BSc Thesis

The efficiency of telehealthcare within the domiciliary care chain.

Lotte Peeters
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Final Version

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Introduction

Healthcare is the world's largest industry, counting for some three trillion US dollars annually. Yet this vast and essential industry is plagued by gross inefficiencies, inequities and quality variations (Mort, Finch & May, 2009).
It is suggested that automation of the healthcare can help the entire health care systemregarding to accessibility and costs (Deen, 2010) by decreasing stringent inefficiencies. Thus, it is stated that automation of services and treatment can improve the efficiency of the supply chain of health by removing inefficiencies. By atomising the core business of healthcare, providing good quality of care, can be increased. There will be less time spent on bureaucracy, travelling and waiting for a patient/ specialist and more time can be spent on actual care of a patient. This also sounds promising for the future, as the need for care is increasing very fast, whilst the capacity of the health care sector is decreasing due to lack of employment because of an ageing population.

One of the new innovations within automation of the health care is telehealthcare. Telehealthcare is an emerging concept in the health care and in general it can be seen as care at a distance provided through technological devices which have to be used by both the client and the health professional. It is an emerging concept although it already lived through some developments the last twenty years. In 1990 the transition from paper to digital files started. Since 2000 the registration of digital files started to form a unity. Moreover, since 2000 the entire automation of healthcare started. Since 2005 web-based applications are used for joint files. After all this, the emergence of telehealthcare really started in 2007; Patient and health professional are separated more and more in terms of time and location (Schrijvers, 2010).

The concept of telehealthcare is longest known and already accepted in the domiciliary care. Here healthcare via multimedia and technological devices is mainly used for social purposes and for consultations and appointments with a social character rather than for medical purposes. Moreover, it is stated that telehealthcare in the domiciliary care sector is inevitable as the group who needs domiciliary care is increasing. It is claimed that telehealthcare makes the chain from patient to health professional and the access to care more efficient (Paschier & Peeters, 2007).

It is known that a lot of inefficiencies influence the health care chain of the Netherlands. Multiple times it is stated that automation can decrease the inefficiencies and inequities through telehealthcare. But is this really the case? Little evidence exists about whether automation of the health care chain through telehealthcare decreases inefficiencies in health care chain. Therefore, the goal of this research paper is to look at the health care chain and its inefficiency problems in the chain and to look for possible solutions telehealthcare can offer in reducing these inefficiencies.

Although the main reason for automation of the health care chain is to eventually improve the quality of care, thus improve effectiveness, this research paper will only be looking at the efficiency-aspect of telehealthcare. There will be no elaboration on the effectiveness of telehealthcare and whether it increases quality of care, because research about effectiveness of telehealthcare has been done several times, for instance in studies like: "The development and

effectiveness of telecare from an integrated technological, humanistic and management perspective" by Taber-Doughty, T. Nevertheless, a topic that will be discussed within this thesis is the client experience. This topic cannot be neglected as it constantly pops up in research about telehealthcare.

Furthermore, this research paper will focus on the sector that is most familiar with telehealthcare and, according to existing literature, is most ready for it as multiple pilots have been done in this sector (Paschier et al., 2007). This sector is the sector of domiciliary care. By gathering all kinds of information about telehealthcare it became clear that the domiciliary care sector is the sector with the most experiences of telehealthcare. By using this sector as research area for the research paper it is thought that most information and data about telehealthcare can be gathered to investigate the capabilities of telehealthcare to decrease inefficiencies in the health care chain, and especially in the domiciliary care chain.

Knowing all this, the following research objective can be formulated:
"The aim of this study is to analyse to what extend telehealthcare is suitable for the solving of the inefficiencies present in the health care chain."
This is done by analyzing the inefficiencies present in the domiciliary care chain and by giving insights about the applications of telehealthcare that increase efficiency in this chain by identifying (best) practices of telehealthcare. This study will be a practice and theory based study. In order to reach the aim of the study it is necessary to clarify research questions and to point out data is needed to answer these questions. A central research question and multiple sub questions are formulated.

The central question is:
"To what extend is telehealthcare a good method to increase efficiency in the domiciliary care chain?"

The sub questions that have to lead to a sufficient answering of the central question are:
1.1. *What is telehealthcare?*
1.2. *Which processes are involved with telehealthcare in the health care chain?*
2.1. *What is efficiency?*
2.2. *How can efficiency be measured?*
3. *Which inefficiencies are present in the health care chain?*
4. *Which inefficiencies are present in the domiciliary care chain?*
5. *An overview of forms of telehealthcare within the domiciliary care sector*.
6. *Which opportunities for improvement can telehealthcare offer within the domiciliary care sector?*

The justification of this thesis is done by looking at the social, scientific and practical relevance of the findings of this thesis.
Social relevance: As a growing demand for care is present in the entire health care chain, whilst the labour force which has to provide this care is declining it is necessary to look for opportunities that increase the capacity of the workforce. Telehealthcare has the potential to be one of the opportunities that increases the capacity of the workforce without increasing the amount of personnel, as telehealthcare has the potential to shorten time spent within the care

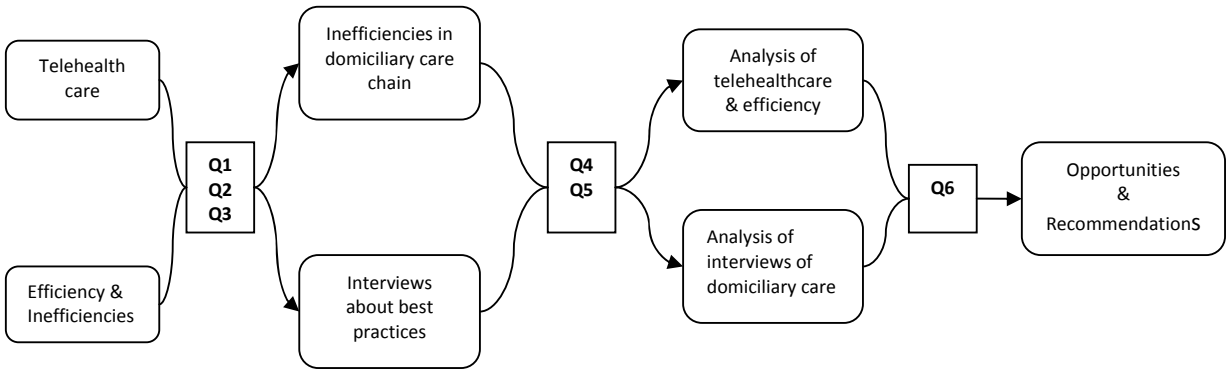
chain from health professional to client. If it can be proven that telehealthcare really is a sufficient opportunity, then this thesis is relevant for the entire society.
Scientific relevance: Little literature exists about telehealthcare and its potential to increase efficiency within the health care chain. As the goal of this thesis is to look to what extend telehealthcare increases the efficiency of the health care chain, it contributes to the existing knowledge about this topic. This thesis can give new insights about telehealthcare and its potential.
Practical relevance: The thesis includes an empirical part. This means that real life experiences about the use of telehealthcare are analysed. It shows examples of how telehealthcare is used in some organisations and gives information about the best way telehealthcare can be used. Therefore it gives information that is relevant when telehealthcare is implemented within an organisation. Thus, this thesis gives insight about the practical use of telehealthcare within a domiciliary care organisation, which can be used when an organisation wants to implement telehealthcare.

Now that the introduction of this thesis is given, the next thing that has to be done is to give an overview of the methods & materials used to constitute this thesis.

Methods & Materials

The research framework below shows the research model of this study. It shows which four steps have to be taken to gather sufficient information to reach the objective of this research. Furthermore, it shows the connection between the different steps and the related sub questions that together constitute the answering of the central question.

1. Literature 2. Empirical 3.Analysis 4. Analyze



1. The literature study

The first study that will be done is a literature study about two topics. Literature will be gathered about the topic telehealthcare; what is telehealthcare? Which approaches and forms of telehealthcare exist? And which definition of telehealthcare will be used in this study? Another topic literature will be gathered on is the supply chain of the health care. Within this topic the emphasis will be on inefficiencies of this chain. Here the questions will be; what is efficiency? And how will efficiency be defined and measured in this study? Furthermore the question will be what inefficiencies exist in the health care chain? Eventually, these two topics create a theoretical background for the entire study. It marks out the research area and it defines the relevant information for the following research that will be done.

2. The empirical study

The focus of the second study is more in-depth on the chain of the domiciliary care sector. Since the concept telehealthcare and its inefficiencies are defined in the previous literature study, now an even better theoretical framework can be constituted, as the focus of this study will first be on the gathering of literature regarding the inefficiencies in the domiciliary care. After this is done, the next step is to do an empirical study. The main goal of this empirical study is the gathering of best practices of telehealthcare regarding inefficiencies in the domiciliary care chain and the opportunities for improvements regarding these inefficiencies. Also client experience is a topic of interest. Interrogation through in-depth interviews is used to gather information regarding the main goal. The target is to interview three health managers of an organisation in the domiciliary care sector of the Dutch health care system. These managers work with telehealthcare in practice and are seen as experts to generalise the entire domiciliary care sector. The health managers being interviewed are selected based on whether they use

telehealthcare in their organisation. The managers are initially contacted by phone or e-mail to ask for a face-to-face interview. The interviews are recorded with audio-device to make sure no information slipped away. Furthermore, the interview questions are formulated in Dutch and are asked in Dutch, because this is the mother language of both interviewer and participant. The topic list of the interviews is shown in appendix I.

3. Analysis

After the interviews are held, they are analyzed. There will be looked for differences and similarities and reasons for these differences and similarities are sought between the three organisations regarding the capability of telehealthcare to decrease inefficiencies in the domiciliary care. Furthermore, best practices and opportunities for improvement are analyzed regarding inefficiencies in the domiciliary chain by telehealthcare. The analysis of the interviews is translated into English. The original interviews are shown in appendix II.

4. Analyze

The central question will be answered in the conclusion. The next and last step of this study will be the analysis of the central question to give recommendations on how to apply telehealthcare in the domiciliary care sector to decrease existing inefficiencies. Also, if necessary, recommendations for further research will be given.

The research strategy of a study shows how the research is done within that study. The research strategy chosen within this thesis is a comparing case study with a hierarchical method. A case study is a study where an in-depth view is given about a limited number of cases. This is a labour-intensive approach which uses qualitative research methods. Here, the process of the in-depth study is the domiciliary care chain with a special interest for telehealthcare. The cases are three domiciliary care organisations that apply telehealthcare in their care. The latter tells why this case study is a comparing case study, because not a single case but three cases will be studied and compared. The sub variant of the comparing case study that is applied in this study is the hierarchical method. This method performs the study in two phases. The first phase is the studying of three independent cases. The second phase consists of the analysis of the answers of the interviews to compare the interviews with each other to identify potential differences and similarities. Explanations for the differences and similarities are sought and the best practices which are most efficiency-improving are identified. The reason this strategy is chosen is because there is not much information about best practices of telehealthcare related to efficiency. In intensively interrogating managers about their telehealthcare practices, new data is gathered and a better insight can be given about practical evidence of telehealthcare as a method to reduce inefficiencies.

Now that an introduction is made and the methods and materials are clarified, the results of this thesis will be constituted in the next chapters.

1.1 What is telehealthcare?

Telehealthcare is an emerging concept in the health care and in general it can be seen as care at a distance provided through technological devices which have to be used by both the client and the health professional.

Nevertheless, there is not one clear definition of this concept. Therefore, this section will give a clarification about the different characteristics telehealthcare has. It also clarifies which characteristics are most applicable to telehealthcare in the domiciliary care sector, as this is the field of research of this thesis. In doing this, the appropriate definition of telehealthcare for this thesis will be identified. The different characteristics that can be identified are clarified in the paragraphs below. In the last paragraph several definitions will be tested to finally constitute the appropriate definition of telehealthcare. In identifying the appropriate definition of telehealthcare the several characteristics of telehealthcare have to be present in the definition. We first start with the elaboration of several forms of telehealthcare.

1.1.1. Forms of telehealthcare.

There are several forms of telehealthcare present in the existing literature. The most familiar form of telehealthcare is the use of video or webcam for communication at distance between client and health professional. This communication is often supported by a data system and a touch screen. Another form of telehealthcare is the exchange of images of injuries and other clinical data through the use of e-mail. Also vital signs and sounds, like blood pressure and temperature are corresponded through the use of e-mail or an installed data system. Also domotica is a form of telehealthcare. This concerns technical devices that are installed at someone's home to the extend the time a client can live at home. Other forms of telehealthcare are; making appointments online, online consulting, the use of websites for information-sharing and telemonitoring. The latter is done with the use of a so called Medical Health Buddy that registers everything the client measures.

1.1.2. Addition to or substitution of regular care.

It has to be mentioned that there is a difference between telehealthcare being a substitute for 'regular' health care or an addition to 'regular' health care. The focus of this thesis will be on telehealthcare as a substitution of care, as we think this is best comparable to regular care. When there is regular care, there is no telehealthcare and when there is telehealthcare, there is no regular care. With telehealthcare being an addition on regular care it is very difficult to measure whether telehealthcare is responsible for the differences in efficiency, since the care is constituted out of both regular care and telehealthcare. Moreover, efficiency cannot be measured, as something new cannot be measured since there is not a situation with which it can be compared to. Thus, the focus of this thesis will be on telehealthcare as a substitution of regular care.

1.1.3. Care at distance.

Probably the most important characteristic of telehealthcare and the biggest difference with regular care is that telehealthcare is care at distance. This means that care is delivered while the client and the health professional are not in the same physical space. This, in most cases, means

that the client is at home and the health professional is at his own workplace. When identifying the appropriate definition of telehealthcare for this thesis, care at distance is one of the aspects that has to be mentioned in the definition.

1.1.4. Tailored care.

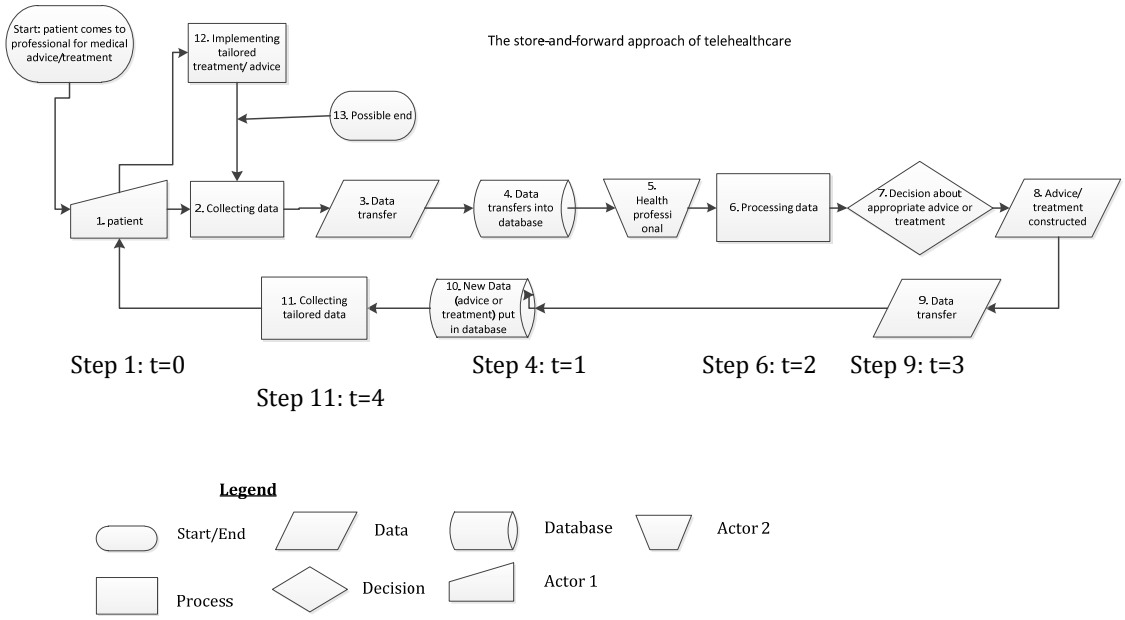
Another characteristic of telehealthcare specified to the domiciliary care sector is that the care is tailored. This means that the care provided by the health professional is personalised care and that the care is adjusted after every contact between the health professional and the client. When identifying the appropriate definition of telehealthcare, the definition has to include this characteristic of telehealthcare.

1.1.5. Two approaches.

There are two different approaches of telehealthcare. These approaches need to be distinguished to better explain the concept of telehealthcare.

The first approach is the asynchronous (store-and-forward) approach. This approach means that there is not a direct interaction between client and health professional at one specified moment (Mort et al, 2009). The care is taken out of 'real time'. "It is the processing and storage of images and data for subsequent transmission and review, for instance digital recording of photo's that need to be reviewed" (Williams et al., 2003). This form of telehealthcare is mostly used in specialties like dermatology, radiology and pathology.

We will picture the model of the 'store-and-forward' approach in a process map and explain the different steps in this approach. The map clarifies which steps both the client and the health professional take when using telehealthcare via the store-and-forward approach.

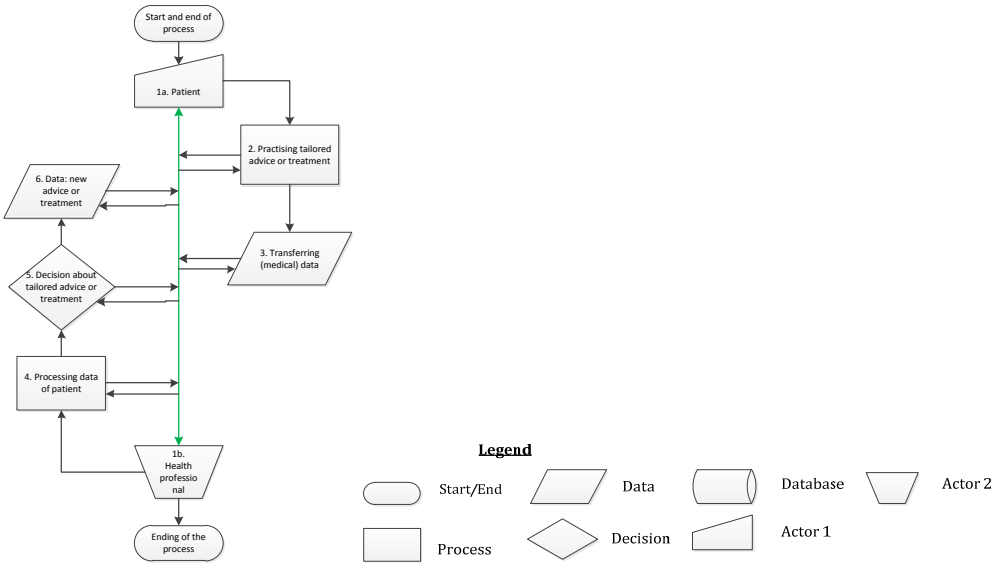


This approach starts at the client, because the client contacts an institution or health professional when he/she needs medical advice or treatment. So, the process starts at step 1. The client. T=time and t=0 at the client as the client starts this chain. t=1 at the moment the data enters the database. t=2 when the health professional picks up the data from the database. t=3 when the health professional puts the tailored advice back in the database. t=4 when the client

collects this advice. So, different t's are given which means that these activities happen at a different moment in time, asynchronously.

1. Client asks for care or information.
2. The client collects data regarding his/her medical problem. This data can vary from personal data about date of birth, sex, lifestyle factors like smoking or working environment to medical data like, blood levels for a thrombosis treatment, sugar levels for diabetes and so on.
3. The collected data is being transferred via internet (email) or via a system to a database.
4. The database stores the data. The data is only available for people involved in this care/information sharing process. So, It is only accessible for the client and health professional(s). This data can be stored for one hour, but also for two days.
5. The health professional logs into the database and collects the data whenever he/she needs it.
6. The data of the client is processed as the health professional examines the data and constitutes multiple alternatives about which treatment or advice has to be given to the client of concern.
7. A decision about the appropriate tailored advice/treatment has been made. This decision constitutes the advice/treatment of care that has to be given to the client.
8. The treatment/advice is being transformed into a clear message the client understands. It also has to be readable for the database, so the treatment/advice is put into the system or on to the internet.
9. The data is transferred from the health professional to the database.
10. Now, the tailored data is again available for both client and health professional and the client can pick up the data from the database whenever it is needed.
11. The client has to collect the tailored data given by the health professional.
12. After the collection of the tailored advice/treatment the client has to implement this advice or treatment in his/her lifestyle.
13. When the implementation is done correctly and the client is satisfied or does not need any care/treatment or advice anymore, the process ends. When this is not the case, the process starts all over again with collecting new medical data as a result of the implementation of the previous tailored advice/ treatment. The process is continued until eventually the medical problem is solved.

The other approach is the synchronous (interactive) approach. This approach means that there is, at a specified moment, direct contact between client and health professional, although client and health professional are not in the same physical space. The care is in 'real time' with "parallel transmission of clinical data", for example video conferencing systems to exchange documentary and still images like x-rays, ECG data, heart and lung sounds (Williams et al, 2002). This form of telehealthcare is mostly used in psychiatry/psychology, cardiology, trauma/emergency, home care/nursing (McLean, Protti & Sheikh, 2010).
We will also picture the 'interactive' approach in a process map and we will identify the steps involved in this approach. The picture clarifies which steps both the client and the health professional take when using this approach of telehealthcare.



This approach of telehealthcare starts with the client. The green line from client to health professional indicates that there is direct contact between the client and the health professional. t=0 for both actors in the chain and supplying, processing and delivering information or care is done synchronously. Also feedback (return) on all the steps can be given at t=0 synchronously as is indicated by the arrows back and forward to the central green line.

1a: The client makes direct contact with the health professional via a communication system (possibly on internet or new developed system).

1b: At the same time the health professional has contact with the client.

2. The client practises some advice or treatment the health professional has given. Feedback on the progress made in this process can be directly given to the health professional and back.

3. Also extra or new (medical) data is communicated through this communication system and reacted on directly by the health professional. For instance a client suffers from diabetes and presents his blood glucose level to his health professional through a technical device.

4. The health professional receives new data and processes it. In doing this it asks the client for additional data or interpretation of the data.

5. While talking with the client about all the information available, the health professional makes a decision about whether the tailored advice or treatment is sufficient and if additional advice/treatment will be given.

6. When the latter is the case, the new advice/treatment is communicated to the client. The client can react on it directly.

There will be an end to this process when both client and health professional have gathered enough information to continue the treatment.

Now that all characteristics of telehealthcare are explained, the definition of telehealthcare within this thesis has to be clarified. The definition will be about both approaches of telehealthcare, because both approaches are applied in the domiciliary care sector.

1.1.6. Testing several definitions.

We will identify the appropriate term for telehealthcare and we will clarify why this is the best term used for this form of care. Existing literature shows that different terms are used for

telehealthcare, namely telemedicine, telecare and e-health. These terms are used as synonyms for each other. This causes confusing, because there is a distinction between these terms.
Telemedicine is the technologies used to interact about medicine. This means that this concept includes technologies used for interaction between clients and specialist about medicine and excludes technologies about non-medicine communication. Because it only includes interaction about medicine, it is a subset of telehealthcare. Telecare is used to describe care which is facilitated by systems that are installed at a client's home. It is care at a distance. Telehealthcare is not only care through systems that are installed at a client's home. E-health is a synonym for telehealthcare. To be consistent and to mark out the research area for this thesis, the term telehealthcare is the only term used in this thesis.
Several definitions of telehealthcare are known in the existing literature and we will test multiple definitions on their completeness and appropriateness regarding this thesis.
One of the definitions of telehealthcare is: "Telehealth is the practice of healthcare delivery, diagnosis, consultation, treatment and transfer of medical data and education using interactive video, visual, audio and data telecommunication". (Varghese & Phillips, 2009)
The strong aspect of this definition is that it pictures telehealthcare as a chain. This complies with the interest of this thesis, namely the health care chain. Nevertheless, this definition also has weak aspects. Namely, it only emphasizes on the interactive approach of telehealthcare. Telehealthcare can also have a store-and-forward approach as explained above, which is also considered in this thesis. Moreover, this definition does not emphasize on the fact that telehealthcare is care at distance, which means the client and specialist are not in the same physical space when interacting via telehealthcare technologies. Therefore, this is not the appropriate definition of telehealthcare for this thesis and it will not be used.

Another frequently used definition is: 'Doing health care at distance' and employing technical artefacts, usually ICTs, to mobilise representations of and information about clients (Finch, Mort, Mair & May, 2007).
This definition is even less complete than the one mentioned above. It does not elaborate on the different approaches of telehealthcare (interactive or store-and-forward). Moreover, it is suggested that telehealthcare is only of convenience for specialists, as it mobilizes representations of and information about clients. This suggests that telehealthcare is used in one way, from specialist to client, whilst the self-management a client needs to have to communicate via telehealthcare is neglected. Furthermore, it does not state in which situations telehealthcare can be used. Can it be used in treatment? Or in consultation of a client? In giving advice to a client? Concluding, this definition is too general and too limited to clarify the concept of telehealthcare.

A third definition of telehealthcare is: "Personalized healthcare delivered over a distance; data are transferred from the client to the professional, who then provides feedback. This definition consists of three essential components, namely:
1. The client has to provide data that gives information about the illness, such as voice recordings, videos, oxygen saturation.
2. A healthcare professional receives the required data at a second location through electronic transfer of the information.
3. Clinical skills and judgment of the healthcare professional are used to provide personalised feedback tailored for the specific client." (McLean et al, 2010)

This definition gives a clear elaboration of telehealthcare and will be used to define telehealthcare in this thesis. One reason why this definition is chosen is because it emphasizes on personalised care and tailored advice. It is originally constituted for a disease with long-term conditions, but it is also applicable to the domiciliary care sector, which is the field of research. It is also applicable to this sector because most client-health professional relations in this sector are also long-term and the process of delivering care is seen as an on-going circle of essential key elements.
Another reason why this definition is chosen is because it complies with almost all the characteristics of telehealthcare that are presented in paragraph 1.1.1 to 1.1.4. Nevertheless, we will have to add one component to this definition, as this definition now only focuses on the store-and-forward approach, whilst it has to focus on both approaches. The component that will be added to the definition is:
4. The cycle of transmission of data and tailored advice can be present both in the interactive and in the store-and-forward approach.
By adding this fourth component the appropriate definition is constituted. The next thing that has to done is the clarification of the concept of telehealthcare from a supply chain perspective. What is a supply chain? What is a health supply chain and which processes are involved in the health supply chain are questions that will be answered in the next chapter.

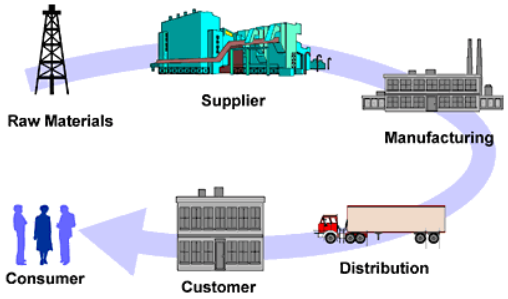
1.2 Which processes are involved with telehealthcare in the health care chain?

In this chapter we will first clarify what a supply chain is. Furthermore, to focus on the health care perspective the definition of a health care chain will be presented. Moreover, we will zoom in on the processes involved with telehealthcare and mark out the areas of interest for this thesis. In doing this, the research object, which is the domiciliary care sector, will be clarified in more detail.

1.2.1. What is a supply chain?

A supply chain is defined as: "A network of physical and decision making activities connected by material, information and money flows that cross organizational boundaries" (Van der Vorst, 2011). All stages of a supply chain are in(directly) involved in satisfying customer demand.

A visual presentation of a supply chain is shown below.



(Weber State University, 2011)

The arrow shows the direction of the process. A regular supply chain starts at the processing of raw materials. These raw materials are brought to or picked up by the supplier which delivers to the manufacturer. The manufacturer processes the raw material and adds value to it. It

changes it into a (finished) good. This good is distributed to the customer (for instance a retailer). If it is not a finished good yet, the customer will finish this process and constitute the finished good. Furthermore, the customer sells the good to the consumer. The consumer receives the finished good en its demand is answered.

Van der Vorst(2010) states that a key aspect of the design of a supply chain is that there is a trade-off between responsiveness and efficiency. Here responsiveness can also be seen as effectiveness. Effectiveness and responsiveness related to the way in which demand is satisfied. The better demand is satisfied, the higher the effectiveness. As stated earlier, a supply chain is designed to satisfy demand. The satisfaction of demand costs money, as a supply chain costs money. Efficiency of a supply chain is reached when the demand of a customer is satisfied with the least costs possible. On the other hand, responsiveness is also an important factor in satisfying the demand of the customer. The higher the responsiveness, the higher the satisfaction. Nevertheless, high responsiveness comes along with high costs, thus low efficiency. This means that in satisfying demand the right trade-off between responsiveness and efficiency has to be made. Features of responsiveness are: range of quantities needed; range of product types; ability to satisfy short lead times; ability to build/develop innovative products; ability to provide high service levels and low stock outs. Efficiency has one main feature, which is: the costs of the entire process of delivering a product to a customer (van der Vorst, 2011).
In the health care sector it is seen as more logical to look at effectiveness rather than to look at efficiency, because the core business of the health care sector is to cure patients as effective as possible. Nevertheless, we only focus on efficiency as we look at substitutes of regular care that are more efficient than regular care. Nevertheless these substitutes have to guarantee at least as much effectiveness as regular care, preferably even more.

After the elaboration on what is a supply chain, we now want to narrow done to the health care sector. The supply chain of this sector is called the health supply chain. This health supply chain is build up differently than a regular supply chain. That is why we would like to elaborate more on this chain.

1.2.2. What is a health supply chain?

In this paragraph the concept health supply chain will be clarified. Before identifying the definition of a health supply chain we give an overview of the differences between a 'regular' supply chain as explained above and a health supply chain. Vissers & Beech (2005) present a clear overview of the differences and similarities between 'regular' manufacturing operations and health care operations in the next table:

Table 1.2.2. Similarities and differences between manufacturing and health care operations.

Characteristics	*Manufacturing*	*Health care*
Object	Material flow	Patient flow
Specification of end-product requirements	Up-front specified	Subjective and fuzzy
Means of production	Equipment and staff	Equipment and staff
Buffers	Stock or lead-times	Waiting times and lead-times
Financial goal	Profit	Cost control
Market environment	Market competition	Limited market competition

(Vissers & Beech, 2005.)*Health management operations*, pag. 27)

As stated earlier, the core business of the health care chain is the patient flow. This characteristic accounts for the differences between the two operations in the table. Every patient has specific requirements, which is the reason why the specification of end-product requirements for health care is subjective and fuzzy. Also the buffers of the health care operations differ from the manufacturing operations. Care is not a commodity that can be stocked. Therefore the health care chain is constituted with waiting times and lead-times.

After this short introduction on the differences between the regular chain and the health care chain, the definition of the health care chain will be clarified. A health supply chain is defined as; "A series of operations, often performed in different units, that need to be performed to produce a particular service to the client (Vissers & Beech, 2005)." This chain of operations is the overall delivery process of treatment to a client. It includes both productive periods of activity and productive periods of waiting. Moreover, as a general supply chain refers to the flow of goods, the health supply chain refers to the flow of clients in the chain. Especially the latter characteristic is a distinctive characteristic of a health supply chain.

1.2.3. Focus within health supply chain.

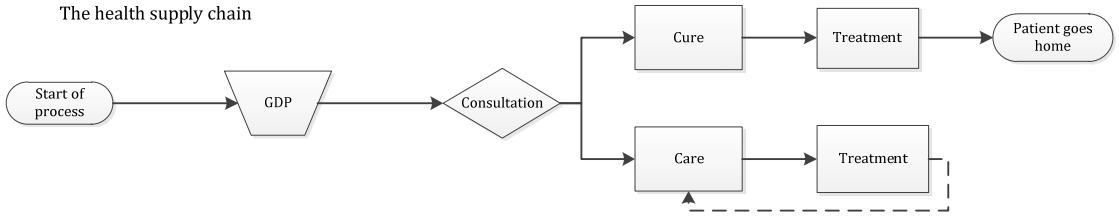
When funnelling the research area, the aspect we would like to address next is the identification of the level in which most efficiency can be gained when implementing telehealthcare in the care process within the domiciliary care sector. Before identifying this level, we will first elaborate the three levels that are present in the health supply chain (Vissers & Beech, 2005).

1. *Operational level*; day-to-day flow of the chain clients is managed through the 'client flow planning'. It, for instance, takes into account the number of clients in each phase and the lengths of the waiting lists for each phase.
2. *Tactical level*; 'care chain planning' facilitates the operational planning by ensuring that the resources available to the chain are enough to fulfil the targets for production and service. The 'demand chain planning' sets the parameters for the care chain planning, based on market information.
3. *Strategic level;* At this level decisions are made regarding the infrastructure of the care chain, for instance the lay-out of the chain and the participation of partners. Also the objectives and targets, which are the planning policies, are set for the chain.

These levels all related to each other and cannot work without each other. Within the health care sector the levels are interpreted as a bottom-up approach (from the operational level; to the tactical level; to the strategic level). The bottom-up approach means that higher levels of planning are based on the lower-level requirements and there should be built-in guarantees that these requirements are met.

The introduction of telehealthcare originates from the increasing demand for care, whilst capacity is decreasing (Deen, 2010). Telehealthcare is seen as an intervention to decrease time-consuming and unnecessary control moments and contact moments between client and health professional. Coming back at the question where most efficiency can be gained when implementing telehealthcare we focus on the level where telehealthcare is most involved. This is at the *operational level*, as the primary goal of telehealthcare is to increase efficiency regarding the care process. This efficiency can be gained by decreasing time spent on day-to-day activities, like travelling, treatment of clients and so on. Thus, by looking at the operational level

of domiciliary care organisations at which telehealthcare is implemented, efficiency gains can be established in relation to regular care.
Furthermore, a distinction that is made within this thesis is the distinction between the cure process and the care process. These terms are also often used as synonyms. They are much related to each other, but nevertheless there is a distinction between the two terms, as is visible in the flow chart below and in the definitions of both terms.



Cure can be defined in multiple ways. Nevertheless, all the different definitions can be combined into one general definition. This definition is: "Restoration to health of a person afflicted with a disease or other disorder. This cure is a course of therapy, a medication, a therapeutic measure, or another remedy used in treatment of a medical problem". (The American Heritage Medical Dictionary, 2007)
It can be concluded that curing is the treatment of a disease to eventually diminish this disease.
Care is defined as: "something to watch over or attend to; something to feel concern about or interest in; a feeling of responsibility (Webster's New World College Dictionary, 2010)". Care in a medical setting is also interpreted in this way. People that give medical care are responsible for watching over someone. Their treatment will not diminish the disease, but will make the living with the disease more tolerable and pleasant.
We mention this distinction as our focus is on the care process and not on the cure process. Both processes are present in the domiciliary care sector, as for instance wounds have to be treated and cured and also people have to receive help when showering. But when a patient is cured from a disease this does not mean he/she does not have to receive care anymore as the disease a client is cured from is mostly not the main reason of receiving domiciliary care. A lot of clients in the domiciliary care sector suffer from a chronic disease that often cannot be cured anymore. They receive care so they can still live as healthy as possible. Moreover, the goal of the domiciliary care sector is to facilitate cure, care and services to clients in such a way that the clients are able to stay at home for a longer time. The focus on the care process is therefore our focus, as all clients within the domiciliary care sector have to receive care, whilst not all of them have to get cured. Therefore, we will only look at the care process when evaluating telehealthcare.

Now the focus of this thesis is made clear, we will picture the care process of the domiciliary care sector in a process map. The process map shows where telehealthcare is implemented in the care process. It gives an overview of the differences between the care processes where regular care is present and where telehealthcare is present. A remark that has to be made is that in the domiciliary care sector the flow of patients is not the only flow of consideration in the chain. Also the flow of the health professional has to be taken into account when looking at the implementation of telehealthcare. Moreover, the latter flow is the flow of interest in this thesis, as we identified that most efficiency can be gained within this flow. When looking at the two figures below, it is visible that the flow of the health professional (figure 1.2.3) has more potential for improvement than the flow of the patient, as within the domiciliary care sector the

patient is at his or her home. The client only experiences waiting time as the health professional has to be in the same physical space when giving care through regular care. We have decided to exclude the patient-perspective from this thesis as the waiting time is inconvenient for a client, but it does not have an effect on the efficiency of the health care chain. This delay for the client does not cost money or extra time for the health care sector.

The flow of the health professional shows more potential for improvement as the health professional is the one travelling to deliver care to the client.

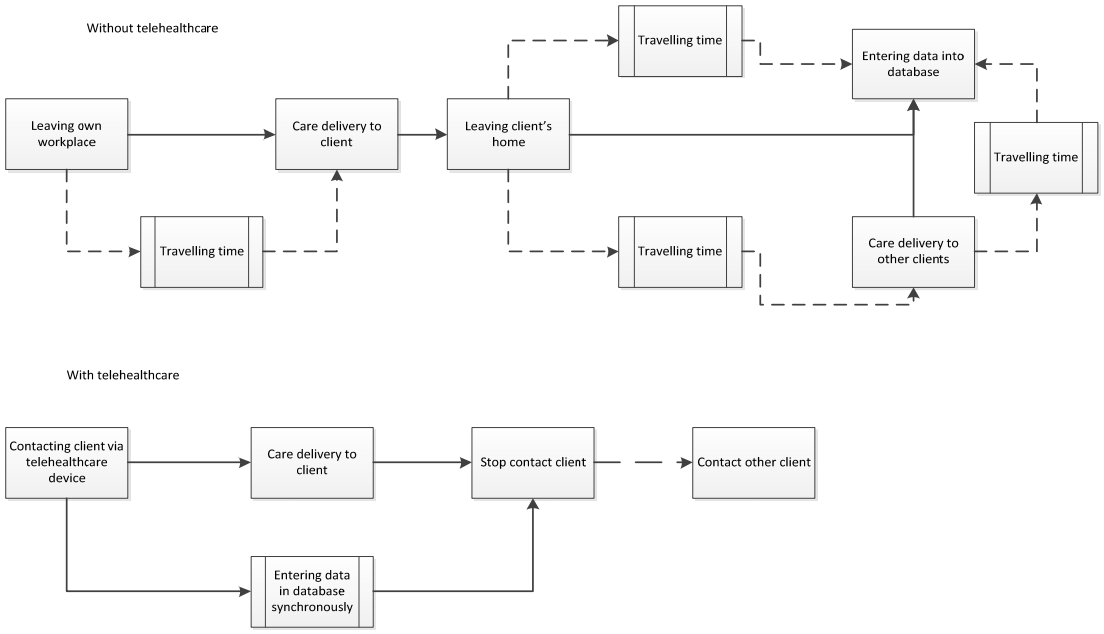


Figure 1.2.3.

The difference between the care processes of the flow of the health professional is very clear when looking at both process maps. With the implementation of telehealthcare in the care process a lot of travelling time can be saved. This saving accounts for less costs and less time spent by the health professional at an appointment with a client. Therefore, it can increase the number of clients treated by a health professional. So, it is expected that in the care process including telehealthcare efficiency gains can be made. Another remark that is relevant is that treatment time of one client will also reduce due to telehealthcare. We expect that the care delivery of a client takes longer when the health professional and client are in the same physical space due to all kinds of social obligations, like for instance drinking a cup of coffee.

As can be seen in the process maps, the processes that are pictured only focus on the treatment process and not on the diagnostic process. This focus is made because the diagnostic process only consists of one contact moment between health professional and client, whilst the treatment process is an on-going process in which more efficiency strikes can be made. Moreover, within the domiciliary care sector the diagnosis is not done by the domiciliary care sector itself. They only give treatment, but are not responsible for the indication of a client. The opportunities for efficiency gains will therefore only be focussed on the treatment process.

Telehealthcare seems to be a promising innovation for the health care sector. Nevertheless, the remark has to be made that it also has a potential negative aspect. Namely, existing literature points out that the use of telehealthcare instead of regular care affects the satisfaction of a client in a negative way, since it is said that indirect, non-face-to-face care is less able to create a good

feeling to patients than direct care (Varghese & Phillips, 2009). It is stated that telehealthcare is impersonal. This can have a negative influence on the efficiency of telehealthcare and client experience will therefore be a topic during the empirical research.

It is mentioned multiple times that efficiency is the topic of interest when looking at the application of telehealthcare within the domiciliary care sector. Before we can identify the inefficiencies present in the domiciliary care sector, we first have to clarify what efficiency is and how it will be measured in this thesis. Therefore, the next chapter focuses on efficiency and the method of measuring efficiency within this thesis.

2.1. What is efficiency?

As the goal of this research is to look whether and to what extend telehealthcare makes the health care chain more efficient, an important concept of this research is efficiency. This concept needs a clarification as efficiency can have different meanings. Moreover, it also has to be funnelled to the health care sector.

According to the business world, efficiency means: "The comparison of what is actually produced or performed with what can be achieved with the same consumption of resources like money, time, labour, etc. (Businessdictionary.com, 2011)".
When translating this definition into the health care perspective the following definition is constituted; "All ways of care delivery from a health professional to a client and the comparison of resources actually used to deliver this care to a client with what can be delivered with the same consumption of resources. The lower the amount of resources used, the more efficient the health care chain is. These resources can differ from time to money or to labour". In the next chapter we will explain which resources are used for measuring efficiency in this thesis.

Fawcett, Ellram & Ogden (2006) state that 'both clients and suppliers appreciate efficiency and neither have time nor resources to waste by being inefficient'. This statement is to some extend true for the health care sector, as people do not want to spend more time and money for the provision of care than necessary. This accounts for both one-time treatments as for long-term conditions. Moreover, neither do health care institutions want to spend money and other resources to useless and inefficient activities and services. Nevertheless, we like to address that the need for efficiency in the health care chain is in a constant struggle with the need for responsiveness. Health care institutions are constantly looking for the appropriate balance between these two concepts.

The next step in this thesis is to identify the appropriate definition of efficiency for this research by asking ourselves the next question: How can efficiency be measured?

2.2. How can efficiency be measured?

When looking at the definition of efficiency from a health care perspective it becomes clear that efficiency can be measured by comparing the 'resources used' with the 'resources available' for a performance. The less resources used, the more efficient a chain is. This means that efficiency can be measured by comparing the usages of resources in different scenarios with each other. To elaborate more, in this research the resources used in the provision and distribution of care with regular health care will be compared to the resources used in the provision and distribution of care with telehealthcare.

Different resources to which efficiency can be measured are; Time, costs, materials used & labour. As it is, in the time span planned for this research, impossible to look at all the resources in measuring efficiency, a selection will be made and one variable will be chosen. First, we will reason why 'materials used', 'costs' and 'labour used' are not chosen to measure the efficiency of telehealthcare.

The resource 'materials used' will be eliminated because it focuses on the flow of goods and is not directly related to the primary process in health care. It does not directly focus on the flow of clients and on the delivery of care.

Next, costs seem a good resource to measure efficiency as, for instance, a reduction of costs of treatment of a client when using telehealthcare can indicate that the use of telehealthcare is more efficient. Nevertheless, we will exclude this resource from this thesis, as it is very time-consuming to gather all kinds of financial data and to do multiple calculations about cost efficiencies. Nevertheless, it can be a good topic for additional research about the efficiency of telehealthcare.

Furthermore, 'labour used' is not chosen because it is very difficult to create a clear image of before and after the implementation of telehealthcare. We do not expect many changes in this resource and also for this resource it is very hard to gather data. Moreover, it is very hard to measure with regards to labour, as the increase or decrease of labour used can also be caused by other investments or adjustments.

Therefore, we have chosen to select time to measure efficiency. Time, because it is an easier indicator to show whether efficiency has increased or decreased. A comparison will be made to identify a potential change in 'time used' through comparing two moments in time. The first moment in time will be the moment at which the health professional did not use telehealthcare yet. The second moment in time will be nowadays, since nowadays the health professional uses telehealthcare as all health professionals interviewed use telehealthcare to practice care. These two moments in time will be compared and the difference in time spent will be seen as a reduction or increase in efficiency. So, this increase or decrease shows whether telehealthcare is less or more efficient regarding time. To supply the data the respondent has to go back in time and the data provided by the respondent is based on memories and potential recorded data.

The answer on the question how efficiency can be measured is known. Moreover, the way in which efficiency will be measured to answer the central question of this research is also known.

The next thing that has to be done is identifying the inefficiencies present in the health care chain. In what way is the health care chain affected by inefficiencies? What are these inefficiencies? That is why the next question is formulated;

3. Which inefficiencies are present in the health care chain?

In this chapter the inefficiencies that are present in the health care chain of the Netherlands are presented to give a clearer reflection of the problems of the health care chain nowadays. The entire health care chain is considered. These ten inefficiencies are most present in the health care sector and have the potential to be less inefficient when telehealthcare is introduced. So, efficiency can potentially be gained at these inefficiencies. Furthermore, we want to emphasize that the focus will only be on inefficiencies present in the Dutch health care chain as the research area is also funnelled to a Dutch health care sector. Moreover, a clarification will be given about the ten most prevalent inefficiencies. These inefficiencies are all present at the operational level, since this is the level of interest within this thesis. This chapter will not look at possible points of improvement regarding the application of telehealthcare, as this will be considered in the following chapters.

Before identifying the inefficiencies within the care process, it has to be stated that the health care chain is a very complex chain. It is far more complex than the chain of other industries.
There are reasons why the health care chain is very complex, namely (Rego & de Sousa, 2009):
- The health care chain provides a great variety of products and services;
- The needs of multiple and different internal and external clients have to be fulfilled. Clients are; the clients, the hospitals and primary care centres which are the final institutional clients, the professionals that treat the clients, the persons in charge of material orders and supplier choice (for instance, health professionals, pharmacists, managers), and the payers of the healthcare service.
- As health professionals perform the diagnosis and decide treatment paths, evaluate the demand of goods/services required by each client, influence the duration of each client in the health institution (this impacts the consumption of materials and services) and develop long run relationships with suppliers regarding specific materials and products, the health care chain depends a lot on the role health professionals play in the management of the health care chain.
- The health care chain deals with very large costs, as medical-surgical supplies and pharmaceuticals are very expensive.
- The health care chain must assure a high service level, as a low service level can damage the healthcare system image and/or can damage the treatment process of a client.
- The health care chain is highly conditioned by existing legislation, for instance by reimbursement systems.
- There is a sensitive balance of the power relationship among diverse professional groups of independent units present in the health care chain. This balance is managed through a complex line of commands (Ford & Scanlon, 2007).
- A lot of flows have to be managed in the health care chain. Besides the management of flows and inventories of materials it also involves flows related to the availability of the appropriate facilities, equipment and human resources at the right time and place. It considers the flows of people, like personnel, clients and visitors in different health institutions.
- The coordination between health professionals and institutions also makes the health care chain a complex chain.

The characteristics of the health care chain that are mentioned above have a great influence on the efficiency of the chain. All these characteristics have influences on the inefficiencies that are present in the health care chain nowadays. The next section will be about the inefficiencies that are present in the health care chain.

3.1. Time of travelling.

The first inefficiency that can be identified in the flow of the health professional is that clients (with limited mobility) living in remote areas are very hard to reach by a health professional and transportation to the client is very time consuming and money consuming for the health professional, thus inefficient.

Although the flow of the patient is not considered during this thesis, it also experiences a lot of inefficiencies that have to be mentioned when looking at the time of travelling. The ability of clients is not always sufficient to move from one's home to a health professional(Williams et al.) .Clients with a limited mobility do not always have the capacity to move to a health institution. This makes transportation very inefficient as it takes a lot of effort, extra time and extra costs for the client to have access to health care. Moreover, due to medical reasons it is sometimes even forbidden for a client to travel back and forth (Finch et al.). So, it can be very money and time consuming for a client to travel to a health professional.

Moreover, an inefficiency that is present in both flows is a long travelling distance (Finch et al.). When a client or a health professional has to travel a long distance just for a short consultation or check, this is very inefficient as it is time and labour consuming, which both costs money. The client has to take time off from his or her work to go to the health professional. This costs the client not only time but also money. The health professional has to leave his or her workplace and has to travel a (long) distance while in the same time multiple other clients could be checked. This costs not only time but also extra labour hours (Fraterman, 2007). During the empirical study we will only focus on the flow of the health professional as explained earlier.

3.2. Inflexible working schedule of the health professional.

An inflexible working schedule of a health professional also accounts for the inefficiency of the health care chain. The planning of working hours of health professionals is not optimal to the moments clients ask for care, which makes that health professionals do not work as efficient as possible. Nevertheless, it is very hard to adjust the working schedules of health professionals in such a way that it perfectly fits with the care that has to be provided to clients. Health organisations have to find a balance between flexible enough to answer care but not to the extend that being flexible costs money. Here the balance between efficiency and responsiveness is present again (Fraterman, 2007).

3.3. Waiting time due to bureaucracy.

The supply of care or other services from a health professional to a client has a lot of inefficiencies. Due to inefficient supply of care clients stay longer in the care process, which costs time, money, effort and labour. When identifying what waiting time is the next identification is given: "The waiting time does not mean that productive resources stood idle, but rather that a particular, individual client (order) was waiting for something else to happen (Kujala, Lillrank, Kronström & Peltokorpi, 2006). Waiting for approvals or other administrative acts increases the amount of 'bed-blockers' as clients have to wait and cannot proceed as further treatment is not possible yet. The unnecessary stay of a client at a health institution due to waiting, results in a sub-optimal use of resources of that particular health institution, because meanwhile care still has to be given (Vissers et al., 2005).

3.4. Waiting time due to wrong site treatments.

Wrong site treatments and related adverse events to solve these wrong site treatments also have an impact on time that is spend by health professionals to make up for the mistakes. This time could also be invested in the treatment of 'new' clients. Therefore, this category has a large, negative impact on the efficiency of health care chain. It not only has an impact on time spent but also on costs. Publicly available industry data about mortality and morbidity suggest that operative and postoperative complications, wrong site surgeries, and anaesthesia-related adverse events increased from 1995 to 2005(Joint Commission, 2006) and that the cost of surgical errors is estimated at nearly $1.5 billion annually including medical expenditures, death, readmissions, and outpatient care within 90 days of surgery(Encinosa & Hellinger, 2008) (Fredendall, Craig, Fowler & Damali, 2009).These numbers are alarming and not only in hospitals but in all health care sectors wrong treatments are given and wrong decisions are made which have a large impact on the efficiency of the healthcare. It is proven that lack of communication about problems occurring during treatment leads to mistakes and therefore leads to extended care processes which results in the increase of costs (Fredendall et al., 2009).

3.5. Seasonal variations in demand.

Also seasonal variations in demand influence the efficiency of the health care chain. These variations extend waiting lists as in some seasons demand for care is higher than in other seasons whilst the capacity of the labour force stays the same or lowers due to holidays. This also brings along that not all treatments are handled smoothly and efficient as health professionals want to treat as much clients as possible, but do not always do this in the most efficient way because lack of integration exists(Andersson & Karlberg, 2001).

3.6. Mismatch between demand and supply.

Also changes in demand and supply have an impact on the efficiency of the health care chain.
Due to major challenges regarding demand like, an ageing population, an increasing number of people living with long-term conditions, people living longer and the increasing expectations of clients that expect a client centred healthcare(Williams et al., 2005) the ways health institutions are dealing with demand have to change. All the upper challenges clarify that demand is increasing. This increasing demand alone does not have to be an inefficiency problem in health care chain nowadays. The issue that makes this increasing demand an efficiency problem is that the capacity of answering this demand is decreasing, as the workforce of health care institutions in general is decreasing(Vissers et al., 2005)This results in a mismatch between supply and demand of care, which decreases efficiency of care as a lot of demand cannot be answered immediately. Decisions have to be made about priorities in the answering of care.

3.7. Bad communication between health professionals.

Communication is said to be the glue of a supply chain (Hofstede, 2011). It is clear that there are a lot of inefficiencies present in the health care chain and most of them have to do with bad communication between and within departments of institutions. For instance, when a client is treated by multiple health professionals or when a client is transferred from one health institution to another, good information flow and good communication are essential. Nevertheless, under such conditions, communication asymmetries arise in the chain (e.g., incomplete communication flows among health professionals, clients, insurers, and payers) (Ford et al., 2007). It is often the case that the handover of the client and the medical records, not always done simultaneously, is a difficult process. Bad communication exists between care

providers which potentially leads to ineffective care as procedures are repeated and data has to be gathered again (Meijboom, Bakx & Westert, 2010).

3.8. Bad collaboration between health professionals.

In order to advance the efficiency of the health care chain, it is stated that 'both the internal and external capability of institutions to collaborate with each other at the level of both business processes and underlying ICT infrastructure is a key determinant'(Fitterer & Rohner, 2009). Thus, collaboration has to be improved to reduce this inefficiency present in the health care chain. It is stated that supply chain managers feel that the existing *cooperation* is still insufficient and there is a need for more partnerships with suppliers and other care providers to make the health care chain more efficient. Thus, bad collaboration is acknowledged as being an inefficiency that is present in the health care chain (Rego et al., 2009). Moreover, nowadays in most health institutions it is the case that the institutions are structured in such a way that management is being held back by traditional governance arrangements, which hampers the implementation of organizational changes that would support effective collaboration (Meijboom et al., 2010).

3.9. Bad data importation and information fixation by health professionals.

It is said that health professionals do not always register and implement all data gathered at clients in the database of the health organisation. Registration and implementation is often forgotten. A lot of registration is still done on paper, which makes it more difficult to synchronize all data available about one client into one database. This synchronization also takes a lot of time, as data has to be registered at least twice. Once on paper and once in a database on the computer. These personal mistakes and inefficient database make the health care chain less efficient (Fraterman, 2007).

3.10. Non-optimal use of atomization of care by health professionals.

A lot of technological tools are developed to optimize the care health professionals provide to clients. Nevertheless, these tools are not always used in the right way, as health professionals do not know how to use these tools. Also a lot of health professionals feel some kind of rejection towards the use of technological devices in the health care chain. They are not used to technology when providing care to clients and first have to feel confident before using these technical tools. (Fraterman, 2007). So, there are a lot of opportunities and tools available to optimize care, but the distrust health professionals feel for these tools make the health care chain less efficient as the atomization possibilities are not used optimal.

As made clear in this chapter a lot of inefficiencies exist in the Dutch health care chain. It can be concluded that the presence of inefficiencies has a negative impact on the chain. We have tried to give a complete overview of the most common inefficiencies that are most present in the Dutch health care and that have the greatest impact on the efficiency of the health care chain. Moreover, we would like to go more into depth about these existing inefficiencies by looking at the existence of these inefficiencies in the domiciliary care sector. This funnelling is done to eventually investigate the potential of telehealthcare to increase efficiency in the domiciliary care sector. That is why the next sub question that has to be answered is;

4. Which inefficiencies are present in the domiciliary care chain?

The previous chapter elaborated on the inefficiencies that are present in the Dutch health care chain in general. This chapter will funnel the research down, by looking at which of the most prevalent efficiencies constituted in the previous chapter are present in the domiciliary care sector.

Through the interrogation of three health professionals of the domiciliary care sector the inefficiencies of the previous chapter will be tested on presence in the domiciliary care sector. Only the inefficiencies that are identified as such and that are mentioned by the health professionals can be identified and generalised within this thesis. A remark that has to be made is that one of the health professionals interrogated is not a health professional of the domiciliary care sector. He is a health professional within the mental health sector. We decided to include this interview as well, because the manager that was interrogated used telehealthcare a lot and in the same manner within his organisation as telehealthcare is used in the domiciliary care sector. Namely, the client within this mental health organisation can make contact with a health professional through the use of telehealthcare whenever necessary. And there are also contact moments set in which the health professional makes contact with the client, for instance to check on medicine intake. This is the same approach as is used in the domiciliary care sector. All organisations say that the goal of their organisation is to prolong the time a client can live in his or her home situation. Furthermore, this decision is also made due to the limited number of cases.

The inefficiencies that are identified in the previous chapter are:

- Time of travelling.
- Inflexible working schedule of the health professional.
- Waiting time due to bureaucracy.
- Waiting time due to wrong site treatments.
- Seasonal variations in demand.
- Mismatch between demand and supply.
- Bad communication between health professionals.
- Bad collaboration between health professionals.
- Bad data importation and information fixation by health professionals.
- Non-optimal use of atomization of care by health professionals.

The analysis of the three interviews shows that only waiting time due to bureaucracy is not present in the domiciliary care sector. The reason for the absence of this inefficiency is that indication is already done in an earlier stage, which means that the domiciliary care sector immediately starts with the delivery of care to a client. This also counts for the mental health sector, as indication of a client is also done in an earlier stage and by another institute.

Every inefficiency will shortly be clarified in this chapter. The next chapter, chapter 6, will give a more thorough clarification of the inefficiencies and especially the potential of telehealthcare to decrease these inefficiencies.

4.1. Time of travelling.

All three health managers state that travelling back and forth to clients is very time and money consuming for a health professional. Also the visiting of clients living in remote areas is very time consuming, as these clients are very hard to reach. According to all three health managers it is not efficient to travel a long distance to a client just for a short consultation or check.

Zuidzorg: "Health professionals have to travel a lot, also to clients that live in remote areas. It is also hard to treat all the clients within a certain interval, for instance in the morning, because it is sometimes not possible due to long travelling time and distances."

Cordaan: "The presence of long travelling distances and long travelling time is one of the main reasons why telehealthcare is implemented."

Proteion: "Long travelling time and distances is certainly one of the main inefficiencies present in the domiciliary care sector."

4.2. Inflexible working schedule of the health professional.

All three health managers state that the inflexible working schedule of a health professional is also inefficiency present in the health care chain. The planning of working hours of health professionals is not optimal to the moments clients ask for care, also due to the fact that there are peaks of demand for care within one day. It is very hard to adjust the working schedules of health professionals in such a way that it perfectly fits with the care that has to be provided to clients, also due to the fact that travelling distances and travelling time have an influence on the number of clients that can be visited within one time interval.

Zuidzorg:" Per day a certain amount of health professionals have to provide care to a certain amount of clients. There has to be a clear division of which health professionals provide care to which clients. Within this division it is essential to treat certain clients within a certain time interval. This can cause some problems, as it is not always possible to answer all the demand due to peak moments of demand. The problems that arise mostly have to do with the travelling distance a health professional has to bridge between multiple clients. Therefore, a limited number of clients can be treated within a certain time interval. It is not realistic to double the amount of health professionals during peak moments, as they will not be necessary anymore when the peak moments are over. So, there is inflexibility within the working schedule of a health professional."

*Proteion: "*It is true that there is inefficiency regarding the working schedule of a health professional. A lot of demands for care are bounded to a certain point in time, for instance drug intake. The planning of routes is dependent on this and certain treatments therefore influence the planning of treatments of other clients."

*Cordaan: "*The inflexible working schedule of health professionals is a problem. A client can have an urgent question. When this question cannot be answered directly due to the tight schedule of a health professional, this can have a negative effect on the mental well-being of a client. He or she can get very tensed and his or her well-being can be disrupted. This causes serious problems within the guidance of a client."

4.3. Waiting time due to wrong site treatments.

It is stated that wrong site treatments and related adverse events have a negative impact on the amount of time spend at a certain client as a health professional has to make up for the mistakes. Only one of the health managers recognizes this inefficiency within the domiciliary care sector.

Proteion: "It is sometimes the case that wrong medication is given or medication is given at a wrong moment in time. This mostly has to do with bad communication between several health

professionals. For instance, a G.P. prescribes a prescription for a certain medicine, but his handwriting is that bad that the wrong medicine is given or with the wrong frequency. It costs additional time to make up for the mistake made."

4.4. Seasonal variations in demand.

In literature it is stated that seasonal variations in demand extend waiting lists as in some seasons demand for care is higher than in others, whilst the capacity of labour stays the same.
These seasonal variations are not recognised within the domiciliary care sector, as within this sector mostly chronically ill patients are treated. There is a constant demand for care throughout the entire year. An inefficiency that is addressed by two health managers is the decrease of the amount of work force during a specific period.
Zuidzorg: "Round Christmas it is sometimes problematic to find enough health professionals to answer all demand. There is an imbalance between demand and supply, because both clients and health professionals want to be home for Christmas. So, there is more demand as clients want to be with family and have to be brought there and there is less supply, because health professionals want a few days off to spend Christmas with their family."
Proteion: "There is not a lower demand for care in specific periods, but during the summer period there is a shortage of workforce due to holidays. This shortage sometimes causes problems, as not all demand can be answered directly."

4.5. Mismatch between supply and demand.

In literature it is stated that there is a growing demand for care, whilst the labour force which has to provide this care is declining. It is also stated that this causes inefficiencies within care as not all demand can be answered directly anymore. All three health managers recognize this phenomenon, but do not yet experience the problems this phenomenon can cause.
Zuidzorg: "There is a clear growing demand of care present within the domiciliary care sector. It is also becoming more and more difficult to find enough personnel. Especially during holidays it is very hard to find enough health professionals. There is too little substitution and there are to little solutions for this imbalance. It is also very hard to find personnel that are willing to work during weekends and evenings."
Proteion: "This is becoming a burden more and more. Also more and more people with limitations want to stay at home. In former times, people would go to an intramural institution."
Cordaan: "We do not experience this phenomenon yet, but there is a great fear for this phenomenon. We still have a lot of vacancies that are answered, but this can change in no time."

4.6. Bad communication between health professionals.

Communication is said to be the glue of a supply chain (Hofstede, 2011). It is also stated that all lot of inefficiencies within the healthcare sector have to do with bad communication between and within departments of institutions. Two health managers acknowledge this inefficiency within the domiciliary care sector.
Zuidzorg: "Bad communication between health professionals of one organisation is not really present. A bigger issue is the communication between different disciplines. This communication is much worse. For instance, when a client has to be included, the transfer from an institution to the domiciliary care sector often does not go smoothly. Often too little information is shared, which causes inefficiency. This inefficiency cannot be solved with telehealthcare, but with an electronic patient record."

Proteion: "This inefficiency is present in the domiciliary care sector and has to be solved through the implementation of the electronic patient record, which will link all data of a client into one file."

4.7. Bad collaboration between health professionals.

It is stated that supply chain managers feel that the existing cooperation is still insufficient and there is a need for more partnerships with suppliers and other care providers to make the health care chain more efficient (Rego et al., 2009). Two health managers recognize this inefficiency within the domiciliary care sector.

Zuidzorg: "This inefficiency is not an issue within the organisation. The contact with other organisations is always focused on collaboration, but it is possible that sometimes someone is too late or contact between organisations is less clear. "

Proteion: "This is similar to the previous inefficiency."

4.8. Bad data importation and information fixation by health professionals.

It is said that health professionals do not always register and implement all data gathered at clients in the database of the health organisation. Registration and implementation is often forgotten (Fraterman, 2007). This inefficiency is acknowledged by the two health managers within the domiciliary care sector. The health manager within the mental health does not recognize this inefficiency, as within their organisation one client is guided by only one health professional and everything is registered together with the client.

Zuidzorg: "This registration often goes wrong. Health professionals try to register everything, but it is often forgotten. For instance, the marking of the fact that medication is given, is often forgotten. A lot of registration is still done in written form, this also accounts for mistakes with registration."

Proteion: "Time registration is done digitally. But the rest is done with written forms. So, much can still be gained by digitalising forms and contracts."

4.9. Non-optimal use of atomization of care by health professionals.

It is stated that there are a lot of opportunities and tools available to optimize care, but the distrust health professionals feel for these tools and the missing knowledge regarding these tools make the health care chain less efficient as the atomization possibilities are not used optimal (Fraterman, 2007). All three health managers acknowledge this inefficiency.

Zuidzorg: "This is experienced. The domiciliary care is working on the schooling of personnel. The personnel first have to be familiar with the atomization opportunities, before they can use it in an optimal manner."

Proteion: "It has not only to do with the knowledge regarding the use of technological tools. It also has to do with whether the organisation uses these tools."

Cordaan: "The only atomization we are familiar with is the digital implementation of data. This system works fine. The only difficulty is that health professionals have to know how to use these tools."

Now that all the interviews are analysed on the presence and influence of inefficiencies on the domiciliary care sector, the next thing that has to be done is to identify which opportunities for improvement telehealthcare can offer regarding these inefficiencies. But first, we will give a short elaboration of the forms of telehealthcare used within the three health organisations.

5. An overview of forms of telehealthcare within the domiciliary care sector.

During the interrogation of the three health managers, three forms of telehealthcare are identified by the health managers as forms of telehealthcare. These forms are a touch screen application, the use of sensors and personal security systems. These forms and whether these forms are new forms of telehealthcare compared the existing literature identified in chapter 1 will shortly be addressed below. Other forms of automation are also mentioned during the interrogation, but these are not identified as forms of telehealthcare by the health managers. These forms are for example, the installation of cameras and the use of a digital pen by health professionals.

The telehealthcare device that is used in all three organisations is the touch screen application.
A touch screen with a data system is installed at a client's home. This data system can also be installed on the television of a client. With one touch at the screen by a client, the system makes contact with a health professional at the care centre. This way of communication is mostly used as an alarming function. The health professional can also make contact to the client through the use of the data system by also touching a button at the screen installed at the care centre. This way of communication is used for reminders for medication intake or to watch when a client is doing wound care. So the procedure of communicating via a touch screen device goes as follows: dial-> contact-> problem discussion-> guidance/advice/treatment given-> contact closed.
This telehealthcare device was in the existing literature also identified as the most familiar form of telehealthcare and it now can be stated that this form of telehealthcare is the form that clients as well as health professionals are most familiar with.

The second form that is used, is used by only one organisation but known by all the managers. This form is the use of sensors to register the structure of the daily life of clients, for instance through the use of bed mats or a sensor on the refrigerator. When there is a deviation visible within the daily life of a client that can harm the health of the client, action is being taken by a health professional. In this way a health professional can act direct and efficient. The installation of sensors is a way to have more control and a better overview of the life of a client.
During the literature review of this thesis, this specific form of telehealthcare was not identified. Nevertheless, it can be identified as a form of domotica as it checks and controls the life of a client through an application that is installed in a client's home and registers the daily life of a client. So, also this form of telehealthcare was already known in existing literature. Moreover, existing literature states that domotica is a form of telehealthcare that is mostly present in the care for elderly. This complies with the domiciliary care sector, as most clients within this sector are elderly.

The third form is personal security systems, which is a speak-listen connection between client and health professional. A client has to push a button when there is something wrong. So the client has to alarm the health professional and has to make contact to the care centre independently. An example of this form of telehealthcare is an alarming device that some clients carry around there neck. When there is something wrong they can push the button on the device and action is taken by the health professional. This form was mentioned by only one manager. Existing literature does not identify this technological device as telehealthcare. In existing literature it is more seen as an alarming device as little communication is done through the use of this device.

Now that multiple forms of telehealthcare used in the domiciliary care sector are identified, the next thing that has to be done is to look at ways in which these devices can offer opportunities for improvement regarding efficiency within the care chain.

6. Which opportunities for improvement can telehealthcare offer?

In this chapter the opportunities for improvement that telehealthcare can potentially offer are discussed. There is a division into three paragraphs. First, the opportunities for improvement regarding the inefficiencies presented in the previous chapter are discussed. The second paragraph will focus on the opportunities for improvement of telehealthcare when looking at the flow of the health professional. It will go through all the steps within the process of this flow. The third and last paragraph will discuss client experience and the opportunities telehealthcare has for improvement within this aspect of health care.

6.1. Opportunities for improvement regarding inefficiencies.

We will address the inefficiencies that are identified in the previous chapter and give opportunities for improvement regarding these inefficiencies. The inefficiencies are ranked starting with the inefficiency that has the highest opportunity for improvement and ending with the inefficiency that has the lowest opportunity for improvement.

6.1.1. Time of travelling.

All three health managers state that telehealthcare can make this inefficiency a lot more efficient. All three health managers also state that one of the main reasons for the implementation of telehealthcare within their organisation was to decrease the time of travelling.

Zuidzorg: "Telehealthcare can definitely decrease this inefficiency. Distance and travel time are definitely decreased by care at distance."

*Proteion: "*The most important efficiency that can be gained by telehealthcare compared to regular care is that travel time is decreased. So telehealthcare can do a lot about this inefficiency. "

Cordaan: "This inefficiency can definitely be corrected by telehealthcare. One of the main reasons why telehealthcare is implemented is to decrease this inefficiency. It makes guidance of clients definitely more efficient."

6.1.2. Mismatch between supply and demand.

All three health managers acknowledge this inefficiency within the domiciliary care sector. They also state that telehealthcare can decrease this growing inefficiency.

*Zuidzorg: "*Telehealthcare is implemented to offer all clients the care they need, although the amount of personnel is decreasing. The growing number of clients can get care from a lower number of personnel. The implementation of telehealthcare 'saves' care. Maybe also by letting personnel work from their home. Or the care centre can take over a lot of clients from the teams that visit the clients, so that fewer personnel have to go on house visits."

Proteion: "There are more and more clients that have a demand for care at unplanned moments. With telehealthcare these demands can be answered directly (7 days a week, 24 hours a day). This makes everything much more efficient. Clients can be helped quick and directly. This is a lot harder to organise when delivering face-to-face care. "

6.1.3. Inflexible working schedule of the health professional.

The three health managers all recognize that the implementation of telehealthcare makes this inefficiency less pressing. They all state that the use of telehealthcare makes the working schedule of a health professional more flexible.

Zuidzorg: "With telehealthcare people can be inserted faster and care delivery will be quicker. The answering of calls for demand will be much easier with the help of telehealthcare, because it simply is faster and thus more efficient. "
Proteion: "A lot of treatments are bound to a time interval, which makes the planning of routes difficult. With the use of telehealthcare a lot of these treatments can be done from a distance, which means that these treatments can be taken out of the route. So, routes can be planned more flexible."
*Cordaan: "*Telehealthcare ensures that the working schedule of a health professional is more flexible. Calls for care can be answered directly, through the use of interactive telehealthcare. This keeps the tension-level of a client low as urgent questions mostly can be answered directly."

6.1.4. Bad data importation and information fixation by health professionals.

The two managers within the domiciliary care sector acknowledge this inefficiency and both state that the implementation of telehealthcare can decrease this inefficiency a bit. Nevertheless, the both make the remark that the health professionals have to know how to work with telehealthcare devices.
Zuidzorg: "Telehealthcare captures all the activities done by a health professional immediately. All contact moments are registered and are in the database and can be looked up when needed. But people are people and mistakes will still be made. As long as telehealthcare still has to be synchronised with the handwritten documents that are at a client's home, mistakes will still be made."
Proteion: "As only time is registered digitally, a lot can still be gained within the domiciliary care sector by making all the processes digital, as can be done when using telehealthcare."

6.1.5. Waiting time due to wrong site treatments.

One health managers acknowledges this inefficiency and also thinks telehealthcare can have a positive influence on this inefficiency.
Proteion: "With telehealthcare people can get more self-control over their life. There are already some clever devices that can prevent wrong site treatments. For instance, there is a device that gives a signal and pops up the medicine a client has to take at a certain moment. A client has to tear down the little bag with medicine attached to the device at that certain point in time. When this does not happen, a message is send to the care centre. A health professional will act as a response to this message. So, with the help of ICT clients can be facilitated more to have self-control over their own life and ICT can build in securities."

6.1.6. Bad communication between health professionals.

Two health managers have recognized this inefficiency. Both managers state that telehealthcare is not the solution for this inefficiency. They both say that an electronic patient record is the solution. Since this is not the interest of our research, we will not elaborate on this opportunity for improvement as a discussion about this topic will broaden this thesis too much.

6.1.7. Bad collaboration between health professionals.

Two health managers mention this inefficiency, but both state that the use of telehealthcare cannot decrease this inefficiency. Again they state that an electronic patient record is the best solution for this inefficiency.

6.1.8. Seasonal variations in demand.

None of the health managers thinks telehealthcare can do anything about this inefficiency. One health manager *(Proteion)* states that telehealthcare ensures that personnel can be inserted more efficient in the domiciliary care sector. But this is an efficiency gain at all times periods.

6.1.9. Non-optimal use of atomization of care by health professionals.

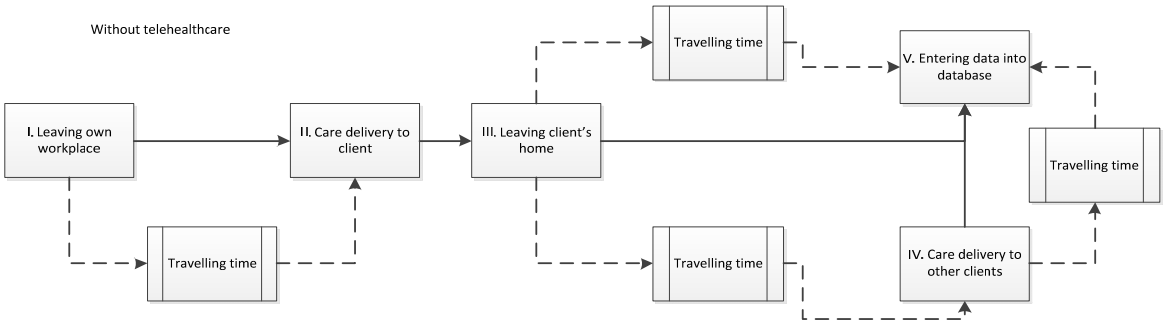
All three health professionals state that telehealthcare cannot decrease this inefficiency present in the domiciliary care sector.

Zuidzorg: "Telehealthcare is in fact an example of an atomization of care which first has to be known by the health professionals before it can be used to the fullest."

Now all opportunities for improvement related to the inefficiencies present in the domiciliary care sector are identified and ranked, the next thing to do is to look at the opportunities for improvement within the flow of the health professional.

6.2. Opportunities for improvement regarding the flow of the health professional.

The flow of the health professional is the flow of interest of this thesis and is constituted in the process map below. Here the process map shows the flow of the health professional when the care process is without telehealthcare. This process map was shown to the three health managers during the interview. Per step, each health manager had to define the efficiency that is gained at that step when using telehealthcare in the care process.



We will analyse the three interviews and will clarify per step the efficiency gains given by the three health managers.

6.2.1. Leaving own workplace.

All three health managers state that this step is gone when telehealthcare is used. The health professional stays at his or her own workplace. One health manager suggests that it is even possible for a health professional to work from his or her home. This is not done yet.

Zuidzorg: "A health professional could work from his or her home situation, but that is not yet the case. A health professional goes to his workplace. It agrees upon a moment that the clients like to be called. This also depends on medicines that have to be taken. In this way a lot of time is saved, as a health professional does not have to travel to his clients anymore. So the saving is primarily in travel time. When a health professional has to remind his clients to their medicine intake, the health professional does not have to travel to a client's home anymore. This is very efficient."

Proteion: "The highest gain is made in the travel time, as with telehealthcare this travel time is 0. So, it saves a lot of travel time."
Cordaan: "There is no travel time anymore. This is the highest gain made when implementing telehealthcare at this step."

6.2.2. Care delivery to client.

Also within this step all three health managers state that the implementation of telehealthcare can gain efficiency. Care with the same quality can now be delivered in less time with the use of telehealthcare.
Zuidzorg: "A contact via telehealthcare takes a health professional about 5 minutes. But when a health professional visits a client it takes much longer. He or she has to walk to the front door, a client has to open the door (this can take long), has to hang his jacket on the peg and has to drink a cup of coffee with the client. It takes much more time than communicating via a display. More calls of clients can be answered within the same time interval with telehealthcare. It is much more efficient. Of course, not all the care can be provided through a display. Some care, like help with showering, is still necessary to provide when being in the same physical space. "
Proteion: "For treatments like drug intake, contact can be made with a client through the use of a display. Previously, a health professional went to a client, but now a client is reminded on its drug intake via the display. It saves a lot of time. Nevertheless, not one client is totally dependent on telehealthcare as some services, like showering, have to be provided by face-to-face care. But telehealthcare can deliver direct care to a client in less time and with fewer mistakes, which leaves extra money and time for other activities. Telehealthcare has also the potential to give more responsibility to volunteers and family to deliver care which was previously done by professionals, as a lot of care within the domiciliary care is the reassurance of clients. This is also more efficient, as it saves money and time for an organisation."
Cordaan: "The introduction of a health professional in a client's home takes much longer when delivering care via face-to-face contact. With telehealthcare a call is made by the health professional to the client with a certain goal. With telehealthcare there is a higher focus on achieving this goal immediately, which saves time. The guidance time is shorter, as a health professional does not have to comply with a lot of social restrictions as is necessary when having a face-to-face contact moment. Also demand for care can be answered directly. This ensures better guidance of a client. When there is not a direct response to a call, as is often the case in regular care without telehealthcare, it costs a lot more time to get the client back in the right rhythm and pattern again. "

6.2.3. Leaving a client's home.

The efficiency strikes made with the implementation of telehealthcare within this step are similar to first step, as travel time is 0. So, the three health managers state that also at this step a lot of efficiency can be gained, as this step disappears when telehealthcare is implemented.

6.2.4. Care delivery to other clients.

The three health managers state that efficiency can be gained at this step, as travelling between clients is not done anymore when telehealthcare is implemented. So, due to the fact that travel time is 0, also at this step efficiency can be gained.
Zuidzorg: "All clients can be treated consecutively from the care centre. At this care centre the health professionals are located."
Cordaan: "More clients can be helped within the same time interval."

6.2.5. Entering data into database.

The three health managers react differently on the question whether efficiency can be gained at this step and in what way it can be gained.

Zuidzorg: "When a health professional has an (unplanned) appointment with a client via telehealthcare, a pop-up turns up on the screen. During the contact moment with the client, all new information is processed into the logbook. This saves a lot of time. Previously, everything was handwritten and therefore processed twice. The health professional that visits the client still has to fill in a handwritten document every time he pays a visit. This causes less efficiency as it has to be processed in the database also."

Proteion: "As well as with regular care as with telehealthcare a visitation has to be registered. There is not a lot of difference between these processes. Telehealthcare is more efficient when looking at time registration, as when a health professional logs on to the system, time is automatically registered. But there already exist a lot of efficient systems within the domiciliary care sector that register everything. A new method of registration is through the use of barcodes. Telehealthcare can make administrative tasks of health professionals much easier, as it takes less time and less effort. "

Cordaan: "No efficiency can be gained here, as nothing changes with the implementation of telehealthcare to our data-gathering system. The data-gathering and implementation into the system is always done simultaneously with when there is an appointment with a client. In this way the client knows everything that is reported."

As can be read above also within the flow of the health professional a lot of efficiency can be gain through the implementation of telehealthcare within an organisation. Now that the entire care process is analysed on efficiencies, another aspect of telehealthcare has to be considered. This aspect is client experience.

6.3. Opportunities for improvement regarding client experience.

As mentioned earlier in this thesis existing literature points out that the use of telehealthcare instead of regular care affects the satisfaction of a client in a negative way, since it is said that indirect, non-face-to-face care is less able to create a good and satisfying feeling to patients than direct care (Varghese & Phillips, 2009). This statement is used during the interviews to introduce the topic to the three health managers. We asked the managers whether they came across this negative aspect of telehealthcare within their organization. We also asked what their experiences are with regard to client experience. The outcome of these questions is presented below.

Zuidzorg: "We expected the same reaction from clients as well, but we have experienced the opposite. Clients indicate that they think telehealthcare is a very personal way of communicating, as it is a strong one-on-one contact moment. Client and health professional are constantly looking at each other and this is experienced as a very personal way of communicating. 97%(Argo, Rijksuniversiteit Groningen, 2010) of the clients indicate that they appreciate the contact via a care centre a lot. Care is much more personalized via telehealthcare, so it is experienced as a positive progression within care. There is a small group of clients that appreciate regular care more, but the majority likes it and does not want to go back to regular care.

Clients experience some negative feelings regarding telehealthcare, but this has to do with the technical shortages it sometimes has. The usage of telehealthcare is very easy, as clients have

contact with the care centre by pressing on just one button. We have experienced barely any problems with the implementation of telehealthcare. Only demented clients are an exception, as severe demented clients do not know how to work with a display.
The health professionals that work at the care centre have a constant working schedule. This means that a client sees the same faces every week during his or her appointment. This gives a feeling of trust and continuity. Nevertheless, the combination of regular and telehealthcare will in most cases be necessary, as some services cannot be provided through telehealthcare. A proper balance between these contact moments is appreciated by the clients. Moreover, there is a small group of (young) clients that want to be as independent as possible. They are used to technology and valuate their privacy, as they want as much care via telehealthcare as possible."
Proteion: "We do not experience this negative aspect. Moreover, we only here positive sounds from clients that use telehealthcare. Especially single elderly say that they feel less lonely. The contact with the health professional is also a moment of social interaction. The contact moment is not only focused on care delivery, but also on social well-being. People feel less lonely when using telehealthcare. 80-90% of the clients think telehealthcare is easy to use. The other 10-20% still has problems with the usage of telehealthcare. The fear of technology of clients that was expected appeared not to be true. Especially where care is communication, advice, guidance and a kind of social support, telehealthcare through the usage of a display can do a lot. A lot of the questions can be answered directly."
Cordaan: "The reason why in the beginning telehealthcare was seen as a bad thing is that it is perceived as an efficiency-strike. While actually it is an addition on the care that is provided, it is something extra. Especially relatives of clients have a negative feeling about telehealthcare, because they think the quality of care provided through the use of telehealthcare is less.
Clients do not perceive this negative aspect, as they think telehealthcare provides more privacy. When a client has severe guidance, they appreciate the fact that this guidance is given through the use of telehealthcare as the neighbourhood does not know that he or she gets this personalized guidance. So their limitation stays 'invisible' for their direct social environment, which is perceived as a positive aspect of telehealthcare. Telehealthcare is offered as an addition to regular care and this is the way a client perceives it. A client is not forced to use telehealthcare. Complete care through telehealthcare is in some cases possible, but we think face-to-face contact is also still very important."

The experiences of clients, through the perspective of three health managers, are now constituted. This means that all the information provided by the three health managers about the three topics of interest is now analysed. Nevertheless, there is some additional information given by the three health managers that is also relevant for this thesis.

6.4. Additional information.

The additional information that will shortly be addressed is about the identification of several other inefficiencies present in the domiciliary care sector. According to the health managers these inefficiencies will also decrease when using telehealthcare. Moreover, additional information will be given about the opportunities for improvement of telehealthcare regarding efficiency.

6.4.1. Labour force.

Health professionals that are not able to work in the health care sector anymore due to age or physical limitations can work again in the health care sector, through the usage of

telehealthcare. Health professionals can work longer, which is more efficient for the health care sector as it saves costs.

6.4.2. Weather conditions.

Bad weather conditions, like snow and glazed frost have a negative impact on the travel time when providing regular care. When telehealthcare is used to provide care, this inefficiency is not relevant anymore and bad weather conditions are not inefficiency anymore.

6.4.3. More advantages of telehealthcare

The evaluation of a pilot study done by *Cordaan* constituted a lot of advantages of telehealthcare. These advantages are:

- Less tension build up by the client.
- An increased feeling of safety of clients.
- An extension/improvement of social contacts.
- Client experience is increased.
- More development opportunities for clients.
- Higher participation within the digital society.
- A more structured day.
- Higher feeling of independency and self-control
- Emotions of clients are better visible through the use of telehealthcare.
- The differences within cultures can be dealt with easier. In some cultures a woman is not allowed to be in the same physical space as a man who is not a relative of the woman.

All these aspects especially improve the quality of care and not the efficiency of care. Nevertheless, the remark has to be made that by increasing the quality of care, the efficiency also benefits from this, because less mistakes are made and there is a lower demand for care.

Discussion & Conclusion

Next we will present the answer on the central question. This answer is divided into three parts, as it focuses on the three main topics of the empirical framework. From these three perspectives the central question will be answered.

The first perspective is: *"To what extend is telehealthcare a good method to increase efficiency in the domiciliary care chain regarding inefficiencies?"*

Our findings are ranked below, starting with the biggest point of improvement. The empirical research shows that the biggest point of improvement regarding inefficiencies within the domiciliary care sector can be made by implementing telehealthcare to decrease *time of travelling*. It is also one of the main reasons why telehealthcare is implemented in the first place. All health managers state multiple times that the implementation of telehealthcare decreases time as it sets time of travelling at 0. This complies with the data gathered throughout the literature study, as one of the largest gains of telehealthcare presented in existing literature is the removal of travelling time.

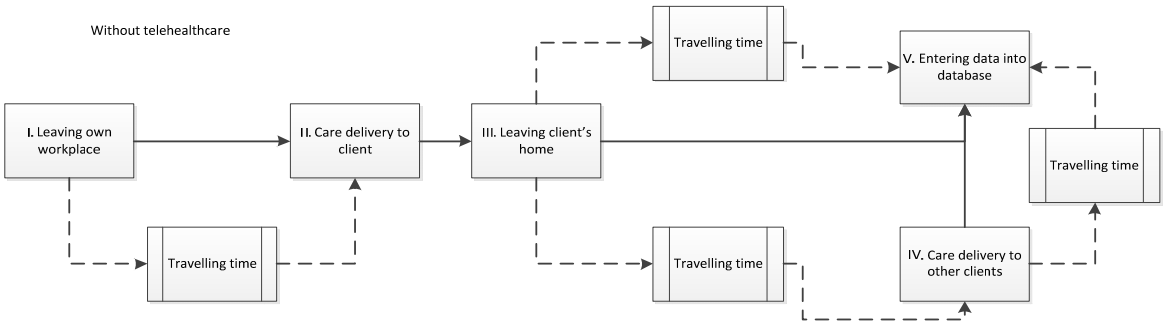
This thesis also makes clear that telehealthcare has a positive impact on the *flexibility of the working schedule of a health professional*. It makes the working schedule more flexible and the working hours can be scheduled more efficiently when telehealthcare is introduced. Thus, this is also a major point of improvement regarding inefficiencies. We did not come across literature that acknowledges this efficiency-gain. Existing literature does mention that care can be given more flexible but that has to do with the next point of improvement which is;

Telehealthcare can decrease the mismatch between supply and demand that is more and more present in the domiciliary care sector, as telehealthcare makes treatments more efficient regarding time. More clients can get treatment in a shorter time interval. This makes the growing mismatch less pressing for the health care sector. This complies with our empirical research.

Literature says that telehealthcare also has a positive impact on the data importation and information fixation done by health professionals. It is said that telehealthcare makes this inefficiency easier and less time-consuming. Our empirical research confirms this statement. Nevertheless, the remark has to be made that telehealthcare can only be more efficient regarding this inefficiency, when it is used with the appropriate knowhow. Health professionals have to know how to work with telehealthcare before it can increase efficiency.

The fact that telehealthcare can decrease the number of wrong site treatments as it enhance the self-control of a client is acknowledged only once during our research. It is said that the cleverness of devices decreases the number of wrong site treatments, as it is easier to work with these devices and as fewer mistakes are made when using these devices. Existing literature also acknowledges this self-control as an efficiency-gain, but literature also states that this is not one of the main reasons for implementing telehealthcare within an organisation in the first place.

The second perspective is: *"To what extend is telehealthcare a good method to increase efficiency in the domiciliary care chain regarding the flow of the health professional?"*



This thesis proves that at almost every step in the chain efficiency can be gained when implementing telehealthcare within the flow of the health professional.
First, all three health managers state that the first step is gone when telehealthcare is used. The health professional stays at his or her own workplace, so time spend at step I is equal to 0. At this step a lot of time can be gained compared to regular care.
Also with the second step all three health managers state that the implementation of telehealthcare can gain efficiency. Care with the same quality can now be delivered in less time with the use of telehealthcare. The efficiency strikes made with the implementation of telehealthcare within the third step are also significant and are similar to the first step, as travel time is 0. Moreover, the health managers state that efficiency can also be gained at the forth step, as travelling between clients is not done anymore when telehealthcare is implemented. So, due to the fact that travel time is 0, also at this step efficiency can be gained. At the last step, step five, the health managers react differently. One health manager acknowledges an increase in efficiency as registration is all done digitally. Another manager thinks there is no difference between telehealthcare and regular healthcare as information at both ways still has to be registered. A third manager also states that no efficiency can be gained, as nothing changes within this step when implementing telehealthcare.

The third perspective focuses on client experience. In the beginning of this thesis we said that we would only focus on efficiency regarding the potential of telehealthcare. But, through the interrogation of multiple health managers it became clear that it is not possible to only look at efficiency when considering the health care sector, as effectiveness and quality of care are the core businesses of every health organisation. That is why we included the topic of *client experience* in this thesis as well; to give a more complete overview of the effect telehealthcare has on the chain of a domiciliary care organisation. The findings related to client experience are different then expected and therefore very surprising. All health managers state that the implementation of telehealthcare has a positive influence on client experience as it is a very personal way of communicating, due to the strong one-on-one contact moment. Care is much more personalized via telehealthcare, so it is experienced as a positive progression within care. Especially single elderly say that they feel less lonely as the contact moment is not only focused on care delivery, but also on social well-being. This does not comply with what is presented multiple times in existing literature. We think that one of the reasons for this difference is that previous literature is mostly based on pilots and assumptions of thoughts of clients, whilst our research is based on real-life findings and real-life data.
Moreover, clients also think telehealthcare provides more privacy, as it is done behind closed doors and the client and health professional do not have to leave their home. Furthermore, telehealthcare is offered as an addition to regular care. A client is not forced to use

telehealthcare. Telehealthcare is something extra that is offered by an organisation and it is stated that it therefore improves not only the efficiency of care, but also the quality of care as more demands for care can be answered directly through the use of telehealthcare.
There is only a small group of clients that do not appreciate telehealthcare, but the majority likes it and does not want to go back to regular care. Nevertheless, the implementation of telehealthcare to exclude regular care is not appreciated by clients. Moreover, the combination of regular and telehealthcare will in most cases be necessary, as some services cannot be provided through telehealthcare. Therefore, a proper balance between these contact moments is most appreciated by the clients.
The usage of telehealthcare is also experienced to be very easy, as clients have contact with the care centre by pressing on just one button. 80-90% of the clients think telehealthcare is easy to use. The other 10-20% still has problems with the usage of telehealthcare. The fear of technology of clients that was expected appears not to be true. In fact, the opposite is true, as clients state that telehealthcare is very easy to use. The few negative feelings clients experience have to do with the technical shortages telehealthcare sometimes has.

So, the most surprising conclusion of this research is that telehealthcare does not only enhance the efficiency of care, but also the effectiveness and quality of care through an improved client experience.

Now that the central question is answered and the three perspectives are addressed, we would like to give some recommendations regarding the further research about this topic.

Recommendations

We would like to recommend to do further research about this topic with a larger number of cases. Because the number of cases interviewed in this thesis is very limited, the findings are very hard to generalize, it is even impossible.

We did a thorough literature study to look for existing data related to the efficiency of telehealthcare. This took a lot of time, but afterwards this amount of effort was not completely necessary, as little data exists about efficiency of telehealthcare. So, we recommend a more thorough empirical study regarding telehealthcare and its potential to improve the efficiency of the health care chain. In this way, more data can be gathered and more knowledge can be spread to health organisations that want to implement telehealthcare.

Although the domiciliary care sector is most familiar with telehealthcare it could also be very interesting to investigate whether other sectors within the health care are also using telehealthcare at the operational level. When interrogating other sectors, it is possible to compare findings between different sectors, which can produce very useful and new information regarding the practical implementation of telehealthcare.

Another aspect that is worthy for future research, is whether telehealthcare also increases efficiency regarding money, labour hours or resources used. As this was not the focus of our research, little findings are done regarding the resources. Nevertheless, it is still very useful to investigate whether telehealthcare is also more efficient than regular care regarding these resources, as the findings regarding these resources also would influence decision-making regarding telehealthcare within the health care sector.

The data provided in this thesis together with future gathered data related to other health care sectors it is a good idea to make a practical manual with do's and don'ts regarding the implementation of telehealthcare. This manual can than be used by organisations that want to implement telehealthcare but do not exactly know how and at which step in the chain telehealthcare has to be implemented.

Summary

In chapter 1.1. of this thesis different forms of telehealthcare are presented. Furthermore, it is stated that telehealthcare has different characteristics and that there are two different approaches within telehealthcare. After this, several definitions are being tested and finally one definition is constituted as the definition of telehealthcare within this thesis.
The focus of chapter 1.2 is on the supply chain perspective, as this is the general focus of this thesis. It identifies what a supply chain is and funnels down to a health supply chain. Within this health supply chain the focus of this thesis is on the operational level. Moreover, within the operational level a distinction is made between the care and cure process. We decided to focus on the care process, as this is most relevant for the domiciliary care sector. Furthermore, a distinction is made between the flow of a client and the flow of a health professional. Since this thesis focuses on the domiciliary care sector, the flow of the health professional is much more interesting as it is proven that this flow has more potential to increase efficiency. That is why the focus within this thesis is on the flow of the health professional. Also, in this chapter client experience is already shortly addressed.

In chapter 2.1. the topic efficiency is discussed. Since the goal of this thesis is to look for opportunities for improvement regarding inefficiencies, the definition of efficiency has to be constituted before elaborating on inefficiencies. The question what is efficiency is answered and specified to the health care sector.
The focus of chapter 2.2. is on the measurement of efficiency. Efficiency can be measured by looking at several resources, like costs, labour used, materials used and time. We decided to focus on time as the measurement of efficiency within this thesis as time is an easy indicator to show whether efficiency has increased or decreased. A comparison will be made to identify a potential change in 'time used' through comparing two moments in time. These moments in time are 'before using telehealthcare' and 'when using telehealthcare'.

In chapter 3 inefficiencies that are present in the entire health care sector are thoroughly investigated and eventually identified. We have decided to focus on the ten inefficiencies that are most present in the health care sector, as the total number of inefficiencies present in the health care sector is too large to discuss all. This selection is also done on the assumption whether the inefficiencies are assumed to be present in the domiciliary care sector.

The focus of chapter 4 is on the inefficiencies that are identified in chapter 3 and whether they are also present in the domiciliary care sector. This chapter is the first chapter constituted of data gathered through the empirical research and it shows that nine of the ten identified inefficiencies of chapter 3 are also present in the domiciliary care sector,. This is stated by the three health managers that are interviewed to gather the empirical data for this thesis.

Chapter 5 shortly addresses the forms of telehealthcare that are used within the domiciliary care organisations of which the managers are interviewed. We compare these forms with the forms gathered through the literature study and acknowledge that there are some differences and similarities between the literature and empirical research.

Finally, chapter 6 ranks the inefficiencies that are most likely to gain efficiency when introducing telehealthcare within a domiciliary care organisation. It also shows which opportunities of improvements there are concerning the flow of the health professional. Furthermore, the topic of client experience is discussed, as this is a topic that can not be neglected when considering the health care sector. There are some interesting findings concerning client experience that were not expected in advance.

Moreover, a discussion and conclusion summarizes all the relevant data about the research question and ranks the efficiency-gains that can be made when implementing telehealthcare. It also shows what is interesting about the findings regarding client experience and why this new data is relevant. The conclusion of this thesis is surprising at it is stated that telehealthcare does not only increase efficiency of care regarding inefficiencies and the flow of the health professional. It also increases the effectiveness and quality of care by an improved client experience.

At the end of this thesis we come up with several recommendations that comply with the findings of this study. These recommendations can increase the knowledge about telehealthcare even more and shows that more empirical research has to be done to stimulate a sufficient implementation of telehealthcare within health organisations as telehealthcare can increase efficiency and quality of care.

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Appendices

Appendix I

Interview topics

Graag een open gesprek op gang brengen door het bespreken van 4 topics; Telezorg, het zorg proces, klantbeleving en inefficiënties. Verder heb ik als afsluiting nog een drietal vragen. De bedoeling is dat u kijkt vanuit het perspectief van uw eigen organisatie. Hoe pakt u dingen aan en waar ziet u nog mogelijkheden binnen uw organisatie. Met name in de eerste 3 topics is dit belangrijk: telezorg, het zorg proces en klantbeleving. Het topic over inefficiënties is iets algemener. Het interview zal ongeveer een uur duren.

A. Telezorg
De focus van mijn onderzoek ligt op telezorg; zorg op afstand, en de efficiëntie van telezorg. Kan telezorg de efficiëntie van de zorg verhogen?Zo ja hoe kan het de efficiëntie verhogen en op welke plekken in het zorg proces wordt telezorg toegepast / kan het toegepast worden?. Maar voordat we over efficiënt gaan praten, zou ik graag meer willen weten over het gebruik van telezorg binnen uw organisatie. Hierover zou ik u wat open vragen willen stellen, namelijk:
Zou u mij uw definitie willen geven van telezorg?
Op welke manier past u telezorg toe binnen uw organisatie?
Welke vorm telezorg gebruikt uw organisatie?
Store-and-forward vs. Interactive approach
Vervanging van vs. aanvulling op bestaande zorg
Waarom?

B. Het zorg proces
Ik zou graag met u een proces tekening door willen nemen. Deze proces tekening laat het behandelingsproces in de thuiszorg sector zien vanuit het perspectief van de hulpverlener. De indicatiestelling wordt in dit schema achterwege gelaten. Graag zou ik met u elke stap willen doorlopen om te bepalen waar efficiëntie geboekt wordt door het gebruik van telezorg t.o.v. zorg zonder telezorg.
Ten eerste, zijn er stappen die ik mis in het behandel proces?
Stap voor stap; waar wordt nu efficiëntie geboekt?Kunt u voorbeelden(best practices) noemen van toepassingen van telezorg die hiervoor gebruikt worden?

C. Klantbeleving
De literatuur laat zien dat er ook negatieve aspecten zijn aan telezorg. Een daarvan is de klantbeleving. Aangezien hulpverlener en cliënt zich niet meer in dezelfde fysieke ruimte bevinden, wordt gezegd dat cliënten zich vaker onbegrepen en ongehoord voelen. De voldoening van cliënten zou minder zijn door telezorg.
Neemt u dit negatieve aspect van telezorg ook waar binnen uw organisatie?
Hoe gaat u om met klantbeleving?

D. Inefficiënties

In de bestaande literatuur wordt ook gezegd dat telezorg de potentie heeft om inefficiënties te verkleinen of te laten verdwijnen. Ik noem nu een 10-tal inefficiënties. Deze inefficiënties komen mogelijk voor op het operationele niveau. Het operationele niveau betekent dat ze voorkomen in dagelijkse activiteiten en beslissingen. Kunt u zeggen of deze inefficiënties daadwerkelijk voorkomen binnen de thuiszorg? En wat de invloed van het gebruik van telezorg is op deze inefficiëntie?

I. Veel reistijd van hulpverlener naar verschillende cliënten.
II. Werkschema van hulpverlener is niet flexibel.
III. Wachttijd door bureaucratie, bijvoorbeeld door het wachten op goedkeuring van behandelingen; bed-blockers.
IV. Wachttijd door verkeerde behandelingmethode. Verkeerde behandelmethode moet gecorrigeerd worden; bed-blockers.
V. Seizoensgebonden vraag naar zorg terwijl aanbod niet veranderd(inflexibiliteit).
VI. Mismatch tussen vraag van cliënten en aanbod van hulpverleners; groeiende vraag naar zorg en krimpende arbeidsmarkt.
VII. Slechte communicatie tussen verschillende hulpverleners.
VIII. Slechte samenwerking tussen verschillende hulpverleners.
IX. Slechte data invoering en informatie vastlegging door hulpverleners.
X. Niet optimale gebruik van automatisering van de zorg door hulpverleners; niet optimale gebruik van technologische hulpmiddelen.

E. Afsluitende vragen:
Ik heb nog enkele afsluitende vragen:

- Wat zijn volgens u de verschillen in efficiëntie in een gezondheidszorg die gebruik maakt van telezorg en een gezondheidszorg die geen gebruik maakt van telezorg?
- Is telezorg volgens u een goede oplossing om de inefficiënties in de gezondheidszorg te verminderen?Waarom wel/ niet?
- Welke vormen van telezorg zijn volgens u het meest geschikt om inefficiënties in de gezondheidszorg te verminderen?Waarom?
- Heeft u nog verdere opmerkingen of suggesties aangaande dit onderwerp en dit interview?

Appendix II: Interview 1

A. Telezorg

Zorgconcept om mensen langer thuis te laten wonen, mensen kunnen vanuit hun huis, 24 uur per dag, contact maken met de hulpverleners en kunnen naast zorg ook diensten en welzijn op afstand krijgen. Dus ondersteund worden om langer thuis te blijven wonen.

I. Store-and-forward of interactive approach?

Interactive approach: touch screen scherm kunnen ze tegenaan klikken en contact maken. Daarbij halsalarm en trekkoorden voor alarmering.

Kan ook met sensoren en camera's ondersteunen om mensen die in de thuiszorg zijn opgenomen toch langer thuis te laten wonen. Geen sensoren gebruikt. Wel camera's maar alleen waar strikt noodzakelijk(blinde man en magnetron)

II. Vervanging van of aanvulling op bestaande zorg?

Het is vervanging van medicatie-afspraken en afspraken waarin gezegd wordt wat er ingenomen/gespoten moet worden. Herinneren aan afspraken, medicijn inname, in alles ondersteunen en structuur bieden.

Bepaalde zorg is echter noodzakelijk dat dit fysiek gebeurt, bijvoorbeeld douche-momenten zijn nog steeds noodzakelijk om te doen in zelfde fysieke ruimte, dit kan niet vervangen worden door telezorg.

B. Het zorg proces

Wordt bij deze stap efficiëntie geboekt: voorbeelden:

I. Contact met cliënt.

Verpleegkundige zou vanuit thuissituatie kunnen werken, maar dat is nu nog niet. Verpleegkundige die gaat naar de werkplek. Spreekt met klanten af wanneer ze graag opgeroepen willen worden, ook afhankelijk van de medicijnen die ze moeten hebben. Veel tijdbesparing doordat verpleegkundige niet meer naar klanten moet reizen.

II. Verzorgen van cliënt.

Hoeft niet naar de klant toe en gaat vanuit die werkplek klanten oproepen om zorg aan te bieden. Dus herinneren aan medicijnen, meekijken met wondverzorging. Vanuit een plek, de zorgcentrale, maakt verpleegkundige oproepen. Werkt niet alleen als alarmeringfunctie, maar zorgcentrale doet zelf oproepen.1 x per dag maakt zorgcentrale contact met klant. Dat vinden mensen vaak een heel fijn en veilig idee. Iedere dag is er iemand die even naar hem/haar kijkt of alles goed gaat. Kijkt verder nog per hulpvraag wat er gedaan kan worden.

Bij veel klanten moet je nog wel langs, omdat er noodzakelijk hulp nodig is, bijvoorbeeld bij het douchen. Er zijn echter klanten die deze 'fysieke' hulp niet meer nodig hebben. Deze klanten maken alleen gebruik van de zorgcentrale.

Ook de 'behandeltijd' duurt korter, nu gemiddeld 5 minuten, terwijl bij fysiek contact het veel langer duurt.

III. Stop contact met cliënt.

IV. Data invoering aangaande behandelde cliënt.

Verpleegkundige kijkt op de computer, roept een klant op; er komt dan een pop-up met wat te doen bij welke klant. Tijdens of na het contact met de klant wordt meteen de nieuwe informatie verwerkt in de computer/logboek. Scheelt tijd, is sneller. De verpleegkundige die thuis op bezoek gaan bij de klant werkt wel nog niet digitaal. Die

voeren gegevens in in een map bij de klanten thuis.--> Zorgt voor minder efficiëntie. Nu nog naast elkaar leggen.

V. Contact met volgende cliënt.

Alle klanten worden achtereenvolgend behandeld vanuit de zorgcentrale.

C. Klantbeleving

I. Ervaart negatieve aspect.

II. Ervaart niet het negatieve aspect.

Ervaart niet dat klanten minder voldoening hebben. Heeft het ook nog niet zo veel gelezen, want ze had het zelf deze reactie ook verwacht van klanten.

III. Omgang met cliënt.

Klanten geven juist aan dat ze het heel persoonlijk vinden, want er is heel sterk een-op-een contact; is dus bij iemand thuis en verpleegkundige kan ook niet vluchten door met de omgeving bezig te zijn. Continu naar elkaar te kijken. Rijksuniversiteit Groningen Argo heeft klantbeleving onderzocht: 97% van de klanten geeft aan dat ze het contact met de zorgcentrale juist heel erg fijn vinden. Worden evaluaties gedaan na een maand en na een jaar en die klanten geven aan dat ze het contact juist heel persoonlijk vinden. Wordt juist positief ervaren. Er zijn wel klanten die aangeven dat ze het niet zo fijn vinden of het een dagelijks standaardpraatje vinden. Grootste groep vind het heel erg fijn en wil niet meer terug, kan niet meer zonder.

Er zijn wel negatieve ervaringen met telezorg, maar die liggen vooral op het technische vlak. Verbindingen vallen weg.

De omgang met telezorg is voor de klant heel handig, je hoeft er maar tegenaan te tikken en ze hebben al contact. Weinig moeite gehad met klanten die het niet kunnen. Dementerende klanten zijn hierop een uitzondering. In het begin van de ziekte kunnen ze nog wel structuur zien en kunnen laten zien hoe het programma werkt. Maar als klanten zwaar dementeren dan snappen ze er niets meer van.

Hulpverleners: Aanleren om te werken met telezorg is een heel moeilijk proces. Al 2 jaar intensief bezig om het uit te rollen. Degenen die er veel mee werken vinden het erg fijn, maar verpleegkundigen die er niet veel mee te maken hebben zijn er niet super in geïnteresseerd. Die moet je op alles wijzen.

Zorgcentrale is een vaste groep mensen: hebben met de verpleegkundigen die nog thuis langs gaan gezamenlijk overleg. Zorgcentrale bestaat altijd uit dezelfde groep mensen op gezette tijden, dus klanten die altijd 's avonds opgeroepen worden, zien ook dezelfde gezichten. Werken 3 a 4 mensen in de avonddiensten en die leren ze snel kennen; dit garandeert een stukje continuïteit.

Als er alleen telezorg geleverd zou worden zou de beleving van de cliënt zeker minder worden. Vaak een combi. 's Ochtends komt de verpleegkundige voor een douche-beurt en drinkt een kop koffie mee en 's middags wordt er contact gelegd via zorgcentrale en dus telezorg. Dat vindt de client fijn. Een juiste balans want alle clienten willen wel een contactmoment hebben.

Er is echter een steeds groter worden groep jonge klanten die willen het liefst zo zelfstandig mogelijk zijn en die zitten niet te wachten op zorg. Hebben liever zorg via beeld, wordt er minder 'inbreuk' gedaan op iemand privacy dan wanneer iemand binnenkomt. Vooral mensen die wat meer gewend zijn aan de technologie vinden

telezorg makkelijker, willen meer op zichzelf zijn. Ouderen die alleen zijn hebben juist behoefte aan visite. Erg persoonlijk

D. Inefficiënties

XI. Reistijd van hulpverlener.

Zeker in de thuiszorg het geval: Verpleegkundigen moeten veel reizen, ook naar klanten die achteraf wonen. Ook moeilijk wanneer een aantal mensen 's ochtends behandeld moeten worden door dagopvang of spuiten, maar dat is soms door lange reistijden en grote afstanden niet altijd te doen. (wanneer klanten ver uit elkaar wonen). Met telezorg kan deze efficiëntie zeker verminderd worden: reisafstand en reistijd wordt zeker verminderd mbv zorg op afstand.

XII. Werkschema van hulpverlener is niet flexibel.

Je zit met een bepaald aantal verpleegkundigen die op een dag werken, deze moet je inzetten voor een bepaald aantal klanten. Die moeten soms verdelen, je kan niet een klant die eigenlijk laat behandeld moet worden, vroeger pakken of een dienst van een hulpverlener elke keer omgooien. Proberen altijd zoveel mogelijk flexibel te zijn. Over het algemeen wordt er in de thuiszorg wel flexibel gewerkt. Er moeten altijd een paar dingen vroeg. Daar zit de meeste moeilijkheid. Maar verder over het algemeen komt men er toch wel uit dat elke klant naar behoren wordt verzorgt. Met telezorg zou je makkelijker mensen kunnen inzetten omdat de verzorging sneller gaat. Meerdere mensen op de drukke tijden inzetten, dat het makkelijker te doen is. Maar per week zijn er zeker 1900 oproepen op de zorgcentrale en ook daar zitten tijden bij die behoorlijk druk zijn. Nieuwe klanten op deze drukke tijden plaatsen maakt het moeilijker maar is noodzakelijk. Soms zijn er spitstijden en kan er niet voldoen worden aan de vraag van klanten. Niet realistisch om op spitstijden het dubbele aantal verpleegkundigen in te zetten, want na een uur heb je te veel verpleegkundigen die niets kunnen doen. De beantwoording van oproepen gaat met telezorg wel makkelijker omdat het gewoon sneller gaat, meer efficiënt.

(700 klanten aangesloten op zorgcentrale)

XIII. Wachttijd door bureaucratie.

Nee, dat is niet aanwezig in de thuiszorg. Waarschijnlijk wel bij operaties /ziekenhuizen. Indicatiestelling is al gedaan bij thuiszorg dus verpleegkundigen kunnen meteen aan de slag. Klanten worden meteen behandeld. Wanneer ze naar een andere specialist gaan of andere wondverzorging krijgen, wordt dit meteen aangepast binnen de thuiszorg.

XIV. Wachttijd door verkeerde behandelingmethode.

Komt in de thuiszorg ook niet voor.

XV. Seizoensgebonden vraag naar zorg terwijl aanbod niet veranderd.

Heel soms zie je dat met vakanties wanneer er minder verpleegkundigen aanwezig zijn, dus minder aanbod maar dan wordt er ook waargenomen dat klanten zelf op vakantie gaan. Evenwicht. Rond kerstdagen is het wel erg problematisch. Dan willen alle klanten naar familie vervoert worden, meer hulp nodig. Dan is het wel eens moeilijk om alles rond te krijgen. Over het algemeen gaat het wel goed. Je ziet tijden met hogere sterftecijfers (zomerdagen warm en met kerst). Dan zit men ook met krapte wat betreft personeel. Eigen ervaring, niet gebaseerd op cijfers.

XVI. Mismatch tussen vraag van cliënten en aanbod van hulpverleners.

Er is een duidelijke groei in de vraag naar zorg aanwezig in thuiszorg en kunnen steeds moeilijker aan mensen komen. Met name in vakantieperiodes, bijna niet rond te krijgen:

te weinig invallers en te weinig oplossingen. Voorheen waren er teams voor de avonden en weekenden, maar nu willen hulpverleners liever overdag werken. Veel meer 24uurs diensten, was een paar jaar geleden nog niet aanwezig in de thuiszorg.
Telezorg geïmplementeerd om de krimpende aantal personeel evengoed alle zorg te laten doen. Groeiende aantal klanten sneller zorg te kunnen bieden met een lager aantal verpleegkundigen. Dus op afstand meer zorg te kunnen bieden. Zorgbesparend bezig te zijn. Daar ook misschien verpleegkundigen thuis te laten werken of om vanuit de zorgcentrale al een hoop klanten van de teams over te kunnen nemen zodat de teams met minder personeel de huisvisitaties kunnen doen. Om zo voldoende zorg te kunnen bieden.

XVII. Slechte communicatie tussen verschillende hulpverleners.

Valt wel mee dat dit voorkomt. Dossier wordt bij klanten thuis gelaten, zodat de hulpverlener van de volgende dag de status van de vorige dag kan lezen. Regelmatig overleg, je ziet veel collega's. De communicatie is eerder slecht naar andere disciplines toe, wanneer bijvoorbeeld klanten opgenomen moeten worden, overdracht, vanuit andere instelling naar thuiszorg instelling wordt er vaak te weinig informatie gedeeld. Dat komt wel voor. Telezorg zelf kan dit niet verbeteren, de oplossing hiervoor is een digitaal patiëntendossier. Teams zien elkaar vaak genoeg.

XVIII. Slechte samenwerking tussen verschillende hulpverleners.

Binnen de organisatie speelt dit niet. Buiten de organisatie kan het zijn dat iemand eens te laat is, maar probeert de samenwerking zo goed mogelijk te laten verlopen. Het kan zijn dat er een huisarts is waar je wat minder mee overweg kan, maar dit staat zorg niet in de weg. Over het algemeen is er veel gericht op samenwerking

XIX. Slechte data invoering en informatie vastlegging door hulpverleners.

Gaat best wel vaak mis. Men probeert alles vast te leggen, maar mensen vergeten dit weleens. Bijvoorbeeld bij het geven van medicatie of het insuline spuiten moet worden afgetekend, dit wordt regelmatig vergeten. Telezorg legt wel meteen alle activiteiten vast en kan je in ieder geval terug zien in de geschiedenis van de computer dat een verpleegkundige contact heeft gemaakt met een klant, maar ook daar valt veel te verbeteren. Mensen blijven mensen. Zolang telezorg en dagelijkse gegevens in dossier bij klant nog naast elkaar gelegd moet worden, zullen deze inefficiënties blijven bestaan, fouten worden gemaakt.

XX. Niet optimale gebruik van automatisering van de zorg door hulpverleners.

Dit wordt ervaren. Thuiszorg is bezig met scholing van personeel en thuiszorg gaat langs bij klanten op huisbezoek om te vragen waar tegenaan gelopen wordt. Telezorg is juist een voorbeeld van een automatisering waarmee hulpverleners eerst bekend moeten zijn, voordat ze het optimaal gebruiken.

Nieuwe inefficiënties:

- **weersomstandigheden:** Wanneer er sneeuw en ijzel ligt dan is het moeilijk om de verpleegkundigen overal te krijgen. Telezorg meer efficiënt.
- **Beperkt budget, financiën:** Gebruik van technologische hulpmiddelen kan wel allemaal, maar moet wel gefinancierd worden. Touch screen zit in de vergoedingen, maar andere hulpmiddelen die noodzakelijk zijn voor klant moeten aangevraagd worden bij WMO, kost geld en tijd. Er is heel veel, maar moet wel allemaal gefinancierd worden. Thuiszorg biedt veel technologische mogelijkheden, maar dit moet wel aangeboden worden aan klanten en betaald worden door hun. Ze laten wel

de mogelijkheden zien. Thuiszorg krijgt wel subsidies voor nieuwe technologieën, mar kan wel eens mis gaan. Wel geld vrij vanuit de overheid. Af en toe te weinig geld, ook terecht. Wordt best wat geëxperimenteerd.

- **Technische mankementen van alle hulpmiddelen aanwezig:** De techniek van technologische hulpmiddelen hapert ook regelmatig. De gewone basale zorg via touch screen gaat goed. Maar wanneer men met sensoren werkt of een bedmat (diabetes patient registratie door hypo binnen een kwartier terug zijn) functioneert niet altijd. Lopen vaak tegen mankementen van hulpmiddelen aan, kan wel al veel maar moet ook nog veel doorontwikkeld worden. Moet wel een 100% garantie komen, want je biedt mensen wel een stuk veiligheid aan. Kan niet verholpen worden door telezorg..dit kent af en toe ook zijn mankementen.

E. Afsluitende vragen

I. Verschillen.

Met name in reistijd. Wanneer er oproepen zijn om klanten aan medicijnen te herinneren, hoeft de verpleegkundige niet meer helemaal naar woning van de klant te rijden. Heel efficiënt. Vooral de reistijd is gewonnen efficiëntie.

Verder een gesprek via beeld/telezorg is verpleegkundige ongeveer 5 minuten mee bezig, maar ga je langs is men snel langer bezig. Je moet ergens heen lopen, klant moet deur open maken(duurt soms lang), hangt jas op. Kost altijd meer tijd dan weer er via beeld wordt gecommuniceerd. Koffie drinken. Er kunnen meer klanten (oproepen) beantwoord worden in dezelfde tijd. Meer efficiënt.

II. Telezorg oplossing voor inefficiënties.

Telezorg is een goed concept/ een goede oplossing. Heel veel hulpverleners die nog niet met telezorg werken zien dit nog niet zo, daarom constante voorlichting. Degenen die wel met telezorg werken, ervaren het ook als iets positiefs. Er wordt resultaat gezien. (Telezorg is nu al 8 jaar ermee begonnen binnen bepaalde projecten, 2 jaar geleden naar alle teams gaan uitbreiden. Binnen die teams zijn nu 300 klanten aangesloten binnen 2 jaar, kost tijd om het allemaal uit te leggen).

Veel meer klanten niet aangesloten dan wel aangesloten. Telezorg moet wel echt een meerwaarde hebben. Niet alle dagelijkse zorg kan uit handen genomen worden door telezorg, moet toch dagelijks langs dan heeft telezorg geen meerwaarde.

Het doel is er wel om bij iedereen waarvoor het een meerwaarde kan betekenen, het te installeren(wordt geprobeerd).

III. Welke vormen.

Leefstal monitoring: werken met sensoren in huis, met name bij dementerenden die niet meer met het touch screen systeem om kunnen gaan. Hangen er sensoren in slaapkamer, badkamer, koelkast, keuken. Het activiteitspatroon van de klant wordt hiermee gemeten. Meet eerst het normale patroon, na twee weken gaat het systeem in werking en is duidelijk of er afwijkingen zijn. Voorbeeld van toiletgang: voorheen 1 x per nacht naar de toilet, nu opeens 5 x per nacht, wordt dit een paar dagen gemeten dan is er misschien iets aan de hand. Heeft de klant een blaasontsteking of een verstoord dag-nacht ritme. Hierop de verpleegkundige interventies op aanpassen.

Touch screen systeem is een goede manier: aanvulling is leefstal monitoring.

Health body: Via vragen kan er op tijd gesignaleerd worden of er iets aan de hand is. Ook wel een aanrader.

IV. Opmerkingen/suggesties.

Geen suggesties.

Tijdens rondleiding:
Kans voor verpleegkundigen die niet meer klanten kunnen verzorgen door leeftijd of lichamelijke beperkingen, maar wel graag nog in de verzorging willen werken is telezorg echt een kans. Werknemers van oudere leeftijd kunnen hierdoor meer ingezet worden, ook erg efficiënt aan telezorg.

Appendix III: Interview 2

A. Telezorg

Mensen met een verstandelijke beperking worden hier begeleidt, ambulant. Twee mogelijke indicatiestellingen: 24 uur p/d begeleiding;zelfstandig wonen en uurtje-factuurtje contact: alleen wanneer begeleiding gevraagd wordt. Clienten kunnen er langer zelfstandig door blijven wonen, essentieel. Het is een andere manier van benaderen. Geen vervanging, maar aanvulling.

III. Store-and-forward of interactive approach?

Beeldscherm verbinding. Clienten op aangesloten. Mensen kunnen via beeldverbinding contact leggen met begeleiding. Telezorg wordt gebruikt voor afspraken: inbellen-contact-bespreking probleem-begeleiding gegeven-contact afgesloten. Onbeantwoorde oproepen zijn zichtbaar voor client en begeleider. Kan er terug gebeld worden. Telezorg biedt ook structuur in de dagbesteding van clienten. Inbellen op gezette tijden om een client de dag door te begeleiden. Begeleiding wordt gedaan door begeleider vanaf de werkplek. Werkplekken zijn afgeschermd door schermen.

Bijvoorbeeld medicatie toediening via telezorg; directe vragen kunnen meteen beantwoord worden.bData wordt niet meteen opgeslagen in datasysteem. Telezorg-systeem en datasysteem lopen niet synchroon. Moet later ingevoerd worden. Werkt met een elektronische clienten-dossier.

IV. Vervanging van of aanvulling op bestaande zorg?

Aanvulling: directe, face-to-face contact blijft bestaan. Bijv 4uur per week begeleiding; 2 uur face-to-face en 2 uur via beeldscherm. Afhankelijk van de klant of telezorg een vervanging of aanvulling wordt/is op reguliere begeleiding.

Het vervangt sowieso geen zorg, want als je iets vervangt, lever je altijd iets in. Het is een uitbreiding.

Vormen noemen.

B. Het zorg proces

Wordt bij deze stap efficiëntie geboekt: voorbeelden:

VI. Contact met cliënt.

Geen reistijd.

Directe beantwoording van hulp zorgt voor betere begeleiding. Wordt er niet meteen gereageerd zoals in de reguliere zorg wel eens voorkomt, dan kost het weer meer tijd om de client weer in het juiste ritme en patroon te krijgen→ minder efficiente begeleiding.--> Alarmering.

VII. Verzorgen van cliënt.

Begeleidingstijd is vaak korter, doordat men niet hoeft te voldoen aan sociale verplichtingen zoals in een face-to-face contact moment. Ook door korte contactmomenten kan betere begeleiding geboden worden.

VIII. Stop contact met cliënt.

IX. Data invoering aangaande behandelde cliënt.

X. Contact met volgende cliënt.

C. Klantbeleving

IV. Ervaart negatieve aspect.

Idee komt doordat het concept gebracht wordt alsof het een efficientie-slag is, alsof de zorg er minder door gaat worden. Terwijl het eigenlijk, zoals het binnen deze organisatie gebeurt,

aangeprezen moet worden als een aanvulling/als iets extra's. Verwanten zijn er vooral negatief over omdat ze het concept niet kennen: wordt geinterpreteerd als:
'oh, dan gaan jullie er nooit meer langs' of 'lekker makkelijk wanneer het regent even bellen via het beeldscherm'. Vaak eerst zien dan geloven.

V. Ervaart niet het negatieve aspect.

In tegendeel. Het geeft de client meer privacy, omdat de buurt alles in de gaten houdt en wanneer een client veel begeleiding nodig heeft, kan dit een negatief imago van de client opleveren tov de buurt. Via telezorg blijft het 'onzichtbaar' voor de directe omgeving.
Telezorg wordt aangeboden als een aanvulling op reguliere begeleiding. Zo ziet de client het ook. Hoort alleen maar positieve geluiden van de klant; volledige telezorg zou mogelijk zijn, maar tot nu toe gaat Cordaan bij elke klant langs.
Klanten worden niet gedwongen tot telezorg, het is een aanbieding als aanvulling op reguliere zorg.

VI. Omgang met cliënt.

Erg persoonlijk contact doordat men elkaar aankijkt en er duidelijk voor gaat zitten. Begeleider toont interesse voor client; is nu meer zichtbaar dan wanneer er gecommuniceerd wordt via de telefoon.

D. Inefficiënties

XXI. Reistijd van hulpverlener.

Komt voor en wordt zeker verholpen door telezorg. Een van de hoofdzaken waarom telezorg is ingevoerd. Maakt de begeleiding zeker efficienter.

XXII. Werkschema van hulpverlener is niet flexibel.

Telezorg zorgt ervoor dat het werkschema van een hulpverlener flexibeler wordt. Wanneer een client 's ochtends een brief heeft gekregen die voor frustratie en spanning zorgt, kan de client direct inbellen en contact leggen met een begeleider. Zo kan het probleem hopelijk snel/direct opgelost worden. Wanneer er gewacht moet worden tot 17.00 uur voor het face-to-face contact moment, kan de spanning zo oplopen dat een client ontregelt raakt.

XXIII. Wachttijd door bureaucratie.

Bestaat niet binnen deze sector. Indicatiestelling is al gedaan. Begeleiding wordt direct verdeeld over de clienten. Wanneer er meer aanmeldingen van clienten zijn, wordt er meer personeel gebruikt. Wanneer er minder aanmeldingen zijn, is de werkdruk wat lager voor het personeel. Kwaliteit moet constant geleverd worden. Geen genezen; maar begeleiden. Mensen met een verstandelijke beperking zullen nooit helemaal genezen.

XXIV. Wachttijd door verkeerde behandelingmethode.

Niet binnen deze sector, indicatie stelling is al gedaan en er worden geen clienten behandeld, maar begeleidt.

XXV. Seizoensgebonden vraag naar zorg terwijl aanbod niet veranderd..

Niet meer vraag per seizoen, want het is een cirkel waarin deze begeleiding zich bevindt. Er zijn wel wat inzakkingen wanneer clienten voor een lange tijd op vakantie/familiebezoek zijn (islam. Landen, Turkije, Marokko). Wanneer dit er veel zijn, wordt de productie lager: mogen 2 weken afwezig zijn; hierna ontvangt de organisatie geen vergoeding meer voor de clienten. Zorgt voor hogere kosten.

XXVI. Mismatch tussen vraag van cliënten en aanbod van hulpverleners.

Tot nu toe nog niet ervaren, maar het is wel de grote angst binnen de gezondheidssector. Er zijn nog veel vacatures waarop veel gereageerd wordt. Het kan zo omslaan naar het moment dat er echt niemand meer is. Telezorg is een prima hulpmiddel om deze groeiende vraag ivt het

krimpende aantal personeel te beantwoorden, aangezien meer mensen in een korter tijdsbestek begeleidt kunnen worden.

XXVII. Slechte communicatie tussen verschillende hulpverleners.

XXVIII. Slechte samenwerking tussen verschillende hulpverleners.

XXIX. Slechte data invoering en informatie vastlegging door hulpverleners.

Niet zo aanwezig, aangezien een persoon verantwoordelijk is voor 1 client. Hiermee wordt gecommuniceerd over afspraakmomenten etcetera. Er wordt door deze ene persoon een rapportage gemaakt na elk begeleidingsmoment; daarin worden de hoogtepunten genoteerd. Af en toe door tijdsgebrek vindt er overdracht plaatst tussen meerdere begeleiders. Hiervoor wordt alles goed digitaal geregistreerd. Dit is nog nooit mis gegaan.

Laptops worden gebruikt tijdens face-to-face gesprekken. Per persoon een logboek (dossier met geschiedenis en enkele werkdoelen incl plan). Alles wordt samen met de client ingevoerd, zodat de client ook weet wat er en welke doelen er geregistreerd worden. Niets meer schriftelijk. Gezamelijk wordt alles geupdate→ verantwoording tov client.

XXX. Niet optimale gebruik van automatisering van de zorg door hulpverleners.

Niet het geval bij telezorg. Dit is de enige automatisering die gebruikt wordt buiten de digitale invoering van gegevens. Dit laatste gaat goed. Zie XI.

In het begin moeilijk voor begeleiders om zichzelf te zien in beeld. Lijkt erg vreemd. Bekeken voelen. Gevoel vn ongemakkelijkehdi bij gebruikt van beeldscherm. Lijkt veel persoonlijker. Ook het geluid is harder.

XXXI. Extra inefficienties

Technische mankementen:

20 maanden binnen organisatie gebruikt gemaakt van telezorg. In eerste instantie een pilot-onderzoek, daarna toepgepast. Probleem ligt vooral bij de hardware, bij de leverancier van de benodigdheden. Redelijk vaak deed er iets niet. Erg mee gestoeid. Zowel medewerkers als clienten hadden last van deze mankementen. Voornamelijk clienten verloren vertrouwen in het systeem en hadden er geen zin meer in. Kostte veel tijd om het systeem te integreren bij de clienten, mee te krijgen in het process. Nog steeds wisselend of het systeem werkt.

Windows communiceert in het Engels wanneer er iets misgaat, daar hebben clienten veel last van.

Werken met mobiele teams:

Doordat er gewerkt wordt met mobiele teams en er geen vaste receptioniste is, werkt communicatie af en toe moeizaam. Allemaal bypasses aangelegd om op elke moment van de dag de juiste begeleider te kunnen contacteren. Bijvoorbeeld sms naar begeleider wanneer een client een onbeantwoorde oproep heeft gehad.

Evaluatie van pilot onderzoek: Telezorg heeft als voordelen:

- Minder spanningopbouw bij client.
- Gevoel van veiligheid is verhoogd bij clienten.
- Verbetering/uitbreiding sociale contacten.
- Client tevredenheid is hoger.
- Ontwikkelingsmogelijkheden.
- Participatie digitale samenleving.
- Gestructureerde dag.
- Zinvolle dagbesteding door bijv spelletjes.

- Grotere zelfstandigheid en zelfredzaamheid.
- Emoties van client zijn beter zichtbaar door telezorg. Ook client kan zijn/haar emoties beter laten zien.
- Verschillen in cultuur kunnen beter benaderd worden. Het is nu mogelijk voor een mannelijke begeleider om een vrouwelijke(islamitische) client te begeleiden. Voorheen was het niet mogelijk om face-to-face contacten te ondernemen, aangezien een vrouw niet met een 'vreemde' man in

E. Afsluitende vragen

V. Verschillen.

VI. Telezorg oplossing voor inefficiënties.

Telezorg is echt de toekomst. Niet als vervanging van reguliere zorg/begeleiding, maar als iets extra's. Moet naar de meerwaarde kijken.
Telezorg is wat doelmatiger. Eerder doel bereikt; intro is veel langer bij face-to-face contact. Oproep wordt gedaan met een doel, doel wordt bijna altijd direct beantwoord. Scheelt tijd.
Prachtige uitbreiding van ondersteuning in de zorg.

Efficienties in:
Reistijd
Begeleidingstijd/behandeltijd: meer clienten in een tijdsperiode
Ook groeiende vraag en krimpend aantal personeel is geholpen met bovenstaande efficientie.

VII. Welke vormen.

- Er zouden nog extra leerprogramma's op geinstalleerd kunnen worden over 'hoe te werken met telezorg'. Verder is er de mogelijkheid voor client en om spelletjes te spelen en dingen zelfstandig te leren(rekenen, internetbankieren bijv.).

Elke woensdag is er een bingo waaraan alle clienten die zijn aangesloten op Pall 4 mee kunnen doen. Verder kunnen ze onderling contact leggen/spelletjes doen.
Ook is er een client die contact heeft met een zus via telezorg. Dit verbeterd de begeleiding ook op een makkelijke manier. Gebruikt voor netwerkcontacten.

- Sensoren: dat wordt niet gebruikt bij Cordaan.
- Philips heeft veel innovaties: op afstand bloedwaarden meten en bloedsuikers laten prikken.

VIII. Opmerkingen/suggesties.

Kwaliteit van begeleiding wordt er alleen maar beter door, niet minder.

Appendix IV: interview 3

A. Telezorg

Zorg en diensten op afstand. Deze zijn gericht op het verbeteren van de kwaliteit van leven, wonen en zorg. Wordt gewerkt met een zorgcentrale die 7 dagen in de week, 24 uur per dag bereikbaar is. De techniek is mooi, maar het gaat natuurlijk om de dienst die erachter zit. Die moet wel altijd gegarandeerd worden. Nu wel na aan het denken over hoe een aantal diensten van die zorgcentrale teruggebracht kan worden naar het eigen wijkteam. Deze zouden ook meer met telezorg moeten werken. Telezorg moet meer bij de eigen medewerkers komen te liggen, de zorgcentrale staat los van 'eigen' personeel.

V. Store-and-forward of interactive approach?

Interactive approach door middel van beeldcommunicatie.

Store-and-forward approach door middel van registratie van gedrag door bewegingssensoren

VI. Vervanging van of aanvulling op bestaande zorg?

Telezorg is zowel een aanvulling als een substitutie van zorg. Wanneer zorg op afstand wordt gedaan zodat de fysieke afstand overbrugd wordt door gebruik van technologie dan gaat het om besparing van reistijd. Ook voor medicatie inname is het een vervanging van de zorg. Voorheen ging een medewerker naar een client toe, nu wordt er via beeld een oproep gedaan.

Kan veel tijd besparen.

Geen enkele client is totaal afhankelijk van telezorg. Bepaalde diensten, zoals het wassen van clienten, kan niet gedaan worden op afstand.

Vormen noemen.

Ondersteuning met beeld, contact tussen client en medewerker op afstand; beeld en spreekverbinding. Tweezijdig systeem; een client kan inbellen, maar een medewerker van de zorgcentrale kan dat ook. Werken met de tv van de klant. Daaraan is een mediabox gekoppeld, camera en twee audio-boxen en een afstandsbediening. Via die afstandbediening kan contact worden gezocht. Wanneer zorgcentrale contact zoekt met client, ontstaat er een optisch signaal dat zichtbaar en hoorbaar is voor de client.

Bewegingssensoren; op afstand gedrag van clienten, kwetsbare ouderen in de thuissituatie kunnen monitoren. Op het moment dat er een gevaarlijke situatie zich voordoet, kan daar dan heel snel op gereageerd worden.

Personenalarmering; spreek-luister verbinding. Dat mensen op een knopje kunnen drukken; moet de client zelf iets doen. Wordt tegenwoordig gekoppeld aan andere sensoren, bijvoorbeeld een dwaalsensor. Als je bij alarmering ook een sensor op de deur zet, dan gaat er een alarm af wanneer diegene een deur openmaakt op een tijdstip waarop dit niet gebruikelijk is. Ook sensoren die gas detecteren. Als er op een moment gas gedetecteerd wordt door een systeem, kan het gas op afstand afgesloten worden. Zorg-alarmering plus.

B. Het zorg proces

Wordt bij deze stap efficiëntie geboekt: voorbeelden:

XI. Contact met cliënt.

Meeste winst zit hem in de reis naar de klant toe. Hier zit de meeste tijdswinst. Reistijd = 0.

XII. Verzorgen van cliënt.

XIII. Stop contact met cliënt.

XIV. Data invoering aangaande behandelde cliënt.

Zowel bij telezorg als reguliere zorg moet een bezoek 'afgehandeld' worden. Moet een rapportage gemaakt worden, van alles registreren. Hierin zit weinig verschil. Alle automatische

registratie, bijvoorbeeld tijdsregistratie, is efficiënter aangezien telezorg systeem meteen inlog tijd registreert. Maar er bestaan al vele efficiënte systemen binnen de thuiszorg waar echt niets meer schriftelijke geregistreerd hoeft te worden. Moet zelf nog regelmatig iets intoetsen op een scherm, al zijn er ook systemen die alles registreren via barcodes. Is geen telezorg.

XV. Contact met volgende cliënt.

C. Klantbeleving

VII. Ervaart negatieve aspect.

VIII. Ervaart niet het negatieve aspect.

Ervaart dit aspect niet. Hoort juist andere geluiden. Bij beeldschermzorg hoort men juist positieve geluiden van mensen die dit systeem gebruiken. Met name ouderen die alleenstaand zijn, zeggen zich minder eenzaam te voelen. Het contact met de verpleegkundige, waarin eigenlijk alleen zorg geleverd wordt, is ook een contact waarin een sociale interactie plaats vindt. Niet alleen gericht op zorg, maar ontstaat ook een gesprek tussen client en zorgverlener. Vooral het beeld geeft het gevoel dat mensen zich minder eenzaam voelen.
De technologie die Proteion heeft is makkelijk in gebruik. 80-90% vindt het ook makkelijk te gebruiken. Die andere 10-20% vindt het wel moeilijk. Uiteindelijk is men op zoek naar de makkelijkste vorm van telezorg, met zo min mogelijk knopjes en alles gesynchroniseerd, maar zover is men nog niet. Overwegend erg positieve geluiden, de angst voor de technologie blijkt niet waar te zijn. Enkelen ervaren wel een negatief effect.

IX. Omgang met cliënt.

Waar zorg vooral communicatie is, advies. Voorlichting, een stukje emotionele ondersteuning, kan er met beeld veel gedaan worden. Heel veel vragen kunnen op deze manier op afstand beantwoord worden. Ter tevredenheid van de klant, daarom is ook een monitor gedaan 'Vindt men het nu ook een goede manier van zorg?'. Ja 80-85% . kan het dus hierbij ingezet worden.

D. Inefficiënties

XXXII. Reistijd van hulpverlener.

Ja, kan telezorg veel aan doen.

XXXIII. Werkschema van hulpverlener is niet flexibel.

Ja, klopt. Met zorg op afstand kan hierbinnen ook efficiënt bereikt worden. Veel zorgvragen zijn gebonden aan bepaalde tijdstippen. Bijvoorbeeld medicijn inname. Planning van routes is hiervan afhankelijk en bepaalde behandelingen zijn bepaald voor de andere afspraken. Kunnen dit soort behandelingen eruit gehaald worden, wordt de route veel flexibeler. Doordat je bepaalde vragen op een bepaald tijdstip uit de route gehaald worden. Routes flexibeler gepland.

XXXIV. Wachttijd door bureaucratie.

Echt dringende vragen komen hierbij niet voor. Voordat er een indicatie is, duurt het nog wat weken voordat de client opgenomen wordt. Als de client een vraag heeft die erg brand, kan dit moeilijk zijn. Moet er gewacht worden. ICT kan de aanvraag van zorg en administratieve processen erg versnellen, maar telezorg doet dit niet.

XXXV. Wachttijd door verkeerde behandelingmethode.

Bij medicatiebegeleiding gaat er nog wel eens het een en ander mis. Mensen krijgen te laat of verkeerde medicatie. Met telezorg kan je mensen wel meer een eigen regie geven. Er zijn nu al slimme apparaatjes die op het moment dat medicatie ingenomen moet worden een signaal afgeven en dan komen de pilletjes uit het apparaat. Zakje van het apparaat gehaald worden, wordt het zakje niet van het apparaat gescheurd, dan gaat er een signaal naar de zorgcentrale. Hier wordt gemeld dat een client niet de medicatie heeft genomen, hier kan dan naar gehandeld

worden. Met ICT kunnen mensen worden gefaciliteerd om meer zelf te doen en zekerheden ingebouwd worden.

XXXVI. Seizoensgebonden vraag naar zorg terwijl aanbod niet veranderd.

Niet minder vraag, maar minder personeel in de zomer. Door zorg op afstand kan personeel efficiënter ingezet wordne. Maar dit is ten alle tijden en niet seizoensgebonden.

XXXVII. Mismatch tussen vraag van cliënten en aanbod van hulpverleners.

Steeds meer last van. Mensen hebben op een bepaald moment een vraag. Zijn ook steeds meer mensen met een beperking die toch thuis blijven wonen, vroeger ging men naar een instituut. Dus meer op niet-geplande momenten een vraag hebben. Met zorg op afstand kan deze vraag meteen beantwoord worden (7 dagen id week, 24 uur per dag). Dat maakt alles efficiënter. Direct en snel geholpen worden. Met face-to-face contact is veel moeilijker te organiseren.

XXXVIII. Slechte communicatie tussen verschillende hulpverleners.

Dit moet opgelost worden met een elektronisch patiëntendossier, niet met telezorg. Waar verschillende mensen toegang tot hebben. Is nog niet aanwezig binnen de thuiszorg. Alle info erin stoppen en oproepen wanneer nodig en mits geauthoriseerd. Ook gelinkt met verschillende sectoren. Privacy mee van doen. Binnen de medicatie gaat nog wel eens iets mis. Binnen deze keten zijn er veel personen mee gemoeid. Er wordt nog wel eens iets verkeerd/onleesbaar genoteerd of iets niet afgetekend. Door digitalisering beter.

XXXIX. Slechte samenwerking tussen verschillende hulpverleners.

Te vergelijken met vorige inefficiënties. Proberen nu MDO's (Multidisciplinaire overleggen) te plannen tussen verschillende sectoren. Hier kan een elektronisch dossier een stuk verbetering in aanbrengen door de informatiedeling.

XL. Slechte data invoering en informatie vastlegging door hulpverleners.

Registratie van tijd is digitaal. Ook voor de facturering erg ideaal.

Binnen de thuiszorg wordt echter verder nog gewerkt met papieren dossiers. Hier is nog veel te winnen. Alle contracten worden schriftelijk ondertekend. Valt nog veel te winnen.

Medewerkers moeten nog leren dat de zorg die men levert ook echt geleverd wordt binnen de tijd die ervoor staat(indicatiestelling). Anders nieuwe indicatie aanvragen, aanpassing aanvragen. Medewerkers focussen zich vaak alleen op zorg.

XLI. Niet optimale gebruik van automatisering van de zorg door hulpverleners.

Heeft met het niet weten hoe om te gaan met middelen te maken. Ook heeft het ermee te maken of de organisatie er gebruik van maakt. Bijvoorbeeld een digitale pen kan veel uitkomst bieden. Alles wordt hiermee opgeschreven en op het moment dat men een vinkje zet, wordt het naar de administratieafdeling gestuurd en deze verwerkt het. Scheelt tijd en maakt flexibel. Komt binnen en kan meteen verwerkt worden.

E. Afsluitende vragen

IX. Verschillen.

Directe zorg aan de klant kan met minder tijd en met minder fouten.

Ook het verkomen van fouten zorgt ervoor dat er extra tijd en geld beschikbaar is voor de zorg, aangezien deze fouten niet meer gecorrigeerd hoeven te worden.

De administratieve taken van verpleegkundigen en verzorgers worden veel makkelijker. Kost daardoor ook minder tijd en minder moeite 'effort'.

Met telezorg kan er ook substitutie plaatsvinden, vooral mantelzorgers en vrijwilligers kunnen nu taken faciliteren die normaal gesproken professionals doen-> dagstructurering. Dit hoeft niet per se door professionals gedaan te worden, kunnen vrijwilligers ook doen met behulp van

telezorg. Efficiënter, kost minder geld en tijd voor organisatie. Veel vraag is niet echt een zorgvraag maar meer geruststelling.
Sensoren: op afstand monitoren: deze informatie wordt ook beschikbaar gesteld aan mantelzorgers. Zij kunnen met dit systeem zien dat thuis nog alles goed is en voelen zich minder belast. Betere controle over cliënt. Zolang de status goed is, hoeft er niet te veranderen. Wanneer er iets niet goed gaat wordt dit meteen geregistreerd door sensoren of beeldcontact en wordt er een automatisch bericht naar de zorgcentrale gestuurd. Men kan direct handelen, efficiënt.

X. Telezorg oplossing voor inefficiënties.

Een van de oplossingen. Er wordt veel van verwacht. Met de inzet van technologie zullen niet alle problemen opgelost worden. Duurder, steeds meer mensen met beperking die ook nog thuis blijven wonen, steeds minder professionals, steeds minder informele zorgverleners.
Eigen verantwoordelijkheid moet genomen worden door mensen.
Moeten weer meer voor elkaar zorgen.
Techniek moet bovenstaand makkelijker en goedkoper maken.
Vak moet weer aantrekkelijker worden.

XI. Welke vormen.

Met name beeldscherm zorg, bewegingssensoren. Ook interessant om via beeldscherm mensen programma's aan te leren, zelfzorg programma's waardoor een client meer kennis en inzicht krijgt in zijn/haar ziekte en wat dat betekent voor leven en gedrag. ZorgTV.
Zelfzorgprogramma's een erg belangrijke vorm van telezorg. Advies en voorlichting.
Digitalisering van afspraak maken en vraag beantwoording via internet/mail.

XII. Opmerkingen/suggesties.

Wat ook genoemd moet worden is dat de kwaliteit van zorg ook omhoog gaat door het gebruik van telezorg. Bijvoorbeeld, als klant kan je nu direct, makkelijk en snel in contact komen met een hulpverlener dmv beeldcontact. Voorheen veel meer wachttijd voor klant/ reistijd voor hulpverlener, vooral bij plots opkomende vragen.
Het is een kwaliteitsverbetering. Ook ziet de klant telezorg als een vorm van sociaal contact.

Inefficiëntie van telezorg: De medewerkers zijn het grootste probleem bij de invoering van telezorg. Goede zorg is voor de meeste medewerkers gedefinieerd als: ik ga bij de klant naar binnen om zorg te verlenen. Het idee van telezorg staat niet aan. Medewerkers moeten meer wennen aan telezorg dan cliënten. Het kost veel meer tijd en energie om deze doelgroep ervan te overtuigen dat telezorg een goede oplossing is voor het leveren van zorg. Meerwaarde ervan, mits goed toegepast.

Moet wel per situatie bekijken of zorg op afstand in die situatie een goede oplossing is. Dat is met elke interventie.