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Number 6

Assisted conception Australia and New Zealand 1999 and 2000

**Tara Hurst
and
Paul Lancaster**

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We acknowledge the use of the book _____ by Professor Robert Jansen for some definitions of assisted conception procedures in Appendix 1.

Requests for data

Any enquiries about data for individual IVF units should be directed to the unit concerned. Other enquiries should be made to the AIHW National Perinatal Statistics Unit.

The report may be obtained from AusInfo Mail Order Sales:

Call toll-free on 132 447 or

visit <http://www.dofa.gov.au/ausinfo/infoaccess/order%5Fform.html>

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Collaborating IVF and GIFT units

New South Wales

North Shore Fertility, Sydney (Professor Douglas M. Saunders)

St George Fertility Centre, Sydney (Dr David C. Macourt)

Lingard Fertility Centre, Newcastle (Dr Robert Woolcott)

Westmead Fertility Centre, Sydney (Associate Professor Peter Illingworth)

City West IVF, Sydney (Dr Geoffrey L. Driscoll)

Royal Prince Alfred Hospital, Sydney (Dr Mark Bowman)

Sydney IVF, Sydney (Professor Robert P.S. Jansen)

IVF NSW, Sydney (Dr Trevor Johnson)

Albury Reproductive Medicine Centre, Albury (Dr Scott Giltrap)

IVF South, Sydney (Professor Michael Chapman)

Fertility First, Sydney (Dr Anne Clark)

IVF East, Sydney (Dr Stephen Steigrad)

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Queensland Fertility Group, Brisbane (Dr David Molloy)

Monash IVF Gold Coast Fertility Centre, Southport (Dr Irving T. Korman)

The Wesley IVF Services, Brisbane (Dr John Allan)

Queensland Fertility Group North Queensland, Townsville (Dr Glenn Schaefer)

Toowoomba IVF, Toowoomba (Dr John Esler)

IVF Queensland Sunshine Coast, Nambour (Dr James Moir)

Monash IVF Queensland, Sunnybank (Dr Kevin Forbes)

Coastal IVF Fertility Services, Maroochydore (Dr Paul Stokes)

Central Queensland Fertility, Rockhampton (Dr Simon Walton)

Victoria

Royal Women's Hospital and Melbourne IVF, Melbourne (Dr John McBain)

Monash IVF, Melbourne (Professor Gab Kovacs)

Melbourne Assisted Conception Centre, Mercy Hospital for Women, Melbourne (Dr Mac Talbot)

Mildura Reproductive Medicine Centre, Mildura (Dr John Bowditch)

Western Australia

PIVET Medical Centre, Perth (Dr John L. Yovich)

Concept Fertility Centre, Perth (Dr Graeme Thompson)

Joondalup IVF, Perth (Dr Anne Jequier)

Hollywood IVF, Perth (Dr Simon Turner)

South Australia

Reproductive Medicine Unit, Adelaide (Professor Rob Norman)

Flinders Reproductive Medicine, Adelaide (Associate Professor Stephen J. Judd)

Tasmania

Highlights

- Viable pregnancies are those reaching at least 20 weeks' gestation. The viable pregnancy rates in 2000 were higher than in any previous year for all IVF and ICSI transfers. When all techniques of assisted conception are included together, the viable pregnancy rate increased gradually from 13.0 per 100 embryo transfer cycles in 1992 to 15.9 in 1999, rising to 17.9 in 2000.
- The number of births after assisted conception in 1999 increased by 11.5% in Australia, and 36.2% in New Zealand, since 1998. There were 4,319 births after assisted conception in Australia in 1999, accounting for 1.7% of all births. In New Zealand, there were 421 births after assisted conception in 1999, accounting for 0.7% of all births.
- Between 1992 and 2000, the total number of cycles with oocyte retrieval or embryo transfer for all techniques of assisted conception increased by 66% from 16,288 cycles in 1992 to 27,067 in 2000. This increase has slowed in recent years, increasing by 1.8% from 26,592 cycles in 1999. There was a relatively greater increase in transfer cycles using frozen embryos than for fresh embryos.
- There has been a marked increase in treatment cycles in which intracytoplasmic sperm injection (ICSI) was used. Oocyte retrieval cycles for ICSI have increased each year from 812 in 1992 to 8,895 in 2000. For the first time, ICSI accounted for more than half (51.4%) of all transfer cycles for all types of assisted conception in 2000.
- The use of gamete intrafallopian transfer (GIFT) for treating infertility has continued to decline. In 2000, there were 1 embryo

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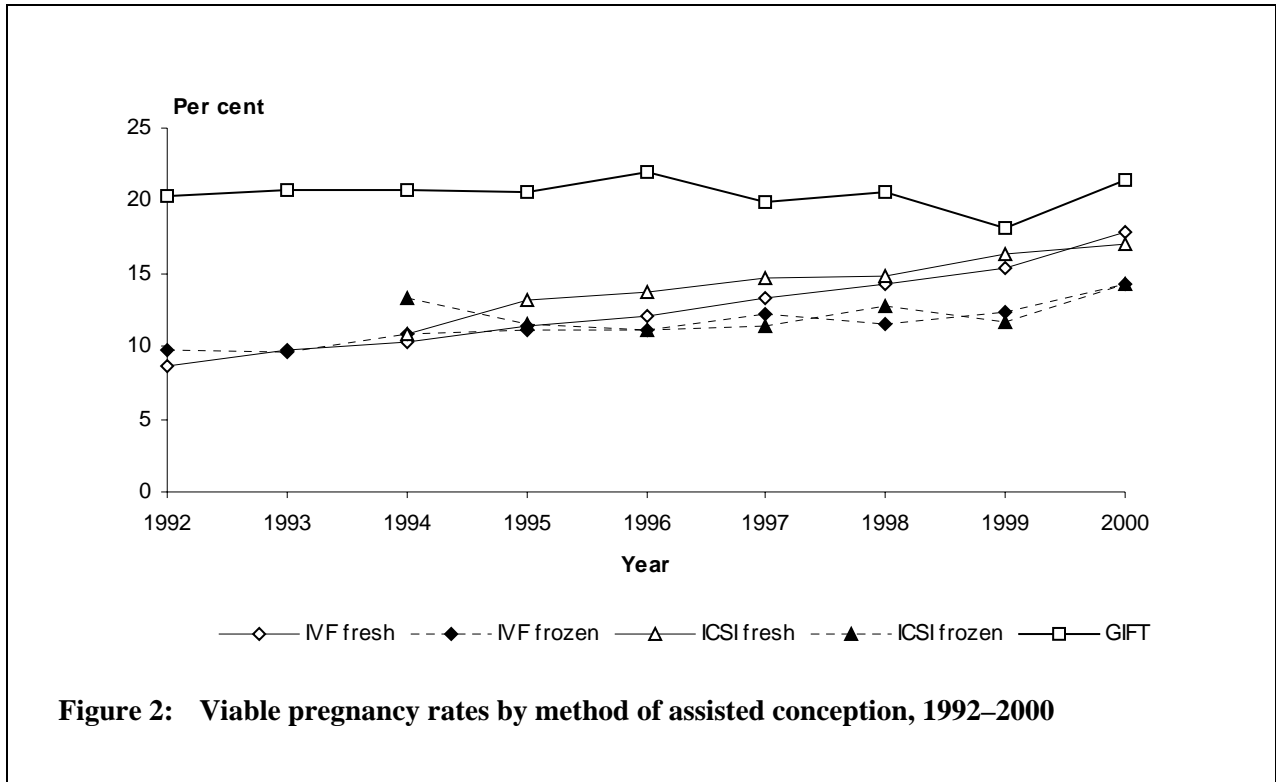
1 Introduction

2 Trends and regional variations in assisted conception

Between 1992 and 2000, the total number of treatment cycles (oocyte retrievals and embryo transfers) for all types of assisted conception increased each year. In 1992, there were 16,288 cycles, increasing to 21,739 in 1996, and 27,067 in 2000.

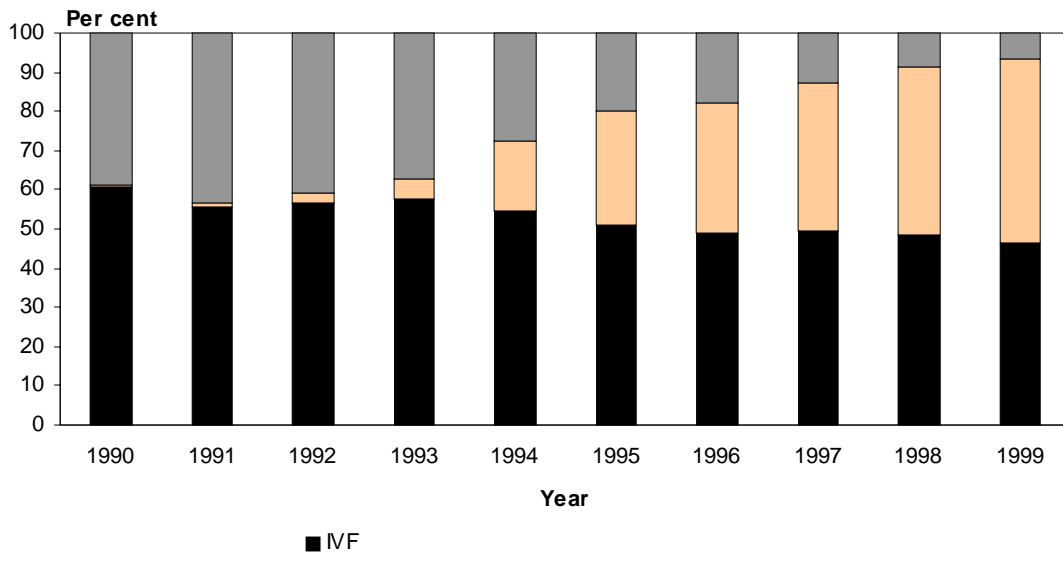
2.1 Trends in assisted conception, 1992–2000

The number of IVF units in Australia and New Zealand increased from 28 in 1992 to 41 in 2000. The total number of cycles with oocyte retrieval or embryo transfer increased by two-thirds (66%), from 16,288 in 1992 to 27,067 in 2000, with increases of 143% for transfers of frozen embryos and 40% for fresh transfers (Figure 1.1). Trends in assisted conception, 1992–2000. p/PTD-0.05(in)TJ20.3



The number of treatment cycles commenced for IVF and transfer of fresh embryos changed little, from 8,474 in 1992 to 8,626 in 2000 (Table 1). The number of cycles with oocyte retrieval and fresh embryo transfer declined slightly, from 7,501 and 6,190, respectively, in 1992 to 7,270 and 6,176 in 2000. The viable pregnancy rate doubled during this period, increasing each year from 8.6 per 100 oocyte retrieval cycles in 1992 to 17.9 in 2000. IVF embryo transfer cycles after freezing increased during this period, from 3,813 in 1992 to 4,951 in 1998, then declined to 4,478 in 2000 (Table 2). The viable pregnancy rate for frozen embryos also increased from a low of 9.6 per 100 embryo transfer cycles in 1993 to 14.2 in 2000.

Following the trend of recent years, the use of ICSI to treat mainly male infertility continued to increase in 2000. This pattern has been reflected in the resulting clinical pregnancies, which for the first time were greater than the number of IVF clinical pregnancies in 1999 (Figure 3). There were 337 oocyte retrieval cycles for microinsemination in 1990, the number then rising each year to 8,895 cycles in 2000. ICSI with transfer of fresh or



By using blastocyst culture, embryos are at a more advanced stage of development when embryo transfer occurs. Most commonly it is used for women with a significant number of fertilised oocytes (i.e. greater than 5). Information on these transfers was first collected in 1998. The viable pregnancy rates after blastocyst culture were generally higher than for conventional IVF and ICSI, increasing annually from 17.5 per embryo transfer cycles in 1998 to 30.4 in 2000 (Table 10).

Special techniques of sperm collection were reported among all IVF units using ICSI, and included techniques such as TESE, MESA, PESA and electro-ejaculation. ICSI pregnancies that used sperm collected by one of these methods accounted for 14% of all transfers of fresh embryos and 12% of all transfers after embryo freezing. The viable pregnancy rates for fresh transfers (17.4 per 100 oocyte retrieval cycles) and after embryo freezing (13.9 per 100 embryo transfers) were similar to those for ICSI (Table 11).

Embryo freezing avoids the necessity for repeated ovarian stimulation in every treatment cycle. As more couples have their infertility treated by assisted conception, more embryos are frozen each year. Since 1994, the number of embryos that were frozen, and the number of embryos thawed, has increased annually, doubling from 19,563 frozen and 14,375 thawed in 1994 to 41,413 frozen and 29,371 thawed in 2000 (Table 12). The number of embryos that are frozen each year exceeds the number thawed, thus increasing the total number of embryos in storage. The number of embryos in storage has more than trebled during this same period, from 22,280 in 1994 to 71,176 in 2000. Policies on how long frozen embryos are kept in storage vary among the IVF units and is dependent upon State legislation.

Cycles of treatment resulting from artificial insemination at an IVF unit were reported for the first time in 1998 for husband's sperm and donor sperm. In 1999, the number of pregnancies for each technique was also reported. There were around 12,500 cycles of artificial insemination in each year. Insemination with husband's sperm accounted for 60% of all artificial inseminations (Table 13). The viable pregnancy rates for insemination of husband's sperm and donor sperm in 2000 were similar to those in 1999, 9.6 and 8.7 per 100 insemination cycles, respectively. It should be noted that the information about artificial insemination in this report was obtained only from clinics and practitioners also treating infertility by assisted conception. The full extent of the use of artificial insemination in Australia and New Zealand cannot be estimated from these data.

2.2 Regional variations in the use of assisted conception

The use of assisted conception to treat infertility can be compared in different populations by relating the number of treatment cycles during a year to the number of women in the reproductive age group. The total number of treatment cycles can be estimated by adding those that reach the stage of oocyte retrieval for IVF, ICSI and GIFT to the number of transfer cycles for frozen IVF and ICSI embryos and donor oocytes/donor embryos. As most women treated by assisted conception are aged between 25 and 44 years, the ratio of the number of treatment cycles is expressed per 100,000 women aged 25–44 years. In the figures for 2000, South Australia and the Northern Territory are reported together because the only IVF clinic in Darwin is a satellite clinic of The

Queen Elizabeth Hospital in Adelaide. The figures for Tasmania and the Australian Capital Territory are also combined for confidentiality purposes as there are only three IVF units between the two regions.

There were considerable variations in treatment ratios among the Australian States, and marked differences between Australia and New Zealand (Table 14, Figure 4). In 2000, the treatment ratio in Australia was 867 cycles per 100,000 women, increasing from 850 cycles per 100,000 women in 1999. This ratio was nearly three times higher than in New Zealand which had a ratio of 300 per 100,000 women in 2000, decreasing from 310 in 1999. In Australia, the highest treatment ratios were in Victoria and New South Wales and the lowest ratios were in Queensland and Western Australia. As these ratios are based on the States in which the IVF units are located, comparisons between States may be slightly affected by interstate movements of infertile women for treatment.

In 2000, IVF was used relatively more in Western Australia and relatively less in Queensland than in the other States. The highest relative use of ICSI was in Victoria and the lowest was in Western Australia and Queensland. GIFT was more likely to be used in Queensland than in the other States.

In 2000, the use of ICSI increased to account for just over half of all treatment cycles in Australia (50.8%), with a relatively smaller proportion of IVF, GIFT and donor oocytes/embryos treatment cycles, 42.3%, 3.4% and 3.4%, respectively. In New Zealand in 2000, where the treatment ratios were much lower than in Australia, IVF accounted for nearly half of all treatment cycles (49.0%), with the proportion of ICSI and GIFT cycles much lower than Australia (40.9% and 0.1%, respectively), and the proportion of donor oocytes/embryos cycles much higher than Australia (10.1%).

3 Variations in pregnancy rates among IVF units

In this report, the pregnancy rates for each technique of assisted conception are given for all IVF units and also for IVF units grouped into four quarters to demonstrate the range of success rates across Australia and New Zealand. Depending on the total number of IVF units using a particular technique, the number of units in each of the four groups may vary. The four quarters are ranked in descending order from Q1, which includes IVF units with the highest pregnancy rates, to Q4, which has the lowest rates. Data are given for the total number of treatment cycles, pregnancies and pregnancy rates for all units in each of the four groups, as well as the range of pregnancy rates within each group. This method of reporting pregnancy rates follows the style of the previous assisted conception report.

For transfers to the uterus or fallopian tubes of fresh embryos, and for transfers of oocytes to the fallopian tubes, clinical and viable pregnancies are reported as rates per 100 oocyte retrievals (egg collections), or per 100 embryo transfers. Results are expressed in this manner for IVF (excluding ICSI), ICSI and GIFT. For transfers of frozen embryos, clinical and viable pregnancies are reported as rates per 100 embryo transfer cycles. In general, any comparisons of pregnancy rates are based on viable pregnancies, which result in births, rather than on clinical pregnancies, which also include early pregnancy losses of less than 20 weeks' gestation.

3.1 Viable pregnancy rates

The interpretation of pregnancy rates for the various techniques of assisted conception, and comparison of results between IVF units, are influenced not only by factors such as the age of treated women and number of embryos or oocytes transferred but also by the relative use of a constantly changing array of techniques.

Combining the results for IVF, ICSI and GIFT (but excluding cycles in which frozen embryos or donor oocytes/embryos were transferred), the overall viable pregnancy rates were 17.6 per 100 oocyte retrieval cycles in 2000 (Table 15). When all techniques of assisted conception are included, the viable pregnancy rates for all cycles in which embryos or oocytes were transferred were 17.9 per 100 transfer cycles in 2000.

The viable pregnancy rates were higher in 2000 than in any previous year for all IVF and ICSI transfers.

(Table 19). For example, the viable pregnancy rate for the highest group was 26.5 per 100 oocyte retrieval cycles and, for the lowest group, it was 10.0, with intermediate rates of 19.9 and 15.4, respectively, for the second and third ranked groups.

In 2000, 40 of the 41 IVF units in Australia and New Zealand used ICSI to treat infertility. There were 10,147 attempted oocyte retrieval cycles (including transfer of fresh donor oocytes/embryos), and the viable pregnancy rate was 17.1 per 100 oocyte retrieval cycles (Table 19). Again, the pregnancy rates in the highest group were two and a half times higher than the lowest ranked group of IVF units.

As already indicated, the use of GIFT to treat infertility has declined considerably in recent years. There were 931 treatment cycles (including transfer of fresh donor oocytes) commenced for GIFT in 2000 (Table 19). The viable pregnancy rates for GIFT have been consistently higher than for IVF and ICSI, partly due to differences in the underlying causes of infertility. The viable pregnancy rate for GIFT was 21.5 per 100 oocyte retrieval cycles in 2000. There were again marked variations between the GIFT pregnancy rates for IVF units in the highest and lowest ranked groups. Some IVF units perform only occasional GIFT cycles, resulting in no pregnancies in a specified year and accounting for the zero value in the lowest groups of IVF units.

The pregnancy rates after transfer of frozen embryos are usually lower than after transfer of fresh embryos, partly attributable to fewer frozen embryos being transferred. In 2000, there were 4,868 embryo transfer cycles for IVF and 4,781 cycles for ICSI. For thawed IVF embryo transfers, the viable pregnancy rate was 14.6 per 100 embryo transfers and for thawed ICSI embryo transfers, the rate was 14.2 (Table 20). There were three- to fourfold differences in viable pregnancy rates between IVF units in the highest and lowest ranked groups.

For all techniques of assisted conception in 2000, there were marked variations in the range of viable pregnancy rates for individual IVF units in each of the four ranked groups of IVF units (Table 21).

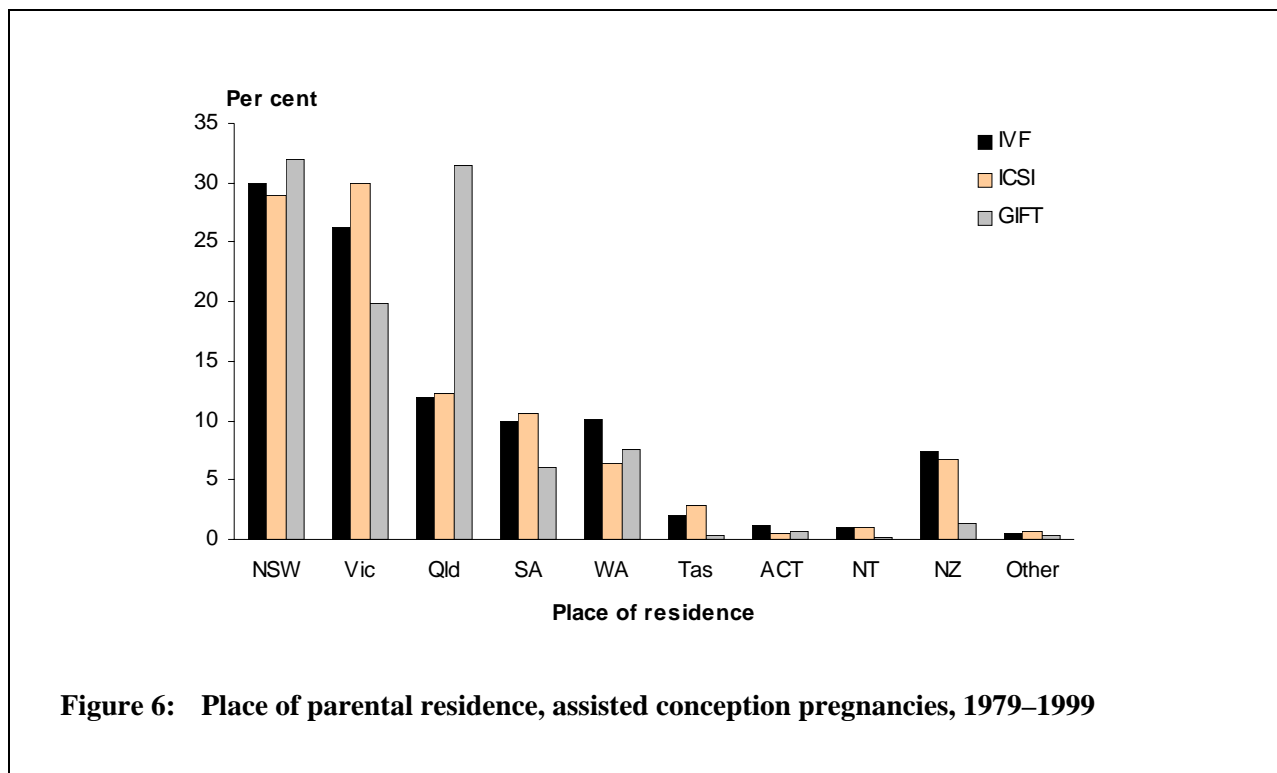
4 Assisted conception pregnancies

This section contains data on all pregnancies resulting from assisted conception, including IVF, ICSI and GIFT. It includes pregnancies occurring after transfer of fresh embryos to the uterus or fallopian tubes, transfer of frozen embryos, an

4.1 Maternal and paternal characteristics

4.1.1 Place of residence

The number of assisted conception pregnancies has continued to increase in most Australian States and Territories and in New Zealand during the 1990s. There were relatively fewer pregnancies in Tasmania and the Australian Capital Territory in 1999 than in 1998. The regional occurrence of assisted conception pregnancies generally reflects population size and the extent to which clinical services are used. GIFT has been relatively more likely to be used in Queensland (52.5% of GIFT pregnancies) than elsewhere over the past two decades (Table 23, Figure 6).



4.1.2 Parental age

The majority (79.4%) of women who conceived by assisted conception in 1998 were in their 30s or 40s; this proportion increased slightly to 80.3% in 1999 (Table 24). The proportion of women aged 40 years and over was 8.8% in 1999, much higher than the proportion for all mothers giving birth in Australia and New Zealand in 1999 (2.4% and 2.9%, respectively). There were relatively more women conceiving by ICSI in their 20s (21.8%) than there were for IVF or GIFT conceptions (17.0% and 18.9%, respectively). Women seeking assisted conception ranged in age from 19 to 53 years of age, with a median age of 33 years. There were eight women aged 50 and over. Use of oocyte donation increases with maternal age, most noticeably after the age of forty (Figure 7). Among all pregnancies after assisted conception, only 7% of pregnancies to women aged 47 or more were after the use of their own oocytes.

been infertile for shorter periods (77.0%), were more likely to have a spontaneous abortion (22.3%

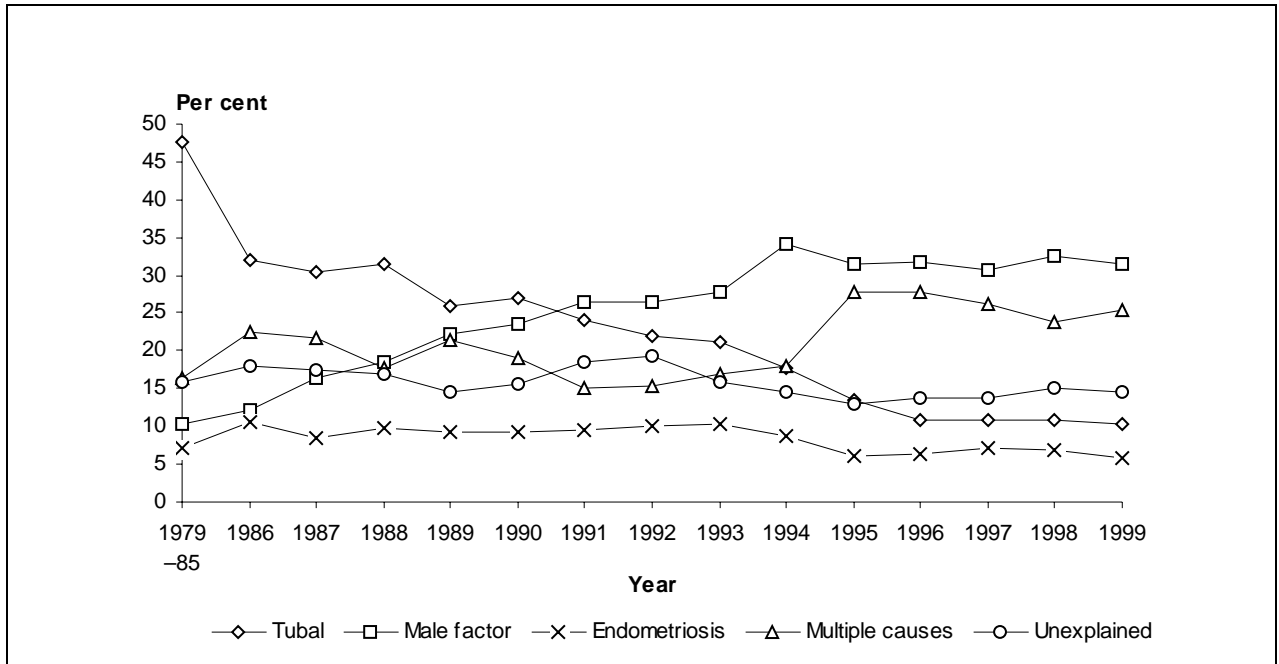


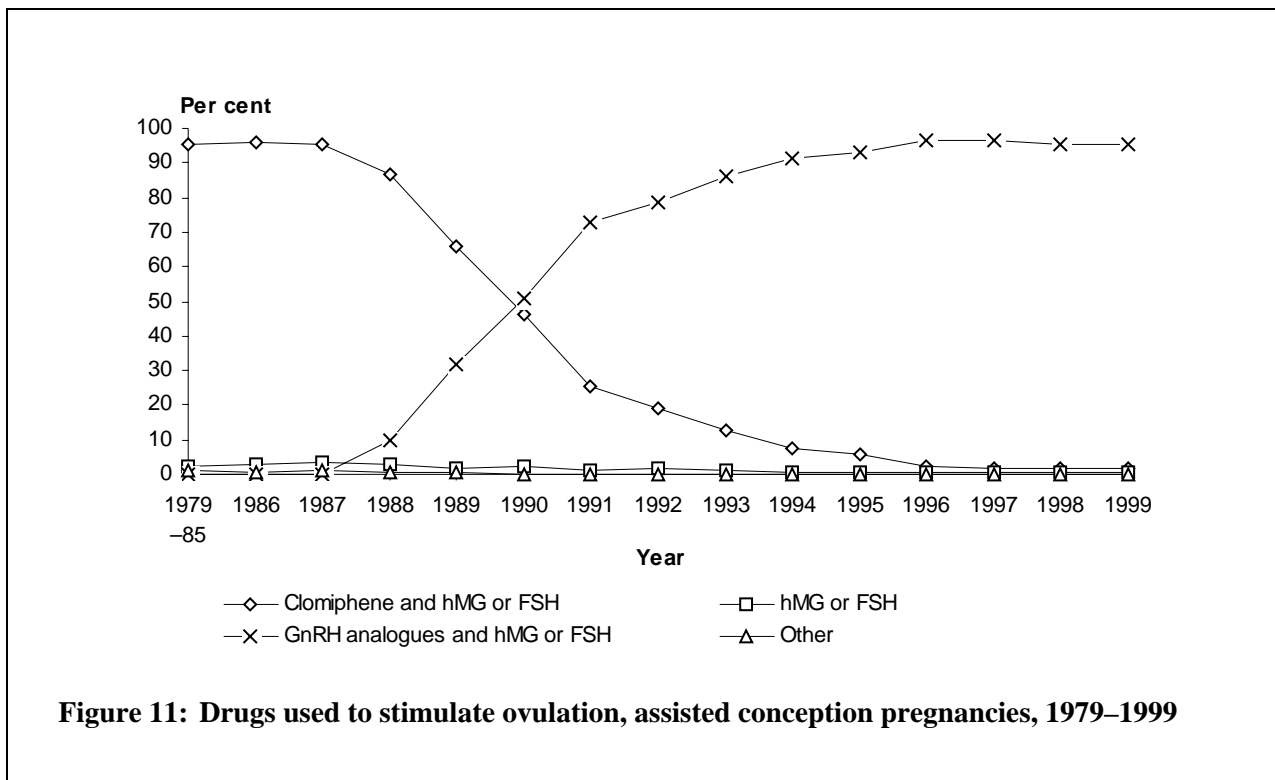
Figure 9:

The proportion of pregnancies resulting in live births was highest for endometriosis (81.3%) and lowest for tubal causes of infertility (72.3%) (Table 29). Spontaneous abortion varied little for the different causes of infertility and was more strongly associated with the woman's age. Ectopic pregnancy was more likely among women treated for tubal causes of infertility (5.0%) than for other causes. Stillbirth was more frequent among women treated for endometriosis (1.4%) than for other causes, but the number of stillbirths in each group was relatively small.

4.2 Management of IVF pregnancies

4.2.1 Ovarian stimulation

Continuing the trend of recent years, gonadotrophin-releasing hormone analogues (GnRHa) combined with gonadotrophins were the main drugs used for stimulating ovulation. In 1999, these drugs were used in over 95% of treatment cycles that resulted in pregnancies (Table 30, Figure 11). The use of clomiphene to stimulate ovulation has declined from over 90% of treatment cycles in the mid-1980s to less than 2% of treatment cycles in 1999. There has been an increase in the number of natural cycles during this period (0.4% in 1979–1997 and 2.1% in 1998–1999).



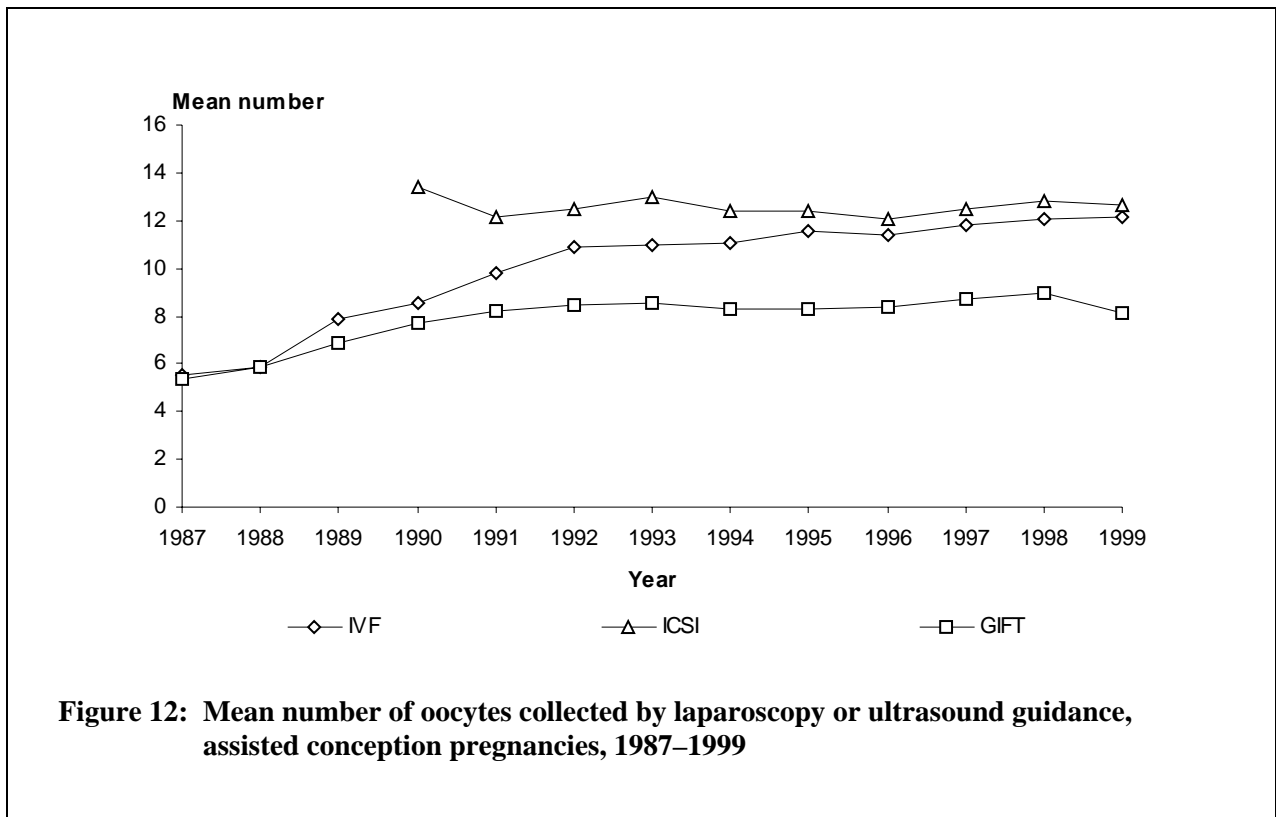
4.2.2 Treatment cycle in which pregnancy occurred

Over half (59.1%) of all IVF pregnancies occurred in the first treatment cycle, and more than two-thirds (79.9%) occurred in the first or second treatment cycle (Table 31). Similarly, 50.6% of all GIFT

pregnancies occurred in the first treatment cycle, and more than two-thirds (79.6%) occurred in the first or second treatment cycle. Just over two-thirds (69.5%) of ICSI pregnancies occurred in the first or second treatment cycle.

4.2.3 Number of oocytes collected

The average number of oocytes collected by laparoscopy or ultrasound guidance has shown a continuing upward trend, more oocytes being collected for IVF or ICSI than for GIFT (Table 32, Figure 12). The mean number of oocytes collected in 1999 was 12.7 for ICSI, 12.1 for IVF, and 8.1 for GIFT. There was a further increase in the proportion of oocyte retrievals in which 15 or more oocytes were collected compared to previous years, occurring in almost one-third (30.1%) of all retrievals.



4.2.4 Ovarian hyperstimulation syndrome (OHSS)

In 1999, 2.4% of women pregnant after assisted conception required hospitalisation for OHSS as a complication of ovarian stimulation (Table 33). The proportion of women hospitalised for OHSS increased with the number of oocytes collected, from 0.2% for those with 1–4 oocytes, 1.0% for 7–8 oocytes, and increasing to 3.9% for 13 or more oocytes.

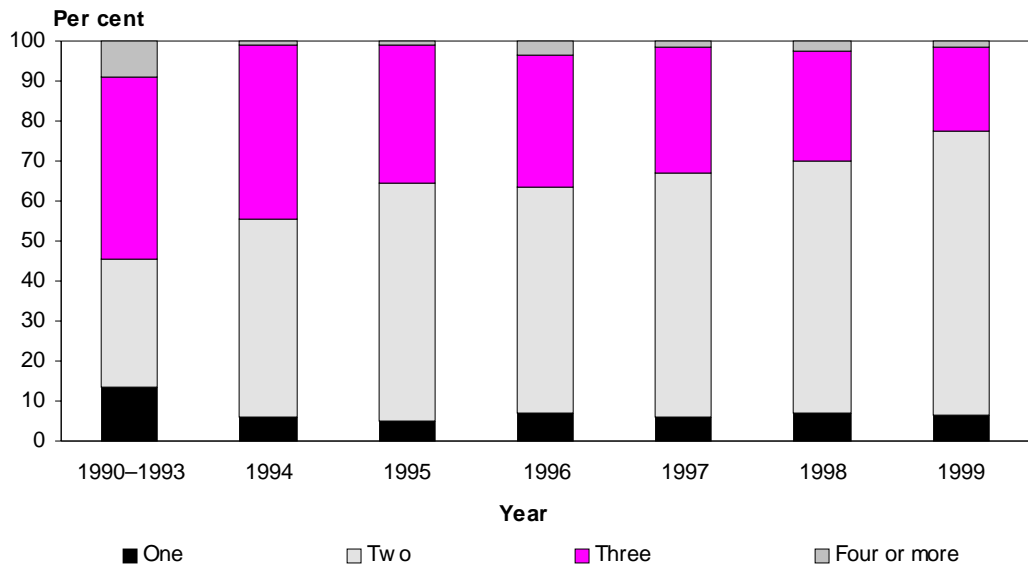
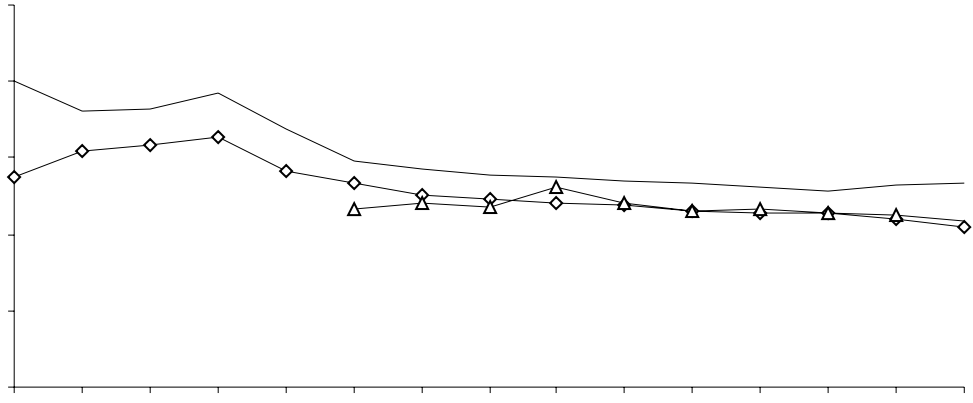


Figure 14: Percentage distribution of number of embryos transferred, ICSI pregnancies, 1990-1999



IVF

5 Outcomes of assisted conception pregnancies

5.1 Characteristics of assisted conception pregnancies

5.1.1 Maternal deaths

No maternal deaths were reported among women who conceived by assisted conception in 1999. Six maternal deaths have previously been reported among a total of 40,585 assisted conception pregnancies.

5.1.2 Maternal age and outcome of pregnancy

The likelihood of achieving a live birth after conceiving with reproductive techniques decreases with advancing maternal age. Over 80% of women aged less than 35 years gave birth to liveborn infants compared with 74.1% of women aged 35 to 39 years and 60.1% of women aged 40 years and over (Table 38). Spontaneous abortion and termination of pregnancy were more likely among

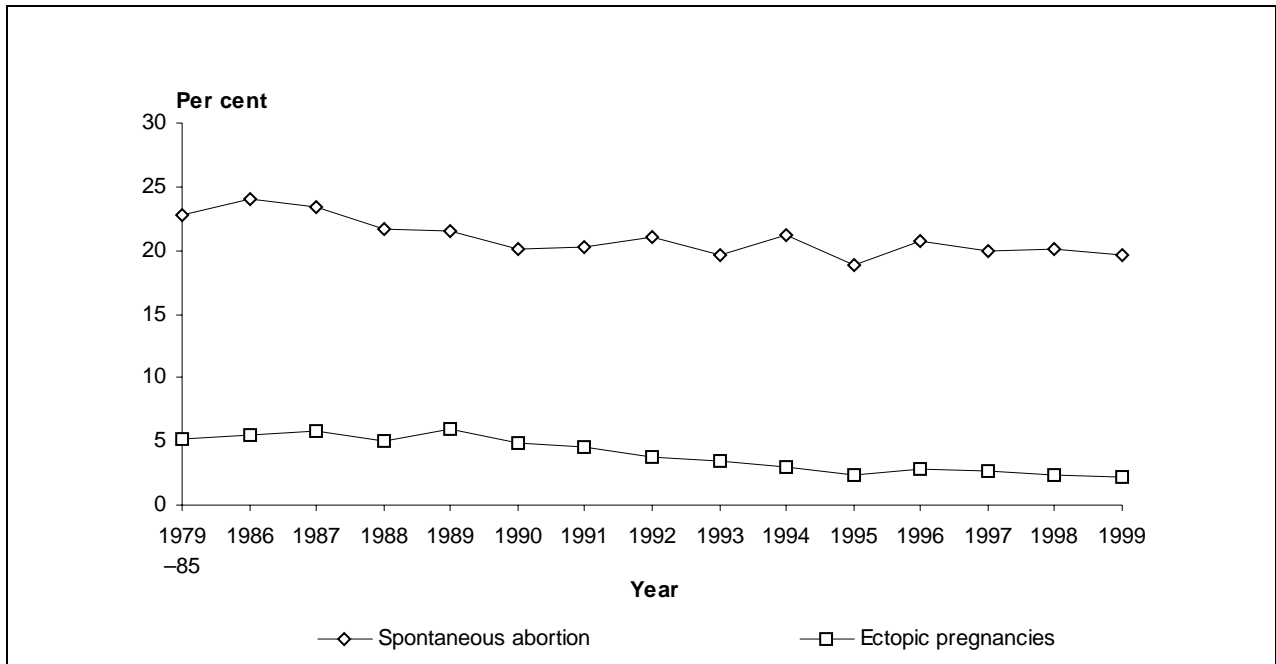


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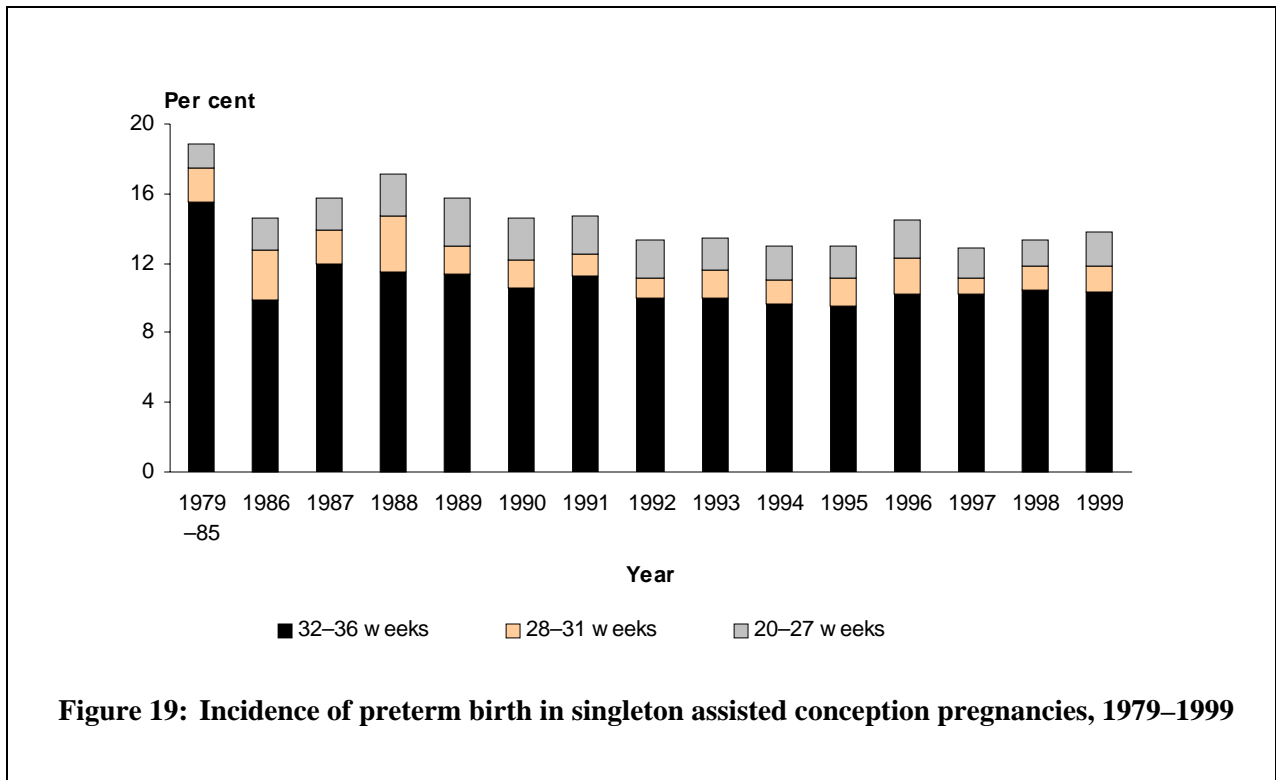
5.1.5 Heterotopic pregnancies

Heterotopic pregnancies are those in which there is both a uterine and tubal (ectopic) pregnancy simultaneously. The uterine pregnancy may abort or continue on to a birth. Heterotopic pregnancies are uncommon. Since assisted conception began in Australia and New Zealand, 185 cases of heterotopic pregnancies (116 leading to abortion and 69 continuing to a birth) have been

5.1.8 Viable pregnancies of at least 20 weeks' gestation

Reflecting the overall increase in assisted conception pregnancies in 1999, there was also a considerable increase in births conceived in that year. In Australia, there were 4,319 births after assisted conception in 1999, accounting for 1.7% of all births in the population, compared with 3,873 infants conceived in 1998, 3,514 in 1997, 3,162 in 1996, 2,947 in 1995, and 2,719 in 1994. In New Zealand, there were 421 births after assisted conception in 1999, 36% more than in 1998 and accounting for 0.7% of all births.

Preterm births of less than 37 weeks' gestation occurred in 24.8% of all IVF pregnancies, 24.4% of all ICSI pregnancies, and 30.3% of all GIFT pregnancies in 1999 (Table 43). The incidence of preterm births was higher with increasing plurality, ranging from 13.8% for singleton assisted conception pregnancies to 62.6% for twin pregnancies and 100% for triplet pregnancies. Preterm births among singleton assisted conception pregnancies declined to their lowest level of 12.9% in 1997, increasing slightly to 13.8% in 1999 (Figure 19), but this proportion was more than double that for all Australian singleton pregnancies (6.2% in 1999). Extremely preterm births of less than 28 weeks' gestation occurring among singleton assisted conception pregnancies declined to their lowest level of 1.5% in 1998, increasing to 1.9% in 1999, compared with 0.6% for all Australian singleton pregnancies.

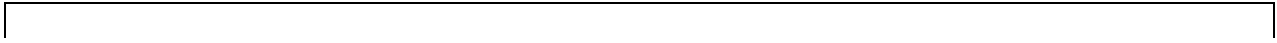


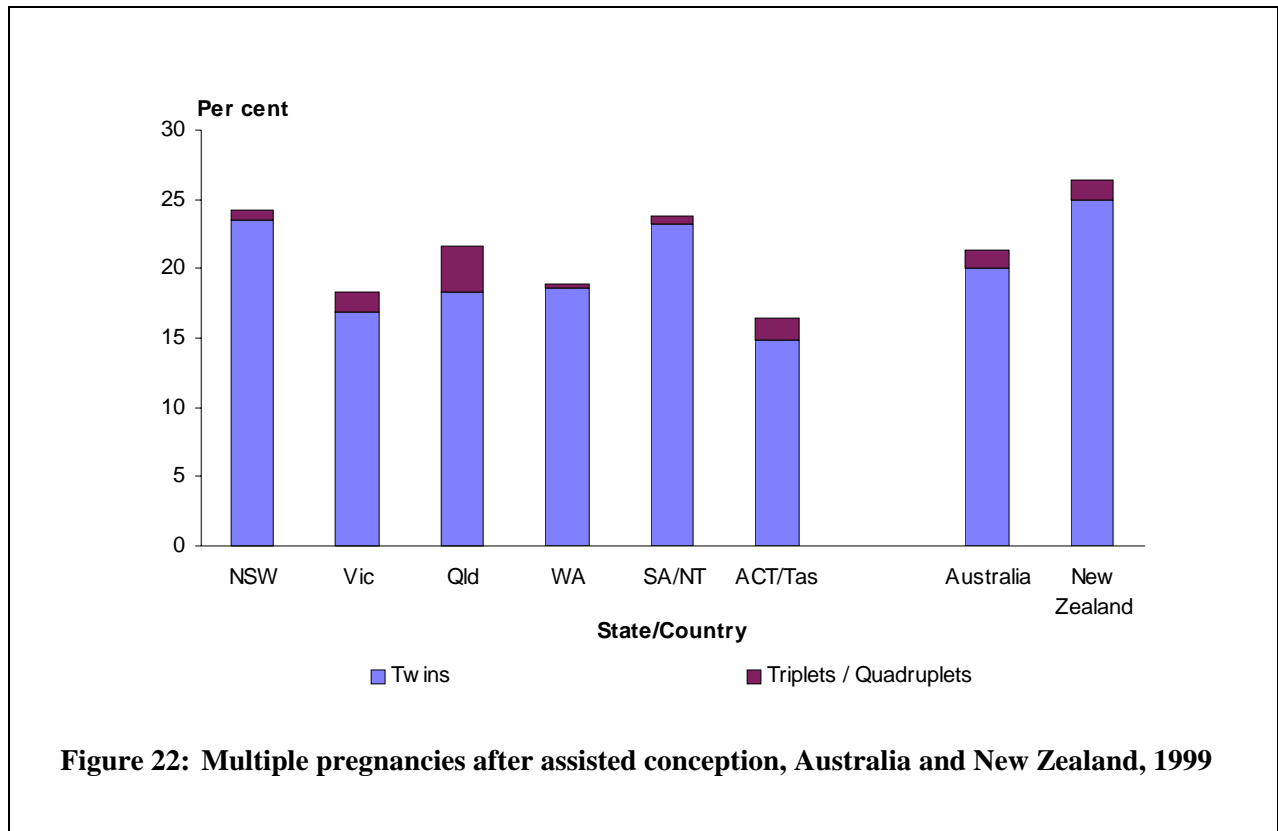
As in previous years, there was a high proportion of preterm births among singleton assisted conception pregnancies in all maternal age groups (Table 44) and for all causes of infertility (Table 45). The proportion was lowest for mothers aged 30–39 (13.4%) and highest for mothers aged less than 25 years (15.8%) and for those aged 40 and over (16.9%). Preterm birth was less likely if infertility was due to endometriosis (12.1%), male factor infertility (12.4%) or unexplained

infertility (12.6%); the highest incidence was among women whose infertility was due to multiple causes or tubal causes (15.7% and 15.1%, respectively). Multiple causes of infertility also include women with tubal causes of infertility.

5.1.9 Multiple pregnancies

Multiple pregnancy occurred in 21.2% of IVF pregnancies, 21.8% of ICSI pregnancies and 26.8% of GIFT pregnancies in 1999 (Table 46). Multiple pregnancies after all types of assisted conception (21.8%) were much more likely than for all Australian births (1.6% in 1999). The incidence of twin pregnancy after IVF declined from 20.2% in 1988 to 14.4% in 1991 but has since risen again to 20.0% in 1999 (Figure 20). The incidence of twin pregnancy after ICSI has varied between 13.2% in 1994 and 20.9% in 1998. After GIFT, the incidence of twin pregnancy has generally been higher than for IVF or ICSI, having declined from 23.5% in 1992 to 18.7% in 1997 but then rising again to 23.7% in 1998. Triplet pregnancies declined to thei





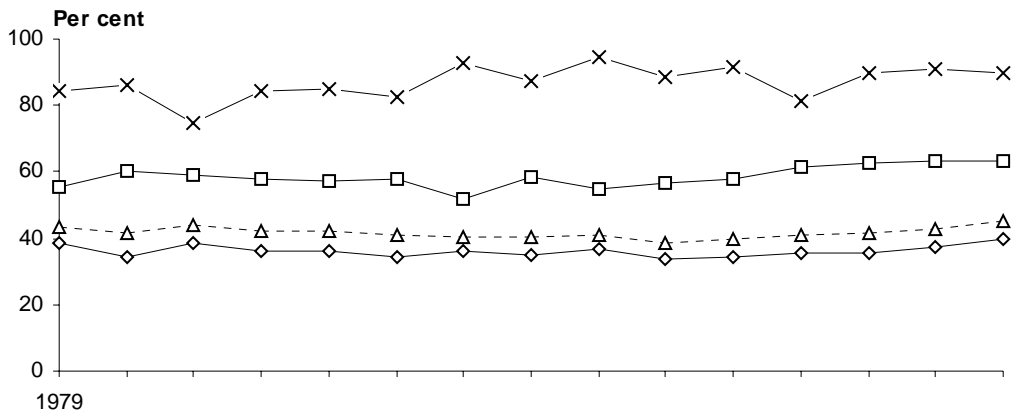
5.1.10 Method of delivery

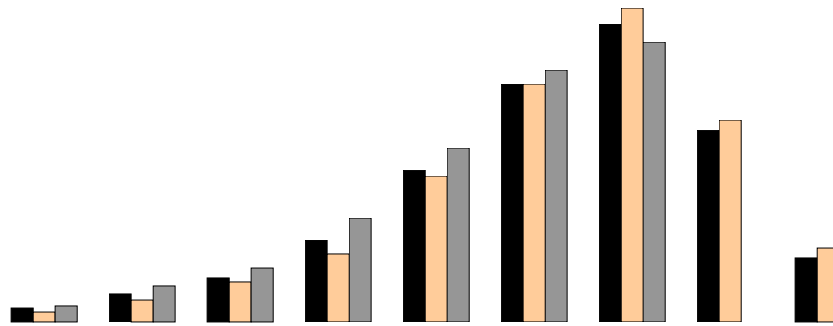
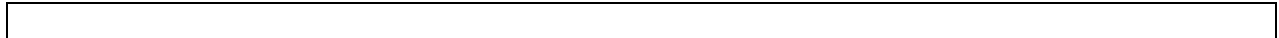
As in previous years, caesarean rates were higher for multiple than for singleton assisted conception pregnancies (Figure 23). In 1999, the caesarean rate was 39.7% for singleton pregnancies, 63.2% for twin pregnancies and 89.6% for triplet pregnancies (Table 50). The caesarean rate for singleton ICSI pregnancies, 37.4%, was lower than that for IVF and GIFT pregnancies, 42.0% and 40.2%, respectively, all of which were considerably higher than the rate of 21.5% for singleton Australian births in 1999. The caesarean rate for singleton assisted conception pregnancies increased with maternal age, from 33.0% for mothers under 30 years of age to 54.9% for mothers aged 40 years and over.

5.2 Characteristics of infants born after assisted conception

5.2.1 Sex of infants

The sex ratio of infants born after assisted conception was 106.8 in 1999, similar to Australia in 1999 (105.6) and previous years (Table 51). The sex ratio of infants born after IVF was 109.0, after ICSI, 105.4, and after GIFT, 102.0. The sex ratio of infants born in all years after use of donor sperm and assisted conception was 111.7 among 3,352 births; after use of donor oocytes, it was 112.5 among 935 births; and after use of frozen embryos, it was 106.1 among 7,869 births.

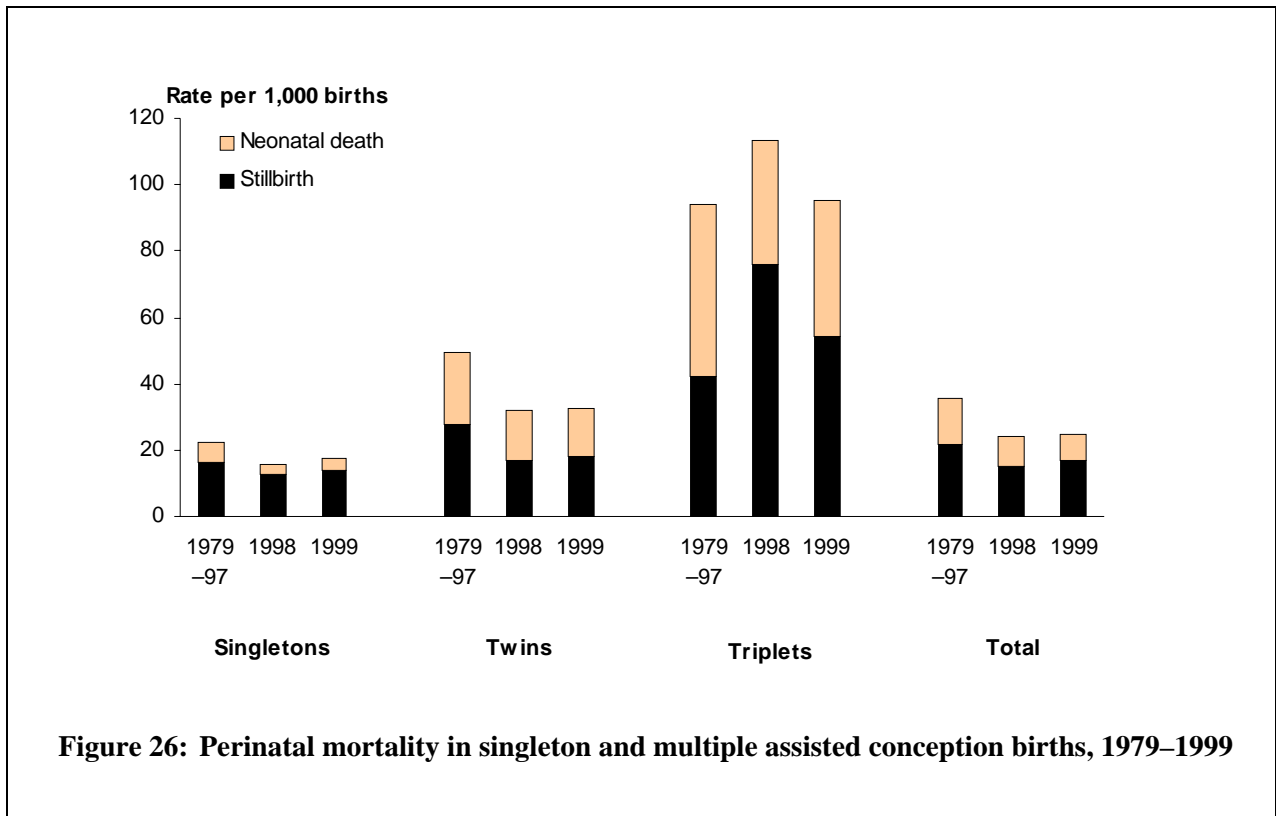




5.2.3 Perinatal mortality

Perinatal deaths include fetal deaths (stillbirths) of at least 20 weeks' gestation and neonatal deaths of liveborn infants occurring within 28 days of birth. The perinatal death rate for all assisted conception births in 1999 was 24.7 per 1,000 births (Table 54), similar to 1998 but lower than in earlier years (Figure 26). For singleton births, the perinatal death rate was 17.3 per 1,000 births, for twins, 32.3 per 1,000 births, for triplets, 95.2 per 1,000 births. There were no quadruplet perinatal deaths. Among 2,186 births after IVF in 1999, the perinatal death rate was 28.8 per 1,000 births; for singleton births, it was 19.2 per 1,000 births, for twins, 36.4 per 1,000 births, and 166.7 per 1,000 triplet births. Among 2,249 births after ICSI in 1999, the perinatal death rate was 22.2 per 1,000 births; for singleton births, it was 16.8 per 1,000 births, for twins, 28.7 per 1,000 births, and for triplets, 78.4 per 1,000 births. Among 305 births after GIFT in 1999, the perinatal death rate was 13.1 per 1,000 births; for singleton births, it was 5.9 per 1,000 births, for twins, 30.0 per 1,000 births, and there were no triplet perinatal deaths.

The perinatal death rate after assisted conception is considerably higher than for all Australian births. In 1999, the perinatal death rate among all births of at least 20 weeks' gestation or 400g birthweight in Australia was 10.1 per 1,000 births. Factors contributing to the higher perinatal death rate after assisted conception include relatively more older mothers, their underlying causes of infertility, and the much higher incidence of multiple births than in the general population.



5.2.4 Congenital malformations

Among 4,740 live births and stillbirths and 23 pregnancies terminated for fetal abnormality after assisted conception in 1999, there were 95 (2.0%) infants and fetuses with major congenital malformations (Table 55). The malformation rate was higher in singleton births (1.9%) than in multiple births (0.9%).

Among pregnancies conceived in 1999 after IVF, th

6 Tables

Table 1: IVF pregnancies after transfer of fresh embryos, numbers and pregnancy rates, 1992–2000

Stage of treatment	Year of treatment								
	1992	1993	1994	1995	1996	1997	1998	1999	2000
Treatment cycles commenced	8,474	8,297	8,638	8,573	8,297	8,275	8,744	8,591	8,626
Cycles with oocyte retrieval	7,501	7,144	7,298	6,833	6,825	6,839	7,177	7,174	7,270
Cycles with embryo transfer	6,190	5,836	5,889	5,547	5,659	5,593	5,822	6,066	6,176
Clinical pregnancies	925	969	1,025	990	1,087	1,171	1,294	1,436	1,561
Viable pregnancies	644	693	753	783	823	911	1,021	1,105	1,301
Clinical pregnancies per 100 oocyte retrieval cycles	12.3	13.6	14.0	14.5	15.9	17.1	18.0	20.0	21.5
Viable pregnancies per 100 oocyte retrieval cycles	8.6	9.7	10.3	11.5	12.1	13.3	14.2	15.4	17.9

Table 3: ICSI pregnancies after transfer of fresh embryos, numbers and pregnancy rates, 1992-2000

Table 9: Embryo transfer cycles after assisted hatching, numbers and pregnancy rates, 1994–2000

Stage of treatment	Year of treatment						
	1994	1995	1996	1997	1998	1999	2000
Cycles with embryo transfer	125	273	626	397	435	576	802
Clinical pregnancies	17	24	56	38	57	80	164
Viable pregnancies	12	19	40	26	50	62	130
Clinical pregnancies per 100 embryo transfer cycles	13.6	8.8	8.9	9.6	13.1	13.9	20.4
Viable pregnancies per 100 embryo transfer cycles	9.6	7.0	6.4	6.5	11.5	10.8	16.2

Note: Cycles with assisted hatching are included in earlier IVF and ICSI tables.

Table 10: Embryo transfer cycles after blastocyst culture, numbers and pregnancy rates, 1998–2000

Stage of treatment	Year of treatment		
	1998	1999	2000
Cycles with embryo transfer	343	437	1,138
Clinical pregnancies	70	160	414
Viable pregnancies	60	121	346
Clinical pregnancies per 100 embryo transfer cycles	20.4	36.6	36.4
Viable pregnancies per 100 embryo transfer cycles	17.5	27.7	30.4

Note: Cycles with blastocyst culture are included in earlier IVF and ICSI tables.

Table 11: Special techniques of sperm collection (TESE, MESA, PESA, etc), ICSI pregnancies after transfer of fresh embryos or embryo freezing, numbers and pregnancy rates, 1996–2000

Stage of treatment	1996	1997	1998	1999	2000
Transfer of fresh embryos					
Treatment cycles commenced	n.a.	902	1,111	1,192	1,255
Cycles with oocyte retrieval	521	874	1,072	1,145	1,223
Cycles with embryo transfer	463	769	925	1,046	1,105
Clinical pregnancies	106	178	220	244	266
Viable pregnancies	88	151	178	200	213
Clinical pregnancies per 100 oocyte retrieval cycles	20.3	20.4	20.5	21.3	21.7
Viable pregnancies per 100 oocyte retrieval cycles	16.9	17.3	16.6	17.5	17.4
Transfer after embryo freezing					
Cycles with embryo transfer	n.a.	n.a.	35	56	346
Clinical pregnancies			27	43	58
Viable pregnancies			14	18	48
Clinical pregnancies per 100 embryo transfer cycles			77.1	76.8	16.8
Viable pregnancies per 100 embryo transfer cycles					

Table 13: Cycles of treatment resulting from artificial insemination, 1998-2000

Type of insemination	Year of treatment
	1998

Table 15: Viable pregnancy rates for all techniques of assisted conception, 2000

Type of assisted conception	Oocyte retrieval cycles	Embryo/gamete transfer cycles	Viable pregnancies	Viable pregnancy rate per 100 oocyte	Viable pregnancy rate per 100 embryo
IVF: fresh embryos	7,269	6,175	1,301	17.9	21.1
IVF: frozen embryos	-	4,478	638	-	14.2
IVF: donor oocytes	-	636	123	-	19.3
IVF: donor sperm ^(b)	281	235	57	20.3	24.3
ICSI: fresh embryos	8,895	7,854	1,513	17.0	19.3
ICSI: frozen embryos	-	4,639	661	-	14.2
ICSI: donor oocytes	-	311	55	-	17.7
ICSI: donor sperm ^(b)	251	237	43	17.1	18.1
GIFT	817	800	175	21.4	21.9
GIFT: donor oocytes	-	7	2	-	28.6
GIFT: donor sperm ^(b)	91	90	22	24.2	24.4
All techniques	16,981^(a)	24,900	4,468	17.6^(a)	17.9

Table 16: Oocyte retrieval cycles for IVF, ICSI and GIFT, by maternal age, cause of infertility, and drugs used to stimulate ovulation, 2000

Characteristic	Oocyte retrieval cycles attempted					
	IVF		ICSI		GIFT	
	Number	Per cent	Number	Per cent	Number	Per cent
Maternal age (at start of treatment)						
<20	-	-	1	0.0	-	-
20-24	81	1.1	149	1.7	6	0.7
25-29	869	12.0	1,328	14.9	96	11.8
30-34	2,430	33.4	3,015	33.9	248	30.4
35-39	2,559	35.2	2,835	31.9	306	37.5
40-44	1,237	17.0	1,449	16.3	150	18.4
45+	93	1.3	118	1.3	11	1.3

Table 18: Number of embryo transfer cycles after cryopreservation, by maternal age, cause of infertility, and number of embryos transferred, 2000

Characteristic	Embryo transfer cycles					
	IVF		ICSI		Donor oocytes	
	Number	Per cent	Number	Per cent	Number	Per cent
Maternal age (at start of treatment)						
<20	-	-	2	0.0	-	-
20-24	48	1.1	97	2.1	-	-
25-29	558	12.5	792	17.1	36	6.7
30-34	1,677	37.4	1,794	38.7	91	16.9

Table 19: Assisted conception pregnancies after transfer of fresh embryos or oocytes, numbers and pregnancy rates for grouped IVF units, 2000

Stage of treatment	Q1	Q2	Q3	Q4	Total
IVF treatment cycles					
IVF units (n)	10	10	10	10	40
Treatment cycles commenced	2,088	1,933	3,039	1,810	8,870
Cycles with oocyte retrieval	1,845	1,645	2,498	1,526	7,514
Cycles with embryo transfer	1,530	1,449	2,235	1,206	6,420
Clinical pregnancies	589	377	454	193	1,613
Viable pregnancies	489	328	384	152	1,353
Clinical pregnancies per 100 oocyte retrieval cycles	31.9	22.9	18.2	12.6	21.5
Viable pregnancies per 100 oocyte retrieval cycles	26.5	19.9	15.4	10.0	18.0
ICSI treatment cycles					
IVF units (n)	10	10	10	10	40
Treatment cycles commenced	2,345	1,742	3,523	2,537	10,147
Cycles with oocyte retrieval	2,147	1,618	3,162	2,137	9,064
Cycles with embryo transfer	1,860	1,461	2,829	1,873	8,023
Clinical pregnancies	667	404	532	316	1,919
Viable pregnancies	566	317	443	222	1,548
Clinical pregnancies per 100 oocyte retrieval cycles	31.1	25.0	16.8	14.8	21.2
Viable pregnancies per 100 oocyte retrieval cycles	26.4	19.6	14.0	10.4	17.1
GIFT treatment cycles					
IVF units (n)	5	6	6	5	22
Treatment cycles commenced	590	304	30	7	931
Cycles with oocyte retrieval	562	228	28	6	824
Cycles with embryo transfer	549	224	28	6	807
Clinical pregnancies	182	41	2	-	225
Viable pregnancies	149	28	-	-	177
Clinical pregnancies per 100 oocyte retrieval cycles	32.4	18.0	7.1	-	27.3
Viable pregnancies per 100 oocyte retrieval cycles	26.5	12.3	-	-	21.5

Table 20: Assisted conception pregnancies after transfer of thawed embryos, numbers and pregnancy rates for grouped IVF units, 2000

Stage of treatment	Q1	Q2	Q3	Q4	Total
IVF treatment cycles					
IVF units (n)	10	10	10	10	40
Cycles with embryo transfer	738	1,108	2,241	781	4,868
Clinical pregnancies	206	247	380	74	907
Viable pregnancies	186	188	283	52	709
Clinical pregnancies per 100 embryo transfer cycles	27.9	22.3	17.0	9.5	18.6
Viable pregnancies per 100 embryo transfer cycles	25.2	17.0	12.6	6.7	14.6
ICSI treatment cycles					
IVF units (n)	10	10	10	10	40
Cycles with embryo transfer	656	1,642	2,036	447	4,781
Clinical pregnancies	162	331	293	43	829
Viable pregnancies	140	257	253	31	681
Clinical pregnancies per 100 embryo transfer cycles	24.7	20.2	14.4	9.6	17.3
Viable pregnancies per 100 embryo transfer cycles	21.3	15.7	12.4	6.9	14.2

Table 21: Assisted conception pregnancy rates after IVF, ICSI and GIFT, 2000

Method of conception	Units (n)					Total
IVF fresh	40	24.3 – 50.0	17.1 – 22.3	13.3 – 16.9	3.7 – 13.3	18.0
IVF frozen	40	18.0 – 38.0	15.3 – 17.7	10.0 – 14.3	0.0 – 9.3	14.6
ICSI fresh	40	22.9 – 31.4	17.3 – 22.8	11.3 – 16.3	3.0 – 11.0	17.1

Table 22: Numbers and outcomes of assisted conception pregnancies by year of conception, 1979–1999

	Year of conception					
	Number			Per cent		
	1979–97	1998	1999	1979–97	1998	1999
IVF conceptions						
Spontaneous abortion	3,744	436	446	21.0	20.2	19.4
Termination of pregnancy	93	10	14	0.5	0.5	0.6
Ectopic pregnancy	808	62	57	4.5	2.9	2.5
Stillbirth	240	20	33	1.3	0.9	1.4
Live birth ^(a)	12,972	1,631	1,753	72.6	75.5	76.1
All IVF outcomes	17,857	2,159	2,303	100.0	100.0	100.0
ICSI conceptions						
Spontaneous abortion	863	354	443	19.1	18.6	19.0
Termination of pregnancy	27	11	13	0.6	0.6	0.6
Ectopic pregnancy	86	40	43	1.9	2.1	1.8
Stillbirth	43	15	20	1.0	0.8	0.9
Live birth ^(a)	3,493	1,485	1,812	77.4	78.0	77.7
All ICSI outcomes	4,512	1,905	2,331	100.0	100.0	100.0
GIFT conceptions						
Spontaneous abortion	1,823	99	77	20.7	25.0	24.2
Termination of pregnancy	53	1	3	0.6	0.3	0.9
Ectopic pregnancy	283	5	7	3.2	1.3	2.2
Stillbirth	94	2	1	1.1	0.5	0.3
Live birth ^(a)	6,551	289	230	74.4	73.0	72.3
All GIFT outcomes	8,804	396	318	100.0	100.0	100.0
All assisted conceptions						
Spontaneous abortion	6,430	889	966	20.6	19.9	19.5
Termination of pregnancy	173	22	30	0.6	0.5	0.6
Ectopic pregnancy	1,177	107	107	3.8	2.4	2.2
Stillbirth	377	37	54	1.2	0.8	1.1
Live birth ^(a)	23,016	3,405	3,795	73.8	76.3	76.6

Table 25: Paternal ages, assisted conception pregnancies, 1999

Age group (years)	Number			Per cent		
	IVF	ICSI	GIFT	IVF	ICSI	GIFT
Less than 20	-	-	-	-	-	-
20-24	7	12	4	0.3	0.5	1.3
25-29	227	240	34	9.9	10.3	11.1
30-34	752	700	107	32.9	30.1	35.0
35-39	781	737	103	34.1	31.7	33.7
40-44	349	386	36	15.3	16.6	11.8
45 and over	172	248	22	7.5	10.7	7.2
Not stated/single female	15	8	12			
All ages	2,303	2,331	318	100.0	100.0	100.0

Table 26: Previous pregnancies for pregnant women, assisted conception pregnancies, 1999

Number of previous pregnancies	Number			Per cent		
	IVF	ICSI	GIFT	IVF	ICSI	GIFT
None	1,084	1,365	152	47.1	58.7	47.8
One	619	612	107	26.9	26.3	33.6
Two	316	211	39	13.7	9.1	12.3
Three	153	77	13	6.6	3.3	4.1
Four or more	131	60	7	5.7	2.6	2.2
Not stated	-	6	-			
All women	2,303	2,331	318	100.0	100.0	100.0

Table 27: Duration of infertility, assisted conception pregnancies, 1999

Duration of infertility (years)	Number	Per cent
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Table 28: Causes of infertility, assisted conception pregnancies, 1979-1999

Table 29: Outcome of pregnancy by causes of infertility, assisted conception pregnancies, 1999

Outcome of pregnancy	Causes of infertility					All causes ^(b)
	Tubal	Male	Endometriosis	Multiple	Unexplained	
	Number					
Spontaneous abortion	109	284	45	264	136	966
Termination of pregnancy	1	10	4	8	3	30
Ectopic pregnancy	25	24	2	32	16	107
Stillbirth	5	17	4	17	4	54
Live birth ^(a)	365	1,225	239	943	568	3,795
All outcomes	505	1,560	294	1,264	727	4,952
	Per cent					
Spontaneous abortion	21.6	18.2	15.3	20.9	18.7	19.5
Termination of pregnancy	0.2	0.6	1.4	0.6	0.4	0.6
Ectopic pregnancy	5.0	1.5	0.7	2.5	2.2	2.2
Stillbirth	1.0	1.1	1.4	1.3	0.6	1.1
Live birth ^(a)	72.3	78.5	81.3	74.6	78.1	76.6
All outcomes	100.0	100.0	100.0	100.0	100.0	100.0

(a) Multiple pregnancies with both stillbirths and live births are included only in the live birth category.

(b) Includes 602 pregnancies with 'other' or 'not stated' causes of infertility.

Table 30: Drugs used to stimulate ovulation, assisted conception pregnancies, 1999

Drugs	Number			Per cent		
	IVF	ICSI	GIFT	IVF	ICSI	GIFT
Natural cycles	41	56	5	1.9	2.5	1.6
Clomiphene and hMG or FSH	33	41	12	1.5	1.8	3.8
hMG or FSH	18	12	-	0.8	0.5	-
GnRH analogues and hMG or FSH	2,091	2,139	298	95.8	95.1	94.6
Other	-	2	-	-	0.1	-
Not stated / Donor	120	81	3			
All drugs	2,303	2,331	318	100.0	100.0	100.0

Table 31: Assisted conception treatment cycle in which conception occurred, 1999

Treatment cycle	Number			Per cent		
	IVF	ICSI	GIFT	IVF	ICSI	GIFT
1	1,360	1,028	161	59.1	44.2	50.6
2	479	591	92	20.8	25.4	28.9
3	207	341	30	9.0	14.6	9.4
4	111	147	18	4.8	6.3	5.7
5 or more	144	221	17	6.3	9.5	5.3
Not stated	2	3	-			
All cycles	2,303	2,331	318	100.0	100.0	100.0

Table 33: Women hospitalised for ovarian hyperstimulation syndrome (OHSS) by number of oocytes collected, assisted conception pregnancies, 1999

Outcome of pregnancy	Number of oocytes collected ^(a)							
	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15+
	Number							
No hospitalisation	108	352	516	597	653	561	459	1,374
Hospitalised	1	-	6	6	16	17	24	51
All outcomes	109	352	522	603	669	578	483	1,425
	Per cent							
No hospitalisation	99.1	100.0	98.9	99.0	97.6	97.1	95.0	96.4
Hospitalised	0.9	-	1.1	1.0	2.4	2.9	5.0	3.6
All outcomes	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(a) Among 211 pregnant women with number of oocytes collected 'not stated' or 'donated', there were 0 (0%) hospitalised for OHSS.

Table 34: Number of embryos or oocytes transferred, assisted conception pregnancies, 1999

Number of embryos or oocytes transferred	Number			Per cent		
	IVF	ICSI	GIFT	IVF	ICSI	GIFT
1	222	148	5	9.6	6.3	1.6
2	1,652	1,661	137	71.7	71.3	43.1
3	401	488	140	17.4	20.9	44.0
4	26	31	31	1.1	1.3	9.7
5 or more	2	3	5	0.1	0.1	1.6
Not stated	-	-	-			
All pregnancies	2,303	2,331	318	100.0	100.0	100.0
Mean number of oocytes	2.1	2.2	2.7			

Table 35: Outcome of assisted conception pregnancies by number of embryos or oocytes transferred, 1999

Table 37: Drugs used in the luteal phase after embryo/oocyte transfer, assisted conception pregnancies, 1999

Drugs	Number			Per cent		
	IVF	ICSI	GIFT	IVF	ICSI	GIFT
Proluton	706	745	79	30.7	32.0	24.8
Human chorionic gonadotrophin (hCG)	879	972	195	38.2	41.7	61.3
Human chorionic gonadotrophin /						

Table 39: Incidence of spontaneous abortions by maternal age group, assisted conception pregnancies, 1999

Maternal age (years)	Number of assisted conception pregnancies ^(a)	Spontaneous abortions	
		Number	Per cent
Less than 25	91	11	12.1
25-29	846	136	16.1
30-34	1,915	327	17.1
35-39	1,534	336	21.9
40-44	389	145	37.3
45 and over	40	11	27.5
Not stated	-	-	
All ages	4,815	966	20.1

(a) Spontaneous abortions and pregnancies of at least 20 weeks' gestation.

Table 40: Ectopic pregnancies after assisted conception, 1999

Outcome of pregnancy	IVF	ICSI	GIFT	All assisted conceptions
Ectopic pregnancies	57	43	7	107
Clinical pregnancies	2,303	2,331	318	4,952
% ectopic pregnancies	2.5	1.8	2.2	2.2
Total abortions and births	2,246	2,288	311	4,845
Ectopic pregnancy ratio ^(a)	1:39.4	1:53.2	1:44.4	1:45.3

(a) Ratio of ectopic pregnancies: total abortions and births.

Table 41: Heterotopic pregnancies after assisted conception, 1979–1999

Outcome of pregnancy	1979–95	1996	1997	1998	1999
Number					
Heterotopic - abortion	88	9	7	8	4
Heterotopic - birth	56	6	2	2	3
All heterotopic pregnancies:	144	15	9	10	7
Clinical pregnancies	23,419	3,695	4,059	4,460	4,952
Per cent					
Heterotopic - abortion	0.38	0.24	0.17	0.18	0.08
Heterotopic - birth	0.24	0.16	0.05	0.04	0.06
All heterotopic pregnancies:	0.61	0.41	0.22	0.22	0.14

Table 42: Reported complications of pregnancy, assisted conception pregnancies, 1999

Pregnancy complications	Number			Per cent		
	IVF	ICSI	GIFT	IVF	ICSI	GIFT
None	1,755	1,764	242	76.3	75.9	76.1
Threatened abortion	60	52	13	2.6	2.2	4.1
Antepartum haemorrhage	34	36	6	1.5	1.5	1.9
Pregnancy-induced hypertension	154	169	18	6.7	7.3	5.7
Placenta praevia	39	32	6	1.7	1.4	1.9
Other complications	257	271	33	11.2	11.7	10.4
Not stated	4	7	-			
All pregnancies	2,303	2,331	318	100.0	100.0	100.0

Table 43: Duration of singleton and multiple assisted conception pregnancies of at least 20 weeks' gestation, 1999

Gestational age (weeks)	Plurality							
	Singleton	Twin	Triplet	All types				
				Singleton	Twin	Triplet	pluralities	
	Number				Per cent			
IVF conceptions								
20-23	13	9	4	26	0.9	2.5	21.1	1.5
24-27	16	10	1	27	1.1	2.8	5.3	1.5
28-31	21	31	4	57	1.5	8.7	21.1	3.2
32-36	148	172	10	330	10.6	48.2	52.6	18.6
37-41	1,190	135	-	1,325	85.3	37.8	-	74.8
42 or more	7	-	-	7	0.5	-	-	0.4
20-36	198	222	19	440	14.2	62.2	100.0	24.8
Not stated	13	-	1	14				
All gestational age	1,408	357	20	1,786	100.0	100.0	100.0	100.0
ICSI conceptions								
20-23	16	8	-	24	1.1	2.1	-	1.3
24-27	11	8	1	20	0.8	2.1	6.3	1.1
28-31	20	20	7	47	1.4	5.2	43.8	2.6
32-36	140	205	8	353	9.9	53.7	50.0	19.4
37-41	1,223	140	-	1,363	86.2	36.6	-	75.1
42 or more	8	1	-	9	0.6	0.3	-	0.5
20-36	187	241	16	444	13.2	63.1	100.0	24.4
Not stated	14	1	1	16				
All gestational age	1,432	383	17	1,832	100.0	100.0	100.0	100.0
GIFT conceptions								
20-23	1	-	-	1	0.6	-	-	0.4
24-27	1	1	1	3	0.6	2.0	8.3	1.3
28-31	3	2	2	7	1.8	4.0	16.7	3.0
32-36	22	28	9	59	13.0	56.0	75.0	25.5
37-41	140	19	-	159	82.8	38.0	-	68.8
42 or more	2	-	-	2	1.2	-	-	0.9
20-36	27	31	12	70	16.0	62.0	100.0	30.3
Not stated	-	-	-	-				
All gestational age	169	50	12	231	100.0	100.0	100.0	100.0
All assisted conceptions								
20-23	30	17	4	51	1.0	2.2	8.5	1.3
24-27	28	19	3	50	0.9	2.4	6.4	1.3
28-31	44	53	13	111	1.5	6.7	27.7	2.9
32-36	310	405	27	742	10.4	51.3	57.4	19.4
37-41	2,553	294	-	2,847	85.6	37.3	-	74.5
42 or more	17	1	-	18	0.6	0.1	-	0.5
20-36	412	494	47	954	13.8	62.6	100.0	25.0

Table 44: Maternal age and duration of singleton assisted conception pregnancies of at least 20 weeks' gestation, 1999

Gestational age (weeks)	Maternal age (years)					All ages
	Less than 25	25-29	30-34	35-39	40 and over	
	Number					
20-27	2	10	23	18	5	58
28-31	1	11	13	13	6	44
32-36	6	51	128	97	28	310
37 or more	48	442	1,058	830	192	2,570
Not stated	1	4	7	11	4	27
All gestational ages	58	518	1,229	969	235	3,009
20-36	9	72	164	128	39	412
	Per cent					
20-27	3.5	1.9	1.9	1.9	2.2	1.9
28-31	1.8	2.1	1.1	1.4	2.6	1.5
32-36	10.5	9.9	10.5	10.1	12.1	10.4
37 or more	84.2	86.0	86.6	86.6	83.1	86.2
All gestational ages	100.0	100.0	100.0	100.0	100.0	100.0
20-36	15.8	14.0	13.4	13.4	16.9	13.8

Table 45: Causes of infertility and duration of singleton assisted conception pregnancies of at least 20 weeks' gestation, 1999

Gestational age (weeks)	Causes of infertility					All causes ^(a)
	Tubal	Male	Endometriosis	Multiple	Unexplained	
	Number					
20-27	6	16	2	18	5	58
28-31	2	12	2	9	10	44
32-36	36	92	19	88	40	310
37 or more	247	848	167	616	383	2,570
Not stated	4	11	-	8	3	27
All gestational ages	295	979	190	739	441	3,009
20-36	44	120	23	115	55	412
	Per cent					
20-27	2.1	1.7	1.1	2.5	1.1	1.9
28-31	0.7	1.2	1.1	1.2	2.3	1.5
32-36	12.4	9.5	10.0	12.0	9.1	10.4
37-or more	84.9	87.6	87.9	84.3	87.4	86.2
All gestational ages	100.0	100.0	100.0	100.0	100.0	100.0
20-36	15.1	12.4	12.1	15.7	12.6	13.8

(a) Includes 365 pregnancies with 'other' or 'not stated' causes of infertility.

Table 46:

Table 47: Plurality of assisted conception pregnancies of at least 20 weeks' gestation and number of embryos or oocytes transferred, 1999

Number of embryos or oocytes transferred	Plurality							
	Singleton	Twin	Triplet	All other pluralities	Singleton	Twin	Triplet	All other pluralities
	Number				Per cent			
IVF conceptions								
1	154	7	-	161	98.6	1.4	-	100.0
2	1,030	274	11	1,315	78.4	21.4	0.2	100.0
3	208	73	9	290	78.3	19.8	1.7	100.0
4	14	3	-	18	88.9	11.1	-	100.0
5 or more	2	-	-	2	50.0	-	50.0	100.0
Not stated	-	-	-	-				
All pregnancies	1,408	357	20	1,786	78.8	20.0	1.1	100.0
ICSI conceptions								
1	112	2	-	114	98.2	1.8	-	100.0
2	1,049	277	2	1,328	79.0	20.9	0.2	100.0
3	258	96	12	366	70.5	26.2	3.3	100.0
4	12	7	3	22	54.5	31.8	13.6	100.0
5 or more	1	1	-	2	50.0	50.0	-	100.0
Not stated	-	-	-	-				
All pregnancies	1,432	383	17	1,832	78.2	20.9	0.9	100.0
GIFT conceptions								
1	5	-	-	5	100.0	-	-	100.0
2	77	23	2	102	75.5	22.5	2.0	100.0
3	71	24	8	103	68.9	23.3	7.8	100.0
4	15	3	1	19	78.9	15.8	5.3	100.0
5 or more	1	-	1	2	50.0	-	3.3	100.0
Not stated	-	-	-	-				
All pregnancies	169	50	12	231	73.2	21.6	5.2	100.0
All assisted conceptions								
1	271	9	-	280	96.8	3.2	-	100.0
2	2,156	574	15	2,745	78.5	20.9	0.5	100.0
3	537	193	29	759	70.8	25.4	3.8	100.0
4	41	13	4	59	69.5	22.0	6.8	100.0
5 or more	4	1	1	6	66.7	16.7	16.7	100.0
Not stated	-	-	-	-				
All pregnancies	3,009	790	49	3,849	78.2	20.5	1.3	100.0

(a) Includes 1 quadruplet pregnancies.

Table 52: Birthweight of assisted conception live births and stillbirths, 1999

Birthweight (g)	Number			Per cent		
	Livebirth	Stillbirth	All births ^(a)	Livebirth	Stillbirth	All births ^(a)
Less than 500	16	37	53	0.3	53.6	1.1
500–999	83	18	101	1.8	26.1	2.1
1000–1499	167	2	169	3.6	2.9	3.6
1500–1999	321	4	325	6.9	5.8	6.9
2000–2499	647	0	647	13.9	0.0	13.7
2500–2999	1,044	6	1,050	22.5	8.7	22.3
3000–3499	1,234	1	1,236	26.6	1.4	26.2
3500–3999	838	1	839	18.0	1.4	17.8
4000 and over	295	0	295	6.4	0.0	6.3
Not stated	8	10	25			
All birthweights	4,653	79	4,740	100.0	100.0	100.0
Mean birthweight (g)	2,914	811	2,883			

(a) Includes 8 infants with unstated outcome.

Table 53: Birthweight of infants, singleton and multiple assisted conception births of at least 20 weeks' gestation, 1999

Birthweight (g)	Number				Per cent			
	Singleton	Twin	Triplet	All births ^(a)	Singleton	Twin	Triplet	All births ^(a)
Less than 500	17	25	11	53	0.6	1.6	7.7	1.1
500–999	37	46	14	101	1.2	2.9	9.8	2.1
1000–1499	30	100	39	169	1.0	6.3	27.3	3.6
1500–1999	59	220	46	325	2.0	13.9	32.2	6.9
2000–2499	153	467	27	647	5.1	29.6	18.9	13.7
2500–2999	531	514	5	1,050	17.8	32.6	3.5	22.3
3000–3499	1,054	181	1	1,236	35.3	11.5	0.7	26.2
3500–3999	814	25	-	839	27.2	1.6	-	17.8
4000 and over	295	-	-	295	9.9	-	-	6.3
Less than 2500	296	858	137	1,295	9.9	54.4	95.8	27.5
Not stated	19	2	4	25				
All birthweights	3,009	1,580	147	4,740	100.0	100.0	100.0	100.0
Mean birthweight (g)	3,243	2,329	1,543	2,883				

(a) Includes 4 quadruplet births.

Table 54: Outcome of infants in singleton and multiple assisted conception births of at least 20 weeks' gestation, 1999

Outcome	Singleton	Twin	Triplet	Quadruplet	All births
Live births ^(a)	2,967	1,551	139	4	4,661
Stillbirths	42	29	8	-	79
All births	3,009	1,580	147	4	4,740
Neonatal deaths	10	22	6	-	38
Perinatal deaths	52	51	14	-	117
Stillbirth rate per 1,000 total births	14.0	18.4	54.4	-	16.7
Neonatal death rate per 1,000 live births	3.4	14.2	43.2	-	8.2
Perinatal mortality rate per 1,000 total births	17.3	32.3	95.2	-	24.7

(a) Live births include births for which birth status was not recorded.

Table 55: Major congenital malformations in singleton and multiple assisted conception births of at least 20 weeks' gestation, 1999

Outcome	Singleton	Multiple	All births ^(a)
Total births			
IVF	1,408	778	2,197
ICSI	1,432	817	2,260
GIFT	169	136	306
All assisted conception births	3,009	1,731	4,763

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Appendix 1 Definitions and glossary

Artificial insemination (AI): Insemination, or injection of semen or prepared spermatozoa, into the vagina, cervix, uterus, or fallopian tube, to aid fertility. The male partner's sperm (AIH) or donated sperm (DI) can be used.

Embryo transfer: Procedure by which the embryo (usually aged 1 to 2 days but may be more if developed to blastocyst stage) is placed into the uterus or the fallopian tube after IVF or ICSI.

Embryo transfer cycle: The transfer of embryos to the uterus or fallopian tube, that were either donated, frozen and thawed, or both.

Fetal death (stillbirth): Death prior to the complete expulsion or extraction from its mother of a product of conception of 20 or more completed weeks of gestation or of 400g or more birthweight; the death is indicated by the fact that after such separation the fetus does not breathe or show any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles.

Fresh embryo: Fresh embryos result from fertilisation in the laboratory of oocytes collected by aspiration from ovarian follicles. These embryos are subsequently transferred within several days to the uterus or fallopian tube.

Frozen embryo: Freezing (cryopreservation) of fresh embryos produces frozen embryos which are subsequently thawed prior to transfer to the uterus or fallopian tube.

Gamete intrafallopian transfer (GIFT): An assisted conception procedure in which unfertilised eggs plus sperm (i.e. gametes) are transferred to the fallopian tube, so that fertilisation occurs in the normal place.

Heterotopic pregnancy: Heterotopic are those in which there is both a uterine

Microepididymal sperm aspiration (MESA): Use of microsurgery to dissect the epididymis to find motile sperm cells suitable to be aspirated, isolated and prepared for ICSI.

Neonatal death: A death of a liveborn infant within 28 days of birth (expressed as a rate per 1,000 live births).

Oocyte: An unfertilised egg (ovum).

Perinatal death: Includes both stillbirths and neonatal deaths (expressed as a rate per 1,000 total births).

Postneonatal death: A death of a liveborn infant more than 28 days after birth but within the first year (expressed as a rate per 1,000 live births).

Pregnancy rate: See 'clinical pregnancy rate' and 'viable pregnancy rate'.

Preterm birth: A liveborn or stillborn infant of less than 37 weeks' gestation.

Spontaneous abortion: Loss of an intrauterine pregnancy detected clinically or by ultrasound, and less than 20 weeks' gestation (from the first day of the last menstrual period).

Stillbirth: See fetal death.

Subzonal insemination (SUZI): An IVF technique involving sperm microinjection, in which one or more sperm are injected through the zona pellucida into the perivitelline space of the oocyte.

Testicular sperm extraction (TESE): Dissection into the testis itself to recover immature sperm cells from the (often small) fraction of testicular tubules there which still contain such cells, for use with ICSI.

Thawed embryo: See frozen embryo.

Treatment cycle: procedure for collecting eggs (oocytes), usually after ovarian stimulation, involving the passing of a needle into a mature follicle either directly at laparoscopy or (more usually) via the vagina guided by transvaginal ultrasound.

Viable pregnancy: A pregnancy of at least 20 weeks' gestation.

Viable pregnancy rate: The percentage of treatment cycles that result in a viable pregnancy of at least 20 weeks' gestation, most commonly expressed per 100 attempted oocyte retrievals (egg collections). A multiple pregnancy is counted as one pregnancy. Pregnancies resulting in live births and/or stillbirths are included.

Appendix 2 Notification form

AIHW NATIONAL PERINATAL STATISTICS UNIT / FERTILITY SOCIETY OF AUSTRALIA

REGISTER OF PREGNANCIES AFTER IVF OR RELATED PROCEDURES

[REDACTED]

IVF Unit/Hospital: _____ Identification number: _____

Usual home address	:	Marital status	:	Date of birth	Age
Suburb/Town	:	[] Married/De facto	:	Mother / /	yrs

[REDACTED]

NUMBER OF PREVIOUS PREGNANCIES: _____ : TYPE OF CONCEPTION IN CURRENT PREGNANCY: _____

[REDACTED]

