Obstetric health care use of women in Egypt

Influences of first pregnancy outcomes at obstetric health care use during second pregnancies.

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Frontpage: Mother shows her newborn baby.
Photo by author, Cairo 2003.

Abstract
Earlier was the availability of health services in Egyptian healthcare the biggest problem, yet it is the non-usage of the services that is of much concern. To make a change of behavior happen, clear insight in the usage of obstetric health care is essential.
To gain more knowledge of obstetric health care use of Egyptian women and to explore whether the outcome of a first pregnancy influences health care use during a second pregnancy, this study investigates potential differences in obstetric care use of these women throughout their birth-giving career.
Little is written yet on the influence of mortality on health care usage. But regarding health care use, the Socio-Behavioral model of Andersen was constructed to understand why people use health care services. Data of the Egyptian Demographic Health Survey 2005 is analysed by constructing descriptive tabulations and performing log-linear tests and logistic regression models.

The findings of the research show that, when comparing usage of obstetric health care at first and second pregnancy, during second pregnancies less antenatal care was used and fewer deliveries in health facilities were observed. At first pregnancy 70.4 percent of the women used sufficient antenatal care. 42.2 percent delivered in a private facility, 30.6 percent went to a public facility and 24.3 percent delivered at home. At second pregnancy 60.4 percent of the women went for sufficient antenatal care. 38.5 percent delivered in a private facility, 25.6 percent in a public facility and 33.2 percent delivered at home.

The outcome of the first pregnancy has a significant influence on health care use during a second pregnancy. The possible explanation, which first pregnancy outcomes could give about the difference between obstetric care use during first and second pregnancies would be: Most women have positive pregnancy outcomes. Women with positive first pregnancy outcomes use less formal obstetric care during second pregnancies than women whose first pregnancy ended negatively. The difference in health care usage between first and second pregnancies is thus due to women with positive first pregnancy outcomes.

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Tables and Figures

Acknowledgements
In 2003 I spent four months living and studying in Cairo. During these months I travelled through most of Egypt and saw the country's large differences in spatial development and people's wealth. Of course I knew on forehead that this country varied from my own but it feels different when you are actually there. I still remember the shock when I first met a woman of my age, who could not read or write. I took this experience as an inspiration for this thesis

This year I started the Masters of Human Population Studies. I decided to combine my knowledge about Egypt with the subjects I was going to learn about demography;. These two perspections combined made the subject for my Masters thesis: Obstetric health care use of women in Egypt.

I am grateful to my first supervisor Fanny Janssen. The cooperation was very pleasant. Furthermore she motivated me and her criticism and comments were of great value to the improvement of my research. I would also like to thank my second supervisor Leo van Wissen, for his comments on the statistical analyses.

Sjoerd Kroon and Christian Ernsten made me very happy when they both offered to read my thesis and to give comments. I greatly appreciated their afford.

Finally I would like to thank my parents and friends for their valuable comments and suggestions.

Annemarie Ernsten, August 2007

1 Introduction

In Egypt the common idea about pregnancy is that both pregnancy and giving birth are natural processes of human live and therefore people tend to think that medical involvement is not necessary. Many women believe that the problems they experience are normal female inconveniences and because of this reason they do not visit an attendant. As a result, small problems can become major ones (UN, 2002).

Mainly due to the national family planning program, a rapid fertility decline has taken place since the 1980s. In 2005 the total fertility rate was 3.1 children per woman. Also infant and maternal mortality rates did decrease. The infant mortality rate (IMR) is now 28 per thousand, while the average IMR in the sub-Saharan countries is about 100 per thousand (UNICEF, 2006). The maternal mortality dropped from 173 per thousand in 1993 to 84 per thousand in 2000, but of these still 92 percent could have been prevented (UN, 2002).

From 1997 until the year 2000 the Egyptian ministry of Health and Population developed the Healthy Egyptians 2010 approach. Healthy Egyptians 2010 is a strategy for the national public health. It is meant to prevent diseases and to promote health, and it is based upon the Health for All approach from the World Health Organization (MOHP, Healthy Egyptians 2010).

To achieve health for all in Egypt, several national goals and objectives were set and four focus areas were chosen. Maternal and Child health is one of the areas, which will be given priority (El-Henawy, 2000). Out of the goals and objectives several strategies were developed. The strategies to improve maternal and child health include acceptance of safe motherhood, by putting stress on early and continuous antenatal care and skilled attendants during delivery as well as family planning services to assure suitable contraception and birth-spacing. The target for maternal mortality is to reduce it to no more than 50 per 100,000 live birth's by 2010 (MOHP, Healthy Egyptians 2010).

The Egyptian government has far reaching plans to improve maternal and child health. But although in the past the availability of health care services in Egyptian healthcare was the biggest problem, nowadays it is the non-usage of the services that is of much concern (UN, 2002). To make a change of this behavior happen, a clear insight in the use of obstetric health care is essential (Hausmann-Muela et al, 2003).

This study investigates potential differences in obstetric health care use of Egyptian women throughout their birth-giving career. It is examined whether positive and negative outcomes of first pregnancies influence the health care use of women who are pregnant for the second time. The objective of the research is to gain more insight in the obstetric health care use of Egyptian women and to explore whether the outcome of a first pregnancy influences health care use during a second pregnancy.

Earlier research already has shown that health care use is dependent on personal circumstances and social well being. And from the various UN and USAID reports it is clear that the proportion of deliveries attended by skilled health personal has increased (UN, 2006). But what has not been examined yet are the differences between pregnancies

of varying order and the influences of earlier pregnancies outcomes. The research presented here makes a start filling these gaps.

To collect more knowledge of the obstetric health care women use in general, the first research questions are:
Which obstetric health care is used by Egyptian women, while being pregnant for the first time, according to their characteristics?
Which obstetric health care is used by Egyptian women, while having their second pregnancy, according to their characteristics?

The answers of the foregoing and next questions will be gained from data of the Egyptian Demographic Health Survey, which was held in 2005. A comparison of these answers will lead to the answer to the next question, which is:

Are there any apparent differences in the obstetric health care use of women who have their first pregnancy and women who have their second pregnancy?

The answers to the previous questions will provide a lot of information regarding obstetric health care use of women in general, and especially, during first and second pregnancy. Another aim of the study is to explore whether previous pregnancy outcomes influence the obstetric health care use during the next pregnancy. For this reason, the next set of questions deal with second pregnancies, namely:

Do the outcomes of the first pregnancy influence the use of obstetric health care when having a second pregnancy?

Do first pregnancy outcomes explain the potential difference between obstetric health care use of first and second pregnancies?

After this introduction, the second chapter will provide some background information regarding the studied population and the context of this study. The third chapter will explain the theory and secondary literature concerning health care use, obstetric health care and previous pregnancy outcomes which a woman can experience. Finally, these theories will be combined into a conceptual framework. The fourth chapter will elaborate on the methodology, which has been applied to find the answers to the research questions. The explanation will give more insight into the data and the definitions of concepts used throughout this dissertation. This information is essential in order to understand the results of the research. Then, the fifth and sixth chapter will give the results according to the research questions. The fifth chapter explains the obstetric health care use during first and second pregnancies. The sixth chapter elaborates on the question whether first pregnancy outcomes influence health care use during second pregnancies. This chapter will also discuss whether pregnancy outcomes explain the differences in obstetric health care use between first and second pregnancies. Finally, in a conclusive chapter the overall answers and conclusions will be given.

2 Egypt

This chapter will describe the social, economic and health situation in Egypt. Knowledge about these features gives a better understanding of the problem which Egyptian women face. Furthermore, it is impossible to get good insight in the usage of obstetric health care without having knowledge of their living environment (Hardee 2004, Hausmann-Muela, 2003).

2.1 Generalities

Egypt is a country located in the North-East of Africa. In 2006 the population was already over 78 million and the population has a growth rate of 2.1 percent (World bank, 2004). The country size is about 1 million square kilometres but of these only six percent is inhabitable. This makes the liveable places extremely high populated. Forty percent of the people live in urban areas, of which Cairo and Alexandria are the most popular. Cairo has areas in which the number of people per square kilometre exceeds 100.000 (WHO, 2005).

The official religion in Egypt is Islam. By far the most people are Sunni-Muslims, but also much apparent is Sufism, which is a more mystical subgroup within Islam. The only other religion of mentionable size in Egypt is Christianity; most Christian people belong to the Coptic Church (Goldschmidt, 2007).

2.2 Economy and education

Having a gross national income of $1500 per capita, Egypt is a lower-middle income country. Its main sources of income are tourism, earnings from the Suez Canal, oil and remittances (UN, 2002). Because the labor market is not growing with the same speed as is the population the unemployment is relatively high. Officially, it is said to be about 9 percent, but it is believed to be much higher (World bank, 2004). For women this number is definitely much higher. Still there is a big gap in the labor participation of women and men. Although the Egyptian constitution gives women and men the same rights this is not always visible in society. Women are behind in economic participation, getting access to education as well as in getting access to health care services (UN, 2002).

The educational system is also facing the problems of the growing population. Sixty percent of Egypt's adult female population is still illiterate, although this number is decreasing. Education is freely available for all people in Egypt and the law protects the right at education. But the educational system needs a reform to reduce school drop out and increase the quality of the lessons (UN 2002; Beamish 2003).

2.3 Health

Early in the 1920's Egypt started building maternal and child healthcare centres in the urban areas and on the country side rural health facilities were set up. The public health care became geographically well spread and today the basic health services are accessible for almost the entire population. Ninety-five percent of the population lives within five kilometre of a health facility (WHO, 2005).

The Ministry of Health and Population services and academic clinics and hospitals are publicly accessible. Unfortunately these services do not automatically include care

focussed at reproductive health. Moreover, public facilities are often of poor quality. The public facilities are responsible for a majority of the reproductive health services. The right of women to medical, physical, psychological and social health care is protected in the Egyptian constitution. In addition to this, the National Council for Childhood and Motherhood was established in the eighties (Beamish, 2003).

The legal age for marriage for women is 16 and for men 18 years old. Once married there is a strong social pressure at the couple to start reproducing and as such to prove their fertility. This results in an average age at first birth for women of 20 years old in rural areas and 23 in urban areas. At the age of 19, over 20 percent of the married women have already given birth to a child (Beamish, 2003).

3 Theoretical framework

In order to find a sufficient answer to the research questions, which were presented in the introduction, more information regarding the theory and secondary literature concerning the subject is necessary. I will use the socio-behavioral model of Andersen to get insight in what determinates obstetric health care use. Through this model, insights in the problematic areas of health care use of the women in this research will be derived. Before the discussion of this model, a paragraph (3.1) will be devoted to the contents of obstetric health care. I will reflect on theories regarding previous pregnancy outcomes in paragraph 3.3. Together these theories will lead to the conceptual model, which is shown in the fourth paragraph.

3.1 Obstetric health care

What is involved in obstetric health care? Obstetric health care is all health care from the beginning of the pregnancy up to about two weeks after labor. Ideally the obstetric health care involves antenatal examinations, meaning the presence of skilled attendants at delivery and post delivery executing examinations of mothers and children.

During the antenatal examinations screenings and tests are done in order to determine anaemia and hypertension, as well as for sexual transmitted diseases. If problems are detected the necessary treatment should be provided. The antenatal visit is also a moment that a pregnant woman receives information about diets and where to seek care in case of pregnancy complications (POLICY Project, 2005).

Skilled attendants during delivery are necessary because in case of complications a trained attendant can recognize these and treat them or send a woman to a health facility. Increasing the number of deliveries assisted by a skilled attendant is a very important factor to reduce maternal mortality (UN, 2006).

Post delivery care involves an examination of the mother of the newborns to detect and to treat possible problems that occur after delivery. Also the health of the child will be checked. Furthermore, at this moment information about caring, breastfeeding, immunization and family planning can be provided and gained (POLICY Project, 2005).

3.2 The Socio-Behavioral Model of Andersen

To gain more insight in the obstetric health care use of Egyptian women and to investigate potential differences in obstetric health care use throughout their birth-giving career a model for health seeking behavior will be used. This paragraph will give a short explanation about the health seeking models. The model which is most suitable for this research, will be explained more in detail. The most used behavioral models for health care seeking in psychology are the Health Belief Model, the Theory of Reasoned Action of Fishbein and Ajzen and the Theory of Planned Behavior of Ajzen, and for medical sociology and anthropology the Health Care Utilization Model of Andersen (Hausmann-Muela, 2003).

The Health Belief Model was developed by a group of social psychologist in the 1950s. This model explained people's behavior, in relation to health. The components of the model are mainly cognitive variables which are measures of perceptions about the disease, the treatment and so on (Janz et al. 2002). The components of the Health Belief Model are proven to be of influence in health behavior. The model is particularly useful

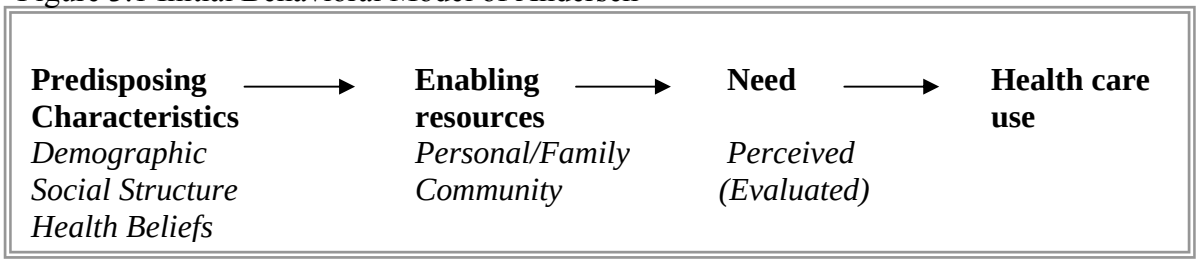
to determine findings for intervention programs (Hausmann-Muela, 2003).
According to Ajzen and Fishbein's Theory of Reasoned Action, people's behavior stems from two things. Firstly, how a person feels about performing a certain action and, secondly, what other people think about them doing that action. Ajzen and Fishbein argue, in their Theory of Reasoned Action, that socio-economic and demographic factors only influence behavior indirectly (Stead, 1985). Ajzen also developed the Theory of Planned Behavior. In this theory he tried to include the fact that although people make choices it is not always their free will to act as they do. Both the Theory of Reasoned Action and the Theory of Planned Behavior indicate that behavior can be predicted from an intention to behavior (Orbell, 1997).
The advantage of these models is that they both take aspects of a person's motivation to do a certain action into account. Yet there has not been paid much attention to socio-economic and demographic aspects, as these are indirect causes of the intention (Stead, 1985; Haussmann-Muela, 2003).

All previous mentioned models and theories have their advantages and disadvantages, but the one that fits this research best is the Socio-Behavioral model of Andersen. The model is also called the behavioral model of health services use and was developed by the American sociologist Andersen in 1968. It was specially constructed to understand why people use health care services. The model was meant to predict and to explain health services use (Andersen, 1995; Hausmann-Muela, 2003). Andersen's model describes health care use as a function of predisposing, enabling and need variables. The model is used during many researches and there have been many versions of the model (Kroeger, 1983). The version as Andersen initially developed it is shown in figure 3.1.

Andersen developed his model initially to explain health care use in the United States. But usage of the model during numerous researches in developing countries showed that it is also there very usefull (Weller et al. 1997).

According to the model, health care use is dependent on several factors: people's need for health services, their ability to use care and their predisposition to do so. The importance of these factors is in the same order. When there is no need for health care the enabling resources are also less important. When there is no ability to receive health care the predisposing characteristics are meaningless.

Figure 3.1 Initial Behavioral Model of Andersen



Source: Andersen (1995)

The factor which is going to be explained is health care use. According to Andersen, the first factor which can cause the use of care is 'need'. As is shown in figure 3.1 the need is

divided into two categories. The first one is the perceived need, which involves how people view their own health. In this their own experience of pain and symptoms of sickness, which let them experience need. The second category is the evaluated need. This need represents professional judgment of the need of people to use health facilities. The evaluated need is more or less the same for every person with the same sickpattern while the perceived need can be different per person (Andersen, 1995).

If need is apparent the enabling resources become important. The health care use of an individual is dependent on the social, economic and demographic characteristics of the family a person belongs to (Andersen, 1995).
The community, family and personal level of ability must be present to make the use of health care possible. At the community level health personnel and facilities must be available. At the family and personal level, people need to know how to get to a health facility and they must have the financial means and the knowledge to obtain certain health services. Thus income is important in this matter (Andersen, 1995).

When a person has the ability and the need to seek health care, the predisposing characteristics will also influence this person's health care seeking behavior. The predisposing characteristics contain three main categories: demographic characteristics, social structure and health beliefs (Andersen, 1995).
In terms of demographic characteristics, the age and gender of a person indicates the likelyhood that the person needs healthcare. Social structure has to do with the status a person has in the community, mostly including education, occupation and ethnicity (Andersen, 1995). Also Kroeger found in his research on anthropological and socio-medical health care research in developing countries that 'formal education turned villagers away from traditional healing' (Kroeger, 1983, p.150).
Health beliefs are defined as attitudes, values and knowledge, which people have about health services. These can influence their perceptions of the need of health care and the use of health facilities (Andersen, 1995).

After Andersen developed the initial model a lot of critique in relation to the different phases in the model were given. Much of the critiques were about missing variables or about definitions, which were to broad. Andersen assessed these critiques and made new models in which he included some of the variables. I like to bring in remembrance the fact that Andersen meant his model to predict and to explain health services use. Yet it appeared that most of the critiques were given when the model was aimed for the prediction of health care use. Furthermore the comments were very much depending of the type of utilization, which was to be studied. This makes the model still very suitable for this research (Andersen 1995).

However some aspects of the model still could be improved. For this reason, Phillips et al. (1998) studied a number of researches at health care utilization, which made use of Andersen's model during the last twenty years. Phillips and his colleagues studied whether extra variables were included in Andersen's model and if so, what kind of variables. They found that forty-five percent of the studies they examined included environmental variables and fifty-one percent included provider-related variables.

3.3 Previous pregnancy outcomes

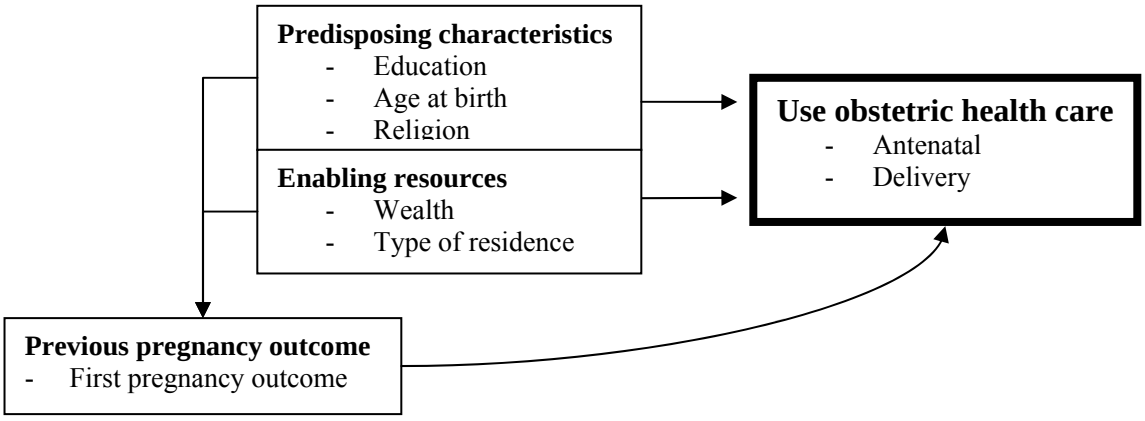
Do positive and negative pregnancy outcomes influence health care use during a second pregnancy? Or does death influence health care use? After an intensive literature research it becomes clear that most research is done on how health care use reduces mortality. Nothing was found accounting to the specific topics of this thesis, probably because it has not or very little been researched.

Also literature considering risk assessment did not give results which could be used to explain the influence of previous pregnancy outcomes at the usage of obstetric health care. I did find examinations, which include the subject of previous experiences in general. Several psyhological magazines go into this subject. Both Christie (2007) and Tversky and Kahneman (1983) mention that current actions are always influenced by experiences and knowledge of a person. Tversky and Kahneman researched intuitive reasoning. Humans assess probabilities of an event to take place according to the knowledge and beliefs they have, they will always search for similar situations (Tversky and Kahneman, 1983). Christie (2007) researched the influence of evaluations on actions of decision makers. In the article it is stated that changes that occur in a human's knowledge, attitudes and opinions are influencing that persons actions.

So, according to these two researches it can be said that having a different past experience probably means that the action, which will be taken, concerning the use of certain health care provisions can also differ.

3.4 Conceptual Model

Figure 3.2 Conceptual model



The conceptual model derived from the previous discussed theories and secondary literature is displayed in figure 3.2. It shows the relationships between health care use, and the different characteristics of the women. The model of Andersen can still be recognized, although there have been some modifications.

Of course obstetric health care use is the factor, which is going to be explained, it is subdivided into antenatal care and delivery care. Andersen used in his initial model a certain sequence of the different factors, but he mentioned that this sequence was mainly of use when the model was aimed for prediction purposes (Andersen 1995). Also Hausmann-Muela et al. (2003) says that it is not always necessary to order the variables.

During this research on obstetric health care use there is no need for the order of factors because the purpose of the model is to explain rather than to predict health care use.
The 'need' factor is left out of the conceptual model. Since with each pregnancy and delivery there is a risk for mother and child (Khalil and Roudi-Fahimi, 2004; WHO, 1994) and therefore each pregnancy needs some form of health care. The need is apparent in all cases in our research population.
As the previous pregnancy outcomes are the main issue of research, this has become a separate factor next to predisposing characteristics and enabling resources. The predisposing characteristics, the enabling resources and previous pregnancy outcomes can all influence the probability that a woman receives the care she needs. The predisposing characteristics in the conceptual model contain education of the mother. Her age during delivery of the child and her religion. And the enabling resources are wealth and type of residence. It is also possible that the previous characteristics and enabling resources influence the outcome of the first pregnancy.

4 Methodology

In the next chapter I give a description of my research. This description starts with a paragraph on the data and the samples, which were used for the study. Than a section will be devoted to the research questions and the method of analysis, which will be applied to the various question. The last paragraph will explain the concepts and elaborates on how these concepts are operationalised during in the research.

4.1 Data and samples

According to Weller et al (1997), Andersen's model of health care utilization is highly useful when working with statistical data. The data used for this research is derived from the Egyptian Demographic Health Survey 2005 (E-DHS). A Demographic Health Survey provides a cross-sectional, nationally representative range of information about all kinds of subjects linked at health population and nutrition (MEASURE DHS, 2006). The main purpose of this DHS was to provide information on family planning, fertility, infant and child mortality, and information on health and nutrition of mother and child (El-Zanaty and Way, 2006).

The study population consists of mothers of whom information about their pregnancies are included in the maternity section of the E-DHS. They all have had a first or a second pregnancy. The maternity section is part of the individual recode file, in which data of 19747 ever-married women age 15-49 is stored. Information is collected about the care women received during pregnancy and the reasons why they sought care (El-Zanaty and Way, 2006).

In the maternity section health information is provided about all pregnancies and births that took place in the five years previous to the survey. Unfortunately the section does not give information about the care used in case a pregnancy was terminated without a delivery. This, and to oppose small sample sizes, are the reasons why different samples are used during the study.

For the whole study three samples are used, which are shown in table 4.1. Best would be to use only one sample for all research questions. This sample should contain a large number of women of whom information was available of their first and second pregnancy. Nevertheless the DHS does not provide such a sample. This is why three different samples of women are used, to create as largest numbers of mothers as possible.

One sample exists of women that had their first pregnancy in the five years preceding the demographic health survey. The second sample consists women who had their second pregnancy in the five years preceding the survey and the third sample contains women who had their first ánd their second pregnancy in these years.

Table 4.1 Sample information

		Information about:	
Sample	N	Pregnancy	Possible termination during first pregnancy included in the sample
1	3741	First	No
2	3429	Second	Yes
3	1531	First and second	No

The first sample includes 3741 women. They all had their first pregnancy, which ended into giving birth to a child. The second sample consists of 3429 women, who all had a

second pregnancy in the five years preceding the demographic health survey. Of them, 2983 had a first pregnancy which outcome was positive. The other 446 women had a pregnancy that was terminated or their child died during or after pregnancy. These terminated pregnancies were included because considering health care use at pregnancy, the DHS provides most information about the antenatal care period. Most women who have had a terminated pregnancy, could have already had or actually had antenatal care examinations.

In the third sample in table 4.1, women are included who had their first and their second pregnancy in the five years previous to the survey. This is the smallest sample. It consists of in total 1531 women for 1476 of them their first child survived through pregnancy and delivery while 55 of the children did not survive. In this sample no women with a terminated pregnancy are included.

4.2 Research design

The objective of this research is to gain insight in the differences in health care use of pregnant women in Egypt, while having their first or second pregnancy. In addition, I aim to explore whether different outcomes of a first pregnancy influence health care use at second pregnancy. To reach the objective, specific information needs to be obtained. Firstly some descriptive questions will be answered. These questions will focus on the obstetric health care and the determinants influencing this kind of health care. Later the first pregnancy outcomes will be included.

To explain if women use health care during second pregnancies in the same way as they did during the previous pregnancies, knowledge is needed concerning the obstetric health care they used regarding the pregnancies separately. This leads to the first research question:

Which obstetric health care is used by Egyptian women, while being pregnant for the first time, according to their characteristics?

To obtain the answer to this question, information is needed about women with a first pregnancy. The E-DHS does not provide healthcare use information when a pregnancy was terminated. Therefore, only women who actually did give birth after their first pregnancy are included in the sample, which is the first in table 4.1.
A different sample is needed to obtain the answer at the question:

Which obstetric health care is used by Egyptian women, while having their second pregnancy, according to their characteristics?

To answer this question the second sample of women, who had a second pregnancy in table 4.1, was used. The sample does not contain women whose second pregnancy was terminated without a birth.
The two foregoing questions are answered in descriptive tables. In these tables the predisposing characteristics and enabling resources are set against health care use. The tables are chosen as way of showing the results because they easily provide knowledge about how the use of obstetric health care is distributed over the women with different

characteristics. Comparing the results of the questions about first pregnancies with the results of the questions about second pregnancies leads to the answer at the next question, which is:

Are there any apparent differences in the obstetric health care use of women who have their first pregnancy and women who have their second pregnancy?

By answering the previous questions information will be gained about obstetric health care use of women in general and specifically for the first and second pregnancy. The aim of the research done in this thesis is to find out if and how first pregnancy outcomes influence the obstetric health care use. Firstly, I analyse if the outcomes have an influence. The question derived from this is:

Do the outcomes of the first pregnancy influence the use of obstetric health care when having a second pregnancy?

The influence of the first pregnancy outcomes will be tested through the usage of a regression model. Firstly, a log linear test is done to detect the structure in the data, than a logistic regression model will be used to explain the outcomes. The women in the sample, which is the second in table 4.1, had a first pregnancy, which could either end in a birth or end in a termination. All of these women had a second pregnancy, which ended in a birth.
The log-linear test was especially done to examine whether not only health care use was influenced by first pregnancy outcomes but, also if first pregnancy outcomes were influenced by the predisposing and enabling characteristics. During the log-linear analysis tests were done with three variables at the time. Health care use, first pregnancy outcome and one of the other characteristics were researched for associations, this was done with all the predisposing characteristics and enabling resources.
The logistic regression models probabilities, it gives the likelihood that a certain action will take place. The model made for this research, includes first pregnancy outcomes, all characteristics and all the associations found in the log linear test. The dependent variable in the logistic test is health care use. It gives a model that explains if and how health care use dependents on the first pregnancies outcome and the characteristics.
The used model has the form of: $\pi = \frac{1}{1+e^{-(\beta_0+\beta_1 x)}}$ Because this is difficult to handle the model will be used in a log odds form, which looks like:

$$\log\left(\frac{\pi}{1-\pi}\right) = \beta_0 + \beta_1 \mathrm{X}_1 + \beta_2 \mathrm{X}_2 + ... + \beta_k \mathrm{X}_k$$

Where π is the probability that a woman used health care during pregnancy, β_0 is a constant factor of health care use, X_{1-k} are the independent variables and β_{1-k} the coefficients of the independent variables.

By now knowledge concerning the questions whether first pregnancy outcomes influence obstetric care use at second pregnancy is obtained. The next thing to research is the way

in which first pregnancy outcomes influence health care use. This leads to the last research question:

Do first pregnancy outcomes explain the potential difference between obstetric health care use of first and second pregnancies?

Health care use during first and during second pregnancy is compared per woman. A new variable is made to measure this difference. To create such a variable information is needed about the first and second pregnancy of a woman. For this reason the third sample in table 4.1, which includes the needed information, is used. In this sample the possible first pregnancy outcomes are survival or death. The results of the research question are visible in a cross tabulation, which shows the new variable of difference by the first pregnancies outcomes.

4.3 Operationalisation

This paragraph gives a link between the possibilities of the DHS-data and the needs of the conceptual model. Here I explain in which way the definitions in the conceptual model are used during this study.

Obstetric health care use is defined as all care, which takes place from the beginning of the pregnancy including the delivery and the maternity time afterwards. There are three periods in this health care, namely the prenatal, delivery and postnatal period (IGZ, 2003). The obstetric health care in these periods is called prenatal / antenatal care, delivery care and postnatal care. This research focuses on the prenatal and delivery period, and has therefore two variables of care. Antenatal care and Delivery care.

- Antenatal care

The WHO has developed a model for antenatal care. In this model four antenatal visits are recommended for women without any specific needs (2001). The DHS provides information about the number of antenatal visits. The categories of the variable antenatal care are divided in two groups, consistent of four or more, or less than four visits during the antenatal period.

- Delivery care

In terms of health care during delivery, the person who assists during delivery and the place where the delivery take place are very important. A skilled assistant at delivery can detect potential problems early and treat them or send the woman to a health facility. When a delivery takes place at a health facility and a problem occurs, help is nearby.
In the DHS questions are asked about who assisted during delivery. The possible assistants were the doctor, the nurse or midwife, the traditional midwife (daya), the family and no one. Women could give more than one answer, this is why only the highest skilled attendant is counted.
Because many places were mentioned, when in the DHS, the question was raised where a delivery had taken place, they were divided into different categories: homes, public facilities, private facilities and other places.

Predisposing characteristics are personal features of the women in the research population (Andersen, 1995). Three important characteristics are used in this research: education, age and religion.

- Education

In the survey, questions were asked about the highest level of education attended, the highest level of education completed and the number of years of education received. For this research I use the variable about highest level of education attended, which groups the educational achievements into four categories. These categories are: no education, primary education, secondary education and higher education.

- Age at birth

The age of the mother, at the moment the pregnancy ended in a birth, will be considered when mentioned the age at birth. The ages are combined in different age groups.

- Religion

A question in the demographic health survey asks the respondents whether they are Muslim or Christian. These answers are also used during the current research.

Enabling resources were conceptualised as the availability of health facilities and the financial means to obtain health care (Andersen, 1995). Ideally, the enabling resources would be operationalised by a variable about personal wealth/income and the presence of health facilities and personnel.

- Wealth

A variable of income is apparent in the Demographic Health Survey for this research. This is a variable of wealth which, categorises the respondents into five categories; poorest; poorer; middle; richer and richest.

- Type of place of residence

No questions were asked about the availability of services unless a women did not make use of any kind of healthcare. But according to the WHO (2005) 95 percent of the Egyptian population lives within five kilometre of a health facility. So a distinction is made between the women living in a rural area and them living in an urban type of residence.

Previous pregnancy outcomes are defined as the outcome of the first pregnancy.

- First pregnancy outcome

Different categories can be measured according to the first pregnancy outcomes. A positive pregnancy outcome means that during pregnancy and after delivery the child survived for at least two months. In the category entitled negative pregnancy outcome, I include terminated pregnancies and babies who died before, during, or within two months after delivery. The possible answers are: positive versus negative and survival versus death, where death does not include terminated pregnancies.

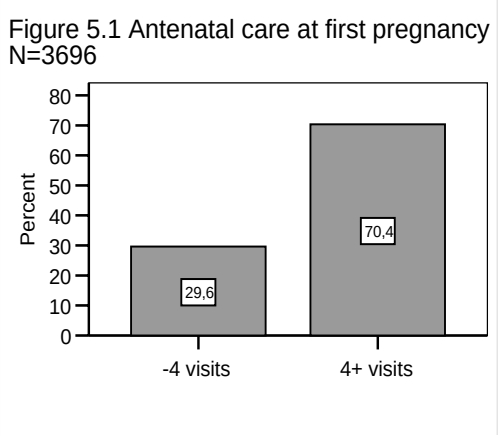
5 Obstetric health care use at first and second pregnancy

This chapter focuses on the general obstetric health care use of women in Egypt. I will give the descriptive results of the first three research questions. These were:
Which obstetric health care is used by Egyptian women, while being pregnant for the first time, according to their characteristics?
Which obstetric health care is used by Egyptian women, while having their second pregnancy, according to their characteristics?
Are differences apparent?

To gain an answer to these questions the general use of prenatal and delivery care during pregnancy will be discussed. Cross tabulations were made to examine the obstetric health care use according to the predisposing characteristics and enabling resources. Finally the results of first and second pregnancy will be compared.

5.1 Antenatal care during first pregnancy

The variable about antenatal care during first pregnancy assesses the number of antenatal visits during a pregnancy. According to the WHO (2001), women with normal pregnancies need at least four antenatal care check ups. When a woman had four or more antenatal check ups, antenatal care is regarded to be sufficient. Most of the women who did go for four or more check ups, 99.8 percent, received the antenatal care from a doctor. In Figure 5.1, the percentages of women who did, and who did not receive sufficient



antenatal care, are shown. From the sample of 3696 women 29.6 percent did not receive sufficient antenatal care during their first pregnancy. This means that 70.4 percent did have at least four antenatal visits.

Table 5.1 gives information about the use of antenatal care during first pregnancy according to the different predisposing characteristics. Looking at the observations there could be a link between education and the use of antenatal care. Most of the women who did not receive sufficient antenatal care during first pregnancy are the women who are not educated. In the group of women who are reported to have had some education, the proportion that also was reported to receive sufficient antenatal care is 20 percent points larger than that of the uneducated group. Considering antenatal care during first

pregnancy there is a difference of almost 50 percent points between the lowest and highest educated women.

Table 5.1 Antenatal care at first pregnancy by predisposing characteristics of the mother
N = 3696

		Total	Antenatal care first preg	
			-4 visits	4+ visits
Predisposing characteristics		N	%	%
Highest educational level	No education	867	**56,4**	43,6
	Primary	365	37,5	62,5
	Secondary	1972	22,0	78,0
	Higher	492	7,3	**92,7**
Age at birth	14 – 19	1105	**42,0**	58,0
	20 – 24	1826	27,3	72,7
	25 – 29	603	16,7	**83,3**
	30+	162	19,8	80,2
Religion	Muslim	3507	**29,7**	70,3
	Christian	185	28,6	**71,4**
	Missing	4	.	.
Total		3696	29,6	70,4

The youngest age at first birth was reported by a person of 14 years old at that time. The youngest age category, in which women from 14 till 20 years are included, received less antenatal care than the other groups. Of the women who were between 14 and 20 years old at the time of their first birth, 58 percent are reported to have had four of more antenatal check ups during her first pregnancy. This percentage rises until the age category 25-29 at age first birth. The category of women being 30 years or older are reported to receive sufficient antenatal care during first pregnancy in 80.2 percent of the cases. This is 3.1 points less than the 25 till 30 years age group.
The E-DHS 2005 only mentioned two possible answers when asking the women about their religion. A woman was either Muslim (94.9 %) or Christian (5.1 %). The proportion of Christian women who are reported to receive sufficient antenatal care was 1.1 percent points higher than the proportion of Muslim women giving this answer.

The enabling resources indicate the ability of a woman to seek care according to her wealth and her place of residence she lives in. Table 5.2 represents the antenatal care during first pregnancy by the different enabling resources.
The observations, which represent the wealth of a woman by the antenatal care seem to show a pattern. The poorest group in the wealth index received least antenatal care while the richest group received most. The biggest differences are between the poorest and poorer, 16.7 percent points, and the middle and richer group, 14.1 percent points. Comparing the poorest and richest groups in the wealth index the percentage of people receiving antenatal care is 50 percent points higher for the women in the richest group.

Table 5.2 Antenatal care at first pregnancy by enabling resources of the mother
N = 3696

Enabling Resources		Total	Antenatal care first preg	
			-4vistis	4+ visits
		N	%	%
Wealth index	Poorest	712	**57,7**	42,3
	Poorer	747	41,0	59,0
	Middle	750	30,1	69,9
	Richer	797	14,2	85,8
	Richest	690	5,7	**94,3**
Type of place of residence	Urban	1491	14,6	**85,4**
	Rural	2205	**39,8**	60,2
Total		3696	29,6	70,4

Women living in an urban area are reported to receive antenatal care in 85.4 percent of the cases. From the women in rural areas only 60.2 percent is reported to have received antenatal care during their first pregnancy. This is a difference of more than 25 percent points, while both groups are supposed to have access to health facilities (WHO, 2005). Both enabling resources, wealth and type of place of residence show a difference between being in a certain category and the proportion of women who received antenatal care during first pregnancy.

5.2 Delivery care at first pregnancy

The second measurement of obstetric health care use is the care obtained during delivery. The places of delivery can be at home, in a public health facility or in a private health facility. When a woman delivered in a public or private health facility she was nearly always assisted by a doctor. In case a woman delivered at home she was either assisted by a daya, which is the traditional birth attendant in Egypt, or by a doctor, nurse or midwife.

Figure 5.2 Place and attendant at first delivery
N= 3741

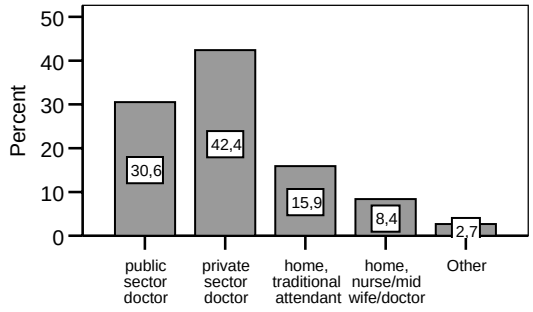


Figure 5.2 shows the distribution over the different places and attendants at delivery. 15.9 percent of the women delivering their first child, delivered at home with a daya assisting and 8.4 percent gave birth at home while a skilled medical person was present. In total this means that 24.3 percent of the women gave birth to their first child at home, 30.6

percent delivered in a public health facility and 42.4 percent delivered in a private facility. These numbers seem to indicate that woman prefer to deliver at a private facility. Over 80 percent of the women in the study population delivered their first child while a trained medical person assisted them.
Home deliveries are in general considered to be less favourable than deliveries in a health facility. Because if medical intervention is needed this is not directly around in a home. A case study done in an Egyptian academic hospital (public facility) by El-Nemer et al. (2006) showed worrying observations about hospital deliveries. The women in this study are often reported to have said that they had the feeling that they were not treated as a person. Some of the women included in this research did not want to deliver in a hospital again, although they are aware of the risk of home deliveries (El-Nemer, 2006).

In table 5.3, the place and attendant at first delivery by the predisposing characteristics are shown. In this table the secondary and higher educated women show the largest proportions for the delivery in a private facility. 66.5 percent of the higher educated women and 46.0 of the secondary educated delivered there. Most of the primary educated woman, namely 37.7 percent, delivered in a health facility in the public sector.

Table 5.3 Delivery care at pregnancy by predisposing characteristics of the mother
N = 3741

		Total	**Place and attendant at first delivery**				
			Public sector, doctor	Private sector, doctor	Home, traditional attendant	Home, medical attendant	Other
Predisposing characteristics		N	%	%	%	%	%
Highest educational level	No education	876	28,8	27,1	**31,4**	9,8	3,0
	Primary	396	**37,7**	27,1	24,9	7,0	3,3
	Secondary	1998	32,1	**46,0**	10,5	9,2	2,3
	Higher	498	22,3	**66,5**	4,0	3,6	3,6
Age at birth	14 - 19	1117	27,7	**35,4**	25,6	9,2	2,1
	20 - 24	1848	30,0	**44,5**	13,9	8,8	2,8
	25 - 29	614	34,2	**48,5**	7,2	6,8	3,3
	30+	162	42,6	**43,8**	5,6	4,3	3,7
Religion	Muslim	3547	31,4	**41,8**	15,9	8,1	2,7
	Christian	190	13,7	**53,7**	16,8	13,7	2,1
	Missing	4	.	.	.	.	.
Total		3741	30,5	**42,4**	15,9	8,4	2,7

Most of the women without education delivered at home. About 31.4 percent delivered at home with a traditional birth attendant. The higher educated women not often delivered at home, 4 percent are reported to have had a home delivery with a daya and 3.6 percent of them said to have delivered at home with a medically trained attendant.
Delivery in a public facility appears to be most popular among older women. The older the age group, the bigger is the percentage of women delivering in a public facility. The opposite is the case with home deliveries. The older is the age group, the smaller is the

percentage of women who delivered in a home. Compared to the 20 - 24 years age group, a higher percentage of women between 14 and 20 years old deliver at home with a traditional birth attendant. The difference is 11.7 percent points while the difference between the other two groups is only 6.7 points. With private facility deliveries it is a similar case. The percentage of women who delivers their first child in a private sector health facility is relatively small in the youngest age group. In every older age group the proportion of women who delivers in a private facility is larger than the younger group, except for the age group of thirty years and older. In this oldest age group the proportion of women who gave birth to their first child in a private health facility is 4.8 percent points less in comparison to the group 25-29 age at first birth.

Christian women do not seem to have an urge to deliver in a public health facility. 31.4 percent of the Muslim women deliver in a public facility, yet only 13.7 percent of the Christian women delivered in this type of health facility. Instead, more Christian women are giving birth at home while being assisted by a medically trained person. 13.7 percent compared to 8.1 percent of the Muslim women. Also the percentage of Christian women delivering in a private facility is higher than the percentage of Muslim woman giving birth over there (53.7 percent: 41.8 percent).

Table 5.4 shows that in the richest wealth group 64.7 percent of the women is reported to have delivered their first baby in a private health facility, while only 5.3 percent of them delivered at home. The poorest women mostly delivered at home, namely 43.9 percent of all poorest women. Except for the poorest, women in all wealth groups show the highest percentages for delivering in a private facility.

Table 5.4 Delivery care at first pregnancy by enabling resources of the mother
N = 3741

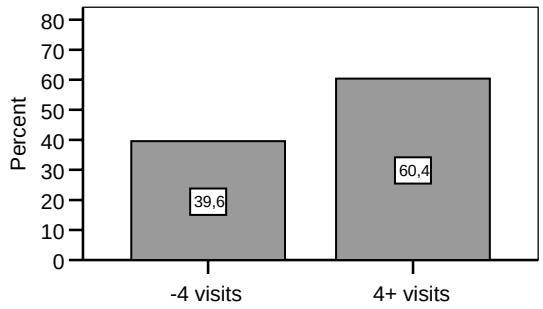
		Total	**Place of and attendant at first delivery**				
			Public sector, doctor	Private sector, doctor	Home, traditional attendant	Home, medical attendant	Other
Enabling resources		N	%	%	%	%	%
Wealth index	Poorest	742	29,8	22,9	**35,2**	8,7	3,3
	Poorer	750	29,1	**34,5**	20,5	13,1	2,8
	Middle	763	32,9	**41,2**	14,3	10,1	1,6
	Richer	805	33,8	**49,2**	8,3	6,2	2,5
	Richest	699	26,6	**64,7**	1,6	3,7	3,4
Type of place of residence	Urban	1509	35,8	**49,4**	6,0	5,2	3,6
	Rural	2232	27,0	**37,7**	22,6	10,6	2,1
Total		3741	30,6	**42,4**	15,9	8,4	2,7

Living in rural area does not reduce the popularity of private health facilities as a place of delivery, although the percentage of woman delivering at home is also relatively high in rural areas. 33.2 percent of the women in rural areas delivered at home, compared to only 11.2 percent of the women living in urban areas. Delivery in a public health facility has the second biggest proportions for both the urban women, namely 35.8 percent, as for the rural women, namely 27 percent.

5.3 Antenatal care during second pregnancy

When women are pregnant for a second time they still need to go for antenatal visit to find out if no problems are occurring. The WHO standard of at least four visits still counts. The percentages of women who did, or did not receive antenatal care are shown in figure 5.3. Most of the women, namely 60.4 percent, did receive four or more antenatal care examinations. The other women, namely 39.6 percent, did not go for an antenatal visit or did not go often enough.

Figure 5.3 Antenatal care at second pregnancy
N=3389



Antenatal care during second pregnancy by the different predisposing characteristic is shown in table 5.5. When the level of education is higher, the percentage of women receiving antenatal care is also higher. The variety between the highest educated women and the uneducated women is 53.3 percent points. The largest difference occurs between the primary and secondary educated women, where the variety is 21.6 percent points.

Table 5.5 Antenatal care at second pregnancy by predisposing characteristics of the mother
N = 3389

		Total	**Antenatal care second preg**	
			-4 visits	4+ visits
Predisposing characteristics		N	%	%
Highest educational level	No education	899	**66,3**	33,7
	Primary	359	51,0	49,0
	Secondary	1746	29,4	70,6
	Higher	385	13,0	**87,0**
Age at birth	14 – 19	176	**55,7**	44,3
	20 – 24	1602	48,8	51,2
	25 – 29	1264	30,8	69,2
	30+	347	21,3	**78,7**
	Missing	1	.	.
Religion	Muslim	3217	39,6	**60,4**
	Christian	171	**39,8**	60,2
	Missing	1	.	.
Total		3389	39,6	60,4

Younger women who are pregnant for the second time are reported to receive less antenatal care, compared to the older women. The difference between women in the age group 20 - 24 and 25 29 is the largest, namely 18 percent points.
In relation to religion and antenatal care, the observations do not show a large difference within the two religions. The variation between Muslim and Christian women is only 0.2 percent points.

In table 5.6 the antenatal care according to the enabling resources is shown. The group of poorest people is the biggest group not receiving antenatal care. 65.3 percent did not have the minimum of four check ups. The richest group is the largest group that received antenatal care, 89.6 percent of them got four or more antenatal examinations. The poorer the wealth group, the larger the percentage of not receiving antenatal care during the second pregnancy. The variation between the poorest and richest group is 54.9 percent points.

Table 5.6 Antenatal care at second pregnancy by enabling resources of the mother
N = 3389

		Total	Antenatal care second preg	
			-4 visits	4+ visits
Enabling resources		N	%	%
Wealth index	Poorest	700	**65,3**	34,7
	Poorer	678	54,1	45,9
	Middle	698	39,0	61,0
	Richer	716	25,7	74,3
	Richest	597	10,4	**89,6**
Type of place of residence	Urban	1351	22,8	**77,2**
	Rural	2038	**50,7**	49,3
Total		3389	39,6	60,4

Of the women living in rural areas about half of them did go for four or more antenatal visits during their second pregnancies, the other half did not. From the women living in urban areas 77.2 percent did receive four or more antenatal health checks. The other 22.8 percent did not receive these checks while having their second pregnancy. There is a difference of 27.9 percent points between the urban and rural women.

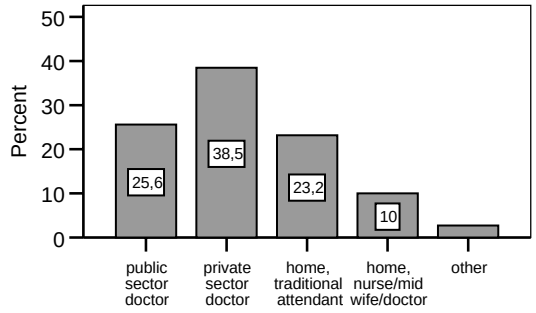
5.4 Delivery care during second pregnancy

The researched delivery care for second pregnancies focuses on the place of delivery and the person who assisted a woman during her child's birth. The delivery could take place in a home, a public health facility or in a private health facility. The attendants can be medically trained, like a doctor, nurse or midwife or attend births based on other skills, in other words, traditional birth attendants.

Figure 5.4 shows at which places the studied women delivered and by whom they were assisted. From the sample of 3421 women, 10 percent delivered at home with a medically trained birth attendant and another 23.2 percent delivered their child at home while a

traditional birth attendant assisted them. In total 33.2 percent of the women in the sample with a second pregnancy delivered at home, 38.5 delivered in a private health facility with a doctor who assisted them. And 25.6 percent of the women delivered after their second pregnancy with assistance of a doctor in a public health facility.

Figure 5.4 Delivery care at second pregnancy
N=3421



Delivery care according to the predisposing characteristics of the women is shown in table 5.7. Considering education it is remarkable that women in the two lowest educational groups mostly are reported to have delivered at home with a traditional attendant after their second pregnancy. The secondary and higher educated women are reported more often to have given birth in a private health facility with a doctor. Furthermore, it seems that when education raises, the proportion of women delivering in a public health facility goes down and the proportion of women delivering in a private health facility goes up.

Table 5.7 Delivery care at second pregnancy by predisposing characteristics of the mother
N = 3421

		Total	**Place and attendant at delivery after second pregnancy**				
			Public sector, doctor	private sector, doctor	Home, traditional attendant	Home, medical attendant	Other
Predisposing characteristics		N	%	%	%	%	%
Highest educational level	No education	903	22,4	19,7	**45,1**	9,2	3,7
	Primary	364	29,9	27,2	**32,4**	8,2	2,2
	Secondary	1765	27,4	**44,0**	14,2	12,0	2,4
	Higher	389	20,8	**67,4**	4,4	4,9	2,6
Age at birth	14 – 19	180	16,7	28,3	**38,3**	15,0	1,7
	20 – 24	1618	23,5	**32,1**	30,9	10,9	2,5
	25 - 29	1274	26,1	**45,9**	15,7	9,5	2,7
	30+	349	37,8	**46,1**	6,9	5,2	4,0
Religion	Muslim	3249	26,3	**37,9**	23,2	9,9	2,7
	Christian	171	12,3	**49,1**	23,4	11,7	3,5
	Missing	1	.	.	.	.	.
Total		3421	25,6	**38,5**	23,2	10,0	2,7

When dividing the women in the research population by the age at which they gave birth after their second pregnancy, the private health facility seems still a very popular place for delivery. The women in the two oldest age groups are reported to have the most deliveries in a private health facility while assisted by a doctor. In the youngest age group, over 50 percent of the women delivered at home, while most of them were assisted by a daya. The observed proportion of women delivering in a public or private health facility, assisted by a doctor, increased when the observed level of education rose. The reverse is the case with the deliveries at home. Both the observed percentages of home delivery with a traditional birth attendant and with a medical attendant became smaller when the educational attainment grew.

Table 5.5, Antenatal care by predisposing characteristics, showed almost no difference between the two religious groups and their usage of antenatal care. Considering delivery care and religion, table 5.7, the differences are numerous. The percentage of Christian women delivering in a private health facility is 11.2 points higher than the percentage of Muslim women delivering there. Also the percentage of women who gave birth at home with a medically trained attendant is a little higher, namely 1.8 percent points. There is quite a big difference between the two religions when considering deliveries in public sector health facilities, Muslim women are reported to have a 14 percent points higher public facility usage than Christian women.

The lowest educational groups and the youngest age groups show more often home deliveries than the higher educated and older women. Also the Christian women are reported to deliver at home more often than the Muslim women. Especially the higher educated, older and Christian women are reported to have given birth to their second child in a private facility more often than women did in the other groups.

Table 5.8 Delivery care at second pregnancy by enabling resources of the mother
N = 3421

		Total	**Place and attendant at delivery after second pregnancy**				
			Public sector, doctor	private sector, doctor	Home, traditional attendant	Home, medical attendant	Other
Enabling resources		N	%	%	%	%	%
Wealth index	Poorest	707	21,8	18,2	**47,2**	8,9	3,8
	Poorer	685	24,1	28,6	**31,1**	13,0	3,2
	Middle	703	27,3	**35,6**	22,6	13,2	1,3
	Richer	723	31,4	**46,7**	10,4	9,4	2,1
	Richest	603	22,9	**66,8**	2,0	5,0	3,3
Type of place of residence	Urban	1363	34,2	**47,1**	8,8	6,7	3,2
	Rural	2058	19,9	**32,8**	32,7	12,2	2,4
Total		3421	25,6	**38,5**	23,2	10,0	2,7

Table 5.8 represents delivery care after second pregnancy by wealth and type of residence. 56.1 percent of the poorest women delivered at home, most of them gave birth

while being assisted by a traditional birth attendant. Also a big proportion of the poorer women delivered at home. 31.1 percent of them delivered at home with a traditional birth attendant. Compared to the poorest women all proportions where a skilled attendant assisted at birth are larger, varying from 3.3 points difference for public sector deliveries until 10.4 points for private sector deliveries.

All three richest wealth groups show the largest proportions at deliveries in a private health facility. There are variations of over 30 points between the middle and the richest wealth group. When wealth went up the observed proportion of women delivering at home went down. Of the richest women 2 percent delivered at home assisted by a traditional birth attendant and 5 percent gave birth at home while being assisted by a medically trained attendant.

When the women are divided by the type of the place they live in, 81.3 percent of the urban women are reported to have had a health facility delivery. Only 52.7 percent of the women living in rural areas, delivered in a health facility. The difference between urban and rural women is almost 30 points. Also, the variation for home deliveries is relatively large, the proportion of rural women that delivered at home being assisted by a daya is 32.7 percent, while the size of this proportion is 8.8 percent of the urban women. The home deliveries with a medically trained assistant are also observed more often in the group of rural women than in the urban women group.
The women who were poor and living in rural areas are more often reported to have had home deliveries than women who were rich and which were living in urban areas. These women gave birth more often in a private health facility while being assisted by a doctor.

5.5 Similarities and differences

To find out if differences are apparent between the obstetric health care use of women who are pregnant for the first and second time, this paragraph will compare the previous results. A comparison is made between the women in the first pregnancies sample and the answers of the women in the sample of second pregnancies. In general women use less health care when the parity of their children rises (El-Zanaty and Way, 2006).

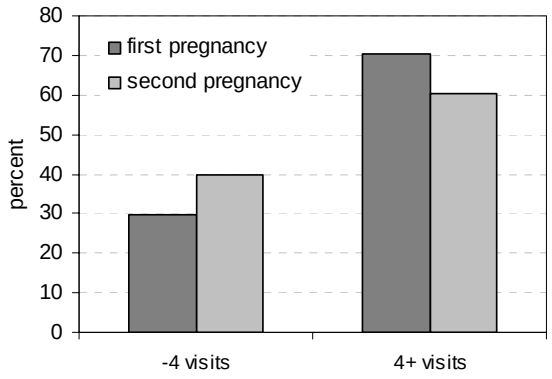
5.5.1 Antenatal care

In this research it becomes also evident that women use less antenatal care while having a second pregnancy. When comparing antenatal care use during first and second pregnancy, see figure 5.5, it is obvious that the proportion of women using antenatal care is 10 points less during second pregnancies.

Considering the predisposing characteristics, education, age at birth and religion, during first and second pregnancy the same patterns are observed. For both the first and the second pregnancy, the highest educated women are reported to have the largest proportion usage of antenatal care. The difference between the highest and lowest educated women is for both the first and the second pregnancy about 50 percent points. Also, for the age at birth similar patterns are visible. In general, the oldest age groups use more antenatal care than the youngest ones. Of course, both samples do not have the

same proportions of women in the same age groups, after all the women having a second pregnancy are in general older than the women giving birth to their first child. The two religious groups show the same use of antenatal care when comparing first and second pregnancies.

Figure 5.5 Antenatal care
First preg. N=3696 Second preg. N=3389

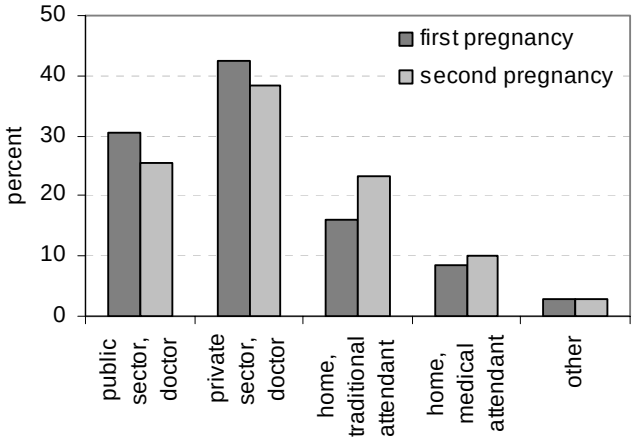


Comparing antenatal care use by enabling resources at both pregnancies, the highest and lowest proportions of antenatal care users are in the same wealth and residence groups. Considering wealth, the largest proportion of women who used antenatal care during first pregnancy was found in the richest wealth group. 94.3 percent of them received four or more antenatal examinations. During the second pregnancy the largest proportion of antenatal care users was observed in the same group, but here it is 89.6 percent of the richest women that received sufficient antenatal care. This involves a difference of nearly 5 points.
The same differences for antenatal care use of urban and rural women appeared during pregnancies of first and second order. At first pregnancy the largest proportion of women who did not receive sufficient antenatal care was found with the rural women, 39.8 percent of them did not have four or more examinations. During second pregnancy this number is 10.9 points higher.

5.5.2 Delivery care

The care used during delivery is not the same at first and at second pregnancy. Figure 5.6 shows the variations between the places and attendants during delivery. The proportions of deliveries in private and public facilities are smaller during second pregnancy, while the proportion of women delivering at home is about 10 percent points larger. Especially the home deliveries with a traditional birth attendant are much more used by the women in their second pregnancy than by women during their first pregnancy. The difference is 23.3 versus 15.9 percent. The difference for public sector deliveries is 4.9 points less at the second pregnancy. This is a little larger than that for private facilities were the difference is 3.9 percent points.

Figure 5.6 Delivery care
First preg. N=3741 Second preg. N=3421



Delivery care use according to the predisposing characteristics of the mothers follows the same routes for first and second pregnancies. The educational group which, are reported to have most home deliveries with a daya is at both pregnancies the uneducated. At first pregnancy the proportion of women, without education, who delivered at home with a daya, was 31.4 percent. For the second pregnancy this percentage was 45.1, this is a difference of 13.8 points. Of the primary, secondary and higher educated women the same proportions of them delivered in a private health facility. This is remarkable because the overall percentage of private sector deliveries became smaller, while the group sizes are almost the same for both pregnancies.

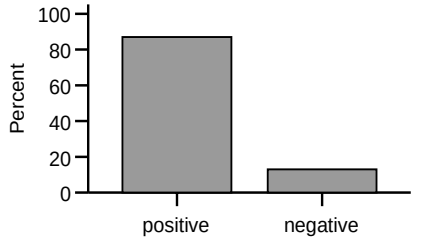
Age at birth gives also similar patterns for delivery care during first and second pregnancy. During the second pregnancy the youngest age group showed more home deliveries with a daya. It is important to realize that when a woman is very young when having her first children she probably does not have much education (Beamish, 2003). At both pregnancies the pattern is visible that when the educational level is higher the proportion of women who delivered in a public health facility is also higher. The reverse is the case for home deliveries.
Already during the separate description of the results it appeared that Muslim and Christian women did not use delivery care in the same way. This is the same for first and second pregnancy. The Christian women do deliver more often at home than the Muslim women. The women who are Muslim though are reported to have had a higher percentage of deliveries in public health facilities in comparison with the Christian women. The differences are 17.7 points for the first pregnancy and 14 percent points for the women who gave birth after their second pregnancy.

6 Health care use according to first pregnancy outcomes

The previous chapter elaborated on obstetric health care accounting for first and second pregnancy. The current chapter will explain the health care use during second pregnancy again, but now the extra variable of first pregnancies outcome will be included. This is to reach the objective of exploring whether first pregnancy outcomes influence health care use during second pregnancies. The questions which I attempt to answer in this chapter are:

Do the outcomes of the first pregnancy influence the use of obstetric health care when having a second pregnancy? And: *Do first pregnancy outcomes explain the potential difference between obstetric health care use of first and second pregnancies?*

Figure 6.1 Outcome of first pregnancy.
N=3431



The DHS gave information about the second pregnancy of 3431 women. 78 percent of these women had a first pregnancy, which ended up in a baby who survived through pregnancy and delivery, see figure 6.1. The other women had a negative pregnancy outcome, which involved terminated pregnancies and children who died within two month's after delivery. Most of the negative pregnancy outcomes were because of termination. About 20 percent of all negative ended pregnancies, 447 in total, ended up in a child who died shortly after delivery. This sample was used to test the associations of the different variables and to find out if there is an influence of first pregnancy outcomes at health care use during second pregnancy.

Furthermore there is information about the care usage during first and second pregnancy of 1535 women, table 6.1. When information about both pregnancies is apparent it is possible to really see if a woman changed her health care using behavior and if this can be caused by first pregnancy outcomes.

Table 6.1 Second pregnancy, having information about both pregnancies
N=1535

	N	%
First child survived	1478	96,3
First child died	57	3,7
Total	1535	100,0

6.1 Antenatal care

According to Andersen (1995), health care use is influenced by predisposing and enabling characteristics. This will probably be the same for the use of antenatal care, to be more certain a test should be done. The same is the case for first pregnancy outcomes. They probably influence health care use during second pregnancy, but to be totally sure a statistical test is needed. The test, which indicates how the different variables are connected, is a log linear one.
The log linear test, done with three variables at the time, gave a result, which showed two-way interactions between antenatal care use and education, age at birth, wealth, type of residence and first pregnancy outcome. The results also showed two way interactions between first pregnancy outcome and age at birth, wealth and type of residence. Religion did not interact with either antenatal care use or first pregnancy outcome.

Because the links between the use of antenatal care and first pregnancy outcomes, predisposing characteristics and enabling resources are now proven, a log linear test can be done. The dependent variable in the test is antenatal care use, the independent variables are: education, age at birth, wealth and type of place of residence. Because during the log-linear test only two-way interactions are found, there is no need to include interactions between outcome and another variable.

Table 6.2 Results of the logistic regression, dependent variable antenatal care use
N=3389
Data source: E-DHS 2005

Variables		B[1]	**Odds Ratio**	95,0% Confidence interval
First pregnancy outcome	Positive		**1**	
	Negative	1,080	**2,944****	2,272-3,814
Highest educational level	No education		**1**	
	Primary	,467	**1,594****	1,224-2,077
	Secondary	1,039	**2,826****	2,316-3,450
	Higher	1,286	**3,617****	2,469-5,298
Age at birth	14-19		**1**	
	20-24	-,003	**,997**	,698-1,424
	25-29	,373	**1,452***	1,001-2,105
	30+	,766	**2,152****	1,374-3,372
Wealth index	Poorest		**1**	
	Poorer	,258	**1,295***	1,027-1,632
	Middle	,527	**1,693****	1,328-2,159
	Richer	,871	**2,390****	1,819-3,142
	Richest	1,629	**5,098****	3,505-7,416
Type of place of residence	Urban		**1**	
	Rural	-,394	**,675****	,556-,819

[1] The coefficients of the variables in the regression model
**Significant for p<0.01
* Significant for p<0.05

The results of the logistic test for antenatal care use during second pregnancy are shown in table 6.2. The coefficients of the variables are shown under β, the next column shows the odds ratios per variable and in the final column the confidence interval in which the odds ratio lays is shown. The reference category is the category of a variable with which all other categories are compared.
Except the age group 20-24, all categories of all variables are a significant contribution to the explanation of antenatal care use during second pregnancy. The odds ratio of negative first pregnancy outcomes is 2.944. This means that a woman who had a negative outcome of her first pregnancy is almost three times as likely to go for at least four antenatal care check ups during her second pregnancy than a woman who had a positive outcome of her first pregnancy.

The table also shows that the use of antenatal care during second pregnancy is highly associated with education, age at birth, wealth and type of residence. The higher the education, the higher is the likelihood that a woman received sufficient antenatal care. This is also the case when looking at wealth. Women in the richest wealth quintile have an odds ratio of over five, meaning that they are five times more likely to use antenatal care during their second pregnancy than women in the poorest wealth group.
Considering age at birth, the eldest age group shows a clear increase in odds ratios when age rises. The odds of the two youngest groups are nearly the same. Women living in rural areas are less likely to use antenatal care during their second pregnancy than women living in urban areas. The chance that rural women get at least four antenatal care examinations is 33.5 percent smaller than that of urban women.

The odds ratios showed that first pregnancy outcomes do influence the use of antenatal care during second pregnancy. But do the outcomes also have an influence at the differences between the health care a woman uses during first and second pregnancy? From a small sample of women the information is available about their obstetric health care usage during first and second pregnancy.
From the women whose child survived first pregnancy 48.0 percent are reported to have the same number of antenatal visits during first and second pregnancy. 35.5 percent reduced the number of antenatal visits and 16.5 percent increased the number of antenatal examinations. The women whose first child died show a different distribution in the proportions of change in antenatal care use. 45.3 percent of them did not change the number of antenatal visits. 22.6 percent of these women reduced the number of antenatal visits during second pregnancy. The proportion of women who increased the number of antenatal examinations was 32.1 percent of the total group of women.

About half of the women who did not show any change in antenatal care use did not get antenatal check ups at all. And of the women whose first child survived and who had less than four antenatal visits during first pregnancy 30 percent of them even reduced the number of visits during her second pregnancy. When comparing the proportions for the groups, which did not change, the proportion of the women whose first child died is slightly smaller than the proportion of the women whose first child survived. The difference is 2.7 percent points.

In table 6.3 the change in antenatal care use by the first pregnancies outcome is shown. The table only compares those women who actually changed their number of antenatal examinations. The variations in the distribution of the proportions of women over the different categories are speaking for them and a Chi-square test gives highly significant results. The largest proportion of the women whose first child survived is found in the category that is reported to have less visits during second pregnancy. In this category the smallest proportion of the women whose first child died is found.
Of the sample of 1535 women of them whose first child survived 57.9 percent did have four of more antenatal examinations. This number is 63.0 percent for those of which their first child died during or shortly after delivery.

Table 6.3 Change in antenatal care use during second pregnancy by outcome of first pregnancy
N=790

		Change in antenatal care use		
		Less visits %	More visits %	Total N
Outcome first preg.	Survival	**68,3**	31,7	761
	Death	41,4	**58,6**	29
Total		67,3	32,7	790

Chi-square gives a highly significant result. ($p < 0,01$)

6.2 Delivery care

In chapter five, the variable representing delivery care, was a joint variable for the place of delivery and the birth attendant. When a delivery takes place in a hospital or different facility this always involves assistance by a doctor. And a traditional birth attendant most often assists home-deliveries; about 30 percent of the home deliveries are assisted by a medically trained person (El-Zanaty and Way, 2006). This is why in this chapter only the place of delivery will be discussed.
For the research of the second pregnancies delivery care use, just as for antenatal care use, a log-linear test has been done. This test examined if there are any three-way interactions apparent, between the use of delivery care, first pregnancy outcome and one of the characteristics. Only two-way interactions were found. Delivery care use is associated with all variables except religion. Outcome is linked to delivery care use, age at birth, wealth and type of place of residence.

To find out the probability that a woman delivered in a health care facility, and in which way this probability is influenced by the first pregnancy outcome and the different characteristics, all variables were combined in a logistic regression model. The coefficients and the odds ratios of the model are shown in table 6.4. The log linear test already showed that medical delivery care use during second pregnancy and the outcome of the first pregnancy are related. Table 6.4 shows an odds ratio for the negative first pregnancy outcome that is 2.694 and highly significant. This means that during second pregnancies women who had a first pregnancy with a negative ending are 2.694 times more likely to deliver in a health facility than women whose first pregnancy ended positively.

Table 6.4 Results of the logistic regression, dependent variable is use of medical delivery care
N= 3429
Data source: E-DHS 2005

Variables		B[1]	**Odds Ratio**	95,0% Confidence Interval
First pregnancy outcome	Positive		**1**	
	Negative	,991	**2,694****	2,074-3,499
Highest educational level	No education		**1**	
	Primary	,404	**1,499****	1,151-1,951
	Secondary	,719	**2,053****	1,683-2,504
	Higher	1,061	**2,889****	1,909-4,373
Age at birth	14-19		**1**	
	20-24	,205	**1,227**	,868-1,734
	25-29	,586	**1,798****	1,251-2,583
	30+	1,387	**4,003****	2,486-6,447
Wealth index	Poorest		**1**	
	Poorer	,364	**1,439****	1,149-1,802
	Middle	,427	**1,533****	1,205-1,949
	Richer	,893	**2,442****	1,851-3,222
	Richest	1,662	**5,267****	3,511-7,903
Type of place of residence	Urban		**1**	
	Rural	-,734	**,480****	,393-,586

[1] The coefficients of the variables in the regression model
**Significant for p<0.01

The predisposing and enabling characteristics all showed the result, which could be expected out of the tables of chapter five. When either age, or the level of education, or wealth rises, the likelihood that a woman delivers in a health facility also increases. Especially age at birth and wealth show a large increase in odds.
The probability that a woman delivers in a health facility increases with 22.7 percent, comparing the youngest age group with the age group 20-24. And the increase is 79.8 percent, comparing the same age group with the women of 25 - 29 years. The eldest women are even four times as likely to deliver in a health facility as the youngest. Considering wealth, table 6.4 shows a steady increase in the odds when wealth grows. The largest increase is visible between the richer and the richest wealth group, the odds are over two times as high for the richest as for the richer.
Women living in urban areas are more likely to deliver in a health facility than women in rural areas. The probability that a rural woman delivers at home is twice as high as this same probability for an urban woman.

The influence of first pregnancy outcome and the other characteristics is clear now. But what is unclear yet is if the first pregnancy outcome also causes of the differences in delivery care use between the first and second pregnancy of a woman. Table 6.5 shows that most women were not reported to have a change in the kind of place where they delivered.

Small proportions of women changed their place of delivery for the second pregnancy. Of the women that changed the place of delivery and whose first child survived, the proportion of them that changed from a health facility to a delivery at home is twice as large as the proportion that changed from a home to a health facility. For the women whose first child did not survive the reverse is the case. Within this group, the proportion that changed to a home is twice as small as is the proportion that changed to a health facility.

Table 6.5 Change in delivery care use between first and second pregnancy by outcome of first pregnancy N=1531

		Change in place of delivery			
		From health facility to home	No change	From home to health facility	Total
		%	%	%	N
Outcome first preg.	Survival	**10,1**	84,8	5,1	1476
	Death	1,8	94,5	**3,6**	55
Total		9,8	85,2	5,0	1531

Chi-square did not give a significant result (p 0.105).
One cell has an expected count less than 5

33.6 percent of the women who were not reported to have had a change in the kind of health facility, in which they delivered, gave birth to their child in a home. The other 66.4 percent delivered in a health facility. 5.4 percent of the women whose first child died did not change from a home to a health facility or the reverse, but they firstly delivered in a public hospital while after second pregnancy they gave birth in a private hospital. For the women whose first child survived this percentage is 4.5 percent. The percentages of women who changed from a private health facility to a public facility are 3.6 percent for both women whose first child survived and women whose first child died.

7 Conclusions and recommendations

The previous chapters elaborated on issues regarding the obstetric health care usage of Egyptian women. In the first paragraph, I will try to give an answer to the research questions based on the analyses, which were done in chapter 5 and 6. The questions will be discussed in the same sequence as was done in the methodology section. In the second paragraph I will discuss questions, which possibly have risen. The last paragraph describes recommendations for further research and policies on this topic.

7.1 Conclusions

An aim of the research was to get more insight in the obstetric health care use of Egyptian women in general and especially for the first and second pregnancy. This paragraph will give the results of the research questions one by one.

7.1.1 First pregnancies

Which obstetric health care is used by Egyptian women, while being pregnant for the first time, according to their characteristics?

To find the best answer at this question, descriptive tables were made, in which the predisposing characteristics and enabling resources are set against health care use.

From the Egyptian women in first the sample (women pregnant for the first time), 70.4 percent had at least four antenatal examinations (according to the WHO standard sufficient antenatal care for women with normal pregnancies involves this amount of antenatal check ups). Most of the women, 42.4 percent, delivered in a private health facility, assisted by a doctor. The second largest group of them, 30.6 percent gave birth in a public health facility, while 15.9 percent delivered at home with a traditional birth attendant and 8.4 percent of the women delivered their first child at home with a medically trained attendant. Nearly all deliveries in health facilities are assisted by a doctor, which means that of the women who gave birth to their first child over 80 percent had a medically skilled birth attendant.

The predisposing characteristics are education, age at birth and religion. Like Andersen (1995) explained in his model of health care use, these characteristics are important when researching health care use. In the case that women had a higher education, the proportions about whom were reported to receive sufficient antenatal care were larger. The proportions of women who gave birth in a private facility were also larger when the level of education increased, while the proportions of women delivering at home with a traditional birth assistant became smaller with the rise of the educational level. The percentage of women who delivered in a public facility was higher in the group of primary educated women than in the one without education, but the proportion was smaller with every increase of education. Although no statistical tests were done in this phase of the research, these results seem to indicate that there is an association between education and obstetric care use. The results also fit with the findings of Kroeger (1983). He did research on anthropological and social medical health care in developing countries and found that in many countries, having formal education increased the use of official health care.

Obstetric health care use and age at birth shows similar patterns as education. When age increased the proportion of women who received at least four antenatal examinations was larger. The older women in the sample are reported to have larger proportions of deliveries in public facilities and also larger proportions of private facility deliveries, except for the eldest age group. Both public and private health facilities were more used when age went up, so home deliveries were less observed.

In his article Andersen stated that often religion is an issue of importance considering the use of health care (Andersen, 1995). The observations for Egypt does not show this importance as clear as it did for age at birth. Both religious groups in Egypt showed the same figures for the use of antenatal care. Considering delivery care different patterns were observed though. Indeed, the largest proportions of women were found in the category that delivery in a private facility. But Muslim women were more often reported to deliver in a public facility than Christian women. Much larger proportions of Christian women were reported to give birth to their child in a private facility and at home with a medical birth attendant than Muslim women. The economical situation of both groups did not show large variations.

Obstetric health care use was also examined through analysing the enabling resources of the pregnant women. These enabling resources were wealth and type of place of residence. And like Andersen (1995) wrote, both seem to have a considerable impact on the use of health care. For the women who were pregnant for the first time, a higher level of wealth involved a larger proportion of receiving sufficient antenatal care. It also meant larger proportions of women who delivered their baby in a private health facility. When the level of wealth increased, the proportion of women who delivered at home with a traditional birth attendant was smaller. The proportion of women who gave birth to their child at home with a medical birth attendant first becomes larger but after the second wealth category this proportion also becomes smaller.

During the study antenatal care use was less observed in rural area than in urban areas, the difference is about 15 percent points in favour of the urban areas. Both women in rural and urban areas show the largest proportions of deliveries in private facilities but the proportion of home deliveries for rural women is three times as big as this proportion for urban women.

7.1.2 Second pregnancies

Which obstetric health care is used by Egyptian women, while having their second pregnancy, according to their characteristics?

During their second pregnancy 60.4 percent of the Egyptian women in the research had at least four antenatal examinations. 38.5 percent of the second time pregnant women delivered in a private health facility, while about the same proportions of women delivered in a public health facility and at home with a traditional birth attendant. 10 percent of the women delivered at home with a medically trained attendant.

The model developed by Andersen was applicable for both first and second pregnancies. In the analysis of second pregnancies the predisposing characteristics education, age and

religion were examined too. The observations on obstetric health care use about the level of educations and the age that a woman had at the time the child was born show the same patterns as were found when examining the total use of delivery care. Considering antenatal care, the higher the level of education and the higher the age meant that a larger proportion of women received sufficient antenatal care. The same thing is true for the proportions of women who deliver in a private health facility. When the level of education raises, the proportion of women who deliver in a public health facility becomes smaller, except for the transition from the uneducated to the primary educated women. When age raises the proportion of women delivering in a public facility becomes larger. Considering home deliveries, the proportion of women in the category home delivery with a traditional birth attendant is smaller with every rise in level of education, while when women are ageing proportions of all home deliveries become smaller.

Muslim and Christian women used antenatal care in similar proportions. Also for home deliveries there are no large differences. But as soon as it comes down to the usage of delivery care in private and public facilities, *there are differences*. The proportion of women who delivers in a public facility is twice as high for Muslim as for Christian women. And the proportion of women making use of private facilities is, although this is for both groups the most popular place, for Christian women 11.2 percent points larger than for Muslim women.

The predisposing resources involved wealth and type of place of residence. The wealthier a woman is the more often the choice is made to have a sufficient number of antenatal examinations. Also the choice for a delivery in a private health facility is more apparent in the wealthier groups than a choice for one of the other places of delivery. A wealthier woman more often delivers in a health facility, either public of private, than at home. Only in the poorest wealth group over half of the women deliver at home.

The variation between the usage of antenatal care of urban and rural women is 17.9 percent points in favour of the urban women. These women also more often deliver in a health facility than rural women. Of the urban women 82.3 percent of the deliveries take place in a health facility, most often in a private one. Of the rural women this proportions is 52.7 percent. The rural women often deliver at home with a traditional birth attendant.

7.1.3 First and second pregnancies

Are there any apparent differences in the obstetric health care use of women who have their first pregnancy and women who have their second pregnancy?

By comparing the results of the questions about first pregnancies with the results about second pregnancies I have shown the differences which appear to exist. There are some differences between the obstetric health care use during first and second pregnancies. About antenatal care, the care use according to the different characteristics shows the same patterns during both pregnancies. But at first pregnancy 70.4 percent of the women had at least four antenatal examinations while of the women with a second pregnancy this percentage was 60.4 percent. Perhaps a connection exists between the idea that for pregnancy and deliveries no medical involvement is needed (UN, 2002). For this reason

women that have a positive outcome of their first pregnancy might use less health care during a second pregnancy.

In the use of obstetric care at delivery there are some apparent differences. The proportion of women who had a home delivery with a traditional birth attendant is for the women with a second pregnancy 7.2 percent point larger than for the women with a first pregnancy. During the second pregnancy a smaller proportion of women, choose to deliver in a health facility than during first pregnancies. These differences about delivery care could also be explained by the idea of pregnancy as a natural thing. Although the total percentages differ, the smallest and larges proportions of health care use per category are during first and second pregnancies observed in the same groups. This means that the patterns according to the predisposing characteristics and the enabling resources are the same during both pregnancies. This was similar to the knowledge provided by Andersen's model of health care use.

7.1.4 Influences

A second aim of the research was to find out if and how previous pregnancy outcomes influence the obstetric health care use. This was analysed by answering the two questions:
Do the outcomes of the first pregnancy influence the use of obstetric health care when having a second pregnancy?
Do first pregnancy outcomes explain the potential difference between obstetric health care use of first and second pregnancies?

The influence of the first pregnancy outcome was tested by a regression model. This model provided knowledge about whether first pregnancy outcomes are influencing the usage of obstetric care at second pregnancies. Via the next question I researched how first pregnancy outcomes influence health care use. In response to this question, health care use during first and during second pregnancy was compared per woman. A new variable was created to measure this difference. Cross tabulations showed the difference by the first pregnancies outcomes.

All characteristics except religion, significantly influenced the usage of obstetric health care. Although according to the literature different religious groups show different patterns of the use of health care (Kroeger 1983, Andersen 1992), yet no association is visible after the log linear test. The outcome of the first pregnancy did have a significant influence.
Almost all of the observed patterns in the usage of obstetric health care during second pregnancies, which were visible in chapter 5 are, by the logistic regression, significantly proven to be due to associations. Thus the use of obstetric health care by women in Egypt is dependent on education, age at birth, wealth and the type of the place of residence. The same model showed that when a woman first had a pregnancy with a negative outcome, she is much more likely to use medical care during her second pregnancy. She is 2.9 times as likely to use antenatal and 2.7 times to give birth in a health facility, then when the outcome of her first pregnancy was positive.

Firstly, pregnancy outcomes do influence the use of health care and do at least partly explain the differences, which were observed when comparing obstetric health care use during first and second pregnancies. The proportion of women who did not change the usage of antenatal care 45.3 for women whose first child survived and 48 percent for them whose first child died. For delivery care these proportions are 84.8 percent and 94.5 percent. Considering antenatal care, of the women who did change their care use behavior, the proportion who changed to less visits was for them whose first pregnancy outcome was positive 20 percent points higher in comparison to them who had a negative first pregnancy outcome. The women whose first pregnancy outcome was negative merely changed towards using more antenatal care instead of less.
The proportion of women who changed their behavior according to delivery care was much smaller. This was the cause of results which were much less clear. But also for these small numbers the same patterns as for antenatal care could be observed. The proportion of women with a positive first pregnancy outcome, who changed from delivering in a health facility to delivering in a home is twice the size of the proportion that changed from a home to a health facility. In case of women whose first child did not survive the reverse was visible.

How do the first pregnancy outcomes explain the differences between first and second pregnancy's health care use? Overall, the health care services are observed to be less used during the second pregnancy. The results of the last two questions show that when a woman has had a pregnancy, which ended positively, this could influence the antenatal care use and the hospital deliveries negatively. The opposite pattern is seen for the women whose first pregnancy ended negatively. From the results in the analysis it is clear that during their second pregnancy women tend to use the same or more antenatal care and deliver at the same place as before. Considering the fact that (fortunately) most of the pregnancies have a positive outcome, the answer is clear. Positive pregnancy outcomes influence health care use negatively and are therefore the major cause of the difference between first and second pregnancies.

7.2 Discussion

The research, which is discussed above is done according to the researcher's best affords. This does not mean that no improvements could be made. The theory about previous pregnancy outcomes is mostly in the area of health connected to mortality. A little part is about the influence of actions by previous experiences. A possible alternative approach could be to analyse the behavior changes after death of the first child from a more psychological point of view. This might give other perceptions on how previous pregnancy outcomes do or do not influence an action. It is possible that certain groups in society are more influenced by previous pregnancy outcomes than others.

The data which was used during the study on the usage of obstetric care by Egyptian women, was derived from the Egyptian Demographic Health Survey 2005. The DHS is a survey of high quality and it is nationally representative. But there is al limit to the number of respondents of the survey. This involves that only a part of the DHS information is useful for this research. Three samples of women were used. All of these samples were different and contained another group of women. Of course it would have

been more clear to do the whole analysis with the same group of women. But this meant that the number of cases would have been very small, especially in regards of the category of women whose first pregnancy did not end positively.
The research about the obstetric health care use of Egyptian women and the influences of first pregnancy outcomes can function as a start, from which other research can be undertaken.

7.3 Recommendations

Depending on the interests of the researcher, the earlier mentioned adjustments at the theory could be made. Or the operationalisation of the concept of obstetric health care use could be broadened because there are more aspects about obstetric health care than could be researched in the time afforded to the current research. To get more clarity on the choices, which were offered to a woman, a link could be made to a Service Provision Assessment. Through this assessment the health services, which are provided to a group of people are researched. Linking the information about the DHS and the SPA would give information about what kinds of health facilities are available and how far a woman needs to travel to get there.

The research currently done did not provide information about women who experienced problems during pregnancy but whose child survived. It also did not explain why some women choose to deliver at home while others did not. An adjustment to this study could be made by performing a qualitative research on the same topic. Interviews could be done with Egyptian mothers. They could be asked about the reasons why they choose to use antenatal care or not and how they feel about the different possible places to bare a child. And furthermore, if their pregnancy was terminated or their child died, it could be asked what they perceived as the reason for this situation.

The results of the research could not only be a start for further research, it also could be used for the advocacy of certain policies. As already stated before, in Egypt the common idea about pregnancy exists that both pregnancy and giving birth are natural processes of human live and that therefore people tend to think that medical involvement is not necessary (UN, 2002). The results of the research show that if a woman first had a positive pregnancy outcome, during the second pregnancy the chance that she goes for sufficient antenatal care becomes smaller than when she had a negative first pregnancy outcome. It is also clear that the women whose child stayed alive during delivery they tend more to give birth to their second child at home than do the women whose first pregnancy ended negatively.

Thus policy is needed to create more awareness about the risk of pregnancies. It is important that people also become aware of the fact that not every pregnancy is the same. In the case that during the first pregnancy everything went fine, this does not automatically involve that less usage of the obstetric health care during a second pregnancy is necessary. Every pregnancy involves a risk for both mother and child (Khalil and Roudi-Fahimi, 2004; WHO, 1994).
Furthermore, policies need to be directed to certain target groups. Especially the poor and uneducated women are the ones who were observed to use less care than the rich and

educated. Also, the younger women and those who live in rural areas had smaller probabilities to use antenatal care and deliver in a health facility than those who were older or living in urban areas. Women that are in one or more of these categories need special attention when policies about the improvement of health care use are made.

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