CHAPTER 2

Conception, Pregnancy, and Childbirth

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CHAPTER OUTLINE

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OPENING QUESTIONS

- What biological, psychological, social, and spiritual factors influence the beginning of the life course?
- What recent technological advances related to conception, pregnancy, and childbirth are important to social work intervention?
- What unique knowledge do social workers bring to multidisciplinary teams working with issues of conception, pregnancy, and childbirth?

KEY IDEAS

As you read this chapter, take note of these central ideas:

1. Conception, pregnancy, and childbirth should be viewed as normative life transitions that require family or family-like supportive relationships to maximize favorable outcomes.

2. Conception, pregnancy, and childbirth are influenced by changing family structures and gender roles.

3. Variations in human behavior at this life stage related to social class, race and ethnicity, and religion—and their interplay—must be considered in assessment and intervention.

4. Assessment and intervention with women and their families at this life stage must reflect the most current scientific and technological developments and emerging societal trends.

5. Women who are poor or lack social support—and therefore experience greater stress than other women—are most at risk for poor pregnancy outcomes.

6. Prenatal care, including childbirth education, ensures the most positive pregnancy outcome possible. Universal access to prenatal care, then, should be a social work priority.

7. Although we are increasingly learning about the role of genetics in human development, 80% to 90% of fertilized ova with a genetic anomaly will abort spontaneously, resulting in 94% to 96% of all births occurring without genetic anomaly.

8. The incidence of low-birth-weight infants continues to be high, particularly for neonates born to poor and minority women and those exposed to teratogens such as nicotine, illegal drugs, and alcohol.
Case Study 2.1

**Jennifer Bradshaw’s Experience With Infertility**

Jennifer Bradshaw always knew that she would be a mom. She remembers being a little girl and wrapping up her favorite doll in her baby blanket. She would rock the doll and dream about the day when she would have a real baby of her own. Now, at 36, the dream of having her own baby is still just a dream as she struggles with infertility.

Like many women in her age group, Jennifer spent her late teens and 20s trying not to get pregnant. She focused on education, finding the right relationship, finances, and a career. As an African American woman, and the first person in her family to earn a PhD, she wanted to prove that she could be a successful clinical psychologist. She thought that when she wanted to get pregnant, it would just happen; that it would be as easy as scheduling anything else on her calendar. When the time finally was right and she and her husband, Allan, decided to get pregnant, they couldn’t.

With every passing month and every negative pregnancy test, Jennifer’s frustration grew. First, she was frustrated with herself and had thoughts like, “What is wrong with me?,” “Why is this happening to us?,” and “We don’t deserve this.” She would look around and see pregnant teens and think, “Why them and not me?” She also was frustrated with her husband for not understanding how devastating this was to her and wondered to herself, “Could it be him with the problem?” In addition, she was frustrated with her family and friends and started avoiding them to escape the comments and the next baby shower. Now, she is baby-less and lonely. She thinks having an infertility problem is even worse for African American women because of the “Black fertility” myth. She gets so tired of hearing, “No one else in the family has had a problem getting pregnant,” “When my husband just breathed on me, I got pregnant,” and “Just relax, and you will get pregnant.” It has also been hard for Allan. For many men, masculinity is connected to virility; Allan would not even consider that he might be the one with the fertility problem, even though it is a male-factor issue in about 50% of infertility cases.

After months of struggling to get pregnant, multiple visits to the obstetrician/gynecologist a laparoscopic surgery, a semen analysis, timed intercourse (which began to feel like a chore), and after taking Clomid, a fertility drug that made her feel horrible, she and Allan finally accepted that they might need to see a specialist. She will never forget the first visit with the reproductive endocrinologist (RE). She was expecting a “quick fix,” thinking that the RE would give her some special pills and then she would get pregnant. But, instead, he casually said to her, “I think your only option is in vitro fertilization [IVF], which runs about $16,000 per cycle, including medications.” The RE also told her that for someone in her age range the success rate would be about 35% to 40%.

From her clinical practice and her friendship circle, Jennifer knows that many women think of in vitro as being a backup plan when they delay pregnancy. But she is learning that in vitro is a big deal. First, it is expensive. The $16,000 per cycle does not include the preliminary diagnostic testing, and in Jennifer’s age group, the majority of women pursuing IVF will need at least two IVF cycles, $32,000 for two tries; three tries brings the bill up to $48,000. Jennifer has heard of couples spending close to $100,000 for infertility treatments.

Although about 15 states mandate insurance companies to cover fertility treatments, in the state where Jennifer lives, there is no fertility coverage mandate; consequently, her insurance company does not cover any infertility treatments. So at the very least, Jennifer and Allan would need to come up with $16,000 to give one IVF cycle a try. It’s heartbreaking for them because they don’t have $16,000 and their parents can’t help them.

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out. So to give IVF even one try, they need to borrow the money. They are considering taking out a home equity loan to pay for the needed IVF cycles and know that they are lucky to be in a position to do that. They have heard of people packing up and moving to states with mandated fertility coverage and/or quitting their jobs and finding jobs that carry specific insurance that will cover fertility treatments. Some couples are even traveling abroad for fertility treatments that can be had for much less than in the United States.

Jennifer has heard that IVF is physically and emotionally exhausting. First the *in vitro* patient is forced into menopause, then the ovaries are hyperstimulated to release numerous eggs (up to 15 to 17 instead of 1), which can be painful. The eggs are surgically extracted, and finally the fertilized embryos are introduced to the IVF patient’s body. Throughout this process, various hormone treatments are given via daily injections, multiple blood tests are taken, and at any point during the procedure something could go wrong and the IVF cycle called off. If all goes well, the IVF patient is left to keep her fingers crossed for the next two weeks waiting for a positive pregnancy test. If the test is negative, the treatment starts over again. She has heard that most women are an emotional wreck during the entire process because of the high stakes and the artificial hormones.

Jennifer and Allan decided to go the IVF route seven months after visiting the R.E. Before they made this decision, however, Jennifer carefully tracked her BBT (basal body temperature), purchased a high-tech electronic fertility monitor, used an ovulation microscope, took multiple fertility supplements, and used sperm-friendly lubricant during intercourse. Still nothing helped. When she heard that acupuncture has been found to increase the success rate of IVF, she started seeing a fertility acupuncturist on a weekly basis for both herbal formulas and acupuncture treatments. The acupuncture treatments/herbs are averaging about $100 per week, also not covered by insurance in her state.

Jennifer and Allan have decided to give IVF three tries and after that they will move on to the next plan, adoption. They adore each other and want more than anything to have their own little one, but if they cannot have that, they will adopt, and Jennifer will realize her dream of being a mom.

—Nicole Footen Bromfield

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**Case Study 2.2**

**The Thompsons’ Premature Birth**

The movement of her growing fetus drew Felicia into an entrancing world of hope and fantasy. Within days of discovering she was pregnant, her husband Will was suddenly deployed to a conflict zone. Through e-mails and occasional cellular phone calls, Felicia told Will details about the changes she experienced with the pregnancy but more and more, it seemed as if she and her baby were inhabiting a different world than that of her
husband. His world was filled with smoke, dirt, bombs, and danger, punctuated with periods of boredom. Although she was only six months into the pregnancy, she had selected muted colors for the nursery and soft clothing in anticipation of the birth. Her changing figure was eliciting comments from her coworkers in the office where she worked part time as a secretary. With weeks of nausea and fatigue behind her, a general sense of well-being pervaded Felicia’s mind and body. She avoided all news media as well as “war talk” at the office to protect her from worry and anxiety. Yet, even the sound of an unexpected car pulling up to the front of her home produced chills of panic. Was this the time when the officers would come to tell her that Will had been killed or wounded in combat? Her best friend only recently had experienced what every military wife fears may happen. The growing life within her and the constant threat of death filled her waking and sleeping hours.

Then, with dawn hours away, Felicia woke to cramping and blood. With 14 more weeks before her delivery date, Felicia was seized with fear. Wishing that Will were there, Felicia fervently prayed for herself and her fetus. The ambulance ride to the hospital became a blur of pain mixed with feelings of unreality. When she arrived in the labor and delivery suite, masked individuals in scrubs took control of her body while demanding answers to a seemingly endless number of questions. Felicia knew everything would be fine if only she could feel her son kick. Why didn’t he kick?

As the pediatrician spoke of the risks of early delivery, the torrent of words and images threatened to engulf her. Suddenly, the doctors were telling her to push her son into the world—her fragile son who was too small and vulnerable to come out of his cocoon so soon. Then the pain stopped. Oblivious to the relief, Felicia listened for her baby’s cry. It didn’t come. Just a few hours earlier, she had fallen asleep while the fetus danced inside her. Now there was only emptiness. Her arms ached for the weight of her infant, and her heart broke with what she believed was her failure as a mother.

In the newborn intensive care unit (NICU), a flurry of activity revolved around baby boy Thompson. Born weighing only 1 pound 3 ounces, this tiny red baby’s immature systems were unprepared for the demands of the extrauterine world. He was immediately connected to a ventilator, intravenous lines were placed in his umbilicus and arm, and monitor leads were placed on all available surfaces. Nameless to his caregivers, the baby, whose parents had already named Paul, was now the recipient of some of the most advanced technological interventions available in modern medicine.

About an hour after giving birth, Felicia saw Paul for the first time. Lying on a stretcher, she counted 10 miniature toes and fingers. Through a film of tears, trying to find resemblance to Will, who is of Anglo heritage, or herself, a light-skinned Latina, in this tiny form, Felicia’s breathing synchronized to Paul’s as she willed him to keep fighting.

Alone in her room, she was flooded with fear, grief, and guilt. What had she done wrong? Could Paul’s premature birth have been caused by paint fumes from decorating his room? From her anxiety and worry about Will?

The Red Cross sent the standard message to Will. Was he in the field? Was he at headquarters? It mattered because Paul may not even be alive by the time Will found out he was born. How would he receive the news? Who would be nearby to comfort him? Would the command allow him to come home on emergency leave? If he were granted permission for emergency leave, it could be days of arduous travel, waiting for space on any military plane, before he landed somewhere in the United States. Felicia knew that Will would be given priority on any plane available; even admirals and generals step aside for men and women returning home to meet a family crisis. But, then again, the command may consider his mission so essential that only official notification of (Continued)
Paul’s death would allow him to return home. Although Felicia told herself she was being unreasonable, she was angry that Will was not here to comfort her. After all, she had supported his decision to join the military and had accepted that she would deliver her child alone. Then, why was this so overwhelming?

Thirteen days after his arrival, Paul took his first breath by himself. His hoarse, faint cry provoked both ecstasy and terror in his mother. A few days earlier Felicia had been notified by the Red Cross that her husband was on his way home, but information was not available regarding his arrival date. Now that he was off the ventilator, she watched Paul periodically miss a breath, which would lead to a decreased heart rate, then monitors flashing and beeping. She longed for Will’s physical presence and support.

Will arrived home 2 days later. He walked into the NICU 72 hours after riding in an armed convoy to the airport. Although Paul would spend the next 10 weeks in the hospital, Will had 14 days before starting the journey back to his job, a very different battlefield than the one on which Paul was fighting.

Paul’s struggle to survive was the most exhilarating yet terrifying roller-coaster ride of his parents’ lives. Shattered hopes were mended, only to be reshattered with the next telephone call from the NICU. Now Felicia dreaded the phone as well as the sound of an unfamiliar car. For Felicia, each visit to Paul was followed by the long trip home to the empty nursery. For Will, stationed thousands of miles away, there was uncertainty, guilt, helplessness, and sometimes an overwhelming sense of inadequacy. Felicia feared the arrival of a car with officers in it, and Will dreaded a Red Cross message that his son had died.

Great joy and equally intense anxiety pervaded Paul’s homecoming day. After spending 53 days in the NICU and still weighing only 4 pounds, 13 ounces, Paul was handed to his mother. She made sure that a video was made so that Will could share in this moment. How she wished he could participate, but she also knew that his heart and thoughts spanned the distance between war on the other side of the world and Paul’s quiet victory at home. With more questions than answers about her son’s future and her ability to take care of him, Felicia took their baby to his new home.

As the NICU social worker at a military hospital, the major goal must be to support the family as they face this challenging transition to parenthood. In the past 53 days, the social worker has helped Felicia answer her questions, understand the unfamiliar medical language of the health care providers, and understand and cope with the strong emotions she is experiencing. The social worker also helped during the transition of Will’s arrival from war and his departure back to war. Understanding the dynamics of a NICU, families in crisis, and the needs of the military family separated by an international conflict is critical to providing this family the level of support needed to manage the multifaceted role transitions.

Case Study 2.3

Hazel Gereke’s and Cecelia Kin’s Experiences With the Options

Forty years ago, at age 44, Hazel Gereke gave birth to her fifth child, Terry. At the time of his birth, Terry’s siblings ranged in age from 2 to 25, and his father was 48. Terry’s mother tells the following story.

I menstruated regularly when I carried Terry and had long, heavy bleeding at first. I went to the doctor who said I was four-and-a-half months pregnant! I was too far along to do anything. You see, back then you had
to have three doctors go before the hospital board to say the pregnancy jeopardized the mother’s health. Well, my doctor was Catholic, so I knew that would not happen. I cried. My husband said, “Hazel, we’ll love it!” I did not have an easy pregnancy with poor sleep, pains everywhere, and extended family demands on top of my other four kids.

Terry was hard to bottle feed but the doctor said he was only a “little slow.” After his first birthday, he sat, began to walk, and said “Mama,” “Daddy,” “bye-bye,” and “eat”—about seven to 10 words. He was beginning to dress and potty train. But when he was 15 to 18 months old, he had terrible seizures all summer long. When I enrolled him in school and saw on the record “Down child,” I went right away to the doctor, who said the test would cost $75. Well, I said, “There’s no need for a test—it won’t change what he is.” I worried because my son, Mike, was teased by the other kids when the county bus came for Terry—they called it “the dummy bus.” I always knew who had compassion, because if they did, Terry stayed around. Otherwise, he went to his room.

When asked if she thinks anything should have happened differently over the years, Hazel reluctantly but honestly replies that “the pregnancy should have been stopped.” Then asked “What has Terry contributed to your family?” she replies, “He has kept the family together and taught us not to take things for granted.” Hazel Gereke has reminded us about the ambivalences and ambiguities that social workers need to keep in mind when working with pregnancy issues or at various points of decision-making across the life course. Let’s hear from another woman, Cecelia Kin, who faces the same genetic challenge 40 years later. Here are selected notes from her journal written during her pregnancy.

**June 9th:** Maybe we just were not meant to have another baby . . . WHAT we have been through is all too amazing: three miscarriages before we had our darling 18-month-old Meridy, plus two more miscarriages since then. Well, at least I know I can get pregnant and we did have a healthy kid so why not again?

**August 20th:** YEH! This pregnancy is going soooo well: 10 weeks along ALREADY! I am tired, but I’ve thrown up only once and feel soo much different from the pregnancies I lost . . . Looking back, I knew that each one was not right . . . I felt AWFUL ALL the time . . . But not this time . . . What a relief . . . . or is it a reward?

**September 1st:** It’s been more than a week since my last journal entry . . . Today we went for the ultrasound, both of us thinking it would be so perfect. It wasn’t. How could this happen to us? What have we done or not done? Haven’t I done everything I could possibly do? I eat right, steered clear of drugs and hate any kind of alcohol . . . I exercise regularly . . . I am in perfect health!! Wham! I can’t believe what we were told. I can’t cry like this any longer. Writing about it may help; it usually does. So, here’s how it went. We just sat there staring at each other after hearing: “A 1:25 chance of a baby with Down Syndrome.” And they told us, “Don’t worry”! You have to be kidding! We both insisted that the next step be done right away . . . so in three (LONG) days, we go back again, this time for something called chorionic villus testing . . . never heard of it.

**September 16th:** I can’t believe this is happening; I feel so angry, so out of control. Then I think of Meridy and that we should just be thankful we have her and believe that our lives can be full, totally complete with just one kid. But, this is not what we want! How can I hold it all together? I don’t want to cry all the time,

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These four stories tell us that conception, pregnancy, and childbirth are experienced in different ways by different people. They also tell us about some of the possible variations, which reflect the complex interplay of person, environment, and time. The biological processes vary little for the vast majority of women and their families, but researchers continue to study the psychological, social, and spiritual dimensions of childbearing. This chapter presents a multidimensional overview of current knowledge about conception, pregnancy, and childbirth gleaned from the literatures of anthropology, genetics, medicine, nursing, psychology, social work, and sociology.

As you read, keep in mind that all elements of childbearing have deep meaning for a society. Procreation allows a culture to persist, as children are raised to follow the ways of their predecessors. Procreation may also allow a culture to expand if the birthrate exceeds the rate at which the society loses members. As Valsiner (1989) reminds us, “Human procreation is socially organized in all its aspects. In any cultural group around the world, society regulates the conditions under which a woman is to become pregnant, how she and her husband [family] should conduct themselves during the pregnancy, how labor and delivery take place, and how the newborn child is introduced into society” (p. 117). Pregnancy and childbearing practices are changing with ever-increasing globalization, demographic changes in immigration patterns, and refugees seeking asylum from war-torn countries. Unfortunately, health caregivers, including social workers, in the United States are often ill-prepared to provide culturally sensitive services (Davis, 2001; Gagnon et al., 2004; Ito & Sharts-Hopko, 2002; Yeo & Maeda, 2000). As this is being written, we are in the midst of a major political debate about the U.S. health care delivery system. If changes occur, will they promote or deter the health and well-being of women and their families?
In the United States, the social meaning of childbearing has changed rather dramatically over the past 30 years, in several ways (Carter & McGoldrick, 2005a; Walsh, 2006):

- Marriage and childbirth are more commonly delayed.
- Most people want smaller families.
- There are approximately 80 million involuntarily childless persons in the world (Bos, van Balan, & Visser, 2005).
- Various options for controlling reproduction are more available and accessible but oftentimes only to the economically advantaged.
- Sexual freedom has increased alongside more couples seeking infertility treatment.
- Over one third of pregnancies worldwide are unplanned, and one fourth are unwanted (Ahman & Shah, 2006).
- Single women of all ages get pregnant and keep the baby; after a decade-long decline in adolescent pregnancy, teen pregnancy began to incline again in 2006.
- Family values and sexual mores vary more compared with previous generations.
- Parents are less subject to traditional gender-role stereotyping—which prescribed that mom takes care of the baby while dad earns a paycheck, and so on.
- Fathers have been found to be more important in the baby’s life, beyond their genetic contributions.
- Spouses return home unexpectedly from a war zone more often due to wives experiencing problematic pregnancies than due to other family crises (Schumm, Bell, & Knott, 2000).
- Medical advances and cultural globalization are raising new ethical issues.

These trends have prompted considerable debate over how our society should define family. The family operates at the intersection of society and the individual. For most people it serves as a safe haven and a cradle of emotional relationships. It is both the stage and partial script for the unfolding of the individual life course.

**Family Diversity**

We continue to witness what family historians call family pluralism, or recognition of the many viable types of family structures. Such pluralism is nothing new, but our tolerance for all types of families has grown over the past few decades. The definition of family must reflect this pluralism. Yet, unresolved moral, political, and economic issues abound (LePoire, 2006). These debates influence which family research proposals are funded (Udry, 1993); how abortion and family policy is constructed (Figueira-McDonough, 1990), particularly at the national level; and who gets access to such family resources as infertility treatment, birth control methods, and prenatal care.

We know that many children are born into a family comprising a married couple and their offspring all living together. We are well aware that some children are born to single women with and without significant others, and some are relinquished at birth. In addition, recent global conflicts have also affected children who have lost a parent in war. Other infants come into the world in the midst of natural disasters, as evidenced during Hurricane Katrina where women gave birth in alleys while waiting for rescue (Buekens, Xiong, & Harville, 2006). Many neglected, abused, and abandoned infants are placed in foster care. Yet, all these children live, formally or informally, for better or for worse, with a family of some type: foster, adoptive, extended, fictive kin, blended, and reunited are examples. Rarely does a child live without some type of family configuration, even those who live in arrangements such as group homes; thus, almost all children still experience the life course through a family lens.
Consider your own family beliefs about favorable and unfavorable circumstances of conception, pregnancy, and childbirth. Perhaps these views vary across the generations, but the views, forged by experiences of past generations, can still create an expectation for certain circumstances and behaviors. Consider the decision made by the Gereke family and the long-term impact on everyone in that immediate family. Also, consider Cecelia Kin’s dilemma about abortion in contrast to the views of her parents as well as those of her husband and his family, all who live in a rural community. Why do you think that Jennifer Bradshaw’s quest is so intense?

In the absence of a biological family “history,” individuals tend to seek a substitute history. The literature is replete with accounts of the quest to find one’s birth family to discover the past and predict the future. Yet, other children who were separated from their birth parents decide to accept their surrogate parents and the accompanying family network as sufficient for support of the necessary tasks of parenthood and other family roles over the life course.

For families separated by major cultural differences and great geographical distances, as is the situation for most immigrant families, the response to multigenerational family expectations, rituals, and themes related to conception, pregnancy, and childbirth may be difficult or problematic. Such experiences pressure families to adapt and change. Still, responses to conception, pregnancy, and childbirth continue to resonate with the themes, myths, legacies, and secrets that bind families across many generations.

**Conception and Pregnancy in Context**

The four case studies at the beginning of this chapter remind us that the emotional reaction to conception may vary widely. The Thompsons’ conception brought joy, in contrast to Jennifer Bradshaw’s frustration and lost dreams followed by her rising hopefulness; Mr. Gereke voiced confidence in contrast to his wife’s apprehension; Cecelia Kin feels caught between her own values and wishes and those of important people in her life. The conception experience is influenced by expectations the parents learned growing up in their own families of birth as well as by many other factors: the parents’ ages, health, marital status, social status, cultural expectations, peer expectations, school or employment circumstances, the social-political-economic context, and prior experiences with conception and childbearing, as well as the interplay of these factors with those of other people significant to the mother and father.

The conception experience may also be influenced by organized religion. The policies of religious groups reflect different views about the purpose of human sexual expression: pleasure, procreation, or perhaps both. Many mainstream religions, in their denominational policy statements, specify acceptable sexual behaviors (Bullis & Harrigan, 1992). Unwanted conception may be seen as an act of carelessness, promiscuity, or merely God’s will—perhaps even punishment for wrongdoing. These beliefs are usually strongly held and have become powerful fodder for numerous social, political, economic, and religious debates related to conception, such as the continued debates about abortion legislation in the United States and around the globe.

Even the mechanisms of conception are socially constructed. Some traditional cultures, such as the Telefomin of New Guinea, believe that repeated intercourse is necessary to conceive, but they forbid intercourse after conception so that multiple births will not occur. In contrast, the Dusan of Borneo believe that conception occurs when the body heat created between males and females causes the woman’s blood to boil, forming the child drop by drop; consequently, intercourse must occur throughout pregnancy for the child to develop fully (Valsiner, 1989). In the United States, conception is believed to be a complex biological event.

Just as the experience of conception has varied over time and across cultures, so has the experience of pregnancy. It too is influenced by religious orientations, social customs, changing values, economics, and even political ideologies. For example, societal expectations of pregnant women in the United States have changed, from simply waiting for birth to actively seeking to maintain the mother’s—and hence the baby’s—health, preparing for the birth process, and sometimes even trying to influence the baby’s cognitive and emotional development while the baby is in the uterus.
**Childbirth in Context**

Throughout history, families—and particularly women—have passed on to young girls the traditions of childbirth practices. These traditions have been shaped by cultural and institutional changes. At the same time, the social function of childbirth has been institutionalized, changing the historical dynamics of pregnancy and childbirth dramatically.

**Place of Childbirth**

Until the early 20th century, 95% of births in the United States occurred at home with a midwife (a trained birthing specialist). Most U.S. presidents were born at home; Jimmy Carter (the 39th president) was the first to be born in a hospital (Rothman, 1991). The family was intimately involved. During the “lying-in month” following birth, the mother was sheltered from outside influences, often lying in a darkened room while being taught by family members how to care for her newborn (Devitt, 1977). Yet, home births faced some danger: in 1900, 8 of every 1,000 women who labored at home died (Achievements in Public Health, 1999). Hospital births also presented great risk at this time: 1 in 6 who delivered in a hospital also died, primarily from sepsis (Vellery-Rodot, 1926). As formalized medical training developed, so did the medicalization of childbirth. By 1940, more than 50% of deliveries occurred in hospitals (Campbell & MacFarlane, 1986), structuring the birthing process and ending the traditional lying-in month. Reflecting this trend, Hazel Gereke’s first child was born at home, but her later children were born in a hospital. To further the trend away from home births, the American Congress of Obstetricians and Gynecologists (ACOG) issued a policy statement in 1975 that protested in-home births and asserted that acceptable levels of safety were only available in the hospital. This policy statement was affirmed in 1999 and again in 2007; it was supported in 2008 by the American Medical Association (ACOG, 2008; American Medical Association House of Delegates, 2008). In fact, a former president of ACOG labeled home births as child abuse (Hosmer, 2001). In contrast, the American College of Nurse Midwives and the American Public Health Association (APHA) support planned home births (American College of Nurse-Midwives, 2005, APHA, 2001). One recent study that used a small randomized sample in the Netherlands, where home births are endorsed, showed no statistical difference in maternal and neonatal outcomes between home births with trained midwives and hospital births. This study has been criticized for its methodology, however (Jansen et al., 2009; McLachlan & Forster, 2009). Recent studies in the United States have shown that home births for identified low-risk women offer no increased risks for mortality and morbidity if there are adequate support structures such as trained midwives and referral sources available (de Jonge et al., 2009; Johnson & Davis, 2005).

The feminist movement advocated for less invasive deliveries in more friendly environments (Johanson, Newburn, & MacFarlane, 2002). However, by 1998, a study of 26,000 births in the United States found that only 1% occurred at home (Ventura, Martin, Curtin, & Mathews, 1998), despite an approximately 75% cost savings for home births over hospital births (Anderson & Anderson, 1999). This rate is declining, with less than 1% (0.59%) of all births in the United States in 2006 ($n = 38,568$) occurring in the home. Most mothers who report participating in planned home births are more than 30 years old, married, have at least one other child, live in less populated areas (small town or rural area), are nonsmokers and nondrinkers, and have comparable or higher educational levels compared with women who deliver at
Different geographical regions demonstrate varying rates of home births, primarily related to the availability of hospital beds and health care preferences (Silveria, Copeland, & Feudtner, 2006). In one study, approximately 12.1% of those women who intended to deliver at home were transferred to the hospital (Johnson & Davis, 2005). Today there are more than 6,500 certified nurse-midwives practicing in all 50 states, mostly in hospitals (American College of Nurse-Midwives, 2008). A current debate centers on the credentialing and supervision of nurse-midwives in home deliveries. The American Medical Association recently proposed several resolutions to promote the utilization of hospitals or birthing centers within hospitals rather than in-home births and recommended that all midwives should submit to supervision by physicians rather than practice autonomously (American Medical Association House of Delegates, 2008). In response, there has been an outcry by members of the American College of Nurse-Midwives to maintain a distinct professional identity (American College of Nurse-Midwives, 2009).

Two other major developments have occurred during the last 30 years (Bain, Gau, & Reed, 1995; Hodnett, Downe, Edwards, & Walsh, 2005). The first is the use of doulas (laywomen who are employed to stay with the woman through the entire labor, encouraging her and providing comfort measures). Studies have shown that women who use doulas (a word from the Greek that means “woman caregiver of a woman” or “woman servant”) experience shorter labors, less pain, fewer medical interventions, higher rates of initiation of breastfeeding, and decreased postpartum depression (American Pregnancy Association, 2009; DONA International, n.d.; Scott, Klaus, & Klaus, 1999). The second development is the recent growth of birthing centers located close to a major hospital or within the hospital itself. Birthing centers offer an alternative to home delivery in a “homelike” freestanding facility with medical support. Recent research reveals that birthing centers reduce the number of medical interventions and increase maternal satisfaction (Hodnett et al., 2005; Oliver, 2005). Births at free-standing birthing centers occur with midwives in attendance 64.7% of the time (Martin, Hamilton, et al., 2009). Other studies have found that increased use of technology is linked to a decrease in the mother’s satisfaction regarding the birthing process (Kornelsen, 2005; van der Hulst, van Teijlingen, & Bonsel, 2004). Birthing centers de-emphasize technology and model the dynamics of a home birth while allowing for rapid medical intervention if needed. Conflicting data exist regarding potential cost savings of birthing centers versus hospital delivery (American Association of Birth Centers, 2007; Anderson & Anderson, 1999; Henderson & Petrou, 2008; Stone, Zwanziger, Hinton, & Bueting, 2000). With the growing impetus to consider national health reform, balancing the safety and economic efficacy of alternative birthing plans, sites, and professionals should receive heightened attention (Bak, 2004; Bak 2009; Cooper, 2004).

A major change over time is the role of fathers in childbirth. During the 16th century, law and custom excluded men from observing deliveries, because labor was viewed as “something to be endured by women under the control of other experienced and knowledgeable women” (Johnson, 2002, p. 165). During the 1960s, when childbirth moved out of the home, hospitals still excluded fathers from participating in the labor process (Kayne, Greulich, & Albers, 2001) and some continue to do so if there are complications (Koppel & Kaiser, 2001). This became accepted practice but began to change in the 1970s. As more women were subjected to episiotomies (incisions to enlarge the opening for the baby during birth), enemas, and anesthesia in a male-dominated arena, often without their full knowledge or consent (Ashford, LeCroy, & Lortie, 2001), fathers were first invited in by physicians to serve as witnesses to avoid litigation (Odent, 1998, 1999). A 1995 survey in the United Kingdom found that fathers were present at 80% of all births, often serving as a “coach” (Woollett et al., 1995). There is still resistance to fathers’ presence in the delivery room in some cultures but, when agreed upon by the couple, it has been shown that the father’s involvement in the birthing process increases attachment, paternal satisfaction, nurturing behaviors, and positive feelings about the process (Pestvenidze & Bohrer, 2007; Reed, 2005), outcomes that are further enhanced if the father has attended childbirth classes (Wockel, Schafer, Beggel, & Abou-Dakn, 2007). Father-supported childbirth has also been found to increase mother’s satisfaction with the birth process and decrease the amount of pain medication needed (Smith et al., 1991). Increasing attention is being given to restrictive policies of some hospitals that will not allow the father to be present if the baby is being delivered by Caesarian birth or if the mother has general anesthesia (Koppel & Kaiser, 2001).
Reflect on the Thompsons’ situation with Will in Afghanistan, unaware of the pending birth of his first child, and Felicia in premature labor without any family present.

**Childbirth Education**

Childbirth education was not formalized until the early 1900s, when the Red Cross set up hygiene and health care classes for women as a public health initiative. In 1912, the U.S. Children's Bureau, created as a new federal agency to inform women about personal hygiene and birth, published a handbook titled *Prenatal Care*, emphasizing the need for medical supervision during pregnancy (Barker, 1998). When Dr. Grantley Dick-Read published *Childbirth Without Fear* in 1944, the medical establishment rejected the idea that women who were educated about childbirth would have less fear and therefore less need for pain medication (Lindell, 1988).

Not until the 1950s did the idea of childbirth education gain credibility. A French obstetrician, Dr. Fernand Lamaze, followed Dick-Read's work with the publication of his book *Painless Childbirth* (1958). Lamaze learned of Pavlov, a Russian psychologist (Lindell, 1988), and incorporated his patterns of hypnosis, which the Russians had learned to use to reduce childbirth pain. This book became the foundation for contemporary childbirth education and led to both social and political changes as women began to educate each other (Lindell, p. 10; Zwelling, 1996). Lamaze proposed that women could use their intellect to control pain if they had information about their bodies and relaxation techniques (DeHart, Sroufe, & Cooper, 2000; Lindell; Novak & Broom, 1995).

Childbirth education changed again in the 1980s as more women went back to work soon after birth and juggled multiple roles; technological interventions also increased at this time. The role of childbirth educator began to be filled by a professional from within the health care system (Zwelling, 1996). Childbirth education became a governmental priority as the gap widened between African Americans and other ethnic groups regarding the incidence of low birth weights and infant mortality (Armstrong, 2000). Significant socioeconomic and racial disparities exist in the utilization of childbirth classes, with one study finding that 76% of Caucasian women attended a childbirth class compared with 44% of African American women. Racial differences also exist in the utilization of prenatal care, with 89% of Caucasian women receiving first trimester prenatal care compared with 75% of African American women (Lu et al., 2003). With increased racial and ethnic diversity in births, childbirth educators must engage more, and a broader range of, minority women (Morton & Hsu, 2007). Research has demonstrated that lower minority participation in childbirth classes is most affected by lack of transportation and childcare problems (Berman, 2006), both of which can be addressed by social workers.

Efforts have been made to improve access to childbirthing resources, as illustrated with the Maternity Care Access Act of 1989, which created a means-tested program called First Steps to provide parenting and childbirth classes to women who previously could not afford them (Rabkin, Balassone, & Bell, 1995). Healthy People 2000 and 2010, the federal government’s national health goals, also support prenatal education as a way to alter individual women’s behavior, thereby improving pregnancy outcomes (Armstrong, 2000; Magill-Cuerden, 2006; U.S. Department of Health and Human Services, 2009c).

Childbirth classes do seem to help. Some outcome studies have shown that childbirth classes result in decreased pain and anxiety (Dickason, Schult, & Silverman, 1990; Goldberg, Cohen, & Lieberman, 1999), shorter labor, decreased use of forceps, improved infant outcome, increased maternal self-confidence (Koehn, 2008), and an overall positive experience (Riedmann, 1996). Recent research has also suggested that emotional support during labor can be more effective than childbirth classes (Waldenstrom, Hildingsson, Rubertsson, & Radestad, 2004). Meditation and psychological insight into the dynamics of labor and delivery may augment the traditional information offered in childbirth classes (Newman, 2005). Childbirth educators are also using the Internet to provide prenatal education and support (Bradley, 1995; Wang, Chung, Sung, & Wu, 2006), which provides enriched...
opportunities for those in rural areas or when face-to-face instruction is unavailable because of incarceration, lack of transportation, or disability.

Childbirth classes must address the needs of all involved in this major life event. The impact of childbirth classes on fathers is still being debated. It appears that the father’s increased information leads to a more positive experience as well as his ability to adjust during the first postpartum year (Johnson & Baker, 2004), but some studies conclude that there is no relationship between the father’s attendance and attachment to the infant at 6 weeks (Tiedje, 2001). At any rate, it appears that classes do not have the same level of positive influence for fathers as they do for mothers (Premberg & Lundgren, 2006), but women report that their relationship with the father is strengthened by his class attendance (Koehn, 2008). One study has shown that if adolescent fathers are provided support, including childbirth education, 82% of these fathers have daily contact with their children at the end of 2 years (Stengel, 2005). The adolescent father is typically 2 to 3 years older than the mother (Hollman & Alderman, 2008), potentially providing a level of maturity to the adolescent relationship that maximizes the educational intervention. Clearly, more information is needed to understand how prenatal education can meet the father’s needs as well as the mother’s needs—and not just the obstetrician’s needs.

Hospital Stay

Pregnancy and childbirth accounts for almost 25% of all hospital admissions in the United States, and in the 18 to 44 age group, three times as many women are admitted for inpatient stays as are men, primarily because of childbirth (Nursing, 2005). We are living in an era that values cost-effective, innovative, comprehensive health services. Thus, policies regarding the length of the new mother’s stay in the hospital are also changing. Forty years ago, women remained hospitalized for seven to 10 days following
birth. By the early 1990s, the norm was two to three days. During the mid-1990s, however, controversial managed-care policies pushed for women with uncomplicated deliveries to be discharged within 24 hours, a savings of 2 hospital days. During the period following delivery, both the mother and infant undergo rapid transitions. The infant must adjust to a new environment, learn to nurse, and begin the process of bonding with parents. Life-threatening problems, such as heart problems, jaundice, or infections, may not be detected until the second or third day of life. Some research has shown, however, that early discharge of the mother and baby does not increase negative outcomes, and many women prefer to leave the hospital shortly after giving birth. Yet, many women appreciate continued assistance of health care workers and midwives after birth (Baker, 2006). Over a 10-year period, there has been a 50% increase in cesarean births, from 20.7% in 1996 to 31.1% in 2006 (Macdorman, Menacker, & Declercq, 2008; Menacker & Martin, 2008). Women who have had a cesarean birth have a higher rate of readmission with early discharge. With the increased incidence of cesarean birth, there also are increased hospital costs (Liu et al., 2002). A more recent trend is that employer-sponsored health care policies can require higher deductibles and co-pays (Wilde-Mathews, 2009), a trend that transfers even more of the cost of the necessary longer hospitalization to the parent(s).

REPRODUCTIVE GENETICS

Recognition of the need for genetics knowledge is not new to social work. In fact, Mary Richmond (1917) advocated that a social worker “get the facts of heredity” in the face of marriage between close relatives, miscarriage, tuberculosis, alcoholism, mental disorder, nervousness, epilepsy, cancer, deformities or abnormalities, or an exceptional ability.

Almost 50 years later, James Watson and Francis Crick (1953) first described the mechanisms of genetic inheritance. But it was not until 1970 that our knowledge of genetics began to explode. In 1990, the Human Genome Project (HGP) was funded by the U.S. Department of Energy and the National Institutes of Health as an international effort to map all the human genes by 2003. By June 2000, the first working draft of the human genome was completed, and in 2003 this project ended. The knowledge that resulted from the HGP has altered social work practice in many areas, primarily in working with persons of reproductive age. Genetic research continues around the world, with future findings that will continue to impact social work practice.

Genetic Mechanisms

Chromosomes and genes are the essential components of the hereditary process. Genetic instructions are coded in chromosomes found in each cell; each chromosome carries genes, or segments of deoxyribonucleic acid (DNA), that contain the codes producing particular traits and dispositions. Each mature germ cell—ovum or sperm—contains 23 chromosomes, half of the set of 46 present in each parent’s cells. As you can see in Exhibit 2.1, when the sperm penetrates the ovum (fertilization), the parents’ chromosomes combine to make a total of 46 chromosomes arrayed in 23 pairs.

The Human Genome Project (1990–2003) genetic researchers estimated that there are 20,000 to 25,000 genes in human DNA, with an average of 3,000 to 5,000 genes per chromosome, slightly more than the number mice have (Human Genome Project, 2009a). The goal now is to determine the complete sequencing of the three billion subunits of the human genome, an effort of global proportions involving both public and privately funded projects in more than 18 countries, including some developing countries (Human Genome Project, 2009a).

The genes constitute a “map” that guides the protein and enzyme reactions for every subsequent cell in the developing person and across the life course. Thus, every physical trait and many behavioral traits are influenced by the combined genes from the ovum and sperm.
Every person has a unique **genotype**, or array of genes, unless the person is an identical twin. Yet, the environment may influence how each gene pilots the growth of cells. The result is a **phenotype** (observable trait) that differs somewhat from the genotype. Thus, even a person who is an identical twin has some unique characteristics. On initial observation, you may not be able to distinguish between identical twins, but if you look closely enough, you will probably find some variation, such as differences in the size of an ear, hair thickness, or temperament.

A chromosome and its pair have the same types of genes at the same location. The exception is the last pair of chromosomes, the **sex chromosomes**, which, among other things, determine sex. The ovum can contribute only an X chromosome to the 23rd pair, but the sperm can contribute either an X or a Y and therefore determines the sex of the developing person. A person with XX sex chromosomes is female; a person with XY sex chromosomes is male (refer to Exhibit 2.1).

Genes on one sex chromosome that do not have a counterpart on the other sex chromosome create **sex-linked traits**. A gene for red/green color blindness, for example, is carried only on the X chromosome. When an X chromosome that carries this gene is paired with a Y chromosome, which could not carry the gene, red/green color blindness is manifested. So, almost all red/green color blindness is found in males. This gene for color blindness does not manifest if paired with an X chromosome unless the gene is inherited from both parents, which is rare. However, if a woman inherits the gene from either parent, she can unknowingly pass it on to her sons.

Whether genes express certain traits depends on their being either dominant or recessive. Traits governed by **recessive genes** (e.g., hemophilia, baldness, thin lips) will only be expressed if the responsible gene is present on each chromosome of the relevant pair. In contrast, traits governed by **dominant genes** (e.g., normal blood clotting, curly hair, thick lips) will be expressed if one or both paired chromosomes have the gene. When the genes on a chromosome pair give competing, yet controlling, messages, they are called **interactive genes**, meaning that both messages may be followed to varying degrees. Hair, eye, and skin color often depend on such interactivity. For example, a light-skinned person with red hair and hazel eyes may mate with a person having dark skin, brown hair, and blue eyes and produce a child with a dark complexion, red hair, and blue eyes.

**Genetic Counseling**

Although Mary Richmond noted in 1917 that many physical traits, medical problems, and mental health problems have a genetic basis, only recently has technology allowed us to identify the specific genes governing many of these traits. Now that the initial mapping of the human genome is complete, as further research is done, the goal is to develop genetic interventions to prevent or cure various diseases or disorders as well as affect conception, pregnancy, and childbirth in other ways. More than 1,000 genetic tests are available, ranging in costs from $200 to $3,000; they are seldom covered by insurance, and there is no federal regulation (Human Genome Project, 2009b). At present, research is underway to genetically alter sperm, leading to male contraception (Herdiman, Nakash, & Beedham, 2006).

Our quickly increasing ability to read a person's genetic code and understand the impact it could have on the person's life oftentimes demands the expertise of a genetic counselor to provide information and advice to guide decisions for persons concerned about hereditary abnormalities. Social workers, with their biopsychosocial perspective, are well positioned to assess the need and in some circumstances provide such services (Bishop, 1993; Schild & Black, 1984; Takahashi & Turnbull, 1994). The interdisciplinary field of genetic counseling acknowledges social work as one of its essential disciplines, thereby making at least a rudimentary understanding of genetics and related bioethical issues essential for social work practice (Garver, 1995; Human Genome Project, 2009b; Rauch, 1988; Reed, 1996). For example, researchers recently reported that a genetic variation has been identified that may explain why there is a higher rate of premature delivery for African American women compared with European American women. This is information that a social worker could use to encourage pregnant African American clients to seek medical consultation related to possible genetically based premature birth risks (Wang et al., 2006).

Social workers need to understand the rising bioethical concerns that genetic research fosters and to use such knowledge to help clients faced with genetically related reproductive decisions. The U.S. government has the largest
bioethics program in the world to address questions such as the following: Who should have access to genetic information? Do adoptive parents have the right to know the genetic background of an adoptee? Will genetic maps be used to make decisions about a pregnancy? Which genes should be selected for reproduction? Will persons who are poor be economically disadvantaged in the use of genetic information?
A major concern of genetic counseling is whether all genetic information should be shared with a client. Some information may only cause distress, because the technology for altering genes is in its infancy and applicable to only a few situations. But recent advances allow for earlier diagnosis, which reduces or prevents the effects of some rare diseases as well as gives some clients more decision options. Today, for example, a late-life pregnancy such as Hazel Gereke’s could be evaluated genetically using amniocentesis in the third trimester, or earlier in the first trimester using chorionic villus testing, which allowed Cecelia Kin to know that her unborn child had Down syndrome. Such evaluation could lead to decisions ranging from abortion to preparation for parenting a child with a disability. However, these options typically are laced with economic, political, legal, ethical, moral, and religious considerations (Andrews, 1994; Chadwick, Levitt, & Shickle, 1997).

Ethical issues related to genetic engineering have an impact not only at the individual and family levels but also at the societal level. For example, when we are able to manipulate genes at will, we must be on guard against genetic elitism. It is one thing to use genetic engineering to eliminate such inherited diseases as sickle-cell anemia but quite another to use it to select the sex, body type, or coloring of a child. We are living in a time of tremendous ethical complexity, involving the interplay of new reproductive technologies; changing family structures, values, and mores; political and religious debate; and economic considerations. This ethical complexity extends to issues of social justice; as increasing numbers of persons gain the ability to control conception, plan pregnancy, and control pregnancy outcomes, social workers need to protect the interests of those who lack the knowledge and other resources to do so.

CONTROL OVER CONCEPTION AND PREGNANCY

The desire to plan the timing of childbearing is an ancient one, as is the desire to stimulate pregnancy in the event of infertility. Contraception and induced abortion have probably always existed in every culture. Effective solutions for infertility are more recent. But it is important to remember that not all methods of controlling conception and pregnancy are equally acceptable to all people. Cultural and religious beliefs, as well as personal circumstances, make some people more accepting of some methods than others.

Contraception

The range of birth control options available today provides women and men with the ability to plan pregnancy and childbirth more than ever before. In 2000, the World Health Organization (WHO) increased medical restrictions on contraception, decreasing the number of women who are eligible for oral contraceptives and intrauterine device (IUD) insertion, citing health concerns. Of the approximately 120 million women who become pregnant worldwide each year, approximately 38% of these are unplanned because of contraceptive failure or lack of pregnancy planning, and about 25% are unwanted (Ahman & Shah, 2006). It has been demonstrated that the rate of abortion increases as the availability of contraceptive use decreases, and abortion is often illegal and unsafe in nonindustrialized countries (Ahman & Shah; World Health Organization, 2004). However, it must also be recognized that the risk of pregnancy, with over half a million dying each year in pregnancy, childbirth, or the immediate postpartum period, is generally higher than the risk of adverse reactions to contraceptives (Belizan, 2008; Best, 2002). In Eastern, Western, and Middle Africa, there is a minimal use of contraceptives and abortion, resulting in high fertility rates (e.g., about six children per woman). However, in South America and Southeastern Asia, where there is limited access to contraceptives, abortion is often used as the primary regulator of fertility (Ahman & Shah). Therefore, the availability and acceptability of contraceptives in impoverished countries reduces the number of abortions (legal and illegal) and maternal mortality,
in addition to regulating family size (Aitken et al., 2008). With the projected 7.4 to 10.6 billion people in the world by 2050, mostly born in countries with poor access to contraceptives, there is an urgent need to provide inexpensive, safe, convenient, and appropriate contraceptive devices to women and men worldwide. A need also exists to increase knowledge of these contraceptives (Goldenberg & Jobe, 2001; Prata, 2009). Overall, the cost of contraception is small in comparison to unwanted pregnancies. A recent review showed that half of all averted pregnancies were stopped by oral contraceptives, about 20% by injectable methods, and 10% by barrier and patch methods (Foster et al., 2009, p. 446), with the implant and intrauterine devices the most cost effective.

Complete sexual abstinence is the only certain form of contraception. Without any contraception, an estimated 85% of heterosexual couples who engage in regular intercourse will conceive within one year (Dirubbo, 2006; Trussell, 2004). There has been a push to encourage adolescents to engage in total abstinence, with educational systems being required, in some situations, to teach abstinence as the only form of birth control. Federal monies for abstinence-only education rose 74% under President Bush and during the last decade, a billion and a half dollars has been spent for abstinence-only programs (McFarlane, 2007).

Approximately 50% of pregnancies in the United States are unintended (Miller & Holman, 2006; Van der Wijden, Kleijnne, & Van den Berk, 2003). The reasons for this is uncertain because contraceptive failure rate data vary across studies. As research and development of various methods of contraceptives continues, information is evolving. It is important for social workers to be familiar with the choices women have and the potential impact of their choices as well as how women of various cultural, racial, and ethnic groups may vary in their use of such options, if available. Each birth control option needs to be considered in light of its cost, failure rate, potential health risks, and probability of use, given the user’s sociocultural circumstances. Female and male contraception options include the following:

- **Breastfeeding.** Women who are exclusively breastfeeding and are amenorrheic are less likely than other women to conceive during the first 6 months postpartum (Hale, 2007). Breastfeeding without the use of other contraceptives carries a pregnancy risk of less than 2% during the first 6 months after giving birth. For breastfeeding to be an effective contraceptive during the first 6 months after delivery, a woman must be amenorrheic, nurse at least every 4 hours during the day and every 6 hours at night, and not introduce the infant to other foods, a practice known as the lactational amenorrhea method (LAM) (Tilley, Shaaban, Wilson, Glasier, & Mishell, 2009; Van der Wijden et al., 2003).

- **Coitus interruptus.** Primarily seen as a male form of contraception, premature withdrawal of the penis from the vagina before ejaculation is probably the oldest form of birth control (Costantino et al., 2007). However, the failure rate is approximately 19% to 27% a year (4% if used perfectly) (Bachmann, 2007; Freundl, Sivin, & Batár, 2010). Coitus interruptus offers no protection from sexually transmitted infections (STIs) and HIV, and may be unsatisfying (Fu, Darroch, Haas, & Ranjit, 1999; Hatecher et al., 1994; Mahendru, Putran, & Khaled, 2009).

- **Periodic abstinence.** Natural family planning, or the rhythm method, is a term used for birth control that does not employ drugs or devices (Freundl et al., 2010) and involves daily tracking of changes in the woman’s body associated with the menstrual cycle and an avoidance of intercourse during fertile periods. The effectiveness rate is 90% to 98% if used perfectly, but if not practiced diligently, the failure rate rises to between 20% and 30% (American Academy of Family Physicians, 2005; Bachmann, 2007; Freundl et al., 2010).

- **Barrier methods.** The male condom (failure rate 2% when used correctly, 15% when used incorrectly or inconsistently over a 12-month period), the diaphragm (6%–20% failure rate), and the cervical cap (20%–36% failure rate) provide increased protection against STIs, with the male condom having the highest protection rate against HIV and hepatitis B (Freundl et al., 2010; Mahendru et al., 2009). Dissatisfaction with condom use is lower than for any other form of birth control, leading to a lower rate of discontinuance (12%) (Moreau, Cleland, & Trussell, 2007). The female condom that was introduced in 1992 either consists of two flexible rings, a soft sponge, or dissolvable capsule (Rowlands, 2009) and also provides some protection against STIs (Freundl et al., 2010). It has approximately
a 5% failure rate when used correctly, 21% when used incorrectly or inconsistently (Family Health International, 2006), and costs between $2.50 and $5 per use. The female condom is visible after insertion (some women are requesting colored condoms), and may cause crackling or popping sounds. Originally thought to provide protection for low-income women internationally, it has not been well accepted (Severy & Spieler, 2000). Approximately 52% of women discontinue use of the diaphragm and cervical cap because they are dissatisfied (Moreau et al., 2007). Both male and female condoms are used with a spermicide that provides a chemical barrier against pregnancy but not STIs (Freundl et al., 2010). Spermicides can damage the skin of the male and increase the risk of infections, including HIV. Research is underway to develop spermicides that both kill sperm and lower the risk of STIs. Vaginal gels have also been found to have a wide variance in failure rates; many women are reluctant to use them, and often discontinue their use (Grimes et al., 2005).

- **Oral contraceptives.** The introduction of birth control pills in the United States in 1960 precipitated major changes in reproduction. With a failure rate of only about 0.3% to 8.0%, they revolutionized family planning (Alan Guttmacher Institute, 2005; Freundl, 2010). Approximately 29% of women who start an oral contraceptive discontinue it because of dissatisfaction (Moreau et al., 2007). The progestosterone-only pill is safe for women who are breastfeeding (Mahendru et al., 2009). Using a combined estrogen and progestosterone pill continuously (versus three out of four weeks to induce menstruation), most women will cease menstruation (amenorrhea) after several months. Using oral contraceptives that have estrogen can increase the risk of breast cancer, but the new regime that does not include the use of estrogen may actually reduce this risk (Rowlands, 2009). Smoking while using oral contraceptives is contraindicated because there is a higher risk of serious cardiovascular problems, and smoking can further lower the levels of estrogen, affecting the efficiency of the contraceptive (Kroon, 2007; Ruger, Moser, & Frisch, 2000). The use of oral contraceptives can lead to the development of inflammatory bowel disease (Cornish et al., 2008) and may be contraindicated in women who are obese (e.g., body mass index greater than 35) (Mahendru et al., 2009).

- **Intramuscular injections.** In 1992, the introduction in the United States of depo-medroxyprogesterone acetate (Depo-Provera), a drug used for many years in Europe, allowed women protection against pregnancy for three months. There have been concerns that Depo-Provera leads to irregular bleeding, decreased bone density, headaches, dizziness, significant weight gain, and breast tenderness (Clark, Dillon, Sowers, & Nichols, 2005; Haider & Darney, 2007; Upadhyay, 2005). In addition, some research has shown that Depo-Provera negatively affects a woman’s sense of well-being and sleep cycle (Brown, Morrison, Larkspur, Marsh, & Nicolaisen, 2008). There is a 0.05% to 3.0% failure rate over 12 months (Alan Guttmacher Institute, 2005; Upadhyay, 2005). The drug Lunelle is given by injection every month compared with the every-three-month injection of Depo-Provera (Freeman, 2004). New research is underway to develop a self-injectable form that will counteract the high discontinuation rates and make it more accessible for those without access to a clinic (Prabhakaran, 2008). This may increase access for rural populations as well as for low-income women but also will require increased education about proper administration.

- **Implants and patches.** Implants are tiny capsules inserted under the skin by a physician; they have a higher effectiveness rate than vasectomy. Older systems consisted of six capsules that made insertion and removal difficult and increased the likelihood of complications (Rowlands, 2009). Implanon, a new single-rod implant, has been shown to be highly effective (i.e., a failure rate of less than 0.05%) and does not carry the risks of multiple rod implants (Freundl et al., 2010; “Single-Rod Etonogestrel Implant Safe and Efficacious,” 2009). In addition, women are given the option to select a transdermal patch, which is changed weekly for three weeks per monthly cycle (Hale, 2007; Rowlands, 2009). The patch has the same effectiveness as oral contraceptives in women who are not obese, but about 3% of women discontinue it because of skin irritation (Rowlands, 2009). In populations that are high risk for unintended pregnancies and abortions, the patch has lower continuation and effectiveness rates than do oral contraceptives, but in low-risk populations, women are more compliant using the patch than oral contraceptives (Bakhru & Stanwood, 2006; Miller & Holman, 2006).
• **Vaginal rings.** The vaginal ring remains in place for 3 weeks and then is removed for 1 week. The continuous release of hormones is similar to oral contraceptives, but there are steadier levels of the contraceptive hormones in the blood (Serrant-Green, 2008). The vaginal ring can be removed up to 2 hours before intercourse (Rowlands, 2009). Recent studies have shown that women are more satisfied with the vaginal ring than oral contraceptives (Schafer, Osborne, Davis, & Westhoff, 2006). They report less depression and irritability (Hollander, 2008) and experience less bleeding than with the pill (Roumen, Op Ten Berg, & Hoomans, 2006), but some women report problems with vaginal discomfort, coital problems, and expulsion (Rowlands, 2009). One study has shown that the vaginal ring can be used as emergency contraception because 87.5% of women who inserted the ring and maintained use for 7 days after intercourse experienced either no ovulation or disrupted ovulation (Croxatto et al., 2005). Another study showed that it was the most effective form of birth control for obese women (Gordon, Thakur, & Atlas, 2007).

• **Intrauterine devices (IUDs).** The use of IUDs has been marked by controversy and legal disputes for a number of years. They were introduced in the early 1900s, but high rates of infection and tissue damage discouraged their use until the 1960s. Most manufacturers discontinued production in the 1980s following expensive legal settlements. However, newer IUDs are widely used and are considered safe and reliable. No discernable difference exists in efficacy or side effects related to the copper levels in the IUDs or to the type of insertion used by the physician. Research is currently underway to develop an IUD whose insertion is easier and can be used in women who are not anatomically suited for insertion of current types (Rowlands, 2009). Approximately 15% of women discontinue use of the IUD within 1 year because of complications, but they have a contraceptive failure rate over 1 year of only between 0.6% and 0.8% for IUDs made of copper and 1.5% to 2% for hormonal IUDs (Freundl, 2010; Population Reports, 2005). The copper IUD does not protect against STIs. Approximately 2% to 10% are expelled during the first year, but if there are no complications, they can be worn for up to 10 years (Bachmann, 2007). Although IUDs are chosen as a contraceptive by only 2% of women (Alan Guttmacher Institute, 2005), conception after discontinuing for the first 3 months is higher than after stopping the pill (71%–80% for the IUD and 60% for women stopping the pill) (Kaplan et al., 2005). The IUD has been found to be the optimal contraceptive for women approaching menopause (Bhathena & Guillebaud, 2006) and can be used by women who are breastfeeding (Hale, 2007).

• **Voluntary surgical sterilization.** Tubal ligation, surgical sterilization for women, is considered permanent and has an effectiveness rate of approximately 99.5% (Alan Guttmacher Institute, 2005). A relatively new approach, which allows for a device to be inserted in the fallopian tubes, provides a barrier to the fertilized egg traveling to the uterus, but there is about a 6% failure rate and a risk of tubular rupture; it also requires verification of placement 3 months after placement (Rowlands, 2009). A hysterectomy, the removal of the uterus, is only done if there is a medical need and may involve the removal of the ovaries and fallopian tubes as well (Tan & Loth, 2010). For women who want to reverse the tubal ligation, there are new methods, including robotic surgery, that reduce the hospital and recovery time significantly from the traditional surgical procedure (Patel, Patel, Steinkampf, Whitten, & Malizia, 2008). In one study, the success rate for robotic surgery was 62.5% compared with the traditional pregnancy rate of 50% (Patel et al., 2008). Vasectomy, or male sterilization, likewise, is considered the most reliable method of contraception, with a failure rate of 0.08% to 0.015% in the first year (Hepp & Meuleman, 2006). Both surgeries require expertise with appropriate preoperative counseling, which may not be available in nonindustrial countries (Aaware, Krishnan, Bousted, Hanbury, & McNicholas, 2005). Recent advances in microsurgery have increased the success rates for reversal procedures, especially if the vasectomy was performed by a urologist less than 10 years ago. The resultant pregnancy rates within 2 years of reversal are approximately 50% (Busato & Wilson, 2009; Simon & Zieve, 2008).

• **Emergency contraception (EC).** In August 2006, the U.S. Food and Drug Administration (FDA) approved the “morning-after pill,” otherwise known as “Plan B,” to be available to women 18 years and older who have a government-issued identification card. It may be purchased without a prescription, but the drug is behind the pharmacist's counter and must be requested (Allen & Goldberg, 2007; Kavanaugh & Schwarz, 2008; Krisberg, 2006). A two-dose
regime and a one-dose administration have been shown to be equally effective (Hansen, Saseen, & Teal, 2007), with an 89% effectiveness rate (Melby, 2009). Plan B contains the same ingredients as oral contraceptives, but higher doses are taken. Significant controversy exists regarding this medication, and some pharmacists have refused to provide it to women (Karpa, 2006). Advocates who oppose Plan B call for women under the age of 18 to have a prescription and for all women to talk to a pharmacist to obtain the contraceptive (Krisberg, 2006). The U.S. Agency for International Development (USAID) has recommended EC for women who have been raped, whose partner’s condom breaks, who run out of other forms of contraceptives, who have forgotten to take several consecutive oral contraceptives doses, and who did not expect to have sexual relations (Severy & Spieler, 2000). The American Academy of Pediatrics has also supported the over-the-counter availability of EC (American Academy of Pediatrics-Committee on Adolescence, 2005). However, concerns have been expressed that women may rely on EC as a routine method of contraception rather than as an emergency form, leading to increased risk behaviors, and it offers no protection from STIs (Harvey, Beckman, Sherman, & Petitti, 1999). The cost is low, but there may be side effects, including nausea, vomiting, and bleeding (American Medical Association, 2002). In addition, the Copper T380A, an intrauterine contraceptive, has been used effectively for emergency contraception (Allen & Goldberg; Hale, 2007). It is important for the social worker to be familiar with these forms of birth control, especially if they work with populations who have a high rate of undesired fertility and low rates of contraceptive use.

- **New contraceptive methods.** Numerous clinical trials exist that are focused on providing contraceptives to those most in need, using easily delivered methods. Steroidal compounds are in clinical trials, and it is expected that they will help to prevent pregnancy even when women miss doses of their oral contraceptives. Mirena is one new intrauterine device that may reduce the negative effects found with Depo-Provera. In addition, a weekly hormonal injection for men (testosterone enanthate), which suppresses sperm production, has been found to reduce pregnancy rates, but the frequency of injection is problematic. Contraceptive vaccines continue to be tested, but the focus is moving from vaccinations for women and toward developing a vaccine for men. Other studies are focusing on the proteins in the sperm, changing the cervical mucus to make it less hospitable to sperm, and new implants. The uses of vaginal or transdermal gels, nasal sprays, and oral medications are being explored.

- Generally it takes 10 to 15 years for development of a new contraceptive (Aitken et al., 2008), but hopefully with new research techniques, the demands of affordable, accessible, effective, low-risk, and culturally acceptable contraceptive availability will be met. In addition, emphasis on providing services to special populations—such as women who suffer from a seizure disorder, developmental disability, movement limitations, or mental disorders—must receive attention. As women with disabilities are living longer, this is an area of interest to social workers (Diekema, 2003; Kaplan, 2006; Welner, 1997).

**Medical Abortion**

Abortion may be the most politicized, hotly debated social issue related to pregnancy today. But it was not always so controversial. Prior to the mid-1800s, abortion was practiced in the United States but was not considered a crime if performed before the fetus quickened (or showed signs of life). After 1860, however, physicians advocated banning abortion because of maternal harm caused by the use of dangerous poisons and practices (Figueira-McDonough, 1990). Legislators also wanted to see growth in the U.S. population. By 1900, all states had legislation prohibiting abortion except in extreme circumstances, typically medically related. Over the years, moral issues increasingly became the basis for debate. Hazel Gereke recounted that as late as 1966, legal abortion had to be “medically related,” which did not cover the difficulty of another child for older parents or the difficulty of raising a child with Down syndrome, a condition that at that time could not be ascertained prenatally. Hazel’s situation was also influenced by the moral or religious stance of the physician and perhaps the hospital. Consider Cecelia Kin’s situation: Abortion is available to her, but familial beliefs and ethics contribute to her indecision and anguish.
Despite laws controlling abortion, it has remained an option for those with economic means. Poor women around the world have been the ones whose access to abortion services is limited, particularly in nonindustrialized countries. In 1973, in Roe v. Wade, the U.S. Supreme Court legalized abortion in the first trimester and left it to the discretion of the woman and her physician. Three years later, in 1976, the Hyde Amendment limited federal funding for abortion, and the Supreme Court ruled in 1989, in Webster v. Reproductive Health Services, that Medicaid could no longer fund abortions, except in cases of rape, incest, or life endangerment (Kaiser Family Foundation, 2008) and that much of the decision making related to abortion should return to the states. Today, states vary considerably in who has access to abortion, when, how, and at what cost. In some states, new rules are effectively decreasing access, particularly for poor and minority populations. Some poor African American women have no greater access to abortion now than they did more than 100 years ago (Ross, 1992), a situation that extends to any group of women who are economically and educationally disadvantaged. Eighty-seven percent of U.S. counties have no abortion provider, and more than one third of women aged 15 to 44 live in these counties (Kaiser Family Foundation), resulting in rural disparities in access to abortion.

It is estimated that 42% of unintended pregnancies end in abortion (Finer & Henshaw, 2006; Kaiser Family Foundation, 2008). Globally, abortion incidence fell from 45.5 million in 1995 to 41.6 million in 2003, a change attributed to increased contraception availability and use. The most dramatic decrease (from 90 to 44 per 1,000 women aged 15 to 44) was in Eastern Europe. In 2003, Western Europe had the lowest abortion rate in the world (12 per 1,000 women, aged 15 to 44) (Guttmacher Institute, 2009a). In spite of technological advances and improved accessibility, in 2003, there were an estimated 70,000 maternal deaths because of unsafe abortions worldwide; these were found most prevalently in nonindustrialized countries (Guttmacher Institute).

During the first trimester and until fetal viability (the point at which the baby could survive outside the womb) in the second trimester, U.S. federal law allows for a pregnant woman to legally choose an abortion, although states can narrow this option. Approximately 89% of abortions in the United States are performed during the first 12 weeks of pregnancy, 9.9% from 13 to 20 weeks, and 1% after 21 weeks (Kaiser Family Foundation, 2008; Strauss et al., 2002). Recent controversy regarding procedures for terminating a pregnancy after fetal viability has called attention to ethical and legal dilemmas that are being addressed in the legal system, by most religions, and in other parts of U.S. culture. Opinion polls continually reveal, however, that like Hazel Gereke, the vast majority of Americans favor abortion as an option under specified conditions. A January 2006 CBS News poll revealed that only 5% of respondents said that abortion should “never” be permitted (PollingReport.com, 2006). Global comparisons suggest that there is little to no relationship between legal restrictions on abortion and incidence (Guttmacher Institute, 2009a). For example, abortion rates are about the same in Africa (29%) as in Europe (28%), while there are vast differences in legality. African nations seldom allow abortions in contrast to European countries, where abortion is generally permitted. What is vastly different in these comparisons is the safety of abortion, which is largely ensured when it is legal.

The 25% decline in the rate of induced abortion in the United States between 1990 and 2005 is attributed to better education and increased use of birth control, including abstinence (Centers for Disease Control and Prevention [CDC], 2000; Kaiser Family Foundation, 2008). But, economic disparities continue to increase, with poorer women having a greater proportion of unwanted pregnancies compared with more affluent women. Between 1994 and 2001, the rate of unintended pregnancy among poor women increased by 29%, and the rate of unintended births increased by 44%. During this same period, the rate of unintended pregnancy among women at or above twice the poverty level declined by 20%, and the rate of unintended births declined as well. The social class disparity in abortion rates also increased during this period (Finer & Henshaw, 2006). Because of these combined factors, poor women are five times as likely as their affluent age counterparts to have unintended births. This disparity may be due, in large part, to the fact that poor women are twice as likely as affluent women to have no health insurance (Finer & Henshaw; Sonfield, 2003).

Abortion procedures fall into three categories:

1. Chemical abortion, also known as medical or nonsurgical abortion, uses the drugs methotrexate, misoprostol, and/or mifepristone (Mifeprex or RU-486, “abortion pill”), followed by prostaglandin. This procedure was used
in 13% of all U.S. abortions in 2005 and rose to 25% by 2008, with 98.5% effectiveness for Mifeprex (Fjerstad, Truissell, Sivin, Lichtenberg, & Cullins, 2009). The combined regimen has 92% efficacy if used within 49 days of gestation. Prostaglandin can be used alone but has lower efficacy (Spitz, Bardin, Benton, & Robbins, 1998).

2. **Instrumental or surgical evacuation.** One of two types of procedures was used in 87% of all U.S. surgical abortions as of 2005 (Jones, Zolna, Henshaw & Finer, 2008). The standard first-trimester vacuum curettage, also called manual vacuum aspiration or MVA, is the one most frequently performed in an outpatient clinic. A suction device is threaded through the cervix to remove the contents of the uterus. It is fairly safe, but because it is invasive, it introduces greater risks than the use of prostaglandin. The second-trimester curettage abortion, accounting for 2.4% of U.S. abortions in 2002 (Strauss et al., 2002), requires even greater dilation of the cervix to allow passage of a surgical instrument to scrape the walls of the uterus. If curettage abortion is performed on an outpatient basis, a second visit is required. With both types of instrumental evacuation, the woman faces risks of bleeding, infection, and subsequent infertility. Abortion between 18 to 26 weeks' gestation is referred to as “late-term abortion” and continues to be hotly debated. The Partial-Birth Abortion Ban Act was introduced in the United States in 1995, passed in 2003, and reaffirmed in Federal Court in 2007. This legislation does not prohibit abortion, as sometimes thought, but bans a procedure called intact dilation and extraction, with no health exceptions (Gosten, 2007). Since its passage, 31 states have banned partial-birth abortion, and the debate continues (Kaiser Family Foundation, 2008).

3. **Amniocentesis.** In the second trimester, a saline solution can be infused into the uterus to end the pregnancy. Amniocentesis is used in only 0.4% of abortions and requires the greatest medical expertise and follow-up care.

Regardless of the timing or type of abortion, all women should be carefully counseled before and after the procedure. Unplanned pregnancies typically create considerable psychological stress, and social workers can help pregnant women consider all alternatives to an unwanted pregnancy—including abortion—consistent with the client's personal values and beliefs. Following an abortion, most women experience only mild feelings of guilt, sadness, or regret that abate fairly soon, followed by relief that the crisis is resolved (David, 1996). Nevertheless, some women may have a more severe response and may require ongoing counseling, particularly those women who had faced pre-abortion trauma such as sexual abuse and intimate violence (Charles, Polis, Sridhara, & Blum, 2008; Robinson, Stotland, Russo, Lang, & Occhiogrosso, 2009). Some researchers have found that as many as 40% of women undergoing abortion have prior unwanted sexual experiences (Rue, Coleman, Rue, & Reardon, 2004). Two recently published reviews of studies that examined the relationship between abortion and subsequent emotional trauma concluded that the studies with the most methodological flaws reported the greatest trauma outcomes. This was in sharp contrast to those studies that were of higher quality, providing evidence that emotional trauma was related to preexisting disorders associated with sexual violence (Charles et al., 2008; Robinson et al., 2009). Counseling is also particularly important from a prevention perspective, because women receiving counseling following a first abortion have been found to practice contraception with greater frequency and success (David, 1996). Social workers need to be mindful of their personal views about abortion in order to help a client make an informed decision that reflects the client's values, religious beliefs, and available options. In addition, it is important to assess for prior traumatic experiences.

**Infertility Treatment**

**Infertility,** the inability to create a viable embryo after 1 year of intercourse without contraception (Clark, 2009; Jordon & Ferguson, 2006), is often a life crisis. There are more than 80 million “childless persons” in the world (Bos et al., 2005), but not all by choice. About 5 million women in the United States are impacted by infertility (approximately 1 in 6 couples) and about 10% to 15% are candidates for assisted reproductive technology (ART), including IVF. In 2007, the Centers for Disease Control and Prevention (CDC) reported that 430 registered fertility clinics in the United
States performed a total of 142,415 ART cycles. The ART treatment resulted in 43,408 deliveries and 57,564 infants born (CDC, 2009a). Forty percent of infertility problems reside with the female, 40% with the male, and the remaining 20% are either both the male and female or are unknown (Clark, 2009; Taylor, 2003). The costs of infertility treatment can be staggering, ranging from approximately $17 million spent in 2000 for male infertility surgery to about $18 billion the same year for assisted reproduction technology cycles (Meacham, Joyce, Wise, Kparker, & Niederberger, 2007). Jennifer and Allan Bradshaw are struggling to find a way to afford infertility treatment.

Social workers must be aware that the mind-body connection is clearly seen in the psychological consequences of infertility (Watkins & Baldo, 2004), as Jennifer Bradshaw poignantly conveys. Information about the impact of infertility on the emotional health of couples is limited, and even less is known about counseling strategies for this specialized at-risk population (Lykeridou, Gourounti, Deltsidou, Loutradis, & Vaslamatzis, 2009; Wischmann, Scherg, Strowitzki, & Verres, 2009). Social workers can give increased attention to building resilience in this population with action-focused coping skills, an area that is significantly underexplored (Sexton, Byrd, & Von Kluge, 2010). Studies have shown that women experiencing infertility have a 69.2% risk of lifetime depression compared with 30% for women who do not experience infertility, and this peaks during the second or third year of treatment (Cwikel, Gidron, & Sheiner, 2004; Karjane, Stovall, Berger, & Svikis, 2008; Noble, 2005). Some infertility medications exacerbate depression (Baxter & Warnock, 2007). Anxiety, social stress, isolation, and marital dissatisfaction also have been shown to increase with infertility problems (Clayton, 2004; Cwikel et al.; Newton, Sherrard, & Glavac, 1999; Verhaak et al., 2005; Wilson & Kopitzke, 2002), exacerbating the higher levels of generalized anxiety disorder, panic disorder, and simple phobias that are present before the struggle with infertility begins (Karjane et al., 2008). However, social support, specifically a positive marital relationship, more than any other factor, modifies the psychological distress both during treatment and following failure of IVF (Gibson & Myers, 2002; Verhaak et al., 2005). Women who have experienced childhood or adult sexual abuse and domestic violence have higher rates of gynecological problems, including pelvic inflammatory disease (PID), which contribute to an increase in infertility (Champion, Piper, Holden, Korte, & Shain, 2004; Champion et al., 2005; Cwikel et al.). Chlamydia trachomatis, an STI, is one of the most common causes of infertility and may be transmitted through an involuntary sexual encounter (Cappello, de Macario, Di Felice, Zummo, & Macario, 2009).

The causes of infertility are many. Recent studies have shown that obesity in both men and women (Al-Hasani & Zohni, 2008; Pasquali, 2006; Sallmen, Sandler, Hoppin, Blair, & Baird, 2006; Wilkes & Murdoch, 2009), Polycystic ovary syndrome (PCOS) with associated insulin resistance (Hahn et al., 2006; McGovern et al., 2007; Pasquali, Gambineri, & Pagotto, 2006), high exposure to lead (Chang et al., 2005), ovulation disorders (which sometimes can be modified by a change in diet and lifestyle), blocked fallopian tubes, endometriosis (Taylor, 2003), chromosomal abnormalities, and cervical and uterine congenital defects all affect fertility (Chavarro, Rich-Edwards, Rosner, & Willett, 2007; Kelly-Weeder & O’Connor, 2006; Khawaja et al., 2009). Women who are exposed to pesticides and pollutants (e.g., women who eat fish with high levels of mercury) and women who have high levels of exposure to lead and cadmium also have reduced fertility (Al-Saleh et al., 2008; Mendola, Messer, & Rappazzo, 2008). Black women have been shown to have twice the rate of infertility of White women, even when risk factors such as smoking and obesity are controlled for, but educational and economic disparities contribute to the higher rate of infertility and less utilization of IVF (Jain, 2006; Seifer, Frazier, & Grainger, 2008; Wells et al., 2008).

Defective sperm function is a leading cause of infertility (Aitken, Wingate, De Iullis, Koppers, & McLaughlin, 2006; Bloom et al., 2009), and approximately 67% of men undergoing surgery for infertility had a diagnosis of varicocele, an operable condition (Meacham et al., 2007). Occupational factors—including exposure to leads, pesticides, estrogens, oxidants, plastics, radiation, and heat—have been found to affect male fertility (Aitken, Skakkebaek, & Roman, 2006; Giudice, 2006; Kefer, Agarwal, & Sabenegh, 2009; Phillips & Tanphaichitr, 2008; Sheiner, Sheiner, Hammei, Potashnik, & Carel, 2003). Other factors have been implicated in male infertility, including sitting for extended periods of time (Boggia et al., 2009; Figa-Talamanca et al., 1996) and advanced age (Sloter et al., 2006). About 10% to 15% of male...
infertility is due to genetic problems (an important issue when IVF is considered) (Ferlin, Arredi, & Foresta, 2006). Some studies seemed to indicate that cigarette smoking reduces the volume of semen in men (Kalyani, Basavaraj, & Kumar, 2007; Pasqualotto, Sobreiro, Hallak, Pasqualotto, & Lucon, 2006; Sepaniak et al., 2006), but other studies do not support this finding (Aziz, Agarwal, Nallella, & Thomas, 2006; Gaur, Talekar, & Pathak, 2007). Smoking has been shown to affect circulation levels of estrogen in women and reduces sperm quality (Gaur et al.; Grainger, Frazier, & Rowland, 2006; Kelly-Weeder & O’Connor, 2006), contributing to both male and female infertility. Caffeine and alcohol have been cited as contributors to infertility in men and women, but more recent evidence does not support this (Chavarro, Rich-Edwards, Rosner, & Willett, 2009; Derbyshire & Abdula, 2008; Papachristou Ornoy, 2006; Papachristou et al., 2006).

In the past, infertile couples could keep trying and hope for the best, but medical technology has given today’s couples a variety of options, summarized in Exhibit 2.2. The primary treatment for male infertility, diagnosed by a sperm analysis, is artificial insemination, using fresh or frozen donor sperm injected into the uterus. This was used by the Arabs in the 14th century for horse breeding, but it was not until 1780 that a British surgeon demonstrated its effectiveness with humans (Bullough, 2005). Artificial insemination is also a treatment choice for lesbian couples and single parents (De Brucker et al., 2009). The success rate varies with age of both the male and female (Kdou et al., 2007), the duration of infertility, previous pregnancy history (Pandian, Bhattacharya, Vale, & Templeton, 2005), and the number of cycles. Overall, it is expected that a woman would become pregnant after one cycle 14% of the time and after 12 cycles 77% of the time, but this drops to 52% in 12 cycles for women between the ages of 40 and 45 (De Brucker et al.). The cost is approximately $300 to $500 per cycle. Ethical and legal questions have been raised regarding the legal status of the sperm donor (what parental rights does he have?) and the psychosocial impact on the mother. Sperm donors

<table>
<thead>
<tr>
<th>Male Infertility</th>
<th>Treatment</th>
<th>Female Infertility</th>
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<td>Problem</td>
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<td>Low sperm count</td>
<td>Change of environment; antibiotics; surgery; hormonal therapy; artificial insemination</td>
<td>Vaginal structural problem Abnormal cervical mucus</td>
<td>Surgery Hormonal therapy</td>
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<tr>
<td>Physical defect affecting transport of sperm</td>
<td>Microsurgery</td>
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<td>Genetic disorder</td>
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<tr>
<td>Exposure to work environment substances</td>
<td>Early detection and changes in work environment</td>
<td>Uterine lining unfavorable to implantation</td>
<td>Hormone therapy; antibiotics; surgery</td>
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<td>Alcohol and caffeine use and cigarette smoking</td>
<td>Reduction or abstinence preconception</td>
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<tr>
<td>Advancing age</td>
<td>Sperm banking at younger age; artificial insemination</td>
<td>Alcohol and caffeine use and cigarette smoking</td>
<td>Abstinence preconception (and post to maximize pregnancy outcome)</td>
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Exhibit 2.2  Causes and Cures for Infertility
are routinely screened for genetic defects and physical suitability, but psychological screening remains controversial—in large part because it is nonstandardized and thus easily misinterpreted.

The birth of the first “test tube baby” in 1978, demonstrating the first of many assisted reproductive technologies (ART), initiated a new era in infertility management and research. The first test tube baby was conceived in the United States in 1983, and by 2006 more than 1% of all babies born in the United States were a result of ART (Van Voorhis, 2006). The Fertility Clinical Success Rate and Certification Act, passed in 1992, requires all clinics performing ART to report success rates. Society for Assisted Reproductive Technology (SART) member clinics have developed embryo transfer guidelines that led participating clinics to reduce the number of transferred embryos, and these rates are published (Stern et al., 2007). ART involves the recovery of eggs following hormonal treatment to induce ovulation. Previously frozen eggs may be used, a less expensive and less invasive technique because it does not require removal or hyperstimulation, but the rates of success decrease (Davis & Jocoy, 2008). Donor eggs are often used for women over the age of 40 because the rate of live births using ART decreases with age, from more than 40% for a woman in her late 20s, to 30% at age of 38, and 10% at the age of 40 (Davis & Jocoy). However, recent research shows that the use of luteinizing hormone (LH), growth hormones, and gonadotrophic hormones may support successful later pregnancies (Alviggi, Humaidan, Howles, Tredway, & Hillier, 2009; Derman & Seifer, 2003).

By the time a couple considers the use of ART, they have often struggled with infertility for a long time, emotionally and physically, and may be desperate. But the high cost and limited success rates deter some prospective candidates. Some ART centers require a psychological evaluation of the couple to assess competency to parent, often focusing on issues of stress, guilt, anxiety, depression, and isolation (Hart, 2002). Treatment focuses on decreasing psychological denial and disengagement (van den Akker, 2005), and when conception occurs, treatment centers on decreasing anxiety in order to increase self-esteem and parenting efficacy (Cox, Glazebrook, Sheard, Ndukwe, & Oates, 2006). Infertile women seeking ART have more education and are less likely to have a child than surrogate or adoptive parents (van den Akker). There is current controversy about the use of ART with women who have HIV, although the current rate of transfer of the virus to the fetus is less than 2% (Zutlevics, 2006).

The most common types of ART include the following:

- **IVF.** Many clinics now inject the sperm directly into the egg(s) that is surgically retrieved (known as intracytoplasmic sperm injection), especially when there is low sperm motility. This has been found to increase success rates, but coverage of this procedure varies among states and so utilization of this procedure is often dictated by insurance plans (Check, 2007; Jain & Gupta, 2007). Treatment costs may vary among clinics, with one cycle of IVF costing approximately $10,000. Some clinics allow partial or complete refunds if pregnancy does not occur with higher priced multiple cycle plans, a practice that is sometimes referred to as “shared risk” (Advanced Fertility Center of Chicago, 2009). Success rates vary, but most clinics suggest that with a single cycle of IVF, there is a 30% to 40% success rate for women under the age of 34, with a live birth rate of 28.3% per cycle (Davis & Jocoy, 2008; Toner, 2002), odds slightly lower than what Jennifer Bradshaw was told. Obviously, in impoverished countries where childlessness is a “crippling social taboo,” this procedure is beyond the reach of most of the population (“Cheap IVF Needed,” 2006; Inhorn, 2003).

- **Gamete intrafallopian tube transfer (GIFT).** At one time, GIFT was used in about 25% of infertility cases, but now that IVF has the same success rate, it only represents 1% of ART procedures (CDC, 2009a; Jain & Gupta, 2007). Success rates are not well documented because this procedure is used so infrequently (Davis & Jocoy, 2008), but some estimate a 25% to 30% success rate with many GIFT treatments, resulting in multiple pregnancies (Wilson, 2009). GIFT requires the same procedure as IVF, except that the fertilized ova are surgically returned to the woman's fallopian tubes (Jain & Gupta, 2007).

- **Intrauterine insemination (IUI).** IUI involves bypassing the cervix (usually altered by antibodies or infection) and surgically implanting the ovum and spermatozoa into the uterus. It is a costly procedure, often used during the early stages of endometriosis. Pregnancy success rates are less than with GIFT (Lodhi et al., 2004).
Preservation and gestational surrogacy. This procedure is the harvesting of embryos to preserve for future use. It is often used when women face surgery because of cancer and will not be able to conceive in the future (Plante, 2000). In 2007, there were 10,321 transfers of fresh donor embryos and 5,632 of frozen donor embryos in the United States, resulting in success rates of 55.1% and 31.9% of live births, respectively (CDC, 2009a). Cervical cancer is the fourth most frequent cancer diagnosed in women between 15 and 39 years old, and it directly affects fertility. Recent surgical procedures that avoid hysterectomy have led to increased fertility, but women have a 33% rate of miscarriage in the first two trimesters (Plante, 2006).

Each procedure carries risks. These include multiple gestations, which carry higher risks of maternal and neonate complications. There is a 50 times greater likelihood of having three or more babies with a pregnancy resulting from ART. Multiple births from ART represent about 50% of all multiple-birth pregnancies (Allen, Wilson, & Cheung, 2006; Gurgan & Demiro, 2007; Jain & Gupta, 2007). An increased rate of birth defects also exists; 6.2% of IVF-conceived children have major birth defects compared with 4.4% of naturally conceived children (Van Voorhis, 2006, p. 193). Sometimes IVF-conceived children have rare genetic malformations (Ceelen, van Weissenbruch, Vermeiden, van Leeuwen, Delemarre-van de Waal, 2008). Genetic counseling is strongly encouraged for this population (Geary & Moon, 2006). For men and women with HIV, infertility can be a result of the infection or caused by a separate issue. ART is being used to help women with HIV conceive, and sperm washing is being used to reduce the risk of transferring the virus from the male (Bostan et al., 2008; Semprini, Hollander, Vucetich, & Gilling-Smith, 2008).

All of these procedures except preservation and gestational surrogacy may use donated ova, but that practice has raised further legal and ethical questions, especially regarding parental rights and responsibilities. There are now an estimated 500,000 spare embryos frozen with about 20,000 added yearly. They can be thawed and destroyed, preserved indefinitely, used for stem cell research, or donated (Clark, 2009), but each option is potentially fraught with ethical and political dilemmas. Psychological and emotional issues may also arise, related to the introduction of third-party genetic material, secrecy, and confidentiality.

Although ART was originally limited to married couples, unattached females in increasing numbers are using this method of conception. A growing population of older women is delaying childbirth for a number of reasons: not having a partner (50%); wanting financial security (32%); a career (19%); being unaware of the impact of age on fertility (18%); and only becoming interested in having children later in life (26%) (Hammarberg & Clarke, 2005). Jennifer Bradshaw is among the 19% who delayed childbirth to establish a career. Whatever the reason, when women try to conceive later in life, they often end up using ART. Surrogate mothers have increasingly volunteered to provide the opportunity for gay couples to bear children, also utilizing ART techniques (Ross, Steele, & Epstein, 2006).

Uterine transplant is on the frontier of infertility treatment. This was first done in 2000 but did not lead to a successful pregnancy. It has been successful in animals and is being explored, especially to assist younger women who have had a hysterectomy (Nair, Stega, Smith, & Del Priore, 2008).

Adoption is another alternative for the infertile couple. In 2002, 2% of adults aged 18 to 44 adopted children while the percentage of infants relinquished by never-married mothers declined to only 1% (Jones, 2009). Adoption is not much less daunting than infertility treatment, however. Infertility coupled with exposure to adoptive relationships are the primary motivations for considering adoption (Bausch, 2006). A time-consuming multiphase evaluation, which includes a home study, is required before finalization of custody. The idea of parenting an infant with an unknown genetic heritage may be a challenge for some people, particularly because an increasing number of problems previously thought to be environmentally induced are being linked—at least in part—to genetics. On the positive side, however, some individuals and couples prefer adoption to the demands and uncertainties of ART, and some adoptive parents are also committed to giving a home to children in need of care.
NORMAL FETAL DEVELOPMENT

The 40 weeks of gestation, during which the fertilized ovum becomes a fully developed infant, are a remarkable time. Gestational age is calculated from the date of the beginning of the woman’s last menstrual period, a fairly easy time for the woman to identify. In contrast, fertilization age is measured from the time of fertilization, approximately 14 days after the beginning of the last menstrual period. The average pregnancy lasts 280 days when calculated from gestational age and 266 days from the time of fertilization. Conventionally, the gestation period is organized by trimesters of about three months each. This is a convenient system, but note that these divisions are not supported by clearly demarcated events.

First Trimester

In some ways, the first 12 weeks of pregnancy are the most remarkable. In an amazingly short time, sperm and ovum unite and are transformed into a being with identifiable body parts. The mother’s body also undergoes dramatic changes.

Fertilization and the Embryonic Period

Sexual intercourse results in the release of an average of 200 million to 300 million sperm. Their life span is relatively short, and their journey through the female reproductive tract is fraught with hazards. Thus, only about one or two in 1,000 of the original sperm reach the fallopian tubes, which lead from the ovaries to the uterus. Typically, only one sperm penetrates the ripened ovum, triggering a biochemical reaction that prevents entry of any other sperm. The zygote (fertilized egg) continues to divide and begins about a seven-day journey to the uterus.

Following implantation in the uterine wall, the zygote matures into an embryo. The placenta, which acts like a filter between the mother and the growing embryo, also forms. The umbilical cord connects the fetus to the placenta. Oxygen, water, and glucose, as well as many drugs, viruses, bacteria, vitamins, and hormones, pass through the placenta to the embryo. Amniotic fluid in the uterus protects the embryo throughout the pregnancy.

By the third week, tissue begins differentiating into organs. During this period, the embryo is vulnerable to teratogens—substances that may harm the developing organism—but most women do not know they are pregnant. Exhibit 2.3 shows how some relatively common drugs may have a teratogenic effect in the earliest stage of fetal development. Research is also showing that maternal diet has an influence on brain development. Studies have found that nutritional deficiency in the first trimester results in an increase in brain abnormalities. High fat
diets negatively affect the development of the hippocampus, which helps control long-term memory and spatial navigation. Protein deficiency causes global deficits and problems in the hippocampus and cortex. Iron deficiencies affect processing speed, recognition memory, and motor development and can cause irreversible behavioral and learning deficits. Zinc deficiency affects cognitive development, cerebella development, and attention (Georgieff, 2007; Massaro, Rothbaum, & Aly, 2006; Niculescu & Lupu, 2009). Nutritional deficiencies also are thought to be a potential risk for later development of schizophrenia (Rifas-Shiman et al., 2006). Research has also shown that thyroid hormones play an important role in brain development and that deficiencies, such as iodine deficiency, during the first and third trimesters may lead to later learning disabilities (de Escobar, 2004; de Escobar, Ares, Berbel, Obregon, & del Rey, 2008; Rifas-Shiman et al.; Sethi, 2004).

The Fetal Period

After the eighth week, the embryo is mature enough to be called a fetus (meaning “young one”) (Novak & Broom, 1995), and the mother is experiencing signs of her pregnancy. Usually the mother has now missed one menstrual
period, but if her cycle was irregular, this may not be a reliable sign. Approximately 50% of women experience nausea and vomiting (morning sickness) during the first trimester, as was the case for Felicia Thompson. A few experience vomiting so severe that it causes dehydration and metabolic changes requiring hospitalization. Multigravidas, women who have had a previous pregnancy, often recognize the signs of excessive fatigue and soreness in their breasts as a sign of pregnancy.

Between the seventh and 12th week, the fetal heart rate can be heard using a Doppler device that affords a three- or four-dimensional view leading to early diagnosis of maternal and fetal problems (Kurjak et al., 2005; Merce, Barco, Alcazar, Sabatel, & Trojano, 2009). At 12 weeks, the gender of the fetus can be detected, and the face is fully formed. The fetus is moving within the mother, but it is still too early for her to feel the movement.

Newly pregnant women often feel ambivalence. Because of hormonal changes, they may experience mood swings and become less outgoing. Concerns about the changes in their bodies, finances, the impact on their life goals, lifestyle adjustments, and interpersonal interactions may cause anxiety. Often the father experiences similar ambivalence, and he may be distressed by his partner’s mood swings. Parents who have previously miscarried may have a heightened concern for the well-being of this fetus.

Second Trimester

By the 16th week, the fetus is approximately 19 centimeters (7.5 inches) long and weighs 100 grams (3.3 ounces). The most rapid period of brain development is during the second trimester (van de Beek, Thijsen, Cohen-Kettenis, van Goozen, & Buitelaar, 2004). Recent evidence cautions pregnant women to monitor the eating of fish with higher levels of mercury to avoid negative impact on the infant’s cognitive skills (McDiarmid, Gardiner, & Jack, 2008; Oken et al., 2005). The second trimester is generally a period of contentment and planning for most women, as it seems to have been for Felicia Thompson. For problem pregnancies, or in troubled environments, quite the opposite may occur. However, the fatigue, nausea and vomiting, and mood swings that often accompany the first few weeks usually disappear in the second trimester.

Hearing the heartbeat and seeing the fetus via ultrasound often bring the reality of the pregnancy home. As seen in the story of the Thompsons, quickening—the experience of feeling fetal movement—usually occurs around this time, further validating the personhood of the fetus. Fetal differentiation, whereby the mother separates the individuality of the fetus from her own personhood, is usually completed by the end of this trimester. Many fathers too begin to relate to the fetus as a developing offspring.

Some fathers enjoy the changing shape of the woman’s body, but others may struggle with the changes. Unless there are specific contraindications, sexual relations may continue throughout the pregnancy, and some men find the second trimester a period of great sexual satisfaction. Often during the second trimester the pregnant woman also experiences a return of her prepregnancy level of sexual desire.

Third Trimester

By 24 weeks, the fetus is considered viable in many hospitals. Today, neurosonography can visualize the fetal brain anatomy when central nervous system (CNS) anomalies are suspected (Malinger, Lev, & Lerman-Sagie, 2006). In spite of
fetal viability, parents are not usually prepared for childbirth early in the third trimester. Felicia Thompson, for instance, was not prepared for the birth of her son, Paul, who at 26 weeks' gestation, struggled to survive. Not only are parents not prepared, but the risks to newborns are very great if birth occurs prior to the 26th week of pregnancy. Recent research indicates another caution for mothers during the third trimester: Smoking during this period can affect critical brain development, lead to higher rates of preterm delivery and low-birth-weight infants, and contribute to subsequent behavioral problems (Baler, Vakow, Fowler, & Benveniste, 2008; Huang & Winzer-Serhan, 2006; Jaddoe et al., 2008).

The tasks of the fetus during the third trimester are to gain weight and mature in preparation for delivery. As delivery nears, the increased weight of the fetus can cause discomfort for the mother, and often she looks forward to delivery with increasing anticipation. Completion of preparations for the new arrival consumes much of her attention.

**Labor and Delivery of the Neonate**

Predicting when labor will begin is impossible. However, one indication of imminent labor is *lightening* (the descent of the fetus into the mother's pelvis). For a primipara—a first-time mother—lightening occurs approximately two weeks before delivery. For a multipara, a mother who has previously given birth—lightening typically occurs at the beginning of labor. Often the mother experiences Braxton Hicks contractions, brief contractions that prepare the mother and fetus for labor—what Hazel Gereke referred to as “false labor.” Usually, true labor begins with a show or release of the mucus plug that covered the cervical opening.

Labor is divided into three stages:

1. In the first stage, the cervix thins and dilates. The amniotic fluid is usually released during this stage (“water breaking”), and the mother feels regular contractions that intensify in frequency and strength as labor progresses. Many factors determine the length of this stage, including the number of pregnancies the mother has experienced, the weight of the fetus, the anatomy of the mother, the strength of the contractions, and the relaxation of the mother in the process. Despite the stories that abound, most mothers have plenty of time to prepare for the upcoming birth. Near the end of this phase, “transition” occurs, marked by a significant increase in the intensity and frequency of the contractions and heightened emotionalism. The head crowns (is visible at the vulva) at the end of this stage.

2. The second stage is delivery, when the *neonate* (newborn) is expelled from the mother. If the newborn is born breech (feet or buttocks first) or is transverse (positioned horizontally in the birth canal) and cannot be turned prior to birth, the mother may require a cesarean section.

3. Typically, within one hour after delivery, the placenta, the remaining amniotic fluid, and the membrane that separated the fetus from the uterine wall are delivered with a few contractions. If the newborn breastfeeds immediately, the hormone oxytocin is released to stimulate these contractions.

Following birth, the neonate undergoes rapid physiological changes, particularly in its respiratory and cardiac systems. Prior to birth, oxygen is delivered to the fetus through the umbilical vein, and carbon dioxide is eliminated by the two umbilical arteries. Although the fetus begins to breathe prior to birth, breathing serves no purpose until after delivery. The neonate's first breath, typically in the form of a cry, creates tremendous pressure within the lungs, which clears amniotic fluid and triggers the opening and closing of several shunts and vessels in the heart. The blood flow is rerouted to the lungs.

Many factors, such as maternal exposure to narcotics during pregnancy or labor, can adversely affect the neonate's attempts to breathe—as can prematurity, congenital anomalies, and neonatal infections. Drugs and other interventions may be administered to maintain adequate respiration. To measure the neonate's adjustment to extrauterine life, Apgar scores—rather simple measurements of physiological health—are assessed at one, five, and 10 minutes after
birth. Apgar scores determine the need for resuscitation and indicate the effectiveness of resuscitation efforts and long-term problems that might arise. The other immediate challenge to the newborn is to establish a stable temperature. Inadequately maintained body temperature creates neonatal stress and thus increased respiratory and cardiac effort, which can result in respiratory failure. Close monitoring of the neonate during the first four hours after birth is critical to detect any such problems in adapting to extrauterine life.

PREGNANCY AND THE LIFE COURSE

As the case studies at the beginning of the chapter indicate, pregnancy is a period of transition. Each family member faces changes in role identification and prescribed tasks. Regardless of the age of the parents or number of previous births, the pregnant woman, and the father when involved, must complete four different developmental tasks:

1. The parent(s) must provide for the mother’s safety and that of the neonate throughout pregnancy, labor, and delivery.

2. The parent(s) must help people in her/their social support system to accept this event.

3. The parent(s) must bond with her/their unborn child.

4. The parent(s) must come to terms with the inequality inherent in a parent/neonate relationship (based on Rubin, 1995).

Although the tasks were the same for Felicia Thompson, Hazel Gereke, Cecelia Kin, and their partners, each had very different resources for negotiating the tasks. To some extent, those resources were specific to their position in the life course. Remember, however, that the tasks are the same regardless of maternal age.

Teen Pregnancy

Fifty percent of adolescents in the United States are sexually active, resulting in approximately 700,000 pregnancies per year in women ages 15 to 19, more than 80% of which are unintended (Speidel, Harper, & Shields, 2008). One third are ended by abortion, another 33% result in miscarriage, and the remaining 33% deliver a live infant (Strasburger, 2007). Between 1991 and 2004, when there was a drop in teen pregnancy rates across all categories, overall pregnancy rates for 15- to 19-year-olds declined by 38% (Anderson, 2008; Contraceptive Technology Update, 2005, 2007; Potera, 2007), and abortion rates for adolescents decreased by 50% (CDC, 2008a, 2008b; 2009b). These declines primarily are attributed to abstinence and increased use of contraceptives (Potera, 2007). However, geographical, racial, and ethnic differences abound. Women in New England states demonstrate 19 births per 1,000 adolescent women while in Mississippi the rate soars to 68 births per 1,000 adolescent women, 60% higher than the national average of 42 births per 1,000 adolescent women (CDC, 2009b). Between 1991 and 2004, the pregnancy rates dropped 45% for Black adolescents and 48% for non-Hispanic White teenagers (Moffett, 2007). However, the birth rate among Hispanic and non-Hispanic Black teens remained three times higher than among Whites (Hamilton, Martin, & Ventura, 2007; Ventura, Abma, Mosher, & Henshaw, 2008). This trend was reversed between 2005 and 2007 as teen birth rates rose 1% between 2006 and 2007 (Landau, 2008).

Nevertheless, the United States has the third highest teenage birth rate in industrialized countries, 52.1 per 1,000 adolescent women ages 15 to 19 compared with fewer than seven per 1,000 in Korea, Switzerland, Denmark, the
Netherlands, and Sweden (OECD, 2008; UNICEF, 2001). The social costs are high: An estimated $7 billion is spent each year on adolescent pregnancy, and only one third of the teen mothers are able to earn a high school diploma (Kaplan et al., 2001; Koshar, 2001). Approximately 38% of teens live in poverty, but 83% of adolescents who give birth are from low-income or impoverished families (Klein, 2005). In addition, daughters of teenage mothers are 66% more likely to become teen mothers themselves (Meade, Kershaw, & Ickovics, 2008). Long-term commitment and financial support from the father of the pregnant teen’s child are unusual, further contributing to the isolation and impoverishment of the young adolescent mother.

**Intimate Partner Violence and Teen Pregnancy**

Adolescents are at significant risk for forced sexual intercourse, with an overall rate of 8% of high school adolescents reporting rape, females at twice the rate of males (Howard, Wang, & Yan, 2007). Although it is difficult to accurately determine the number of adolescent pregnancies that are a result of statutory rape, it appears that as many as 66% of the birth fathers are adult males and at least half of the birth mothers in these situations are under the age of 16 (Kandakai & Smith, 2007). Studies have shown that between 45% and 62% of girls who become pregnant had been sexually abused prior to the pregnancy, and the younger the teen is, the more likely the pregnancy resulted from sexual abuse (Kandakai & Smith; Noll, Shenk, & Putnam, 2009). In addition, adolescent males who have been sexually abused have a greater risk of fathering a child than those who have not (Francisco et al., 2008). There is an increased risk of complications among pregnant women who have experienced intimate partner violence (IPV), including low-birth-weight infants, premature delivery, and neonatal death. Moreover, the rate of homicide, the most common form of maternal death, is increased when women are exposed to IPV (Chambless, 2008). In addition, the success of breastfeeding postpartum is compromised by IPV (Kendall-Tackett, 2007; Mohler et al., 2008; Sarkar, 2008). Finally, women who have a past history of abuse have an increased risk of depression and posttraumatic stress disorder and higher risk of postpartum depression (Kendall-Tackett). Witnessing domestic violence has been shown to be a risk factor for teen pregnancy, but the violence often does not stop in the teen’s home. Approximately 25% of teens report violence in their dating relationships, and about half of pregnant teens have been physically abused during their pregnancy (Raphael, 2005; Shadigian & Bauer, 2004). In addition, for teens who live in highly stressful familial environments where there are uncontrollable anger issues and serious familial problems, including sexual and physical abuse, there is a higher pregnancy rate, impacted most specifically by the length of time of the family dysfunction (Hillis et al., 2004). Social workers are often on the front line helping these teens as they struggle with emotional and physical suffering.

**Teen Pregnancy Outcomes**

Teen pregnancy carries medical risks also. Pregnant teens have higher incidences of toxemia (pregnancy-induced high blood pressure), infections, and anemia than adult women, and their neonates are at greater risk for low birth weight, prematurity, and infant mortality than neonates born to adult women (Chedraui, 2008). The rate of prematurity and low birth weight among African American adolescents is twice as high as the rate for Hispanic and European American adolescents. New research is showing that obese pregnant teens experience an even higher risk of cesarean delivery, failure to progress in labor, preeclampsia, pregnancy-induced hypertension, gestational diabetes, low-birth-weight infants, and infants whose weight is greater than the 90th percentile at birth (Sukalich, Mingione, & Glantz, 2006). Although pregnancy-related complications are not limited to teen mothers, it is important for social workers to note that Black women are three times as likely to die from such complications as Caucasian women are (a rate that has risen 33% in the past 100 years) (Population Council, Inc., 1999). Teen abortions comprise 19% of all 1.21 million U.S. abortions (Kaiser Family Foundation, 2008).

Limited financial resources, the inadequate and fragmented facilities often found in impoverished communities, and the normal adolescent avoidance of problems frequently contribute to a delayed diagnosis of pregnancy
for disadvantaged young women. Of course, delayed diagnosis hampers timely prenatal care and limits pregnancy options, increasing the risks of both mortality and morbidity (sickness) for fetus, newborn, and mother.

The experience of pregnancy varies somewhat with stage of adolescence:

- **Young adolescents, ages 10 to 14.** Following years of increases, the pregnancy rate for this group is remaining unchanged at 0.7 pregnancies per 1,000 women ages 10 to 14 (Hamilton et al., 2007, Klein, 2005). Adolescents in this age group are more likely than older teens to delay obtaining prenatal care (East, Khoo, & Reyes, 2006; Hueston, Geesey, & Diaz, 2008). A higher rate of pregnancy complications exists with this age group than with older teens, including higher infant mortality rates (Gilbert, Jandial, Field, Bigelow, & Danielsen, 2004; Markovitz, Cook, Flick, & Leet, 2005). Having a cohesive family, with parents who are actively engaged with the teen and monitor her activities, and positive peer choices are factors that protects against pregnancy at this age (Manlove, Logan, Moore, & Ikramullah, 2008). As the average age of first menstruation decreases, it is not uncommon for girls as young as 10 years old to ovulate. At the same time, the interval between the onset of menstruation and the completion of the educational process has lengthened, increasing the possibility of disrupting pregnant teens’ education and thus predisposing them to a lifetime of poverty. Premature birth is 3.4 times more common for young adolescents than for nonadolescent women, possibly because of the difficulty of meeting the nutritional demands of both the growing fetus and the growing adolescent (DuPlessis, Bell, & Richards, 1997).

- **Middle adolescents, ages 15 to 17.** The rate of teen pregnancies in this age group dropped 46% between 1990 and 2004, from 77.1 per 1,000 in 1990 to 41.5 per 1,000 in 2004 (Moore, 2008). It increased 1% between 2006 and 2007, however (CDC, 2009c). This age group experiences more preterm deliveries and low-birth-weight babies than older teens (Gilbert et al., 2004). Young women at this age have completed most of their physical growth but are still emotionally immature. They may engage in sexual activity to demonstrate independence, maintain status in their peer group, explore self-identity, or experiment with new behaviors. The sense of invulnerability that permeates adolescence often provides a false sense of security.

- **Late adolescents, ages 18 to 19.** This group accounts for two thirds of all births to mothers under age 20. The highest birth rate is among non-Hispanic Black adolescents, followed closely by Native American adolescents (Education Daily, 2008). Interesting differences exist in birth outcomes among the different ethnic groups. Comparatively, White adolescents have the highest overall rate of negative outcomes of any ethnic group when compared with birth outcomes of women in the same racial group ages 20 to 29. African American teens have the highest rate of pregnancy complications, and this has been a historical pattern, but when compared with Black pregnant women ages 20 to 29, the differential is less than that of White women. Asian American women have the best pregnancy outcomes of any ethnic group (Gilbert et al., 2004). The relatively recent phenomenon of “adolescence” has redefined pregnancy for this age group. Until the 20th century, marriage and childbearing were normative during this life stage. Late adolescents who become pregnant tend to be more mature than younger teens and often have a positive relationship with the infant’s father. They are more focused on the future and may have more social supports. However, if the teen's education is disrupted, the pregnancy may be viewed as a major impediment to achieving career goals.

One significant feature of teen pregnancy is the fact that there is a 66% greater chance of a teen giving birth if her mother also bore a child during adolescence (Meade, Kershaw, & Ickovis, 2008). From a family systems perspective, the pregnant teen may be repeating her mother’s behaviors. Research also suggests that younger sisters of pregnant teens, compared with younger sisters without a pregnant older sister, show more acceptance of at-risk behaviors for pregnancy, engage in more problem behaviors, and have more interaction with the older sibling’s social network (East, 1996; East & Shi, 1997). The family’s response to the pregnancy and the teen mother’s emotional stability will significantly influence her parenting behaviors. Positive role modeling of family dynamics and social support are especially important.
Prevention and the Costs of Teen Pregnancy

Many initiatives have focused on pregnancy prevention. In 2004, teen pregnancy in the United States cost at least $9.1 billion for health care, $2.3 billion for child welfare, and $2.9 billion in lower tax revenues (Koch, 2006); and public-supported Medicaid pays for more than 66% of adolescent deliveries (Gavin, Kuo, Adams, Ayadi, & Gilbert, 2005). Prenatal care for adolescents saves between $2,369 and $3,242 per delivery, with variations because of the time of initiation of care (Hueston, Quattlebaum, & Benich, 2008). The role of sex education is controversial in the United States and reached a fevered pitch during the Bush administration’s promotion of abstinence-only programs. Although there are conflicting studies, most research shows that comprehensive sex education reduces the likelihood of teen pregnancy more than abstinence-only programs (Kohler, Manhart, & Lafferty, 2008; Santelli, Lindberg, Finer, & Singh, 2007). It is important for social workers to be aware of the various prevention models, policies, and funding that provide prevention programs to this high-risk group. Effective prevention programs must also consider issues outside the pregnancy, such as violence and substance abuse.

The role and needs of the adolescent father have been woefully neglected in the research on adolescent pregnancy. Almost 50% of all high school males have sexual intercourse, and they are likely to have four or more sexual partners during this life phase. Approximately 71% report using a condom during their first sexual encounter (Troccoli, 2006). Approximately 17.4 males per 1,000 between the ages of 15 and 19 become fathers in the United States (Kimball, 2004). An extensive study has shown that teen fathers who remain connected with their children enjoy the interactions with their children and are more invested in their children than older fathers (Fitzgerald & McKelvey, 2005). Often teen fathers have fewer financial resources, limited education, and fewer opportunities to juggle the demands of adolescence and fatherhood, and although they want to remain involved with their baby, the challenges sometimes prove to be too great (Kimball). It is important to engage the fathers in coparenting (Fagan, 2008) and provide supportive interventions (Dallas, 2009). For these reasons, many programs targeting teen mothers also provide services to engage teen fathers.

Early Adulthood Pregnancy

Physiologically, a young woman in her 20s and 30s is at the optimal age for pregnancy. Psychologically, young adults are involved in establishing life goals, and these often involve parenthood. Thus, pregnancy during this period of the life course is a normative event in most cultures. Research suggests that even during the prime childbearing years, women who have appropriate social support are healthier psychologically and physically during their pregnancies, especially among women who have a high-risk pregnancy (Cannella, 2006; Giurgescu, Penckofer, Maurer, & Bryant, 2006).

Often a woman in her second or third decade of life is actively employed. Legal, physical, and social considerations exist related to maintaining employment during pregnancy. Pregnant women are protected by two federal laws, the Pregnancy Discrimination Act (PDA), which amended Title VII of the Civil Rights Act of 1964 (Habig, 2008, p. 1215) and the United States Family and Medical Leave Act (FMLA), which directs employers on how to comply with the PDA (HR Specialist, 2009). The PDA states that a pregnant woman cannot be denied a job or be fired because of her pregnancy, nor can she be forced out of the workplace as long as she can complete her job requirements (HR Specialist). Pregnancy is not considered a disability, so it is not covered under the American with Disabilities Act (Habig). However, at times, some employers consider all women of childbearing age in the “flight-risk category” (Williams, 2000, p. 2169), and the PDA was developed to protect all women in their childbearing years from discrimination (Habig). In 2007, the Equal Employment Opportunity Commission (EEOC) experienced a 14% increase in pregnancy-based work complaints, and in 2008 there were 5,587 complaints (up 40% from the previous year) and 20,400 inquiries about pregnancy discrimination (Shellenbarger, 2008).
There have been numerous challenges to the PDA, and courts have interpreted the law in multiple ways (Piedra, 2008); this remains an area requiring social work advocacy. Employers are not required to provide insurance coverage for contraceptives (Habig, 2008; Pugh, 2007), or to pay for maternity leave (HR Specialist, 2009). It is expected that the number of complaints against employers will rise as more women are aware of their rights and they attempt to juggle careers and pregnancy.

**Delayed Pregnancy**

An increasing number of women are delaying childbirth until their late 30s and 40s, even into their 50s and 60s; the average age of first-time mothers has increased from 21.4 in 1970 to 25 in 2006 (Mathews & Hamilton, 2009). The percentage of women giving birth after 35 has increased from 1 in 100 births in 1970 to 1 in 12 in 2006 for married women (Mathews & Hamilton), and 1 in 6 births for single women over the age of 30 (Ventura, 2009). Differences exist across racial groups, with first births to women over 35 occurring in 5.6% of non-Hispanic Whites, 3.2% of African Americans, 1.9% of Puerto Ricans, and 1.4% of Mexican Americans (Khoshnood, Wall, & Lee, 2005). One specialist posits that delayed childbearing is primarily the result of men building their careers rather than women making the choice (Ryan, 2009). Many have been struggling with infertility for several years; others, like Jennifer Bradshaw, deliberately have chosen to wait until their careers are established. Other women are choosing to have children with a new partner. Some single women, driven by the ticking of the so-called biological clock, finally choose to go ahead and have a child on their own, often using artificial insemination (Hammarberg & Clarke, 2005).

As a result of the increasing success rate of infertility treatment, there are reports of women bearing their own child or their grandchild(ren) at an elderly age. One single woman reportedly misrepresented her age when she sought infertility treatment, and with the assistance of IVF delivered twin boys at the age of 66. The toddler boys were orphaned in 2009 when their mother died of the cancer diagnosed shortly after she gave birth (Pykett, 2009). In recent years, there have been news reports of a woman who gave birth to her triplet grandchildren after IVF (Weingartner, 2008), and another woman, who was a surrogate mother for her daughter-in-law, delivering twin girls (Medical News Today, 2004).

Waiting until later in the life cycle to reproduce increases pregnancy risks. Although most women acknowledge that they may encounter fertility issues if pregnancy is delayed, approximately 85% of women who know they have fertility problems and are over the age of 30 believe that IVF will overcome the effects of age. As with Jennifer and Allan Bradshaw, they may be faced with a rude awakening when they start the process. If pregnancy is successful, the risks are substantial for prematurity and genetic anomalies. Although non-Hispanic Whites make up the largest proportion of women who deliver after the age of 35, 10.6% of older African American women deliver low-birth-weight babies (compared with 4.9% for non-Hispanic Whites, 7.6% for Puerto Ricans, and 5.3% for Mexican Americans (Khoshnood, Wall, & Lee, 2005). Women over 30 have increased risk of caesarean delivery and preterm labor, with women who have already had a delivery having fewer complications than women with their first pregnancy at this time of life (Brunner, Larisswa, & Huber, 2009; Chan & Lao, 2008). An increased chance of maternal and infant mortality exists as the maternal age increases (Joseph et al., 2005). Finally, advanced paternal age has been shown to increase the risk of prematurity, with fathers over the age of 34 more likely to have a premature baby than a teenaged father, when controlled for maternal age. No race or ethnicity differences were found in risk for the fathers (Reichman & Teitler, 2006).

Women who choose later pregnancy have increased challenges. They have higher incidences of preconceptual complications such as diabetes, hypertension, and high cholesterol, but this may be counterbalanced by healthier behaviors, fewer gynecological infections, and fewer psychosocial stressors than experienced by younger women (Weisman et al., 2006). For women in their early 30s, there is a 15% chance of pregnancy each month with a miscarriage risk of 20%; for women older than 35, there is a 10% chance of pregnancy each cycle with a 25% chance of miscarriage and 1/350 chance of Down
syndrome. For women over 40, the rates of pregnancy per month drop to less than 5% naturally (about 10% with IVF), the rate of miscarriage is about 33%, and 1 in 38 babies is born with genetic anomalies. It is expected that all of the eggs of women over 45 are abnormal, and there is less than a 1% chance of pregnancy in one month, with a miscarriage rate of more than 50% and genetic problems in about 1 in 12 pregnancies (Southern California Center for Reproductive Medicine, 2009).

RISK AND PROTECTIVE FACTORS IN CONCEPTION, PREGNANCY, AND CHILDBIRTH

Despite significant advances in the medical management of pregnancy and childbirth, the United States ranks 30th in the world in infant mortality, worse than most industrialized nations (MacDorman & Mathews, 2009). In 2003, there were 12.1 maternal deaths per 100,000 live births in the United States (Hoyert, 2007). Thus, the understanding and prevention of risk factors, the characteristics that increase the likelihood of a problem, are of particular concern. Risk factors include biological, psychological, social, familial, environmental, and societal dimensions. Like risk factors, protective factors, which help reduce or protect against risk, also range from biological to societal dimensions. Exhibit 2.4 presents selected risk and protective factors for conception, pregnancy, and childbirth.

Social workers must be knowledgeable about the risk and protective factors that are associated with the most commonly occurring problems they address with individuals and families. It is also critical that social workers remember that the presence of a risk or protective factor cannot totally predict any one outcome. Even when a risk factor is present, it may not be sufficient to result in the related outcome, or the effect may have a rather broad range of impact. For example, pregnant women’s prenatal heroin use is known as a risk factor for their children’s intelligence, but children exposed to heroin in the womb have had IQ scores ranging from 50 to 124 (Wachs, 2000). Another consideration is timing. One child with a defective gene may experience the onset of a genetic illness much earlier or later than another child with the same gene.

And finally, most outcomes are determined by several factors. Seldom is one environmental, social, or biological risk factor solely responsible for an outcome (Epps & Jackson, 2000). We are unlikely to ever be able to predict all the developmental patterns that might result from a given set of risks (Vallacher & Nowak, 1998; Wachs, 2000).

One explanation for the great variability in individual outcomes when risk factors are present is the concept of resiliency, or the ability to cope and adapt (Garmezy, 1993; Werner, 2000). Both individuals and families are faced with stressful situations, chronic or crisis, over the life course (Walsh, 2006). And both the individual and family may possess characteristics that have been identified as the ability to bounce back, respond, adapt, or successfully cope with these life events. Certain family characteristics related to resiliency—such as good communication and problem-solving processes—can serve as protective factors for individual development (Walsh). Family risk factors with individual impact may include marital discord and inadequate parenting skills. Throughout this chapter risk and protection themes emerge. Financial stability, available health care resources, and social support are recurring protective factors that relate to better outcomes. Major risk factors include maternal age (younger and older), nutritional deficiencies, parental genetic makeup, prematurity, and poverty.

Critical Thinking Questions 2.2

Pregnancy is a powerful experience for the pregnant woman as well as for her partner. What are the biological needs of the pregnant woman? The psychological needs? The social needs? Where there is an involved father, what are the biological needs of the father? The psychological needs? The social needs?
The events related to childbearing are affected by economic, political, and social forces. Social workers are well equipped to address the needs of all persons of reproductive age that derive from these forces. Although most pregnancies result in favorable outcomes, for those that do not social workers can play an important role. Moreover, many negative outcomes can be prevented through social work interventions, prenatal care, childbirth education, introduction to new medical technologies, and genetic counseling. The social worker who participates in these interventions requires knowledge of, and collaboration with, a range of other professionals.

**Problem Pregnancies**

In some sense, each of the pregnancies described at the beginning of this chapter is a problem pregnancy. Pregnancy can become problematic for a variety of reasons, but only four types of problem pregnancies are discussed here: undesired pregnancy, ectopic pregnancy, miscarriage and stillbirth, and maternal brain death.
Undesired Pregnancy

Approximately three million unplanned pregnancies per year in the United States result in a live birth (Afable-Munsuz & Braveman, 2008). This number has increased in recent years, especially among women 15 to 24 (18.6% of births) (Kissin, Anderson, Kraft, Warner, & Jamison, 2008). More than two thirds of these women are not married (National Campaign to Prevent Teen and Unplanned Pregnancy, 2008). It is estimated that 1.94 million unintended pregnancies are prevented each year through publically funded family services (Guttmacher Institute, 2009b). Clearly the women who find themselves pregnant or who are at risk for unintended pregnancies face many challenges, including a higher risk of pathological anger and rejection of the infant after birth (Brockinton, Aucamp, & Fraser, 2006). Pregnancies that are unplanned are a problem because they are associated with increased stress. A higher incidence of intimate partner violence exists both during the pregnancy and after delivery among women in this situation (Charles & Perreira, 2007). In addition, women experiencing an undesired pregnancy have a higher rate of smoking and using illicit drugs during pregnancy, and often wait until the third trimester to initiate care (Orr, James, & Reiter, 2008). The rates of unintended pregnancies are higher among Black and Latina women (35 and 40 per 1,000, respectively, compared with 22 per 1,000 among all women in the United States), those without a college education, unmarried women, and women who are poor (Afable-Munsuz & Braveman; Matson, Peipert, Allsworth, Phipps, & Redding, 2006). Often women in unplanned pregnancies experience higher risk for inadequate prenatal care, health problems late in the pregnancy and right after birth, and significant postnatal problems. A higher risk of preterm birth also exists (Afable-Munsuz & Braveman). Of particular concern for social workers is the growing disparity of unwanted pregnancy related to income.

Ectopic Pregnancy

An ectopic pregnancy occurs if the zygote implants outside the uterus, 93% of the time in the fallopian tubes (Murano & Cocuzza, 2009). The incidence of ectopic pregnancy rose sixfold in the United States between 1970 and 1992, the last year that the CDC collected data. During, and since, this same time period, morbidity and mortality have substantially decreased (Kdous, 2006). Each year more than 100,000 pregnancies are terminated because of ectopic implantation, and it accounts for more than 9% of the maternal deaths in the first trimester (Ehrenberg-Buchner, Sandadi, Moawad, Pinkerton, & Hurd, 2009; Murano & Cocuzza; Walling, 2001). Although more than 50% of women presented with an ectopic pregnancy have no known risk factors (Brown-Guttovz, 2006), women who have had previous ectopic pregnancies, tubal damage from surgeries or infection (especially Chlamydia trachomatis, a major cause of pelvic inflammatory disease), a history of infertility, a previous abortion, IVF, IUD use, or a maternal age over 35 or under 25 are at greater risk for an ectopic pregnancy (Ankum, 2000; Blandford & Gift, 2006; Jaffe, 2006).

Ultrasound, or transvaginal sonography (TVS), is now a common obstetrical procedure used in early pregnancy in the United States and can detect an ectopic pregnancy within the first trimester (Bourne, 2009). Early diagnosis has resulted in innovative surgical and nonsurgical options (Ehrenberg-Buchner et al., 2009; McLaren et al., 2009). When found within the first 6 weeks of pregnancy, ectopic pregnancy is typically treated with medication (methotrexate), which has been found to be 89% effective (Ehrenberg-Buchner et al.); otherwise, abdominal surgery is necessary (Api et al., 2006; Cooper, 2000). Without early diagnosis, abdominal pain and vaginal bleeding are nonspecific and only occur in 50% of the patients with an ectopic pregnancy (Brown-Guttovz, 2006). If tubal rupture occurs, the situation is life threatening and requires a visit to the emergency clinic. TVS, coupled with the measurement of pregnancy hormonal levels, decreases maternal mortality (Bourne; Guvendag, 2006; Splete, 2002). However, because the diagnosis of ectopic pregnancy cannot be made without sophisticated medical equipment, all sexually active women with lower abdominal pain and vaginal bleeding should be evaluated (Tay, Moore, & Walker, 2000). Only 30% of women with an ectopic pregnancy will have difficulty with subsequent conception (Brown-Guttovz).
Miscarriage and Stillbirth

**Miscarriage** is the naturally occurring loss of a fetus prior to 20 weeks of gestation—a *spontaneous abortion*. Approximately 10% to 20% of all clinically recognized pregnancies end in spontaneous abortion, often without a discernible cause and often unrecognized by the mother (Neugebauer et al., 2006). Recurrent miscarriage, three or more consecutive miscarriages, occur in 2% to 3% of women and are usually caused by chromosomal abnormalities, metabolic disorders, immune factors, problems with the woman's reproductive anatomy, or metabolic disorders (Horn & Alexander, 2005). Approximately 70% of these women ultimately are able to conceive (Kiwi, 2006; “New Concepts on the Causes of Recurrent Miscarriages,” 2006). Recent research focusing on the causes of miscarriage point to multiple potential factors, including fetal chromosomal anomalies (Christiansen, Nielsen, & Kolte, 2006), sickle cell trait (Taylor et al., 2006), uterine cancer (Critchley & Wallace, 2005), polycystic ovary syndrome (PCOS) (van der Spuy & Dyer, 2004), rubella (Edlich, Winters, Long, & Gubler, 2005), number of members in a household, coffee consumption, number of pregnancies, history of abortion (Nojomi, Akbarian, & Ashory-Moghadam 2006), stress (Nepomnaschy et al., 2006), and obesity (Yu, Teoh, & Robinson, 2006). At greater risk are those women who are African American, have less education, and of lower socioeconomic status, especially with income below the poverty level (Price, 2006).

An estimated 20.9% of threatened spontaneous abortions become complete abortions (Buss et al., 2006). If the abortion is incomplete, any placenta or fetus that is not expelled must be surgically removed or the mother risks hemorrhage and infection. Counseling of women who struggle with miscarriages focuses on genetics and the biopsychological needs of the woman and her family (Laurino et al., 2005; Neugebauer et al., 2006).

Stillbirth is defined as the fetal loss at 20 weeks or later and accounts for 60% of all perinatal mortality. Each year, more than 4 million stillbirths occur annually, most in impoverished countries (McClure, Nalubamba-Phiri, & Goldenberg, 2006; Nhu et al., 2006). In the United States approximately 25,000 stillbirths occur annually, 37.9 per 10,000 births with 3.2 per 1,000 occurring between 20 and 27 weeks and 4.3 per 1,000 after 28 weeks (Ananth, Liu, Joseph, Kramer, & Fetal and Infant Health Study Group of the Canadian Perinatal Surveillance System, 2008; Barclay, 2009). Approximately 8% to 13% of fetal deaths at this gestational period are caused by chromosomal and genetic abnormalities, with other risks including obesity, advanced maternal age, and women with no previous pregnancies. African American women experience 2.2 times greater chance of stillbirth than non-Hispanic White women, with higher education reducing the hazard for stillbirth more for Caucasian women than for Black women (Willinger, Ko, & Reddy, 2009). Women who had a preexisting mental illness prior to pregnancy have a greater rate of fetal loss (Gold, Dalton, Schwenk, & Hayward, 2007), and women who have been victims of domestic violence are also at greater risk. There is a greater chance of subsequent pregnancies ending in stillbirth once this has occurred (Barclay). In cases of stillbirth, labor generally proceeds immediately and is allowed to occur naturally. But the pregnancy may continue for several days following cessation of movement. Although this wait can be distressing for the mother, cesarean sections are usually avoided because of the high number of complications for the mother (Barclay). Stillbirths are often unexpected, resulting in great stress and anguish for parents, who blame themselves and struggle with unresolved guilt. Social workers can help parents to understand and cope with the strong emotions they are experiencing.

Maternal Brain Death (Postmortem Pregnancy)

Until recently, if a pregnant woman suffered irreversible brain death, the death of the fetus was almost inevitable. Today recent technological advances can maintain the woman on life support for up to five months, allowing for the maturation of the fetus before delivery (Catlin & Volat, 2009). To date there are reports of 22 postmortem pregnancies worldwide, and all but two have resulted in the delivery of a live infant. Although the ability to support a woman who is brain dead physiologically until the fetus is more mature is relatively new, Julius Caesar was born by cesarean section after his
mother died (Sperling, 2004). Factors that promote successful fetal outcomes include appropriate resuscitation, prompt diagnosis of brain death, and adequate maternal nutrition (Hussein, 2004; Mallampalli & Guy, 2005; Souza et al., 2006). Legal and ethical issues are also raised by supporting a mother until delivery of the fetus, including organ harvesting, the rights of the fetus and the mother, and consideration of family member’s decisions (Hussein; Hussein, Govenden, Grant, & Said, 2006; Lane et al., 2004; Sperling). It is common law that the fetus is denied the right of legal protection, and this was supported in Roe v Wade, where the 14th amendment was cited as not including the unborn as a person (Sperling, 2006). Social workers often participate as members of medical ethics teams where such issues are deliberated.

**At-Risk Newborns**

Not all pregnancies proceed smoothly and end in routine deliveries. There are more than 540,000 babies born too early in the United States and 13 million worldwide. In the United States, the rate of premature birth rose 31% between 1981 and 2007, and in 2007 12.7% of all births were early (Cantor, 2007; Gaylord, Greer, & Botti, 2008; Johnson & Chavkin, 2007; Kent, 2009; March of Dimes, 2010). This is one of the highest rates in industrialized countries (Johnson & Chavkin) and much higher than the targeted rate of 7.6% proposed in the Healthy People's Initiative goal for 2010 (Rabin, 2009). In 2007 Mississippi led the country with a premature birth rate of 18.3%, and Puerto Rico's rate was 19.4% (March of Dimes; Rabin). There is a disparity in the rates of prematurity among different ethnic groups. One in five of births to African American women is premature, compared with 1 in 8 for non-Hispanic White women. The African American infant has a mortality rate two to three times higher than non-Hispanic White women (Kent; MacDorman & Mathews, 2009), but there is some question as to whether the number of Black deaths is accurately reported (Wingate & Alexander, 2006). The rates for American Indian, Alaskan natives, and Puerto Rican premature births are also higher than those for the non-Hispanic White woman, but Asian, Pacific-Islander, Central and South American, Mexican, and Cuban rates are lower than for non-Hispanic White women (Damus, 2008; Grady, 2009; Reedy, 2007). Increased research attention is being given to the interplay between biological determinants and social patterns that may contribute to prematurity (Kramer & Hogue, 2009).

In 2005, the cost of preterm birth in the United States was $26.2 billion or $51,600 per infant during the initial hospitalization (Cantor, 2007). Costs for the first year of life for an infant born at fewer than 28 weeks’ gestation soar to $181,000, and to $85,000 for the infant born between 28 and 31 weeks (Silber et al., 2009). Prematurity is the leading cause of death in infancy, with two thirds of infant deaths linked to prematurity (Callaghan, MacDorman, Rasmussen, Cheng, & Lackritz, 2006). Several policy initiatives in the United States address the issue of prematurity. Passage of the Prematurity Research Expansion and Education for Mothers who Deliver Infants Early ([PREEMIE] PL 109-450) Act in 2006 mandated interagency coordination, improved data collection, and education for healthcare professionals (Cantor, 2007; Damus, 2008; GovTrack.us, 2006; Spong, 2009). The March of Dimes National Prematurity Campaign and the 2008 Surgeon General’s Conference on prematurity also have brought increased attention to this serious health problem (Damus).

**Prematurity and Low Birth Weight**

A radical shift has occurred in our culture over the past 20 years: at first glance the desire for a positive pregnancy outcome has been replaced by the assumption that the pregnancy will be flawless and the baby will be perfect; yet, there is parental anxiety about maternal health and that of the baby (Tiran & Chummun, 2004). Prematurity is the leading cause for illness and death in obstetrics (Reedy, 2008) and can have a profound long-term effect on the family (Carvalho, Linhares, Padovani, & Martinez, 2009).

Approximately 70% of preterm births occur at 34 to 36 weeks’ gestation (40 weeks is full gestation) and are referred to as **late-preterm births** (March of Dimes, 2009). These babies may weigh more than 2,500 grams but are
still premature. Between 1990 and 2006, the rate of late preterm births rose 20%, with about 900 late preterm babies born each day in the United States. There appears to be minimal difference in this rate based on race or maternal age (Martin, Kirmeyer, Osterman, & Shepherd, 2009). Previously it was considered that babies born closer to their due date had fewer complications, but new evidence shows that they are at risk for possible neurodevelopmental problems, feeding and respiratory difficulties, and poor temperature regulation (Darcy, 2009; Reedy, 2008). These infants have increased rates of readmission to the hospital during their first year of life, higher health costs, and greater morbidity than full-term infants (McLaurin, Hall, Jackson, Owens, & Mahadevia, 2009).

**Low-birth-weight (LBW)** infants—infants weighing less than 2,500 grams (5 pounds 8 ounces) at birth—account for 65% of all premature births (Darcy, 2009). Infants under 2,500 grams account for 7.9% of births, those between 2,000 grams (4.4 pounds) and 2,499 grams (5.5 pounds) account for 4.9% of births, and those between 1,500 grams (3.3 pounds) and 1,999 grams (4.4 pounds) account for 1.4% of births (CDC, 2009d). In the past it was postulated that LBW infants had fewer long-term complications than more immature infants, but there may be more risk than expected (Reedy, 2007). LBW infants are six times more likely to die in the first week of life compared with a full-term infant and have a mortality rate in the first year three times greater (March of Dimes, 2009).

The rate of **very low-birth-weight (VLBW)** infants—infants weighing less than 1,500 grams (3 pounds 3 ounces)—has increased from 1.15% of all births in 1980 to 1.4% in 2007, primarily as a result of multiple births (often a complication of ART) (CDC, 2009d; Hoyert, Matthews, Menacker, Strobino, & Guyer, 2006; Lucille Packard Children's Hospital, 2010). Children born at this weight have a greater risk for poor physical growth (Datar & Jacknowitz, 2009), learning disabilities, and behavioral problems (March of Dimes, 2009). Infants born in rural areas have lower success rates than those born in urban areas, possibly as a result of less access to neonatal intensive care units (NICUs) (Abdel-Latif et al., 2006). There are significant racial differences in the number of VLBW infants born, with African American women having a higher premature delivery rate (Reedy, 2008).

**Extremely low-birth-weight (ELBW)** infants—infants weighing less than 1,000 grams (2.2 pounds)—experience approximately a 50% to 80% survival rate (Gargus et al., 2009). Delivery rates decrease as the neonate’s weight decreases, with those between 500 grams (1.1 pounds) and 999 grams (2.2 pounds) representing 0.6% of those born prematurely and those under 500 grams (less than 1.1 pounds) only representing 0.2% (CDC, 2009d). One large study found that 18 months after birth, 40% of ELBW infants had died, 16% were unimpaired, 22% had mild impairments, and the same percentage had moderate to severe neurodevelopmental impairments. Less than 1% of infants born weighing less than 500 grams survived free of impairments (Gargus et al.). Paul Thompson is considered an ELBW newborn, and at approximately 540 grams, he has a 50% chance of survival.

About 30% of LBW births can be attributed to perinatal environmental factors, such as maternal illness (e.g., stress and genital infections), some maternal working conditions, smoking, poor maternal weight gain during pregnancy along with being underweight before the pregnancy, intrauterine infections, and maternal short stature (Goldenberg, Hauth, & Andrews, 2000; Heck, Schoendorf, & Chavez, 2002; Spencer & Logan, 2002). More than 50% of children are born to mothers who work during their pregnancy, and some work conditions pose risk of prematurity. Women who have high job stress, moderate or low social support, a demanding posture for 3 hours per day, and whole-body vibrations have an increased risk of premature delivery (Croteau, Marcoux, & Brisson, 2007).

One of the greatest risk factors for the infant’s decreased birth weight (LBW, VLBW, ELBW, or intrauterine growth retardation) is maternal smoking. Women who smoke have smaller babies, with female neonates more negatively affected than males (Ling, Lian, Ho, & Yeo, 2009; Suzuki et al., 2008; Volgt, Hermanussen, Wittwer-Backofen, Fusch, & Hesse, 2006). Other risk factors for prematurity, LBW, and VLBW include alcohol and other drug use (especially polydrug and cocaine use) (Bada et al., 2005; Sokol et al., 2007). Also, advanced maternal age (greater than 30), high blood pressure, and a nontechnical/nonprofessional paternal occupation (perhaps a measure of socioeconomic status) are associated with repetitive premature deliveries (Sclowitz & Santos, 2006). Obesity, adolescent pregnancy, diabetes, late or inadequate prenatal care, a male infant or a multiple pregnancy, or a previous cesarean section also increase the risk of prematurity (Guillory, Cai, & Hoff, 2008). Finally, mothers enrolled in Medicaid have increased rates of prematurity.
and infant death compared with mothers enrolled in nonpublic insurance plans (Brandon et al., 2009). The mother’s adequate nutrition prior to conception, as well as during pregnancy, is another important factor in fetal health. Risk is decreased by gaining between 20 and 35 pounds with a singleton pregnancy if the mother’s pre-pregnancy weight was normal. If the mother was underweight, a gain of 28 to 40 pounds is recommended compared with 11 and 20 pounds if the mother was obese (Hitti, 2009; Institute of Medicine, 2009). Children born prematurely are at risk for lower IQ scores (Narberhaus et al., 2007; Weisglas-Kuperus et al., 2009), and more impairments in language and visual motor skills (Ortiz-Mantilla, Chourdhury, Leevers, & Benasich, 2008). Prematurity also contributes to developmental delays (Delgado, Vagi, & Scott, 2007; Kalia, Visintainer, Brumberg, Pici, & Kase, 2009) and cognitive disabilities (Petrini et al., 2009) as well as higher attention problems and self-regulatory problems (Aarnoudse-Moens, Weisglas-Kuperus, van Goudoever, & Oosterlaan, 2009). Preterm birth accounts for one third of all cases of cerebral palsy (Wenstrom, 2009) and carries a higher risk of neonatal seizures (Petrini et al.). Thus, the Thompsons have reason to wonder what the future holds for their baby. In spite of the risks associated with preterm birth, the first cohort of survivors is now reaching early adulthood, and early studies are heartening because their high school graduation rates are equal to their normal birth weight peers (Saigal et al., 2006).

The survival rates of premature infants have improved largely because of explosive growth in the field of neonatal medicine and the establishment of regional NICUs. Studying the long-term effects of prematurity is difficult because today’s 5-year-old who was LBW received significantly less sophisticated care than the current patients in the NICU. It is proposed that the vulnerability of the premature brain during this critical period of fetal development is negatively affected by the stressful neonatal environmental conditions (Elley, 2001; Perlman, 2001). Therefore, neonatal environmental conditions may be as much of a risk factor for negative pregnancy outcomes as simple prematurity (Als, Heidelise, & Butler, 2008).

Newborn Intensive Care

As the Thompsons know all too well, parents’ expectations for a healthy newborn are shattered when their child is admitted to an NICU. Their fear and anxiety often make it hard for them to form a strong emotional bond with their newborn. About 90% of mothers and 80% of fathers report that they develop an attachment to the infant during the third trimester of pregnancy. But when an infant is premature, the parents have not had the same opportunity. In addition, the fear that a sickly newborn may die inhibits some parents from risking attachment. Mothers of VLBW infants visit the newborn significantly less than do mothers of infants who weigh more; for fathers, visitation is influenced by geographical distance and the number of other children in the home (Latva, Lehtonen, Salmelin, & Tamminen, 2007). Some parents are consumed with guilt about their baby’s condition and believe that they will only harm the newborn by their presence. The NICU experience places the mother at risk of depression, but it also has been found that short-term psychotherapy can reduce stress and promote visitation (Friedman, Kessler, & Martin, 2009). Felicia and Will Thompson had to work hard to contain their anxiety about Paul’s frailties.

Early disruption in bonding may have a larger long-term impact on the child than the infant’s actual medical condition (Wigert, Johannson, Berg, & Hellstrom, 2006). The response has been a movement toward family-centered NICU environments, which are structured to promote interaction between the infant and the parents, siblings, and others in the family’s support system. Mothers seem to more readily engage in caring for their infants in this environment than fathers (Johnson, 2008). Ample opportunity to interact with Paul facilitated Felicia and Will Thompson’s attempts to bond with him.

Neuroscientists have recently called attention to the physical environment needs of prematurely born babies, noting the competing needs of these vulnerable babies and the medical staff that care for them in NICUs. The medical staff needs lights, noisy equipment, and alarms to signal physiological distress. The vulnerable baby needs a physical environment that more nearly approximates the uterus, without bright lights and stressful noise stimulation (Brandon, Ryan, & Barnes, 2008; Zeisel, 2006). With this discrepancy in mind, NICUs are being modified to accommodate the neurological needs of the vulnerable newborns.
Neonatology, the care of critically ill newborns, has only recently been recognized as a medical specialty. It is a much-needed specialty, however. Since the advent of the NICU in the 1970s, the survival rate of critically ill neonates has continued to increase. It is highly unlikely that Paul Thompson would have survived in 1970. Social workers in a NICU must negotiate a complex technological environment requiring specialized skill and knowledge while attempting to respond with compassion, understanding, and appropriate advocacy. Research has clearly shown the need for social work intervention that enables the parents to bond with their children and decrease the level of stress (Spielman & Taubman-Ben-Ari 2009). It helps to remember that the effort could affect a neonate's life course.

Major Congenital Anomalies

Overall, only 2% to 4% of all surviving newborns have a birth defect. However, the number of neonates born with anomalies caused by genetics, exposure to teratogens, or nonhereditary factors that affect development of the fetus does not reflect the number of abnormal embryos. Fewer than half of all fertilized ova result in a live birth; the rest are spontaneously aborted. The probability that a fertilized ovum with a genetic anomaly will abort spontaneously ranges from 80% to 90% (Opitz, 1996). Social workers need to be mindful of the low probability that a child will be born with a genetic disorder or congenital anomaly when responding to parental fears. The American College of Medical Genetics with the March of Dimes has established a recommended list of 28 metabolic, endocrine, and hemoglobin disorders for which newborns should be screened because early intervention for these hereditary yet rare diseases is essential. As of March 2006, only five U.S. states met all of these recommendations. Each state health department or the National Newborn Screening and Genetics Resource Center (www.nccr.org/about.asp) provides the list of mandatory screenings by a specific state. Visit www.ornl.gov/sci/techresources/Human_Genome/medicine/genetest.shtml#testsavailable to obtain a list of diseases for which genetic tests are available.

Preventing, diagnosing, and predicting the outcome of genetic disorders are very difficult because of the complexities of genetic processes:

- **Variable expressivity.** Genes manifest differently in different people. For example, persons with cystic fibrosis, caused by a recessive gene, display wide variability in the severity of symptoms. The expression of the disorder appears to be influenced by the interplay of psychological, social, political, economic, and other environmental factors. The effects can be exacerbated by maternal substance abuse, inadequate maternal nutrition, and birth trauma. Children with cystic fibrosis born into poverty may not have benefited from early diagnosis, may live in an inner city that exposes them to increased levels of pollution, or may lack adequate home medical care because the primary caregiver is also responsible for meeting the family's economic needs.

- **Genetic heterogeneity.** The same characteristic may be a consequence of one of a number of genetic anomalies. For example, neural tube defects may result either from gene mutations or from exposure to specific teratogens (Motamedi & Meador, 2006; Orn, 2006).

- **Pleiotropy principle.** The same gene may influence seemingly unrelated systems (Rauch, 1988). Hair color, for example, is typically linked to a particular skin color (such as blonde hair with light complexion, black hair with olive complexion).

- **Epigenetics.** More recently, researchers have focused on another dimension of heritability that points to environmental factors that influence gene expression (phenotype) without changing the genetic makeup of a person (genotype). These factors influence the chemicals that trigger (methyl groups) or inhibit (acetyl groups) genetic expression. Furthermore, these chemicals appear to have a generational influence without genetic alterations. Examples of these epigenetic environmental influences include nutrition, trauma such as childhood abuse, and teratogens (Lederberg, 2001). The epigenetic influences in many cases are preventable and treatable, especially if identified early in development.
Genetic anomalies fall into four categories, summarized in Exhibit 2.5 (Opitz, 1996; Rauch, 1988; Reed, 1996; Vekemans, 1996):

1. **Inheritance of a single abnormal gene.** An inherited anomaly in a single gene may lead to a serious disorder. The gene may be recessive, meaning that both parents must pass it along, or it may be dominant, in which case only one parent needs to have the gene in order for it to be expressed in the child. A third possibility is that the disorder is sex-linked, meaning that it is passed along by either the father or the mother.

2. **Multifactorial inheritance.** Some genetic traits, such as height and intelligence, are influenced by environmental factors such as nutrition. Their expression varies because of multifactorial inheritance, meaning that they are controlled by multiple genes. Multifactorial inheritance is implicated in traits that predispose a person to mental illnesses, such as depression. However, these traits are merely predisposing factors, creating what is called genetic liability. Siblings born with the same genetic traits thus may vary in the likelihood of developing a specific genetically based disorder, such as alcoholism or mental illness (Rauch, 1988; Takahashi & Turnbull, 1994).

3. **Chromosomal aberration.** Some genetic abnormalities are not hereditary but rather are caused by a genetic mishap during development of the ovum or sperm cells. Sometimes the cells end up missing chromosomes or having too many. When the ovum or sperm cell has fewer than 23 chromosomes, the probability of conception and survival is minimal. But in the presence of too many chromosomes in the ovum or the sperm, various anomalies occur. Down syndrome, or trisomy 21, the most common chromosomal aberration, is the presence of 47 chromosomes—specifically, an extra chromosome in the 21st pair. Its prevalence is 1 in 600 to 1,000 live births overall as with Cecelia Kin, but as seen in Hazel Gereke's story, it increases to 1 in 350 for women over age 35 (Vekemans, 1996). Other chromosome anomalies include Turner syndrome (a single sex chromosome, X) and Klinefelter syndrome (an extra sex chromosome, XXY).

4. **Exposure to teratogens.** Teratogens can be divided into four categories: radiation, infections, maternal metabolic imbalance, and drugs and environmental chemicals. In the Thompson story, Felicia wondered if Paul’s premature birth was a result of prenatal exposure to paint fumes. It may have been, depending on what specific chemicals were involved, when exposure occurred, and to what degree. Parents who, like the Thompsons, are experiencing considerable guilt over their possible responsibility for their baby’s problems may take comfort from the knowledge that the impact of exposure to teratogens can vary greatly. Much depends on the timing of exposure. The various organ systems have different critical or sensitive periods, summarized in Exhibit 2.6.

Parents who have reason to fear these congenital anomalies often opt for diagnosis during pregnancy. Chorionic villi testing (CVT) involves the insertion of a catheter through the cervix into the uterus to obtain a sample of the developing placenta; it can be done as early as eight weeks but carries a slightly higher risk of causing spontaneous abortion (miscarriage) compared with amniocentesis. Amniocentesis is the extraction of amniotic fluid for chromosomal analysis; it involves inserting a hollow needle through the abdominal wall during the second trimester. A frequent procedure is ultrasonography (ultrasound), which produces a visual image of the developing fetus, typically done during 18 to 22 weeks of pregnancy. Risk factors for any prebirth genetic testing includes mothers over the age of 35, carriers of sex-linked genetic disorders and single gene defects, parents with chromosomal disorders, and women who have had previous and recurring pregnancy loss (American Pregnancy Association, 2009).

If an anomaly is detected, the decisions that need to be made are not easy ones. The possibility of false readings on these tests makes the decisions even more complicated. Should the fetus be aborted? Should fetal surgery be undertaken? Could gene replacement therapy, implantation of genetic material to alter the genotype—still a costly experimental procedure—prevent an anomaly or limit its manifestation? Do the parents have the financial and psychological means to care for a neonate with a disability? This was a question that the Gerekes and Cecelia Kin asked of themselves. What is the potential impact on the marriage and extended family system? What is the potential long-term impact of
knowing one’s genetic makeup? For example, the 2008 Genetic Information Nondiscrimination Act (GINA) prohibits insurance companies and employers from using genetic information in discriminatory ways (Human Genome Project, 2009b). However, as the U.S. healthcare system undergoes change and new knowledge about genetic engineering emerges, this is an issue that should be considered by social workers. We do know that nonurgent decisions should be postponed until parents have an opportunity to adjust to the crisis and acquire the necessary information (Fost, 1981).

**Special Parent Populations**

Social workers should recognize the risks involved for some special parent populations. Six of these special populations are discussed here.

**Pregnant Substance Abusers**

Our knowledge of the developmental impact of maternal use of illegal and legal substances is rapidly increasing. The good news is that healthcare professionals are increasingly able to avoid prescribing legal drugs that might harm...
the developing fetus, once pregnancy is confirmed. The bad news is that too many pregnant women are still harming their babies through use of illegal drugs or abuse of legal substances. And, unfortunately, many women do not know they are pregnant during the first trimester, a period when the fetus is very vulnerable to teratogens.

Although it is difficult to obtain reliable statistics, an estimated 22% of females of childbearing age abuse substances. Moreover, approximately 25% of pregnant women use two or more teratogenic substances. Among pregnant substance abusers, 91% use heroin, methadone, or other opiates, 35% use stimulants, 25% cannabis, 22% benzodiazepines, and 7% hallucinogens—with 38% injecting their main drug (McElhatton, 2000).

Possible effects of commonly abused legal and illegal substances are presented in Exhibit 2.7. Fetal alcohol spectrum disorders (FASD) include fetal alcohol effects (FAE) and fetal alcohol syndrome (FAS), which are caused by alcohol consumption during pregnancy. FASD results in cognitive disability, malformations of the skeletal system and major organ systems, central nervous system defects, and social and learning disabilities in the child. FASD are 100% preventable with alcohol abstinence (American Pregnancy Association, 2010). Cocaine and crack use is connected with increased chances of the placenta separating from the uterine wall, which can lead to maternal and fetal death, intracranial hemorrhage for both mother and newborn, urinary and genital defects in the neonate, and increased risk of sudden infant death syndrome as well as neonatal withdrawal that can last for several weeks. Amphetamines are associated with increased rates of spontaneous abortions and possible heart defects. Ecstasy seems to increase the likelihood of cardiovascular and musculoskeletal anomalies in the fetus (McElhatton, 2000). Pregnant substance abusers in general have a higher incidence of miscarriages, prematurity, and LBW, as well as STIs, tuberculosis, and HIV, than other pregnant women (Kesmodel, Wisborg, Olsen, Henriksen, & Secher, 2002; March of Dimes, 2006).
Furthermore, the neonate who was exposed prenatally to substances like alcohol, tobacco, and illegal drugs is 46 times more likely than normal to die in the first month of life (Larson, 1995).

Interestingly, some individuals appear to be “resistant” to teratogens like alcohol, and no teratogen causes defects all the time (Opitz, 1996). In fact, about 60% of babies born to alcoholic mothers show no signs of being affected by their mother’s drinking (Opitz). Still, teratogenic substances should be avoided during pregnancy to increase the chances of a healthy outcome. Social workers are collaborating with other professionals to provide public education to women in the childbearing years about the teratogenic effects of alcohol, tobacco, and other drugs. Because fathers are known to influence the substance use by mothers, and there is increasing evidence that paternal use impacts sperm, fathers increasingly are included in preventive efforts (Bertrand, Floyd, & Weber, 2005; Chang, McNamara, Orav, & Wilkins-Haug, 2006).

**Mothers With Eating Disorders**

There was an increase in eating disorders, primarily anorexia nervosa (self-imposed starvation) and bulimia (binging and purging), among U.S. teenagers and women in the United States during the past century, but the rate has stabilized in recent years (Hoek, 2006). More common is obesity; more than half of women of childbearing age are overweight or obese, which poses risk of infertility and can impact postnatal recovery as well as the health of the baby (Allison, Lavery & Sarwer, 2009). Because eating disorders frequently result in menstrual disorders, reduced sex drive, and infertility, pregnancy is frequently overlooked in this population (Bonne, Rubinoff, & Berry, 1996). One study of almost 1,000 Fellows of the American College of Obstetricians and Gynecologists revealed that less than half of the obstetrics/gynecological fellows assess for an eating disorder (Leddy, Jones, Morgan, & Schucklin, 2009).

An eating disorder is likely to result in poor pregnancy outcomes, such as fetuses small for gestational age (SGA), LBW infants, and increased neonatal mortality (Bulik et al., 2009; National Eating Disorders Association, 2005). Premature delivery occurs at twice the expected rate, and perinatal mortality is six times the expected rate. The length of time the mother is able to breastfeed her infant has not been found to be affected by eating disorders, however (Brinch,
Isager, & Tolstrup, 1988). Social workers who work regularly with women with eating disorders or with pregnant women need to be knowledgeable about the possibilities for poor pregnancy outcomes in pregnant women with eating disorders.

**Lesbian Mothers**

In recent years, the number of lesbians who are or who desire to be mothers has increased, but these women continue to face many obstacles and dilemmas leading to disparities in family health when compared with heterosexual women and couples (Gartrell et al., 1996; O’Hanlon, 2009). More than one third of lesbians are estimated to be mothers, and it is reasonable to assume that more would choose motherhood if the larger society offered greater support.

Perhaps the major risk factor for lesbian mothers is the potential for rejection or disapproval by the members of a society with negative views of homosexuality (King, 2001; Laird & Green, 1996). Conception, pregnancy, and childbirth demand role realignments for heterosexual couples and create stress. These same dynamics occur in lesbian couples, but they often face a greater challenge because of society’s reluctance to recognize lesbian relationships.

Lesbian mothers face other challenges. Despite increased availability of alternative fertilization methods, many health care providers remain insensitive to issues that lesbian women may face when using them and may limit access to fertility treatment (The Ethics Committee of the American Society for Reproductive Medicine, 2006). Lesbian women who become pregnant may lack the support of family and friends, and birthing facilities may not allow female partners to be involved with the birth process. In addition, employers may limit access to, or reluctantly provide, resources such as medical benefits for pregnancy and childbirth (Laird & Green, 1996). The lesbian partner of a childbearing or adopting lesbian mother may not be recognized as the child’s parent in many states.

Yet, lesbian mothers have advantages that some other special parent populations do not have. A study of 27 lesbian mothers indicated that these family households are strong, individual functioning is good, and a variety of parenting skills are common (Dundas & Kaufman, 2000). Other studies of lesbian mothers report that all respondents sought prenatal care and that 89% to 100% attended childbirth education classes (Gartrell et al., 1996). Social workers can help health care providers recognize both the strengths of and the special challenges facing lesbian mothers.

**Mothers and Fathers With Disabilities**

One in five persons reports a physical or mental disability, and more than half of these people are female (Jans & Stoddard, 1999). People with physical or mental disabilities may be perceived as “asexual,” and thus conception, pregnancy, and childbirth frequently are not considered relevant issues for them (Cole & Cole, 1993; Sawin, 1998). This is not the case. For one thing, not all disabilities negatively affect reproduction. For example, 75% of women with rheumatoid arthritis experience remission of disease during pregnancy (Connie, 1988; Corbin, 1987). Other interesting data come from a four-year national study funded by the National Institutes of Health (NIH), which compared 506 women with physical disabilities with 444 women without a disability (Nosek, 1995).

The NIH study found a remarkable difference between the two populations in the use of contraception, because women with disabilities have more limited options. For example, the use of barrier methods may be compromised by limited use of hands. Overall, women with disabilities were less likely to use oral contraception, possibly because their access to it was limited. Disabled and nondisabled women did not differ in their rates of tubal ligation and partner vasectomy, but women with disabilities were much more likely to have had a hysterectomy (22% vs. 12%), the most invasive and risky surgical sterilization option (Nosek, 1995).

Perhaps one of the most striking findings of the NIH study was that 10% of women with disabilities reported abuse—such as coerced sterilization—by health care providers, compared with only 3% of nondisabled women. In addition, for the women who had access to medical care, 37% of women with disabilities perceived their physician as uninformed about the effect of their disability on reproductive health (Nosek, 1995). This is an issue that exists worldwide and is perhaps even more pervasive in nonindustrialized countries (Emmett & Alant, 2006).
Women with disabilities who do decide to become pregnant must be monitored more closely than nondisabled women to offset the increased risks associated with the disability. Although women with disabilities have higher rates of complications during pregnancy (Nosek, Howland, Rintal, Young, & Chanpong, 1997), with careful planning they can make the adaptations needed to care for newborns. For a summary of the effects of selected disabilities on conception, pregnancy, and childbirth, see Sawin (1998).

Despite public distaste for the practice, some persons with disabilities continue to be targets of involuntary sterilization (Disabled Women's Network Ontario, 2006; International Federation of Persons with Physical Disability, 2008). Professionals do not agree about how to handle the reproductive rights of individuals with severe inheritable disorders or with limited capacity to care for a child. Many do agree, however, that physical, environmental, interpersonal, informational, and policy barriers leave people with disabilities disenfranchised from both the reproductive health system and other reproductive options.

Not surprisingly, a 1997 study identified reproductive health as one of the four top research priorities for disabled persons (Berkeley Planning Associates, 1996). For some populations such research is only recently emerging. Women with spinal bifida is a population that only recently is living beyond sexual maturity because of medical advances (Jackson & Mott, 2007). In addition, new models of psychosocial intervention with women with disabilities are emerging (Miller & Marini, 2004; Sheppard-Jones, Kleinert, Paulding, & Espinosa, 2008). As society slowly begins to recognize persons with disabilities as full members of society, some of the negative implications of conception, pregnancy, and childbirth with this population may be dispelled.

**Incarcerated Pregnant Women**

An estimated one out of four women inmates are pregnant when they are incarcerated or have delivered a baby within the preceding year, and about 90% have substance abuse problems (Elaison & Arndt, 2004; Wooldredge & Masters, 1993). These women and their babies are at particular risk because most of the mothers are poor; many abuse drugs prior to, during, and after incarceration; many have severe physical and mental health problems; and most lack education and skills related to pregnancy, childbirth, and prenatal care (Kaplan & Sasser, 1996). An analysis of research findings from 10 studies, all that reported a comparison group, revealed that prematurity and low birth weight occurred more frequently for imprisoned women if the comparison group was not disadvantaged. Otherwise, birth outcomes were more favorable for imprisoned women (Knight & Plugge, 2005).

Although the U.S. prison population grew at a slower rate between 2000 and 2008 compared with the previous decade, by the end of 2008 11,978 inmates were women (6.7%). Of these women in prison, 7,226 (60%) were between the childbearing ages of 19 and 40 (Bureau of Justice Statistics, 2009). For all jailed women, an estimated 80% are of childbearing age (Kyei-Aboagye, Vragovic, & Chong, 2000). Based on Bloom’s (1995) analysis that 8% to 10% of women are pregnant when they enter prison, a rough estimate of the number of pregnant new prison inmates in 2008 would be 578 to 722. Over the past 10 to 15 years, this population has been the focus of some, albeit limited, research and development of services because of the high-risk pregnancy potential (Elaison & Arndt, 2004; Schulte-Day, 2006; Siefert & Pimlott, 2001; U.S. Federal Bureau of Prisons, 1998; Wismont, 2000). In general, birth outcomes in terms of weight are acceptable (Martin, Kim, Kupper, Meyer, & Hays, 1997), but there are variations. For example, one study of 360 infants revealed differences by race whereby Whites incarcerated during weeks 14 to 20 had lower birth weight infants compared with those incarcerated during weeks 1 to 13, but this was not found for Hispanics (Howard, Strobino, Sherman, & Crum, 2009). Another study of 147 infants found better birth weight if women had prenatal care that started in the first trimester and birth weight increased with each additional prenatal visit (Howard et al.). However, good prenatal care is typically found only in larger prisons associated with academic medical centers (Cordero, Hines, Shibley, & Landon, 1992; Gabel & Johnston, 1995).

Regardless of the type of facility, prison life can pose incredible stress because of illegal drug access, anger and hostility, lack of social support, concern/jealousy about alternative caregivers, and impaired mother-child relationships (Hutchinson, Moore, Propper, & Mariaskin, 2008). Alternative living environments that provide adequate services are a
possible means of improving pregnancy outcomes for this group of women (Blinn, 1997; Bloom & Steinhart, 1993; Siefert & Pimlott, 2001; Stevens & Patton, 1998). Social workers working in prisons and jails can advocate for conditions to improve birth outcomes for the infants and pregnancy consequences for the mothers as well as their extended families.

**HIV-Infected Mothers**

Women comprise nearly half of the 33.2 million HIV infections worldwide (Gable, Gostin, & Hodge, 2008); 68% of all HIV patients live in sub-Saharan Africa (Guidozzi & Black, 2009). The United Nations program on HIV and AIDS (UNAIDS) estimates that more than 600,000 mother-to-newborn HIV transmissions occur each year, with the numbers increasing rapidly, especially in Africa and Southeast Asia (UNAIDS, 2006). Transmission from mother to infant is estimated at 20% to 45% if the mother breastfeeds and takes no preventive drugs (Kanabus). However, 2005 data revealed that with the use of antiretroviral drugs for treatment and prophylaxis, no breastfeeding, and elected caesarian birth when appropriate, the risk of transmission is reduced to less than 2% (Mofenson, 2006). However, the stigma of HIV/AIDS paired with low status of women denies access to reproductive and sexual health services in many countries (Gable et al., 2008).

Elective cesarean sections reduce the risk of mother-to-infant transmission by 50%, and the use of highly active antiretroviral therapy (HAART) has reduced the rate of transmission to less than 5% (Kanabus, 2006; McIntyre & Gray, 2002). Recent studies are suggesting that AZT is a teratogen, causing mutations of the DNA if taken in the first trimester, but the risks must be weighed against the transmission of a potentially fatal viral infection (Kanabus, 2006). However, the cost of any treatment is prohibitive to women in impoverished countries and it is not widely available to them.

Breastfeeding is an area of special concern when there is no antiretroviral treatment. HIV can be transmitted through breast milk and is significant in the high rates of this disease in Africa, where, without HAART, breastfeeding may account for 40% of HIV transmissions from mothers to infants (Nduti et al., 2000). To further complicate the issue, infant mortality rates have increased in poor countries where formula feeding has been implemented—partially because of contaminated water supplies used to make the formula. The United Nations suggests that in poorer countries, breastfeeding is a better option because it does help prevent infectious disease and malnutrition (Kanabus, 2006; Kent, 2002). However, it also recommends that women be informed about their choices for infant feeding.

The standard protocol for neonates born to HIV-positive mothers is to treat them with the drug zidovudine (ZDV) for 6 weeks (Cotter & O'Sullivan, 2004). However, this medication is not widely available in poorer countries, increasing the number of children who will die from AIDS.

The news is encouraging in other ways. In 1994, the American Society for Reproductive Medicine (ASRM) discouraged women who were HIV positive from having children because transmission of the virus could not be prevented. In 2002, the same group said that the recent advances in therapies greatly reduce the rate of transmission and withdrew their recommendations to avoid childbearing. The Society (2002) suggested cesarean sections, bottle feeding, special sperm washing and testing if the father is HIV positive, and counseling if both mother and father are HIV positive, because of the possibility of orphaning the baby (ASRM, 2002).

Social workers must be aware of the complexities of this issue as well as societal prejudices against women with HIV infections. Working to increase HIV awareness and promote clear notification of HIV status will continue to be important social work roles in the next decade.

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**Critical Thinking Questions 2.3**

What factors might be contributing to the increase in premature births in the United States? Why do you think the rate of prematurity is higher in the United States than in most other industrialized countries? How could you go about learning more about the answers to these questions?
Social workers practicing with persons at the stage of life concerned with conception, pregnancy, and childbirth should follow these principles:

- Respond to the complex interplay of biopsychosocial and spiritual factors related to conception, pregnancy, and childbirth.
- When working with clients, both females and males, of childbearing age, always consider the possibility of conception, pregnancy, and childbirth; their potential outcomes; and their impact on the changing person/environment configuration.
- Identify the needs of vulnerable or at-risk groups, and work to provide services for them. For example, structure birth education classes to include not only family but family-like persons, and provide interpreters for the hearing impaired or use appropriate technology to deliver content.
- Actively pursue information about particular disabilities and their impact on conception, pregnancy, and childbirth and include this topic in client assessment.
- Acquire and apply skills in advocacy, education about reproductive options, consumer guidance in accessing services, and case management.
- Assume a proactive stance when working with at-risk populations to limit undesirable reproductive outcomes and to help meet their reproductive needs. At-risk groups include adolescents, low-income women, women involved with substance abuse, women with eating disorders, and women with disabilities who lack access to financial, physical, psychological, and social services.
- Assist parents faced with a potential genetic anomaly to gain access to genetic screenings, prenatal diagnosis, postnatal diagnosis, treatment, and genetic counseling.
- Involve parents in decision making to the greatest extent possible by delaying nonurgent decisions until parents have had a chance to adjust to any crisis and acquire the necessary information to make an informed decision.
- Establish collaborative relationships with other professionals to enhance and guide assessment and intervention.
- Identify and use existing programs that provide education and prenatal services to women, particularly for those most at risk of undesirable outcomes.

**KEY TERMS**

- assisted reproductive technologies (ART)
- chromosomes
- dominant genes
- embryo
- extremely low birth weight
- family pluralism
- fertilization
- fertilization age
- fetal viability
- fetus
- genes
- genetic liability
- genotype
- germ cell
- gestation
- gestational age
- infertility
- interactive genes
- late-preterm birth
- low birth weight (LBW)
1. Select one topic from the chapter outline. Identify a community service setting that addresses the chosen topic. Interview a professional from that setting, preferably a social worker, to solicit the following information:

- Services provided
- The role of the social worker
- The roles of the other disciplines
- The mechanisms used to acquire new knowledge on the topic
- The challenges and rewards of social work practice in that setting

2. Locate the National Association of Social Workers Code of Ethics on the organization’s website at www.naswdc.org. Choose an ethical issue from the list below. Using the Code of Ethics as a guide, what values and principles can you identify to guide decision making related to the issue you have chosen?

- Should all women and men, regardless of marital status or income, be provided with the most current technologies to conceive when they are unable to do so?
- What are the potential issues of preservation and gestational surrogacy in terms of social justice and diversity?
- Should pregnant women who abuse substances be incarcerated to protect the developing fetus?
- Do adoptive parents have the right to know the genetic background of an adoptee?
- Which genes should be selected for reproduction?
- Will persons who are poor be economically disadvantaged in the use of genetic information?

3. Select one of the four life journeys that introduced this chapter: Jennifer Bradshaw’s, the Thompsons’, the Gerekes’, or Cecelia Kin’s. Identify the risk and protective factors related to their conception, pregnancy, and childbirth experience. Then change one factor in the story; for example, assume that Cecelia Kin lived in a metropolitan area and her income was not needed. How might that alter her life course? Then try changing one factor in another story; for example, assume Jennifer had only a 10th-grade education. How does that change the trajectory of her story? Try again; for example, assume Felicia Thompson was being treated for depression when she became pregnant. Again, how does that factor alter her life course and that of her child?

4. In student groups of three or four, review the list of contraception options presented in this chapter. With each group representing a different three- to five-year age range of the child-bearing age spectrum (ages 15 to 44), discuss the potential access and use or misuse of each form of contraception. Also, consider the role of a social worker in various social welfare settings in helping women (who represent different age, religious, and ethnic groups) select a form of birth control.
The American Pregnancy Association  
www.americanpregnancy.org

Site presented by the American Pregnancy Association contains information on a number of pregnancy-related topics, including infertility, adopting, pregnancy options, multiples pregnancy, and the developing baby.

Center for Research on Women with Disabilities (CROWD)  
www.bcm.edu/crowd

Site presented by the Center for Research on Women with Disabilities contains reports on sexual and reproductive health for women with disabilities, educational materials, and links to other related research.

Centers for Disease Control and Prevention  
www.cdc.gov

U.S. government site contains public health information, current research, and health census data that include diseases and conditions related to conception, pregnancy, and childbirth with a focus on prevention. Available in both English and Spanish.

Childbirth.org  
www.childbirth.org

Award-winning site maintained by Robin Elise Weiss contains information on conception, pregnancy, and birth, including recommended pregnancy books and access to a free online childbirth class.

Genetic Alliance  
www.geneticalliance.org

Site presented by the Genetic Alliance, an information and advocacy organization, contains information about training, programs, public policy, publications, and events.

Human Genome Project  
www.ornl.gov/hgms

Site of the Human Genome Program of the U.S. Department of Energy that has sequenced the genes present in human DNA provides quick access to recent news, including related legislation. Available in both English and Spanish.

Planned Parenthood  
www.plannedparenthood.org

Official site of the Planned Parenthood Federation of America Inc. contains information about Planned Parenthood, health and pregnancy, birth control, abortion, STDs, prochoice advocacy, and a guide for parents.

U.S. Bureau of Census  
www.census.gov

Site presented by the U.S. Census Bureau provides current census data related to the family and social context of conception, pregnancy, and childbirth.

Women’s-Health.com  
www.womens-health.com

Free, membership site presented by Women’s Health Interactive contains information on pregnancy and childbirth and provides links to partnership sites to access print, video, and audio media on human reproduction.