#### Linköping University Medical Dissertations No. 1179

# Teenagers' unintended pregnancies and contraception

by

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Serie: Linköping University medical dissertations,

No. 1179

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Printed in Sweden by Liu-Tryck, Linköping, Sweden,2010 Cover design: Dennis Netzell

ISBN: 978-91-7393-413-8

ISSN: 0345-0082



#### **Abstract**

Teenage pregnancies are often not intended, and there is a high risk that unintended pregnancies will lead to abortion. The wide-spread availability of Youth Clinics, the subsidizing of contraceptives and the introduction of new and effective contraceptives have failed to lower the abortion rates. The aim of this thesis was to study possible risk groups and to highlight underlying reasons for contraceptive failure.

*Methods:* Study I and II were quantitative studies with the aims of investigating whether teenagers who sought emergency contraception (Paper I) and teenage mothers (Paper II) were at risk for new unintended pregnancies during a 12-month follow-up period.

Study III and IV were qualitative studies. The aim in study III was to see how contraceptive use was documented in medical records (MRs) concerning teenagers who had attended for induced abortion. In study IV the aim was to find out reasons for non-use or inconsistent use of contraceptives among teenagers attending for abortion.

Results: In study I and II data were collected from medical and antenatal records. The results showed that both groups, despite contraceptive counselling, were at high risk for new unintended pregnancies leading to abortion. Attendance at the postpartum visit was low and 24% of the teenage mothers did not receive any recommendation about using a particular contraceptive method. Within 12 months 25% had a new pregnancy and of these one third led to legal abortion.

In Study III two themes were generated from the analysis of the MRs; \_Contraceptive methods previously used' and \_Plan for future contraceptive use'. All MRs did not contain information about contraceptive use. In study IV one theme was generated from the analysis of the interview text: \_Struggling with feelings of uncertainty and patterns of behaviour'

Conclusion: Teenagers using emergency contraceptive pills and teenage mothers were at high risk for unintended pregnancies. Contraceptive failure in teenagers who have had an abortion may be due to in part to the absence of contraceptive counselling at abortion visits and in part to problems with contraceptive use due to insufficient knowledge and not knowing what do when side-effects occurs.

Keywords: teenagers, unintended pregnancies, legal abortion, contraceptive counselling, postpartum visit, *Chlamydia trachomatis* 

## Sammanfattning på svenska

Den här avhandlingen handlar om tonåringar, oplanerade graviditeter och preventivmedel. Sedan abort blev lagligt i Sverige 1975 har tonårsgraviditeter minskat under hela 1990-talet. Det här betraktades som bra och man tillskrev de insatser som gjorts för att förebygga tonårsgraviditeter detta. Insatserna var undervisning i skolorna om sex- och samlevnad sedan mitten av 1950-talet, under 1980-talet utbyggnad av ungdomsmottagningar och subventionering av preventivmedel.

Minskningen har dock avstannat och idag har Sverige tillsammans med Island flest tonårsgraviditeter i Norden. I jämförelse med övriga Europa och övriga världen är dock andelen tonåringar som blir gravida lågt. Tonårsgraviditeter är oftast oplanerade och resulterar ofta i en abort. Samtidigt som andelen tonårsgraviditeter har minskat har andelen som gör abort ökat. Andelen aborter bland tonåringar i Sverige är högst i Norden. Idag är besök på ungdomsmottagningar gratis, preventivmedel är subventionerat till tonåringar och det finns en acceptans för tonåringars sexualitet i samhället.

Under 1990-talet har nyare p-piller med mindre biverkningar introducerats och nya metoder har också blivit tillgängliga i Sverige som p-ring, p-stavar och p-plåster. Sedan 2001 är akut p-piller receptfritt och därmed mer lättillgängligt. Trots detta sjunker inte andelen tonårsaborter utan visar en tendens till ökning. Idag gör också fler tonåringar upprepade aborter jämfört med tidigare.

#### Avhandlingen kan delas in i två delar.

**Den första delen** syftade till att studera riskgrupper bland tonåringar för oplanerade graviditeter och abort. Den består av delarbete I och II. Dessa arbeten är så kallade kvantitativa studier. Två grupper av tonåringar har studerats och följts upp avseende risk för oplanerad graviditet och abort. Vi ville se hur **många** som utsatte sig för risk för oönskade graviditeter. Att räkna antal är en del av studierna. Dessa arbeten ingick i en medicinsk licentiat examen 2006 i Örebro.

**Den andra delen** av avhandlingen hade som syfte, utifrån frågeställningar som kom fram i arbete I och II, att studera preventivmedelsrådgivning i samband med abort. Ett annat syfte var också att ta reda på tonåringars egna erfarenheter av preventivmedel och preventivmedelsrådgivning. Dessa arbeten är så kallade kvalitativa studier där man undersöker uppfattningar och mönster och inte är intresserad av att räkna antal.

#### **Delarbeten:**

I **delarbete** I studerades tonåringar och unga kvinnor som sökte på en ungdomsmottagning för att få akut p-piller. Studien genomfördes under 6 månader 1998 – 1999 och då behövdes ett recept får att få akut p-piller eller så delades det ut gratis på

bland annat på ungdomsmottagningar. De tabletter som då användes gav mer biverkningar jämfört med dagens akut p-piller . Genomsnittsåldern på dem som sökte var 17 år. De 134 som sökte för att få akut p-piller hade haft oskyddat samlag i 54% av fallen och 46% hade misslyckats med kondomanvändning eller glömt att ta ett eller flera p-piller. När de följdes upp ett år senare hade 10 stycken blivit oplanerat gravida varav 8 stycken hade gjort abort, en tonåring hade fått missfall och i ett fall var det oklart om graviditeten fortsatte eller ej. I den här gruppen tonåringar blev andelen som gjorde abort 4ggr större än förväntat vid jämförelse med riksgenomsnittet för åldersgruppen.

I delarbete II som var en journalgenomgång, studerades 250 stycken tonåringar som fött barn under åren 1996 – 2000. Genomsnittsåldern var 19 år. Det noterades om de kommit på ett återbesök inom 12 veckor efter förlossningen vilket ingår i det mödravårdsprogram som alla gravida erbjuds. Vidare undersöktes det om de fått ett preventivmedel eller inte vid det besöket vilket är ett av syftena med besöket. På efterbesöket kom 75% och av dessa fick c:a 75% ett preventivmedel. Genom att titta i journaler ett år efter förlossningen undersöktes om de blivit gravida igen och om de då valt att föda barn eller att göra abort. En fjärdedel, 56 st, hade blivit gravida igen och av dem gjorde 20 st abort. Ingen skillnad hittades mellan dem som gjort abort och dem som ej gjort abort avseende om de kommit på återbesök eller inte. Ingen skillnad hittades heller om de fått preventivmedel eller ej. Det kan bero på att antalet tonårsmammor som studerades var för få. Andelen som gjorde abort var i denna grupp c:a 5 ggr högre än förväntat om man jämförde med riksgenomsnittet för åldersgruppen.

I **Delarbete III** studerades 36 stycken journaler som förts när tonåringar sökt för abort. Syftet var att studera hur det var dokumenterat i journalerna om tonåringarnas tidigare erfarenheter av preventivmedel och vilket preventivmedel som skulle användas efter aborten. Genomsnittsåldern var 17 år. För att studera detta valdes en kvalitativ analysmetod som kallas innehållsanalys. Texten i journalerna gicks systematiskt igenom och grupperades i så kallade meningsenheter. De meningsenheter som innehöll samma information samlades i kategorier. Dessa kategorier analyserades avseende innehåll för att få fram ett tema. Två teman kom fram: 'Preventivmedelsmetoder som tidigare använts' och 'Planering av framtida preventivmedelsanvändning'. Inom dessa teman fanns så kallade subkategorier/undergrupper som handlade om problem med preventivmedelsanvändning. I tio journaler saknades uppgift om tidigare preventivmedel och i 5 stycken saknades uppgift om framtida planering för preventivmedelsanvändning.

I **delarbete IV** intervjuades tolv stycken tonåringar c:a fyra veckor efter att de genomgått en abort. Sex stycken öppna frågor ställdes som handlade om deras erfarenhet av preventivmedelsanvändning, var de hade fått preventivmedel ifrån, vem de pratade med preventivmedel med och vad de tyckte om preventivmedelsanvändning. Genomsnittsåldern var 17 år. Följdfrågor ställdes för att få en djupare förståelse.

Intervjuerna skrevs ner ordagrant och texten analyserades med samma metod som ovan. Analysen resulterade i ett tema 'Att bemästra osäkerhet och beteende'. Tre stycken kategorier formade detta tema och de var 'Osäkerhet', 'Påverkan på preventivmedels användning' och 'Ängslan'. Av intervjuerna framkom att tonåringar diskuterar preventivmedel med många, framförallt vänner föräldrar och pojkvänner. De söker också själva information på nätet. Föräldrar visade sig ofta stödja att preventivmedel användes men agerade inte aktivt för att hjälpa till. Problem med biverkningar ledde ofta till att preventivmedel inte användes vilket i sin tur ledde till oplanerad graviditet. Akut p-piller användes inte alltid trots risk för graviditet.

Sammanfattning: Delarbete I och II visade att trots att preventivmedelsrådgivning gavs i samband med besök för akut p-piller och efter graviditet fungerade inte preventivmedelsanvändningen hos en del tonåringar vilket ledde till oplanerade graviditeter och abort. I delarbete III visades det att i flera fall diskuterades tidigare preventivmedelsanvändning, men dokumentationen var ytlig vilket skulle kunna spegla att diskussionen också varit ytlig. Detta kunde orsaka att preventivmedel inte användes eller inte användes på ett bra sätt i. Dessutom saknades det i journalerna uppgifter om preventivmedelsanvändning i vissa fall vilket kan betyda att man inte diskuterat preventivmedel eller att man inte journalfört det. I delarbete IV visade det sig att flera tonåringar försökte diskutera problem med preventivmedel med rådgivare på ungdomsmottagningar, men att de inte alltid togs på allvar. När de försökte lösa problemen själva lyckades de inte och slutade med preventivmedel. Detta kunde bidra till att de blev oplanerat gravida trots att de visste var de skulle få preventivmedel och använt detta tidigare.

**Slutsats:** För att preventivmedel skall fungera för att förebygga oplanerade graviditeter behövs bättre rådgivning än vad som ges idag. Problem med biverkningar måste diskuteras och lösas. Akut p-piller behöver användas mer och därför behöver det ingå i all preventivmedelsrådgivning. Rådgivning behöver vara individuell och upprepas. Hur föräldrar skall kunna involveras mer behöver studeras närmare.

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## **Abbreviations**

CI Confidence Interval

COC Combined oral contraceptive

EC Emergency contraception

ECP Emergency contraceptive pills

IUD Intrauterine device

LAM Lactational amenorrhea

MBR Medical Birth Register

MR Medical Records

MHC Maternal Health Care Center

NBHW National Board of Health and Welfare

OC Oral contraceptive

OTC Over the counter

OR Odds Ratio

PI Pearl Index

POP Progestin only pill

SMI Smittskyddsinstitutet (Swedish Institute for Infectious Disease Control)

SRH Sexual and reproductive health

STI Sexually transmitted infection

YC Youth clinic

WHO World Health Organization

## Introduction

The world population of adolescents increases, just as the total population of the world increases. It appears that concern with adolescents increases at the same time, and it therefore seems important for researchers to consider issues that are important for adolescents to find their place in the larger society.

It is well recognized that the transition from adolescence to adulthood is a time of great personal changes and that the development of sexual identity and sexual activity is a most important part of this transition. Sexual and reproductive health (SRH) rights are accepted as fundamental to the sustainable development of societies (Avery et al 2008). The World Health Organization (WHO) developed sexual and reproductive health strategies for Europe in 2001, and reported a program of global strategies in 2004 (Avery et al 2008). Special tasks aiming at teenagers have also been developed by the WHO. The SRH for adolescents in Europe and Sweden is generally good but this population still remains vulnerable(Danielsson et al 2001, Berg-Kelly 2003, Amy et al 2007).

Appropriate timing of childbirth is a fundamental part of SRH. Teenage pregnancies are often unintended and there is a consensus worldwide among health care providers that every effort should be undertaken to prevent their occurrence (Santow et al 1999, Darroch et al 2001, Amy et al 2007).

Unintended teenage pregnancies often have socio-economic consequences and can often lead to abortion. Thereby, there is a need for the prevention of unintended pregnancies (Churchill et al 2000, Darroch et al 2001). Teenagers experiencing an unintended pregnancy are a vulnerable group no matter which choice they make, to terminate the pregnancy with an abortion or to deliver. Increased dropout rates from school and low socio-economic conditions have been reported among teenage mothers (Danielsson et al 2001, Wahn et al 2008). Similar problems have also been reported for their male partners. Partners of teenage mothers have been found to have more behavioural problems than other young men. These problems may have a negative impact on parenting (Ekéus et al 2003). Children born to teenagers also seem to have an increased risk of becoming disadvantaged children (Irvine et al 1997, Ekéus et al 2003, Tripp et al 2005).

In order to achieve a reduction of unintended teenage pregnancies and to reduce induced abortions a number of actions have been undertaken in Sweden such as education in schools about sexual and reproductive health, establishing of Youth Clinics (YC) and subsidized contraceptives to teenagers (Santow et al 1999). Compared with the other Nordic countries with similar reliable abortion statistics, similar living conditions and views about teenage sexuality, Sweden has, however, a higher rate of abortions among teenagers. Sweden also has higher total teenage pregnancy rates than the other Nordic

countries, but the pregnancy rates in all Nordic countries have decreased during the past years (Folkhälsorapporten 2009, National Board of Health and Welfare (NBHW), Avery et al 2008, Lindh et al 2009).

Unintended pregnancies are dependent mainly on the level of sexual activity, how contraceptives are used and on the lack of contraceptive use (Trussell 2004, Avery et al 2008). Trends in childbearing clearly vary among countries and over time (Knudsen et al 2003). However, no differences can be seen in sexual activity, contraceptive use and attitudes towards contraception between the Nordic countries. Therefore, it should be possible to prevent more of the unplanned pregnancies in Sweden that presently lead to abortion than it is done today (Santow et al 1999, Knudsen et al 2003).

Abortion rates among teenagers in Sweden were at their lowest in 1995, but have thereafter increased. Between 1995 and 2008, the teenage abortion rates in Sweden increased by approximately 40 percent (Induced abortions 2008 NBHW). During the same period, the repeat abortion rates also increased from 11.5 to 16.0 percent. Thus the preventive efforts aiming at teenagers have so far failed.

Why has the introduction of new contraceptive methods not yet had any impact on teenage abortion rates in Sweden? What is the significance of the introduction and use of emergency contraception (EC)? A review of the literature shows that the quality of contraceptive counselling has not yet been carefully investigated and the elements of good contraceptive counselling have also not been clearly defined (Moos et al 2003, Nobili et al 2007).

Many of the important goals in the preventive work against teenage pregnancies and abortion that have been pointed out by other countries have already been fulfilled in Sweden (Gispert et al 1978, Amy et al 2007, Rasevic et al 2009).

This thesis were carried out to try to find if there are special risk groups among teenagers in Sweden to target and to give special attention to. We also wanted to find out whether there were any hindrances for contraceptive use.

## **Background**

#### Sexual behaviour of young people

During the transition to adulthood, teenagers need adults for guidance (Meleis et al 2000). The teenagers are developing the ability to make logical conclusions and to engage in cognitive thinking during this time (Berg-Kelly 1995, Davis et al 1999). Because this is a process that takes place from 12 years of age up to approximately 18 years of age, the teenagers need guidance from adults during this period. Younger teenagers often state that friends are most important while older teenagers state that parents and mothers are most important (Bender et al 2005, Johansson et al 2007, Rembeck et al 2008). Teenagers rely on their friends to discuss SHR-matters with, but they trust their parents more (Bender et al 2005).

The mean age at first sexual intercourse among Swedish teenagers has been reported to be 16-17 years for both sexes. This age has remained stable since the 1960s (Edgardh 2000, Forsberg 2006). In Sweden approximately 12% of the teenagers aged 15 years have had sexual intercourse at least once. By age 20, the comparable number has reached approximately 85%. After having once started having intercourse it is estimated that 95% of 18-19-year-olds remain sexually active (Darroch et al 2001). Thus adults, parents and teachers as well as healthcare providers that encounter teenagers should be aware of teenagers' needs for counselling about sexual health matters.

Sexual competence during intercourse among teenagers has been measured and defined as containing four elements: regret, willingness, autonomy and the use of contraception at first intercourse (Wellings et al 2001). Lack of sexual competence has been reported to increase with declining age. Ninety-one percent of British teenage girls, age 13 to 14 at first intercourse, have been defined as sexually incompetent (Wellings et al 2001). The authors concluded that risk behaviour and adverse outcomes were areas having a potential for improvement in the use of preventive strategies.

In order to prevent unplanned pregnancies health care providers therefore need to give optimally contraceptive counselling to teenagers and when appropriate parents should be involved (Gispert et al 1978, Davis et al 1999, Allen et al 2007). Instead of involving health care providers or parents, the teenagers often go to peers for advice and thus may get knowledge from their peers that is not well founded (Asker et al 2006, Hansen et al 2007, Brown et al 2007). Contraceptive adherence has been reported to be better among teenagers who can discuss contraceptives with their parents. It also appears that the parents' knowledge of the teenager's contraceptive use is important for consistent contraceptive use (Stone et al 2002, Allen et al 2007, Ogle et al 2008). School, partners, friends and parents have been reported as important sources of information about

contraceptives (Hansen et al 2007, Cibula 2008, Fronteira et al 2009, Breidablikk et al 2009). Professionals, such as midwives and physicians seem to be less important (Virjo et al 1999, Hansen et al 2007).

Insufficient or incorrect knowledge of SRH may lead to non use of contraceptives (Sundby 1999, Sydsjö et al 2006, Haldre et al 2009). Teenagers who reveal feelings of not being able to get pregnant have also a risk for inconsistent or non use of contraceptives (Kero et al 2001, Sydsjö et al 2006).

The communication skills of health care providers are an important element in making the meetings with teenagers' successful (Davis et al 1999, French 2002, Berg-Kelly 2003, Sundby 2006). The teenager may also need a second opinion from another contraceptive counsellor to feel that he or she can rely on the information given (Tonårsgynekologi 1991).

Health care providers at Youth Clinics (YC) and teachers involved in school education play a crucial role in seeing to it that contraceptive use is encouraged to prevent unintended pregnancies (Wiksten-Almströmer 2006, Forsberg 2007). Age at first intercourse, adolescent pregnancy, contraceptive use and knowledge of contraceptives and STIs are all factors that can be useful indicators in assessing the success of SRH for adolescents (Avery et al 2008).

In Sweden the law prohibits sexual intercourse before 15 years of age (The Swedish Law, SFS). The reasons behind this law have to do with protecting teenagers from sexual abuse. Therefore it is important to evaluate if the teenager might have been coerced into having intercourse. From different studies there have been reported that twelve to 21 percent of Scandinavian female teenagers had experience of sexual coercion, and of those four percent stated that they had been raped (Lundberg 1999, Edgardh 2000, Breidablik et al 2009). Consequently, questions about sexual abuse and coercion should be addressed in the discussion with teenagers especially when they are experiencing an unintended pregnancy.

During the 1990s an increase was found in the use of contraceptives at the time of the most recent intercourse. The prevalence varied between 70% and 85% (Knudsen et al 2003, Forsberg 2006). Presently, the use of any contraceptive method at the time of first intercourse in adolescents in Sweden remains fairly high (approximately 75%) (Kieler et al 2003, Forsberg 2006). The condom is the most commonly used contraceptive at the first intercourse. Oral contraceptives (OC) are the predominant method at the most recent intercourse (Wielandt et al 2002). Dual protection with combined oral contraceptives (COC) and a condom have increased over time as shown in a recent Swedish study but there has been no increase in condom use alone (Lindh et al 2009, Folkhälsorapporten

2009). Dual protection has been shown to reduce the number of unplanned pregnancies if it is used consistently (Trussel 2004).

Teenagers with coitarche at the age of 17 or earlier have been reported to have menarche at an earlier age. This group has also been reported to have more partners but does not seem to use condoms more frequently than those who have had only one or a small number of partners. Teenagers reporting their sexual debut at an early age have been shown to be at increased risk for unintended pregnancies and for contracting sexually transmitted infections (STIs) in the future (Edgardh 2000). Teenagers who have become sexually active tend to continue to be sexually active, despite of whether the teenager has a steady partner or not. Efforts need to be maintained to ensure that contraceptives are used to avoid unplanned pregnancies and STIs in this group (Darroch et al 2001, Stenqvist et al 2010).

Since the 1970s, the use of drugs and alcohol in association with unprotected intercourse has decreased (Häggström-Nordin et al 2002, Darj et al 2003). Use of emergency contraception (EC) has been considered by some to encourage risk-taking behaviour, but studies to date have shown the contrary, that use of EC can also increase the use of condoms (Walker et al 2004, Polis et al 2007).

Despite the fact that many teenagers use a contraceptive at the start of a relationship this behaviour does not seem to persist. Both non-use and inconsistent use have been reported to be common (Balassone et al 1989, Rosenberg et al 1995, Whitaker et al 2008). Teenagers seem to have low motivation for using a contraceptive consistently. This also seems to be true for the group of teenagers who have undergone an abortion (Ekstrand et al 2009).

#### **Youth Clinics**

The first Youth Clinic (YC) in Sweden opened in 1970 in Borlänge, a medium-sized town in the middle of Sweden. It was established by a paediatrician. It had been recognized that there was a need for a place where the teenagers could meet health professionals who had a special understanding of teenagers. The YCs offer various types of counselling and health services free of charge. Today there are approximately 200 YCs in Sweden. The idea behind YCs is that several professional groups should work as a team with the teenagers, a team that is to include midwives, nurses, social workers and physicians, all working closely with one another (Wiksten-Almströmer 2006). The YCs were initially considered as playing an important role in the prevention of unintended pregnancies among teenagers. The abortion rate among teenagers decreased and the YCs were considered as successful (Santow et al 1999).

The goal of the YCs is to address the teenagers in a respectable and non-judgmental way (Wiksten-Almströmer 2006). This goal has not always been met, it seems, since teenagers have expressed feelings of anxiety regarding the treatment from the health care providers and have said that they experience the providers as being judgmental. Moreover, teenagers have expressed uncertainty about secrecy (French et al 2002, Bayley et al 2009).

The professionals at the YCs should be able to identify groups that are at high risk for unintended pregnancies. Teenagers using emergency contraception, with a history of pregnancy or those with a foreign background have all been identified as subgroups at risk for unintended pregnancies (Larsson et al 2003, Helström et al 2006, Moreau et al 2005, Loeber 2009). Thus these groups have to be recognised by healthcare providers in order to improve the preventive work (Rasch et al 2007, Loeber 2009).

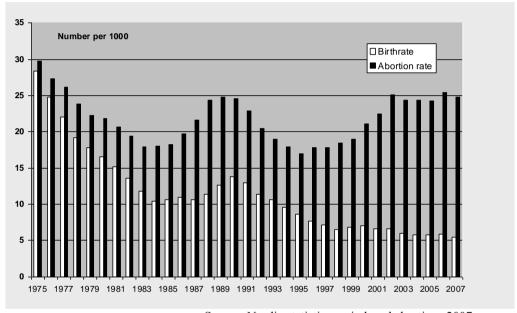
The provision of YCs is not mandated by law. Municipalities and county councils may choose to establish or not to establish as they see fit. This may cause organizational problems and might be a reason for the varying quality of the YCs throughout the country (Ideström 2009). Access to the YCs is not uniform and has been reported to be unsatisfactory in some areas (Gemzell Danielsson et al 2009).

#### Teenage mothers

Pregnant teenagers who decide to continue their pregnancies are a particularly vulnerable group. In Sweden about 2 % of children are born to teenage mothers(MBR). Since the 1990s the number of teenagers who chose to go on with their pregnancy to term has declined (Figure1). High frequencies of dropouts from school and low socio-economic conditions have been reported for this group (Wahn et al 2008). The teenage mothers have a history of childhood sexual- and physical abuse more often than mothers who had their first child as adults. Teenage mothers also face a greater risk of becoming single parents. (Wahn et al 2008, Papamicheal et al 2009). Both for socio-economic reasons and for health reasons of mother and first child, it is desirable for teenage mother to delay the time to a second birth. (Smith et al 2001, Ekéus et al 2004) The needs of teenage mothers need to be addressed and preventive strategies intensified (Adler et al 1997, Adam et al 2005, Amy et al 2007).

Seventy-three percent of teenage mothers have been reported to have had an unplanned pregnancy compared with 14% among adult mothers (Wahn et al 2008). Although it is widely held that teenagers in Sweden are free to choose to continue a pregnancy to term, this belief has been questioned (Ekstrand et al 2009). Non-use of contraceptives and being very young are factors found to give ambivalent feelings towards pregnancy and to have an influence on decision making about abortion (Törnbom et al 1999).

Antenatal and postpartum programs differ between countries (Glasier et al 1996, Levitt et al 2004). The antenatal and postpartum program in Sweden is free of charge and stipulates that the first antenatal visit will take place before the end of 12 gestational weeks. The program also stipulates the number of antenatal visits to take place and that a postpartum visit will occur before the end of the 12th week after delivery (Mödrahälsovård, Sexuell och Reproduktiv Hälsa 2008).



Source: Nordic statistics on induced abortions 2007

**Figure1.** Changes in birth rate (per 1000) and abortion rate (per 1000) between 1975-2007 among young women 15-19 years old in Sweden.

It could be assumed that the preventive work aiming at reducing the frequency of future unintended pregnancies would be successful in Swedish first-time mothers. These teenagers regularly meet a midwife throughout their pregnancies and also meet her after delivery (Wahn et al 2008). At the postpartum visit, contraceptive counselling is supposed to be given and contraceptives prescribed (Mödrahälsovård, Sexuell och Reproduktiv Hälsa 2008). However, as shown in a Finnish study, healthcare providers at postpartum check-ups often delay the initiation of effective contraceptive use which may result in a risk for new unintended pregnancies (Sannisto et al 2009). Whether this is also true in Sweden is not known. The degree of compliance with the postpartum program among women in Sweden has been reported to be 75% with lower participation among foreign born women (Ny et al 2007).

The reasons for low attendance at the post partum visit when attendance at the antenatal visits is quite high needs to be investigated. There is also a need to investigate why a contraceptive is not prescribed at every post partum visit instead of delaying this practice until some future meeting (Sannisto et al 2009).

#### Contraception and induced abortion in Sweden

**Table I**. Important breakthroughs

**1938** The law against contraception was abolished and education about contraception was allowed. A new law that allows abortions on special conditions was passed.

**1955** Mandatory education about sexuality and interpersonal relations became part of the Swedish school education

1964 Contraceptive pills were introduced

1966 Introduction of IUDs

1970 The first Youth Clinic opened

**1975** The abortion law that was passed in 1974 made abortion free and legal. At the same time the preventive work against abortion was started up by making contraceptives more readily available and by providing counselling free of charge.

1976 Sterilisation to women and men over 25 years of age was permitted by law.

Source: Sundström 2004

According to the Swedish authorities (Folkhälsorapporten 2009) the strategies to prevent unplanned pregnancies in Sweden should be:

*First*, primary prevention that addresses the general population with no known problem. *Second*, secondary prevention that deals with the problem when it has arisen with the aim of identifying it early, giving treatment and counselling and tracing the sources when dealing with STIs. When an unplanned pregnancy has been identified leading to birth or induced abortion the aim is to prevent a new unplanned pregnancy from occurring in the future.

*Third*, to promote healthy behaviour to enhance good public health. To achieve this, school education and education at YCs are important.

The goal for Swedish society should be not so much to simply focus on preventing abortions but rather to focus on preventing the unintended pregnancies from occurring in

the first place, and as a consequence, preventing unintended births(Folkhälsorapporten 2009).

#### Contraception

During the past 40 years, contraceptive methods have been improved. New hormonal contraceptive methods with fewer side-effects have been developed as have new routes of administration (Lidegaard 2008, Milsom et al 2008). Highly effective hormonal contraceptives and copper IUDs have been available in Sweden since the 1960s (Table I). Currently contraceptives with different hormone content are available and there are several different routes available for providing these contraceptives.

After introduction of the combined oral contraceptive pill, it was immediately requested by many women. Approximately 400,000 women were using this method in 1969, five years after the introduction of the method in Sweden (Sundström 2004). Today, the number of users is about the same as it was then (Milsom et al 2002). The first contraceptive pills contained high doses of ethinylestradiol and various progestins. The side-effects were frequent and included thromboembolism, jaundice, coagulation disorders, weight gain, low libido and psychological side effects (Böttiger et al 1980). Today the hormonal contraceptive pills available have a lower hormonal content and thus cause fewer side-effects (Odlind et al 1995, Kieler et al 2003). Despite this, the frequency of discontinuation, especially due to psychological side effects, has increased (Lindh et al 2009). The thromboembolic risk remains, but seems to have been reduced (Böttinger et al 1980, Lidegaard 2008). Despite a reduction in risk, fear of thromboembolism remains as one of the main reasons why many young women choose not to use the pill or discontinue use after first trying the method (Milsom et al 2002, Lindh et al 2009). In Sweden, as in other western countries, media alarms on risks of using COCs have led to discontinuation of this method (Milsom et al 2002, Odlind et al 2002).

There is a constant attempt to attain a balance between reduction of side-effects such as thromboembolism, bleeding disorders and psychological side effects and achievement of high contraceptive reliability in order to increase use and compliance (Milsom et al 2008, Lidegaard 2008, Calaf i Alsina 2010).

In order to increase access to contraceptives, midwives were trained during the 1970s to insert an intra uterine device. After special education they also were given permission to prescribe combined oral contraceptives (COCs). Since 2003, midwives have had the right to prescribe any contraceptive method within the scope specified within their profession. Presently, it is assumed that it will be easy to get a contraceptive prescription from a physician or a midwife and that contraceptives will be available at any pharmacy (Tydén et al 2002, Larsson et al 2002).

In Sweden more than 50% of teenagers have started to use a contraceptive method before they have become 16 years of age (Cibula 2008). Approximately 75% of teenagers use a contraceptive method at the first intercourse and 70 % report using contraception at their most recent intercourse (Forsberg 2006).

COC is used by approximately 50% of sexually active women younger than 24 years. It is the most used contraceptive method in many countries (Milsom et al 2008). Several studies show that COCs are often used incorrectly and in an inconsistent manner. Teenagers are the group with the highest risk of inconsistent use of contraceptives (Vaughan et al 2008, Dilbaz et al 2008). This might be one explanation why the preventive work against unintended teenage pregnancies has not yet met its goals (Törnbom et al 1999, Sundby et al 1999, Brown et al. 2007). After a period of inconsistent use, however, resumption of a method may occur and the extent of use may be better after being exposed to the risk of an unplanned pregnancy (Kero et al 2005).

In order to increase use and compliance, long-acting methods could be recommended to teenagers who often do not plan the intention to get pregnant for many years (Paukku et al 2003, Wiegertz et al 2004, Vaughan et al 2008, Whitaker et al 2008, Mansour et al 2010). In 2009, Grimes introduced the term—forgettable contraception" for these long-acting methods (Grimes 2009).

Many studies have been undertaken to understand why contraceptives are not used when they should be used (Balassone 1989, Kero et al 2001, Wulff et al 2002, Larsson et al 2002, Bianchi-Demicheli et al 2003, Mansour et al 2010). There seems to be a lack of implementation of the existing knowledge that will ensure use of contraceptives (Törnbom et al 1999, Kero et al 2001). Research is still needed to evaluate contraceptive counselling and its effectiveness (Nobili et al 2007, Ferriera et al 2009). Qualitative studies are also needed to evaluate individual contraceptive failure and reasons for this (Balassone 1989, Moos et al 2003, Larsson et al 2003).

An important reason for discontinuation of a contraceptive method is opposition from the partner (Vaughan et al 2008). There are only a few studies concerning teenage boys and men and their views about contraceptive use (Avery et al 2008). Thus, the gender aspect also needs to be studied more carefully.

The risk of becoming pregnant is low if modern contraceptives are used correctly (Table II). This is true also for -typical use" but the risk accumulates over time (Trussel 2004). Teenagers, as well as adult women, often express a sense of not being able to get pregnant, which could explain non use but the failure to get pregnant is often the result of not having enough knowledge or of having misconceptions about fertility (Sydsjö et al 2006, Ekstrand et al 2009). There is a need for more studies concerning discontinuation

of OC due to side-effects, or due to fear of side-effects (Lindh et al 2009). Misinterpretations and fear may often be a result of poor knowledge about how contraceptives actually work.

**Table II.** Estimated Pearl Index (PI) for different contraceptive methods with "typical use". PI states number of women experiencing an unintended pregnancy per 100 women year. If no contraceptive method is used it is estimated that 85% of women will experience a pregnancy within a year.

Method	Estimated Pearl Index
Combined hormonal contraceptives *	0.5-1.5
POP-medium dose**	0.5-1.5
POP – low dose	2-6
Progestin injectable	0.1-0.5
Progestin Implants	0.1-1.0
Copper IUD (>250mm <sup>2</sup> Cu)	0.7-1.0
IUD – levonorgestrel	0.2-0.6
Condom	3-14
Diaphragm	6-20
Periodic abstinence ("natural" family planning)	2-20
LAM ***	0.8-1.2
Sterilization – male/female	0.1-0.5

<sup>\*</sup>Combined hormonal methods = COC, combined hormonal patch and combined hormonal vaginal ring

Source: Medical Product Agency in Sweden 7:2005

Inconsistent use when a relationship ends is common (Sundby et al 1999). In a study by Rosenberg, 22% of the subjects returned with questions after contraceptive counselling and 9% required a visit to obtain more thorough discussion and information (Rosenberg et al 1998).

<sup>\*\*</sup>POP= Progestin only pill

<sup>\*\*\*</sup>Lactational amenorrhea (LAM) is a highly effective temporary method of contraception after childbirth but a second method should be introduced when the mother is not fully breastfeeding, when menstruation returns or after 6 months (Truitt et al 2003).

#### Induced Abortion

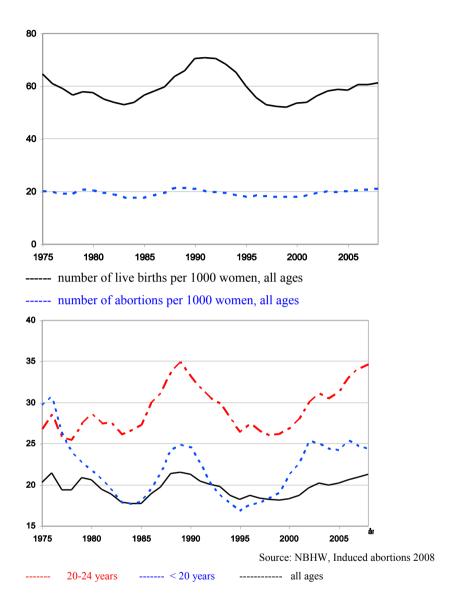
The Swedish abortion law was passed in 1974 and introduced in 1975 (The Swedish law, SFS 1974:595). The aim was to extinguish illegal and clandestine abortions. There are recommendations about how the abortion program should be organized and the recommendations have been revised several times (NBHW SOSFS 2004:4). Today all women in Sweden have by law a right to induced abortion on demand until the end of the 18th gestational week. After this limit, the woman has to ask for permission from the National Board of Health and Welfare, which can approve abortion for special reasons. Abortions are performed in public hospitals and at private clinics after special permission has been granted. Abortion is part of the Swedish national health insurance program and is performed at little cost on for the women. This easy access has actually eliminated illegal abortions in Sweden as well in the other Nordic countries (Knudsen et al 2003).

Since the abortion law was passed in 1975, the total annual number of abortions in Sweden has averaged between 30,000 and 38,000 (Figure 2) (Induced abortions 2008 NBHW).

The number of abortions among teenagers was 7,471 in 1975 (29.7 per 1,000 women) and in 2008 the number of teenage abortions was 7,561 (24.4 per 1,000 women). The lowest teenage abortion rate in Sweden was 16.9 per 1,000, a rate attained in 1995, and during the period 1993–1999 the teenage abortion rate was < 20 per 1,000 women. Thereafter, the abortion rate has increased successively (Figure 2). There is also a steady increase in repeat abortions among teenagers (Induced abortions 2008 NBHW, Lindh et al 2009).

Induced abortions were initially performed surgically, but during the 1980s methods for medical abortion were developed and became available in 1992 (Folkhälsorapporten 2009). Methods for medical abortion are continuously being refined and these methods now enable women to perform the abortion at home before the 9th gestational week. (Bygdeman et al 2000, Induced abortions 2008 NBHW).

Most women who undergo an abortion are reported to feel relief and responsibility for their own actions (Kero 2005). Gynaecologists and midwives who are working with legal abortion generally have a liberal attitude towards abortion and the present legislation (Hammarstedt et al 2005).



**Figure 2** .Number of live births and number of abortions per 1000 women 1975-2008 in Sweden

In abortion care physicians and midwives usually work close together. During the preabortion visit contraceptive counselling should be given by the physician or the midwife according to national and local guidelines (Inducerad abort ARG-rapport, NBHW SOSFS 2004:4). A follow-up is mandatory after 3-4 weeks and at this time contraception issues should be discussed again (NBHW SOSFS 2004:4). Studies on the results of the impact of contraceptive counselling before or after abortion are conflicting. Bender et al (2004) could not show any effect on contraceptive use after a thorough contraceptive counselling in relation to abortion. This finding was, however, contradicted in results from a study by Nobili et al (2007).

Health care providers have often been reported to have the intention of giving contraceptive counselling in relation to abortion. Yet they may feel unable to do so for reasons depending on working conditions out of their own control (Foy et al 2005, Taschudin et al 2007, Zhu et al 2009). What contraceptive counselling and education means is poorly defined and can mean different for different counsellors (Hiller 2002, French 2002, Nobili et al. 2007).

The motivation to use contraceptives effectively may be enhanced immediately after an abortion (Kero et al 2005, Vaughan et al 2009). Coitus may be recommenced shortly after childbirth. Ovulation returns approximately two weeks after induced abortion. Consequently, use of an effective contraceptive method should be started as soon as possible (Byrd et al 1998, Boesen et al 2004, Zhu et al 2009).

Women with a history of repeated abortions often report difficulties with finding an acceptable contraceptive method. As a result members of this group more often than others have not used any contraceptive method at all (Törnbom et al 1996, Kero et al 2005).

The increase in the frequency of repeated teenage abortions raises questions about the quality of the client-provider interaction at meetings taken after abortion and about contraceptive counselling in general. Is the counselling insufficient or is there no counselling at some pre-abortion visits as suggested by some teenagers or is there an overload of information that makes it impossible to comprehend all the information that is given? What is actually discussed during post-abortion visits need to be explored more carefully.

#### **Emergency contraception**

Emergency contraception (EC) is a method whereby a drug or device is used after unprotected intercourse with the intention of preventing a pregnancy. Emergency contraception was first described in the 1930s, when high doses of stilboestrol were given (Morris et al 1966). In the late 1970s Yuzpe introduced a new regimen consisting of 100 µg of ethinyl oestradiol and 0.5 mg of levonorgestrel taken orally and repeated in 12 hours and used within 72 hours of unprotected intercourse (Yuzpe et al 1977). This method was approved in Sweden in 1993. This method is still the most commonly used method worldwide (Grimes et al 2002). In the end of the 1990s the use of oral

levonorgestrel (1500 µg within 72 hours of unprotected intercourse) was introduced. It was introduced in Sweden in 2000 and has been available in Sweden as an over the counter drug (OTC-drug) since 2001. The contraceptive effect of levonorgestrel emergency contraceptive pill (ECP) is mainly due to inhibition of the LH peak which in turn leads to a delay of follicular maturation and inhibition of ovulation (Marions et al 2004). No effects on the endometrium have been shown (Swahn et al 1996). ECP mechanisms of action is shown in figure 3.

Levonorgestrel-only ECP seems to be more effective and to have less pronounced side-effects compared with the Yuzpe regimen (Marions et al 2004, Bastianelli et al 2008).

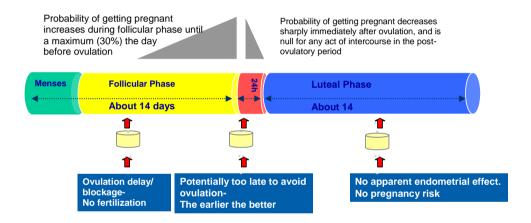


Figure 3. ECP mechanisms of action (Gemzell-Danielsson et al 2010)

During 2009, ulipristalactate 30 mg as a single dose began to be marketed. Like levonorgestrel, ulipristalacetate inhibits follicular maturation and ovulation. Moreover, this method is believed to maintain and effect for 120 hours (Glasier et al 2010). The method is presently recommended as the first choice of ECP but to date a prescription is still needed and midwives may not issue prescriptions for ulipistalactate.

Besides these hormonal methods an IUD can be used as an EC if it is inserted within 5 days after unprotected intercourse. The efficacy of EC to prevent unintended pregnancies is estimated to be 85% with hormonal methods and 99% with an IUD (Marions et al 2005).

**Table III**. EC in Sweden. Efficacy data from WHO 1998, Glasier et al 2010

Method	Year of introduction	Efficacy (%)	Duration of use after unprotected intercourse (hours)
Yuzpe	1993	38-77	72
Levonorgestrel	2000	61-95	72 (120)
Ulipristalacetate	2009	85	120
Cu-IUD	?	99	120

ECP with levonorgestrel is well known among women and teenagers in Sweden (Aneblom et al 2002, Larsson et al 2004). ECP has not been demonstrated to lower the number of abortions nor to have an impact on contraceptive practice even when given as advance protection (Tydén et al 2002, Marston et al 2005, Moreau et al 2005, Polis et al 2009). The use of ECP by teenagers has been found to be inconsistent (Sundby et al 1999. Glasier et al 2004, Ekstrand et al 2008). It has been speculated that the explanation might be that after unprotected intercourse women sometimes make a risk evaluation as to whether they might become pregnant or not. If the teenager/woman consider the risk of pregnancy to be low they do not use EC (Moreau et al 2005). EC given as advance protection has been proven to affect the time interval when EC is used but still about half of the teenagers in a Swedish study did not use it after unprotected intercourse. (Ekstrand et al 2008). One explanation for the failure of the introduction of EC to lower the abortion rates may be that providers of contraceptives rarely seem to supply information about EC (Moreau et al 2005, Taschudin et al 2007).

The copper IUD is also highly effective and has the advantage of offering ongoing contraception. (Bastianelli et al 2008). Despite the fact that an IUD is more effective than levonorgestrel as EC, it is rarely offered by providers as an alternative method (Moss et al 2009). Most adolescents and young women are unaware of IUDs as an option but they have been shown to be positive to the method when informed (Whitaker et al 2008, Schwarz et al 2009).

The reasons why information about EC is not part of general contraceptive counselling are not known. Moreover, there is a need for studies concerning why IUDs seldom are proposed in Sweden as an EC.

Why then have abortion rates continued to rise despite the development of new and effective ECP with few side-effects? Studies from Trussel (2003) and Moreau (2005) propose different explanations: the failure to use ECP reflects an increase in risk-taking behaviour; it is not as available as we think; and is the efficacy of ECP overrated?

#### Medical records

Making use of the medical record (MR) is another way for health care providers to communicate. What is to be documented in MRs is regulated by national guidelines (NBHW, Patientjournallagen 1993). A MR should include information about the patient's health; the aim of the visit; medical findings from tests and examinations; information about allergies and whether a drug is prescribed, what it is for and how it should be used. From the medical record it should also be possible to understand the plan for follow-up (NBHW, Patientjournallagen 1993).

National as well as local guidelines regulate what should be discussed during the preabortion visit. Contraceptive counselling is part of the interaction between the gynecologist and the patient at the pre-abortion-visit. According to the National guidelines it is mandatory and should be given with attention to making it of high quality (Inducerad abort 2008 ARG-rapport). The interaction between the individual and the prescriber is a critical part of the counselling and is considered crucial for the choice of contraceptive method and compliance to the method (Moos et al 2003, Taschudin et al 2007).

One of the purposes of the documentation is to provide support to health care-providers responsible for the care of the individual patient. The MR is a communication tool between care-givers and should enable a care-giver that have not met a patient previously to make decisions about steps to take based on the content in the MR.

It is also meant to be informative for the patient herself and to help her to understand what care she has received. MRs are also the basis for scrutiny of the treatment given and are also intended to form the basis for legal procedures and for scientific research (NBHW, Patientjournallagen 1993). The encounters between health care providers and clients provide a window through which preventive programs in SHR-matters can be viewed. Researching program-client interactions has the potential for leading to major improvements in the quality of care, the design of programs and in policy making (Simmons et al 1994). By studying documentation in MRs creating an idealized picture of what went on can be avoided, but there can be short-comings to rely on the MR since not everything that occurred during the interaction may have been recorded (Foy et al 2005).

### **Aims**

- To assess the short- and long-term risk of unintended pregnancy and to determine the prevalence of *Chlamydia trachomatis* infections in young women requesting emergency contraception at a Swedish youth clinic (Paper I).
- To determine whether a group of teenage mothers giving birth to their first child constitute a high-risk group for future legal abortions (Paper II).
- To study whether a group of teenage mothers complied with the requirement of a postpartum visit and whether they received or did not receive contraceptive counselling at the postpartum visit (Paper II).
- To examine the documentation in MRs pertaining to the visits of teenagers requesting an abortion; to assess how earlier contraceptive use was documented and how future contraception was planned as a reflection of what was discussed between the teenager and the health care provider (Paper III).
- To study the experiences of contraceptive use and contraceptive counselling among a group of teenagers requesting an abortion (Paper III and IV).
- To explore specific hindrances for teenagers to use contraceptives (Paper IV).

## Materials, Subjects and Methods

Study	Design	Subjects	Data collection	Analysis
I	A prospective cohort study	(n=134) Young women with the median age 17 years requesting ECP at a YC 1998 – 1999 were asked to answer questions from a questionnaire designed by the main author and then monitored for unplanned pregnancies for 12 months	Data from questionnaires and MRs	Descriptive statistics
II	A retrospective cohort study	(n=250) Data collection from antenatal and medical records of teenage mothers giving birth at Örebro University Hospital between 1996 and 2000. The MRs were monitored for 12 months for new pregnancies	Data from antenatal records and MRs	Descriptive and comparative statistics
ш	A qualitative descriptive study	(n=36) Data collection from MRs using a topic guide with focus on four areas: sociodemographic characteristics, reproductive history, current pregnancy and follow up postpartum	Data from medical records	Qualitative content analysis
IV	A qualitative interview study	(n=12) Teenagers attending an outpatient clinic for abortion were interviewed 3-4 weeks after the abortion about their experiences with contraceptives	Interviews with open questions followed by probe questions when needed	Qualitative content analysis

## **Subjects and Material**

#### **Quantitative studies (Paper I and Paper II)**

Study I (**Paper I**) was a prospective investigation of young women attending a central Youth Clinic in Örebro Sweden, for EC during a study period of 6 months (September 1998 – February 1999). During the period 136 women attended for ECP and of these 134 (Age Median 17, range 13 - 27 years) were included in the study (Figure 4).

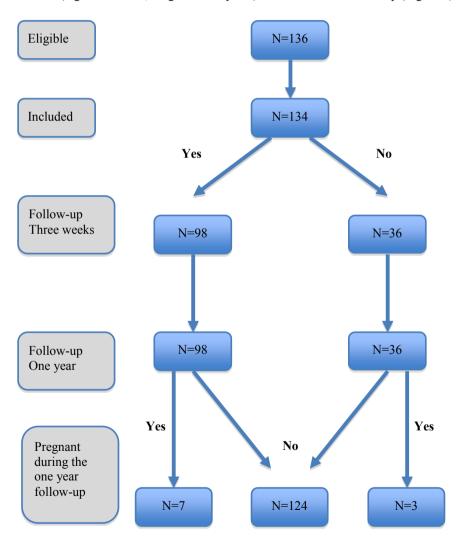


Figure 4. Flowchart of the participants studied in paper I

Two young women were lost to follow up because their personal identification numbers were not identifiable from the records. A return visit after three weeks for follow-up and contraceptive counselling was offered to all young women and 98 showed up at this appointment. The teenage female population in the county served as a control group. Data from national statistics concerning abortion rates (Induced abortions NBHW), birth rates and maternal characteristics from the Medical Birth Registers (MBR) were compared with data from the study group.

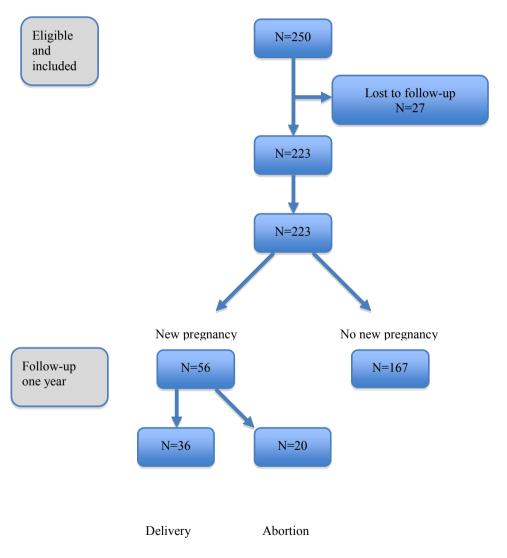


Figure 5: Flowchart of the participants studied in paper II

In Study II (**Paper II**) all teenage mothers i.e. under 20 years of age at the time of delivery, giving birth at Örebro University Hospital, during the years 1996 – 2000 were included. The teenage mothers were identified through the local register covering all deliveries at the hospital. All MRs were available. The records were thereafter monitored for new pregnancies during the following 12 months. Complete data (antenatal and post partum) were available for 223 (89%) of the 250 teenage mothers (Figure 5). The most common reason for —lost-to-follow up" was moving out of the county. The teenage female population in the county served as a control group. Data from national statistics concerning abortion rates (Induced abortions NBHW), birth rates and maternal characteristics from the MBR, were compared with data from the study group.

There were two more hospitals in the county where obtaining an abortion was possible. MRs at those hospitals were monitored in the same way to identify new pregnancies regarding the study-group.



Photo: Gabriella Falk

## **Qualitative Studies (Paper III and Paper IV)**

## Paper III

MRs from abortion visits were selected retrospectively and included consecutively, starting in January 2006. Records were included until no new information occurred. In all 36 MRs were selected and this number was considered sufficient since no new information was found

## Paper IV

All teenagers applying for induced abortion were invited to participate during December 2008 to March 2009. There were no exclusion criteria. During the study period 37 teenagers attended for abortion. Participants were recruited until the interviews gave no new information. Due to practical and ethical reasons 18 teenagers were not invited to participate in the study. Eventually, 12 teenagers (age 16–20) were included in the study. The participants could choose between making a visit to the clinic for the interview or being contacted by telephone 3 weeks after the abortion. All interviews were performed by the same author (GF).

#### Methods

# Quantitative studies (Paper I and Paper II)

#### Paper l

The young women seeking ECP were requested to complete a questionnaire at the primary visit and a second questionnaire at the follow-up visit. The first questionnaire covered five topics: socio-demographic characteristics, reproductive history, history of contraceptive use, history of sexually transmitted infections (STIs) and questions regarding present intercourse. The second questionnaire contained topics on side effects of EC and bleeding patterns. The questionnaires were not formally validated.

Pregnancy tests at the follow-up visit were performed using a commercially available pregnancy test measuring hCG in urine (HCG+, Abbot laboratories, Diagnostic division, Wiesbaden, Germany). Tests for *Chlamydia trachomatis* were performed using PCR (Amplicor, Roche Diagnostic Systems, Inc, Brandenburg, NJ, USA)

The young women were monitored for pregnancies during the following 12 months by repeated scanning of medical hospital records. This was made possible by the Swedish system whereby an individually unique identification number is allocated to all Swedish residents, a number that can be followed no matter where they live in Sweden.

## Paper II

Data on the teenage mothers were extracted from antenatal and medical records. The extracted data covered socio-demographic characteristics, reproductive history, current pregnancy and information gathered at the post partum visit with special focus on contraceptive counselling and breast feeding.

This follow up using MRs was made possible by using the individually unique national identification number allocated to all Swedish residents. The MRs for all teenagers were available. During the first 12 months after delivery the teenaged mothers were monitored through MRs to see whether a new pregnancy had occurred and whether the outcome was a new delivery, a miscarriage or a legal abortion.

## Qualitative Studies (Paper III and Paper IV)

In study III and IV an inductive qualitative approach was chosen since we wanted to gather empirical information about factors influencing contraceptive counselling and contraceptive use from written information in MRs and from the teenagers own lived experiences. A qualitative content analysis method was used for the analysis of the MRs and the interviews were based on guidelines from Graneheim and Lundman (Graneheim et al 2004). By using a qualitative content analysis we attempted to identify core consistencies and meanings in the data that are referred to as "Patterns" (Patton 2002). Content analysis provides a systematic basis for making inferences from verbal and written data and is found to be well suited in research about human communication (Watzlawick et al 1967, Downe-Wambolt 1992).

A combination of manifest and latent analysis was performed in study III and IV. The manifest analysis deals with what is visible in the text and the latent with what the text is talking about. Both manifest and latent analysis deal with interpretation but in varying levels of depth and abstraction (Down-Wamboldt 1992, Kondracki et al 2002, Graneheim et al 2004). In study III, texts that concerned the post-abortion visit and the follow-up were chosen and constituted the unit of the analysis. In study IV, the interviews were transcribed verbatim. In order not to lose any information the whole texts chosen from the MRs and the whole texts from each transcribed interview were analyzed.

As qualitative content analysis is an interpretative process the analysis was performed in several steps. The analysis process in both studies started with naive reading of the whole texts to obtain a sense of the whole. Then the whole texts were divided into meaning units, i.e. parts of the text relating to the same central meaning, in order to facilitate an initial abstraction. Each meaning unit was then labelled with a code. In study IV the meaning units were first condensed before being labelled with a code. The codes were then compared based on differences and similarities and sorted into subcategories based

on similarities (manifest content). Each subcategory was scrutinized to search for similarities in the texts labelled with the same code. Similarities found were then sorted into categories. The subcategories and categories can be described as a grouping of texts with the same meaning. Finally an underlying meaning (latent content) was sought for both in study III and IV. The analysis process involved back and forth movements between the whole text, the meaning units, codes, subcategories, categories and themes. The texts from the MRs and the interviews were also read after the analysis was done to ensure that the texts and the results matched. This procedure is based on the model from Graneheim and Lundman, and Krippendorf. (Krippendorf 1980, Graneheim et al 2004).

Before starting the analysis we discussed how trustworthiness best should be achieved and for this we used the concepts credibility, dependability and transferability as described by Graneheim and Lundman (Graneheim et al 2004). To ensure credibility we wanted to include MRs describing teenagers with differences in age, experiences and background to get a variation of the data. This was also true for the interviews. Before starting study III we read the texts from three MRs in order to see if this was a possible unit of analysis for the study purpose and we found that it was. We first analyzed 30 MRs and after that we discussed if this was enough. We found that some of the information in the first MRs analyzed could be strengthened in new MRs even where new information could be found. Therefore we analyzed six more MRs. New information was found and six additional MRs were analyzed. In the two last MRs no new information was found so we then stopped the analysis. The texts both from the MRs and transcribed interviews were found to be of manageable size; they gave enough information and were possible to analyze with qualitative content analysis. The texts were short in each MR and therefore could be analyzed as they were without condensing the texts, the procedure as recommended by Graneheim and Lundman (2004). Another issue to aid in achieving credibility is to select suitable meaning units. Division of parts of the text into meaning units was done independently by two of the authors. There was overall agreement on the dividing of the meaning units. The few meaning units divided differently were discussed until a consensus was reached.

To ensure dependability, the MRs were collected consecutively during three months. During this time routines at the clinic were the same. The MRs were written by six physicians, both male and female, all of whom were anonymous to the researchers. The physicians' ages ranged from their being in their 30s all the way up to their 60s – the age at the beginning of their specialization as gynecologist to the age near retirement. Local guidelines existed so that the physicians were assumed to work in the same way. In study IV the interviews were performed during four months. No changes in the routines at the clinic nor in the subsidizing of contraceptives on a local level happened during this time. The interview in study IV followed an interview guide. The questions in the guide had emerged from the results in study III. All co-authors agreed on the topics in the six

questions in the interview guide. The questions sometimes needed clarifying when posed to the teenagers and follow-up questions were posed to narrow the focus. All different steps in the process of analysis were discussed between the researchers until an agreement was met.

To ensure transferability the characteristics of the teenagers were presented in a Table I in study III and in the text under results in study IV. When presenting categories and themes, quotations were selected when suitable.

#### **Statistics**

Descriptive methods were used to describe the young women attending for ECP (Paper I). Univariate analysis was performed for categorical data, using the chi-square test, and the associations are expressed as odds ratios (OR) with 95% confidence intervals (CI). The time to a new pregnancy is presented by use of Kaplan-Meier curves comparing those who had an abortion with those who had a new delivery (Paper II). The log rank test was used to determine any statistically significant difference between the groups with and without abortion (Paper II). Statistical significance for all characteristics was set at p < 0.05. Statistical analysis was performed with SPSS for Windows version 13.

## **Ethics**

Study I was approved by the Medical Research Ethical Committee in Örebro after complementary addition 16 October 1998.

Study II was approved by the Medical Research Ethical Committee in Örebro (2002/134 500:16).

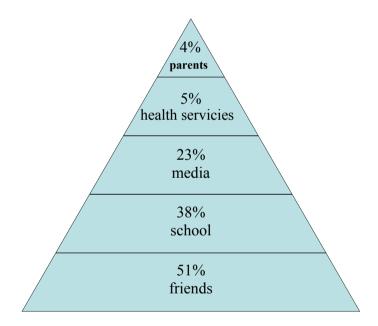
Study III was approved by the regional ethical committee in Linköping (M 160-07). Study IV was approved by the regional ethical committee in Linköping (M 103-08).

# **Results**

# Quantitative studies (Paper I and Paper II)

### Paper I

During the study period 134 young women received EC. The median age was 17 years (range 13–27). The reasons for attendance for EC were failure to use a contraceptive (54%) and contraceptive failure (46%). COC was used by 13% of the 134 subjects. Among those who stated contraceptive failure as a reason, 65% claimed to have used the condom as their contraceptive method, and of these 58% experienced condom breakage and 42% had had unprotected intercourse. Stated sources of knowledge about ECP are presented in figure 6.



**Figure 6**. Stated sources of knowledge about ECP. Some participants stated more than one source.

The follow-up visit after three weeks was attended by 73%. Pregnancy tests and tests for *Chlamydia trachomatis* were performed and both tests were negative in all cases. Side effects were reported with the same frequency as in previous studies (WHO1998). Menstruation started at the expected time in 52% of the young women. It was delayed in 22% and started early in 26%. One patient became pregnant despite receiving ECP.

After contraceptive counselling at the follow-up visit, the contraceptive methods chosen were COC (70%), condom (18%) and POP or IUD (45%). Eight per cent did not want any contraceptive method at all.

During the 12 months of follow-up, 10 unintended pregnancies occurred in the study population (Figure 4). There was no difference in abortion rate between the young women who attended the three months follow up, who thus had the opportunity to receive contraceptive counseling, and those who did not attend (OR 0.84, 95%CI 0.47-2.37).

The pregnancies occurred 1-9 months after the visit for ECP. None of the young women who became pregnant had returned a second time to the YC for EC They had either started and terminated oral contraception (OC) or had never commenced using the prescribed OC, according to the medical records.

Eight of the pregnant teenagers decided to request induced abortion and one teenager had a miscarriage. One of the young women came for counseling regarding abortion but was then lost to follow-up as she did not return for the appointment. As a result, the abortion rate in the study group was 60/1000 women, compared to the national level of 18.9/1000 women <20 years of age in 1999.

**Table IV.** Summary of the findings concerning pregnancies, abortion and tests for *Chlamydia trachomatis* in the quantitative studies (Paper I and Paper II)

	Young women receiving ECP (Paper I)	Teenage mothers (Paper II)	
n	136	250	
Smoker n (%)	44 (33%)	114 (46%)	
Occupation n (%) Student Employed Unemployed Data missing	236 (100%)	170 (68%) 34 (14%) 36 (14%) 10 (4%)	
Follow-up 3 weeks/post partum and thus had the opportunity to receive contraceptive counselling	98 (73%)	159 (71%)	
Follow up 12 months n (%)	134 (98%)	223 (89%)	
Age , years (Median, range)	17 (13-27)	19 (15-19)	
Received a contraceptive	90 (67%)	131 (52%)	
Pregnant within 12 months n (%)	10 (7.4%)	56 (25.1%)	
Abortion within 12 months n (%)	8 (5.9%)	20 (12.5%)	
Estimated abortion rate	60/1000	90/1000	
Test for <i>Chlamydia trachomatis</i> (n)	134	34	
Test for <i>Chlamydia trachomatis</i> positive (n)	0	5	

## Paper II

During the study period, 250 out of 11,184 (2.2%) live births at the Örebro University Hospital were to teenage mothers. These accounted for 26% of all teenage pregnancies in the area during that time, miscarriages and ectopic pregnancies excluded. Thus 74% of the teenage pregnancies ended in legal abortion. The median age of the mothers included in the study was 19 years (range 15–19) and of the fathers 22 years (range 14–39). Socioeconomic status and basic characteristics are shown in table V.

Of the fathers, 24% were students, 28% were employed, 18% were unemployed and for 30% data were not recorded. Ten per cent of the mothers were single mothers (living alone), and 24% had a history of spontaneous or legal abortion.

The attendance at the antenatal program was good. The median week of delivery was week 39, and the median birth weight was 3,448 g. Vaginal deliveries accounted for 92,4% and cesarean section for 7.6%.

Seventy-one percent had attended the post-partum check-up. Of these attendees, 74% received a contraceptive. The postpartum check-up occurred at a median of 9 weeks after delivery. At that time 74% of the mothers were breastfeeding and of them 18% partially.

Within the 12-month period that followed delivery, 56 new pregnancies were recorded and of those 20 led to a legal abortion (figure 5). This made the abortion rate approximately 5 times higher than expected, 90/1000 teenagers compared to the level in the county of 18/1000 and the overall national level of 19/1000 teenagers. The pregnancies leading to a new birth occurred at a median time of 8 months after the first delivery and the pregnancies that led to a legal abortion occurred at a median time of 5 months after the delivery. Fourteen new pregnancies occurred within four months after delivery.

Previous miscarriage or induced abortion as well as being a single mother were associated with the risk of having an induced abortion within one year after delivery. (Table V).

**Table V.** Odds ratios and 95% CI of presumed risk factors for legal abortion during 12 months of follow-up (Paper II, n=223).

	Odds Ratio	95% CI
Maternal age, years		
15-17	1.5	0.5-4.1
18-19	reference	
Partner's age		
<20	0.9	0.2-5.3
>20	reference	
Single mother		
Yes	3.6	1.2-5.3
no	reference	
Smoker		
Yes	1.8	0.7-4.7
no	reference	
Occupation		
Student	1.7	1.1-4.5
other	reference	
History of miscarriage or abortion		
Yes	2.9	1.1-7.4
no	reference	
Index pregnancy unplanned		
Yes	2.1	0.7-5.7
No	reference	
Attendance for postpartum visit		
Yes	0.7	0.3-1.9
No	reference	
Breastfeeding		
Yes	0.6	0.2-1.8
No	reference	
Contraceptive prescription		
Yes	0.7	0.2-2.2
No	reference	

# **Qualitative studies**

#### Paper III

The mean age of the participants in paper III was 17 years. Seven had a history of previous pregnancies, two were parous and five had a history of abortion.

Documentation on partner relationships was lacking in 16 of the MRs. It was not possible to evaluate ethnicity.

In ten MRs information about previous contraceptive use was not recorded. In five MRs there was no documentation about plans for future use of contraceptives. In eight MRs, the documentation stated that the teenager had not started to use contraception at follow-up. This was interpreted either as an indication that these issues had not been discussed or that there was insufficient documentation in the MRs.

The findings from the 36 MRs generated two themes. The first theme —Contraceptive methods previously used" consisted of the subthemes: Reasons for non-use and inconsistent use of contraceptives and Barriers to contraceptive use. The second theme —Plan for future contraceptive use" consisted of the subthemes Informing about different contraceptive methods, Prescription of a certain method and when to start and Follow-up after abortion.

Lack of knowledge about contraceptives, problems with side-effects and sub-optimal guidance from providers and parents were the main findings within the first theme—Contraceptive methods previously used" with its subthemes. These factors were considered as barriers to contraceptive use. Uncertainty about risk for thromboembolism was documented as a major reason for not being prescribed a combined hormonal contraception or any hormonal contraceptive. In the documentation, statements about discontinuation of contraception were found without further explanations being given of the reasons for this.

Waiting for an appointment for a prescription of a contraceptive was stated as a reason for not having started with a contraceptive method. Another reason for non-use was waiting for the next menstruation before starting with contraceptives.

In the theme —Plan for future contraceptive use" it was found that plans about contraception often were absent leaving it to the teenager to arrange for contraception. General statements about counselling were found but the content of this counselling could not be evaluated from the documentation.

Three weeks after the abortion, a nurse contacted the patient with a phone call. If the teenager had not started with a contraceptive method, a recommendation was made that she should turn to another health care provider for a contraceptive.

All kinds of contraceptives except IUDs and ECP were documented as suggested future contraceptives.

### Paper IV

One theme was generated from the twelve interviews: —Struggling with feelings of uncertainty and pattern of behavior". This theme consisted of three categories. The first category *Uncertainty* dealt with decisions and behaviours that varied between different times and different individuals. The teenager could solve a problem in one way at one time but in another way when she was facing the same problem again. Uncertainty about the risk of getting pregnant was stated. In some cases this uncertainty led to non-use of contraceptives.

The access to health care providers differed from immediate access to a waiting time of several weeks for an appointment.

The teenagers' satisfaction with the interaction between the teenagers and the care givers varied. The opinions on the information supplied by the health care providers varied from statements that it was satisfactory to reporting that there was a complete absence of information.

The second category *Influences on contraceptive use* dealt with questions asking with whom the participant had discussed contraceptives, how they got knowledge about contraceptive use, and their behaviour after the abortion. The teenagers often stated friends as an important source of information but school, partners and parents were also mentioned. Partners were reported to take the initiative to use contraceptives and to initiate ECP after unprotected intercourse.

After the abortion some said they intended to use contraceptives in a more consistent way in order not to have to apply for an abortion again.

The third category *Anxiety* dealt with side-effects and fear in relation to contraceptive use. There were statements in the interviews about feelings of uncertainty when forgetting pills, about side-effects and not knowing how to deal with these problems. Fear of pain was stated as a reason for not choosing an implant for contraception.

The theme, the three categories and the eight subcategories that were emerging from the analysis are presented in table VI.

 $\textbf{Table VI}. \ \, \textbf{Shows the theme, the three categories and the eight subcategories emerging from the analysis}$ 

	Struggling with feelings of uncertainty and pattern of behaviour						
Uncertainty		Influences on contraceptive use		Anxiety			
Irratio- nal deci- sion- making	Unpredict- able behaviour	Lack of partici- pation in desci- sion- making	Know- ledge from different sources	Abortion and experience that influences views about contracep- tion	Contraceptives a joint decision	Nega- tive impact on daily life	Fee- lings of fear

# Discussion

# Methodological considerations

**Populations** 

Study I (Paper I) was a prospective study comprising 134 young women who were followed for 12 months after ECP treatment. All 134 could be evaluated at the end of the follow-up period. Study II (Paper II) was a retrospective study of teenage mothers who gave birth at a university hospital. Those studies used a quantitative methodology but with different designs.

The rates of abortions were compared with national statistics of the general population (Paper I, Paper II). The rates of abortion were found to be significantly higher in the populations studied.

It could, however, be argued that the comparison between the abortion rates of the young women attending for ECP (Paper I) and the general population is not appropriate. At these ages a substantial number of teenagers still have not initiated intercourse and thereby are not at risk for an unintended pregnancy. Thereby, it may not be appropriate to compare the results from paper I with the rates from the general population. Ideally, the control group should have consisted of a group of sexually active young women without a known history of unprotected intercourse applying for contraceptives, i.e. young women seeking contraceptive counselling at the YC. With such a control group we would have had two sexually active populations to compare. Consequently, we can not exclude that the higher abortion rates in the group of young women included in paper I reflect the behaviour of a sexually active population attending an YC rather than indicating a particularly high risk ECP-using population. However other studies have shown that teenagers who use ECP are a high risk group for unintended pregnancies (Churchill et al 2000).

Study II (Paper II) was a retrospective study where antenatal and postnatal MHC records of 250 teenage mothers were analyzed. MRs were scrutinized 12 months after delivery (Paper II). Eleven per cent was lost to follow-up because they had moved out of the county. The results were compared with teenagers of the same age living in the same county. Data (Paper II) were also compared with national statistics and evaluated. For this purpose MBR, Statistics Sweden and the National Board of Health and Welfare served as sources. These registers are continuously evaluated and the validity of the data is high with an estimated loss of information that varies between 0.5–3% per year (Induced abortions 2008 NBHW, MBR 2009).

In the study concerning ECP (Paper I) 134/136 eligible women were included and it was possible to obtain data from a one year follow up for all of these 134 young women.

The group of teenage mothers (Paper II) consisted of 250 mothers who gave birth between 1996 and 2000. Pre-and postnatal information was available for all participants and a one-year follow up was possible in 223/250 cases. Consequently 89% were followed for one year and thus the drop-out/lost to follow-up rates in both Paper I and Paper II were low.

On the other hand relatively few patients were included in these studies (Paper I and Paper II) and the statistical power may thereby have been low. Consequently, the results must be interpreted with caution. The failure to be able to demonstrate differences between women with or without a new pregnancy (Paper II), birth or abortion during the follow-up period regarding socio-economic variables and the prescription of contraceptives could be due to the small sample size.

#### Questionnaire

There is always a risk that subjects will misunderstand the questions asked in questionnaires. This makes the interpretation of the answers hazardous. It is important to know that the person who answers a particular question has interpreted and understood the question in the way the investigators intended. It is also of importance that that the test measures what it as intended to test – the so called validity. The procedure to validate a questionnaire or a scale usually includes the use of another measuring scale to which the results obtained by the new scale are correlated.

The questionnaires used in Paper I were not formally validated. Nor was the reliability of the questionnaires tested.

The term —eontent validity" means a subjective judgment that the questionnaire includes all the relevant items. The higher the content validity of a measure, the broader the valid inferences that we can draw about the person under a variety of conditions (Streiner et al 1995).

The questionnaires used in the present study (Paper I) were constructed by professionals with great experience and are considered to cover important items. Thus, the content validity was considered to be high. This is, however, the weakest form of validation and it could not be excluded that the interpretations of the results from paper I may be hampered by a low validity of the questionnaires used.

The participants answered the questionnaire together with the health care professional. This could contribute a source of bias by virtue of a health care provider - patient

interaction. On the other hand, the presence of this person may have given the subject the opportunity to ask for clarification of questions if there were any doubts.

## Qualitative design (Paper III and Paper IV)

Study III (Paper III) was performed with the aim of analyzing data from MRs. The method for analysis that was chosen was qualitative content analysis. This method is based on the theoretical assumption that deals with communication theory described by Watzlawick (Watzlawick et al 1967). They state that texts based on interviews are shaped within the interaction between the researcher/physician and the participants. In every text there is a message to be interpreted. They also state that every communication has content as well as a relationship aspect and that all communication also contains a nonverbal communication. The interpretation also depends on the interpreters' and the researchers' own personal experiences (Patton 1990). Two of the researchers (GF; JB) in study III and IV had many years of experience with work at YCs, with contraceptive counselling, working at MHCs and with giving counselling to teenagers and women attending for abortion. One of the researcher (A-B I) had experience from research with several studies using qualitative content analysis.

The intention in paper III was to explore what was said between clients and providers concerning contraceptive use at an abortion visit. This method was chosen since there are regulations specifying how to provide documentation in MRs and therefore the documentation should reflect what was discussed between teenagers and health care providers (NBHW, Patientjournallagen 1993). We wanted to explore how contraceptive counselling were given at abortion visits since this is considered important in the secondary preventive work against unplanned pregnancies (Folkhälsorapporten 2009). The MRs, however, do not necessarily cover or report what actually has been said. Thus we were only able to study what was documented. Consequently, we do not know if previous contraception had been discussed in the 10/36 medical files where no information on this matter was supplied, but only know that if there was a discussion it was not documented. In order to cover what actually had been said it would have been possible to tape record the consultation, or interview health care providers or patients afterwards. However, both these methods are accompanied by a risk of not performing the consultations in the usual way since it is known that someone is watching. Moreover, there is a risk of recall bias when asking afterwards what has been discussed (Simmons et al 1994).

Study IV (Paper IV) was conducted to explore what the teenagers themselves had experienced with contraceptive use and if there was a possibility to detect whether they had experienced any hindrance to contraceptive use. The interviews lasted eight to twenty-five minutes with the mean time of fifteen minutes. This is in accordance with the reported length of telephone interviews in similar studies (Sundby et al 1999). The clock

started when the participant answered and stopped when good-byes were said. The interviews were performed with six semi structured questions followed by probe questions. These questions reflected questions that had emerged from study III. The overall impression of the interviews was that the same story was told over and over again with small differences

Two teenagers who had accepted participation were not pursued further when they said after several phone calls that the time for the interview did not suit them. This was considered a signal that they might not want to participate but could not or did not want to say so directly.

Eighteen teenagers were not asked about participations during the period of inclusion (Paper IV). This was due to organizational and ethical reasons. The group of teenagers who were not asked to participate in the study did not differ from the interviewed teenagers in age. Ethnicity could not be evaluated. We were not able to perform any comparisons about previous pregnancies or living conditions between the included participants and those who were not included since it was not possible to extract this information from the MRs (Paper IV). Thereby we could not exclude that a selection bias occurred.

The interviews (Paper IV) were planned to be face to face but this had to be changed because the majority of the teenagers declined to come to the outpatient clinic for the interviews. Instead they agreed to a telephone interview. By allowing the teenagers to choose the method they preferred, they may have felt more comfortable when speaking about these items which are considered important in this kind of research (Simmons et al 1994, Porter et al 2007). One interview was at the clinic and this interview was not considered to be of different quality from the others by the interviewer.

This might be a reflection of the fact that teenagers today are now quite comfortable speaking in a cell phone at different places and times.

In qualitative research there are no strict rules to apply. The analyses are guided by procedural suggestions and methodological guidelines (Patton 2002). The analyses (Paper III, Paper IV) were performed on the researchers' analytic thought processes inspired by procedures and guidelines described by Graneheim and Lundman (Graneheim et al 2004). To ensure trustworthiness, the analytical procedures and processes have been described as fully as possible.

The findings in these two studies cannot automatically be transformed to other teenagers. They can, however, serve as guidance when it comes to dealing with other teenagers in similar situations. Practitioners can themselves compare the content in the studies with

their experiences and decide if the results can be transferred for use in their own settings when they are working with abortion-care issues.

# Issues that was not possible to study

One of the aims in study II was to address the question whether the index pregnancies were unintended or not and if ethnicity was a risk factor for new unintended pregnancies. It was not possible to answer these questions. Whether the index pregnancy was intended or not was only stated in 46 (18%) of the antenatal records and thus it was not possible to evaluate this issue further. In this study the ethnicity of the teenage mothers could not be evaluated since this was not mentioned in the antenatal or medical records.

In all studies (Paper I-IV) there is a lack of documentation and questions about sexual abuse. This is known to be a reason for unplanned pregnancies and should therefore be addressed (Lundberg 1999, Kero et al 2001, Bayley et al 2009).

## Young women at risk for unintended pregnancies

The major finding was that despite contraceptive counselling, young women applying for ECP (Paper I) and teenage mothers (Paper II) were at high risk of having unintended pregnancies in the future. The main reason for unintended pregnancies in these groups was non use of contraception. Previous studies have also shown that non-use was the major cause for unintended pregnancies and that 15% were due to imperfect use or failure of a contraceptive method (Henshaw et al 1999, Yildirim et al 2005). In study I (Paper I) non-use of contraceptives was stated as the reason for attendance for EC in 33 %.

Choice of the condom as a contraceptive is known to be associated with inconsistent use, and 42% of those who claimed to be condom users had not used a condom on the occasion when they were in need of EC (Paper I). Despite knowledge of EC, EC was not used after unprotected intercourse (Paper IV). This is in accordance with the results from other studies (Aneblom et al 2002, Glasier et al 2005, Ekstrand et al 2008). Inconsistent use was not only shown for condom use, but also for COC and POP (Paper IV).

Seventy percent of the teenagers received a prescription for COC after contraceptive counseling when attending for EC (Paper I). Fifty-one percent of the teenage mothers received POP or COC at the postpartum visit (Paper II).

OCs are the most commonly used, and most frequently requested, method among teenagers (Milsom et al 2002, Walker et al 2004, Lindh et al 2009). Thirteen percent were using COC when attending for EC (Paper I) and 53% stated that they had used COC during at least one period. According to the MRs, those who became pregnant had used OC and stopped using it or had never initiated use (Paper I, Paper II). This stresses the major problems with the use of OC. Inconsistent use of OC seems to be more common

among teenagers than among adult women (Vaughan et al 2008). Teenagers tend to stop using a contraceptive method if they do not have an ongoing relationship. Sundby et al (1999) showed that a transitional period between acquaintances and a period when two people become a stable couple are the most vulnerable periods for unprotected sex (Sundby et al 1999) and this was confirmed in the present study (Paper IV).

Compared with cohabiting mothers, single mothers seemed to be a risk group for new unintended pregnancies (Paper II). This has also been shown in a recent Finnish study (Niinimäki et al 2009). Reasons for non-use of contraceptives among single teenage mothers might be on account of that health care provider did not address the question or that the individuals themselves did not expect to have intercourse. Not expecting to have intercourse has previously been shown to be a reason for not using a contraceptive (Ekstrand et al 2008) and this seems to be true also for the groups studied in Paper I and Paper II. In Paper I eight percent did not want a contraceptive method and in Paper II this figure was as high as 24%.

In study III data about future contraceptive use were missing in five of the MRs and in eight MRs there were statements that the teenager had not started to use a contraceptive method (Paper III). Statements were found that the teenager had not started using a contraceptive method because she was uncertain about the time at which she should start. Another reason was that she had changed her mind about what contraceptive to use (Paper III, Paper IV).

No difference in the proportion of subsequent unintended pregnancies was found between those who received a contraceptive method and those who did not (Paper I, Paper II). A possible explanation might be that the study groups were too small to allow us to detect differences.

The pregnancies occurred 1-9 months after the visit for ECP (Paper I). Fourteen pregnancies had occurred within 4 months after the delivery (Paper II), which led to induced abortion in nine cases. Twelve months after delivery, 25% of the teenage mothers had become pregnant again (Paper II) whether they had received contraceptive counselling or not. This is in accordance with results from previous studies (Polaneczky et al 1994, Smith et al 2002). One-third of the teenagers had an induced abortion and two-thirds carried the pregnancy to term (Paper II).

Sexual activity was resumed shortly after pregnancy and a majority of women reported that they had intercourse within 7-8 weeks after pregnancy (Byrd et al 1998, Boesen et al 2004). Consequently use of a contraceptive should be started early after abortion and delivery in order to prevent unintended pregnancies. To give contraceptive counselling at

postpartum visits is thus considered important to avoid future unintended pregnancies (Sannisto et al 2009). The results in Paper II indicate that this can be improved.

The group of young women attending for ECP (Paper I) had not returned to the YC a second time for ECP when they once again had unprotected intercourse. At the time of the study (1999) ECP was not available over the counter and at no cost, and IUDs were not then offered on a routine basis. The Yuzpe regimen is associated with frequent side effects (WHO 1998). It can not be excluded that the young women suffered from a number of side effects of the ECP and therefore did not show up the next time they had an unprotected intercourse. However, the study was not designed to reveal this. Levonorgestrel and Ulipristalacetate ECP have more favorable profiles concerning side effects and it might be speculated that this should make repeated use more frequent. On the other hand, results from later studies have shown that the major reason for non-use of ECP, including levonorgestrel, is that the women do not identify the risk of pregnancy. Glasier found that women who had ECP at home and become unintentionally pregnant had not used ECP because they did not consider the risk of becoming pregnant at the time in question (Glasier et al 2004). A similar line of reasoning was also found in a Swedish study of women seeking abortion (Tydén et al 2002). Another reason for not returning for ECP when needed could be that the teenage did not feel comfortable with the encounter with the health care providers. It has been questioned if the moral attitudes expressed by some healthcare providers have led to failure of some to use ECP (Tydén et al 2002).

The interviews (Paper IV) also contained statements about misinterpreting the risk of getting pregnant and the teenagers did not seem to have the knowledge about when safe periods occur. This is consistent with the results from other studies (Sydsjö et al 2006). Providing education about safe periods should be readdressed since it has been shown that a risk of getting pregnant exists during the whole menstrual cycle (Wilcox et al 2001). Therefore EC should always be used after unprotected intercourse.

An IUD used as an emergency contraceptive is more effective than hormonal EC and prevents unintended pregnancies in 99% (Marions et al 2005, Bastianelli et al 2008). This method was not considered when planning and performing the study (Paper I). At that time use of an IUD by nulliparous women was only considered as a method to be used after special considerations had been taken into account because of fear for increased risk of genital infections. The young women receiving ECP (Paper I) were not shown to be a high risk group for STIs. Consequently, it is now established that IUDs may be used safely by nulliparous women and teenagers should be informed about the method (Whitaker et al 2008, Schwarz et al 2009).

Health care providers should, however, always consider the risk of genital infections and should recommend testing for STI on an individual basis and give thorough information about protection from infections.

More frequent use of IUDs would give teenagers and young women an opportunity to choose a highly effective EC method and to be aware of a contraceptive method with high efficacy in the future (Bastianelli et al 2008).

## Follow-up

Seventy-three percent attended the follow-up visit after ECP (Paper I) and 71% attended the postpartum visit (Paper II).

There was no statistically significant difference between those who had and had not attended the follow-up visit (Paper I, Paper II) concerning subsequent unintended pregnancies. This may reflect insufficient counselling concerning pregnancy risk and contraception. This lack of difference may also be due to the relatively small size of the study groups.

The lack of difference between the groups who attended or not attended the follow up visit is surprising. In paper IV we found statements concerning incorrect information from health care providers about contraceptive use or that the teenager had misinterpreted information that was given. Correct contraceptive counselling at abortion visits, at follow-up and post partum is of utmost importance and this seems to be an area that could be improved.

Documentation about follow up (Paper III) was lacking in five MRs. It cannot be determined whether this lack of documentation resulted because no counselling was given or counselling given was simply not recorded. Even if counselling actually was given, the lack of documentation may hamper further contraceptive counselling. If the teenager cannot decide upon a contraceptive method at the first visit a second visit should be scheduled (Davis et al 1999, Bianchi-Demicheli et al 2003, Brown et al 2007). Seven teenagers had a history of pregnancy and two of those were parous (Paper III). Thus it could be assumed that they had received contraceptive counselling and that it should have been possible for them to avoid a second unplanned pregnancy.

## Contraceptive counselling

Contraceptive counselling in relation to abortion and delivery

Eleven percent of the teenagers had a history of spontaneous abortion and 17% of legal abortion (Paper I, Paper II). Having a history of induced abortion was found to be related to a new unintended pregnancy leading to legal abortion (Paper II). This finding is in accordance with other reports (Bianchi-Demicheli et al 2003). The rate of repeat abortion

among teenagers doubled between 1975 and 2005. The lack of documentation on both previous and future use of contraception (Paper III) indicates that the question of contraception is not taken seriously enough! This finding highlights the need to prevent repeat abortion by providing more thorough and more individualized contraceptive counselling.

At times teenagers had to wait several weeks for an appointment to discuss contraceptive methods with a counsellor (paper IV). The time required to get an appointment for an abortion is recommended not to exceed ten days according to local guidelines which is satisfactory. An abortion may thereby become an alternative to contraception which is not the intention of the Swedish system (Folkhälsorapporten 2009). It also means that the access to contraceptives in Sweden might not be better than in countries with less well developed clinics aiming at teenagers (Goicoela et al 2007, Rasevic et al 2009).

Today it is assumed that in Sweden there is good access to contraceptive methods and to contraceptive counselling. This counselling is sometimes given by physicians but in the majority of cases by midwives. Allowing midwives to prescribe contraceptives has been pointed out as being unique in Europe (Cibula et al 2008). Contraceptives are subsidized to teenagers and are available at low cost, which makes them available for almost all teenagers irrespective of their age and economic situation (Danielsson et al 2001, Larsson et al 2003). The findings in study IV showed that in this group of teenagers the expense of contraceptives did not seem to be a hindrance for using contraceptives.

Contraceptive counselling at abortion visits is one of many issues to be discussed at the appointment Consequently, there is a risk of an overload of information that is difficult to take in, and this might affect the evaluation or understanding of the counselling given (Bender et al 2004, French et al 2009).

It has been suggested that a good time for contraceptive counselling is very soon after pregnancy. Teenagers as well as adult women have been reported to have better compliance in using a contraceptive method after abortion or childbirth than before (Depineres et al 2005, Kero et al 2005). The findings about intention to use a contraceptive after pregnancy are, however, somewhat conflicting. In a study by Ekstrand et al 2009 the level of intention was not found to improve after an abortion. In the present study (Paper IV) the teenagers expressed an intention to use contraceptives consistently, which is in accordance with the results from other studies (Kero et al 2005). At the same time, statements in study III and IV indicates that risk assessment declines with time.

#### Youth clinics

The access to the counselling given at the women's clinic and at Youth Clinics seemed to vary (Paper IV). It was found that some teenagers had attended YC several times for

various reasons other than contraceptive counselling, and some of these had not received either contraceptive counselling or a contraceptive previous to the pregnancy that led to their abortion (Paper IV). Previous studies have shown that teenagers who had attended YCs for reasons other than contraceptive counselling have expressed relief when the issue had been brought up by health care providers (French et al 2009). Thus, the staff at the YCs should be aware of the desirability of giving contraceptive counselling any time a teenager has an appointment.

YCs have existed in Sweden since the 1970s. There is still a lack of a uniform organization as well as uniform goals that are equal throughout the country. This has been pointed out as troublesome (Ideström 2009, Gemzell-Danielsson et al 2009).

It has been suggested that the lack of proper contraceptive practice during the teen age years may persist within the same individual in the future (Sydsjö et al 2009) and continue even when she is an adult women. This stresses the importance of correct contraceptive practice from the beginning of use, use most often initiated at the YC. Male teenagers and young men should be welcomed to participate in contraceptive counselling. The interviews (Paper IV) revealed that many partners participate in taking responsibility for contraceptive use.

# **Sexually Transmitted Infections**

None of the young women were tested positive for *Chlamydia trachomatis* (Paper I). In study II only 34 of the pregnant teenagers were tested, and 5 (14%) of these were positive for *Chlamydia trachomatis* (Paper II). Those who were tested had attended for termination of the pregnancy but had changed their mind and decided to continue the pregnancy. The guidelines at the time of the study stated that tests for *Chlamydia trachomatis* should be considered on an individual basis since the infection rates had shown a decline during the mid 1990s. However during the last ten years chlamydia infections have shown a step increase in teenagers as well as in other age groups (SMI).

### **Contraceptives**

Fear

Fear of pain in relation to insertion of an implant was a reported reason for not using this method (Paper IV). Fear of IUDs have also been related to fear of pain at the time of insertion (Sääv et al 2007). Breast cancer risks were also expressed as a reason for discontinuation. It is known that fear of thromboembolism causes discontinuation of COC (Milsom et al 2002). In the present studies (Paper III, Paper IV) there are indications that parents and providers do not want to recommend a combined hormonal method because of uncertainty about contraindications for COC use. This once again stresses the importance of correct knowledge among providers. There is also a need to

reach the parents of the teenagers to enhance the chances of providing correct information (Whitaker et al 1999, Bender et al 2005).

### Long acting methods

Long-acting methods have been proposed for consideration as first-choice contraceptives (Truitt et al 2003, Paukku et al 2003, Sannisto et al 2009). IUDs were used by 16% and a long-acting progestin method by 2% (Paper II). New implants were introduced in 2001 and thus were not available for the teenagers in study I and II. One of the most effective contraceptive methods is an IUD. There is no need to withhold prescribing an IUD as the EC method for a teenager and nulliparous woman. Screening for STIs should be done at the time, and if sign of infections exist the insertion should be delayed until after antibiotic treatment has been given (Brockmeyer et al 2008). Teenagers may have a higher rate of expulsions and bleeding disorders than parous women (Hubacher 2007).

#### Counselling

For some teenagers one single visit for contraceptive counselling will be enough, but for many a second visit is necessary (Davis et al 1999, Sundby et al 1999, Brown et al 2007). Women attending contraceptive counselling have been reported to pose questions after counselling in 22% of cases and need for a second visit in 9 % (Rosenberg et al 1998). To achieve successful contraceptive use, the availability of competent counsellors is crucial. The counsellor should have enough time and the patient should receive informative leaflets about the chosen contraceptive method as reinforcement (Burke et al 2001, French et al 2009).

Family planning providers should help clients to find the contraceptive method that they would most likely use successfully (Sundby et al 1999). The counselling should include a discussion about all available contraceptives with their health benefits and side-effects being fully explained. In this way the teenager can find the contraceptive method best suited for her, which will enhance the chance that it will be used consistently and as perfectly as possible (Trussell 2004). According to the documentations in the MRs (Paper III) these goals are most often not met. The documentation on counselling in relation to the abortion visit was often brief and sometimes absent. Only occasionally was a deeper discussion documented.

Side-effects were reported as a reason for discontinuation (Paper III, Paper IV). This is in accordance with the results from several previous studies (Ballasone 1989, Rosenberg et al 1995, Brunnhuber et al 2002, Lindh et al 2009). These all have shown side-effects of hormonal contraceptives as major reasons for discontinuation. Teenagers who feel that this issue is not considered seriously by health care providers simply do not return to the same service (French et al 2009).

# **Summary**

Unintended pregnancies cannot be avoided altogether but with correct use of contraceptives they can be reduced (Santow 1999, Amy et al 2007). New ways of administering hormonal contraceptives also reduce the users' failure rate of using a new method. Much is known about potential risks and how contraceptives should best be used. However, education still needs to be given repeatedly both to health care providers and patients.

Today, teenagers in Sweden often do not have the intention to get pregnant until ten to fifteen years later in their life. They often start with a contraceptive method early and the challenge for health care providers lies in promoting consistent contraceptive use (Cibula 2008). Therefore all contraceptive methods should be considered as the first choice contraceptive method, not only OC. The best method for the individual should be chosen together with the teenager. Forgettable methods (Grimes 2002) such as implants, vaginal rings and IUDs could be promoted as first-choice methods and take preference over all others.

This thesis on unintended pregnancies and contraception in a developed country such as Sweden can be of value and of importance also for developing countries. Healthcare providers in developing countries often point out the need for youth friendly settings with high medical quality and awareness about teenagers needs (Amy et al 2007, Mohammad-Alizadeh et al 2007). Parents and partners are important persons to be acknowledged and addressed (Whitaker et al 1999, Bender et al 2005). Friends were stated as the most important source of information on contraception. (Paper I, Paper IV). Teenagers often express a wish and a trust to discuss sensible matters with both their parents and their friends. Parental openness may promote the use of contraceptives among teenagers of both sexes (Stone et al 2002, Bender et al 2005, Sydsjö et al 2006, Avery et al 2008).

Lastly, the preventive work even in an ideal setting will never reduce the number of unintended pregnancies to zero in any age-group. Therefore induced abortions carried out in optimal conditions are needed as a complement of contraception. (Amy et al 2007).

# **General summary and Conclusions**

- Teenagers attending for EC were at high risk for future unintended pregnancies and for legal abortion (Paper I).
- Teenage mothers were at high risk for future unintended pregnancies and for legal abortion (Paper II).
- Teenagers attending for EC were not a risk-group for *Chlamydia trachomatis* infections (Paper I).
- Previous pregnancies and being a single mother were related to new unintended pregnancies among teenage mothers (Paper II).
- Teenage mothers' attendance at the postpartum visit was low and often delayed (Paper II).
- At the postpartum visit a prescription of a contraceptive method was not always considered (Paper II).
- Documentation in MRs at abortion visits often lacked information about previous contraceptive use and plans for future contraceptive use (Paper III).
- If the documentations in the MRs actually reflect what was discussed about contraceptives between healthcare providers and teenagers, the contraceptive counselling was not sufficient (Paper III).
- Teenagers might not have received adequate contraceptive counselling when receiving a contraceptive prescription (Paper IV).
- Non-use of contraceptives and incorrect use of contraceptives seems to be due to lack of knowledge about contraceptives and how to use contraceptives correctly (Paper III and IV).
- Lack of knowledge and problems with side-effects of contraceptives were reported as hindrances for teenagers to use contraceptives (Paper IV).
- Parents, friends and the Internet seem to be more important sources of information than health care providers (Paper IV).

# Implications for practice and future research

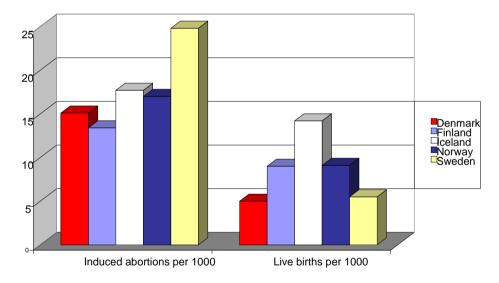
- It seems that EC is underused today and that IUDs are seldom offered or used.
   Use of IUDs has been proven safe even for teenagers. To offer this or an ECP and to study the long-term effects on unplanned pregnancies would be interesting.
- The level of attendance by new mothers at the follow-up visit after pregnancy is not satisfactory, as newer studies in Sweden have shown. By planning for the post partum visit during the final antenatal visit and to inform the mothers-to-be that the post partum visit is -mandatory" and that contraceptive use will be discussed are changes that might be made. Such changes would have to be accompanied by special efforts within the overall maternity programme to reach the teenagers and women who do not speak Swedish.
- To evaluate if contraceptive counselling could be followed up by using the Internet more effectively to deal with for questions that arise when there is uncertainty about, and problems with, contraceptive use would be worth studying. Such a study might lead to better access to contraceptive counselling.
- To design a study investigating if better counselling about the transitional nature of many side-effects, could lead to more consistent use of contraceptives by those who otherwise stop when side-effects first occur.
- Teenagers do not always have enough knowledge to make their own decisions about contraceptive use without help and counselling. Parents are potentially important sources for providing such knowledge. Further studies on how to best involve parents in decision-making would be desirable.
- Since contraceptive counselling is considered essential to ensure the best possible
  use of contraceptives, attitudes and knowledge among health care providers
  should be evaluated in both future quantitative and qualitative studies.
- The Internet has been proven to enhance knowledge and medical use in certain populations. The area of contraception seems suitable for interactive learning, and research in this area is an interesting field. To evaluate if contraceptives/ECP could be prescribed/available using the Internet would be of interest.
- To study teenagers who are sexually active but as yet have no experiences of unintended pregnancies could give new information about how to enhance contraceptive use among groups known to be at risk for unintended pregnancies.

# **Appendix**

# I. A global outlook

### Nordic countries

During the 2000s, abortion rates decreased in Finland and increased in Sweden. In the other Nordic countries the rates have remained stable. There were 9.0 induced abortions per thousand women (age 15–49) in Finland and 17.2 in Sweden 2007. The figures for Denmark, Norway and Iceland were close to the Nordic average (13.7/1000). Abortion rates among female adolescents in the Nordic countries have remained quite stable, although there have been some differences in trends: Finland is the only Nordic country where abortions among teenagers have decreased during the 2000s. In Sweden and Iceland the rates have remained the same and in Denmark and Norway a slight increase has been noted (Nordic Statistics on induced abortions 2007).



**Figure 7.** Induced abortions and live births in the Nordic countries, teenagers 2007

There are more teenagers becoming pregnant in Sweden than in the other Nordic countries (Folkhälsorapporten 2009). Abortion rates and birth rates among teenagers in the Nordic countries are shown in figure 7.

The Nordic countries all permit legal abortion but with some differences in the legislation that can explain differences in the relative numbers of induced abortions. Still the countries all have reliable statistics and health care systems similar to each other which can make comparisons between the Nordic countries meaningful whereas comparisons with other countries are less meaningful since there are more major differences within the societies (Induced abortions 2008 NBHW). In the other Nordic countries contraceptive use are reported together with abortion statistics but this is not the case in Sweden (Knudsen et al 2003).

Why Sweden did not succeed in decreasing unintended pregnancies and reduce abortion rates to the same level as in the other Nordic countries remains to be researched.

## Other parts of the world

Each year 500,000 women die during pregnancy or childbirth worldwide and 70,000 (13%) of those deaths are due to complications of unsafe abortion (Adam et al 2005, Mayor 2004). The death rate due to unsafe abortions is estimated to be as high as 30-50% of maternal deaths in some countries (Induced abortions 2008 NBHW). Worldwide maternal mortality has not been improved during the last 10–15 years and the need for skilled midwives and other health professionals is urgent (Nordström 2004). Teenagers face an excessive risk of unintended pregnancies and STIs because of their sexual behaviour and this risk is even greater if they lack information or have little or no access to sexual and reproductive health services (Singh et al 2000, Goicoela et al 2008, Avery et al 2008). The gap between developing and developed countries is huge (Adam et al 2005).

Approximately 26 million legal and 20 million illegal abortions were performed worldwide in 1995, resulting in a global abortion rate of 35 per 1000 women aged 15-45 years. About 37 percent of the women in the world have access to legal abortion, 23 percent have access with some limitation and 40 percent live in countries where abortions are illegal (Induced abortions 2008 NBHW).

The highest abortion rate, 90/1000 per year is found in Eastern Europe, and the lowest <10/1000, in Western Europe (Henshaw et al 1999, Avery et al 2008). Sweden together with Estonia, Hungary, Iceland, Romania and the United Kingdom all have moderate abortion rates (20–34.9/1000) (Table VII). Sweden together with the other Nordic countries all have very low birth rates (Figure 8).

It is thought that more than half of teenage pregnancies are unintended and that >50 % of teenage pregnancies end in abortion (Adler 1997, Cleland et al 2004). In many developing countries abortions are illegal and often unsafe with adverse outcome for the teenager (Munasinghe et al 2005). Teenage pregnancies can however be planned and

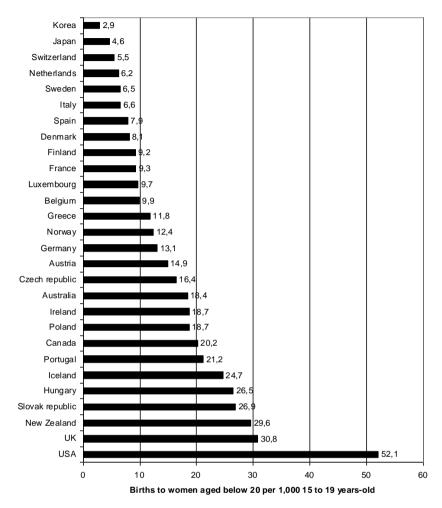
have a positive outcome for the teenager and her offspring in developed as well as in developing countries (Tripp et al 2005, Wahn 2008).

**Table VI.** Pregnancy, abortion and birth rates per 1000 females aged 15-19 years

Category	Pregnancy rate: pregnancies	Abortion or birth rate per
	per 1000 women	1000 women
Very low	< 20.0	< 10.0
Low	20–39.9	10.0–19.9
Moderate	40.0–69.9	20.0–34.9
High	70.0–99.9	35.0–49.9
Very high	> 100.0	> 50.0

Source: Singh et al 2000

One-tenth of all births worldwide each year are to women of ages below 20 years of age and more than 90% of these births occur in developing countries (Mayor 2004). One-third of the women in developing countries give birth before the age of 20, with a range from 8% in East Asia to 55% in West Africa (Mayor 2004). Girls of this age are twice as likely as women in their twenties to die from causes related to pregnancy and childbirth and their newborns are 50% more likely to die than those born to women in their twenties. The risk of maternal mortality among teenagers was one in seven in Niger but only one in 29,800 in Sweden, which is the country with the lowest risk (Mayor 2004, Shah et al 2004).



**Figure 8.** The number of births to women aged below 20 per 1,000 women. Data are from 1998 Modified from Innocenti report card, UNICEF

Lack of antenatal care is more common among teenagers than among adult women and increases the risk of obstetric complications (Berglund et al 1998, Yildirim et al 2005, Wahn et al 2008). Teenagers' higher risk of contracting an STI can lead to higher rates of infertility and to complications during abortions and pregnancies (Darville 2005). The approach of using triple protection, that is employing preventive work against unintended pregnancies and STIs as well as working to preserve fertility should always be followed (Brady 2003).

# II. Topic guide - Frågeguide (Paper IV)

- Berätta om dina erfarenheter av preventivmedel
- Berätta om hur du har fått veta hur du skall använda preventivmedel
- Berätta hur Du tycker att det är att använda preventivmedel.
- Berätta hur du tänker om att använda preventivmedel nu.
- Berätta med vem/vilka du har diskuterat preventivmedel
- Berätta hur du skulle vilja få veta mer om preventivmedel.

# Acknowledgements

I wish to thank all who made it possible to complete this thesis and especially:

Associate Professor Jan Brynhildsen my tutor for support and guidance. Thank you for joining me on this journey and relieving me from the burden of having to solve —the abortion question" by pointing out that this is merely a medical dissertation!

Associate Professor Ann-Britt Ivarsson my assistant tutor for excellent guidance in the mysterious world of qualitative research. I have always looked forward to our meetings in Örebro!

Professor Göran Berg for guidance in the research field.

Associate Professor Ann Josefsson, head of the department of Obstetrics and Gynecology, Linköping University Hospital and my colleague, for giving me time to complete this thesis.

Professor Ian Milsom, co-author in Paper I and the one inspiring me to go into this field of research

Associate Professor Ulf Hansson, co-author in Paper I.

Professor Jens Schollin, co-author in Paper II and my tutor in my Licentiate thesis defended in Örebro 2006. Good luck with the medical school in Örebro!

Associate Professor Kerstin Nilsson, co-author in Paper II and my assistant tutor in my Licentiate thesis defended in Örebro 2006.

Ingrid Östlund MD, Ph D, Head of the Dept of Obstetrics and Gynecology in Örebro and my former colleague, co-author in Paper II.

Eva Gustafsson for helping me with the medical records in study III.

The nurses at the out-patient clinic in Linköping University Hospital for making study IV possible by informing and inviting teenagers to participate in the study.

The staff and my colleagues at the department of Obstetrics and Gynecology, Linköping University Hospital, for support and pep talks.

My room-mates Elisabeth Nedstrand and Evelyn Lundin for talks about different interesting things not always connected to work.

Preben Kjölhede, Anna-Clara Spetz, Lotta Lindh-Åstrand and Ingegerd Ahldén for constructive criticism of the papers in this thesis.

Maria Rundberg and Ingela Olsson for making every day possible by solving different practical matters.

My friend Ninna Gullberg from high school and my second cousin Agneta Tinnfält, for doing this before me, inspiring me and showing me that age is nothing!

Professor emeritus Larry Lundgren, for linguistic revision of this thesis.

Lasse, my husband, simply Siempre!

Our grown up children:

Erik for showing interest and supporting me! Ylva for telling me that I did not have to do this, which gave me a choice! Eva for being my -study-mate" this last year!

Hanna, Pontus and Erik L for reviewing —Sammanfattning på svenska".

Arvid, I hope to see a lot of you in the future!

My brother Lars who pointed out at my Medical Licentiate examination that if I was this dedicated, why not go on?

My brother Sven for showing me that there are always new options and new directions to take.

My parents Ebba and Ove, —På lek på allvar" right?

This study was supported by grants from the Örebro County Council Research Committee, the Foundation for Medical Research of Örebro Medical Centre Hospital Örebro Sweden and ALF grants from the County Council of Östergötland.

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