GP13no0,grepl(Ontology[i,1],Code,ignore.case=TRUE))$DeclarationAmount,na.rm=TRUE));(k=k+1))
  }
j=1
k=1
ALLPrevention13 <- unique(do.call(rbind, lapply( ls(patt="Prevent13"), get) ))
assign(paste("Prevention13",sep=""),sum(ALLPrevention13$DeclarationAmount,na.rm=TRUE))
if(Prevention13>1) {write(Prevention13, "C:/..//Prevention13.csv")}
if(Doubt131>1) {write(Doubt131, "C:/..//Doubt131.csv")}
if(Doubt132>1) {write(Doubt132, "C:/..//Doubt132.csv")}
if(Doubt133>1) {write(Doubt133, "C:/..//Doubt133.csv")}
if(Doubt134>1) {write(Doubt134, "C:/..//Doubt134.csv")}
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if(Doubt138>1) {write(Doubt138, "C:/..//Doubt138.csv")}
if(Doubt139>1) {write(Doubt139, "C:/..//Doubt139.csv")}
if(Doubt1310>1) {write(Doubt1310, "C:/..//Doubt1310.csv")}
if(Doubt1311>1) {write(Doubt1311, "C:/..//Doubt1311.csv")}
if(Doubt1312>1) {write(Doubt1312, "C:/..//Doubt1312.csv")}
if(Doubt1313>1) {write(Doubt1313, "C:/..//Doubt1313.csv")}
if(Doubt1314>1) {write(Doubt1314, "C:/..//Doubt1314.csv")}
if(Doubt1315>1) {write(Doubt1315, "C:/..//Doubt1315.csv")}
if(Doubt1316>1) {write(Doubt1316, "C:/..//Doubt1316.csv")}
if(Doubt1317>1) {write(Doubt1317, "C:/..//Doubt1317.csv")}
if(Doubt1318>1) {write(Doubt1318, "C:/..//Doubt1318.csv")}
if(Doubt1319>1) {write(Doubt1319, "C:/..//Doubt1319.csv")}
if(Doubt1320>1) {write(Doubt1320, "C:/..//Doubt1320.csv")}
if(Doubt1321>1) {write(Doubt1321, "C:/..//Doubt1321.csv")}
if(Doubt1322>1) {write(Doubt1322, "C:/..//Doubt1322.csv")}
if(Doubt1323>1) {write(Doubt1323, "C:/..//Doubt1323.csv")}
}

## For loop and file making 2014

```r
j=1
k=1
for(i in 1:nrow(Ontology)){
  if (Ontology[i,2]=="Prevention"){
    assign(paste("Prevent14",j,sep=""),subset(GP14no0,grepl(Ontology[i,1],Code,ignore.case=TRUE)));(j=j+1))
  else {assign(paste("Doubt14",k,sep=""),sum(subset(GP14no0,grepl(Ontology[i,1],Code,ignore.case=TRUE))$DeclarationAmount,na.rm=TRUE));(k=k+1))
  }
j=1
k=1
ALLPrevention14 <- unique(do.call(rbind, lapply( ls(patt="Prevent14"), get) ))
assign(paste("Prevention14",sep=""),sum(ALLPrevention14$DeclarationAmount,na.rm=TRUE))
if(Prevention14>1) {write(Prevention14, "C:/..//Prevention14.csv")}
if(Doubt141>1) {write(Doubt141, "C:/..//Doubt141.csv")}
if(Doubt142>1) {write(Doubt142, "C:/..//Doubt142.csv")}
if(Doubt143>1) {write(Doubt143, "C:/..//Doubt143.csv")}
if(Doubt144>1) {write(Doubt144, "C:/..//Doubt144.csv")}
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if(Doubt146>1) {write(Doubt146, "C:/..//Doubt146.csv")}
if(Doubt147>1) {write(Doubt147, "C:/..//Doubt147.csv")}
if(Doubt148>1) {write(Doubt148, "C:/..//Doubt148.csv")}
if(Doubt149>1) {write(Doubt149, "C:/..//Doubt149.csv")}
```
if(Doubt1410> -1) {write(Doubt1410, "C:/..../Doubt1410.csv")}
if(Doubt1411> -1) {write(Doubt1411, "C:/..../Doubt1411.csv")}
if(Doubt1412> -1) {write(Doubt1412, "C:/..../Doubt1412.csv")}
if(Doubt1413> -1) {write(Doubt1413, "C:/..../Doubt1413.csv")}
if(Doubt1414> -1) {write(Doubt1414, "C:/..../Doubt1414.csv")}
if(Doubt1415> -1) {write(Doubt1415, "C:/..../Doubt1415.csv")}
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if(Doubt1419> -1) {write(Doubt1419, "C:/..../Doubt1419.csv")}
if(Doubt1420> -1) {write(Doubt1420, "C:/..../Doubt1420.csv")}
if(Doubt1421> -1) {write(Doubt1421, "C:/..../Doubt1421.csv")}
if(Doubt1422> -1) {write(Doubt1422, "C:/..../Doubt1422.csv")}
if(Doubt1423> -1) {write(Doubt1423, "C:/..../Doubt1423.csv")}

#For loop and file making 2015

j=1
k=1
for(i in 1:nrow(Ontology)){
  if (Ontology[i,2]="Prevention"){
    assign(paste("Prevent15",j,sep=""),subset(GP15no0,grepl(Ontology[i,1],Code,ignore.case=TRUE)));
    (j=j+1)}
  else {
    assign(paste("Doubt15",k,sep=""),sum(subset(GP15no0,grepl(Ontology[i,1],Code,ignore.case=TRUE))$DeclarationAmount,na.rm=TRUE));
    (k=k+1) }}

j=1
k=1
ALLPrevention15 <- unique(do.call(rbind, lapply( ls(patt="Prevent15"), get) ))
assign(paste("Prevention15",sep=""),sum(ALLPrevention15$DeclarationAmount,na.rm=TRUE))
if(Prevention15> -1) {write(Prevention15, "C:/..../Prevention15.csv")}
if(Doubt151> -1) {write(Doubt151, "C:/..../Doubt151.csv")}
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if(Doubt1520> -1) {write(Doubt1520, "C:/..../Doubt1520.csv")}
if(Doubt1521> -1) {write(Doubt1521, "C:/..../Doubt1521.csv")}
if(Doubt1522> -1) {write(Doubt1522, "C:/..../Doubt1522.csv")}
if(Doubt1523> -1) {write(Doubt1523, "C:/..../Doubt1523.csv")}

# Code to calculate prevention percentage

assign(paste("GP","Total13",sep=""),sum(GP13$DeclarationAmount,na.rm=TRUE))
assign(paste("GP","Total14",sep=""),sum(GP14$DeclarationAmount,na.rm=TRUE))
assign(paste("GP","Total15",sep=""),sum(GP15$DeclarationAmount,na.rm=TRUE))
if(GPTotal13> -1) {write(GPTotal13, "C:/..../GPTotal13.csv")}
if(GPTotal14> -1) {write(GPTotal14, "C:/..../GPTotal14.csv")}
if(GPTotal15> -1) {write(GPTotal15, "C:/..../GPTotal15.csv")}
F) 1st Questionnaire

Onderzoek Preventie Huisartsenzorg

Om te beginnen alvast dank voor uw behulpzaamheid om als inhoudsdeskundige expert mee te werken aan het onderzoek over preventie in de huisartsenzorg.

Dit is de vragenlijst voor het onderzoek naar preventie in de huisartsenzorg bestaande uit 7 vragen. De beantwoording van deze korte vragenlijst duurt naar verwachting 5 minuten. Nadat alle experts deze vragenlijst hebben ingevuld, ontvangt u een tweede vragenlijst van vergelijkbare omvang.

Let op: Bij tussentijds afsluiten van de internetbrowser gaan uw gegevens verloren.

Wachtwoord: [_field]
Start
Onderzoek Preventie Huisartsenzorg

Intro

Doelstelling Onderzoek
In opdracht van Zorgverzekeraars Nederland wordt als onderdeel van een master aan de Technische Universiteit Eindhoven onderzoek gedaan naar het aandeel van preventie in de uitgaven van de huisartsenzorg.

Vertrekpunt onderzoek:
Angrijpspunt om onderzoek te doen naar de preventie-uitgaven in de huisartsenzorg zijn de declaratiegegevens van de zorgverzekeraars per te declareren product (prestatiecode). Dit angrijpspunt is gekozen vanwege de beschikbare data. Sommige declaraties zijn direct aangemerkt als 'uitgaven aan preventie'. Een voorbeeld hiervan zijn de uitgaven die vallen onder de declaratie 'stoppen met roken'. Echter, een grote hoeveelheid declaraties van een huisarts is met direct betrekking tot preventie. Hierbij kan het zo zijn dat de huisarts wel een deel van zijn tijd besteed aan preventie, maar wordt dit op het niveau van het te declareren product niet zichtbaar. Een voorbeeld hiervan zijn consulten. In dit onderzoek wordt via expert opinion gebracht een indicatie te krijgen hoe groot het aandeel van preventie is in deze activiteiten van de huisarts. U bent een van deze experts.

Wat wordt in dit onderzoek verstaan onder preventie?
Op de volgende pagina zal een definitie worden geven wat in dit onderzoek onder preventie wordt verstaan.

Onderzoeksmethode
Om een inschatting te krijgen in het aandeel van preventie in activiteiten van de huisarts wordt in dit onderzoek gebruik gemaakt van de Delphi methode. Dit betekent dat experts worden geraadpleegd en getracht wordt met hen tot consensus te komen.

Welke vragen moet ik beantwoorden?
In deze eerste vragenlijst geeft u voor diverse activiteiten van de huisarts een inschatting van het aandeel preventie. Nadat alle experts deze vragenlijst hebben ingevuld, ontvangt u een tweede vragenlijst van vergelijkbare ontwerpf. U krijgt dan dezelfde vragen te zien als in deze vragenlijst, maar dan met de antwoorden van de andere respondenten (de respondenten worden geanonimiseerd). Vervolgens heeft u de mogelijkheid om, gegeven alle reacties, uw eigen antwoord aangepast te wijzigen. Op basis hiervan wordt getracht de spreiding in de antwoorden van de respondenten te verminderen.

Mocht u een vraag niet kunnen of willen beantwoorden, dan wordt u verzocht dit te vermelden in het opmerkingenuild aan het einde van de vragenlijst.

Invullen naam
Geef verzoek ik u hieronder uw naam in te vullen. Uw naam is nodig om uw eigen antwoorden zichtbaar te maken bij de tweede vragenlijst. Uw naam wordt voor geen enkel ander doel enzide gebruikt.

1. Wat is uw naam?*

[Input field for name]

[Submit button]
Wat is preventie?
De definitie van preventie is zeer lastig te geven. In dit onderzoek wordt daarom juist een beroep gedaan op uw expertise en is het vertrekpunt bij de beantwoording uw eigen inschatting wat u onder preventie verstaat.

Om hiervoor wel enig kader te geven wordt hieronder beschreven welke soorten preventie, zoals in de literatuur beschreven, bij uw inschattings betrokken kunnen worden. Dit zijn:
- Selectieve preventie: preventie gericht op een selectieve groep mensen die een verhoogde kans hebben om ziek te worden
- Geïndiceerde preventie: preventie gericht op individuele personen met één of meerdere verhoogde risicofactoren
- Zorg gerelateerde preventie: preventie gericht op individuele personen waarbij een diagnose is vastgesteld en preventie gericht is om verergering van ziekte te voorkomen

Activiteiten die een preventief karakter hebben zijn bijvoorbeeld bewustwording creëren, advies geven en onderzoek of controles uitvoeren van bijvoorbeeld bloeddruk of suikerspiegel.

Universale/primaire preventie, gericht op de gehele bevolking, wordt niet in dit onderzoek betrokken. Aannames is dat dit soort preventie niet door een huisartsenpost wordt uitgevoerd.

Start Vragenlijst
Nu de toelichting op preventie gegeven is, start de vragenlijst. Er kan altijd terug gescoord worden voor de uitleg. Het is mogelijk bij aanklikken van het percentagevak het geverste percentage te typen.

2. Hoeveel procent wordt er naar uw inschatting aan preventie gedaan bij een regulier consult:
   - Er is een fysiek consult 0 %
   - Er is een telefonisch consult 0 %
   - Er is een in email consult 0 %
   - Er is een (thuis) visite 0 %

3. Hoeveel procent wordt er naar uw inschatting aan preventie gedaan bij een ANW consult (Avond Nacht Weekend):
   - Er is een fysiek consult 0 %
   - Er is een telefonisch consult 0 %
   - Er is een (thuis) visite 0 %

4. Hoeveel procent wordt er naar uw inschatting aan preventie gedaan bij een HAP consult (Huisartsenpost):
   - Er is een fysiek consult 0 %
   - Er is een telefonisch consult 0 %
   - Er is een (thuis) visite 0 %

---

57
5. Hoeveel procent wordt er naar uw inschatting aan preventie gedaan bij een POH GGZ consult (Praktijk Ondersteuner Huisarts GGZ)?
   - Er is een fysiek consult: 0 %
   - Er is een telefonisch consult: 0 %
   - Er is een e-mail consult: 0 %
   - Er is een groepconsult: 0 %
   - Er is een (thuis) visite: 0 %

6. Hoeveel procent wordt er naar uw inschatting aan preventie gedaan in de Multidisciplinaire zorg bij:
   - DM2 (Diabetes Mellitus 2): 0 %
   - VRM (Vascular Risicomanagement): 0 %
   - COPD: 0 %

7. Hoeveel procent wordt er naar uw inschatting aan preventie gedaan in de volgende modules:
   - Modules Ouderzorg: 0 %
   - Modules POH Somatische: 0 %

8. Heeft u nog opmerkingen?

Versturen
G) 2\textsuperscript{nd} Questionnaire

Onderzoek Preventie Huisartsenzorg

Om te beginnen dank voor het invullen de vragenlijst voor het onderzoek over preventie in de huisartsenzorg. Graag nodig ik u uit om de tweede vragenlijst in te vullen (duur ongeveer 5 minuten). Via deze wetenschappelijke (Delphi-)methode wordt getracht om de spreiding in de inschattingen van het aandeel preventie binnen de huisartsenzorg te verkleinen.

Start

Onderzoek Preventie Huisartsenzorg

Bevindingen eerste vragenlijst
De enquête is ingevuld door drie groepen experts: huisartsen, medisch adviseurs bij zorgverzekeraars en wetenschappers met kennis op dit terrein. De inschatting hoeveel aan preventie wordt gedaan binnen een te declareren product verschilt per categorie experts. De experts binnen een categorie schatten het aandeel preventie nagenoeg gelijk in. In deze tweede enquête wordt u gevraagd – met de kennis van de inschattingen van de andere experts – wederom een inschatting te geven van het aandeel preventie.

Aanpassingen in de vragenlijst
Veel van de respondenten hebben ook opmerkingen gegeven bij de eerste vragenlijst. Hartelijk dank hiervoor. De opmerkingen worden meegenomen in het onderzoek en hebben ook geleid tot aanpassing en aanvulling van de tweede vragenlijst. Namelijk:

- AAW en HAP zijn samengevoegd
- Extra vraag over kenmerken van verzekerden
- Vraag of openstaan voor meeting
- Het Preventiekader is omgevormd

Tweede vragenlijst
Dit is de tweede vragenlijst die wordt voorgelegd aan dezelfde groep experts. De duur van deze vragenlijst is gelijk aan de vorige. Bij deze nieuwe vragenlijst krijgt uw eerste eigen inschatting te zien en de gemiddelde inschatting te zien per expertgroep. Met de kennis van de andere respondenten wordt u gevraagd opnieuw een inschatting te geven van het aandeel preventie.

Afsluiten browser en backspace
Let op: Bij tussenliggende afsluiten van de internetbrowser gaan uw gegevens verloren. Bij backspace kunt u middels de pijltjes in uw browser weer terug.

1. Wat is uw naam?

Door naar Enquête
Wat is preventie?
De definitie van preventie is zeer lastig te geven. Dit hebben diverse respondenten ook aangegeven in de vorige vragenlijst. Er is geen grijze gebied van preventie. Toch is het gebeuren dat de inschatting van respondenten niet vrijblijvend zijn. Er is mede daardoor gekozen om preventie niet specifiek af te bakenen in deze tweede vragenlijst. Het vertrekt bij de beantwoording blijft daarom uw eigen inschatting wat u onder preventie verstaat.

Wel is het kader van preventie beperkt tot:
- Geïndiceerde preventie: preventie gericht op individuele personen met één of meerdere verhoogde risicofactoren
- Zorg gerealiseerde preventie: preventie gericht op individuele personen waarbij een diagnose is vastgesteld en preventie gericht is om verergering van ziekte te voorkomen

Activiteiten die een preventief karakter hebben zijn bijvoorbeeld beoordeling createn, advies geven en onderzoek of controles uitvoeren van bijvoorbeeld bloeddruk of suikerspiegel. Universale, primaire en selectieve preventie wordt niet in dit onderzoek betrokken.

Start Vragenlijst
Nu de vulling op de tweede vragenlijst en preventie gegeven is, start de vragenlijst. Er kan altijd terug gescrold worden voor de uitleg over preventie. Het is mogelijk bij aanklikken van het percentagehak het gevenste percentage te typen.

### Preventie in Regulier Consult

<table>
<thead>
<tr>
<th>Persoonlijke invoer 1e Vragenlijst</th>
<th>Fysiek</th>
<th>Televisie</th>
<th>E-mail</th>
<th>Visite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personale intree 1e Vragenlijst</td>
<td>20</td>
<td>5</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>Gemiddeld Preventie Wetenschappers</td>
<td>10</td>
<td>3</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Gemiddeld Medisch Adviseurs</td>
<td>18</td>
<td>13</td>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td>Gemiddeld Huisartsen</td>
<td>25</td>
<td>8</td>
<td>4</td>
<td>20</td>
</tr>
</tbody>
</table>

### Preventie in ANW/HAP Consult

<table>
<thead>
<tr>
<th>Persoonlijke invoer 1e Vragenlijst</th>
<th>Fysiek</th>
<th>Televisie</th>
<th>Visite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personale intree 1e Vragenlijst</td>
<td>5</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Gemiddeld Preventie Wetenschappers</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Gemiddeld Medisch Adviseurs</td>
<td>7</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Gemiddeld Huisartsen</td>
<td>14</td>
<td>7</td>
<td>17</td>
</tr>
</tbody>
</table>

### Preventie in POH GGZ Consult

<table>
<thead>
<tr>
<th>Persoonlijke invoer 1e Vragenlijst</th>
<th>Fysiek</th>
<th>Televisie</th>
<th>E-mail</th>
<th>Visite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personale intree 1e Vragenlijst</td>
<td>20</td>
<td>5</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>Gemiddeld Preventie Wetenschappers</td>
<td>10</td>
<td>8</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Gemiddeld Medisch Adviseurs</td>
<td>24</td>
<td>17</td>
<td>11</td>
<td>22</td>
</tr>
<tr>
<td>Gemiddeld Huisartsen</td>
<td>21</td>
<td>15</td>
<td>11</td>
<td>13</td>
</tr>
</tbody>
</table>
4. Hoeveel procent wordt er naar uw inschatting aan preventie gedaan bij een POH GGZ consult (Praktijk Ondersteuner Huisarts GGZ)?

<table>
<thead>
<tr>
<th>Er is een fysiek consult</th>
<th>Er is een telefonisch consult</th>
<th>Er is een in email consult</th>
<th>Er is een groepsconsult</th>
<th>Er is een (tuin) visite</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 %</td>
<td>0 %</td>
<td>0 %</td>
<td>0 %</td>
<td>0 %</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Preventie in Multidisciplinaire zorg</th>
<th>DMO</th>
<th>VM</th>
<th>COPD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persoonlijke invloed 1e Vragenlijst</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Gemiddeld Preventie Wetenschappers</td>
<td>18</td>
<td>75</td>
<td>18</td>
</tr>
<tr>
<td>Gemiddeld Medisch Adviseurs</td>
<td>40</td>
<td>48</td>
<td>36</td>
</tr>
<tr>
<td>Gemiddeld Huisartsen</td>
<td>82</td>
<td>85</td>
<td>66</td>
</tr>
</tbody>
</table>

5. Hoeveel procent wordt er naar uw inschatting aan preventie gedaan in de Multidisciplinaire zorg bij:

| DM2 (Diabetes Mellitus 2) | 0 % | 0 % |
| VM (Vascular Riskmanagement) | 0 % | 0 % |
| COPD | 0 % | 0 % |

<table>
<thead>
<tr>
<th>Preventie in Modules</th>
<th>Ouderenzorg POH Somatiek</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persoonlijke invloed 1e Vragenlijst</td>
<td>0 %</td>
</tr>
<tr>
<td>Gemiddeld Preventie Wetenschappers</td>
<td>18 %</td>
</tr>
<tr>
<td>Gemiddeld Medisch Adviseurs</td>
<td>31 %</td>
</tr>
<tr>
<td>Gemiddeld Huisartsen</td>
<td>49 %</td>
</tr>
</tbody>
</table>

6. Hoeveel procent wordt er naar uw inschatting aan preventie gedaan in de volgende modules:

<table>
<thead>
<tr>
<th>Modules</th>
<th>Ouderenzorg</th>
<th>POH Somatiek</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 %</td>
<td>0 %</td>
<td></td>
</tr>
</tbody>
</table>


- Luifelijk
- Mannetlik Geslacht
- Lage Sociale Klasie
- Aantal consulten in jaar van verzekerde
- Verzekerd maakt gebruk van GGZ
- Verzekerde heeft gebruik gemaakt van ziekenhuiszorg
- Verzekerde maakt gebruik van Wijkverpleging

8. Staat u open voor een meeting om tot en consensus te komen?

- Ja
- Ja, maar alleen digitaal
- Nee

9. Heeft u nog opmerkingen?
## H) Results questionnaires

<table>
<thead>
<tr>
<th>1st</th>
<th>Minimal Value 2013</th>
<th>Min 2013</th>
<th>Excl Inschrijf %</th>
<th>Max Value 2013</th>
<th>Max 2013</th>
<th>Excl Inschrijf %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>€ 67.310.425</td>
<td>2,5%</td>
<td>4,0%</td>
<td>€ 712.682.176</td>
<td>26,4%</td>
<td>42,3%</td>
</tr>
<tr>
<td>Sc</td>
<td>€ 102.338.846</td>
<td>3,8%</td>
<td>6,1%</td>
<td>€ 230.603.068</td>
<td>8,5%</td>
<td>13,7%</td>
</tr>
<tr>
<td>Ma</td>
<td>€ 98.198.036</td>
<td>3,6%</td>
<td>5,8%</td>
<td>€ 498.541.237</td>
<td>18,5%</td>
<td>29,6%</td>
</tr>
<tr>
<td>Ep</td>
<td>€ 205.050.978</td>
<td>7,6%</td>
<td>12,2%</td>
<td>€ 697.885.549</td>
<td>25,8%</td>
<td>41,4%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1st</th>
<th>Minimal Value 2014</th>
<th>Min 2014</th>
<th>Excl Inschrijf %</th>
<th>Max Value 2014</th>
<th>Max 2014</th>
<th>Excl Inschrijf %</th>
</tr>
</thead>
<tbody>
<tr>
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<td>4,3%</td>
<td>€ 777.399.844</td>
<td>28,8%</td>
<td>46,2%</td>
</tr>
<tr>
<td>Sc</td>
<td>€ 146.359.609</td>
<td>5,4%</td>
<td>8,7%</td>
<td>€ 257.054.930</td>
<td>9,5%</td>
<td>15,3%</td>
</tr>
<tr>
<td>Ma</td>
<td>€ 106.224.871</td>
<td>3,9%</td>
<td>6,3%</td>
<td>€ 543.471.134</td>
<td>20,1%</td>
<td>32,3%</td>
</tr>
<tr>
<td>Ep</td>
<td>€ 223.668.372</td>
<td>8,3%</td>
<td>13,3%</td>
<td>€ 760.806.105</td>
<td>28,2%</td>
<td>45,2%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1st</th>
<th>Minimal Value 2015</th>
<th>Min 2015</th>
<th>Excl Inschrijf %</th>
<th>Max Value 2015</th>
<th>Max 2015</th>
<th>Excl Inschrijf %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>€ 64.945.843</td>
<td>2,4%</td>
<td>3,9%</td>
<td>€ 695.276.846</td>
<td>25,7%</td>
<td>41,3%</td>
</tr>
<tr>
<td>Sc</td>
<td>€ 116.667.220</td>
<td>4,3%</td>
<td>6,9%</td>
<td>€ 264.084.917</td>
<td>9,8%</td>
<td>15,7%</td>
</tr>
<tr>
<td>Ma</td>
<td>€ 125.744.936</td>
<td>4,7%</td>
<td>7,5%</td>
<td>€ 500.868.594</td>
<td>18,5%</td>
<td>29,7%</td>
</tr>
<tr>
<td>Ep</td>
<td>€ 209.814.541</td>
<td>7,8%</td>
<td>12,5%</td>
<td>€ 679.267.094</td>
<td>25,1%</td>
<td>40,3%</td>
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</tbody>
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<table>
<thead>
<tr>
<th>2nd</th>
<th>Min 2013</th>
<th>Min 2013</th>
<th>Excl Inschrijf %</th>
<th>Max Value 2013</th>
<th>Max 2013</th>
<th>Excl Inschrijf %</th>
</tr>
</thead>
<tbody>
<tr>
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<td>4,6%</td>
<td>7,4%</td>
<td>€ 680.256.977,00</td>
<td>25,2%</td>
<td>40,4%</td>
</tr>
<tr>
<td>Sc</td>
<td>€ 149.215.327,20</td>
<td>5,5%</td>
<td>8,9%</td>
<td>€ 350.956.722,15</td>
<td>13,0%</td>
<td>20,8%</td>
</tr>
<tr>
<td>Ma</td>
<td>€ 133.808.388,81</td>
<td>4,7%</td>
<td>7,9%</td>
<td>€ 464.328.874,25</td>
<td>17,2%</td>
<td>27,6%</td>
</tr>
<tr>
<td>Ep</td>
<td>€ 269.583.337,95</td>
<td>10,0%</td>
<td>16,0%</td>
<td>€ 658.783.656,60</td>
<td>24,4%</td>
<td>39,1%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2nd</th>
<th>Minimal Value 2014</th>
<th>Min 2014</th>
<th>Excl Inschrijf %</th>
<th>Max Value 2014</th>
<th>Max 2014</th>
<th>Excl Inschrijf %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>€ 133.051.614,92</td>
<td>4,5%</td>
<td>7,1%</td>
<td>€ 740.362.676,75</td>
<td>25,2%</td>
<td>39,4%</td>
</tr>
<tr>
<td>Sc</td>
<td>€ 196.130.001,95</td>
<td>6,7%</td>
<td>10,4%</td>
<td>€ 382.751.015,50</td>
<td>13,1%</td>
<td>20,4%</td>
</tr>
<tr>
<td>Ma</td>
<td>€ 145.278.528,85</td>
<td>5,0%</td>
<td>7,7%</td>
<td>€ 506.460.870,20</td>
<td>17,3%</td>
<td>27,0%</td>
</tr>
<tr>
<td>Ep</td>
<td>€ 289.094.566,78</td>
<td>9,9%</td>
<td>15,4%</td>
<td>€ 716.513.856,75</td>
<td>24,4%</td>
<td>38,2%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2nd</th>
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<th>Min 2015</th>
<th>Excl Inschrijf %</th>
<th>Max Value 2015</th>
<th>Max 2015</th>
<th>Excl Inschrijf %</th>
</tr>
</thead>
<tbody>
<tr>
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<td>7,0%</td>
<td>€ 660.206.889,65</td>
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<td>37,4%</td>
</tr>
<tr>
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<td>5,8%</td>
<td>9,3%</td>
<td>€ 348.716.416,55</td>
<td>12,3%</td>
<td>19,7%</td>
</tr>
<tr>
<td>Ma</td>
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<td>5,7%</td>
<td>9,2%</td>
<td>€ 464.817.791,40</td>
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<td>26,3%</td>
</tr>
<tr>
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<td>€ 270.538.785,55</td>
<td>9,5%</td>
<td>15,3%</td>
<td>€ 637.443.924,55</td>
<td>22,5%</td>
<td>36,1%</td>
</tr>
</tbody>
</table>
I) Programming code of Macros in Spreadsheet Model

The following text is the VBA code used for running the spreadsheet model. It can be used to see what action to which cell is done.

```vba
Sub ChangeInput_Click()
On Error GoTo 1
ActiveWorkbook.FollowHyperlink (ActiveWorkbook.Path & "\Ontology.csv"), NewWindow:=True
Exit Sub
1: MsgBox Err.Description
End Sub
Sub Prepare_Click()
Call Step1_Click
Call Step2_Click
End Sub
Sub Step2_Click()
On Error GoTo 1
ActiveWorkbook.FollowHyperlink (ActiveWorkbook.Path & "\R code used part.R"), NewWindow:=True
Exit Sub
1: MsgBox Err.Description
End Sub
Sub RUN_Click()
On Error Resume Next
Call ClearYZA_Click
Call YPrev_Click
Call ZPrev_Click
Call AAPrev_Click
Call YTotal_Click
Call ZTotal_Click
Call Y2013_Click
Call Z2014_Click
Call AA2015_Click
End Sub
Sub Y5_Click()
myFile = "C:\..\Doubt131.csv"
Open myFile For Input As #1
Do Until EOF(1)
  Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("Y5").Value = Mid(text, pos, 11)
End Sub
Sub Y6_Click()
myFile = "C:\..\Doubt132.csv"
Open myFile For Input As #1
Do Until EOF(1)
  Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("Y6").Value = Mid(text, pos, 11)
End Sub
Sub Y7_Click()
myFile = "C:\..\Doubt133.csv"
Open myFile For Input As #1
Do Until EOF(1)
  Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("Y7").Value = Mid(text, pos, 11)
End Sub
Sub Y8_Click()
myFile = "C:\..\Doubt134.csv"
Open myFile For Input As #1
Do Until EOF(1)
  Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("Y8").Value = Mid(text, pos, 11)
End Sub
Sub Y9_Click()
myFile = "C:\..\Doubt135.csv"
Open myFile For Input As #1
Do Until EOF(1)
  Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("Y9").Value = Mid(text, pos, 11)
End Sub
Sub Y10_Click()
```

```
myFile = "C:\..\Doubt136.csv"
Open myFile For Input As #1
Do Until EOF(1)
  Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, "]")
ActiveWorkbook.Sheets(1).Range("Y10").Value = Mid(text, pos, 11)
End Sub

Sub Y11_Click()
myFile = "C:\..\Doubt137.csv"
Open myFile For Input As #1
Do Until EOF(1)
  Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, "]")
ActiveWorkbook.Sheets(1).Range("Y11").Value = Mid(text, pos, 11)
End Sub

Sub Y12_Click()
myFile = "C:\..\Doubt138.csv"
Open myFile For Input As #1
Do Until EOF(1)
  Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, "]")
ActiveWorkbook.Sheets(1).Range("Y12").Value = Mid(text, pos, 11)
End Sub

Sub Y13_Click()
myFile = "C:\..\Doubt139.csv"
Open myFile For Input As #1
Do Until EOF(1)
  Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, "]")
ActiveWorkbook.Sheets(1).Range("Y13").Value = Mid(text, pos, 11)
End Sub

Sub Y14_Click()
myFile = "C:\..\Doubt1310.csv"
Open myFile For Input As #1
Do Until EOF(1)
  Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, "]")
ActiveWorkbook.Sheets(1).Range("Y14").Value = Mid(text, pos, 11)
End Sub

Sub Y15_Click()
myFile = "C:\..\Doubt1311.csv"
Open myFile For Input As #1
Do Until EOF(1)
  Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, "]")
ActiveWorkbook.Sheets(1).Range("Y15").Value = Mid(text, pos, 11)
End Sub

Sub Y16_Click()
myFile = "C:\..\Doubt1312.csv"
Open myFile For Input As #1
Do Until EOF(1)
  Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, "]")
ActiveWorkbook.Sheets(1).Range("Y16").Value = Mid(text, pos, 11)
End Sub

Sub Y17_Click()
myFile = "C:\..\Doubt1313.csv"
Open myFile For Input As #1
Do Until EOF(1)
  Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, "]")
ActiveWorkbook.Sheets(1).Range("Y17").Value = Mid(text, pos, 11)
End Sub

Sub Y18_Click()
myFile = "C:\..\Doubt1314.csv"
Open myFile For Input As #1
Do Until EOF(1)
  Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, "]")
ActiveWorkbook.Sheets(1).Range("Y18").Value = Mid(text, pos, 11)
End Sub

Sub Y19_Click()
myFile = "C:\..\Doubt1315.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
    text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("Y19").Value = Mid(text, pos, 11)
End Sub

Sub Y20_Click()
myFile = "C:\..\Doubt1316.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
    text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("Y20").Value = Mid(text, pos, 11)
End Sub

Sub Y21_Click()
myFile = "C:\..\Doubt1317.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
    text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("Y21").Value = Mid(text, pos, 11)
End Sub

Sub Y22_Click()
myFile = "C:\..\Doubt1318.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
    text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("Y22").Value = Mid(text, pos, 11)
End Sub

Sub Y23_Click()
myFile = "C:\..\Doubt1319.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
    text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("Y23").Value = Mid(text, pos, 11)
End Sub

Sub Y24_Click()
myFile = "C:\..\Doubt1320.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
    text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("Y24").Value = Mid(text, pos, 11)
End Sub

Sub Y25_Click()
myFile = "C:\..\Doubt1321.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
    text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("Y25").Value = Mid(text, pos, 11)
End Sub

Sub Y26_Click()
myFile = "C:\..\Doubt1322.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
    text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("Y26").Value = Mid(text, pos, 11)
End Sub

Sub Y27_Click()
myFile = "C:\..\Doubt1323.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
    text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("Y27").Value = Mid(text, pos, 11)
End Sub
ActiveWorkbook.Sheets(1).Range("Y27").Value = Mid(text, pos, 11)
End Sub

Sub YPrev_Click()
myFile = "C:\\Prevention13.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
    text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("Y1").Value = Mid(text, pos, 11)
End Sub

Sub Y2013_Click()
call Y5_Click
Call Y6_Click
Call Y7_Click
Call Y8_Click
Call Y9_Click
Call Y10_Click
Call Y11_Click
Call Y12_Click
Call Y13_Click
Call Y14_Click
Call Y15_Click
Call Y16_Click
Call Y17_Click
Call Y18_Click
Call Y19_Click
Call Y20_Click
Call Y21_Click
Call Y22_Click
Call Y23_Click
Call Y24_Click
Call Y25_Click
Call Y26_Click
Call Y27_Click
End Sub

Sub Z5_Click()
myFile = "C:\\Doubt141.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
    text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("Z5").Value = Mid(text, pos, 11)
End Sub

Sub Z6_Click()
myFile = "C:\\Doubt142.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
    text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("Z6").Value = Mid(text, pos, 11)
End Sub

Sub Z7_Click()
myFile = "C:\\Doubt143.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
    text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("Z7").Value = Mid(text, pos, 11)
End Sub

Sub Z8_Click()
myFile = "C:\\Doubt144.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
    text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("Z8").Value = Mid(text, pos, 11)
End Sub

Sub Z9_Click()
myFile = "C:\\Doubt145.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
    text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("Z9").Value = Mid(text, pos, 11)
End Sub

Sub Z10_Click()
myFile = "C:\\Doubt146.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
    text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("Z10").Value = Mid(text, pos, 11)
End Sub
Sub Z11_Click()
    myFile = "C:\\Doubt147.csv"
    Open myFile For Input As #1
    Do Until EOF(1)
        Line Input #1, textline
        text = text & textline
    Loop
    Close #1
    pos = InStr(text, ""
    ActiveWorkbook.Sheets(1).Range("Z11").Value = Mid(text, pos, 11)
End Sub

Sub Z12_Click()
    myFile = "C:\\Doubt148.csv"
    Open myFile For Input As #1
    Do Until EOF(1)
        Line Input #1, textline
        text = text & textline
    Loop
    Close #1
    pos = InStr(text, ""
    ActiveWorkbook.Sheets(1).Range("Z12").Value = Mid(text, pos, 11)
End Sub

Sub Z13_Click()
    myFile = "C:\\Doubt149.csv"
    Open myFile For Input As #1
    Do Until EOF(1)
        Line Input #1, textline
        text = text & textline
    Loop
    Close #1
    pos = InStr(text, ""
    ActiveWorkbook.Sheets(1).Range("Z13").Value = Mid(text, pos, 11)
End Sub

Sub Z14_Click()
    myFile = "C:\\Doubt1410.csv"
    Open myFile For Input As #1
    Do Until EOF(1)
        Line Input #1, textline
        text = text & textline
    Loop
    Close #1
    pos = InStr(text, ""
    ActiveWorkbook.Sheets(1).Range("Z14").Value = Mid(text, pos, 11)
End Sub

Sub Z15_Click()
    myFile = "C:\\Doubt1411.csv"
    Open myFile For Input As #1
    Do Until EOF(1)
        Line Input #1, textline
        text = text & textline
    Loop
    Close #1
    pos = InStr(text, ""
    ActiveWorkbook.Sheets(1).Range("Z15").Value = Mid(text, pos, 11)
End Sub

Sub Z16_Click()
    myFile = "C:\\Doubt1412.csv"
    Open myFile For Input As #1
    Do Until EOF(1)
        Line Input #1, textline
        text = text & textline
    Loop
    Close #1
    pos = InStr(text, ""
    ActiveWorkbook.Sheets(1).Range("Z16").Value = Mid(text, pos, 11)
End Sub

Sub Z17_Click()
    myFile = "C:\\Doubt1413.csv"
    Open myFile For Input As #1
    Do Until EOF(1)
        Line Input #1, textline
        text = text & textline
    Loop
    Close #1
    pos = InStr(text, ""
    ActiveWorkbook.Sheets(1).Range("Z17").Value = Mid(text, pos, 11)
End Sub

Sub Z18_Click()
    myFile = "C:\\Doubt1414.csv"
    Open myFile For Input As #1
    Do Until EOF(1)
        Line Input #1, textline
        text = text & textline
    Loop
    Close #1
    pos = InStr(text, ""
    ActiveWorkbook.Sheets(1).Range("Z18").Value = Mid(text, pos, 11)
End Sub

Sub Z19_Click()
    myFile = "C:\\Doubt1415.csv"
    Open myFile For Input As #1
    Do Until EOF(1)
        Line Input #1, textline
        text = text & textline
    Loop
    Close #1
    pos = InStr(text, ""
    ActiveWorkbook.Sheets(1).Range("Z19").Value = Mid(text, pos, 11)
End Sub
ActiveWorkbook.Sheets(1).Range("Z19").Value = Mid(text, pos, 11)
End Sub

Sub Z20_Click()
myFile = "C:\\Doubt1416.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("Z20").Value = Mid(text, pos, 11)
End Sub

Sub Z21_Click()
myFile = "C:\\Doubt1417.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("Z21").Value = Mid(text, pos, 11)
End Sub

Sub Z22_Click()
myFile = "C:\\Doubt1418.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("Z22").Value = Mid(text, pos, 11)
End Sub

Sub Z23_Click()
myFile = "C:\\Doubt1419.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("Z23").Value = Mid(text, pos, 11)
End Sub

Sub Z24_Click()
myFile = "C:\\Doubt1420.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("Z24").Value = Mid(text, pos, 11)
End Sub

Sub Z25_Click()
myFile = "C:\\Doubt1421.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("Z25").Value = Mid(text, pos, 11)
End Sub

Sub Z26_Click()
myFile = "C:\\Doubt1422.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("Z26").Value = Mid(text, pos, 11)
End Sub

Sub Z27_Click()
myFile = "C:\\Doubt1423.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("Z27").Value = Mid(text, pos, 11)
End Sub

Sub ZPrev_Click()
myFile = "C:\\Prevention14.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
text = text & textline
Loop
Close #1
Sub Z2014_Click()
Call Z5_Click
Call Z6_Click
Call Z7_Click
Call Z8_Click
Call Z9_Click
Call Z10_Click
Call Z11_Click
Call Z12_Click
Call Z13_Click
Call Z14_Click
Call Z15_Click
Call Z16_Click
Call Z17_Click
Call Z18_Click
Call Z19_Click
Call Z20_Click
Call Z21_Click
Call Z22_Click
Call Z23_Click
Call Z24_Click
Call Z25_Click
Call Z26_Click
Call Z27_Click
End Sub

Sub AA5_Click()
myFile = "C:\..\Doubt151.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
    text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("AA5").Value = Mid(text, pos, 11)
End Sub

Sub AA6_Click()
myFile = "C:\..\Doubt152.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
    text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("AA6").Value = Mid(text, pos, 11)
End Sub

Sub AA7_Click()
myFile = "C:\..\Doubt153.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
    text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("AA7").Value = Mid(text, pos, 11)
End Sub

Sub AA8_Click()
myFile = "C:\..\Doubt154.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
    text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("AA8").Value = Mid(text, pos, 11)
End Sub

Sub AA9_Click()
myFile = "C:\..\Doubt155.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
    text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("AA9").Value = Mid(text, pos, 11)
End Sub

Sub AA10_Click()
myFile = "C:\..\Doubt156.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
    text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("AA10").Value = Mid(text, pos, 11)
End Sub

Sub AA11_Click()
myFile = "C:\..\Doubt157.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
    text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("AA11").Value = Mid(text, pos, 11)
End Sub

Sub AA12_Click()
myFile = "C:\\Doubt158.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("AA12").Value = Mid(text, pos, 11)
End Sub

Sub AA13_Click()
myFile = "C:\\Doubt159.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("AA13").Value = Mid(text, pos, 11)
End Sub

Sub AA14_Click()
myFile = "C:\\Doubt1510.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("AA14").Value = Mid(text, pos, 11)
End Sub

Sub AA15_Click()
myFile = "C:\\Doubt1511.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("AA15").Value = Mid(text, pos, 11)
End Sub

Sub AA16_Click()
myFile = "C:\\Doubt1512.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("AA16").Value = Mid(text, pos, 11)
End Sub

Sub AA17_Click()
myFile = "C:\\Doubt1513.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("AA17").Value = Mid(text, pos, 11)
End Sub

Sub AA18_Click()
myFile = "C:\\Doubt1514.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("AA18").Value = Mid(text, pos, 11)
End Sub

Sub AA19_Click()
myFile = "C:\\Doubt1515.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("AA19").Value = Mid(text, pos, 11)
End Sub

Sub AA20_Click()
pos = InStr(text, """)
ActiveWorkbook.Sheets(1).Range("AA20").Value = Mid(text, pos, 11)
End Sub

Sub AA21_Click()
myFile = "C:\Doubt1517.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, """)
ActiveWorkbook.Sheets(1).Range("AA21").Value = Mid(text, pos, 11)
End Sub

Sub AA22_Click()
myFile = "C:\Doubt1518.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, """)
ActiveWorkbook.Sheets(1).Range("AA22").Value = Mid(text, pos, 11)
End Sub

Sub AA23_Click()
myFile = "C:\Doubt1519.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, """)
ActiveWorkbook.Sheets(1).Range("AA23").Value = Mid(text, pos, 11)
End Sub

Sub AA24_Click()
myFile = "C:\Doubt1520.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, """)
ActiveWorkbook.Sheets(1).Range("AA24").Value = Mid(text, pos, 11)
End Sub

Sub AA25_Click()
myFile = "C:\Doubt1521.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, """)
ActiveWorkbook.Sheets(1).Range("AA25").Value = Mid(text, pos, 11)
End Sub

Sub AA26_Click()
myFile = "C:\Doubt1522.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, """)
ActiveWorkbook.Sheets(1).Range("AA26").Value = Mid(text, pos, 11)
End Sub

Sub AA27_Click()
myFile = "C:\Doubt1523.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, """)
ActiveWorkbook.Sheets(1).Range("AA27").Value = Mid(text, pos, 11)
End Sub

Sub AAPrev_Click()
myFile = "C:\Prevention15.csv"
Open myFile For Input As #1
Do Until EOF(1)
    Line Input #1, textline
text = text & textline
Loop
Close #1
pos = InStr(text, """)
ActiveWorkbook.Sheets(1).Range("AA1").Value = Mid(text, pos, 11)
End Sub
Sub AA2015_Click()
Call AA5_Click
Call AA6_Click
Call AA7_Click
Call AA8_Click
Call AA9_Click
Call AA10_Click
Call AA11_Click
Call AA12_Click
Call AA13_Click
Call AA14_Click
Call AA15_Click
Call AA16_Click
Call AA17_Click
Call AA18_Click
Call AA19_Click
Call AA20_Click
Call AA21_Click
Call AA22_Click
Call AA23_Click
Call AA24_Click
Call AA25_Click
Call AA26_Click
Call AA27_Click
End Sub

Sub YTotal_Click()
myFile = "C:\..\GPTotal13.csv"
Open myFile For Input As #1
Do Until EOF(1)
Line Input #1, textline
    text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("Y30").Value = Mid(text, pos, 11)
End Sub

Sub ZTotal_Click()
myFile = "C:\..\GPTotal14.csv"
Open myFile For Input As #1
Do Until EOF(1)
Line Input #1, textline
    text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("Z30").Value = Mid(text, pos, 11)
End Sub

Sub AATotal_Click()
myFile = "C:\..\GPTotal15.csv"
Open myFile For Input As #1
Do Until EOF(1)
Line Input #1, textline
    text = text & textline
Loop
Close #1
pos = InStr(text, "")
ActiveWorkbook.Sheets(1).Range("AA30").Value = Mid(text, pos, 11)
End Sub

Sub ClearYZAA_Click()
Range("Y5:AA27").ClearContents
End Sub

Sub Step1_Click()
On Error GoTo 1
    KILL "C:\..\*.*
Exit Sub
1: MsgBox Err.Description
End Sub

Sub Grafiek13_Klikken_Click()
MsgBox "Made by Perry Maas"
End Sub

Sub Grafiek14_Klikken_Click()
MsgBox "Made by Perry Maas"
End Sub

Sub TU_Click_Click()
ActiveWorkbook.FollowHyperlink Address:="http://www.tue.nl"
End Sub

Sub ZN_Click_Click()
ActiveWorkbook.FollowHyperlink Address:="http://www.zn.nl"
End Sub