CDC

Reproductive Health

2000 Assisted Reproductive Technology Success Rates

National Summary and Fertility Clinic Reports

DEPARTMENT OF HEALTH & HUMAN SERVICES • USA

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2000 Assisted Reproductive Technology Success Rates

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Preface

For many people who want to start a family, the dream of having a child is not easily realized; about 15% of women of childbearing age in the United States have received an infertility service. Assisted reproductive technology (ART) has been used in the United States since 1981 to help women become pregnant, most commonly through the transfer of fertilized human eggs into a woman's uterus. However, for many people, deciding whether to undergo this expensive and time-consuming treatment can be difficult.

The goal of this report is to help potential ART users make informed decisions about ART by providing some of the information needed to answer the following questions:

- What are my chances of having a child by using ART?
- Where can I go to get this treatment?

The Society for Assisted Reproductive Technology (SART), an organization of ART providers affiliated with the American Society for Reproductive Medicine (ASRM), has been collecting data and publishing annual reports of pregnancy success rates for fertility clinics in the United States and Canada since 1989. In 1992, the U.S. Congress passed the Fertility Clinic Success Rate and Certification Act. This law requires the Centers for Disease Control and Prevention (CDC) to publish pregnancy success rates for ART in fertility clinics in the United States. Since 1995, CDC has worked in consultation with SART, ASRM, and RESOLVE: The National Infertility Association to report ART success rates.

The 2000 report of pregnancy success rates is the sixth to be issued under the law. This report is based on the latest available data on the type, number, and outcome of ART cycles performed in U.S. clinics.

The 2000 ART report has four major sections:

- ***Commonly asked questions about the U.S. ART clinic reporting system:*** This section provides background information on infertility and ART and an explanation of the data collection, analysis, and publication processes.
- ***A national report:*** The national report section presents overall success rates and shows how they are affected by certain patient and treatment characteristics. Because the national report summarizes data from all 383 fertility clinics that reported, it can give people considering ART a good idea of the average chance of having a child by using ART.
- ***Fertility clinic tables:*** Success also is related to the expertise of a particular clinic's staff and the quality of its laboratory. The fertility clinic table section displays results of ART success rates for individual U.S. fertility clinics in 2000.
- ***Appendixes:***

  Appendix A contains technical notes on the interpretation of 95% confidence intervals.

  Appendix B (Glossary) provides definitions for technical and medical terms used throughout the report.

Appendix C includes the names and addresses of all reporting clinics along with a list of clinics known to be in operation in 2000 that did not report their success rate data to CDC as required by law.

Success rates can be reported in a variety of ways, and the statistical aspects of these rates can be difficult to interpret. As a result, presenting information about ART success rates is a complex task. This report is intended for the general public, and the emphasis is on presenting the information in an easily understandable form. CDC hopes that this report is informative and helpful to people considering an ART procedure. We welcome any suggestions for improving the report and making it easier to use.

Commonly Asked Questions About the U.S. ART Clinic Reporting System

Background Information, Data Collection Methods, Content and Design of the Report, and Additional Information About ART in the United States

1. How many people in the United States have infertility problems?

The latest data on infertility available to CDC are from the 1995 National Survey of Family Growth.

- Of the approximately 60 million women of reproductive age in 1995, about 1.2 million, or 2%, had had an infertility-related medical appointment within the previous year and an additional 13% had received infertility services at some time in their lives. (Infertility services include medical tests to diagnose infertility, medical advice and treatments to help a woman become pregnant, and services other than routine prenatal care to prevent miscarriage.)
- Additionally, 7% of married couples in which the woman was of reproductive age (2.1 million couples) reported they had not used contraception for 12 months and the woman had not become pregnant.

2. What is assisted reproductive technology (ART)?

Although various definitions have been used for ART, the definition used in this report is based on the 1992 law that requires CDC to publish this report. According to this definition, ART includes all fertility treatments in which both egg and sperm are handled. In general, ART procedures involve surgically removing eggs from a woman's ovaries, combining them with sperm in the laboratory, and returning them to the woman's body or donating them to another woman. They do NOT include treatments in which only sperm are handled (i.e., intrauterine, or artificial, insemination) or procedures in which a woman takes drugs only to stimulate egg production without the intention of having eggs retrieved.

The types of ART include the following:

- IVF (in vitro fertilization). Involves extracting a woman's eggs, fertilizing the eggs in the laboratory, and then transferring the resulting embryos into the woman's uterus through the cervix. For some IVF procedures, fertilization involves a specialized technique known as intracytoplasmic sperm injection (ICSI). In ICSI a single sperm is injected directly into the woman's egg.
- GIFT (gamete intrafallopian transfer). Involves using a fiber-optic instrument called a laparoscope to guide the transfer of unfertilized eggs and sperm (gametes) into the woman's fallopian tubes through small incisions in her abdomen.
- ZIFT (zygote intrafallopian transfer). Involves fertilizing a woman's eggs in the laboratory and then using a laparoscope to guide the transfer of the fertilized eggs (zygotes) into her fallopian tubes.

In addition, ART often is categorized according to whether the procedure used a woman's own eggs (nondonor) or eggs from another woman (donor) and according to whether the embryos used were newly fertilized (fresh) or previously fertilized, frozen, and then thawed (frozen). Because an ART procedure includes several steps, it is typically referred to as a cycle of treatment. (See **What is an ART cycle?** below.)

3. What is the 1992 Fertility Clinic Success Rate and Certification Act?

This law (Fertility Clinic Success Rate and Certification Act of 1992 [FCSRCA], Section 2 [a] of P.L. 102-493 [42 U.S.C. 263 (a) -1]), which the U.S. Congress passed in 1992, requires all clinics performing ART in the United States to annually report their success rate data to CDC. CDC uses the data to publish an annual report detailing the ART success rates for each of these clinics.

4. How do U.S. ART clinics report data to CDC about their success rates?

CDC contracts with a professional society, the Society for Assisted Reproductive Technology (SART), to obtain the data published each year in the ART Success Rates report. SART is an organization of ART providers affiliated with the American Society for Reproductive Medicine (ASRM). SART maintains a list of all ART clinics known to be in operation in each year and tracks clinic reorganizations and closings. This list includes clinics and individual providers that are members of SART as well as clinics and providers that are not SART members. SART actively follows up reports of ART physicians or clinics not on its list to update the list as needed.

Each year SART distributes a standard database management software system and instructions to all ART clinics. Clinics electronically enter data into the SART system for each ART procedure they started during a given reporting year. The data collected include information on the client's medical history (such as infertility diagnoses), clinical information pertaining to the ART procedure, and information on resulting pregnancies and births.

See below **(Why is the report of 2000 success rates being published in 2002?)** for a complete description of the reporting process.

5. What is an ART cycle?

Because ART consists of several steps over an interval of approximately two weeks, an ART procedure is more appropriately considered a ***cycle*** of treatment rather than a procedure at a single point in time. The start of an ART cycle is considered to be when a woman begins taking drugs to stimulate egg production or starts ovarian monitoring with the intent of having embryos transferred. (See Figure 3, page 15, for a full description of the steps in an ART cycle.) For the purposes of this report, data on ***all cycles that were started,*** even those that were discontinued before all steps were undertaken, are submitted to CDC through SART and are counted in the clinic's success rates.

6. Why is the report of 2000 success rates being published in 2002?

Before success rates based on live births can be calculated, every ART pregnancy must be followed up to determine whether a birth occurred. Thus the earliest that clinics can report complete annual data is late in the year *after* ART treatment was initiated (about nine months

past year-end, when all the births have occurred). Accordingly, the results of all the cycles initiated in 2000 were not known until October 2001. After ART outcomes were known, the following steps had to be completed before the report could be published:

- Clinics entered their data into an electronic data collection system and verified the data's accuracy before sending the data to SART.
- SART compiled a national data set from the data submitted by individual clinics.
- CDC data analysts did comprehensive checks of the numbers reported for every clinic.
- Clinic tables, national figures, and accompanying text for both the printed and Web site versions were compiled and laid out.
- CDC, SART/ASRM, and RESOLVE reviewed the report.
- Necessary changes were incorporated and proofread.
- The report was submitted to the Government Printing Office to begin the printing and production process.

These steps are time consuming but essential for ensuring that the report provides the public with correct information and does not misrepresent any clinic's success rates.

7. What quality control steps are used to ensure data accuracy?

To have their success rates published in this annual report, clinics have to submit their data in time for analysis and the clinics' medical directors have to verify by signature that the tabulated success rates are accurate. In addition, CDC and SART review all data submitted by the clinics to identify any inconsistencies between data items and data values that are not within expected ranges. During this review process some clinics are asked to review their records a second time to confirm or update their data as needed.

In past years a sample of reporting clinics were also randomly selected for on-site data validation visits. During these visits, a two-member SART team reviewed the clinics' medical records and compared medical record data with the data the clinics had submitted to CDC. In each year that these site visits were conducted (1998 through 2001), the rates of discrepancy between the medical records and the data submitted to CDC were low. In nearly all cases, data on pregnancies and live births were found to be accurately reported.

8. Which clinics are represented in this report?

The data in both the national report and the individual fertility clinic reports come from 383 fertility clinics that provided and verified information about the outcomes of the ART cycles started in their clinics in 2000.

Although we believe that almost all clinics that provided ART services in the United States throughout 2000 are represented in this report, data for a few clinics or practitioners are not included because they either were not in operation throughout 2000 or did not report as required.

Clinics and practitioners known to have been in operation throughout 2000 that did not report and verify their data are listed in this report as nonreporters, as required by law. (See Appendix C, Nonreporting ART Clinics for 2000, by State.) We will continue to make every effort to include all clinics and practitioners providing ART services in future reports.

9. Does this report include all ART cycles performed by the reporting clinics?

This report includes data for the 99,639 cycles performed by the 383 clinics that reported their data as required. A small number of ART cycles are not included in either the national data or the individual fertility clinic tables. These were cycles in which a new treatment procedure (e.g., cytoplasmic egg transfer) was being evaluated. Only 41 ART cycles fell into this category in 2000.

10. How are the success rates determined?

Two measures of success are presented in this report: **(1) pregnancy** and **(2) birth** of one or more living infants (the delivery of multiple infants is counted as one live birth). The pregnancies reported here were diagnosed using an ultrasound procedure. Live births were reported to the ART physician by either the patient or her obstetric provider. Because this report is geared toward patients, the focus is on live birth rates.

Both pregnancy and live birth rates were calculated based on all cycles ***started*** by each clinic. As noted throughout the report, success rates were additionally calculated at various steps of the ART cycle to provide a complete picture of the chances for success as the cycle progresses.

11. If a woman has had more than one ART treatment cycle, how is the success rate calculated?

As required by law, this report presents ART success rates in terms of cycles started each year rather than in terms of women. (A cycle starts when a woman begins taking fertility drugs or having her ovaries monitored for follicle production.) Therefore, women who had more than one ART cycle started in 2000 are represented in multiple cycles. Success rates cannot be calculated on a "per woman" basis because women's names are not reported to SART and CDC.

12. What factors that influence success rates are presented in this report?

The national report presents a more in-depth picture of ART than can be shown for each individual clinic. Success rates are presented in the context of various patient and treatment characteristics that may influence success. These characteristics include age, infertility diagnosis, history of previous births, previous miscarriages, previous ART cycles, number of embryos transferred, type of ART procedure, use of techniques such as intracytoplasmic sperm injection (ICSI), and clinic size.

13. Why doesn't the report contain specific medical information about ART?

This report describes a woman's average chances of success using ART. Although the report provides some information about factors such as age and infertility diagnosis, individual couples face many unique medical situations. This population-based registry of ART procedures cannot

capture detailed information about specific medical conditions associated with infertility. A physician in clinical practice should be consulted for the individual evaluation that will help a woman or couple understand their specific medical situation and their chances of success using ART.

14. Does CDC have any information on the age, race, income, and education levels of women who donate eggs?

CDC does not collect information on egg donors beyond what is presented in this report. Success rates for cycles using donor eggs or using embryos derived from donor eggs are broken down by the age of the woman who ***received*** the eggs or embryos.

15. Are there any medical guidelines for ART performed in the United States?

The American Society for Reproductive Medicine (ASRM) and the Society for Assisted Reproductive Technology (SART) issue guidelines dealing with specific ART practice issues, such as the number of embryos to be transferred in an ART procedure. Further information can be obtained from ASRM or SART (both at telephone 205-978-5000 or Web sites http://www.asrm.org and http://www.sart.org).

16. How can I get information about costs and insurance coverage of ART?

RESOLVE, a major national consumer group supporting people dealing with infertility, provides current information on insurance coverage in each state and guidance on paying for treatment. This information is available on RESOLVE's Web site (http://www.resolve.org) and from its national help line (617-623-0744). The American Society for Reproductive Medicine (ASRM) also provides information on insurance coverage. This information is available on ASRM's Web site (http://www.asrm.org).

17. What is CDC doing to ensure that the report is helpful to the public?

We continually review comments from patients and providers on issues to consider for future reports. In 1999 CDC held focus groups of people who were either considering or undergoing ART in four cities in different areas of the country. The groups generally were satisfied with both the format and content of the report. They suggested specific ways to improve the report and additional information to include. Many of these changes have been incorporated into the annual report.

18. What information should I ask for when I go to an ART clinic?

For a list of some of the questions you may want to ask when you meet with an ART practitioner, visit RESOLVE's Web site at http://www.resolve.org or contact its help line at 617-623-0744.

19. Where can I get additional information on U.S. fertility clinics?

For further information on specific clinics, contact the clinic directly. In addition, SART can provide general information on its member clinics (telephone 205-978-5000, extension 109).

National Summary and Fertility Clinic Reports

2000 National Report

INTRODUCTION TO THE 2000 NATIONAL REPORT

Data provided by U.S. clinics that use assisted reproductive technology (ART) to treat infertility are a rich source of information about the factors that contribute to a successful ART treatment–the delivery of a live-born infant. Pooling the data from all reporting clinics provides an overall national picture that could not be obtained by examining data from an individual clinic.

A woman's chances of having a pregnancy and a live birth by using ART are influenced by many factors, some of which (e.g., the woman's age, the cause of infertility) are outside a clinic's control. Because the national data set includes information on many of these factors, it can give potential ART users an idea of their average chances of success. Average chances, however, do not necessarily apply to a particular individual or couple. People considering ART should consult their physician to discuss all the factors that apply in their particular case.

The data for this national report come from the 383 fertility clinics in operation in 2000 that provided and verified data on the outcomes of all ART cycles started in their clinics. The 99,639 ART cycles performed at these reporting clinics in 2000 resulted in 25,228 live births (deliveries of one or more living infants) and 35,025 babies.

The national report consists of graphs and charts that use 2000 data to answer specific questions related to ART success rates. These figures are organized according to the type of ART procedure used. Some ART procedures use a woman's own eggs, and others use donated eggs or embryos. (Although sperm used to create an embryo also may be either from a woman's partner or from a sperm donor, information in this report is presented according to the source of the egg.) In some procedures, the embryos that develop are transferred back to the woman (fresh embryo transfer); in others, the embryos are frozen (cryopreserved) for transfer at a later date. This report includes data on frozen embryos that were thawed and transferred in 2000. Finally, in a small number of procedures a woman other than the ART patient gestates, or carries, the pregnancy. This woman is known as a gestational carrier or surrogate. The gestational carrier usually has a contractual obligation to return the infant to its intended parents. In this report ART procedures that used a gestational carrier are classified separately.

The national report has six sections:

- Section 1 (Figures 1 and 2) presents information from all ART procedures reported.
- Section 2 (Figures 3 through 31) presents information on the 74,957 ART cycles that used only fresh embryos from nondonor eggs or, in a few cases, a mixture of fresh and frozen embryos from nondonor eggs.
- Section 3 (Figures 32 and 33) presents information on the ART cycles that used only frozen embryos (13,083 cycles resulting in 11,394 transfers).
- Section 4 (Figures 34 through 37) presents information on the ART cycles that used only donated eggs or embryos (10,389 cycles resulting in 9,156 transfers).
- Section 5 (Figures 38 through 40) presents information on the 1,210 ART cycles in which a woman other than the patient carried the pregnancy (gestational carrier or surrogate cycles).
- Section 6 (Figures 41 through 43) presents trends in the number of ART procedures and success rates from 1996 through 2000.

The 2000 national summary table, which is based on data from all clinics included in this report, is on page 73, immediately preceding the individual clinic tables. An explanation of how to read these tables is on pages 67–72.

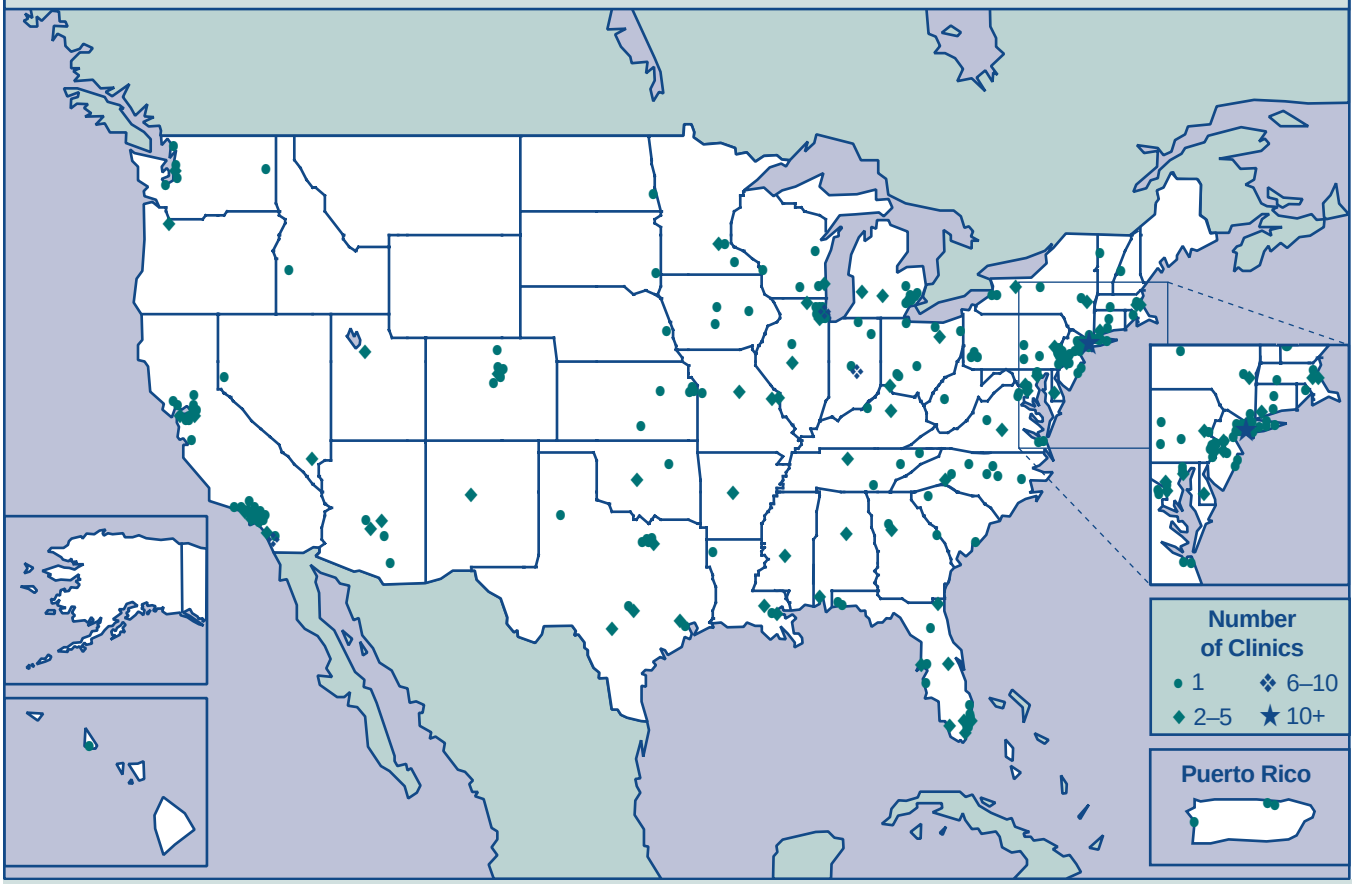
SECTION 1: OVERVIEW

Where are U.S. ART clinics located, how many ART cycles did they perform in 2000, and how many infants were born?

Although ART clinics are located throughout the United States, the greatest number of clinics is in the eastern United States. Most clinics are in or near major cities. Figure 1 shows the locations of the 383 reporting clinics. The fertility clinic section of this report, arranged in alphabetical order by state, city, and clinic name, provides specific information on each of these clinics.

The number of clinics, cycles performed, live-birth deliveries, and live babies born as a result of ART all have increased steadily since CDC began collecting this information in 1995. (See Section 6, pages 57–59.) Because in some cases more than one infant is born during a live-birth delivery (e.g., twins), the total number of live babies born is greater than the number of live-birth deliveries. CDC estimates that ART accounts for approximately 0.9% of total U.S. births.

Figure 1
Location of ART Clinics in the United States and Puerto Rico, 2000

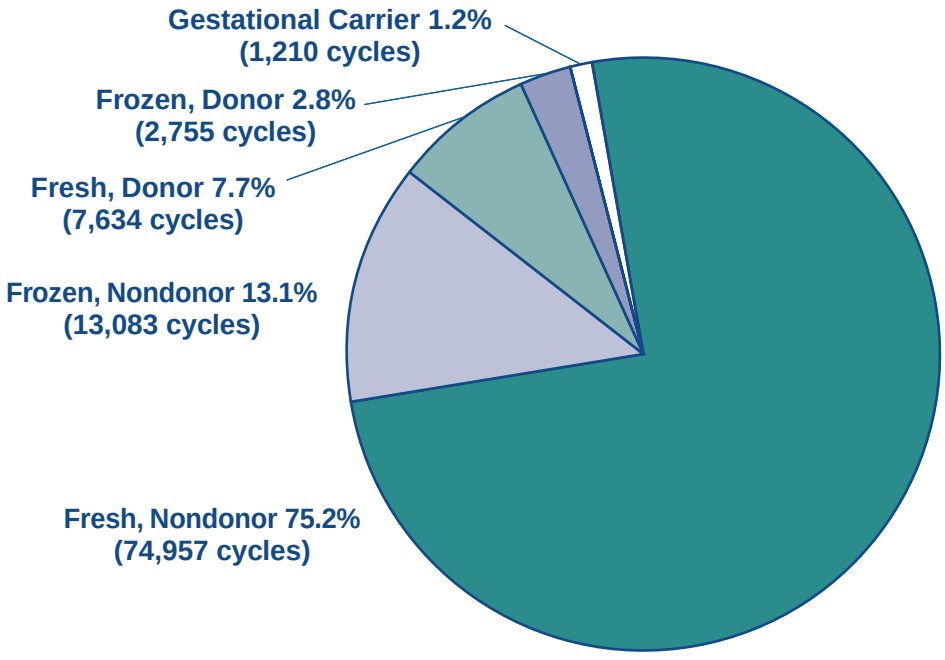


Number of ART clinics in the United States in 2000:	408
Number of U.S. ART clinics that submitted data in 2000:	383
Number of ART cycles reported for 2000:	99,639
Number of live-birth deliveries resulting from ART cycles started in 2000:	25,228
Number of live babies born as a result of ART cycles carried out in 2000:	35,025

What types of ART procedures were used in the United States in 2000?

For more than 75% of the 99,639 ART cycles carried out in 2000, fresh, nondonor eggs or embryos were used and the patient carried or gestated her own pregnancy. ART cycles that used frozen, nondonor embryos were the next most common type, accounting for slightly more than 13% of the total. In 10% of cycles, eggs or embryos were donated by another woman. A gestational carrier was involved in only 1% of cycles. A gestational carrier is a woman who carries a pregnancy for another woman and returns the infant to the intended parents at birth. These relatively rare cycles were classified separately but do include all of the four embryo types (i.e., fresh, nondonor; frozen, nondonor; fresh, donor; and frozen, donor embryos).

Figure 2
Types of ART Procedures–United States, 2000



SECTION 2: ART CYCLES USING FRESH, NONDONOR EGGS OR EMBRYOS

What are the steps for an ART procedure using fresh, nondonor eggs or embryos?

Figure 3 presents the steps for an ART cycle using fresh, nondonor eggs or embryos and shows how ART users in 2000 progressed through these stages toward pregnancy and live birth.

An ART **cycle is started** when a woman begins taking medication to stimulate the ovaries to develop eggs or, if no drugs are given, when the woman begins having her ovaries monitored (using ultrasound or blood tests) for natural egg production.

If eggs are produced, the cycle then progresses to **egg retrieval**, a surgical procedure in which eggs are collected from a woman's ovaries.

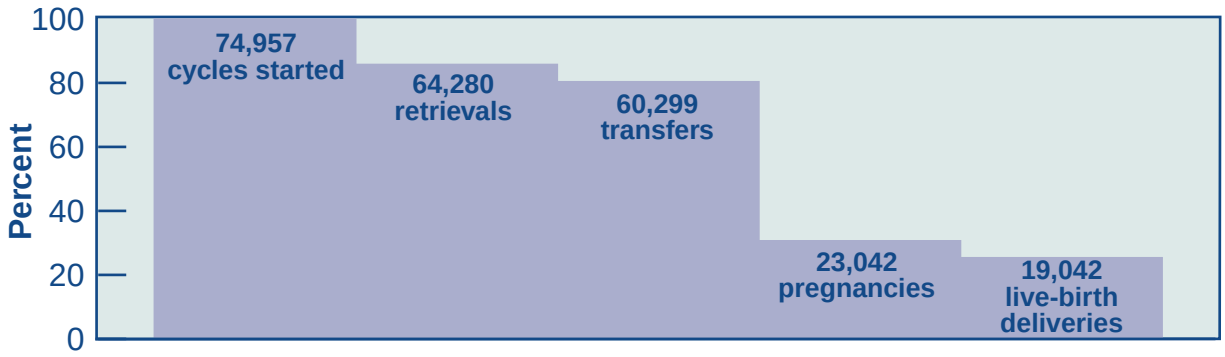
Once retrieved, eggs are combined with sperm in the laboratory. If fertilization is successful, one or more of the resulting embryos are selected for **transfer**, most often into a woman's uterus through the cervix (IVF), but sometimes into the fallopian tubes (e.g., GIFT or ZIFT; see pages 466 and 467 for definitions).

If one or more of the transferred embryos implants within the woman's uterus, the cycle then progresses to clinical **pregnancy**.

Finally, the pregnancy may progress to a **live birth**, the delivery of one or more live-born infants. (The birth of twins, triplets, or more is counted as *one* live birth.)

A cycle may be discontinued at any step for specific medical reasons (e.g., no eggs are produced, the embryo transfer was not successful) or by patient choice.

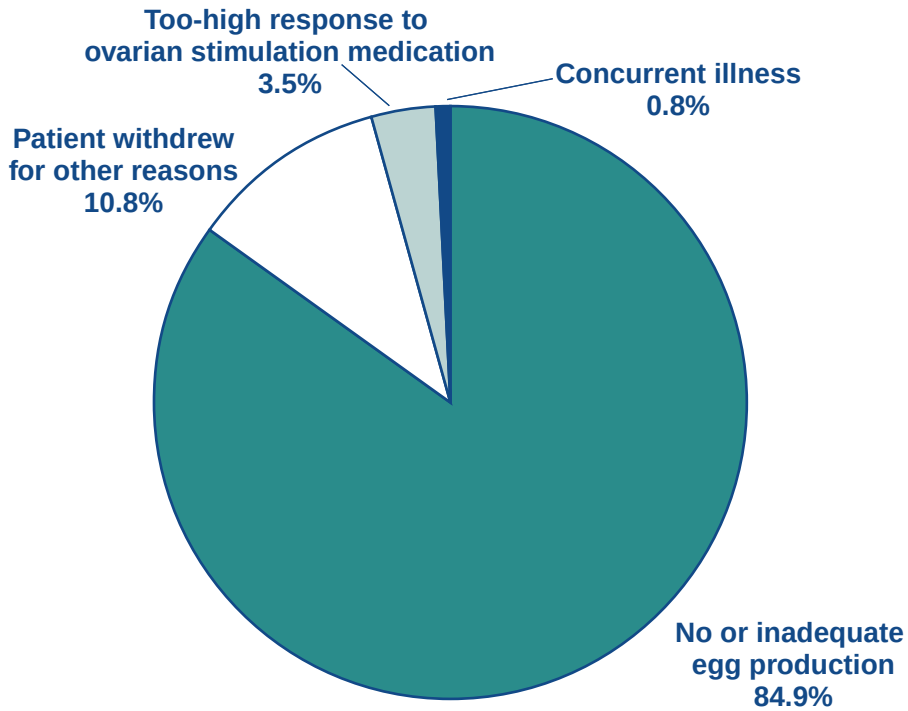
Figure 3
Outcome of ART Cycles Using Fresh, Nondonor Eggs or Embryos, by Stage, 2000



Why are some ART cycles discontinued?

In 2000, 10,677 ART cycles (14.2%) were discontinued before the egg retrieval step (see Figure 3). Figure 4 shows reasons why the cycles were stopped. For 85% of these cycles, there was no or inadequate egg production. Other reasons included too high a response to ovarian stimulation medications (i.e., potential for ovarian hyperstimulation syndrome), concurrent medical illness, or a patient's personal reasons.

Figure 4
Reasons ART Cycles Using Fresh, Nondonor Eggs or Embryos Were Discontinued in 2000

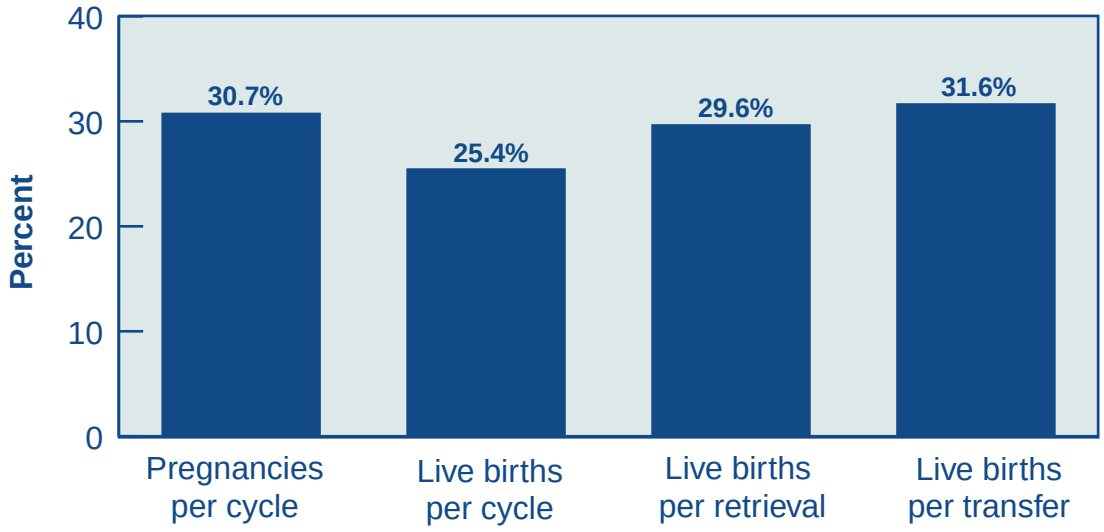


How is the success of an ART procedure measured?

Figure 5 shows ART success rates using four different measures, each providing slightly different information about this complex process. All of these rates have increased slightly each year since CDC began monitoring them in 1995. (See Section 6, pages 57–59.)

- **Pregnancy per cycle rate:** the percentage of ART cycles started that produced a pregnancy. This rate is higher than the live birth per cycle rate because some pregnancies end in miscarriage, induced abortion, or stillbirth. (See Figure 7, page 19.)
- **Live birth per cycle rate:** the percentage of ART cycles started that resulted in a live birth (a delivery of one or more living babies). This rate is the one many people are most interested in because it represents the average chances of having a live-born infant by using ART. **Throughout this report, live birth rate means live birth per cycle rate unless otherwise specified.**
- **Live birth per egg retrieval rate:** the percentage of ART cycles in which eggs were retrieved that resulted in a live birth. It is generally higher than the live birth per cycle rate because it excludes cycles that were canceled before eggs were retrieved. In 2000, about 14% of all cycles using fresh, nondonor eggs or embryos were canceled for a variety of reasons (see Figure 4).
- **Live birth per transfer rate:** includes only those ART cycles in which an embryo or egg and sperm were transferred back to the woman. This rate is the highest of these four measures of ART success.

Figure 5
Success Rates for ART Cycles Using Fresh, Nondonor Eggs or Embryos, by Different Measures, 2000

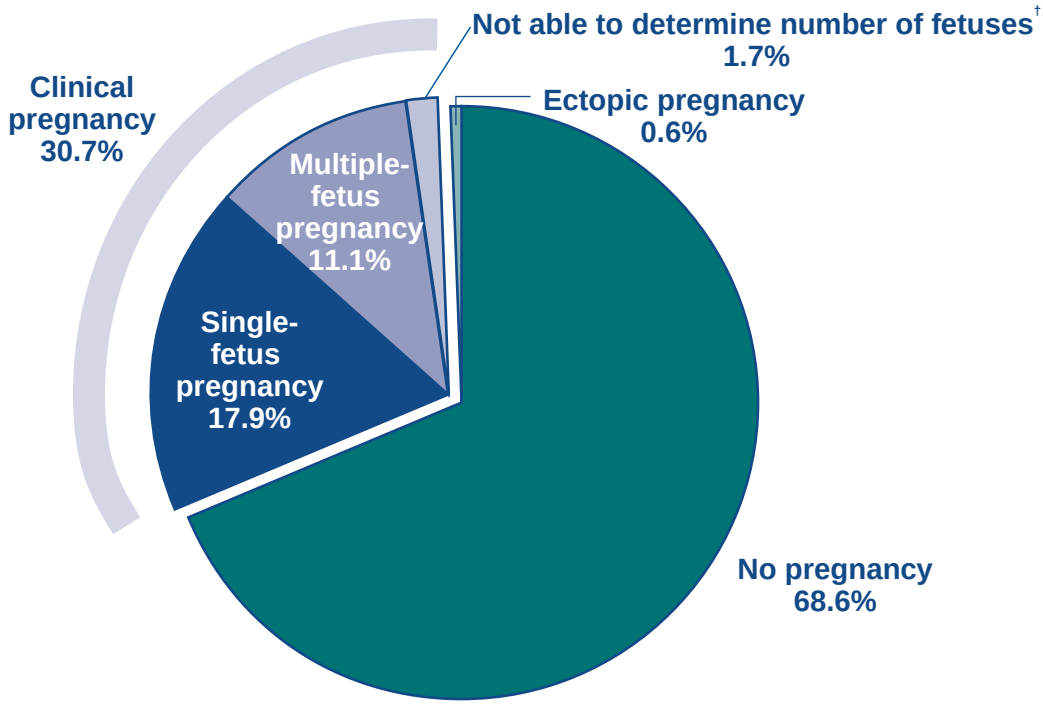


What percentage of ART cycles results in a pregnancy?

Figure 6 shows the results of ART cycles in 2000 that used fresh, nondonor eggs or embryos. Most of these cycles (68.6%) did not produce a pregnancy; a very small proportion (0.6%) resulted in an ectopic pregnancy (the embryo implanted outside the uterus), and 30.7% resulted in clinical pregnancy. Clinical pregnancies can be further subdivided as follows:

- 17.9% resulted in a single-fetus pregnancy.
- 11.1% resulted in a multiple-fetus pregnancy.
- 1.7% ended in miscarriage before the number of fetuses could be accurately determined.

Figure 6
Results of ART Cycles Using Fresh, Nondonor Eggs or Embryos,* 2000



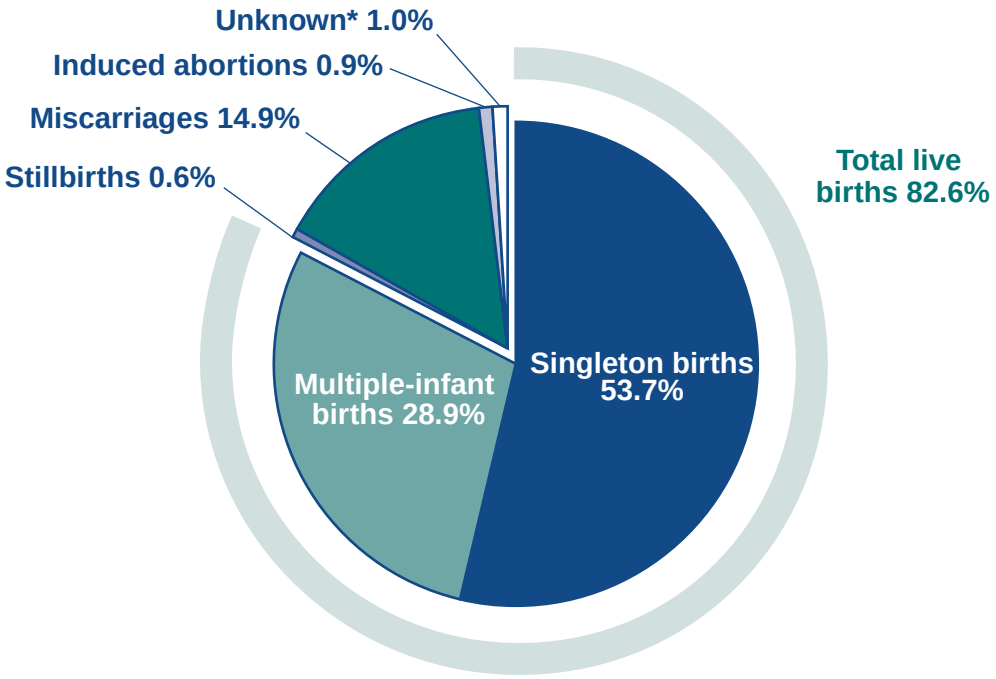
*Total does not equal 100% due to rounding.
†Number of fetuses not known because the pregnancy ended in an early miscarriage.

What percentage of pregnancies results in live births?

Figure 7 shows the outcomes of pregnancies resulting from ART cycles in 2000 (see Figure 6). Slightly more than 82% of the pregnancies resulted in a live birth (54% in singleton births and 29% in multiple-infant births). Approximately 16% of pregnancies resulted in an adverse outcome (miscarriage, induced abortion, or stillbirth). For 1% of pregnancies, the outcome was not reported.

Although the birth of more than one baby is counted as one live birth, multiple-infant births are presented here as a separate category because they often are associated with problems for both mothers and infants. Infant deaths and birth defects are not included as adverse outcomes because the available information for these outcomes is incomplete.

Figure 7
Outcomes of Pregnancies Resulting From ART Cycles Using Fresh, Nondonor Eggs or Embryos, 2000



* Lost to follow-up.

Using ART, what is the risk of having a multiple-fetus pregnancy or multiple-infant birth?

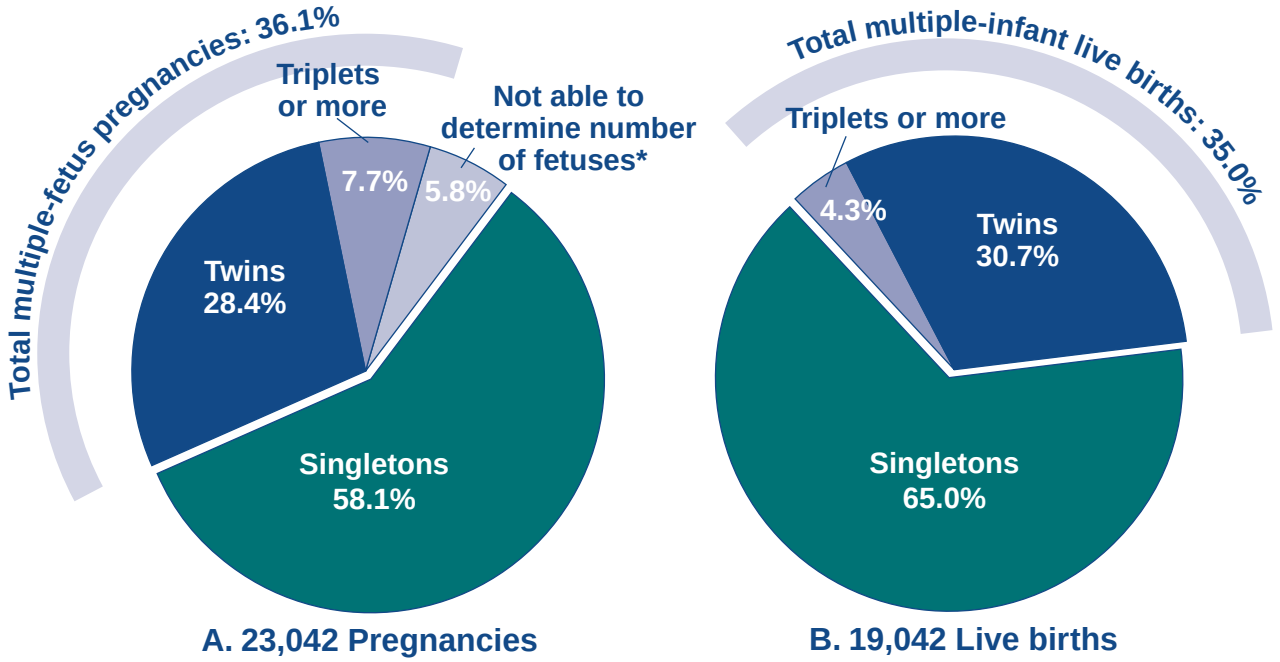
Multiple-infant births are associated with greater problems for both mothers and infants, including higher rates of caesarean section, prematurity, low birth weight, and infant death and disability.

Part A of Figure 8 shows that among the 23,042 pregnancies that resulted from ART cycles using fresh, nondonor eggs or embryos, 58% were singleton pregnancies, 28% were twin pregnancies, and about 8% were triplet or greater pregnancies. About 6% of pregnancies ended in miscarriage in which the number of fetuses could not be accurately determined. Therefore, the percentage of pregnancies with more than one fetus might have been higher than the 36% reported.

In 2000, 3,782 pregnancies resulting from ART cycles ended in either miscarriage, stillbirth, or induced abortion, and 218 pregnancy outcomes were not reported. The remaining 19,042 pregnancies resulted in live births. Part B of Figure 8 shows that 35% of these live births produced more than one infant (30.7% twins and 4.3% triplets or more). This compares with a multiple-infant birth rate of 3% in the general U.S. population.

Although the total rates for multiples were similar between pregnancies and live births, there were more triplet pregnancies than triplet births. Triplet (or more) pregnancies may be reduced to twins or singletons by the time of birth. This can happen naturally (e.g., fetal death), or a woman and her doctor may decide to reduce the number of fetuses using a procedure called multifetal pregnancy reduction. Information on medical multifetal pregnancy reductions is incomplete and therefore is not provided here.

Figure 8
Risk of Having Multiple-Fetus Pregnancy and Multiple-Infant Live Birth From ART Cycles Using Fresh, Nondonor Eggs or Embryos, 2000

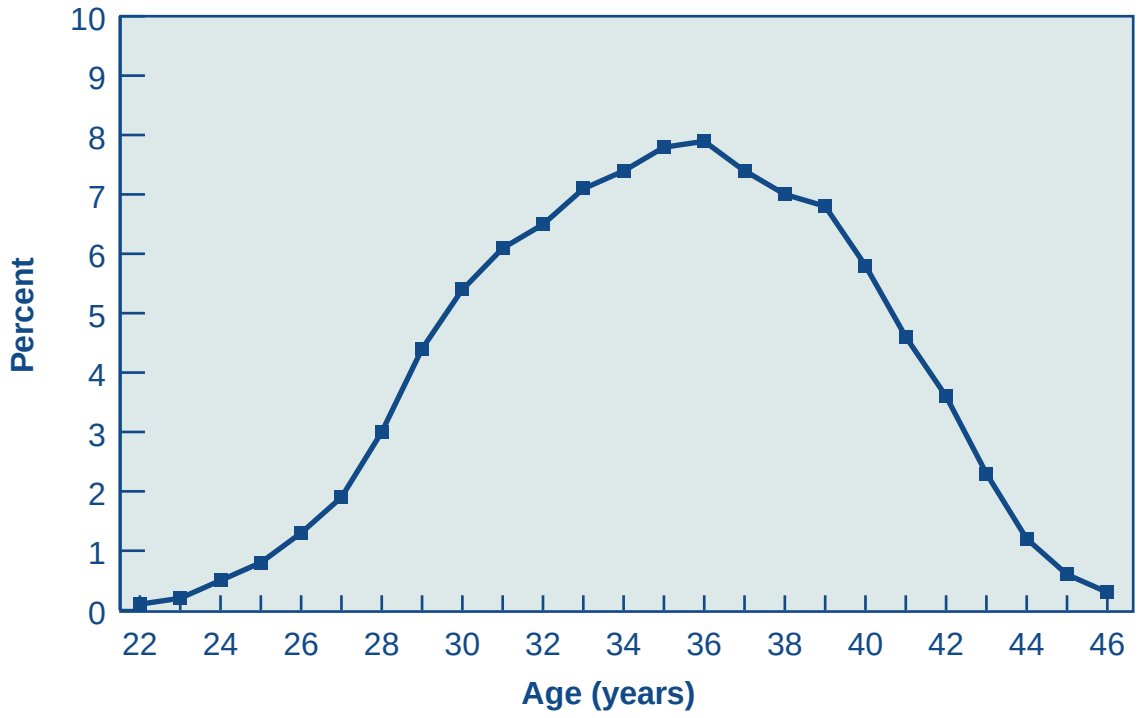


* Number of fetuses not known because the pregnancy ended in an early miscarriage.

What are the ages of women who have an ART procedure?

Figure 9 presents ART cycles using fresh, nondonor eggs or embryos according to the age of the woman who had the procedure. About 70% of these cycles were among women aged 30–39. Because very few women younger than age 22 used ART and very few women older than age 46 used ART with their own eggs, those cycles are not included in the figure.

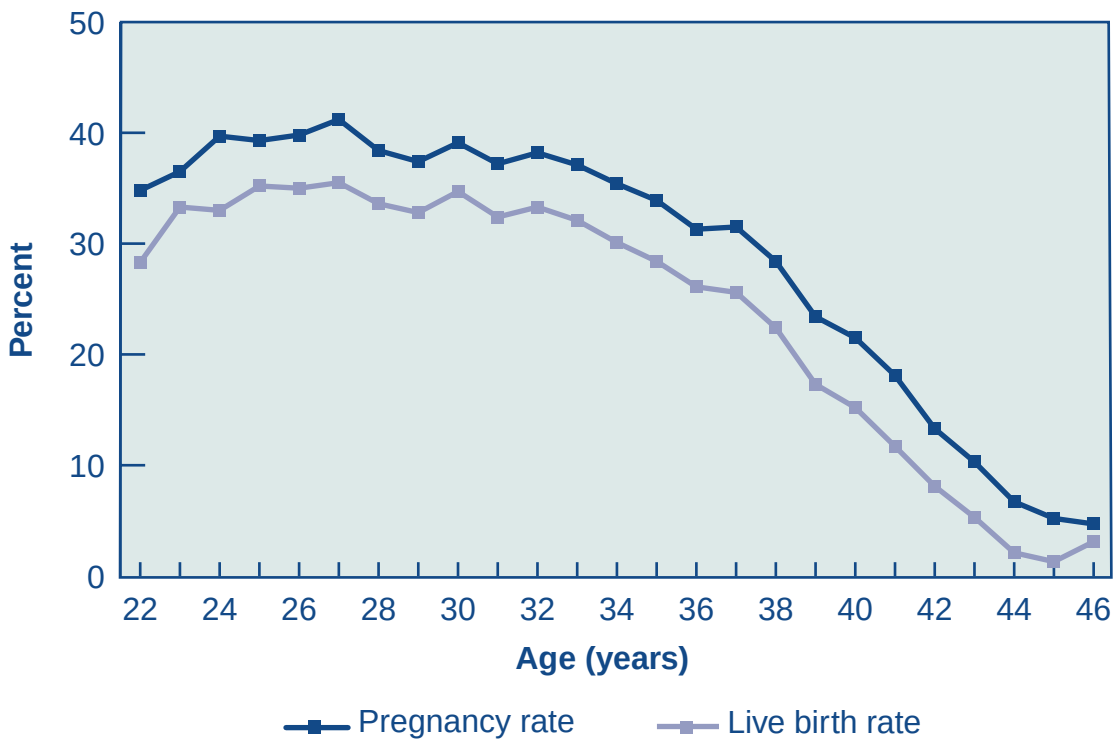
Figure 9
Age Distribution of Women Who Had ART Cycles Using Fresh, Nondonor Eggs or Embryos, 2000



Do ART success rates differ among women of different ages?

A woman's age is the most important factor affecting the chances of a live birth when her own eggs are used. Figure 10 shows both the pregnancy and live birth rates for women of different ages who had ART procedures using fresh, nondonor eggs or embryos in 2000. Among women in their 20s, both pregnancy and live birth rates were relatively stable; however, both rates declined steadily from the mid-30s onward as fertility declined with age. For additional detail on success rates among women aged 40 years or older, see Figure 11.

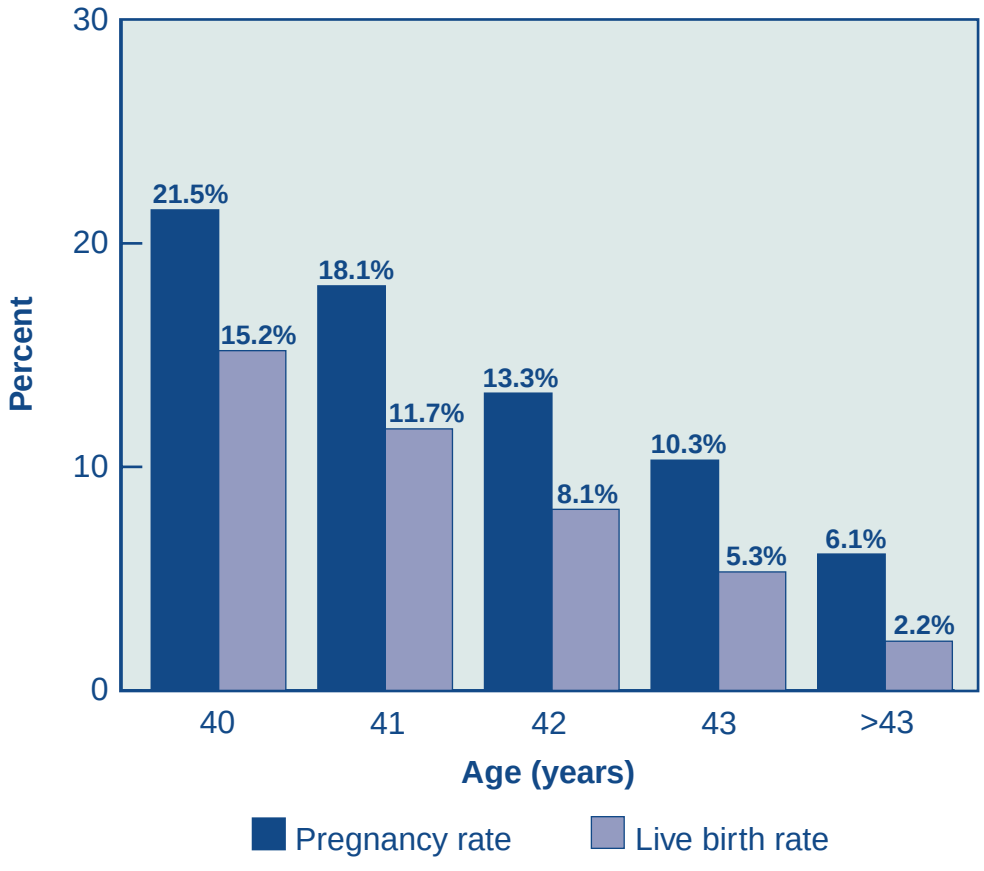
Figure 10
Pregnancy and Live Birth Rates for ART Cycles Using Fresh, Nondonor Eggs or Embryos, by Age of Woman, 2000



How do ART success rates differ for women who are 40 or older?

Success rates decline with each year of age and are particularly low for women 40 or older. Figure 11 shows pregnancy and live birth rates for women 40 or older who used fresh, nondonor eggs or embryos. The average chance for pregnancy was about 22% for women aged 40; the live birth rate for this age was about 15%. This rate dropped steadily with each one-year increase in age. The live birth rate was approximately 5% for women aged 43, and 2% for women older than 43. Women 40 or older generally have much higher success rates using donor eggs. (See Figure 35.)

Figure 11
Pregnancy and Live Birth Rates for ART Cycles Using Fresh, Nondonor Eggs or Embryos Among Women Aged 40 or Older, 2000

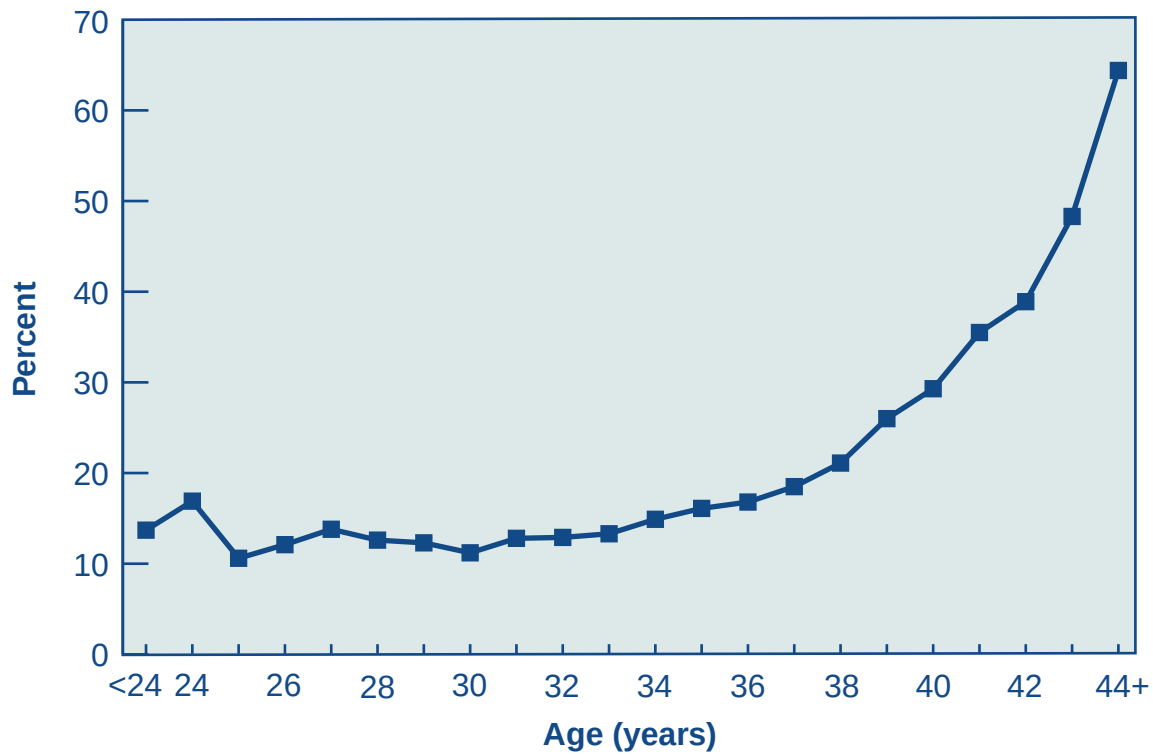


How do miscarriage rates vary among women of different ages undergoing ART?

A woman's age not only affects the chance for pregnancy when her own eggs are used, but also affects her risk for miscarriage. Figure 12 shows miscarriage rates for women of different ages who became pregnant using ART procedures in 2000. Miscarriage rates generally were near or below 15% among women younger than 34. The rates began to increase among women in their mid-to-late 30s and continued to increase with age, reaching 29% at age 40 and 48% at age 43.

The miscarriage rates observed among women undergoing ART procedures using fresh, nondonor eggs or embryos appear to be similar to those reported in various studies of other pregnant women in the United States.

Figure 12
Miscarriage Rates Among Women Who Had ART Cycles Using Fresh, Nondonor Eggs or Embryos, by Age of Woman, 2000



How does a woman's age affect her chances of progressing through the various stages of ART?

In 2000, a total of 74,957 cycles using fresh, nondonor eggs or embryos were started:

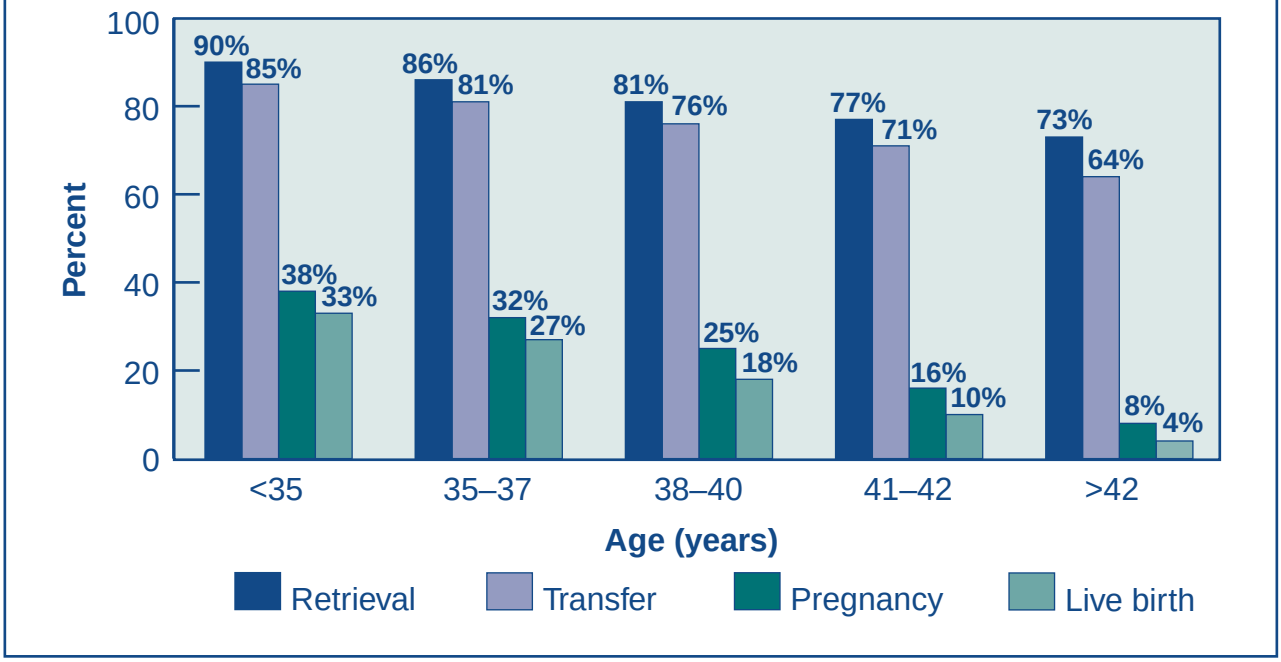
- 33,453 in women younger than 35
- 17,284 in women 35–37
- 14,701 in women 38–40
- 6,118 in women 41–42
- 3,401 in women older than 42

Figure 13 shows that a woman's chance of progressing from the beginning of ART to pregnancy and live birth (using her own eggs) *decreases* at **every stage** of ART as her age *increases*.

- As women get older, the likelihood of a successful response to ovarian stimulation and progression to **egg retrieval** decreases.
- As women get older, cycles that have progressed to egg retrieval are slightly less likely to reach **transfer**.
- The percentage of cycles that progress from transfer to **pregnancy** also decreases as women get older.
- As women get older, cycles that have progressed to pregnancy are less likely to result in a **live birth** because the risk for miscarriage is increased (see Figure 12).

Overall, 33% of cycles started in 2000 among women younger than 35 resulted in live births. This percentage decreased to 27% among women aged 35–37, 18% among women aged 38–40, 10% among women 41–42, and 4% among women older than 42.

Figure 13
Outcomes of ART Cycles Using Fresh, Nondonor Eggs or Embryos, by Stage and Age Group, 2000

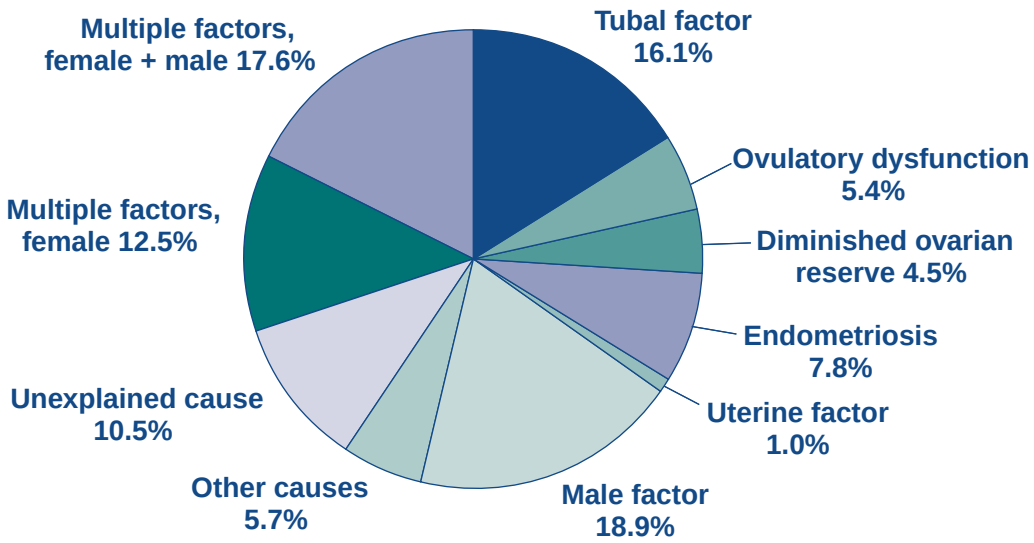


What are the causes of infertility among couples who use ART?

Figure 14 shows the diagnoses reported for infertility among couples who had an ART procedure using fresh, nondonor eggs or embryos in 2000. Diagnoses range from one infertility factor in one partner to multiple factors in either one or both partners. However, diagnostic procedures may vary from one clinic to another, so the categorization may be inexact.

- **Tubal factor** means that the woman's fallopian tubes are blocked or damaged, making it difficult for the egg to be fertilized or for an embryo to travel to the uterus.
- **Ovulatory dysfunction** means that the ovaries are not producing eggs normally. Such dysfunctions include polycystic ovary syndrome and multiple ovarian cysts.
- **Diminished ovarian reserve** means that the ability of the ovary to produce eggs is reduced. Reasons include congenital, medical, or surgical causes or advanced age (older than 40).
- **Endometriosis** involves the presence of tissue similar to the uterine lining in abnormal locations. This condition can affect both fertilization of the egg and embryo implantation.
- **Uterine factor** means a structural or functional disorder of the uterus that results in reduced fertility.
- **Male factor** refers to a low sperm count or problems with sperm function that make it difficult for a sperm to fertilize an egg under normal conditions.
- **Other causes** of infertility include immunological problems, chromosomal abnormalities, cancer chemotherapy, and serious illnesses.
- **Unexplained cause** means that no cause of infertility was found in either the woman or the man.
- **Multiple factors, female only**, means that more than one female cause was diagnosed.
- **Multiple factors, female and male**, means that one or more female causes and male factor infertility were diagnosed.

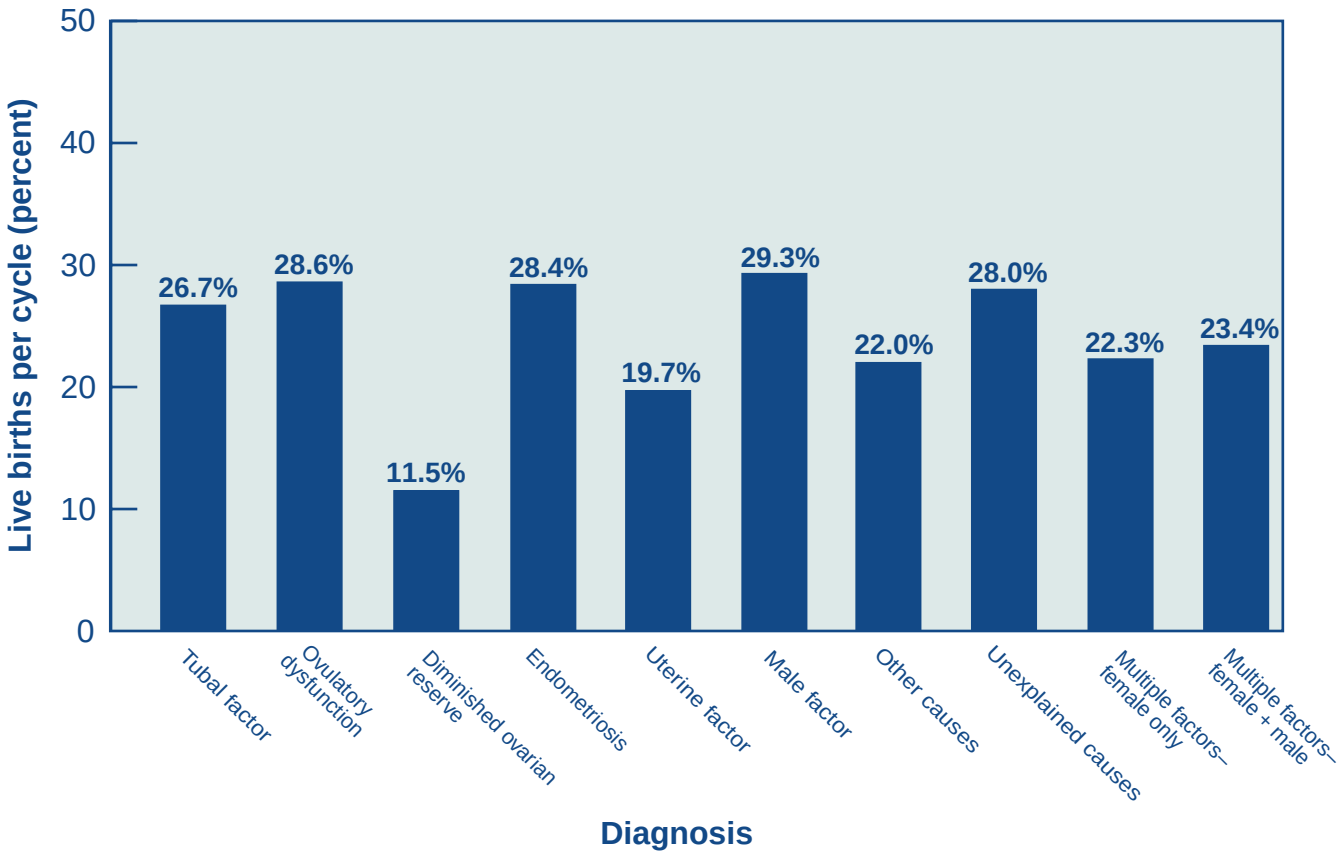
Figure 14
Diagnoses Among Couples Who Had ART Cycles Using Fresh, Nondonor Eggs or Embryos, 2000



Does the cause of infertility affect the chances of success using ART?

Figure 15 shows the percentage of live births after an ART procedure according to the causes of infertility. (See Figure 14 or the glossary in Appendix B for an explanation of the diagnoses.) Although the national average success rate was 25.4%, success rates varied somewhat depending on diagnosis; however, the definitions of these diagnoses may vary from clinic to clinic. In general, couples diagnosed with tubal factor, ovulatory dysfunction, endometriosis, male factor, or unexplained infertility had above-average success rates. The lowest success rate was observed for those with diminished ovarian reserve. Additionally, couples with uterine factor, "other" causes, or multiple infertility factors had below-average success rates.

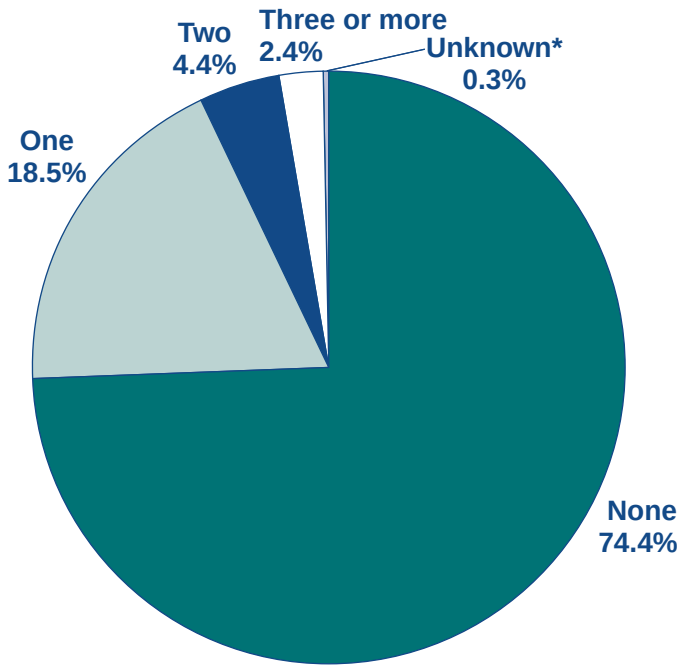
Figure 15
Live Birth Rates Among Women Who Had ART Cycles Using Fresh, Nondonor Eggs or Embryos, by Diagnosis, 2000



How many women who use ART have previously given birth?

Figure 16 shows the number of previous births among women who had an ART procedure using fresh, nondonor eggs or embryos in 2000. Most of these women (about 74%) had no previous births, although they may have had a pregnancy that resulted in a miscarriage or an induced abortion. About 19% of women using ART in 2000 reported one previous birth, and about 7% reported two or more previous births. However, we do not have information about how many of these were ART births and how many were not. These data nonetheless point out that women who have previously had children can still face infertility problems, including the infertility of a new partner.

Figure 16
Number of Previous Births Among Women Who Had ART Cycles Using Fresh, Nondonor Eggs or Embryos, 2000

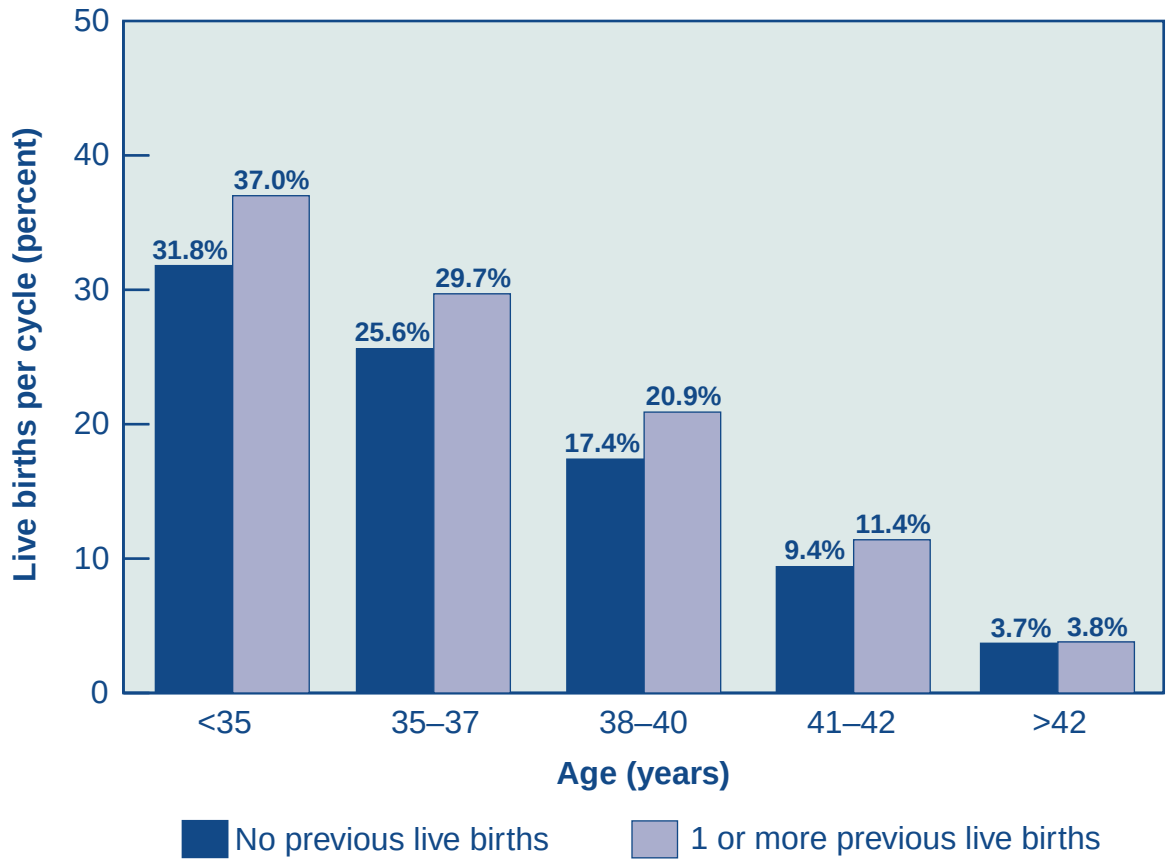


* Lost to follow-up.

Do women who have previously given birth have higher ART success rates?

Figure 17 shows the relationship between the success of an ART cycle and the history of previous births. Previous live-born infants were conceived naturally in some cases and through ART in others. In all age groups, women who had a previous live birth were slightly more likely to have a successful ART procedure.

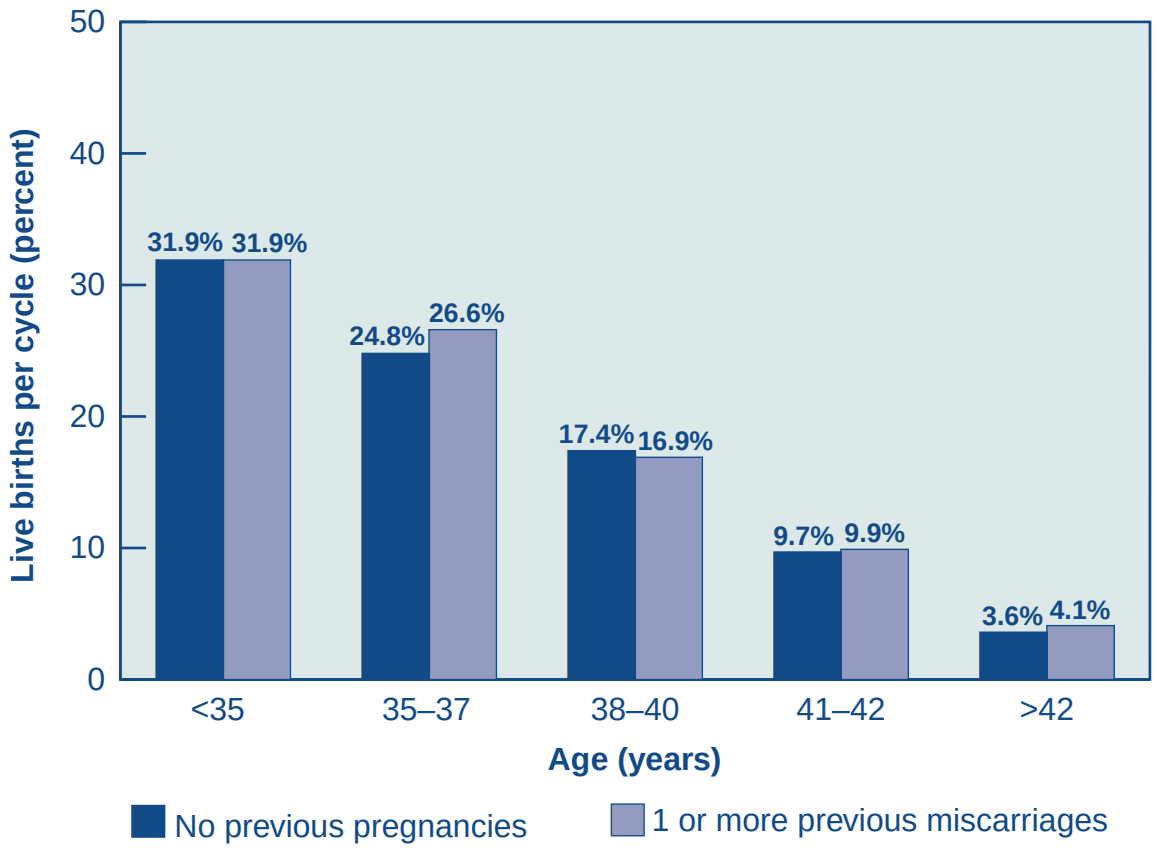
Figure 17
Live Birth Rates for ART Cycles Using Fresh, Nondonor Eggs or Embryos, by Woman's Age and Number of Previous Live Births, 2000



Are women with previous miscarriages more likely to be successful using ART compared with women who have never been pregnant?

More than 55,700 ART cycles were performed among women who had not previously given birth (see Figure 16). However, about 25% of those cycles were reported by women with one or more previous pregnancies that had ended in miscarriage. We do not have information on whether the previous pregnancies were the result of ART or were conceived naturally. Figure 18 shows the relationship between the success of an ART cycle and the history of previous miscarriage. In all age groups women who had a previous miscarriage had live birth rates that were comparable to the live birth rates among women who had never been pregnant. Thus a history of unsuccessful pregnancy does not appear to be associated with reduced chances for success during ART.

Figure 18
Live Birth Rates for ART Cycles Using Fresh, Nondonor Eggs or Embryos, by Woman's Age and History of Miscarriage, Among Women With No Previous Births,* 2000

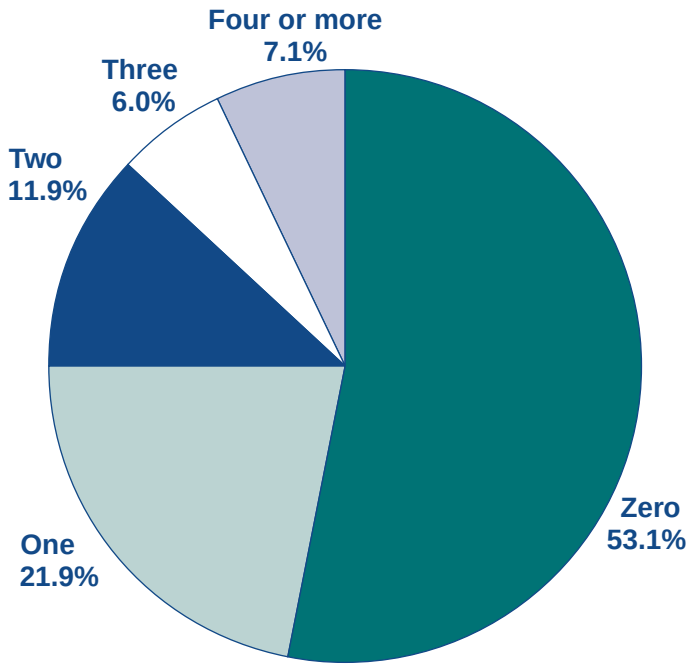


*Women reporting only previous ectopic pregnancies or pregnancies that ended in induced abortion were not included in the above statistics.

How many current ART users have undergone previous ART cycles?

Figure 19 presents ART cycles that used fresh, nondonor eggs or embryos in 2000 according to whether previous ART cycles had been performed. For about 47%, one or more previous cycles were reported. (This percentage includes previous cycles using either fresh or frozen embryos.) This finding illustrates that it is not uncommon for a couple to undergo multiple ART cycles. We do not have information on when previous cycles were performed, nor do we have information on the outcomes of those previous cycles.

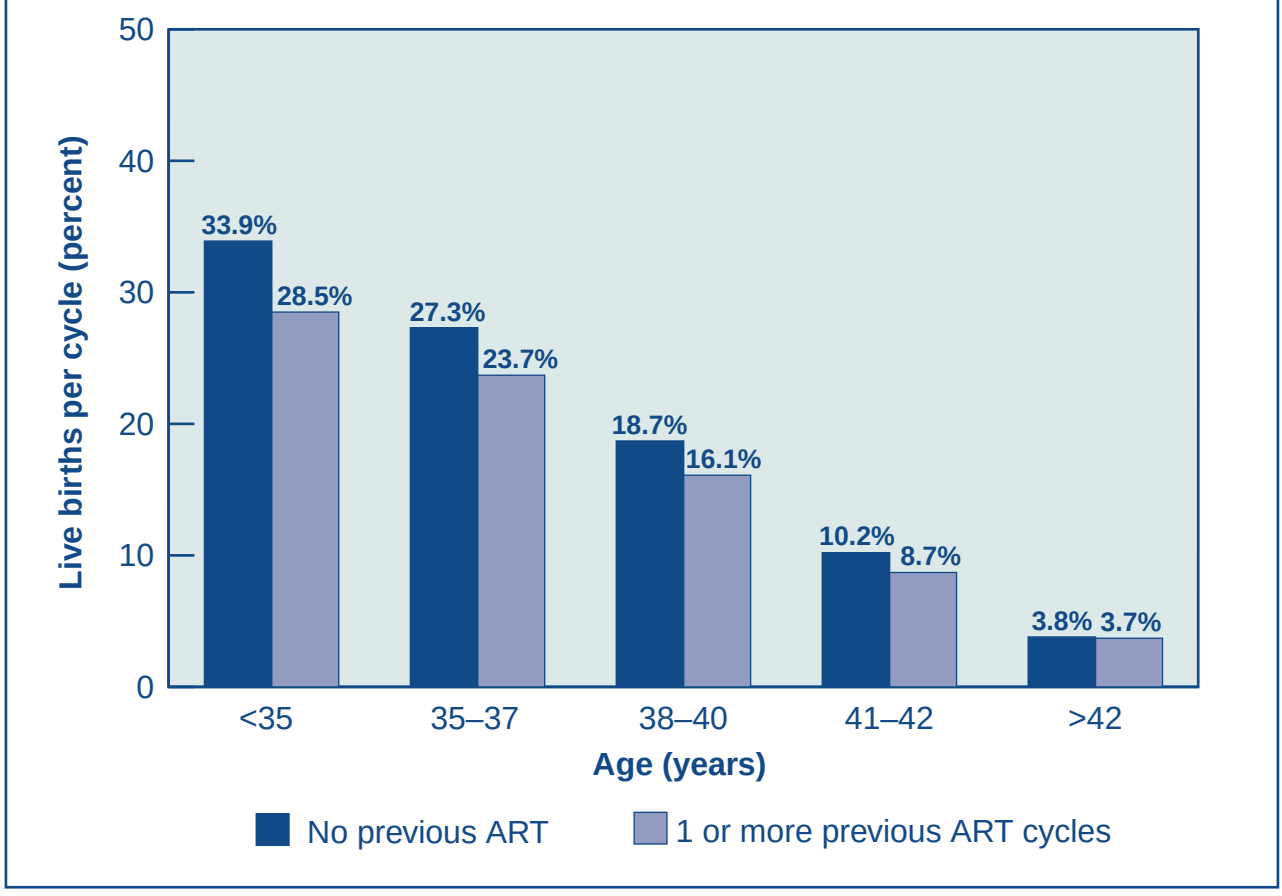
Figure 19
Number of Previous ART Cycles Among Women Undergoing ART in 2000 With Fresh, Nondonor Eggs or Embryos



Are success rates different for women using ART for the first time and women who previously used ART but did not give birth?

Figure 20 shows the relationship between the success of ART cycles performed in 2000 using fresh, nondonor eggs or embryos and a history of previous ART cycles among women with no previous births. In all age groups up to age 42, success rates were lower for women who had previously undergone an unsuccessful ART cycle. Women older than 42 who used their own eggs had low success rates overall. Whether or not a woman had previously undergone ART was not further predictive of success rates in this oldest age group.

Figure 20
Live Birth Rates for ART Cycles Using Fresh, Nondonor Eggs or Embryos, by Woman's Age and History of Previous ART Cycles, Among Women With No Previous Births, 2000

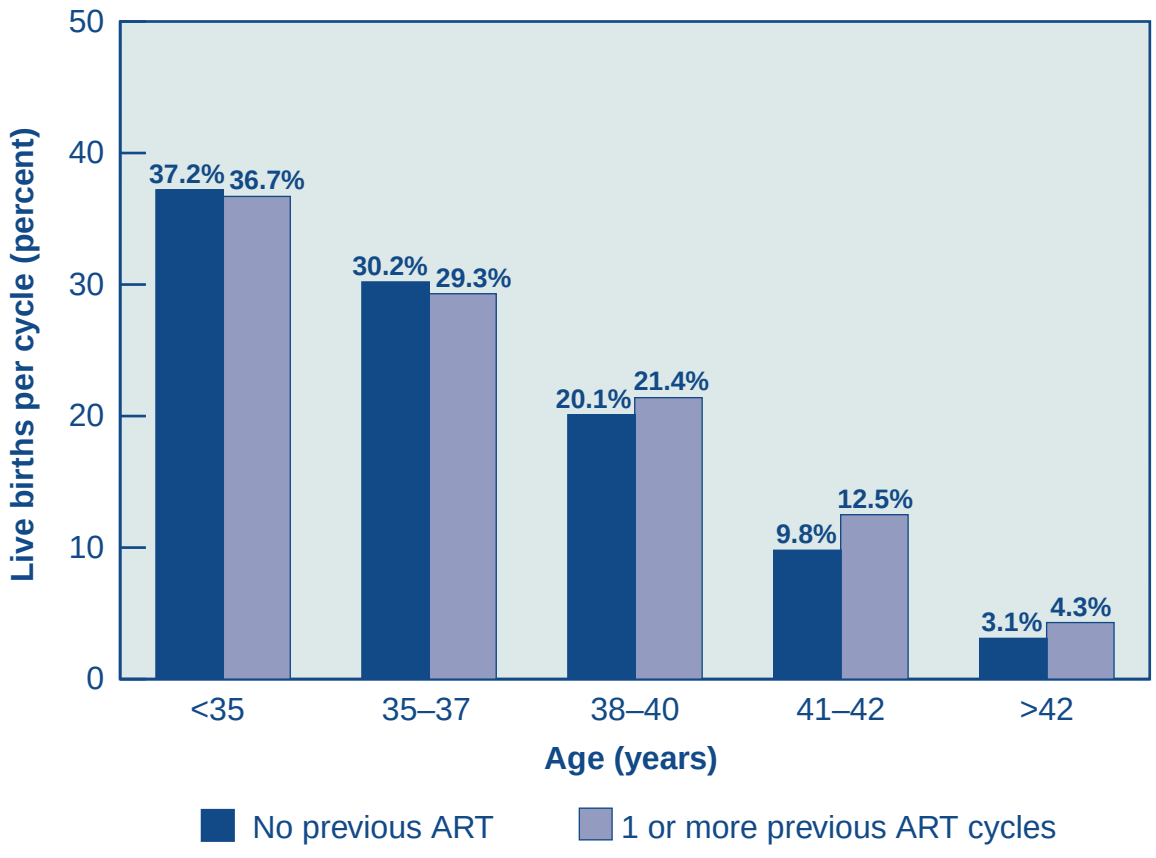


What are the success rates for women who have had *both* previous ART and previous births?

Figure 21 shows the relationship between the success of ART cycles performed in 2000 using fresh, nondonor eggs or embryos and a history of *both* previous ART cycles and previous births. We do not have information on whether the previous births were the result of ART or were conceived naturally. However, among women with previous births, there was no decline in success rates if they had undergone previous ART cycles.

Taken together, Figures 20 and 21 show that having undergone previous ART cycles may be related to the success of the current ART cycle. However, it is important to consider the outcomes of previous cycles and whether the woman has given birth in the past.

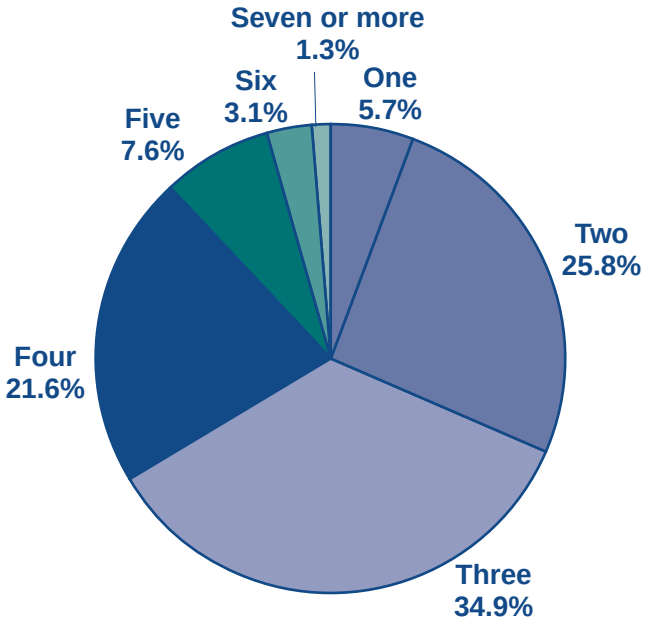
Figure 21
Live Birth Rates for ART Cycles Using Fresh, Nondonor Eggs or Embryos, by Woman's Age and History of Previous ART Cycles, Among Women With One or More Previous Births, 2000



How many embryos are transferred in an ART procedure?

Figure 22 shows that approximately 68% of ART cycles that used fresh, nondonor eggs or embryos and progressed to the embryo transfer stage in 2000 involved the transfer of three or more embryos, about 34% of cycles involved the transfer of four or more, and 12% of cycles involved the transfer of five or more embryos.

Figure 22
Number of Embryos Transferred During ART Cycles Using Fresh, Nondonor Eggs or Embryos, 2000

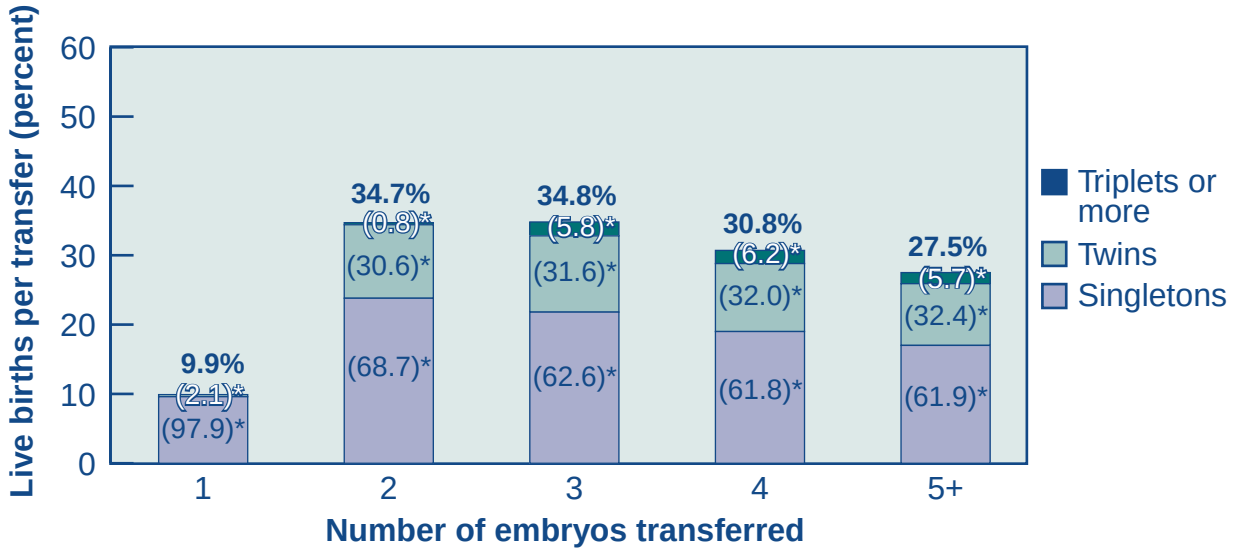


In general, is an ART cycle more likely to be successful if more embryos are transferred?

Figure 23 shows the relationship between the number of embryos transferred during an ART procedure in 2000 and the number of infants born alive as a result of that procedure. The success rate increased when two or more embryos were transferred; however, transferring multiple embryos also poses a risk of having a multiple-infant birth. Multiple-infant births cause concern because of the additional health risks they create for both mothers and infants. Also, pregnancies with multiple fetuses can be associated with the possibility of multifetal reduction.

The relationships between number of embryos transferred, success rates, and multiple-infant births are complicated by several factors, such as age and embryo quality. See Figure 24 for more details on women most at risk for multiple births.

Figure 23
Live Births per Transfer and Percentages of Multiple-Infant Births for ART Cycles Using Fresh, Nondonor Eggs or Embryos, by Number of Embryos Transferred, 2000

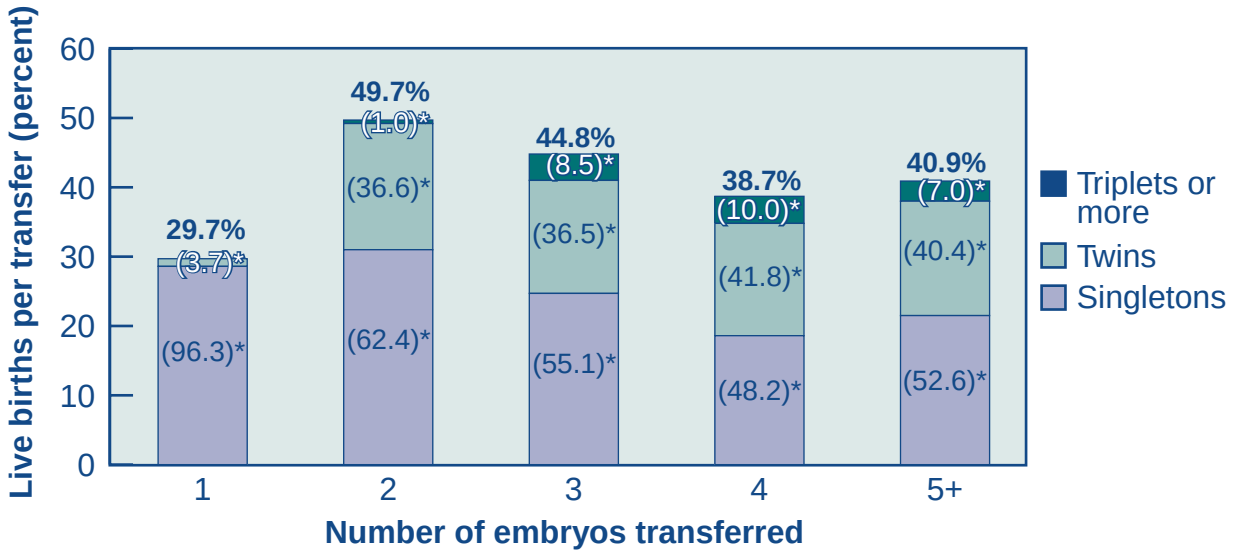


*Percentages of live births that were singletons, twins, and triplets or more are in parentheses.
Note: In rare cases a single embryo may divide and thus produce twins. For this reason a small percentage of twins resulted from a single embryo transfer and a small percentage of triplets resulted when two embryos were transferred.

Are live birth rates affected by the number of embryos transferred for women who have more embryos available than they choose to transfer?

Although, in general, transferring more than one embryo tends to improve the chance for a successful ART procedure (see Figure 23), other factors are also important. Previous research suggests that the number of embryos fertilized and thus available for ART is just as, if not more, important in predicting success as the number of embryos transferred.* Additionally, younger women tend to have both higher success rates and higher multiple-infant birth rates. Figure 24 shows the relationship between the number of embryos transferred, success rates, and multiple-infant births for a subset of ART procedures in which the woman was younger than 35 and the couple chose to set aside some embryos for future cycles rather than transfer all available embryos at one time. For this group, the chance for a live birth using ART was about 50% when only two embryos were transferred. There was no increase in the success rate when three embryos were transferred. The proportion of live births that were multiple-infant births was about 38% with two embryos and 45% with three embryos. Transferring three or more embryos also created an additional risk for higher-order multiple births (i.e., triplets or more).

Figure 24
Live Births per Transfer and Percentages of Multiple-Infant Births for ART Cycles in Women Who Were Younger Than 35; Used Fresh, Nondonor Eggs or Embryos; and Set Aside Extra Embryos for Future Use, by Number of Embryos Transferred, 2000



*Percentages of live births that were singletons, twins, and triplets or more are in parentheses.
Note: In rare cases a single embryo may divide and thus produce twins. For this reason a small percentage of twins resulted from a single embryo transfer and a small percentage of triplets resulted when two embryos were transferred.

* A more detailed CDC report that discusses how various factors affect live birth and multiple-infant birth rates among women in both older and younger age groups was published in *JAMA* in 1999 (Vol. 282, No. 19, pages 1832–1838). The American Society for Reproductive Medicine (ASRM) and the Society for Assisted Reproductive Technology (SART) issue guidelines dealing with the number of embryos to be transferred in an ART procedure. Further information can be obtained from ASRM or SART (telephone 205-978-5000 or Web site http://www.sart.org).

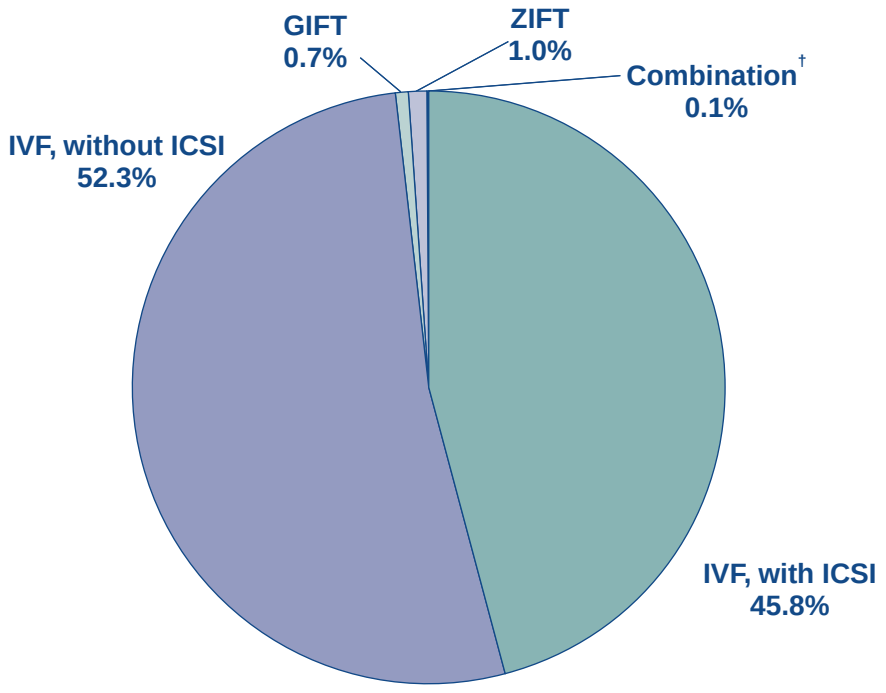
What were the specific types of ART performed among women who used fresh, nondonor eggs or embryos in 2000?

For more than half of the ART procedures using fresh, nondonor eggs or embryos in 2000, standard IVF (in vitro fertilization) techniques were used in which eggs and sperm were combined in the laboratory, the resulting embryos were cultured for two or more days, and one or more embryos were then transferred into the woman's uterus through the cervix.

For nearly 46% of ART procedures, fertilization was accomplished using intracytoplasmic sperm injection (ICSI). This technique involves injecting a single sperm directly into an egg; the embryos were then cultured and transferred as in standard IVF.

For a small proportion of ART procedures, unfertilized eggs and sperm (gametes) or early embryos (zygotes) were transferred into the woman's fallopian tubes. These procedures are known as gamete and zygote intrafallopian transfer (GIFT and ZIFT). Some women with tubal infertility are not suitable candidates for GIFT and ZIFT. GIFT and ZIFT are more invasive procedures than IVF because they involve inserting a laparoscope into a woman's abdomen to transfer the embryos or gametes into the fallopian tubes. In contrast, IVF involves transferring embryos or gametes into a woman's uterus through the cervix without surgery.

Figure 25
Types of ART Procedures Using Fresh, Nondonor Eggs or Embryos,* 2000

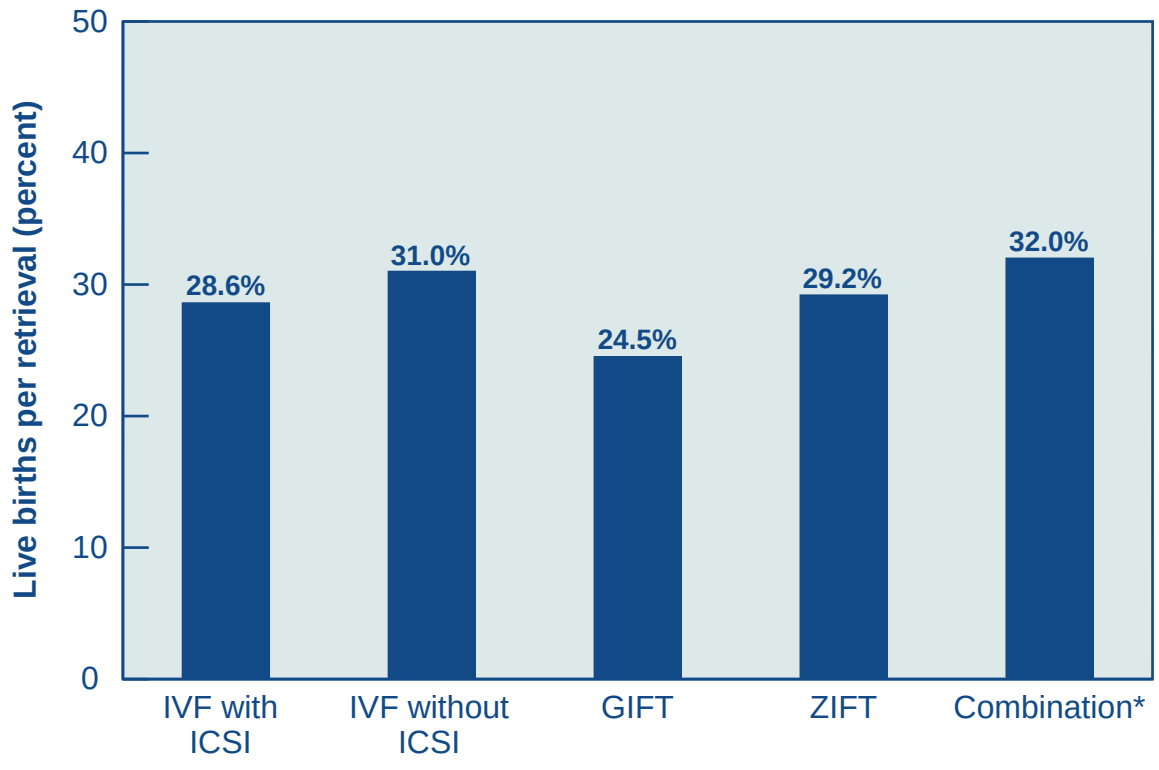


*Cycles that were canceled before egg retrieval were classified as IVF, GIFT, or ZIFT based on the intended ART method.
†Combination of IVF with or without ICSI and either GIFT or ZIFT.

What are the success rates for different types of ART procedures?

Figure 26 shows the percentage of egg retrievals in 2000 that used a particular type of ART procedure and resulted in a live birth. Success rates for IVF with ICSI (intracytoplasmic sperm injection), IVF without ICSI, GIFT, and ZIFT were similar. Although the rate appears to be slightly higher for cycles that used a combination of IVF and either GIFT or ZIFT, this rate was based on a fairly small number of cycles (only 0.1% of the total number of fresh, nondonor procedures used a combination of procedures) and should be interpreted with caution. Because similar patterns were seen in all age groups, results are given for all age groups combined. See Figures 27 through 29 for further details on IVF procedures that used ICSI.

Figure 26
Live Births per Retrieval for Different Types of ART Procedures, Using Fresh, Nondonor Eggs or Embryos, 2000

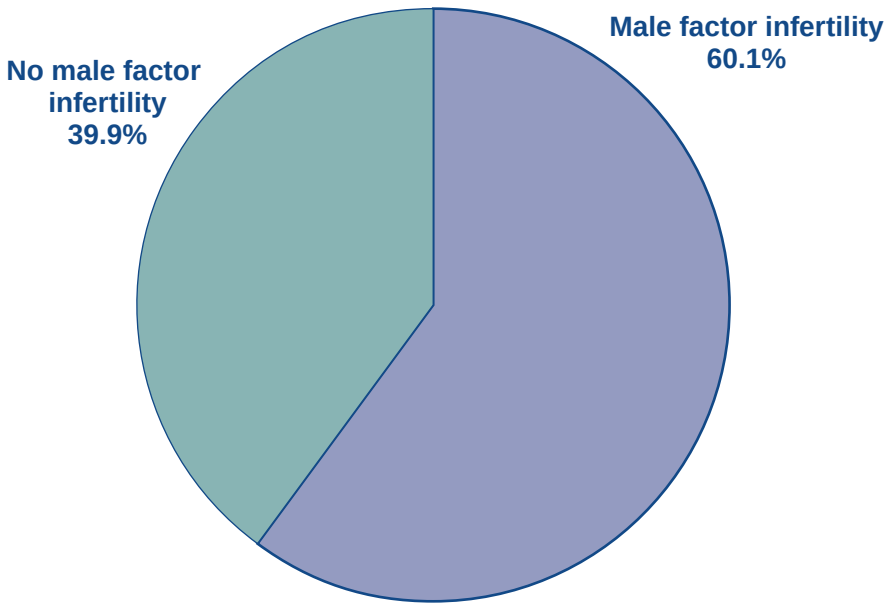


*Combination of IVF with or without ICSI and either GIFT or ZIFT.

What percentage of cycles that use ICSI are performed on couples with male factor infertility?

Intracytoplasmic sperm injection (ICSI) was developed to overcome problems with fertilization that sometimes occur in couples diagnosed with male factor infertility. In 2000, 34,285 ICSI cycles were performed. Although the majority of couples using ICSI had a diagnosis of male factor infertility, a sizable portion of ICSI cycles (40%) were performed on couples without a diagnosis of male factor infertility.

Figure 27
Use of ICSI* by Couples With and Without Diagnosis of Male Factor Infertility,† 2000

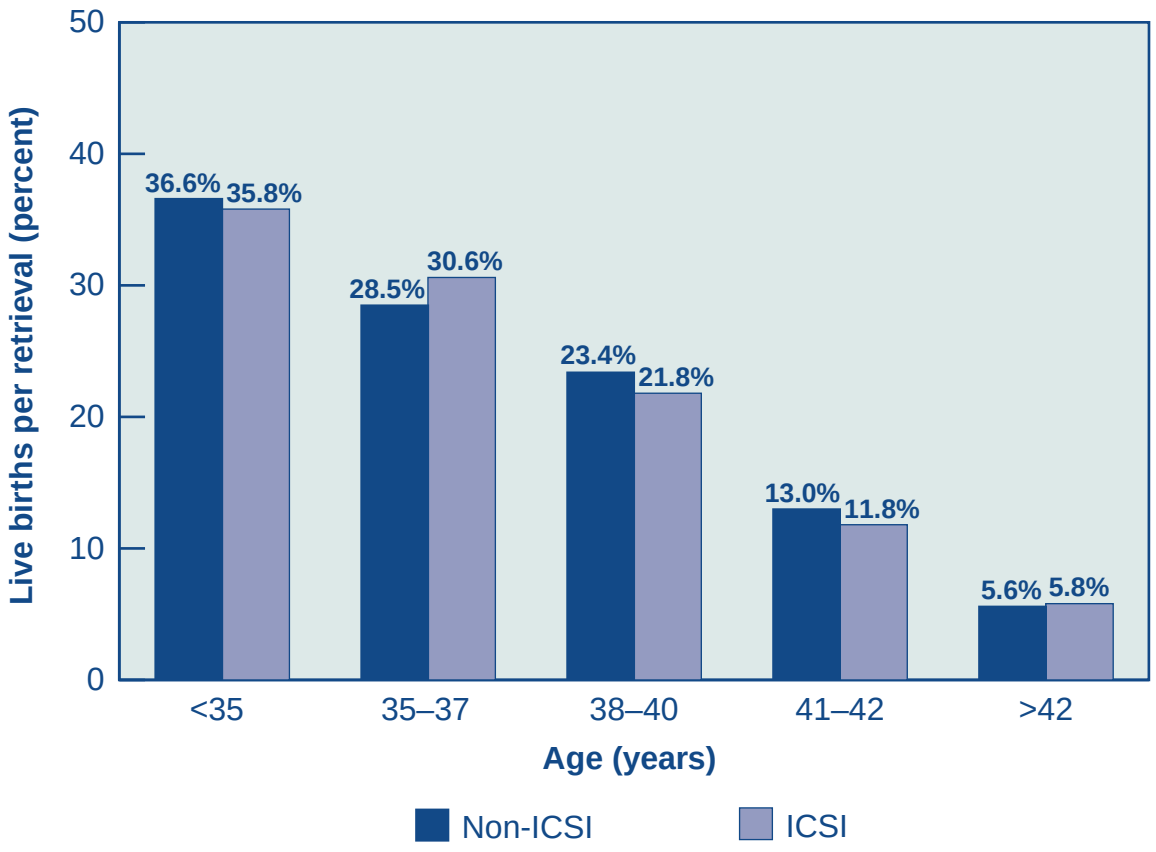


*Intracytoplasmic sperm injection.
†Based on 34,285 cycles that used IVF with ICSI.

What are the success rates for couples with male factor infertility when ICSI is used?

Figure 28 compares the success rates for ART procedures that used ICSI with those not using ICSI among couples diagnosed with male factor infertility. Because ICSI can be performed only when at least one egg has been retrieved, the live birth per retrieval rates are presented. In 2000, success rates per retrieval were comparable between ICSI cycles and cycles that used IVF without ICSI. Although Figure 28 is limited to those procedures in which the couple was diagnosed with male factor infertility, no information is available about the severity of the condition, so it is possible that ICSI was used more often in the most serious cases (for example, among those with the lowest sperm counts). Therefore, the findings presented in Figure 28 do not necessarily provide an indication of how all couples with male factor infertility would have fared had they not used ICSI.

Figure 28
Live Births per Retrieval for ART Cycles Using Fresh, Nondonor Eggs or Embryos Among Couples Diagnosed With Male Factor Infertility, by Use of ICSI* and Woman's Age,† 2000

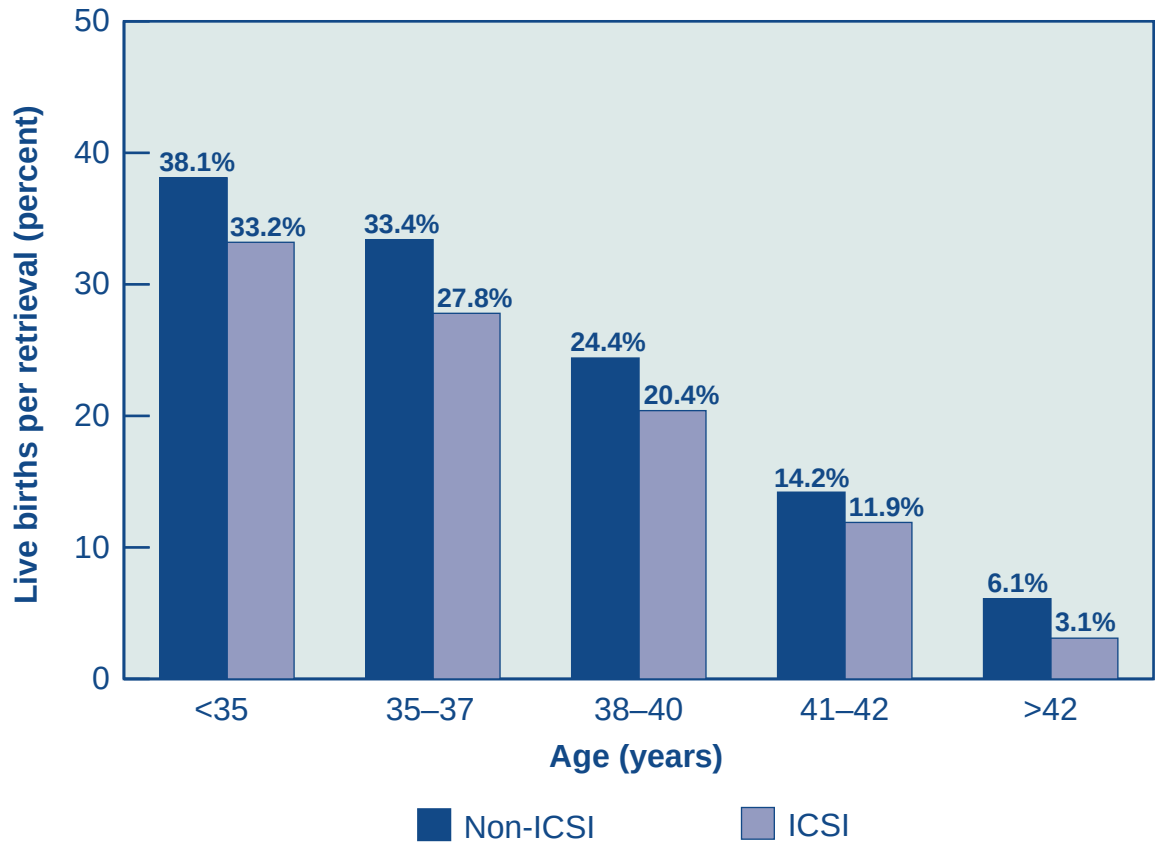


*Intracytoplasmic sperm injection.
†Cycles using donor sperm and cycles using GIFT or ZIFT are excluded.

What are the success rates for couples without a diagnosis of male factor infertility when ICSI is used?

As shown in Figure 27, a large number of ICSI cycles are now performed even when couples are not diagnosed with male factor infertility. Figure 29 presents success rates per retrieval for those cycles compared with cycles that used IVF without ICSI. For every age group, the ICSI cycles were less successful. Information was not available to determine whether this finding was related to the ICSI procedure directly or whether the patients who used ICSI were different from those who used IVF alone. However, when separately evaluated, patients with one or more previous ART cycles that had not been successful (i.e., the group that was perhaps the most difficult to treat) were also observed to have lower success rates for the ICSI cycles in comparison with cycles that used IVF without ICSI.

Figure 29
Live Births per Retrieval for ART Cycles Using Fresh, Nondonor Eggs or Embryos Among Couples Not Diagnosed With Male Factor Infertility, by Use of ICSI* and Woman's Age,† 2000

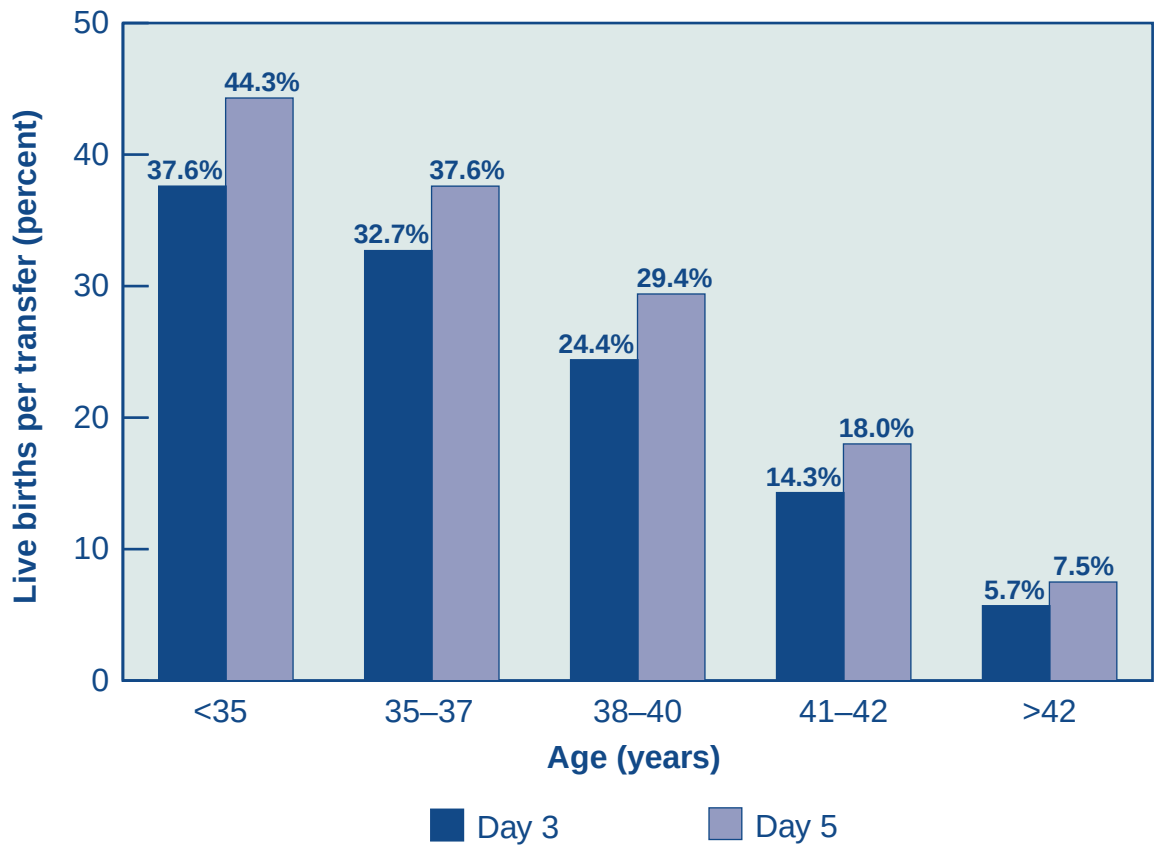


*Intracytoplasmic sperm injection.
†Cycles using GIFT or ZIFT are excluded.

Are success rates affected by the day of embryo transfer?

Once an ART cycle has progressed from egg retrieval to successful fertilization, the embryo(s) can be transferred into the woman's uterus anytime from one to six days after the eggs were retrieved. Figure 30 shows live birth rates per transfer for cycles that used fresh, nondonor embryos by the day embryo transfer occurred. In 2000, almost 73% of embryo transfers occurred on Day 3. Using advanced laboratory techniques, embryo growth in the laboratory can be extended beyond Day 3, most commonly to Day 5. Among those ART cycles that progressed to the embryo transfer stage, the success rate was higher for embryos that had been cultured for five days than for those cultured for only to three days. This pattern of results was seen for all age groups. However, it should be noted that embryo culture for five days may not be the best treatment option for all patients undergoing ART because there is a risk that some embryos may not survive to Day 5.

Figure 30
Live Births per Transfer for ART Cycles Using Fresh, Nondonor Eggs or Embryos, by Day of Embryo Transfer,* 2000

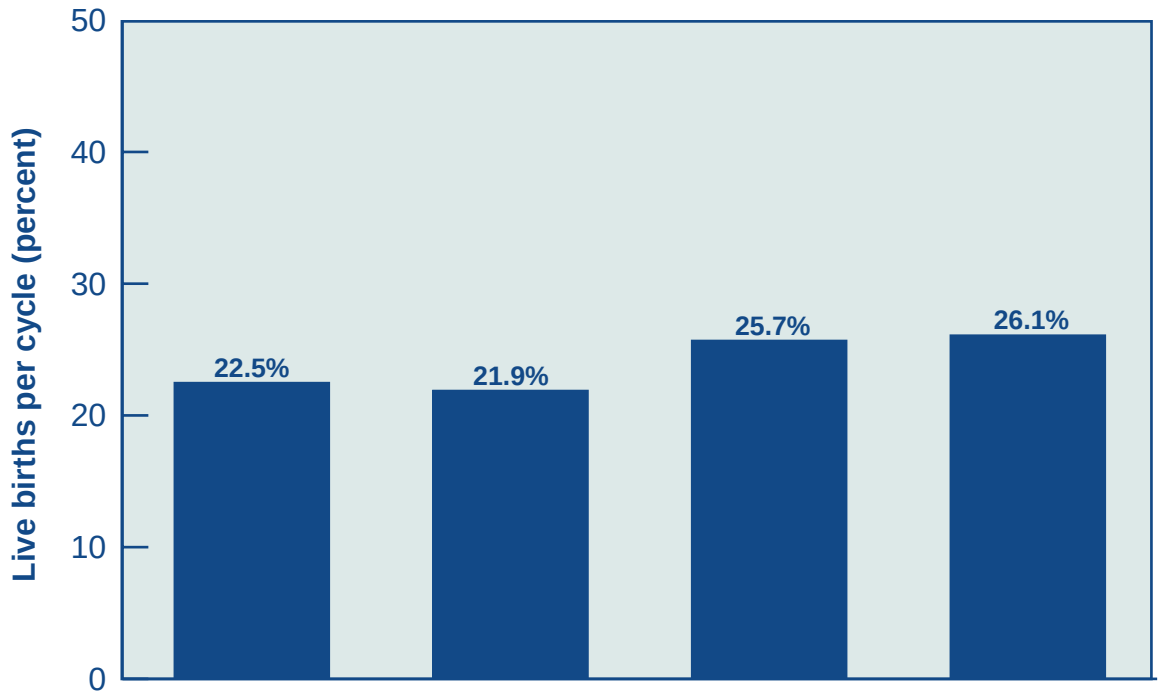


*GIFT and ZIFT were excluded. This comparison was limited to transfers on Day 3 and Day 5. Embryo transfers performed on Days 1, 2, 4, and 6 were not included because each of these accounted for a small proportion of procedures.

Does the size of the clinic affect its success rate?

The number of ART procedures carried out every year varies among fertility clinics in the United States. In 2000, success rates tended to be slightly higher among clinics that performed more cycles. In Figure 31, clinics are divided equally into *four groups* (called quartiles) based on the size of the clinic as determined by the number of cycles it carried out. The percentage for each quartile represents the average success rate for clinics in that quartile. For the exact number of cycles and success rates at an individual clinic, refer to the clinic table section of this report.

Figure 31
Live Birth Rates for ART Cycles Using Fresh, Nondonor Eggs or Embryos, by Clinic Size, 2000

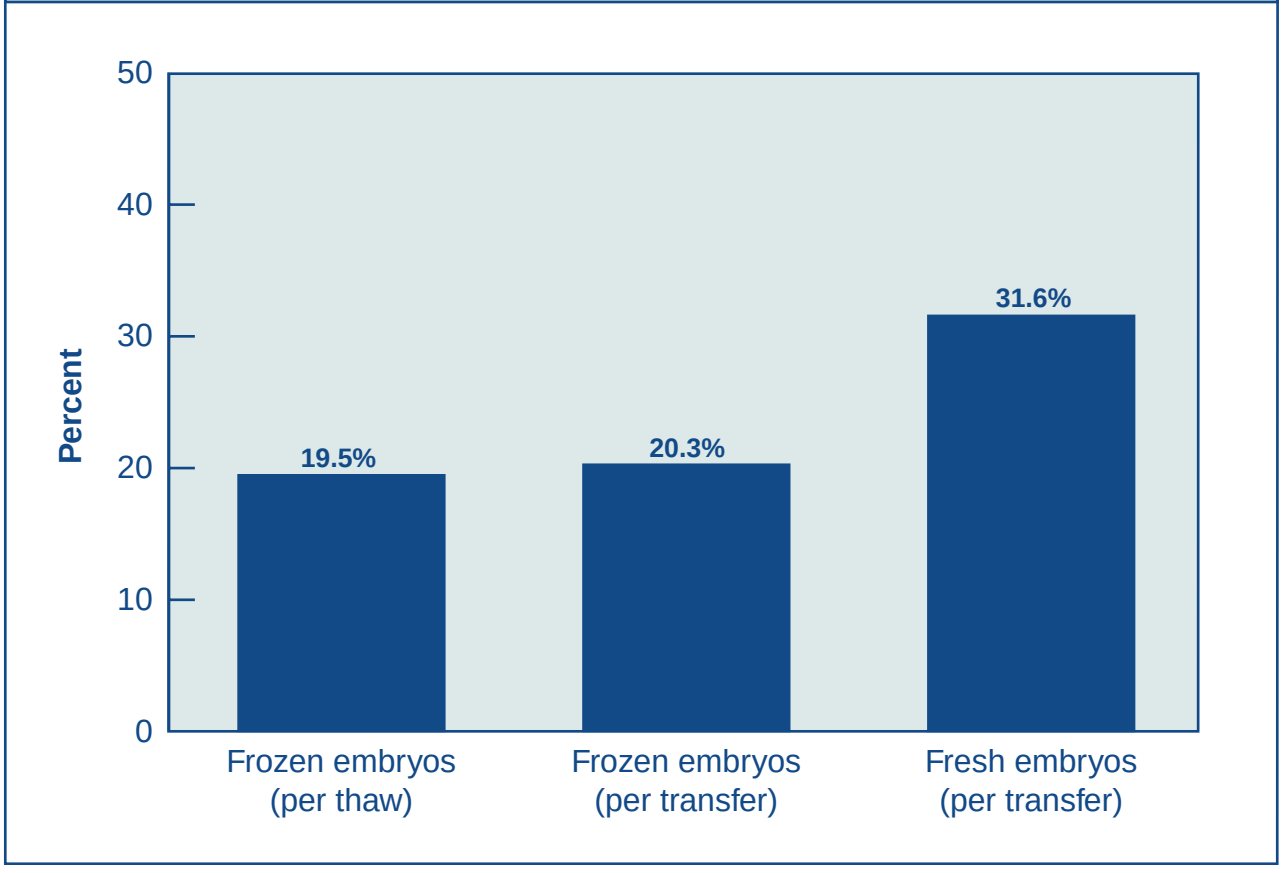


SECTION 3: ART CYCLES USING FROZEN, NONDONOR EMBRYOS

What are the success rates for ART cycles using frozen, nondonor embryos?

Frozen embryos were used in approximately 13% of all ART cycles performed in 2000, or 13,083 cycles. Figure 32 compares the success rates for frozen embryos with the rate for fresh embryos among women using their own eggs. Because some embryos do not survive the thawing process, the live birth per thaw rate is usually lower than the live birth per transfer rate. In 2000, the live birth per thaw and live birth per transfer rates for frozen embryos were lower than the live birth per transfer rate for fresh embryos. However, cycles that use frozen embryos are both less expensive and less invasive than fresh embryo cycles because the woman does not have to go through the fertility drug stimulation and egg retrieval steps again.

Figure 32
Success Rates for ART Cycles Using Frozen Embryos and Fresh Embryos, 2000



What is the risk of having a multiple-fetus pregnancy or multiple-infant birth from an ART cycle using frozen, nondonor embryos?

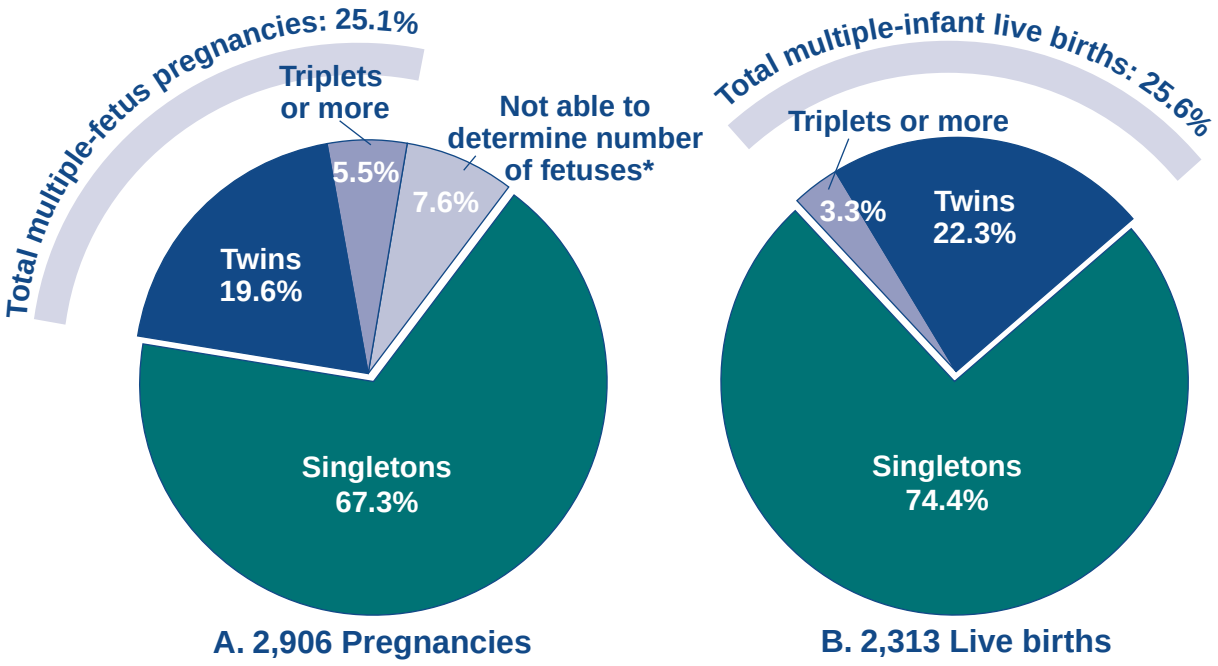
Multiple-infant births are associated with greater problems for both mothers and infants, including higher rates of caesarean section, prematurity, low birth weight, and infant death and disability.

Part A of Figure 33 shows that among the 2,906 pregnancies that resulted from ART cycles using frozen, nondonor embryos, 67% were singleton pregnancies, about 20% were twin pregnancies, and slightly more than 5% were triplet or greater pregnancies. Almost 8% of pregnancies ended in miscarriage before the number of fetuses could be accurately determined. Therefore, the percentage of pregnancies with more than one fetus might have been higher than the 25% reported.

In 2000, 2,313 pregnancies from ART cycles that used frozen, nondonor embryos resulted in live births. Part B of Figure 33 shows that slightly more than 25% of these live births produced more than one infant (22.3% twins and 3.3% triplets or more). This compares with a multiple-infant birth rate of 3% in the general U.S. population.

Although the total rates for multiples were the same for pregnancies and live births, there were more triplet pregnancies than triplet births. Triplet (or more) pregnancies may be reduced to twins or singletons by the time of birth. This can happen naturally (e.g., fetal death), or a woman and her doctor may decide to reduce the number of fetuses using a procedure called multifetal pregnancy reduction. Information on medical multifetal pregnancy reductions is incomplete and therefore is not provided here.

Figure 33
Risk of Having Multiple-Fetus Pregnancy and Multiple-Infant Live Birth From ART Cycles Using Frozen, Nondonor Embryos, 2000



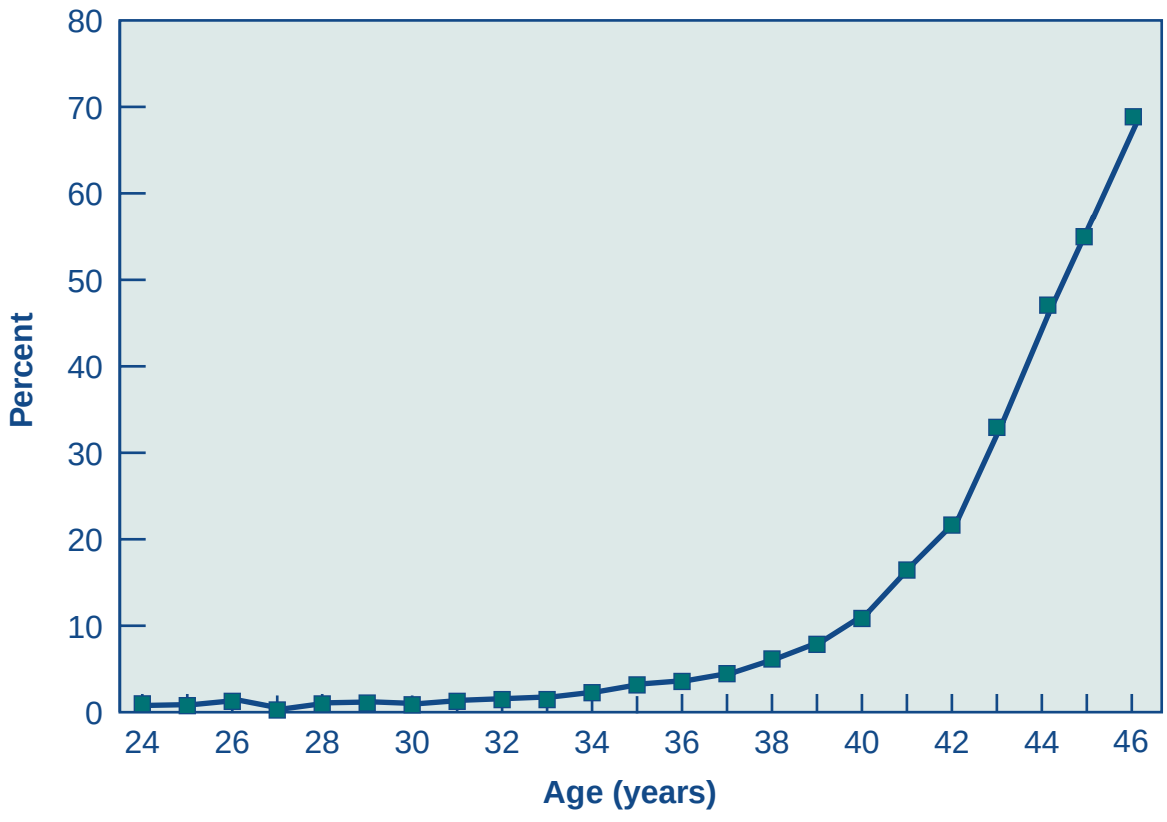
* Number of fetuses not known because the pregnancy ended in an early miscarriage.

SECTION 4: ART CYCLES USING DONOR EGGS

Are older women more likely to have ART using donor eggs or embryos?

As shown in Figures 10, 11, and 12, eggs produced by women in older age groups form embryos that are less likely to implant and more likely to spontaneously abort if they do implant. As a result, ART using donor eggs is much more common among older women than among younger women. Donor eggs or embryos were used in slightly more than 10% of all ART cycles carried out in 2000, or 10,389 cycles. Figure 34 shows the percentage of ART cycles using donor eggs in 2000 according to the woman's age. Few women younger than age 39 used donor eggs; however, the percentage of cycles carried out with donor eggs increased sharply starting at age 39. Among women older than age 46, more than 70% of all ART cycles used donor eggs.

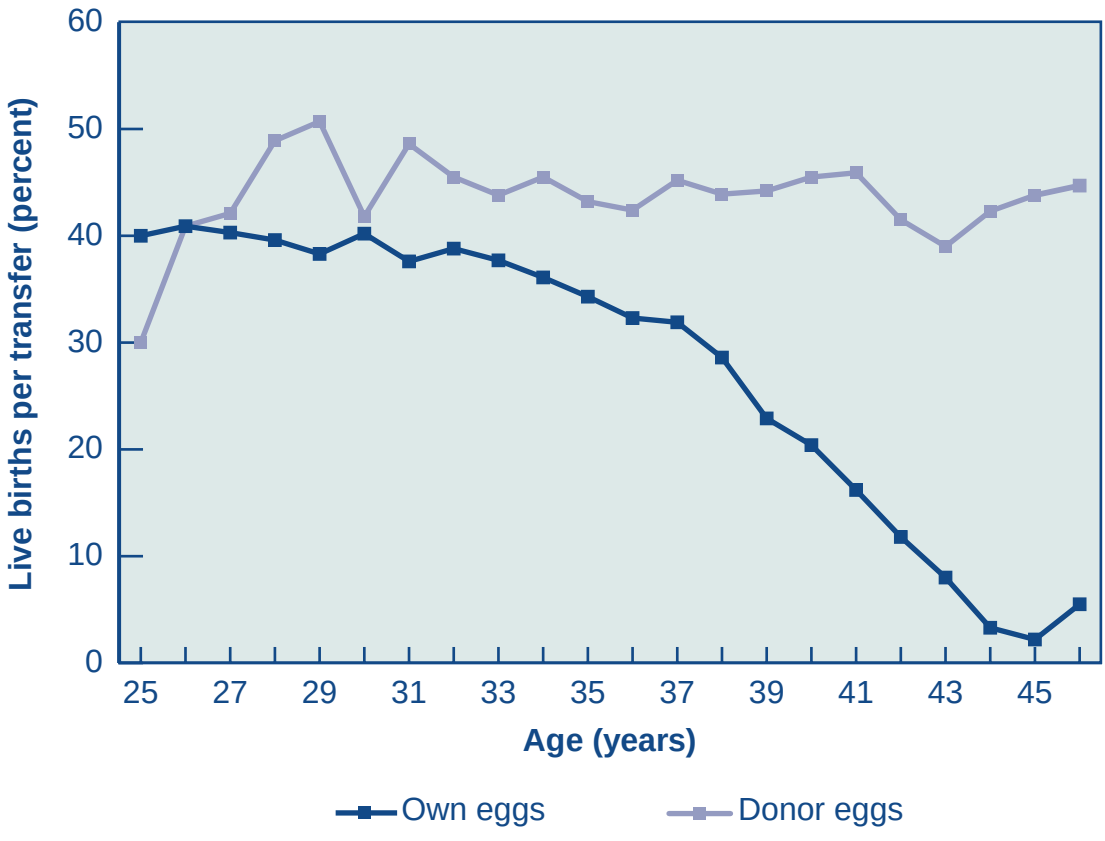
Figure 34
Percentage of ART Cycles Using Donor Eggs, by Age of Recipient, 2000



What are the success rates for ART when donor eggs are used?

Figure 35 compares success rates for ART using fresh, donor eggs or embryos with those for ART using a woman's own eggs or embryos among women of different ages. The likelihood of a fertilized egg implanting is related to the age of the woman who produced the egg. Egg donors are typically in their 20s or early 30s. Thus the live birth per transfer rate for cycles using embryos from donor eggs varies only slightly across all age groups. The average live birth per transfer rate is 43%. In contrast, the live birth rates for cycles using embryos from the woman's own eggs decline steadily as women get older.

Figure 35
Live Births per Transfer for Fresh Embryos From Own and Donor Eggs, by Age of Recipient, 2000



What is the risk of having a multiple-fetus pregnancy or multiple-infant birth from an ART cycle using fresh, donor eggs?

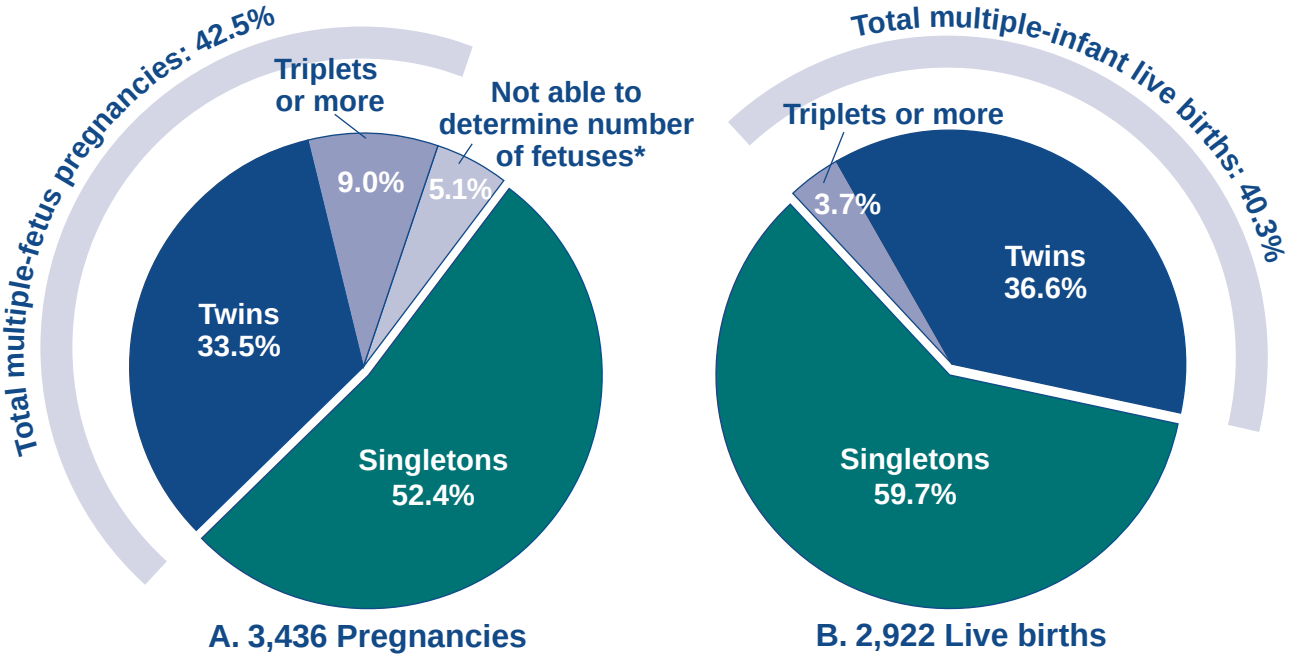
Multiple-infant births are associated with greater problems for both mothers and infants, including higher rates of caesarean section, prematurity, low birth weight, and infant death and disability.

Part A of Figure 36 shows that among the 3,436 pregnancies that resulted from ART cycles using fresh, donor eggs, slightly more than 52% were singleton pregnancies, about 34% were twin pregnancies, and 9% were triplet or greater pregnancies. About 5% of pregnancies ended in miscarriage before the number of fetuses could be accurately determined. Therefore, the percentage of pregnancies with more than one fetus might have been higher than the 43% reported.

In 2000, 2,922 pregnancies from ART cycles that used fresh, donor eggs resulted in live births. Part B of Figure 36 shows that about 40% of these live births produced more than one infant (36.6% twins and 3.7% triplets or more). This compares with a multiple-infant birth rate of 3% in the general U.S. population.

Although the total rates for multiples were similar for pregnancies and live births, there were more triplet pregnancies than triplet births. Triplet (or more) pregnancies may be reduced to twins or singletons by the time of birth. This can happen naturally (e.g., fetal death), or a woman and her doctor may decide to reduce the number of fetuses using a procedure called multifetal pregnancy reduction. Information on medical multifetal pregnancy reductions is incomplete and therefore is not provided here.

Figure 36
Risk of Having Multiple-Fetus Pregnancy and Multiple-Infant Live Birth From ART Cycles Using Fresh, Donor Eggs, 2000

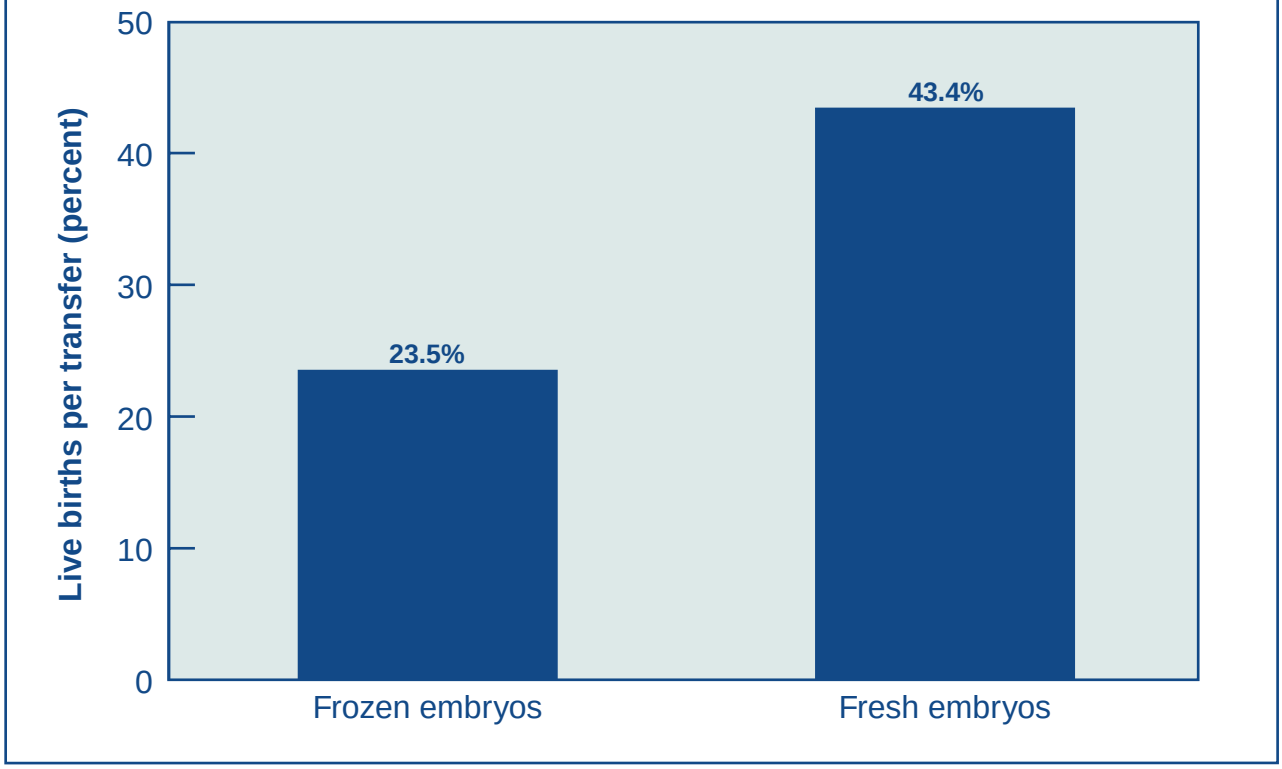


* Number of fetuses not known because the pregnancy ended in an early miscarriage.

How do success rates differ between women who use fresh, donor embryos and those who use frozen, donor embryos?

Figure 37 shows that the success rates per transfer for frozen, donor embryos were substantially lower than the success rates per transfer for fresh, donor embryos. This is similar to the findings for frozen, nondonor embryos (See Figure 32).

Figure 37
Live Births per Transfer for Fresh Donor and Frozen Donor Embryos, 2000



SECTION 5: ART CYCLES USING GESTATIONAL CARRIERS

In some cases a woman has trouble carrying a pregnancy. In such cases the couple may use ART with a gestational carrier or surrogate. A gestational carrier is a woman who agrees to carry the developing embryo for a couple with infertility problems (the intended parents). Cycles in which a gestational carrier is used typically have higher success rates than cycles in which the ART patient carries the pregnancy. Therefore, these cycles are presented as a separate section in this report.

How many clinics perform gestational carrier cycles?

Gestational carriers were used in slightly more than 1% of all ART cycles carried out in 2000, or 1,210 cycles. Less than half of all reporting fertility clinics (166 clinics) performed this type of cycle. Also, approximately two-thirds of the gestational carrier cycles were performed by just 34 clinics; each of these clinics performed 10 or more cycles that used a gestational carrier in 2000. These clinics are listed on the next page. Other clinics that performed between 1 and 9 gestational carrier cycles are listed on the following pages.

Figure 38A
ART Clinics That Performed 10 or More Gestational Carrier Cycles in 2000

Clinic Name	Location	Total number of gestational carrier cycles performed in 2000	Proportion of total cycles performed at this clinic
Zouves Fertility Center	Daly City, CA	31	7.1
Marin Fertility Medical Group	Greenbrae, CA	10	13.5
Coastal Fertility Medical Center, Inc.	Irvine, CA	17	4.8
La Jolla IVF, Smotrich Center for Reproductive Enhancement	La Jolla, CA	15	19.5
Reproductive Partners–San Diego	La Jolla, CA	23	9.6
Reproductive Sciences Center	La Jolla, CA	42	29.0
University of Southern California Reproductive Endocrinology and Infertility	Los Angeles, CA	11	4.6
Huntington Reproductive Center	Pasadena, CA	109	8.7
Reproductive Partners–Redondo Beach	Redondo Beach, CA	10	2.9
Northern California Fertility Medical Center	Roseville, CA	36	6.0
San Diego Fertility Center	San Diego, CA	10	3.5
ASTARTE Fertility Center	San Francisco, CA	18	7.3
Fertility Associates of the Bay Area	San Francisco, CA	10	6.8
San Francisco Fertility Centers, Pacific Fertility Center/ San Francisco Center for Reproductive Medicine	San Francisco, CA	54	4.1
Reproductive Science Center of the San Francisco Bay Area	San Ramon, CA	21	2.9
Center for Assisted Reproductive Medicine/CFP	Santa Monica, CA	53	7.0
North Bay Fertility Center, Inc.	Santa Rosa, CA	18	8.2
The Fertility Institutes, Jeffrey Steinberg, M.D., Inc.	Tarzana, CA	10	8.6
The Colorado Center for Reproductive Medicine	Englewood, CO	34	3.5
New England Fertility Institute	Stamford, CT	11	1.6
Fertility and Laser Center	Baton Rouge, LA	10	4.8
Shady Grove Fertility Reproductive Science Center	Rockville, MD	40	2.5
Center for Assisted Reproduction	Boston, MA	14	1.0
Fertility Center of New England, Inc. New England Clinic of Reproductive Medicine	Reading, MA	15	1.8
Boston IVF	Waltham, MA	19	0.5
Sher Institute for Reproductive Medicine	Las Vegas, NV	12	3.9
The Nevada Center for Reproductive Medicine	Reno, NV	10	4.0
Cooper Center for In Vitro Fertilization, P.C.	Marlton, NJ	33	2.1
Reproductive Medicine Associates of New Jersey	Morristown, NJ	13	1.1
Pennsylvania Reproductive Associates Women's Institute for Fertility, Endocrinology, and Menopause	Philadelphia, PA	19	4.5
Reproductive Science Institute of Suburban Philadelphia	Wayne, PA	14	7.8
Center for Assisted Reproduction	Bedford, TX	26	3.9
Obstetrical & Gynecological Associates	Houston, TX	11	1.4
Fertility Center of San Antonio	San Antonio, TX	14	4.0

Figure 38B
ART Clinics That Performed 1–9 Gestational Carrier Cycles in 2000

Clinic Name	Location
ART Program of Alabama	Birmingham, AL
University of Alabama at Birmingham	Birmingham, AL
Center for Reproductive Medicine	Mobile, AL
Fertility Treatment Center	Chandler, AZ
Arizona Center for Fertility Studies	Scottsdale, AZ
University of Arkansas for Medical Sciences IVF	Little Rock, AR
Garfield Fertility Center	Alhambra, CA
Southern California Reproductive Center	Beverly Hills, CA
West Coast Fertility Centers	Fountain Valley, CA
Reproductive Partners–Long Beach	Long Beach, CA
University of California–Los Angeles Fertility Center	Los Angeles, CA
Reproductive Specialty Medical Center	Newport Beach, CA
Northridge Center for Reproductive Medicine	Northridge, CA
IVF–Orange	Orange, CA
Susan P. Willman, M.D.	Orinda, CA
IGO Medical Group of San Diego	San Diego, CA
Simon R. Henderson, M.D.	San Francisco, CA
University of Califorina–San Francisco In Vitro Fertilization Program	San Francisco, CA
The Center for Fertility and Gynecology Vermesh/Ben-Ozer Center for Fertility	Tarzana, CA
Fertility and Surgical Associates of California	Thousand Oaks, CA
Pacific Reproductive Center	Torrance, CA
San Antonio Fertility Center	Upland, CA
Advanced Reproductive Medicine University of Colorado Health Sciences Center	Aurora, CO
Colorado Springs Center for Reproductive Health	Colorado Springs, CO
Reproductive Medicine and Fertility Center of Southern Colorado	Colorado Springs, CO
Colorado Reproductive Endocrinology	Denver, CO
Conceptions Reproductive Associates	Littleton, CO
The Center for Advanced Reproductive Services at the University of Connecticut Health Center	Farmington, CT
Yale University School of Medicine In Vitro Fertilization Program	New Haven, CT
The Stamford Hospital	Stamford, CT
Delaware Institute for Reproductive Medicine, P.A.	Newark, DE
Boca Fertility	Boca Raton, FL
Palm Beach Fertility Center	Boca Raton, FL
Edward Zbella, M.D., P.A.	Clearwater, FL
F.I.R.S.T. Florida Institute for Reproductive Sciences and Technologies	Cooper City, FL
University of Florida/Park Avenue Women's Center	Gainesville, FL
Florida Institute for Reproductive Medicine	Jacksonville, FL
IVF Florida Memorial Advanced Fertility Treatment Center	Margate, FL
Fertility & IVF Center of Miami, Inc.	Miami, FL
Palmetto Fertility Center of South Florida	Miami, FL

Gestational Carriers

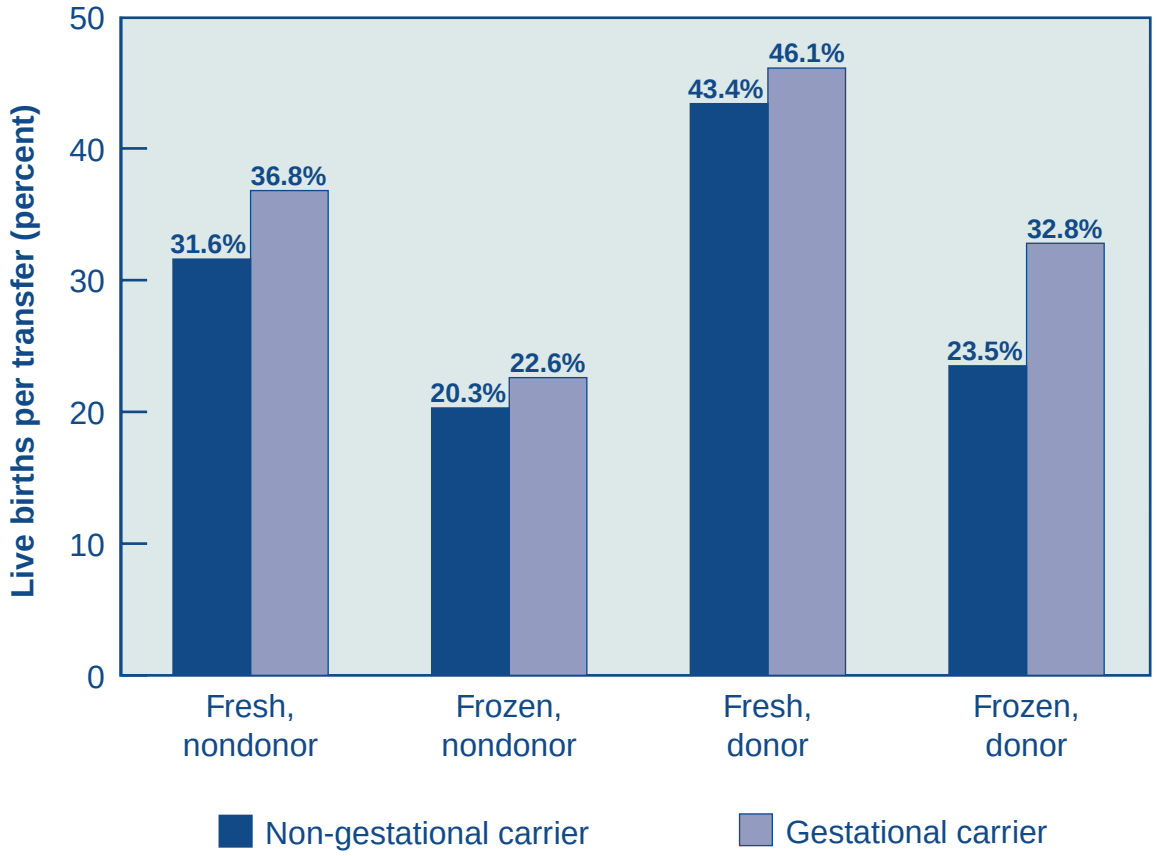
Clinic Name	Location
South Florida Institute for Reproductive Medicine	Miami, FL
Center for Infertility & Reproductive Medicine, P.A.	Orlando, FL
Reproductive Health Institute	Orlando, FL
Frank C. Riggall, M.D., P.A.	Orlando, FL
Fertility Center of Sarasota Julio E. Pabon, M.D., P.A.	Sarasota, FL
Advanced Reproductive Technologies Program at University Community Hospital Drs. Verkauf, Bernhisel, Tarantino, Goodman & Yeko	Tampa, FL
Genetics & IVF Institute of Florida	West Palm Beach, FL
Reproductive Biology Associates	Atlanta, GA
Atlanta Center for Reproductive Medicine	Woodstock, GA
Advanced Institute of Fertility	Arlington Heights, IL
Northwestern University	Chicago, IL
Rush Center for Advanced Reproductive Care	Chicago, IL
Watertower Women's Center, L.L.C.	Chicago, IL
Advanced Fertility Center of Chicago	GurneeE, IL
Highland Park IVF Center	Highland Park, IL
Center for Human Reproduction–Illinois	Hoffman Estates, IL
Reena Jabamoni, M.D., S.C.	Oakbrook, IL
Advanced Reproductive Center, Ltd.	Rockford, IL
Advanced Fertility Group	Indianapolis, IN
Midwest Reproductive Medicine	Indianapolis, IN
Reproductive Care of Indiana	Zionsville, IN
Mid-Iowa Fertility, P.C.	West Des Moines, IA
Reproductive Resource Center of Greater Kansas City	Overland Park, KS
Reproductive Medicine & Infertility Shawnee Mission Medical Center	Shawnee Mission, KS
The Center for Reproductive Medicine	Wichita, KS
University OB/GYN Associates Fertility Center	Louisville, KY
Center for Fertility and Reproductive Health	Shreveport, LA
Greater Baltimore Medical Center Fertility Center	Baltimore, MD
Helix Center for ART	Baltimore, MD
MidAtlantic Fertility Centers	Bethesda, MD
Johns Hopkins Fertility Center	Lutherville, MD
Massachusetts General Hospital Vincent IVF Unit	Boston, MA
Baystate IVF	Springfield, MA
Reproductive Science Center of Boston	Waltham, MA
Center for Reproductive Medicine Oakwood Hospital and Medical Center	Dearborn, MI
Grand Rapids Fertility & IVF, P.C.	Grand Rapids, MI
Michigan Reproductive & IVF Center, P.C.	Grand Rapids, MI
Fakih Institute of Reproductive Science & Technology	Rochester Hills, MI
Ann Arbor Reproductive Medicine Associates, P.C.	Ypsilanti, MI
Center for Reproductive Medicine	Minneapolis, MN
Reproductive Medicine Center	Minneapolis, MN
The Midwest Center for Reproductive Health, P.A.	Minneapolis, MN
Reproductive Medicine & Infertility Associates, P.A.	Woodbury, MN
Infertility & IVF Center	Saint Louis, MO
The Infertility and Reproductive Medicine Center at Washington University School of Medicine and Barnes-Jewish Hospital	Saint Louis, MO
Nebraska Methodist Hospital REI	Omaha, NE

Clinic Name	Location
Nevada Fertility C.A.R.E.S.	Las Vegas, NV
Delaware Valley OB/GYN and Infertility Group	Lawrenceville, NJ
Institute for Reproductive Medicine and Science Saint Barnabas Medical Center	Livingston, NJ
IVF New Jersey	Somerset, NJ
Center for Reproductive Medicine of New Mexico	Albuquerque, NM
Medical Offices for Human Reproduction (CHR) Center for Human Reproduction	New York, NY
Offices for Fertility and Reproductive Medicine, P.C.	New York, NY
Program for In Vitro Fertilization, Reproductive Surgery and Infertility New York University School of Medicine	New York, NY
Long Island IVF Associates	Port Jefferson, NY
CNY Fertility Center	Syracuse, NY
North Carolina Center for Reproductive Medicine The Talbert Fertility Institute	Cary, NC
Institute for Assisted Reproduction	Charlotte, NC
Fertility Unlimited, Inc.	Akron, OH
Bethesda Center for Reproductive Health & Fertility	Cincinnati, OH
Center for Reproductive Health	Cincinnati, OH
Ohio Reproductive Medicine	Columbus, OH
Fertility Center of Northwestern Ohio	Toledo, OH
Northwest Fertility Center	Portland, OR
Portland Center for Reproductive Medicine	Portland, OR
University Fertility Consultants Oregon Health & Science University	Portland, OR
Reproductive Endocrinology & Infertility Specialists	Allentown, PA
Family Fertility Center	Bethlehem, PA
Main Line Fertility and Reproductive Medicine, Ltd.	Bryn Mawr, PA
University of Pennsylvania	Philadelphia, PA
Women & Infants' IVF Program	Providence, RI
Reproductive Endocrinology and Infertility	Greenville, SC
Center for Reproductive Medicine and Fertility	Chattanooga, TN
Nashville Fertility Center	Nashville, TN
Trinity In Vitro Fertilization Program	Carrollton, TX
North Texas Reproductive Medicine	Coppell, TX
Presbyterian Hospital ARTS Program	Dallas, TX
Center for Women's Health	Houston, TX
Advanced Reproductive Care Center of Irving	Irving, TX
The Centre for Reproductive Medicine	Lubbock, TX
South Texas Fertility Center University of Texas Health Science Center, San Antonio	San Antonio, TX
Center of Reproductive Medicine	Webster, TX
Fertility and Reproductive Health Center	Annandale, VA
Dominion Fertility and Endocrinology	Arlington, VA
Fertility Institute of Virginia	Richmond, VA
The Richmond Center for Fertility and Endocrinology, Ltd.	Richmond, VA
The New Hope Center for Reproductive Medicine	Virginia Beach, VA
The Center for Reproductive Endocrinology and Fertility	Spokane, WA
Pacific Gynecology Specialists	Seattle, WA
GYFT Clinic, P.L.L.C.	Tacoma, WA
University of Wisconsin–Madison Infertility and Women's Endocrine Service	Madison, WI
Advanced Institute of Fertility	Milwaukee, WI

What are the success rates for ART cycles using gestational carriers?

Figure 39 shows ART success rates for women who used gestational carriers by type of ART procedure. Success rates are presented per transfer rather than per cycle because that is the only way to directly compare fresh and frozen cycles. The types of ART procedures are divided into those that used fresh, nondonor eggs or embryos; frozen, nondonor eggs or embryos; fresh, donor eggs or embryos; and frozen, donor eggs or embryos. For comparison, the success rates for cycles that did not include a gestational carrier are also presented. For every type of ART, those cycles that used a gestational carrier had higher success rates than those cycles that did not.

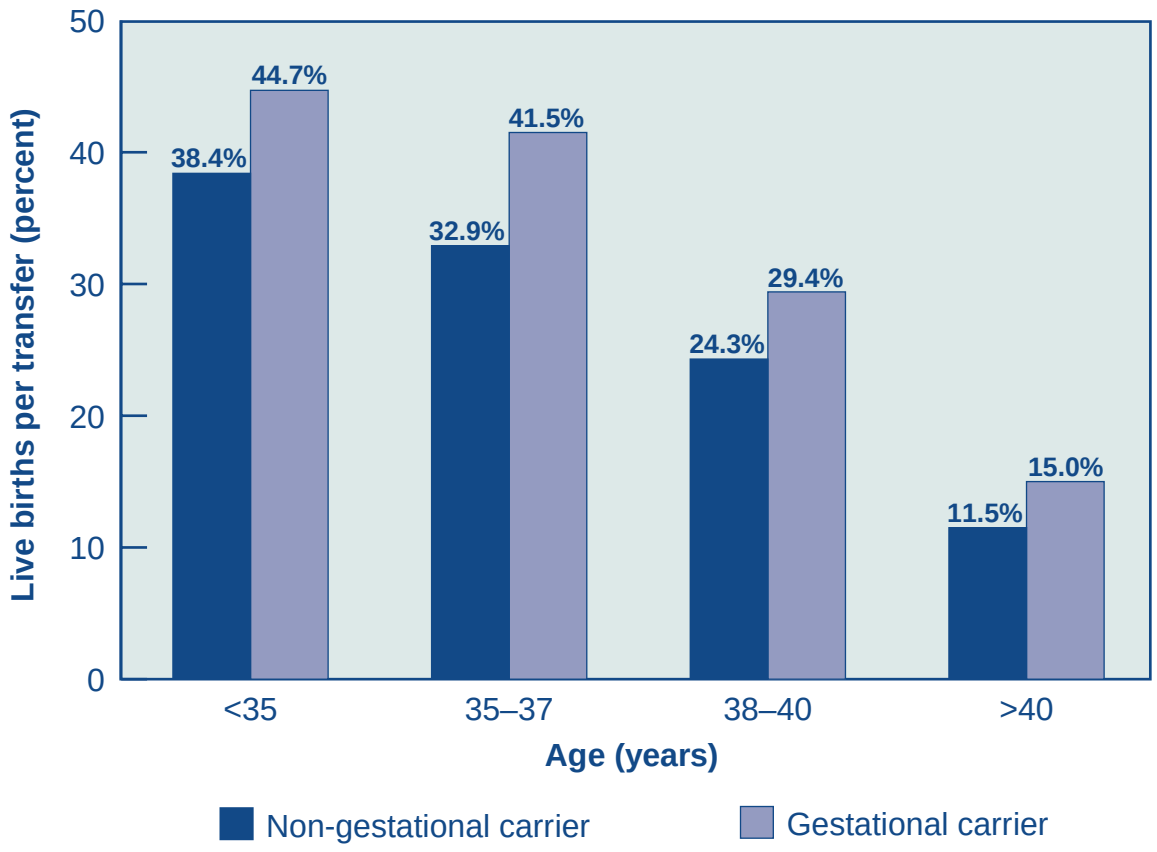
Figure 39
Live Births per Transfer Among Women Who Had Gestational Carrier Cycles Compared With Women Who Did Not, by Type of ART Procedure, 2000



Do success rates differ by age for women who use gestational carriers compared with women who do not?

Figure 40 compares success rates per transfer for ART procedures that used a gestational carrier in 2000 with cycles that did not. This age comparison is presented for the most common ART type–cycles that used fresh, nondonor eggs or embryos. In all age groups, success rates for ART procedures that used gestational carriers were higher than success rates for those cycles that did not. However, age was a strong predictor of success regardless of whether a gestational carrier was used.

Figure 40
Comparison of Live Births per Transfer Between Cycles That Used Gestational Carriers and Those That Did Not (Both Using Fresh, Nondonor Embryos), by ART Patient's Age,*† 2000



*Age categories reflect the age of the ART patient, not the age of the gestational carrier.
†We were unable to further subdivide ages >40 because the number of such cycles is very small.

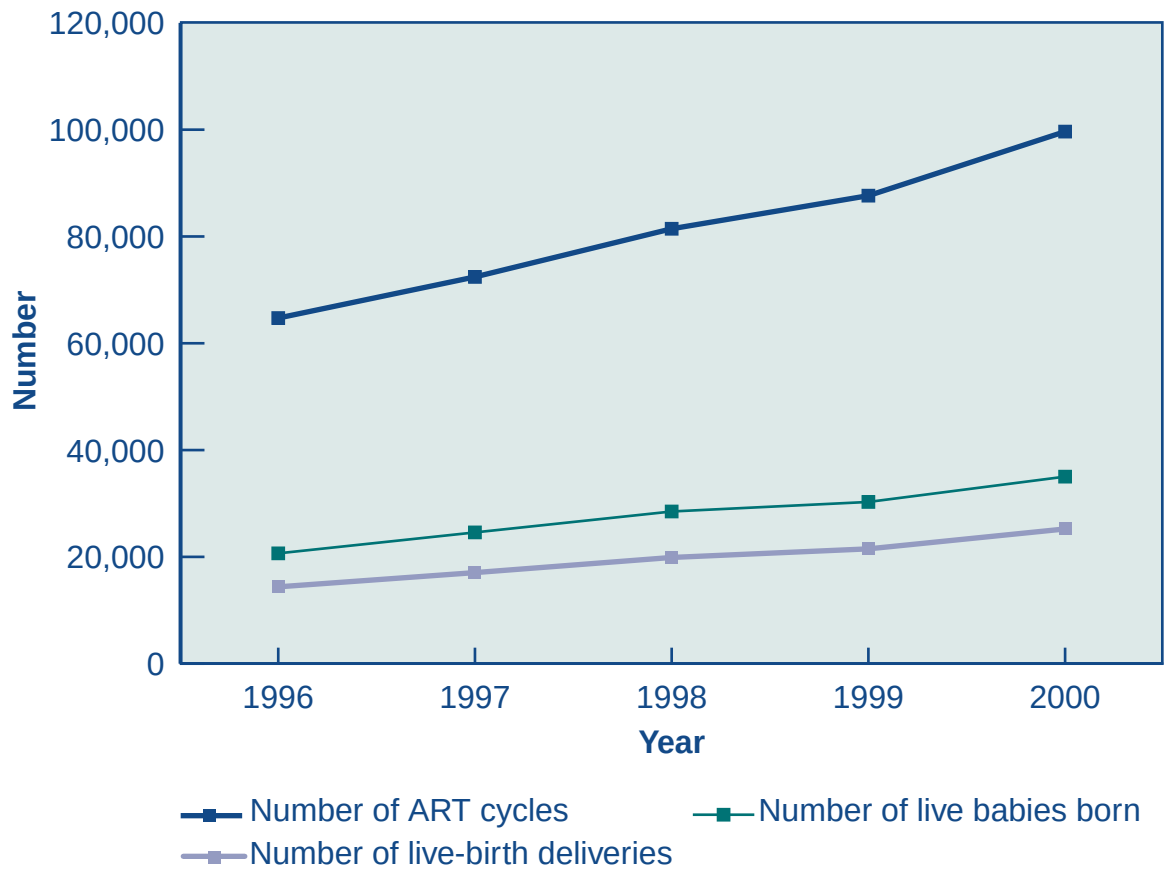
SECTION 6: ART TRENDS, 1996–2000

This report marks the sixth consecutive year that CDC has published an annual report detailing the success rates for ART clinics in the United States. Having several years of data gives us the opportunity to examine trends in ART use and success rates over time. Because the first year of data collection, 1995, did not include non-SART member clinics, we limit our examination of trends to the years 1996–2000.

Is the use of ART increasing?

Figure 41 shows the number of ART cycles performed, the number of live-birth deliveries, and the number of infants born using ART from 1996 to 2000. The number of ART cycles performed in the United States increased 54% overall, from 64,724 cycles in 1996 to 99,639 in 2000. The number of live-birth deliveries increased 73%, from 14,573 in 1996 to 25,228 in 2000. The number of live babies born who were conceived using ART also increased steadily over the past five years. In 2000, a total of 35,025 infants were born, an increase of 67% over the 20,921 born in 1996. Because in some cases more than one infant is born during a live-birth delivery (e.g., twins), the total number of live babies born is greater than the number of live-birth deliveries.

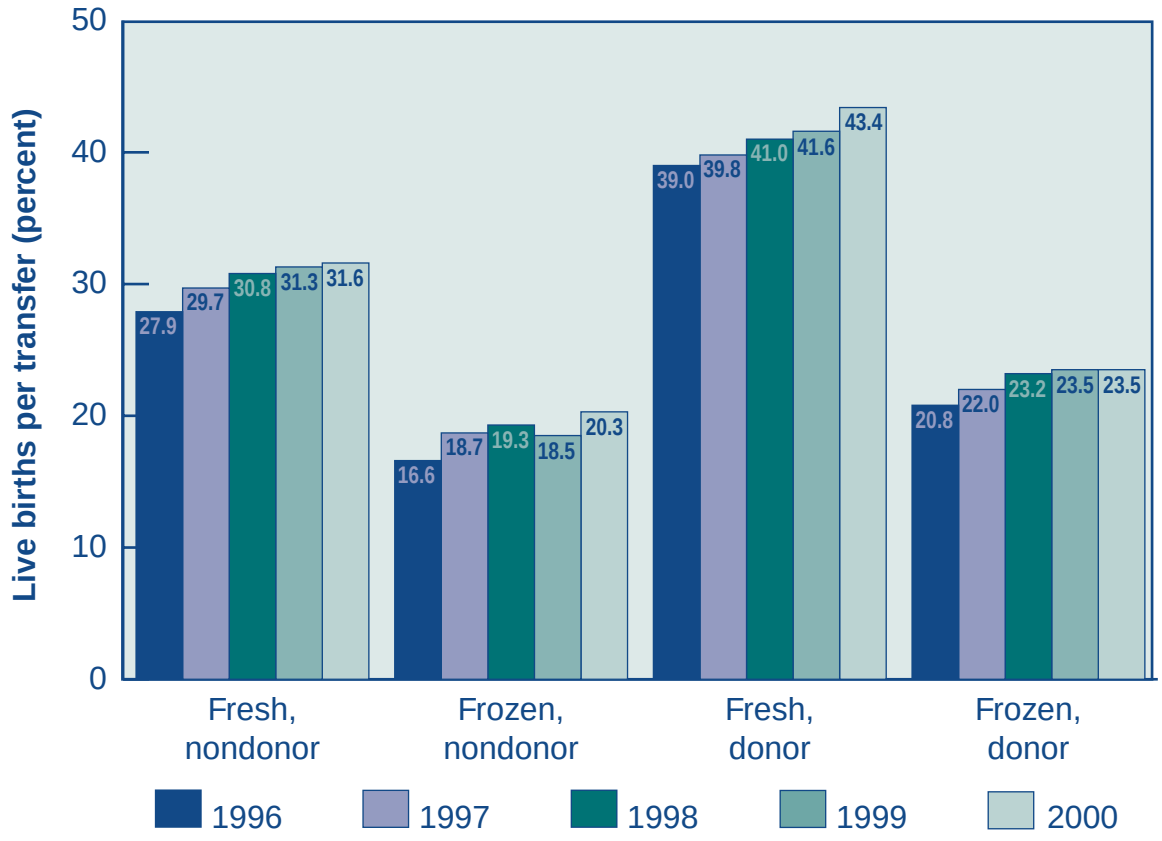
Figure 41
Number of ART Cycles Performed, Number of Live-Birth Deliveries, and Number of Live Babies Born Using ART, 1996–2000



Have ART success rates improved over the past five years?

Figure 42 presents success rates for the four primary types of ART cycles: fresh, nondonor; frozen, nondonor; fresh, donor; and frozen, donor. Success rates are presented per transfer rather than per cycle because that is the only way to directly compare fresh and frozen cycles. Overall, success rates have improved over the past five years for all four types of cycles.

Figure 42
Live Births per Transfer, by Type of ART Procedure,* 1996–2000

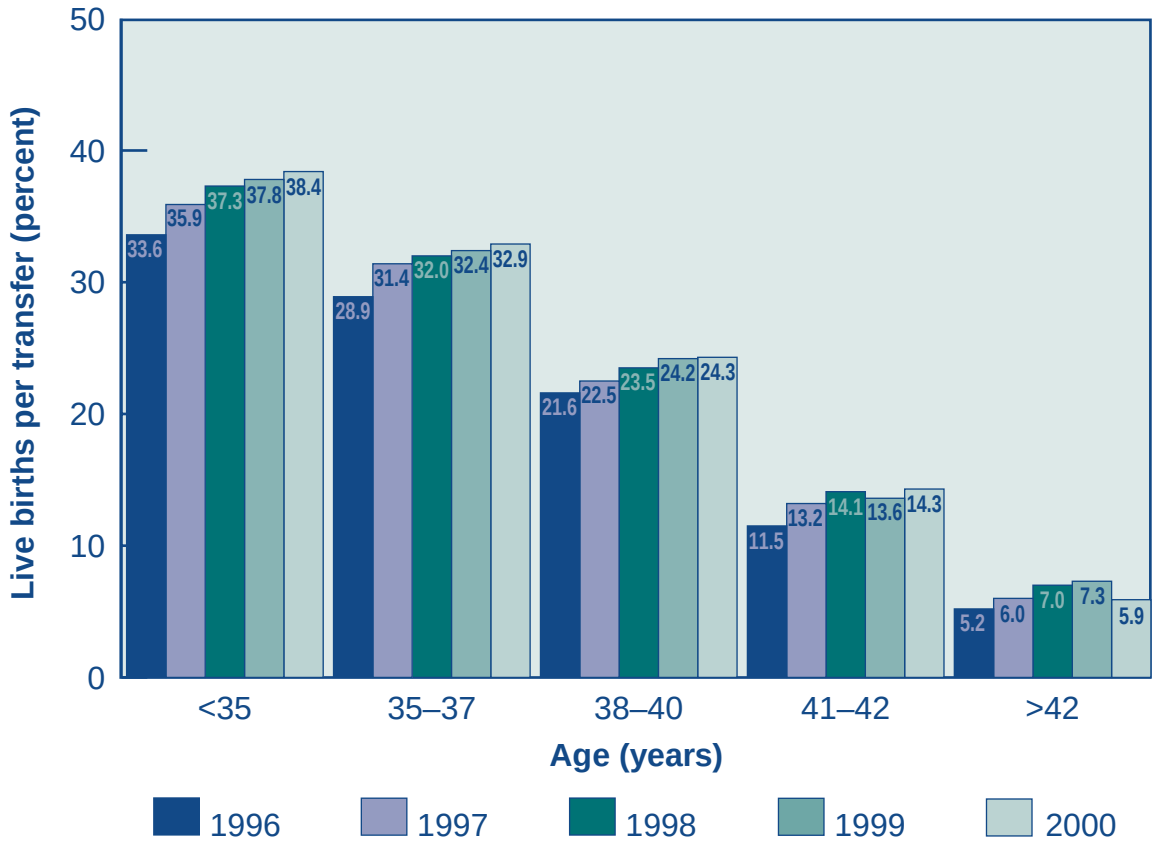


*Cycles in which a gestational carrier was used are not included in any of these statistics.

Have ART success rates improved over the past five years for all women or only women in particular age groups?

Figure 43 presents success rates per transfer for ART cycles using fresh, nondonor eggs or embryos by women's age for the previous five years. Increases in live births were seen in every age category.

Figure 43
Live Births per Transfer for ART Cycles Using Fresh, Nondonor Eggs or Embryos, by Woman's Age,* 1996–2000



*Cycles in which a gestational carrier was used are not included in any of these statistics.

National Summary and Fertility Clinic Reports

2000 Fertility Clinic Tables

INTRODUCTION TO FERTILITY CLINIC TABLES

In this section, each clinic's data are presented in a one-page table that includes the types of ART used, patient diagnoses, success rates that each clinic reported and verified for 2000, and individual program characteristics. Clinics are listed in alphabetical order by state, city, and clinic name. The first table in this section is the national summary of combined data from all clinics.

Many people considering ART will want to use this report to find the "best" clinic. However, comparisons between clinics must be made with caution. Many factors contribute to the success of an ART procedure. Some factors are related to the training and experience of the ART clinic and laboratory professionals and the quality of services they provide. Other factors are related to the patients themselves, such as their age and the cause of their infertility. Some clinics may be more willing than others to accept patients with low chances of success or may specialize in various ART treatments that attract particular types of patients. These and other factors to consider when interpreting clinic data are discussed below.

Important Factors to Consider When Using These Tables to Assess a Clinic

- *These statistics are for 2000.* Data for cycles started in 2000 could not be published until 2002 because the final outcomes of pregnancies conceived in December 2000 were not known until October 2001. Additional time was then required to collect and analyze the data and prepare the report. Many factors that contribute to a clinic's success rate may have changed, for better or for worse, in the two years since these procedures were performed. Personnel may be different. Equipment and training may or may not have been updated. As a result, success rates for 2000 may differ from current rates.

- *No reported success rate is absolute.* A clinic's success rates will vary from year to year even if all determining factors remain the same. However, the more cycles that a clinic carries out, the less the rate is likely to vary. Conversely, clinics that carry out fewer cycles are likely to have more variability in success rates from year to year. As an extreme example, if a clinic reports only one ART cycle in a given category, as is sometimes the case in the data presented here, the clinic's success rate in that category would be either 0% or 100%. For further detail, see the explanation of confidence intervals on page 461.

- *Some clinics see more than the average number of patients with difficult infertility problems.* Some clinics are willing to offer ART to most potential users, even those who have a low probability of success. Others discourage such patients or encourage them to use donor eggs, a practice that results in higher success rates among older women. Clinics that accept a higher percentage of women who previously have had multiple unsuccessful ART cycles will generally have lower success rates. In contrast, clinics that offer ART procedures to patients who might have become pregnant with less technologically advanced treatment will have higher success rates.

  A related issue is that success rates shown in this report are presented in terms of cycles, as required by law, rather than in terms of women. As a result, women who had more than one ART cycle in 2000 are represented in multiple cycles. If a woman who underwent several ART cycles at a given clinic either never had a successful cycle or had a successful cycle only after numerous attempts, the clinic's success rates would be lowered.

- *Cancellation rates affect a clinic's success rate.* Cancellation rates for cycles using fresh, nondonor eggs or embryos vary among clinics from less than 1% to approximately 42%. A high cancellation rate tends to lower the live birth per cycle rate but may increase the live birth per retrieval and live birth per transfer rates.
- *Success rates for unstimulated (or "natural") cycles are included with those for stimulated cycles.* In an unstimulated cycle, the woman ovulates naturally rather than through the daily injections used in stimulated cycles. Unstimulated cycles are less expensive because they require no daily injections and fewer ultrasounds and blood tests. However, women who use natural or mild stimulation produce only one or two follicles, thus reducing the potential number of embryos for transfer. As a result, unstimulated cycles have lower success rates, and clinics that carry out a relatively high proportion of unstimulated cycles will have lower success rates. Nationally, fewer than 1% of ART cycles in 2000 were unstimulated. However, in a very few clinics, more than 25% of cycles were unstimulated.
- *Success rates are calculated per cycle rather than per patient.* Therefore, for patients who undergo both fresh and frozen cycles, success rates are calculated separately for each cycle. Clinics that have very good live birth rates with frozen embryos would have higher ART success rates if these births were included as successes from the original stimulated cycle. Consumers should look at both rates (for cycles using fresh embryos and for those using frozen embryos) when assessing a clinic's success rates.
- *The number of embryos transferred varies from clinic to clinic.* In 2000, the average number of embryos that a clinic transferred to women younger than age 35 ranged from one to five for fresh, nondonor cycles. The American Society for Reproductive Medicine and the Society for Assisted Reproductive Technology discourage the transfer of a large number of embryos because it increases the likelihood of multiple gestations. Multiple gestations, in turn, increase both the probability of premature birth and its related problems and the need for multifetal pregnancy reductions.

In addition, success rates can be affected by many other factors, including

- the quality of eggs.
- the quality of sperm (including motility and ability to penetrate the egg).
- the skill and competence of the treatment team.
- the general health of the woman.
- genetic factors.

We encourage consumers considering ART to contact clinics to discuss their specific medical situation and their potential for success using ART. Because clinics did not have the opportunity to provide a narrative to explain their data, such a conversation could provide additional information to help people decide whether or not to use ART.

Although ART offers important options for the treatment of infertility, the decision to use ART involves many factors in addition to success rates. Going through repeated ART cycles requires substantial commitments of time, effort, money, and emotional energy. Therefore, consumers should carefully examine all related financial, psychological, and medical issues before beginning treatment. They also will want to consider the location of the clinic, the counseling and support services available, and the rapport that staff have with their patients.

An explanation of how to read a fertility clinic table begins on page 67.

Sample Clinic Table

A comparison of clinic success rates may not be meaningful because patient medical characteristics and treatment approaches vary from clinic to clinic. (See pages 63–65.)

2000 ART CYCLE PROFILE

1 Type of ART[a,b]

IVF	98%	**Procedural factors:**	
GIFT	1%		
ZIFT	<1%	With ICSI	66%
Combination	<1%	Unstimulated	<1%

2 Patient Diagnosis

Tubal factor	9%	Other factor	2%
Ovulatory dysfunction	5%	Unknown factor	3%
Diminished ovarian reserve	18%	*Multiple Factors:*	
Endometriosis	16%	Female factors only	21%
Uterine factor	<1%	Female & male factors	15%
Male factor	23%		

4 2000 PREGNANCY SUCCESS RATES

3 Data verified by X.Y. Zee, M.D.

Type of Cycle[a]	5 Age of Woman <35	35–37	38–40	41–42[e]
4A Fresh Embryos from Nondonor Eggs				
Number of cycles	161	45	27	5
Percentage of cycles resulting in pregnancies[c,d]	29.6	29.2	26.7	2/5
Percentage of cycles resulting in live births[c,d]	22.4	20.0	14.8	1/5
6 (Confidence Interval)	(15.9 - 28.8)	(8.3 - 31.7)	(1.4 - 28.2)	
Percentage of retrievals resulting in live births[c,d]	25.2	23.1	20.0	1/4
Percentage of transfers resulting in live births[c,d]	25.2	25.0	4/18	1/4
Percentage of cancellations[c,d]	11.2	13.3	25.9	1/5
Average number of embryos transferred	3.1	3.5	3.7	4.3
Percentage of pregnancies with twins[c,d]	48.9	3/12	1/8	0/2
Percentage of pregnancies with triplets[c,d]	8.5	2/12	1/8	0/2
Percentage of live births having multiple infants[c,d]	58.3	4/9	2/4	0/1
4B Frozen Embryos from Nondonor Eggs				
Number of transfers	17	3	3	1
Percentage of transfers resulting in live births[c,d]	2/17	1/3	1/3	0/1
Average number of embryos transferred	2.4	2.7	2.0	1.0

	All Ages Combined[f] Fresh Embryos	Frozen Embryos
4C Donor Eggs		
Number of transfers	13	3
Percentage of transfers resulting in live births[c,d]	5/13	1/3
Average number of embryos transferred	3.2	4.0

7 CURRENT CLINIC SERVICES AND PROFILE

Current Name: ART Clinic of the United States

Donor egg?	Yes	Gestational carriers?	Yes	SART member?	Yes
Donor embryo?	Yes	Cryopreservation?	Yes	Verified lab accreditation?	Yes
Single women?	No			*(See Appendix C for details.)*	

[a] Clinic-level statistics do not include gestational carrier cycles because the number of such cycles is very small. See pages 50–56 for national data.
[b] Reflects patient and treatment characteristics of ART cycles performed in 2000 using fresh, nondonor eggs or embryos.
[c] When fewer than 20 cycles are reported in an age category, rates are shown as a fraction and confidence intervals are not given. Calculating percentages from fractions may be misleading and is not encouraged.
[d] A multiple-infant birth is counted as *one* live birth.
[e] Clinic-specific outcome rates are unreliable for women older than 42 undergoing ART cycles using fresh or frozen embryos with nondonor eggs. Readers are urged to review national outcomes for these age groups. (See page 23.)
[f] All ages (including ages >42) are reported together because previous data show that patient age does not materially affect success with donor eggs.

How to Read a Fertility Clinic Table

This section is provided to help consumers understand the information presented in the fertility clinic tables. The number before each heading refers to the number of the corresponding section in the sample clinic table on the opposite page. Technical terms are defined in the Glossary (Appendix B).

1. Type of ART used

This section gives the breakdown of ART cycle types that each clinic performed using fresh, nondonor eggs or embryos (IVF, GIFT, ZIFT, or combinations thereof). It also lists the percentage of procedures that involved intracytoplasmic sperm injection (ICSI), which was not performed by all clinics in 2000, and the percentage of cycles that were unstimulated. (See Glossary for definitions of IVF, GIFT, ZIFT, and ICSI.)

2. ART patient diagnosis

Consumers may want to know what percentage of a particular clinic's patients have the same diagnosis as they do. (See Glossary for definitions of diagnoses.) In addition, patients' diagnoses may affect a clinic's success rates. However, the use of these diagnostic categories may vary somewhat from clinic to clinic.

3. Verification

To have success rates published in the annual report, a clinic's medical director must verify the accuracy of the tabulated success rates. The name of the individual who verified the clinic's data is shown.

4. Success rates by type of cycle

Success rates are given for the three categories of cycles described in 4A–C below: cycles using fresh embryos from nondonor eggs, cycles using frozen embryos from nondonor eggs, and cycles using donor eggs. The ART success rates shown were calculated based on data from all ART cycle types (IVF, both with and without ICSI; GIFT; and ZIFT). Data from these procedures were combined because there was little difference in success rates when we examined each type of ART procedure separately.

The success rates indicate the average chance of success for the given procedure at the clinic in 2000 for each of four age groups. Success rates are calculated as the percentage of cycles started, egg retrievals, or embryo transfers that resulted in either pregnancies or live births at the ART clinic in 2000. For example, if a clinic started a total of 50 cycles in 2000 and these resulted in 15 live births, the average success rate for cycles started at that clinic would be

15 (births) ÷ 50 (cycles) = 0.3 or 30%.

Thus, the success rate at that clinic in 2000 was 30%, meaning that 30% of cycles started that year resulted in a live birth.

Success rate calculations are very unstable if they are based on a small number of cycles. Therefore, when fewer than 20 cycles are reported in a given category, the rates are shown as fractions rather than percentages. For example, the sample clinic carried out only five fresh embryo cycles using nondonor eggs among women aged 41–42 years. Of these five cycles,

two–or 40%–were successful. However, because of the small number of cycles, 40% is not a reliable success rate, so the success rate is presented as 2/5, meaning two out of five.

4A. Cycles using fresh embryos from nondonor eggs

This section includes IVF, ICSI, GIFT, and ZIFT cycles that used a woman's own eggs. Cycles that used frozen embryos or donor eggs or embryos are not included here.

- **Percentage of cycles resulting in pregnancies**

  (Number of pregnancies divided by number of cycles started, expressed as a percentage of cycles)

  A stimulated cycle is started when a woman begins taking fertility drugs; an unstimulated cycle is started when egg production begins being monitored. The number of cycles that a clinic starts is not the same as the number of patients that it treats because some women start more than one cycle in a year. Because some pregnancies end in a miscarriage, induced abortion, or stillbirth, this rate is usually higher than the live birth rate.

- **Percentage of cycles resulting in live births**

  (Number of live births divided by number of cycles started, expressed as a percentage of cycles)

  This number represents the cycles that resulted in a live birth out of all ART cycles started. One live birth may include one or more children born alive; that is, a multiple-infant birth (e.g., twins, triplets) is counted as one live birth.

- **Percentage of retrievals resulting in live births**

  (Number of live births divided by number of egg retrieval procedures, expressed as a percentage of retrievals)

  This number represents the cycles that resulted in a live birth out of all cycles in which an egg retrieval was performed. The number of egg retrievals a clinic performs often is smaller than the number of cycles started because some cycles are canceled before the woman has an egg retrieved. As a result, this rate is usually higher than the live births per cycle started rate. Cycles are canceled for many reasons: eggs may not develop, the patient may become ill, or the patient may choose to stop treatment. (See Figure 4.)

- **Percentage of transfers resulting in live births**

  (Number of live births divided by number of embryo transfer procedures, expressed as a percentage of transfers)

  This number represents the cycles that resulted in a live birth out of all cycles in which one or more embryos were transferred into the woman's uterus or, in the case of GIFT and ZIFT, egg and sperm or embryos were transferred into the woman's fallopian tubes. A clinic may carry out more egg retrievals than embryo transfers because not every retrieval results in egg fertilization and embryo transfer. For this reason, live birth rates based on transfers generally will be higher than those reported for egg retrievals and for cycles started.

- **Percentage of cancellations**

  (Number of cycles canceled divided by the total number of cycles, expressed as a percentage of cycles)

  This number refers to the cycles that were stopped before an egg was retrieved. A cycle may be canceled if a woman's ovaries do not respond to fertility medications and thus do not produce a sufficient number of follicles. Cycles also may be canceled because of illness or other medical or personal reasons.

- **Average number of embryos transferred**

  (Average number of embryos per embryo transfer procedure)

  The average number of embryos transferred varies from clinic to clinic. The American Society for Reproductive Medicine and the Society for Assisted Reproductive Technology have practice guidelines that address this issue.

- **Percentage of pregnancies with twins**

  (Number of pregnancies with two fetuses divided by the total number of pregnancies, expressed as a percentage of pregnancies)

  A pregnancy with two fetuses is counted as *one* pregnancy.

- **Percentage of pregnancies with triplets or more**

  (Number of pregnancies with three or more fetuses divided by the total number of pregnancies, expressed as a percentage of pregnancies)

  Pregnancies with multiple fetuses can be associated with increased risk for mothers and babies (e.g., higher rates of caesarean section, prematurity, low birth weight, infant death) and the possibility of multifetal reduction.

  A pregnancy with three or more fetuses is counted as *one* pregnancy.

- **Percentage of live births having multiple infants**

  (Number of deliveries resulting in a birth of more than one infant divided by the number of live births, expressed as a percentage of live births)

  A delivery of one or more babies is counted as *one* live birth.

4B. Cycles using frozen embryos from nondonor eggs

Frozen (cryopreserved) embryo cycles are those in which previously frozen embryos are thawed and then transferred. Because frozen embryo cycles use embryos formed from a previous stimulated cycle, no stimulation or retrieval is involved. As a result, these cycles usually are less expensive and less invasive than cycles using fresh embryos. In addition, freezing some of the embryos from a retrieval procedure may increase a woman's overall chances of having a child from a single retrieval.

4C. Cycles using donor eggs

Success rates are presented separately for cycles using fresh donor eggs or embryos and those using frozen donor embryos. Older women, women with premature ovarian failure (early menopause), women whose ovaries have been removed, and women with a genetic concern about using their own eggs may consider using eggs that are donated by a young, healthy woman. Embryos donated by couples who previously had ART also may be available. Many clinics provide services for donor egg and embryo cycles. For these cycle types, results from women in all age groups (including older than 42) are reported together because previous data show that patient age does not affect success rates with donor eggs. (See Figures 34 and 35 on pages 46 and 47.)

5. Age of woman

Because a woman's fertility declines with age, clinics report lower success rates for older women attempting to become pregnant with their own eggs. For this reason, rates for women using nondonor eggs or embryos are reported separately for women younger than age 35, for women 35–37, for women 38–40, and for women 41–42. Clinic-specific outcome rates are not shown for women older than 42 who undergo ART using their own eggs because the number of women in this age group at each clinic is small; therefore, a calculation of the live birth rate in older age groups may not be meaningful. Readers are encouraged to review national outcomes for these age groups shown on page 23. The sample clinic table illustrates the decline in ART success rates among older women: 22.4% of cycles started in women younger than 35 resulted in live births, whereas only 14.8% of cycles started in women aged 38–40 resulted in a live birth.

6. Confidence interval

The tables show a range, called the **95% confidence interval**, that conveys the reliability of a clinic's demonstrated success rate. This range is calculated only if 20 or more cycles are reported in an age category. (When fewer than 20 cycles are reported in a given category, success rates are shown as fractions rather than percentages; see paragraph 4, Success Rates by Type of Cycle, pages 67–68.) In general, the more cycles that a clinic performs, the narrower the range. A narrow range means we are more confident that a clinic would have a similar success rate if it treated other similar groups of patients under similar clinical conditions. On the other hand, a wide range tells us that a clinic's success rate is more likely to vary under similar circumstances because we had less information (fewer cycles) on which to base our estimates.

Even though one clinic's success rate may appear higher than another's based on the confidence intervals, ***these confidence intervals are only one indication that the success rate may be better. Other factors also must be considered*** when comparing rates from two clinics. For example, some clinics see more than the average number of patients with difficult infertility problems, while others discourage patients with a low probability of success. For further information on important factors to consider when using the tables to assess a clinic, refer to pages 63–65.

For a more detailed explanation and examples of confidence intervals, see pages 461–462 in Appendix A.

7. Clinic services and profile

- **Current Name.** This name reflects name changes that may have occurred since 2000, while the clinic name at the top of the table was the name of the ART clinic as it existed in 2000. Some clinics not only have changed their names but have reorganized as well. Reorganization is defined as a change in ownership or affiliation or a change in two of the three key staff positions (practice director, medical director, or laboratory director). In such cases, no current name will be listed, but a statement will be included that the clinic has undergone reorganization since 2000. Also, in such cases, no current clinic services or profile will be listed.
- **Donor egg program.** Some clinics have programs for ART using donor eggs. Donor eggs are eggs that have been retrieved from one woman (the donor) and then transferred to another woman who is unable to conceive with her own eggs (the recipient). Policies regarding sharing of donor eggs vary from clinic to clinic.
- **Donor embryo.** These are embryos that were donated by another couple who previously underwent ART treatment and had extra embryos available.
- **Single women.** Clinics have varying policies regarding ART services for single (unmarried) women.
- **Gestational carriers.** A gestational carrier is a woman who carries a child for another woman; sometimes such women are referred to as gestational surrogates. Policies regarding ART services using gestational carriers vary from clinic to clinic. Some states do not permit clinics to offer this service.
- **Cryopreservation.** This item refers to whether or not the clinic has a program for freezing extra embryos that may be available from a couple's ART cycle.
- **SART member.** For 2000, 360 of the 383 reporting clinics are SART members.
- **Verified lab accreditation.** If "yes" appears next to this item, the ART clinic uses an embryo laboratory accredited by one of the following organizations:
    - College of American Pathologists (CAP), Reproductive Laboratory Accreditation Program
    - Joint Commission on Accreditation of Healthcare Organizations (JCAHO)
    - New York State tissue bank program

  If "pending" appears here, it means that the clinic has submitted an application for accreditation to one of the above organizations and has provided proof of such application to SART.

  "No" indicates that the embryo laboratory has not been accredited by any of these three organizations.

  CDC provides this information as a public service. **Please note that CDC does not oversee any of these accreditation programs.** They are all nonfederal programs. To become certified, laboratories must have in place systems and processes that comply with the accrediting

organization's standards. Depending on the organization, standards may include those for personnel, quality control and quality assurance, specimen tracking, results reporting, and the performance of technical procedures. Compliance with these standards is confirmed by documentation provided by the laboratory and by on-site inspections. For further information, consumers may contact the accrediting organizations directly, as follows:

- CAP, Reproductive Laboratory Accreditation Program: For a list of accredited laboratories, call 800-323-4040 and ask for Laboratory Accreditation.
- JCAHO: Call 630-792-5000 to inquire about the status of individual laboratories.
- New York State: Call 518-485-5341 to find out which laboratories are certified under the tissue bank regulations.

Further information on laboratory accreditation is provided in Appendix C.

2000 National Summary

A comparison of clinic success rates may not be meaningful because patient medical characteristics and treatment approaches vary from clinic to clinic. (See pages 63–65.)

2000 ART CYCLE PROFILE

Type of ART[a,b]

IVF	98%
GIFT	<1%
ZIFT	1%
Combination	<1%

Procedural factors[a,b]

With ICSI	47%
Unstimulated	<1%

Patient Diagnosis

Tubal factor	15%
Ovulatory dysfunction	5%
Diminished ovarian reserve	8%
Endometriosis	7%
Uterine factor	1%
Male factor	17%
Other factors	7%
Unknown factor	10%
Multiple factors:	
Female factors only	13%
Female & male factors	17%

2000 PREGNANCY SUCCESS RATES

Type of Cycle[a]	Age of Woman <35	35–37	38–40	41–42[d]
Fresh Embryos From Nondonor Eggs				
Number of cycles	33,453	17,284	14,701	6,118
Percentage of cycles resulting in pregnancies	37.6	32.2	24.6	16.0
Percentage of cycles resulting in live births[c]	32.8	26.7	18.5	10.1
Percentage of retrievals resulting in live births[c]	36.2	31.1	22.7	13.1
Percentage of transfers resulting in live births[c]	38.4	32.9	24.3	14.3
Percentage of cancellations	9.6	14.0	18.6	22.7
Average number of embryos transferred	2.9	3.2	3.5	3.7
Percentage of pregnancies with twins	31.9	27.7	22.2	15.2
Percentage of pregnancies with triplets or more	8.5	8.1	6.0	2.6
Percentage of live births having multiple infants[c]	38.6	35.3	27.2	17.4
Frozen Embryos From Nondonor Eggs				
Number of transfers	6,090	2,766	1,670	541
Percentage of transfers resulting in live births[c]	22.3	20.4	16.5	14.6
Average number of embryos transferred	2.9	2.9	3.2	3.3

Donor Eggs	All Ages Combined[e] Fresh Embryos	Frozen Embryos
Number of transfers	6,731	2,425
Percentage of transfers resulting in live births[c]	43.4	23.5
Average number of embryos transferred	2.9	3.0

CURRENT CLINIC SERVICES AND PROFILE

Total Number of Reporting Clinics: 383

Percentage of clinics that offer the following services:

Donor egg?	87%
Donor embryo?	54%
Single women?	84%
Gestational carriers?	65%
Cryopreservation?	98%

Clinic Profile:

SART member?	94%
Verified lab accreditation?	
Yes	89%
No	4%
Pending	7%

[a] Gestational carrier cycles are not included in these calculations. See pages 50–56 for summary statistics on these cycles.
[b] Reflects patient and treatment characteristics of ART cycles performed in 2000 using fresh, nondonor eggs or embryos.
[c] A multiple-infant birth is counted as *one* live birth.
[d] See page 23 for national summary statistics for women older than 42.
[e] All ages (including ages >42) are reported together because previous data show that patient age does not materially affect success with donor eggs.