
1998

Assisted

Reproductive

Technology

Success Rates

NATIONAL SUMMARY AND
FERTILITY CLINIC REPORTS



Updates to this report will be posted on the CDC Web site at the following address:
<http://www.cdc.gov/nccdphp/drh/art.htm>

1998
**ASSISTED REPRODUCTIVE
TECHNOLOGY SUCCESS RATES**
NATIONAL SUMMARY AND FERTILITY CLINIC REPORTS

Centers for Disease Control and Prevention
National Center for Chronic Disease Prevention and Health Promotion
Division of Reproductive Health
Atlanta, Georgia

American Society for Reproductive Medicine
Society for Assisted Reproductive Technology
Birmingham, Alabama

RESOLVE: The National Infertility Association
Somerville, Massachusetts

December 2000

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

This publication was developed and produced by the National Center for Chronic Disease Prevention and Health Promotion of the Centers for Disease Control and Prevention in collaboration with the American Society for Reproductive Medicine, the Society for Assisted Reproductive Technology, and RESOLVE: The National Infertility Association.

Centers for Disease Control and Prevention

National Center for Chronic Disease
Prevention and Health Promotion

James S. Marks, M.D., M.P.H.,
Director

Division of Reproductive Health

Lynne S. Wilcox, M.D., M.P.H.,
Director

Women’s Health and Fertility Branch

Christopher S. Parker, M.P.A., M.P.H.,
Acting Branch Chief
Laura A. Schieve, Ph.D.
Lilith Tatham, D.V.M., M.P.H.
Gary Jeng, Ph.D.
Robert A. Cicatello
Nancy M. Burnett

Technical Information and Editorial
Services Branch

Christine Fralish, M.L.I.S.,
Branch Chief
Linda Elsner
Phyllis Moir, M.A.

American Society for Reproductive Medicine

J. Benjamin Younger, M.D.,
Executive Director

Society for Assisted Reproductive Technology

Philip I. McNamee, M.D.,
President
David I. Hoffman, M.D.
Jacob F. Mayer, Ph.D.
Joyce G. Zeitz

Registry Committee

James P. Toner, M.D., Ph.D.,
Chairman
Dale W. Stovall, M.D.
Michael P. Steinkampf, M.D.

The November Group, Inc.

C. Martin Beard

Redshift Technology, Inc.

Matthew V. Scott

RESOLVE: The National Infertility Association

Margaret R. Hollister, J.D.,
Executive Director
Diane Clapp

Publication support was provided by Palladian Partners under Contract No. 200-98-0415 for the National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, U.S. Department of Health and Human Services.

Table of Contents

| | |
|--|-----|
| Preface | 1 |
| Commonly Asked Questions About This Report | 3 |
| 1998 National Report | 7 |
| Introduction to the 1998 National Report | 9 |
| Section 1: Overview | 10 |
| Section 2: ART Cycles Using Fresh, Nondonor Eggs or Embryos | 12 |
| Section 3: ART Cycles Using Only Frozen Embryos | 31 |
| Section 4: ART Cycles Using Donor Eggs | 32 |
| 1998 Fertility Clinic Tables | 35 |
| Introduction to Fertility Clinic Tables | 37 |
| Important Factors to Consider When Using These Tables to Assess a Clinic | 37 |
| How to Read a Fertility Clinic Table | 41 |
| 1998 National Summary Table | 47 |
| Alabama | 49 |
| Arizona | 53 |
| Arkansas | 61 |
| California | 63 |
| Colorado | 114 |
| Connecticut | 121 |
| Delaware | 126 |
| District of Columbia | 128 |
| Florida | 131 |
| Georgia | 153 |
| Hawaii | 156 |
| Illinois | 158 |
| Indiana | 179 |
| Iowa | 187 |
| Kansas | 190 |
| Kentucky | 194 |
| Louisiana | 198 |
| Maryland | 204 |
| Massachusetts | 212 |
| Michigan | 221 |
| Minnesota | 235 |
| Mississippi | 239 |

| | |
|---|-------------|
| Missouri | .240 |
| Nebraska | .247 |
| Nevada | .249 |
| New Hampshire | .251 |
| New Jersey | .252 |
| New Mexico | .268 |
| New York | .270 |
| North Carolina | .299 |
| North Dakota | .306 |
| Ohio | .307 |
| Oklahoma | .321 |
| Oregon | .324 |
| Pennsylvania | .326 |
| Puerto Rico | .345 |
| Rhode Island | .346 |
| South Carolina | .347 |
| South Dakota | .349 |
| Tennessee | .350 |
| Texas | .356 |
| Utah | .379 |
| Vermont | .382 |
| Virginia | .383 |
| Washington | .391 |
| West Virginia | .399 |
| Wisconsin | .400 |
| Appendices | .409 |
| Appendix A: How to Interpret a Confidence Interval | .409 |
| Appendix B: Glossary of Terms Used in This Report | .413 |
| Appendix C: ART Clinics That Reported 1998 Data for Publication, by State | .419 |
| Nonreporting ART Clinics for 1998, by State | .445 |

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, which 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, SART and CDC have worked together to report ART success rates.

The 1998 report of pregnancy success rates is the fourth to be issued under the law. It is coauthored by CDC, SART/ASRM, and RESOLVE: The National Infertility Association. This report is based on the latest available data collected by SART on the type, number, and outcome of ART cycles performed in U.S. clinics.

In addition to a brief question-and-answer section that follows this preface, the 1998 ART report has three major sections:

- **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 contains data from all 360 fertility clinics that reported, it can give people considering ART a good idea of the average chances 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 1998.

- **Appendices:**

Appendix A is a guide to interpreting reliability ranges (called 95% confidence intervals).

Appendix B is a glossary that 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 1998 that did not report their success rate data to CDC as required.

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, SART/ASRM, and RESOLVE hope 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 This Report

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., artificial insemination or intrauterine 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

- IVF (in vitro fertilization).
- GIFT (gamete intrafallopian transfer).
- ZIFT (zygote intrafallopian transfer).

These terms are explained in Figure 2 on page 11 and in the glossary, which begins on page 413.

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).

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.

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

As mandated by law, the report describes a woman's average chances of success using ART and presents the success rates of individual U.S. fertility clinics in a particular year. Although the report provides some information about factors, such as age and primary infertility diagnosis, that may affect success with ART, it doesn't address specific medical problems. 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.

In addition, 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 (telephone 205-978-5000 or Web site <http://www.asrm.org>).

Why is the report of 1998 success rates being published in 2000?

Before success rates based on live births can be calculated, every ART pregnancy must be followed up to determine if a birth occurred. Thus the earliest that clinics can report annual data is late in the year *after* ART treatment was initiated (nine months past year-end, when all the births have occurred). Accordingly, the results of all the cycles initiated in 1998 were not known until October 1999. 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 randomly selected a percentage of the reporting clinics for on-site quality control visits by SART validation teams, who checked the submitted data against the information in the medical records to be sure they matched.
- CDC data analysts did comprehensive checks of the numbers reported for every clinic.
- Clinic tables, national figures, and accompanying text in both the printed and Web site versions were compiled and laid out.
- CDC, SART/ASRM, and RESOLVE reviewed and approved the report.

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.

Which clinics are represented in this report?

The data in both the national report and the individual fertility clinic reports come from 360 fertility clinics that provided and verified information about the outcomes of the ART cycles started in their clinics in 1998. For current information on SART member clinics, contact SART (205-978-5000, extension 109).

Although we believe that almost all clinics that provided ART services in the United States throughout 1998 are represented in this report, data for a few clinics or practitioners have not been included in this report because they either were not in operation throughout 1998 or did not report as required. Clinics and practitioners known to have been in operation throughout 1998 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 1998, by State.) We will continue to make every effort to include all clinics and practitioners providing ART services in future reports.

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 that the tabulated success rates are accurate. After the data have been verified, a quality control process called validation begins. This year, 29 of the 360 reporting clinics were selected for site visits. Two members of the SART Validation Committee visited these clinics and compared medical record data on 50 randomly selected cycles with the data submitted for the report. In almost all cases, data on pregnancies and births in the medical records were consistent with reported data. Validation primarily helps to ensure that clinics are being careful to submit accurate data. It also serves to identify any systematic problems that could cause data collection to be inconsistent or incomplete.

Although SART compares medical records with data submitted for this report, the validation process does not include any assessment of clinical practice or overall record keeping.

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

A small number of ART cycles are not included in the national data. All of these cycles are in one of the following two categories:

- Surrogate or gestational carrier cycles, in which a woman receives the embryo transfer and carries the developing fetus for another woman. The gestational carrier usually has a contractual obligation to return the infant to its intended parents. In 1998, 809 such cycles were reported to CDC; the overall success rate of cycles using gestational carriers was 29.2%.
- Cycles in which a new treatment procedure (e.g., preimplantation genetic diagnosis or cytoplasmic egg transfer) was being evaluated. Only 25 ART cycles fell into this category in 1998.

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 1998 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.

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.

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

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. Because of our publication schedule, we were able to use only some of the suggestions in last year's report; additional changes were incorporated this year, and other improvements are being considered for future years.

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).

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.

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).

1998

National

Report

Introduction to the 1998 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 and 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 360 fertility clinics in operation in 1998 that provided and verified data on the outcomes of all ART cycles started in their clinics. ART cycles performed at the reporting clinics in 1998 resulted in 19,891 deliveries of one or more living infants (live births) and 28,500 babies.

The national report consists of graphs and charts that use 1998 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 1998.

The national report has four sections:

- Section 1 (Figures 1 and 2) presents information from all ART procedures reported.
- Section 2 (Figures 3 through 21) presents information on the 61,650 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 (Figure 22) presents information on the ART cycles that used only frozen embryos (11,228 cycles resulting in 10,058 transfers).
- Section 4 (Figures 23 and 24) presents information on the ART cycles that used only donated eggs or embryos (7,756 cycles resulting in 7,065 transfers).

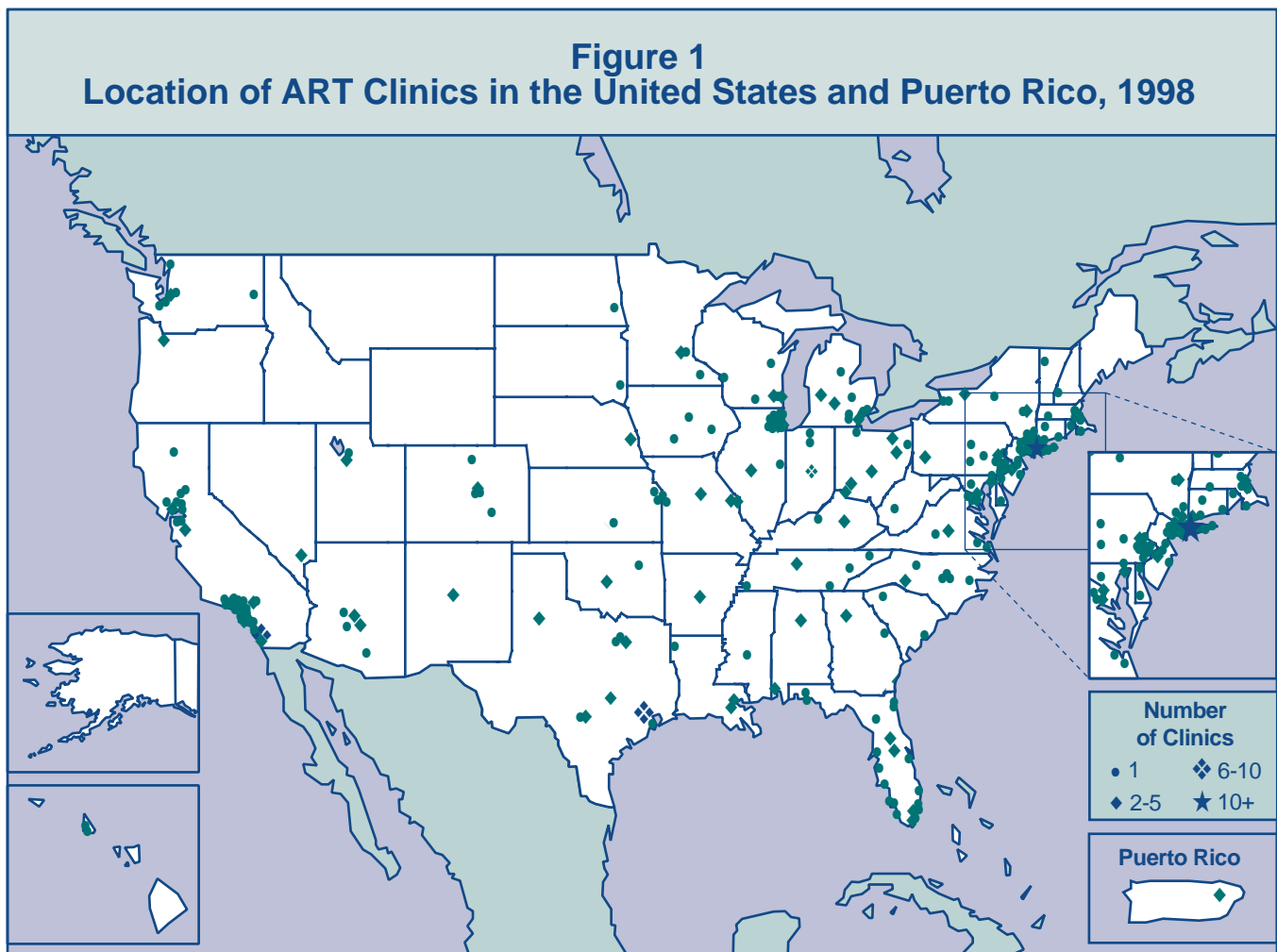
The 1998 national summary table, which is based on data from all clinics included in this report, is on page 47, immediately preceding the individual clinic tables. An explanation of how to read these tables is on page 41.

SECTION 1: OVERVIEW

Where are U.S. ART clinics located, how many ART cycles did they perform in 1998, 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 360 reporting clinics. The fertility clinic section of this report, arranged in alphabetical order by state, city, and clinic, 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. 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. In 1998, approximately 0.7% of all live babies born in the United States were the result of ART procedures.



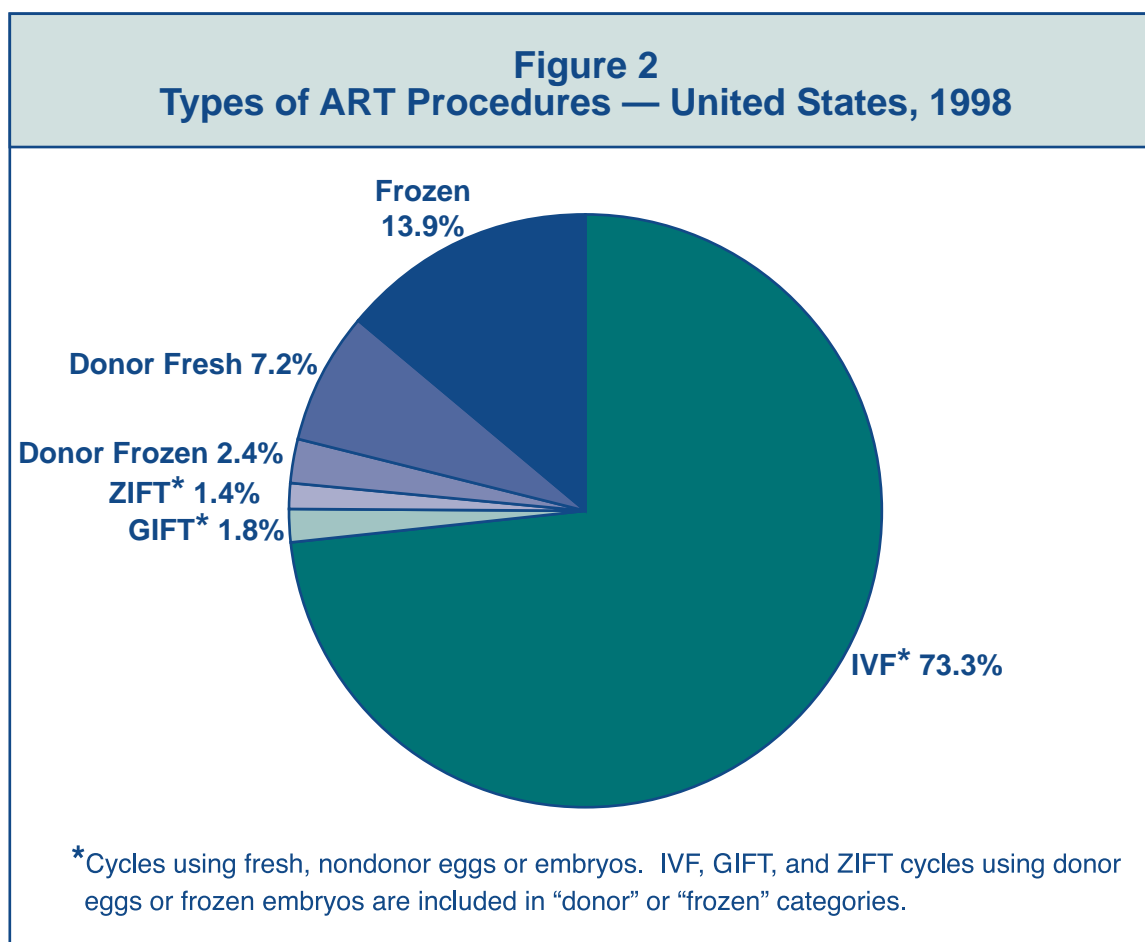
| | |
|--|--------|
| Number of ART clinics in the United States in 1998: | 390 |
| Number of U.S. ART clinics that submitted data in 1998: | 360 |
| Number of ART cycles reported for 1998: | 80,634 |
| Number of live-birth deliveries resulting from ART cycles started in 1998: | 19,891 |
| Number of live babies born as a result of ART cycles carried out in 1998: | 28,500 |

What types of ART procedures were used in the United States in 1998?

The 80,634 ART cycles carried out in 1998 used one of the following procedures:

- **IVF (in vitro fertilization)** involves extracting a woman's eggs, fertilizing the eggs in the laboratory, and then transferring the resulting embryo(s) into the woman's uterus through the cervix.
- **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.

Most IVF, GIFT, and ZIFT cycles used fresh, nondonor eggs or embryos.



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

The results of all ART (IVF, GIFT, and ZIFT) cycles that used fresh, nondonor eggs or embryos are presented together throughout this report, except where indicated in Figure 19, because the numbers of ZIFT and GIFT procedures are relatively small.

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 1998 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.

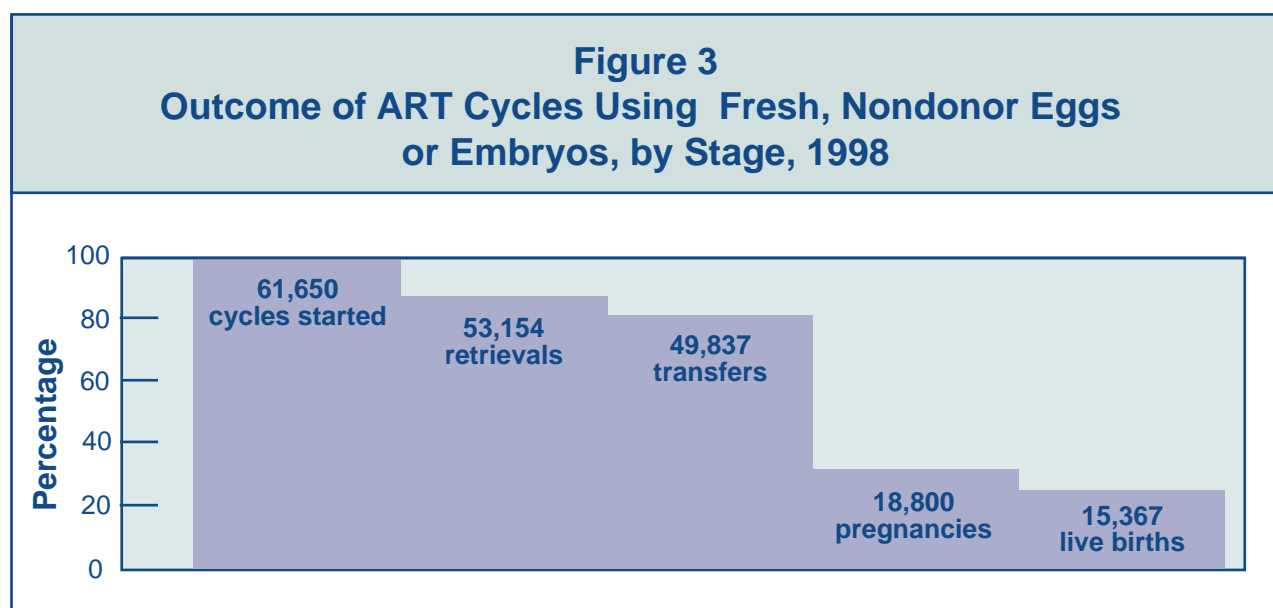
If eggs are produced, the cycle then progresses to **egg retrieval**, a surgical procedure in which eggs are collected from a woman's ovaries.

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).

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.)

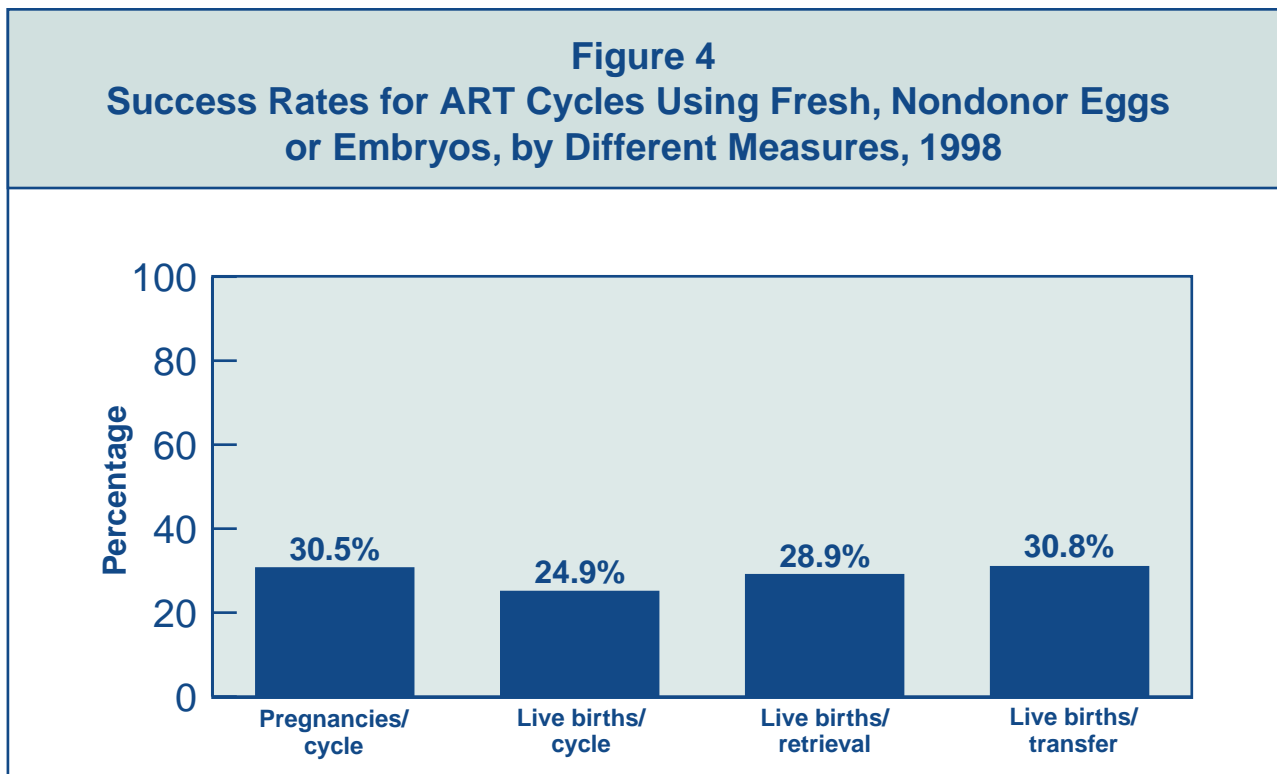
A cycle may be discontinued at any step for specific medical reasons (e.g., no eggs are produced or the embryo transfer was not successful) or by patient choice.



How is the success of an ART procedure measured?

Figure 4 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; for example, the live birth per cycle rate was 19.6% in 1995 and 24.9% in 1998. Age-specific success rates using each of these measures are shown in the National Table on page 47.

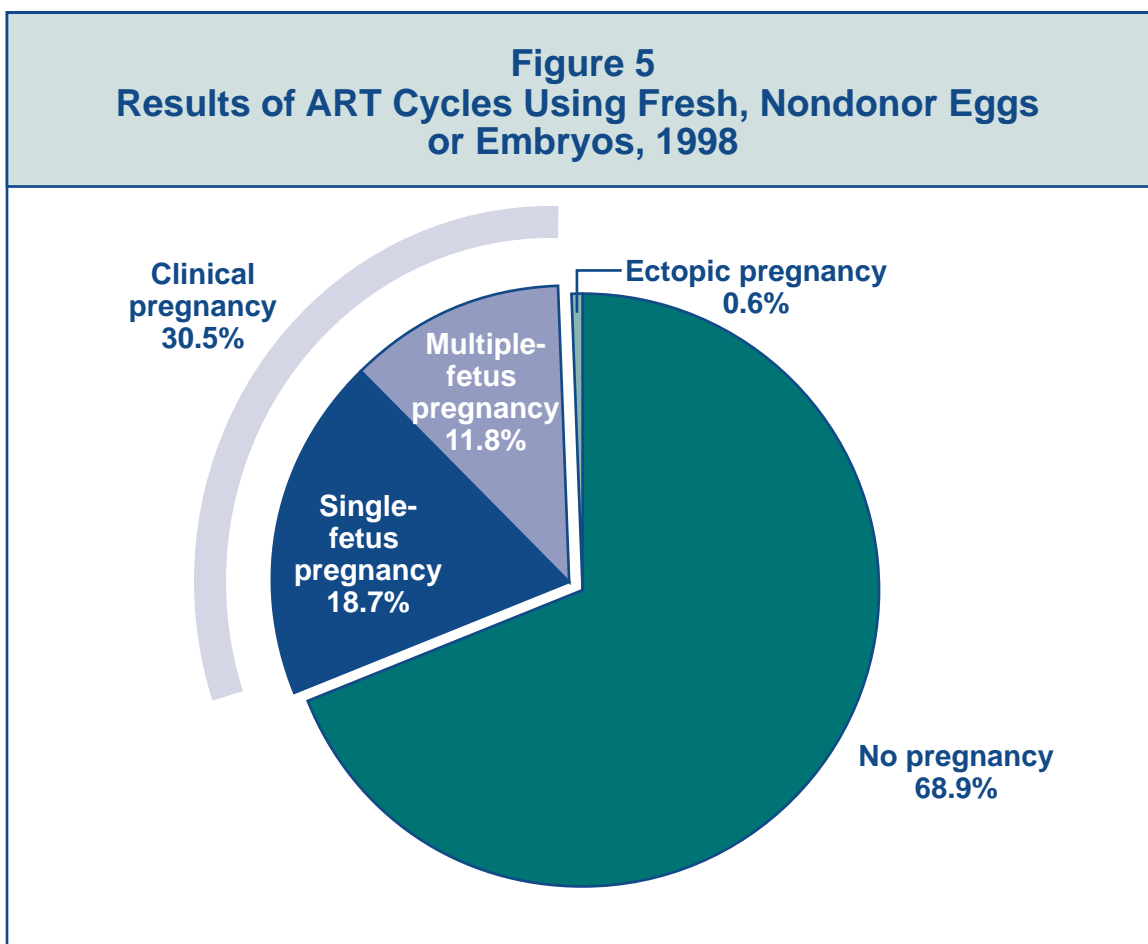
- **Pregnancy per cycle rate:** the percentage of ART cycles started that produced a pregnancy. This rate is higher than the live birth per cycle rate because some pregnancies end in miscarriage, therapeutic abortion, or stillbirth (see Figure 6, p. 15).
- **Live birth per cycle rate:** the percentage 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 those cycles that were canceled before eggs were retrieved. In 1998, about 14% of all cycles using fresh, nondonor eggs or embryos were canceled for a variety of reasons.
- **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 generally is the highest of these four measures of ART success.



What percentage of ART cycles results in a clinical pregnancy?

Figure 5 shows the results of the 1998 ART cycles that used fresh, nondonor eggs or embryos. Most of these cycles (68.9%) did not produce a pregnancy, while a very small proportion (0.6%) resulted in an ectopic pregnancy (the embryo implanted outside the uterus). Clinical pregnancy was achieved in 30.5% of these ART cycles. More specifically,

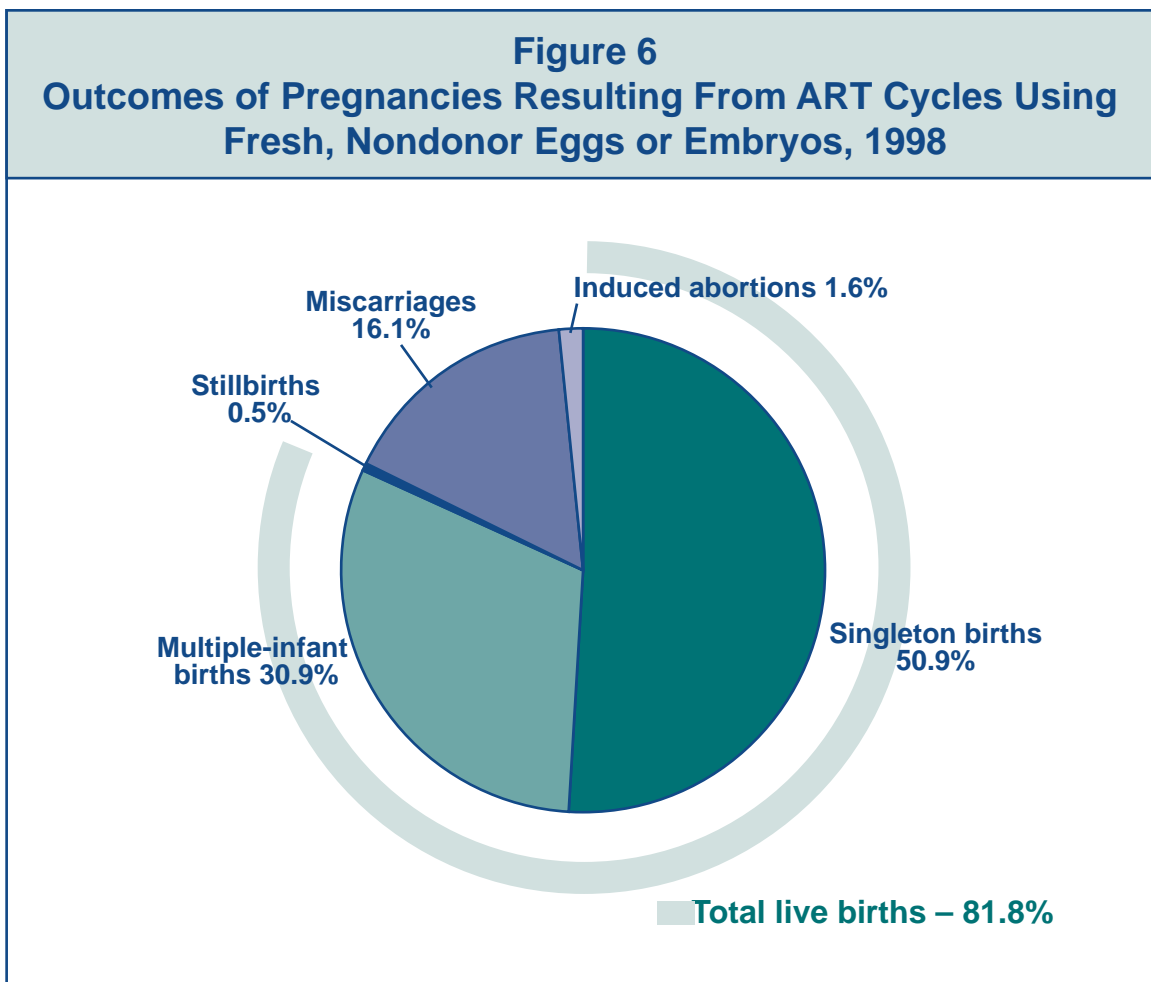
- 18.7% resulted in a single-fetus pregnancy.
- 11.8% resulted in a multiple-fetus pregnancy.



What percentage of pregnancies results in live births?

Figure 6 shows the outcomes of pregnancies resulting from ART cycles in 1998 (see Figure 5). Approximately 82% of the pregnancies resulted in a live birth (50.9% in a singleton birth and 30.9% in multiple-infant births). Approximately 18% of pregnancies resulted in an adverse outcome (miscarriage, induced abortion, or stillbirth).

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.



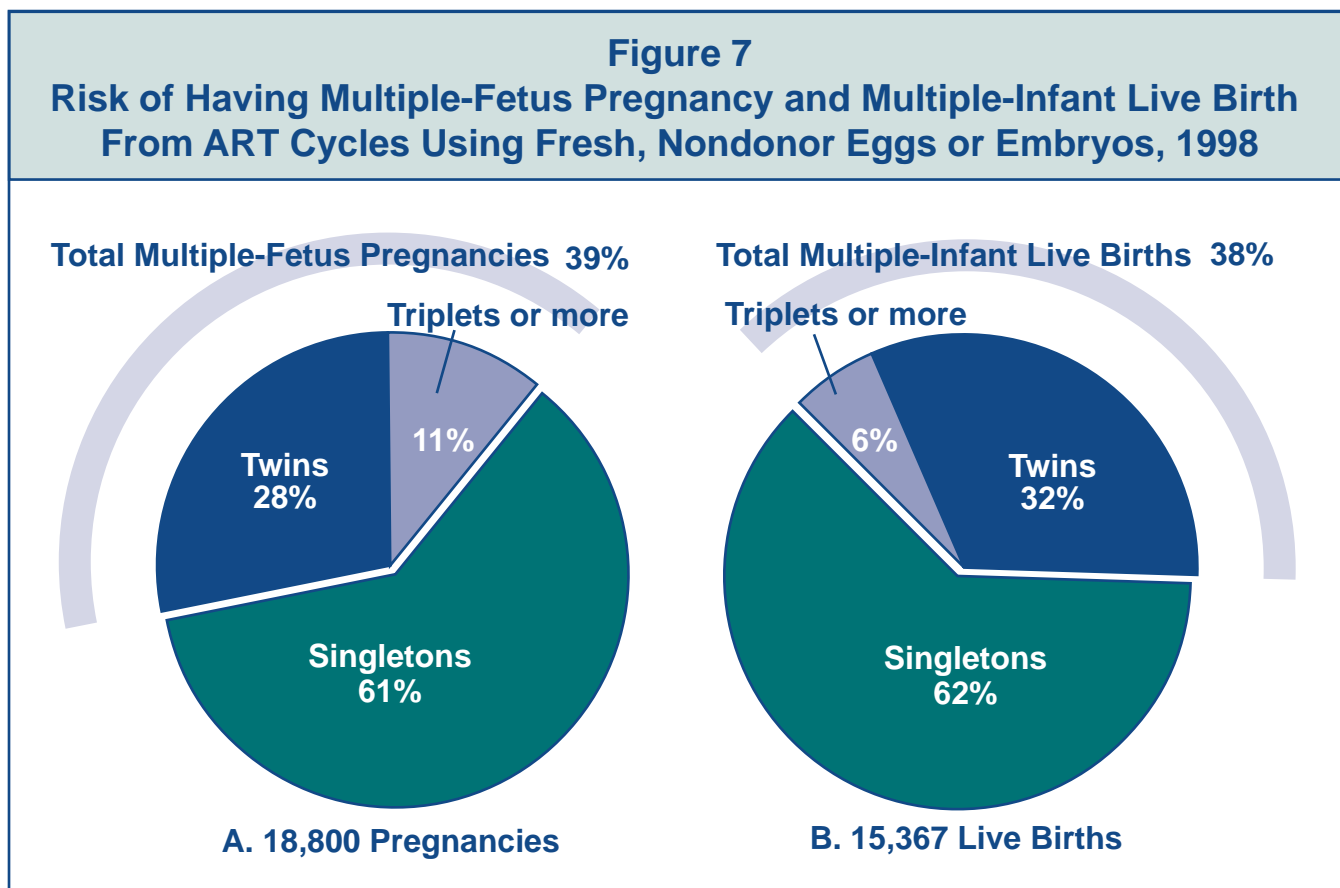
Using ART, what is the risk of having a multiple-fetus pregnancy or multiple-infant birth?

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

Part A of Figure 7 shows that among the 18,800 pregnancies that resulted from ART cycles using fresh, nondonor eggs or embryos, 61% were singleton pregnancies, 28% were twin pregnancies, and 11% were triplet or greater pregnancies. Thus, overall, about 39% of the pregnancies included more than one fetus.

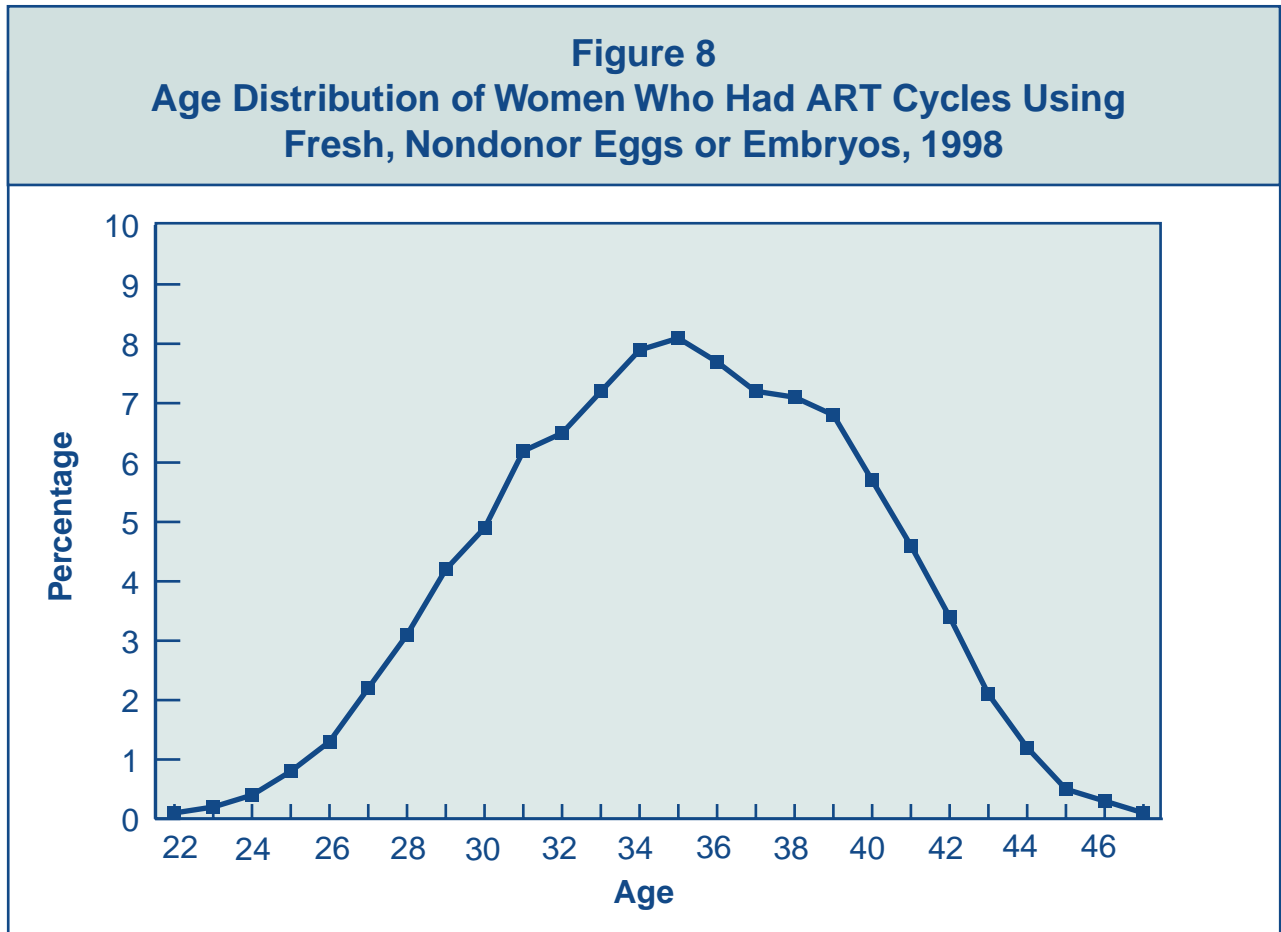
In 1998, 3,433 pregnancies ended in either miscarriage, stillbirth, or induced abortion. The remaining 15,367 pregnancies resulted in live births. Part B of Figure 7 shows that about 38% of these live births produced more than one infant (32% twins and 6% triplets or more). This compares with a multiple-infant birth rate of less than 3% in the general U.S. population.

Although the total rates for multiples were similar between pregnancies and live births, there were almost twice as many triplet pregnancies as 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.



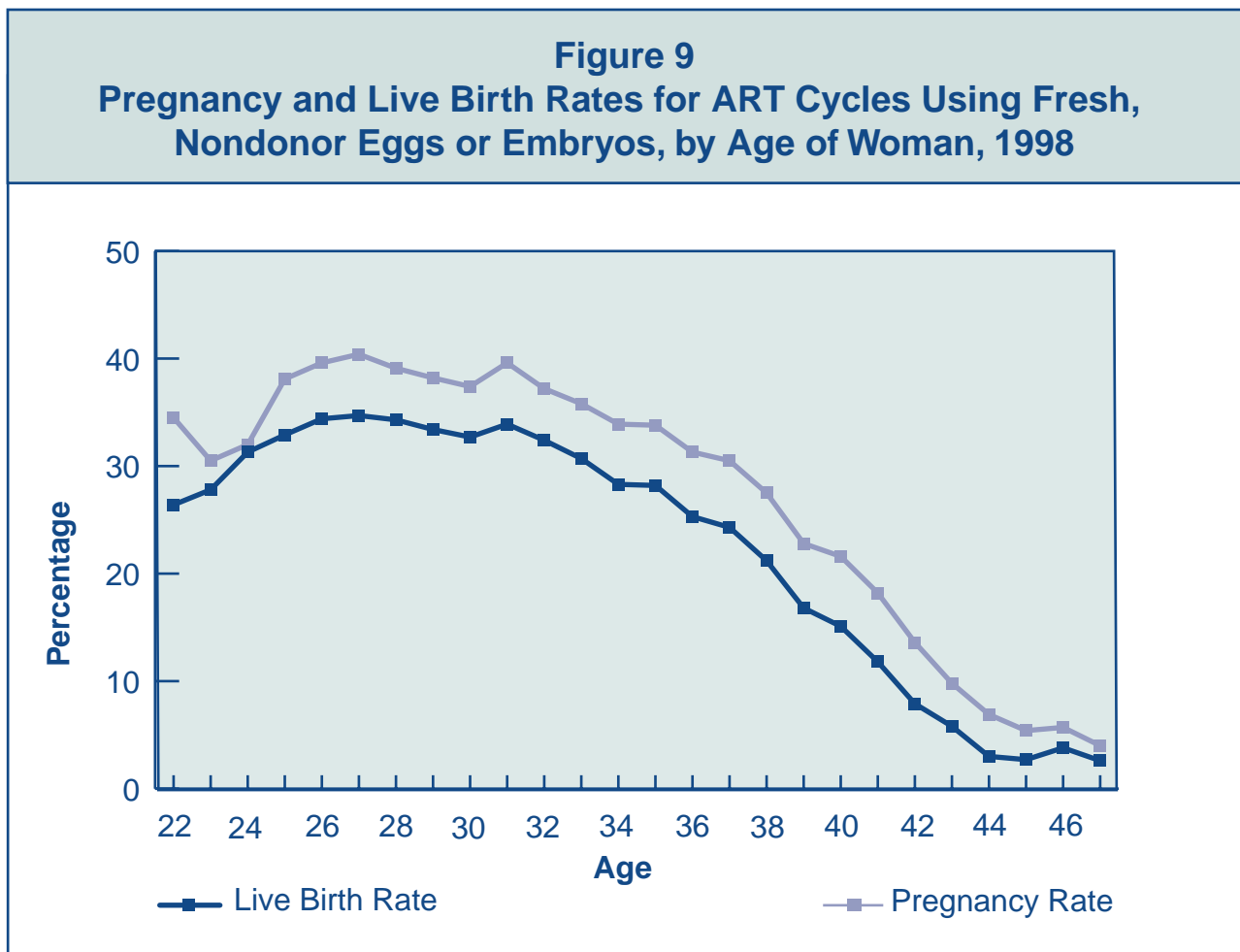
What are the ages of women who have an ART procedure?

Figure 8 presents 1998 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 47 used ART with their own eggs, those cycles are not included in the figure.



Do ART success rates differ among women of different ages?

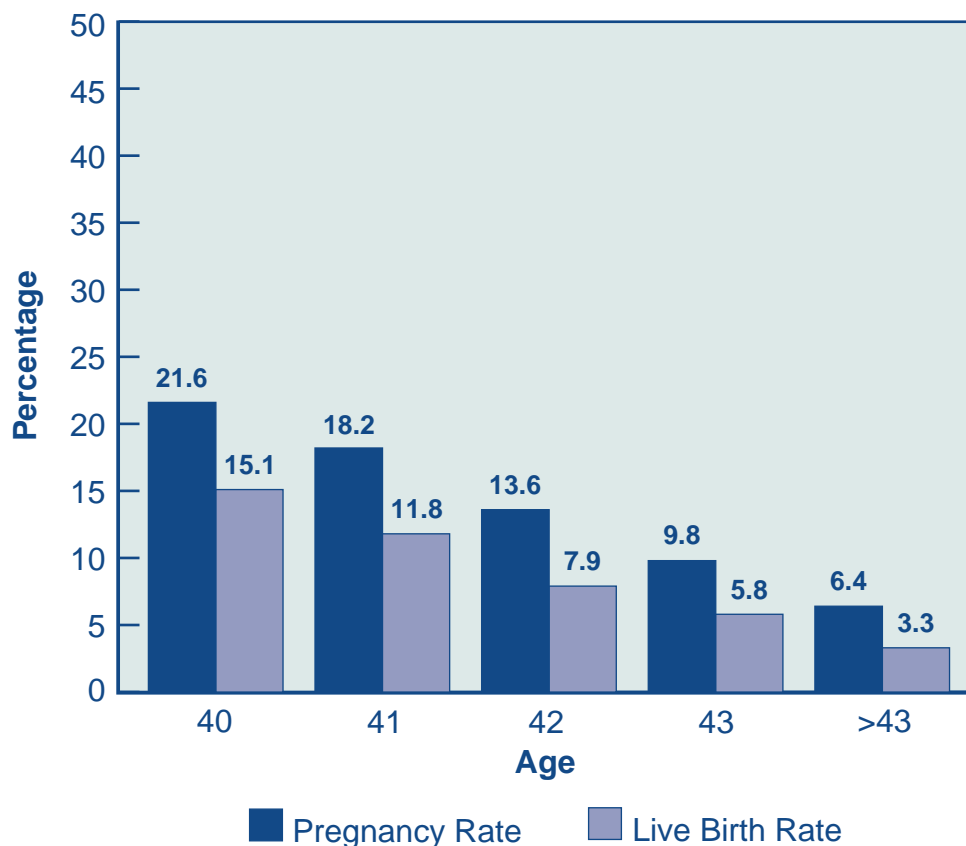
A woman's age is the most important factor affecting the chances of a live birth when her own eggs are used. Figure 9 shows both the pregnancy and live birth rates for women of different ages who had ART procedures in 1998. Among women in their twenties, both pregnancy and live birth rates were relatively stable; however, both rates declined sharply from the mid-thirties onward as fertility declined with age. For additional detail on success rates among women aged 40 years and older, see Figure 10.



How do ART success rates differ for women aged 40 years or older?

Success rates decline from the mid-thirties onward and are particularly low for women 40 and older. Figure 10 shows pregnancy and live birth rates for women 40 or older. The average chance for pregnancy was 21.6% for women aged 40; the live birth rate for this age was 15.1%. This rate dropped steadily with each one-year increase in age. The live birth rate was approximately 6% for women aged 43, and 3% for women older than 43.

Figure 10
Pregnancy and Live Birth Rates for ART Cycles Using Fresh, Nondonor Eggs or Embryos Among Women Age 40 and Older, 1998

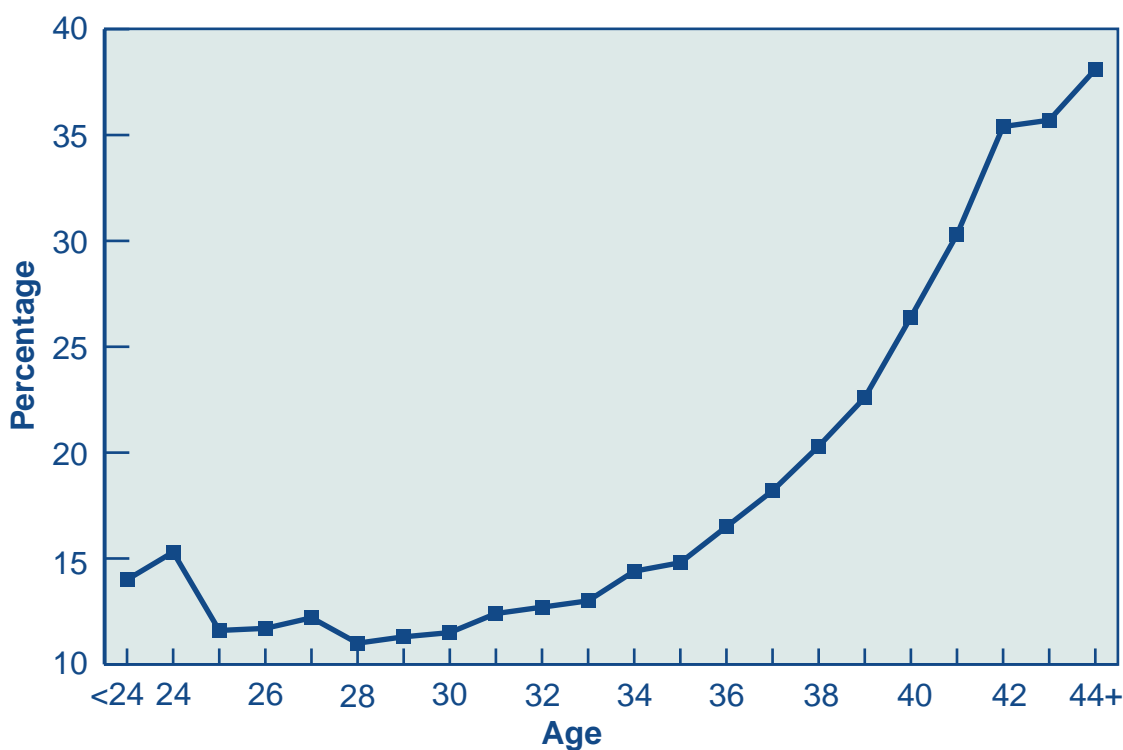


How do miscarriage rates vary among women of different ages undergoing ART?

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 11 shows miscarriage rates for women of different ages who became pregnant using ART procedures in 1998. Miscarriage rates generally were near or below 15% among women younger than 35. The rates began to increase among women in their mid- to late-30s and continued to increase with age, reaching 26% at age 40 and 35% at age 42.

The miscarriage rates observed among women undergoing ART procedures appear to be similar to those reported previously in various studies of women who were either pregnant or attempting to conceive.

Figure 11
Miscarriage Rates Among Women Who Had ART Cycles Using Fresh, Nondonor Eggs or Embryos, by Age of Woman, 1998



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

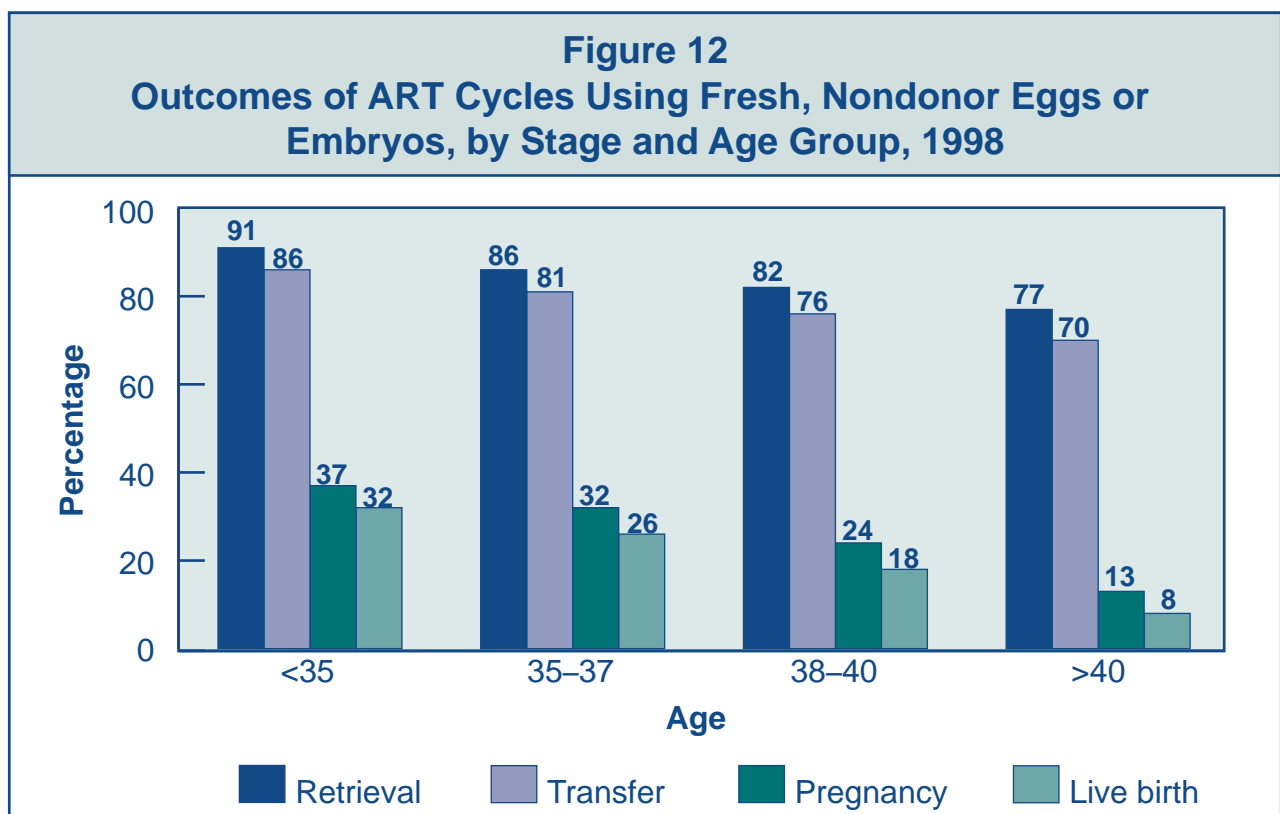
In 1998, a total of 61,650 cycles using fresh, nondonor eggs or embryos were started:

- 27,858 among women younger than 35.
- 14,146 among women 35–37.
- 12,037 among women 38–40.
- 7,609 among women older than 40.

Figure 12 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 11).

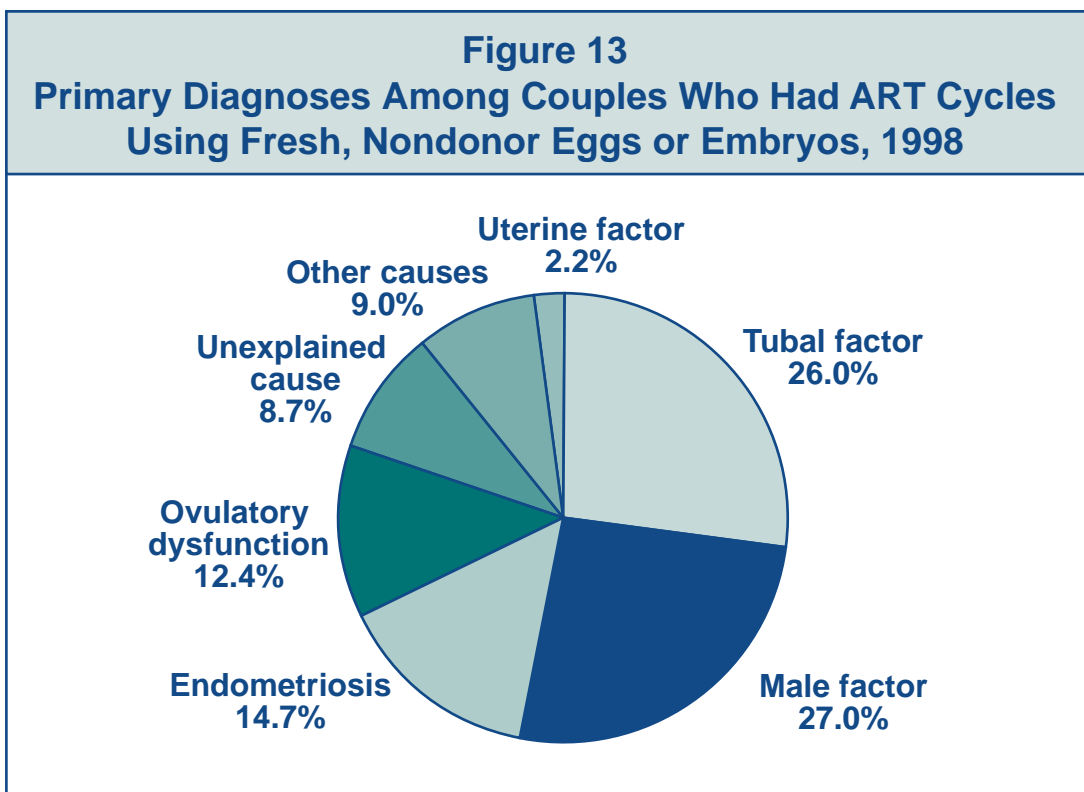
Overall, 32% of cycles started in 1998 among women younger than 35 resulted in live births. This percentage decreased to 26% among women aged 35–37, 18% among women aged 38–40, and 8% among women older than 40.



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

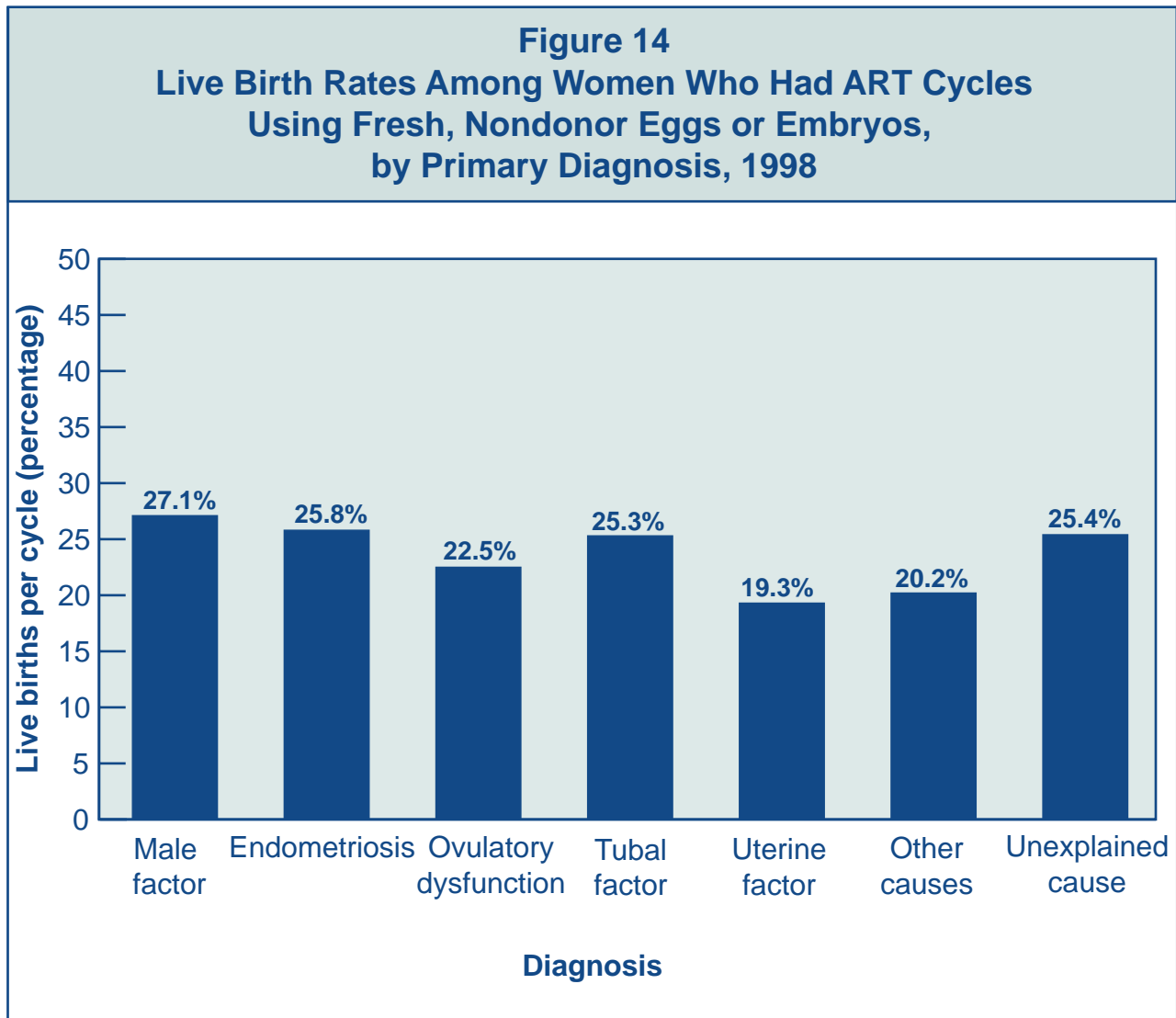
Figure 13 shows the primary diagnoses reported for infertility among couples who had an ART procedure in 1998. Although some couples have more than one cause of infertility, only one is reported as primary. In addition, diagnostic procedures and categories may vary from one clinic to another, so the categorization may be inexact.

- **Tubal factor** usually 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.
- **Male factor** usually 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.
- **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.
- **Ovulatory dysfunction** means that the ovaries are not producing eggs normally or that egg production has diminished with age.
- **Uterine factor** means a disorder of the uterus that results in reduced fertility.
- **Unexplained cause** means that no cause of infertility was found in either the woman or the man.
- **Other causes** of infertility include immunological problems, chromosomal abnormalities, cancer chemotherapy, and serious illnesses.



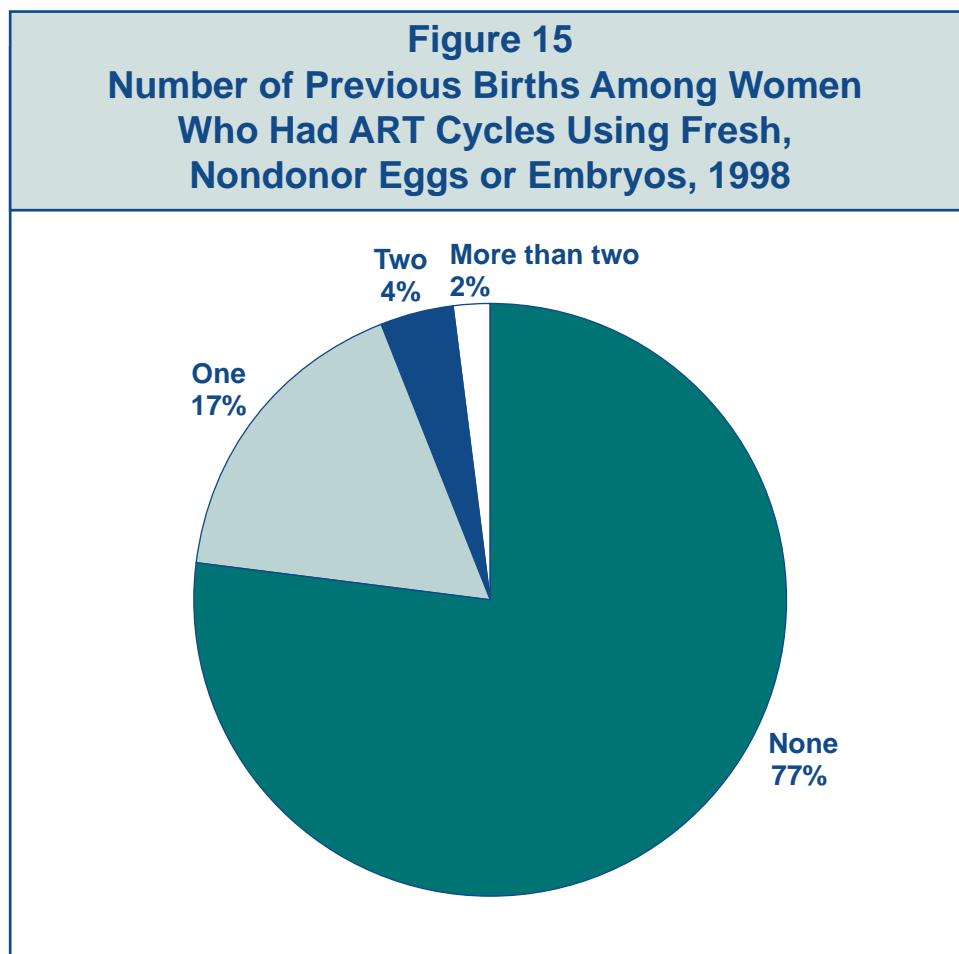
Does the cause of infertility affect the chances of success using ART?

Figure 14 shows the percentage of live births after an ART procedure according to the primary cause of infertility. (See the glossary in Appendix B or Figure 13 for an explanation of the diagnoses.) The success rates varied little among most of the different diagnoses; most were near the overall national success rate of 24.9%. However, the use of these diagnostic categories may vary from clinic to clinic, and the definitions are imprecise.



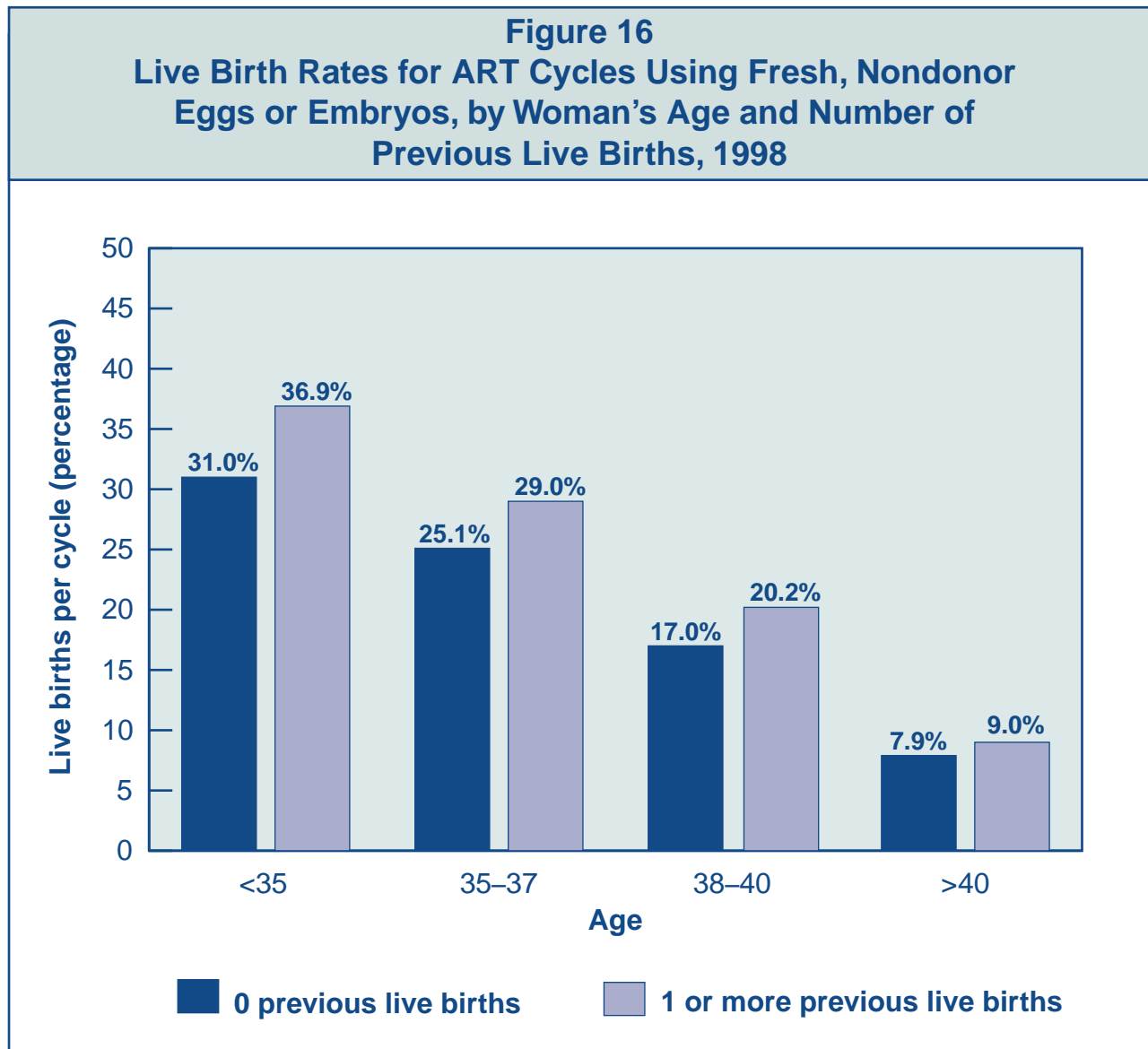
How many women who used ART have previously given birth?

Figure 15 shows the number of children born previously to women who had an ART procedure in 1998. Most of these women (77%) had no previous births although they may have had a pregnancy that resulted in a miscarriage or a therapeutic abortion. Seventeen percent reported one previous birth, and 6% reported two or more. However, we do not know how many of these children were conceived naturally and how many by an ART procedure. These data nonetheless point out that women who have previously had children can still face infertility problems, including the infertility of a new partner.



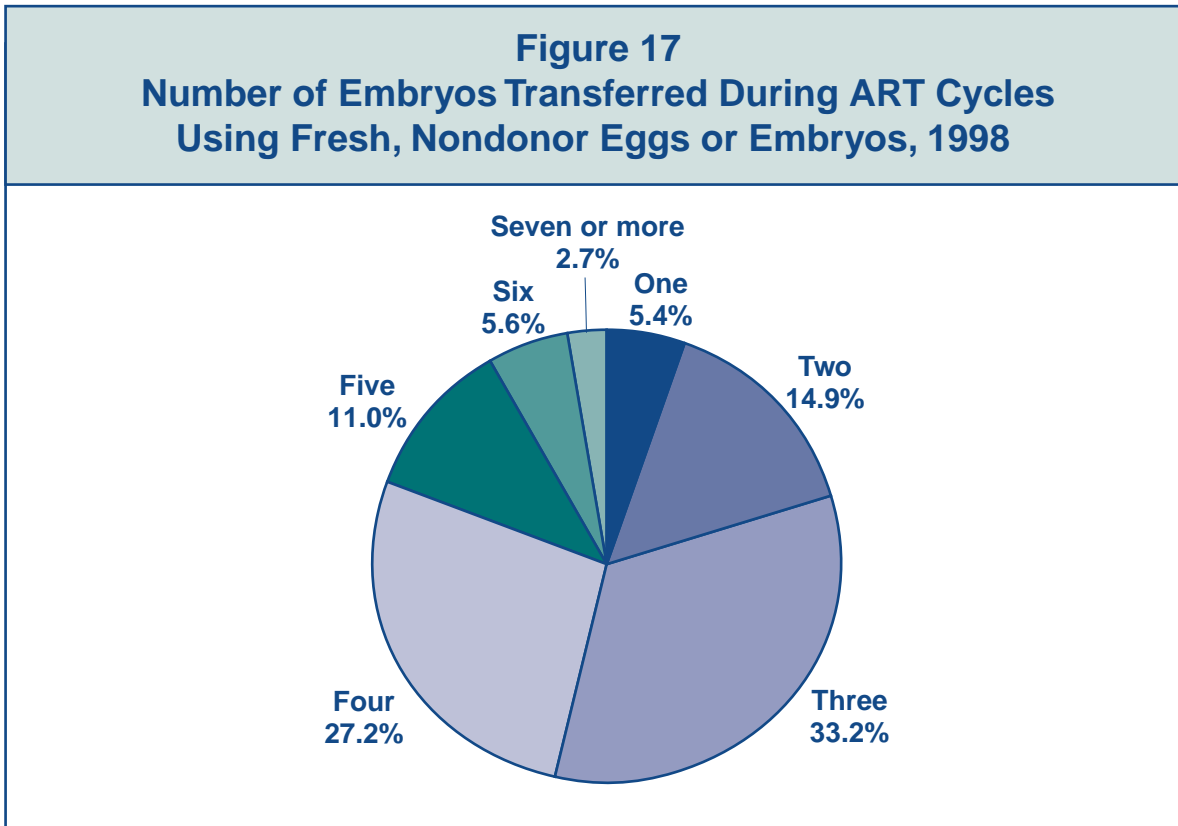
How do the chances of success using ART compare for women who have previously given birth and women who have not?

Figure 16 shows the relationship between the success of an ART cycle performed in 1998 and the history of previous births to the woman who had the treatment. Previous live-born infants were conceived naturally in some cases and through ART in others. In all age groups, women who had not had a previous live birth were less likely to have a live birth by using ART.



How many embryos were transferred in ART procedures?

Figure 17 shows that approximately 80% of ART cycles that progressed to the embryo transfer stage in 1998 involved the transfer of three or more embryos, 47% of cycles involved the transfer of four or more, and 19% of cycles involved the transfer of five or more embryos.

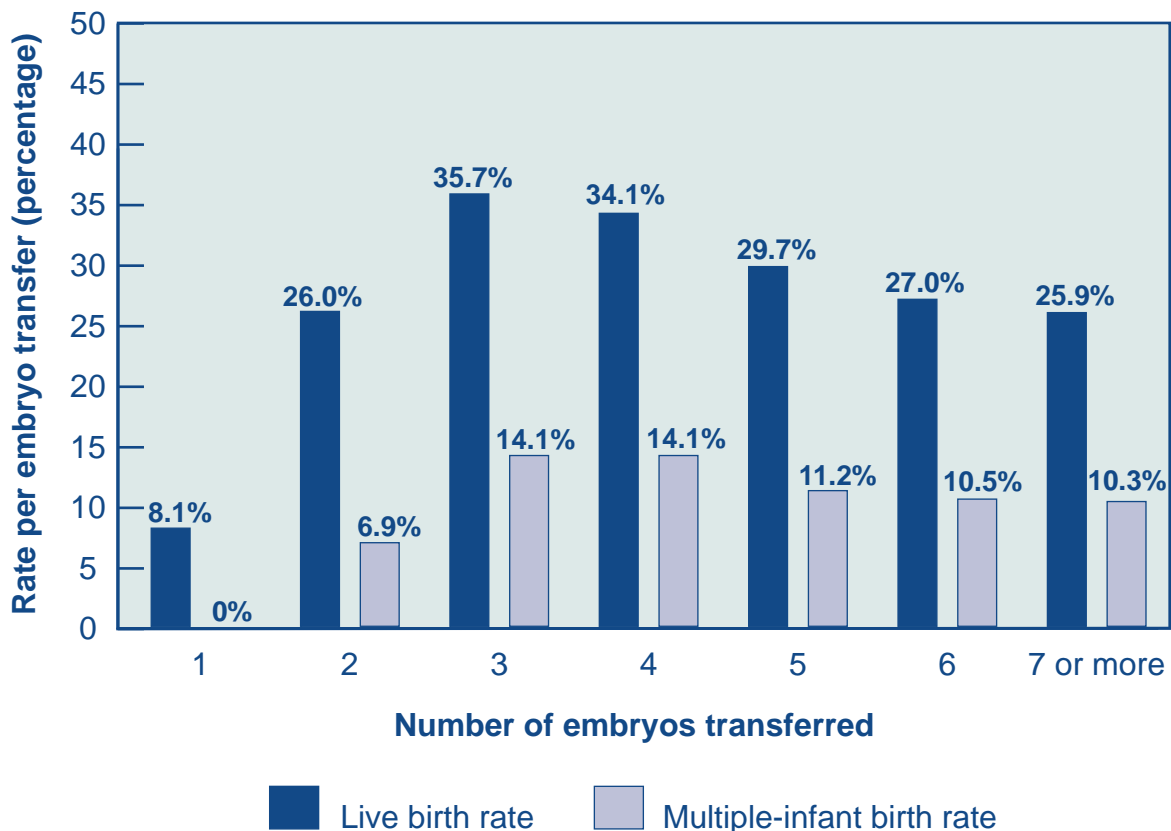


Is an ART cycle more likely to be successful when more embryos are transferred?

Figure 18 shows the relationship between the number of embryos transferred during an ART procedure in 1998 and the number of infants born alive as a result of that procedure. In general, transferring multiple embryos during an ART cycle improves the chances for a live birth but also increases the possibility of a multiple-infant birth. Multiple-infant births cause concern because of the additional health risks they create for both the mother and infants.

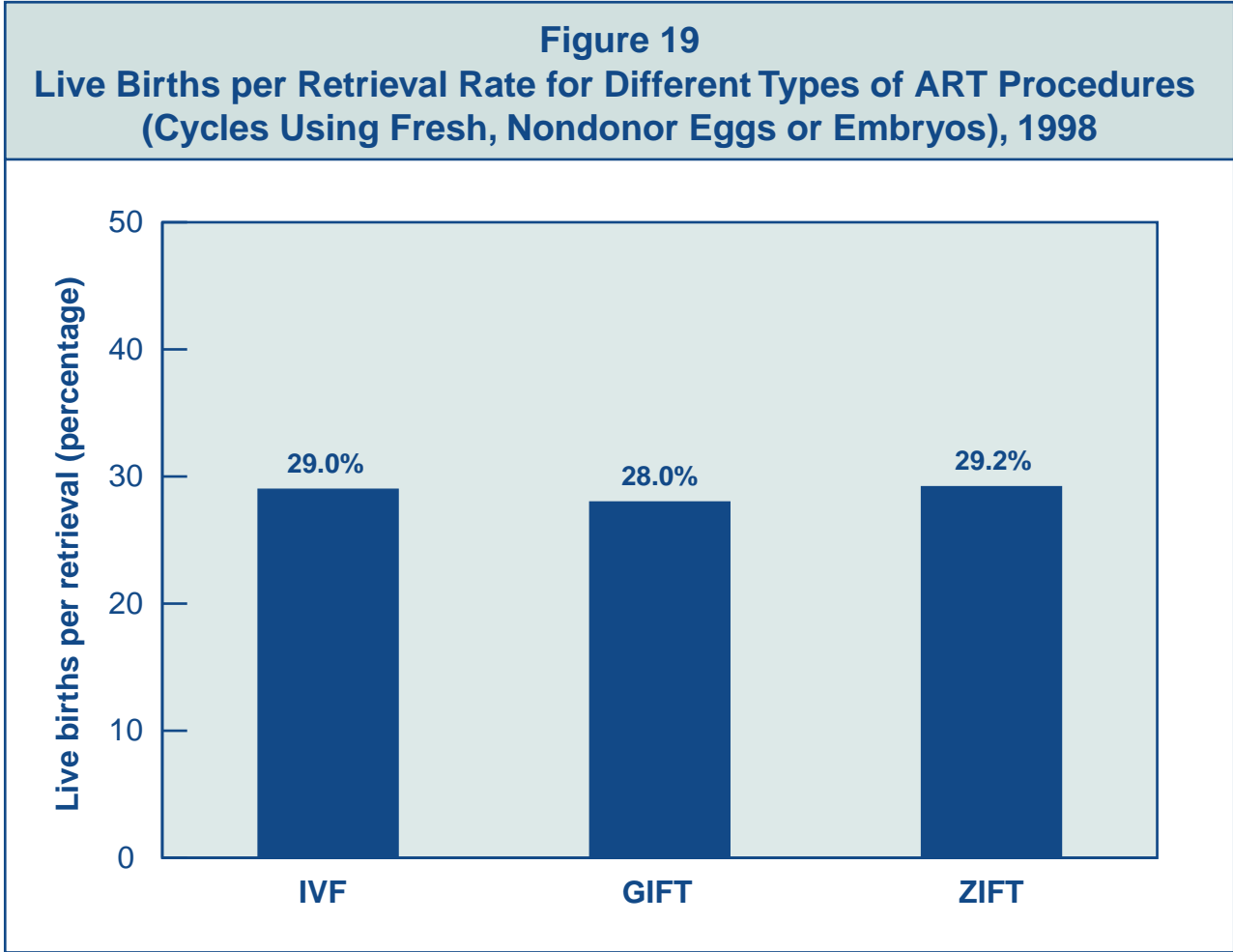
The relationships between number of embryos transferred, success rates, and multiple-infant births are complicated by several factors, such as age and embryo quality. Thus, the relationships shown in this figure do not hold for all women. A more detailed CDC report that discusses how various factors may affect the relationship between the number of embryos transferred, live birth rates, and multiple-infant birth rates was published in *JAMA* in 1999 (Vol. 282, No. 19, pages 1832–1838).

Figure 18
Live Birth and Multiple-Infant Birth Rates for
ART Cycles Using Fresh, Nondonor Eggs or Embryos,
by Number of Embryos Transferred, 1998



What are the live birth rates for different types of ART procedures?

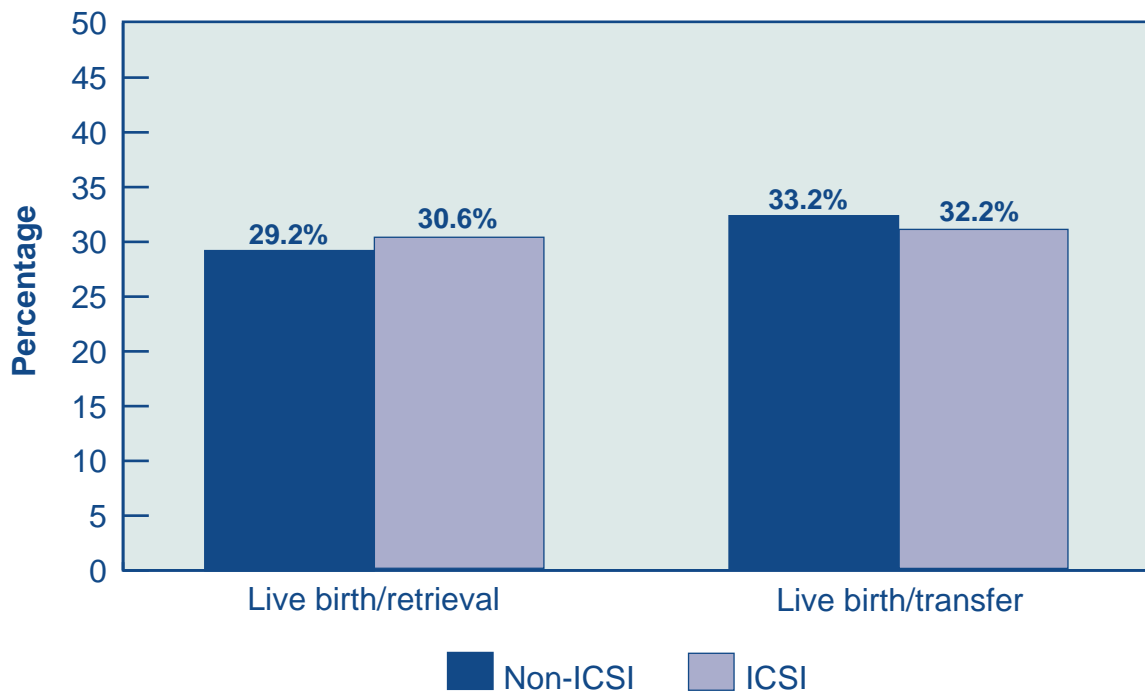
Figure 19 shows the percentage of egg retrievals in 1998 that used a particular type of ART procedure and resulted in a live birth. Because the same patterns were seen among all age groups, results are given for all age groups combined. In 1998, success rates for IVF, GIFT, and ZIFT were very similar. Some women with tubal infertility are not suitable candidates for GIFT and ZIFT. In addition, 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 into a woman’s uterus through the cervix without surgery.



Is an ART cycle more likely to be successful for couples with male factor infertility when ICSI is used?

In 1998, approximately 40% of ART cycles using fresh, nondonor eggs or embryos used ICSI (intracytoplasmic sperm injection, a procedure in which a single sperm is injected directly into an egg), most often to overcome problems with sperm function or motility. Figure 20 compares the success rates for ART procedures involving ICSI with those not involving ICSI among couples with male factor as the primary diagnosis. Because ICSI can be performed only when at least one egg has been retrieved, only the live birth per retrieval rate and the live birth per transfer rate are compared. In 1998, success rates per retrieval were slightly higher when ICSI was used, indicating that ICSI may improve the chances of fertilization among couples with male factor infertility. The similarity in success rates for live births per transfer with and without ICSI shows that once the egg was fertilized, ICSI did not affect the success rate.

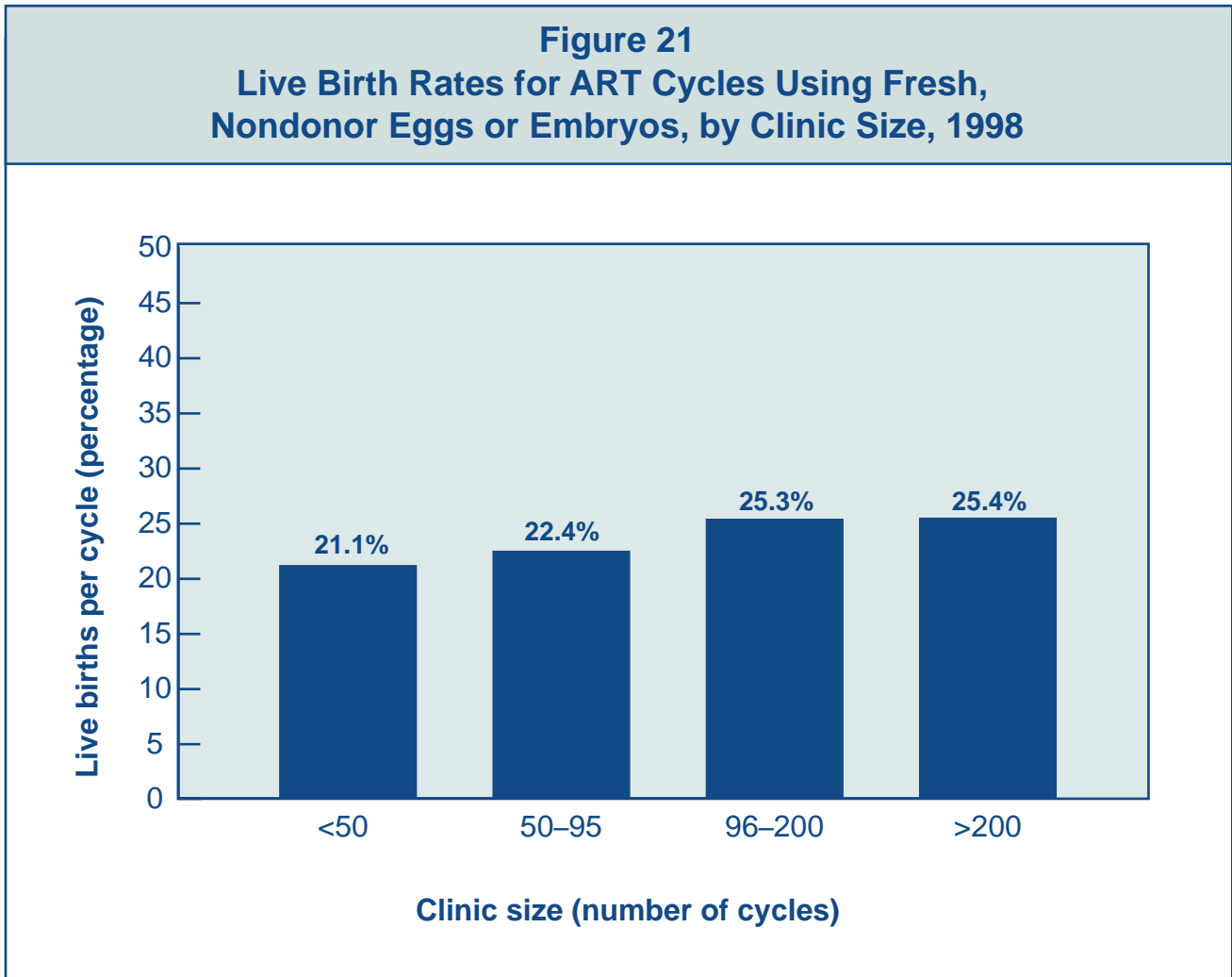
Figure 20
Success Rates for ART Cycles Using Fresh, Nondonor Eggs or Embryos, Including and Not Including ICSI Among Couples With Male Factor Infertility,* 1998



*As the primary diagnosis; cycles using donor sperm are excluded.

Does the size of the clinic affect its success rate?

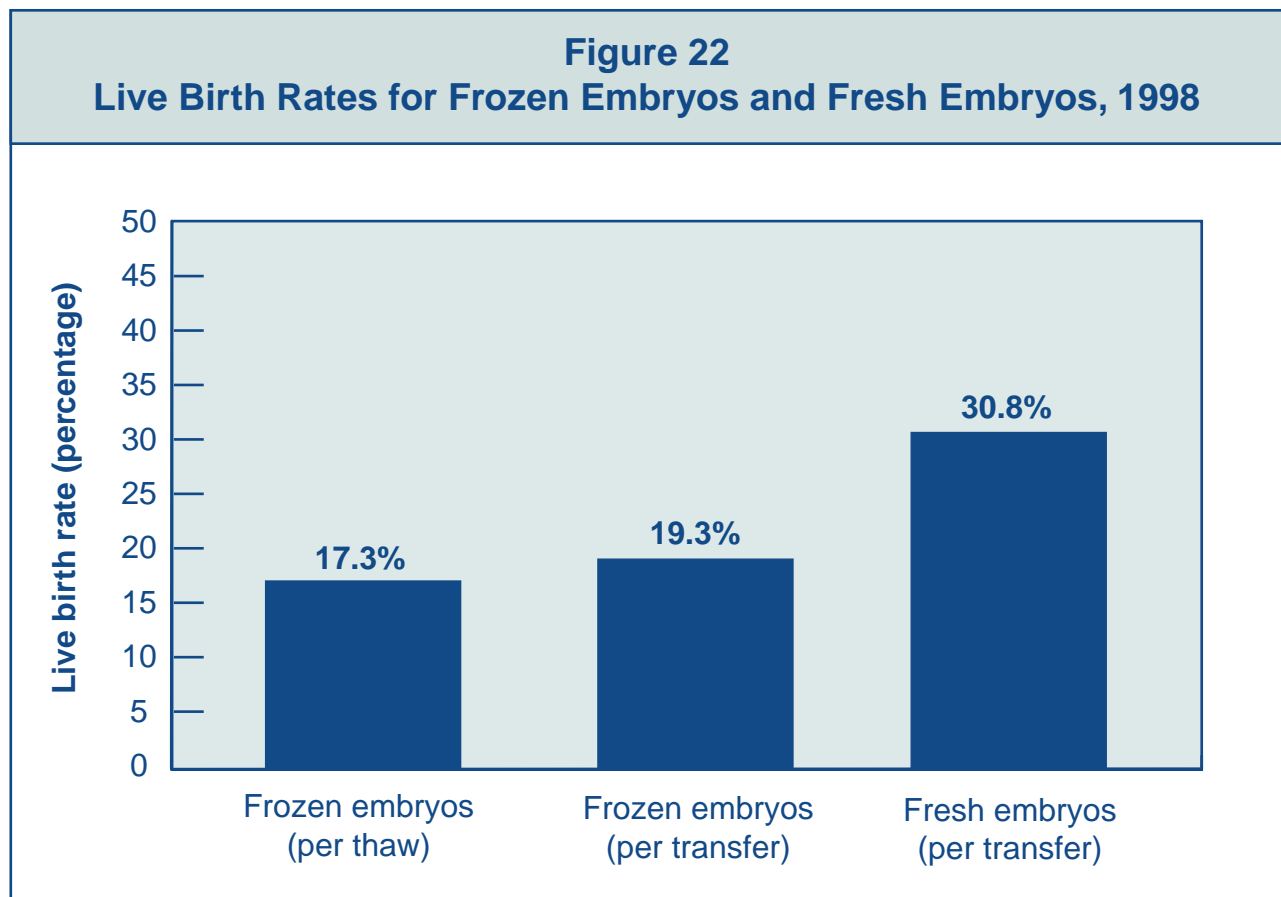
The number of ART procedures carried out every year varies among fertility clinics in the United States. In 1998, success rates tended to be slightly higher among clinics that performed more cycles. In Figure 21, clinics are divided into four *equal* groups (called quartiles) based on the size of the 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.



SECTION 3: ART CYCLES USING ONLY FROZEN EMBRYOS

What are the success rates for ART using frozen embryos?

Approximately 14% of all ART cycles performed in 1998, or 11,228 cycles, used only frozen embryos. Figure 22 compares the success rates for frozen embryos with the rate for fresh embryos. Some embryos do not survive the freezing or thawing process. Thus, the live birth per thaw rate, which takes into account all embryos frozen, is usually lower than the live birth per transfer rate. In 1998, 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 process again.

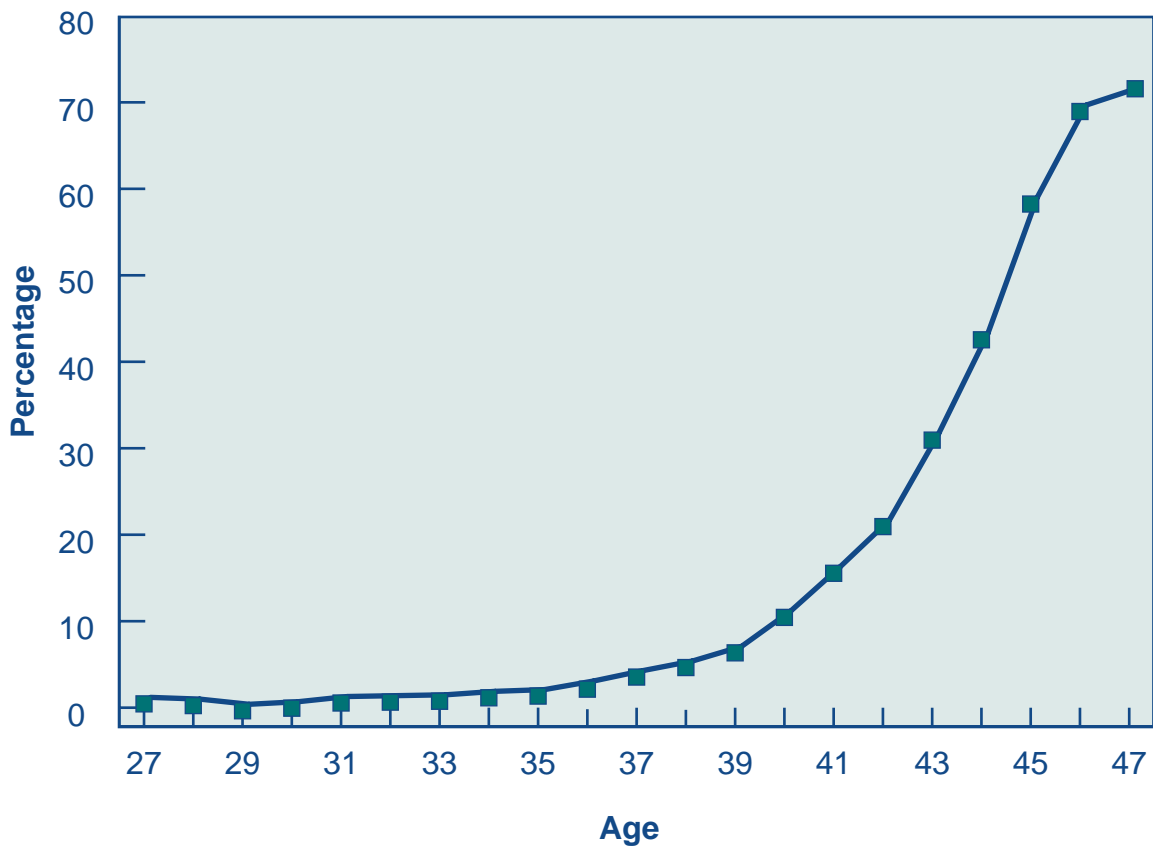


SECTION 4: ART CYCLES USING DONOR EGGS

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

As shown in Figures 9, 10, and 11, 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 were used in approximately 10% of all ART cycles carried out in 1998, or 7,756 cycles. Figure 23 shows the percentage of ART cycles using donor eggs in 1998 according to the woman's age. Donor eggs were used in less than 5% of cycles among women younger than age 37. The percentage of cycles carried out with donor eggs then increased sharply. Among women older than age 46, more than 70% of all ART cycles used donor eggs.

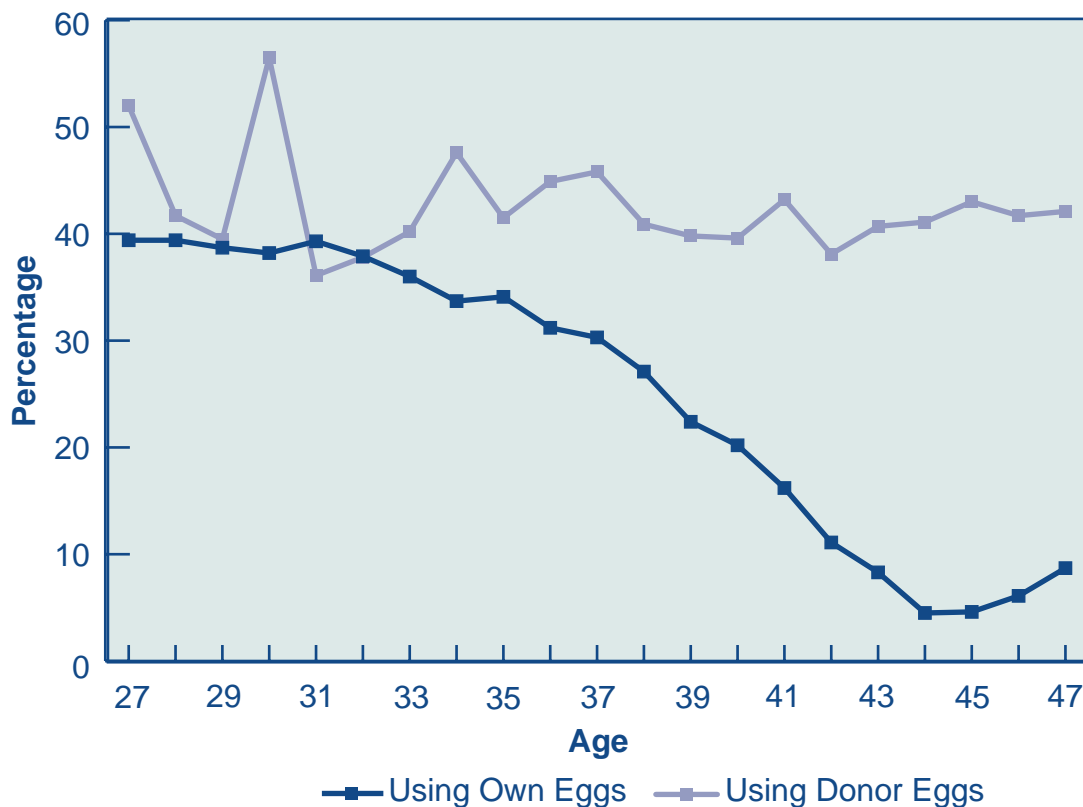
Figure 23
Percentage of ART Cycles Using Donor Eggs,
by Age of Recipient, 1998



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

Figure 24 compares success rates for ART using donor eggs with those for ART using a woman's own eggs 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 twenties or early thirties. Thus, the live birth per transfer rate for cycles using embryos from donor eggs varies only slightly across all age groups. In contrast, this rate for cycles using embryos from the woman's own eggs declines steadily as women get older.

Figure 24
Live Births per Transfer for Fresh Embryos From Own and Donor Eggs, by Age of Recipient, 1998



1998

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 1998, and individual program characteristics. Clinics are listed in alphabetical order by state, city, and clinic. 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 different 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 1998.* Data for cycles started in 1998 could not be published until 2000 because the final outcomes of pregnancies conceived in December 1998 were not known until October 1999. 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 1998 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 reliability ranges (confidence intervals) on page 44.
- *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 than clinics that do not. In contrast, clinics that offer ART procedures to patients who might have become pregnant with less technologically advanced treatment will have higher success rates than clinics that do not.

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 1998 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.* Some clinics are more likely than others to cancel a cycle if a woman produces only a small number of eggs. Cancellation rates for cycles using fresh, nondonor eggs or embryos vary among clinics from less than 1% to approximately 35%. 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 required by 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 than those that do not. Nationally, fewer than 1% of ART cycles in 1998 were unstimulated. However, in a very few clinics, more than 25% of cycles were unstimulated.
- *Live births resulting from extra embryos from a stimulated cycle that were frozen and transferred at a later date are counted only once under "cycles using frozen embryos."* Clinics that have very good live birth rates with frozen embryos would have higher ART success rates if live births from frozen embryos were included as a success for the original stimulated cycle. Consumers should look at rates for both cycles using fresh embryos and those using frozen embryos when assessing a clinic's success rates.
- *The number of embryos transferred varies from clinic to clinic.* In 1998, the average number of fresh, nondonor embryos that a clinic transferred to women younger than 35 years old ranged from 1.0 to 5.9. 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 41.

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 pp. 37–39.)

1998 ART CYCLE PROFILE

| 1 Type of ART ^a | | | | 2 Patient Diagnosis | | | |
|----------------------------|------|----------------------------|-----|-----------------------|-----|----------------|-----|
| IVF | 100% | Procedural factors: | | Tubal factor | 25% | Uterine factor | 1% |
| GIFT | 0% | | | Male factor | 25% | Other factors | 13% |
| ZIFT | 0% | With ICSI | 66% | Ovulatory dysfunction | 21% | Unexplained | 0% |
| Combination | 0% | Unstimulated | 0% | Endometriosis | 15% | | |

4 1998 PREGNANCY SUCCESS RATES

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

| Type of Cycle | 5 Age of Woman | | | |
|---|----------------|--------------|--------------|------------------|
| | <35 | 35-37 | 38-40 | >40 ^d |
| 4A Fresh Embryos From Nondonor Eggs | | | | |
| Number of cycles | 161 | 45 | 27 | 5 |
| Percentage of cycles resulting in pregnancies ^b | 29.6 | 29.2 | 26.7 | 2/5 |
| Percentage of cycles resulting in live births ^{b, c} | 22.4 | 20.0 | 14.8 | 1/5 |
| 6 (Reliability Range) | (15.9 - 28.8) | (8.3 - 31.7) | (1.4 - 28.2) | |
| Percentage of retrievals resulting in live births ^{b, c} | 25.2 | 23.1 | 20.0 | 1/4 |
| Percentage of transfers resulting in live births ^{b, c} | 25.2 | 25.0 | 4/18 | 1/4 |
| Percentage of cancellations ^b | 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 ^b | 48.9 | 3/12 | 1/8 | 0/2 |
| Percentage of pregnancies with triplets or more ^b | 8.5 | 2/12 | 1/8 | 0/2 |
| Percentage of live births having multiple infants ^{b, c} | 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 ^{b, c} | 2/17 | 1/3 | 1/3 | 0/1 |
| Average number of embryos transferred | 2.4 | 2.7 | 2.0 | 1.0 |
| 4C Donor Eggs | | | | |
| Number of fresh embryo transfers | 5 | 1 | 5 | 2 |
| Percentage of fresh transfers resulting in live births ^{b, c} | 1/5 | 1/1 | 2/5 | 1/2 |
| Average number of fresh embryos transferred | 3.0 | 4.0 | 3.4 | 3.0 |
| Number of frozen embryo transfers | 2 | 0 | 0 | 1 |
| Percentage of frozen transfers resulting in live births ^{b, c} | 0/2 | | | 1/1 |
| Average number of frozen embryos transferred | 3.0 | | | 5.0 |

7 CURRENT CLINIC SERVICES AND PROFILE (AS OF 1/15/2000)

Current Name: ART Clinic of the United States

Services Offered:

| | | | |
|---------------|-----|-----------------------|-----|
| Donor egg? | Yes | Gestational carriers? | Yes |
| Donor embryo? | Yes | Cryopreservation? | Yes |
| Single women? | No | | |

Clinic Profile:

| | |
|-----------------------------|-----|
| SART member? | Yes |
| Verified lab accreditation? | Yes |

Additional information on lab accreditation is available in Appendix C.

^a Reflects patient and treatment characteristics of ART cycles performed in 1998 using fresh, nondonor eggs or embryos.

^b When fewer than 20 cycles are reported in an age category, rates are shown as a fraction. Calculating percentages from fractions may be misleading and is not encouraged.

^c A multiple-infant birth is counted as one live birth.

^d Among women >40, rates change with every year of age. Refer to Figure 10 for average chances of success by year of age.

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 example clinic table on the opposite page. Technical terms are defined in the glossary in 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. It also lists the percentage of procedures that involved intracytoplasmic sperm injection (ICSI), which was not performed by all clinics in 1998, 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 from clinic to clinic, and the definitions are imprecise. Thus, these statistics should be applied with caution.

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, GIFT, and ZIFT). Data from these procedures were combined because the percentages of GIFT and ZIFT cycles are generally small.

The success rates indicate the average chance of success for the given procedure at the clinic in 1998 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 1998. For example, if a clinic started a total of 50 cycles in 1998 and 15 live births resulted, the average success rate for cycles started at that clinic would be

$$15 \text{ (births)} \div 50 \text{ (cycles)} = .3 \text{ or } 30\%.$$

Thus, the success rate for 1998 is 30%, meaning that 30% of cycles started that year resulted in a live birth.

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 two fresh embryo cycles using donor eggs among women older than age 40. Of these two cycles, one—or 50%—was successful. However, because of the small number of cycles, 50% is not a reliable success rate, so the success rate is presented as 1/2, meaning one out of two.

4A. Cycles Using Fresh Embryos From Nondonor Eggs

This section includes IVF, 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, i.e., a multiple-infant birth is counted as one live birth.

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

(Number of live births divided by number of egg retrievals, 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.

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

(Number of live births divided by number of embryo transfers, 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 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 or more 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) and the possibility of multifetal reduction.

A gestation with two 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 living baby divided by the number of live births, expressed as a percentage of live births)

A delivery of one or more living 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. Live birth rates do not vary much by the recipient's age when donor eggs or embryos are used. (See Figure 24 on page 33.)

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 are reported separately for women younger than age 35, for women aged 35–37 years, for women aged 38–40 years, and for women older than age 40. This example illustrates the decline in ART success rates among older women: 22.4% of cycles started in women younger than age 35 resulted in live births, whereas only 1 out of 5 cycles started in women older than age 40 resulted in live births.

6. Reliability Range

The tables show a range, also called the 95% confidence interval, that tells us how reliable a clinic's demonstrated success rate is. This range is calculated only if 20 or more cycles are reported in an age category. 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 reliability ranges 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 37 to 39.

For a more detailed explanation and examples of confidence intervals, see page 411 in the Appendix.

7. Clinic Services and Profile

- **Current name.** This name reflects name changes that may have occurred since 1998, while the clinic name at the top of the table was the name of the ART clinic as it existed in 1998. Some clinics not only have changed their names but 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 1998. 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, and many women ask about them when considering whether to use donor eggs.

- **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 1998, 332 of the 360 clinics reporting data 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

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.

1998 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 pp. 37–39.)

1998 ART CYCLE PROFILE

| Type of ART ^a | | | | Patient Diagnosis | | | |
|--------------------------|-----|----------------------------|-----|-----------------------|-----|----------------|-----|
| IVF | 96% | Procedural factors: | | Tubal factor | 25% | Uterine factor | 2% |
| GIFT | 2% | | | Male factor | 24% | Other factors | 12% |
| ZIFT | 2% | With ICSI | 40% | Ovulatory dysfunction | 15% | Unexplained | 8% |
| Combination | <1% | Unstimulated | <1% | Endometriosis | 14% | | |

1998 PREGNANCY SUCCESS RATES

| Type of Cycle | Age of Woman | | | |
|--|--------------|--------|--------|------------------|
| | <35 | 35-37 | 38-40 | >40 ^c |
| Fresh Embryos From Nondonor Eggs | | | | |
| Number of cycles | 27,858 | 14,146 | 12,037 | 7,609 |
| Percentage of cycles resulting in pregnancies | 37.2 | 31.9 | 24.2 | 13.4 |
| Percentage of cycles resulting in live births ^b | 32.0 | 26.0 | 17.9 | 8.2 |
| Percentage of retrievals resulting in live births ^b | 35.2 | 30.2 | 21.9 | 10.7 |
| Percentage of transfers resulting in live births ^b | 37.3 | 32.0 | 23.5 | 11.8 |
| Percentage of cancellations | 9.3 | 13.8 | 18.1 | 23.3 |
| Average number of embryos transferred | 3.4 | 3.6 | 3.7 | 3.9 |
| Percentage of pregnancies with twins | 30.6 | 26.6 | 22.2 | 13.9 |
| Percentage of pregnancies with triplets or more | 12.5 | 10.3 | 6.8 | 4.1 |
| Percentage of live births having multiple infants ^b | 42.0 | 36.5 | 27.8 | 18.3 |
| Frozen Embryos From Nondonor Eggs | | | | |
| Number of transfers | 5,299 | 2,369 | 1,516 | 874 |
| Percentage of transfers resulting in live births ^b | 21.0 | 18.7 | 17.8 | 12.8 |
| Average number of embryos transferred | 3.2 | 3.3 | 3.3 | 3.3 |
| Donor Eggs | | | | |
| Number of fresh embryo transfers | 592 | 558 | 982 | 3,173 |
| Percentage of fresh transfers resulting in live births ^b | 42.2 | 44.3 | 40.0 | 40.6 |
| Average number of fresh embryos transferred | 3.3 | 3.3 | 3.4 | 3.4 |
| Number of frozen embryo transfers | 223 | 165 | 289 | 1,083 |
| Percentage of frozen transfers resulting in live births ^b | 27.4 | 21.2 | 23.9 | 22.5 |
| Average number of frozen embryos transferred | 3.3 | 3.2 | 3.4 | 3.3 |

CURRENT CLINIC SERVICES AND PROFILE (AS OF 1/15/2000)

Total number of reporting clinics: 360

Services Offered:

| | | | |
|---------------|-----|-----------------------|-----|
| Donor egg? | 83% | Gestational carriers? | 61% |
| Donor embryo? | 50% | Cryopreservation? | 90% |
| Single women? | 81% | | |

Clinic Profile:

| | |
|-----------------------------|-----|
| SART member? | 92% |
| Verified lab accreditation? | |
| Yes | 67% |
| No | 25% |
| Pending | 8% |

^a Reflects patient and treatment characteristics of ART cycles performed in 1998 using fresh, nondonor eggs or embryos.

^b A multiple-infant birth is counted as one live birth.

^c Among women >40, rates change with every year of age. Refer to Figure 10 for average chances of success by year of age.