

106 年

人工生殖施行結果分析報告

The Assisted Reproductive

Technology Summary

2017 National Report of Taiwan

衛生福利部國民健康署

中華民國 108 年 5 月

Health Promotion Administration,

Ministry of Health and Welfare

May 2019

凡 例

- 一、人工生殖資料庫於民國 87 年建立，由各人工生殖機構定期通報期間內於其機構接受人工生殖（但不含配偶間的人工授精）之個案資料。
- 二、本報告係依據人工生殖機構所通報之個案資料進行統計分析，報告內容以圖表為主，以文字說明為輔。
- 三、所稱「年」，係為個案接受人工生殖「開始使用排卵藥物」或「開始進入治療週期」的日期介於 106 年 1 月 1 日至 106 年 12 月 31 日之期間，即使懷孕與活產分析亦同。
- 四、「年齡」之統計係以「足歲」計算，亦即未滿 35 歲（如：34 歲又 9 個月）列入 34 歲年齡層計算。
- 五、同時植入「新鮮胚胎」與「冷凍胚胎」之週期，於胚胎種類分析時，列為「新鮮胚胎」類別計算。
- 六、報告除印製成冊，另刊登於本署網站；87 年至 106 年之報告亦可於網站中參考。

（本署網站：<http://hpa.gov.tw>）

Guide to the Report

1. The assisted reproduction database of Taiwan was established in 1998 and has been periodically updated with assisted reproduction (excluding data for artificial insemination using husband's semen) case data reported from each assisted reproduction institution in Taiwan.
2. This report is based on the results of a statistical analysis conducted on case data received from various assisted reproduction institutions. Details of the report are expressed in graphs with a corresponding text explanation.
3. The term “year” herein refers to the period between January 1st and December 31st of 2017 in which the case had received reproduction assistance; that is, covering the “date of initiating the use of the fertility drug” or the “date of initiating the treatment cycle”. The period so defined shall be applied to pregnancy and live birth analyses as well
4. “Age” statistics in the report refer to the “full age”; that is a subject who is 34 years and 9 months old shall be categorized and calculated in the 34 years age group.
5. Cycles of “fresh embryos” and “frozen embryos” which are simultaneously transferred shall be categorized and calculated as “fresh embryos”.
6. In addition to this publication, this report is also posted on the Health Promotion Administration, Ministry of Health and Welfare website where Reports from 1998 to 2017 are also available.
(website: <http://www.hpa.gov.tw>)

目 錄

第一章 總論	1
第一節、人工生殖治療週期	2
第二節、人工生殖的技術	2
第二章 所有治療週期之統計	4
第一節、治療週期數	4
第二節、接受人工生殖治療者之年齡	5
第三節、不孕原因分析	5
第四節、使用人工生殖方法	6
第五節、顯微操作技術	6
第六節、植入週期數與胚胎數	7
第七節、懷孕與活產情形	8
第八節、出生嬰兒狀況	12
第三章 配偶間人工生殖	14
第一節、配偶間人工生殖情形	14
第二節、試管嬰兒懷孕與活產情形	17
第三節、配偶間植入新鮮胚胎及冷凍胚胎之 人工生殖情形比較	19
第四章 人工生殖趨勢（87-106年）	22
第一節、人工生殖治療週期趨勢	22
第二節、植入週期成功率趨勢	26
第三節、各年齡層之植入週期成功率趨勢	28
第四節、活產週期胎數百分比	30
附錄 1 106年人工生殖統計摘要	31
附錄 2 106年個別人工生殖機構統計資料	35
參考網站	80

表次

表 1 106 年人工生殖治療週期	4
表 2 106 年人工生殖使用捐卵之受術妻年齡別	4
表 3 106 年人工生殖受術妻年齡別	5
表 4 106 年人工生殖個案治療週期之使用顯微操作技術情形	6
表 5 106 年人工生殖植入類型百分比	7
表 6 106 年人工生殖出生嬰兒體重與先天缺陷	12
表 7 106 年配偶間人工生殖受術妻年齡別	14
表 8 87 年至 106 年人工生殖治療週期數、活產週期數與 活產嬰兒數.....	23

圖次

圖 1	106 年人工生殖個案不孕之原因	5
圖 2	106 年人工生殖胚胎植入數百分比	7
圖 3	106 年人工生殖懷孕週期無活產紀錄分析	8
圖 4	106 年人工生殖受術妻年齡與懷孕率及活產率關係圖	9
圖 5	106 年人工生殖使用顯微操作技術 ICSI 與 懷孕率及活產率之關係	9
圖 6	106 年人工生殖成功率分析	11
圖 7	106 年人工生殖活產週期之胎數百分比	12
圖 8	106 年人工生殖活產週期之胎數別與體重之關係百分比	13
圖 9	106 年配偶間人工生殖受術妻年齡與 懷孕率及活產率關係圖	15
圖 10	106 年配偶間人工生殖植入胚胎懷孕後 受術妻年齡與自然流產率關係	16
圖 11	106 年配偶間人工生殖施行試管嬰兒方式 活產週期中植入胚胎數之分布	17
圖 12	106 年配偶間人工生殖施行試管嬰兒方式 植入胚胎數之活產率	18
圖 13	106 年配偶間人工生殖施行試管嬰兒方式 植入胚胎數之多胞胎活產率	18
圖 14	106 年配偶間人工生殖植入新鮮胚胎及冷凍胚胎之 成功率比較	19
圖 15	106 年配偶間人工生殖植入新鮮胚胎及冷凍胚胎之 受術妻年齡別懷孕率	20
圖 16	106 年配偶間人工生殖植入新鮮胚胎及冷凍胚胎之 受術妻年齡別活產率	20
圖 17	106 年配偶間人工生殖植入新鮮胚胎及冷凍胚胎之 受術妻年齡大於(含)40 歲者之年齡別懷孕率	21
圖 18	106 年配偶間人工生殖植入新鮮胚胎及冷凍胚胎之 受術妻年齡大於(含)40 歲者之年齡別活產率	21
圖 19	87 年至 106 年人工生殖受術妻之年齡百分比分布	22
圖 20	87 年至 106 年人工生殖治療週期數、活產週期數與 活產嬰兒數	24
圖 21	87 年至 106 年人工生殖之治療週期懷孕率與活產率	25
圖 22	87 年至 106 年人工生殖之治療週期累積懷孕率與 累積活產率	25

圖 23 87 年至 106 年植入新鮮胚胎與冷凍胚胎之 植入週期活產率.....	26
圖 24 87 年至 106 年植入新鮮胚胎與冷凍胚胎之 植入週期單胎率.....	27
圖 25 87 年至 106 年使用配偶間精卵之 植入週期活產率（為受術妻年齡層區分）.....	28
圖 26 87 年至 106 年使用配偶間精卵之 植入週期單胎率（為受術妻年齡層區分）.....	29
圖 27 87 年至 106 年活產週期胎數百分比.....	30

Table of Contents

CHAPTER 1 Overview	39
Section 1 Assisted Reproduction Treatment Cycles	40
Section 2 Assisted Reproductive Technology (ART)	40
CHAPTER 2 Overall ART Cycle Statistics.....	42
Section 1 The Number of Treatment Cycles.....	42
Section 2 Ages of Women Receiving ART	43
Section 3 Causes of Infertility.....	44
Section 4 Types of ART Used	44
Section 5 Micromanipulation Technique	45
Section 6 The Number of Transfer Cycles and Embryos Transferred	45
Section 7 Status of Pregnancy and Live Births.....	47
Section 8 Status of New-Born Infants.....	52
CHAPTER 3 ART Cycles Using Nondonor Eggs, Sperm, or Embryos	53
Section 1 Status of ART Cycles Using Nondonor Eggs, Sperm, or Embryos	53
Section 2 Pregnancy and Live Birth Using IVF	54
Section 3 Fresh and Frozen Embryo Transfer in Nondonor ART.....	55
CHAPTER 4 Trend of Assisted Reproduction (1998 –2017).....	56
Section 1 Trends of ART Cycles	56
Section 2 Trends in Success Rates of Transfer Cycles.....	57
Section 3 Trends in Success Rates of Transfer Cycles by Age-Specific Groups.....	58
Section 4 Number of Fetus in Live Birth Cycles	59
Appendix 1 Summary of Assisted Reproduction Statistics In 2017	72
Appendix 2 Statistical Data on Individual ART Institutions in 2017	76
Reference Websites	80

List of Tables

Table 1 ART Cycles in 2017	42
Table 2 Age-Specific Women Using Donated Eggs in ART in 2017.....	42
Table 3 Age-Specific Women in ART in 2017	43
Table 4 Status of Micromanipulation Technique Application in ART Case Cycles in 2017.....	45
Table 5 Percentage of Transfer Type in ART in 2017.....	45
Table 6 Weight and Congenital Defect of ART Born Infants in 2017	52
Table 7 Age Distribution of Women Receiving ART Using Nondonor Eggs, Sperm, or Embryos in 2017.....	54
Table 8 The Number of Treatment Cycles, Live Birth Cycles, and Live Birth Infants of ART from 1998 to 2017.....	64

List of Graphs

Figure 1 Causes of Infertility in ART in 2017	44
Figure 2 Percentage of Number of Embryos Transferred in ART Cycles in 2017	46
Figure 3 Analyses on Pregnancy with No Live Birth Cycles of ART in 2017	47
Figure 4 Correlations between Women's Age and Pregnancy and Live Birth Rate of ART in 2017	48
Figure 5 Correlation between the Usage of Micromanipulation Technique (ICSI) and both Pregnancy and Live Birth Rates in ART in 2017.....	49
Figure 6 Analysis of ART Success Rates in 2017	51
Figure 7 Percentage of Fetus Numbers of the ART Live Birth Cycles in 2017.....	52
Figure 8 Correlation between Number of Births and Birth Weight of Live Birth Cycles in 2017.....	53
Figure 9 Correlation between Women's Age and both Rates of Pregnancy and Live Birth of Nondonor ART in 2017	55
Figure 10 Correlation between Age and Miscarriage Rate of the Pregnant Women after ART Using Nondonor Eggs, Sperm, or Embryos in 2017	56
Figure 11 The Proportion of Live Birth Distributed across the Number of Embryos Transferred during Nondonor IVF Procedure in 2017.....	58
Figure 12 Live Birth Rates of Number of Embryos Transferred during Nondonor IVF Procedure in 2017	58
Figure 13 Multiple Birth Rates of Number of Embryos Transferred during Nondonor IVF Procedure in 2017	58

Figure 14 Comparison of the Success Rate between Fresh Embryo and Frozen Embryo Transfer from Nondonor Gametes in 2017	59
Figure 15 Age-Specific Pregnancy Rate of Fresh and Frozen Embryo Transfer from Nondonor Gametes in 2017	60
Figure 16 Age-Specific Live Birth Rate of Fresh and Frozen Embryo Transfer from Nondonor Gametes in 2017	60
Figure 17 Age-Specific Pregnancy Rate of Fresh and Frozen Embryo Transfer in Women at Age 40 and above from Nondonor Gametes in 2017.....	61
Figure 18 Age-Specific Live Birth Rate of Fresh and Frozen Embryo Transfer in Women at Age 40 and above from Nondonor Gametes in 2017.....	61
Figure 19 Age Distribution of Women Receiving ART from 1998 to 2017.....	62
Figure 20 The Number of ART Cycles, Live Birth Cycles and Live Births from 1998 to 2017.....	65
Figure 21 Pregnancy Rate and Live Birth Rate of ART from 1998 to 2017.....	66
Figure 22 Cumulative Pregnancy Rate and Cumulative Live Birth Rate of the ART Cycles from 1998 to 2017	66
Figure 23 Live Birth Rate of Transfer Cycle Using Fresh and Frozen Embryos from 1998 to 2017.....	67
Figure 24 Singleton Live Birth Rate of Transfer Cycle Using Fresh and Frozen Embryos from 1998 to 2017	68
Figure 25 Live Birth Rate of Transfer Cycles Using Nondonor Embryos from 1998 to 2017.....	69
Figure 26 Singleton Live Birth Rates of Transfer Cycles Using Nondonor Embryos from 1998 to 2017.....	70
Figure 27 Number of Fetus in Live Birth Cycles between 1998 and 2017	71

第一章 總論

為健全人工生殖之發展，保障不孕夫妻、人工生殖子女與捐贈人之權益，維護國民之倫理及健康，於 96 年 3 月 21 日公布施行人工生殖法。依據該法第 27 條規定，人工生殖機構應通報受術人次、成功率、不孕原因，以及所採行之人工生殖技術等相關事項，由主管機關建立人工生殖資料庫管理，並定期進行統計分析公布資料。

我國人工生殖業務及資料庫之管理，自民國 84 年起即陸續訂定相關辦法規範。人工生殖機構在 87 年初共有 48 家，截至 108 年 4 月止，通過許可之醫療機構共有 85 家。醫療機構應依人工生殖法之規定，須申請主管機關許可後，始得實施人工生殖、接受生殖細胞之捐贈、儲存或提供之行為，為維護醫療機構施行人工生殖技術之醫療品質，本署並定期辦理人工生殖機構之許可審查。

本報告針對 106 年於 84 家人工生殖機構接受治療之個案進行統計分析。第一章簡介人工生殖的方法與治療週期之涵義。第二章以所有治療週期為統計，包含配偶間的人工生殖資料以及接受精卵捐贈者之資料。第三章針對配偶間的人工生殖進行分析。第四章特針對 87 年至 106 年的趨勢進行分析。

第一節、人工生殖治療週期

茲因人工生殖包含長達近兩週或更久的數個步驟，故於資料分析時以「週期 (cycle)」為單位考量會比單一時間點的考量要來得妥切。以這種方式計算，在統計分析時，同一對接受人工生殖治療之夫妻將可能貢獻一個或一個以上的週期。

當個案開始使用排卵藥物以刺激排卵，或為了胚胎的植入而開始進行檢查時，即為週期計算開始，而其最終目標在於順利生產健康之嬰兒，然而並非所有接受治療之週期都能順利的懷孕並持續到生產，但仍會被列於治療週期個案統計。

第二節、人工生殖的技術

本節針對人工生殖技術 (Assisted Reproductive Technology, ART) 所呈現的幾種人工生殖方法及顯微操作技術進行說明。

一、人工生殖的方法

1. IVF/ET: In Vitro Fertilization and Embryo Transfer 體外受精與胚胎移植，通稱為試管嬰兒。
過程為取出卵子和精子，在體外受精，發展為早期胚胎，再由子宮頸口植入子宮內。
2. GIFT: Gamete Intrafallopian Transfer 精卵輸卵管植入術。
將精子和取出的卵子直接經由腹腔鏡放回輸卵管內，在體內受精。
3. ZIFT/TET: Zygote Intrafallopian Transfer/Tubal Embryo Transfer 受精卵/胚胎輸卵管植入術。
精子和卵子在體外受精後植入輸卵管內，讓受精卵/胚胎自然由輸卵管進到子宮著床。
4. AID: Artificial Insemination Using Donor's Semen 使用捐贈精子的人工授精。
將捐贈的精蟲以注入方式注入子宮腔中。

二、顯微操作技術

1. ICSI：Intracytoplasmic Sperm Injection 卵質內精子注射。

將單隻精子注射到卵質內，使精卵結合受精的方法。

2. Assisted Hatching 協助孵化。

將透明帶打薄或打洞，協助胚胎孵化著床。

3. Embryo biopsy 胚胎切片。

取出部分胚胎細胞，進行基因診斷、染色體篩檢或其他檢查，供胚胎植入參考。

依人工生殖法第 5 條之規定，以取出夫之精子植入妻體內實施之配偶間人工授精(Artificial Insemination Using Husband's Semen, AIH)，除第 16 條第 3 款規定禁止選擇胚胎性別及其違反之處罰規定外，不適用人工生殖法之規定。此類配偶間人工授精的治療不侷限於人工生殖機構，個案資料不需通報，因此本文所稱人工生殖個案以及所有分析數據均不包含以 AIH 方式執行之人工生殖。

第二章 所有治療週期之統計

本文所列的資料期間，均以週期開始的時間點為計算基準。所使用的分析資料係來自 106 年的 84 家人工生殖機構定期通報的資料。

第一節、治療週期數

34,877 週期為配偶間人工生殖(占 92.1%)，2,972 週期為使用捐贈精卵人工生殖。106 年人工生殖之週期(含未完成取卵或植入之週期)共有 37,849 週期(表 1)。其中，使用捐卵之受術妻其年齡分布如表 2。

表 1 106 年人工生殖治療週期

週期類別	人工生殖治療週期數	單位：週期
使用捐贈精卵	2,972	
使用捐精		407
使用捐卵		2,565
使用配偶精卵	34,877	
全部治療週期	37,849	

表 2 106 年人工生殖使用捐卵之受術妻年齡別

受術女性年齡	治療週期數	百分比	單位：週期/%
<25	1	0.1	
25-29	114	4.4	
30-34	333	13.0	
35-39	450	17.5	
40-44	748	29.2	
45-49	749	29.2	
≥50	170	6.6	
使用捐卵治療週期	2,565	100.0	

第二節、接受人工生殖治療者之年齡

大多數接受治療之受術妻其年齡介於 35 歲到 39 歲之間，占 40.0% 為最多(表 3)，其中，又以 35 歲的婦女接受人工生殖治療週期為最多，占有所有治療週期之 8.6%，其次為 37 歲婦女，占有所有治療週期之 8.2%。

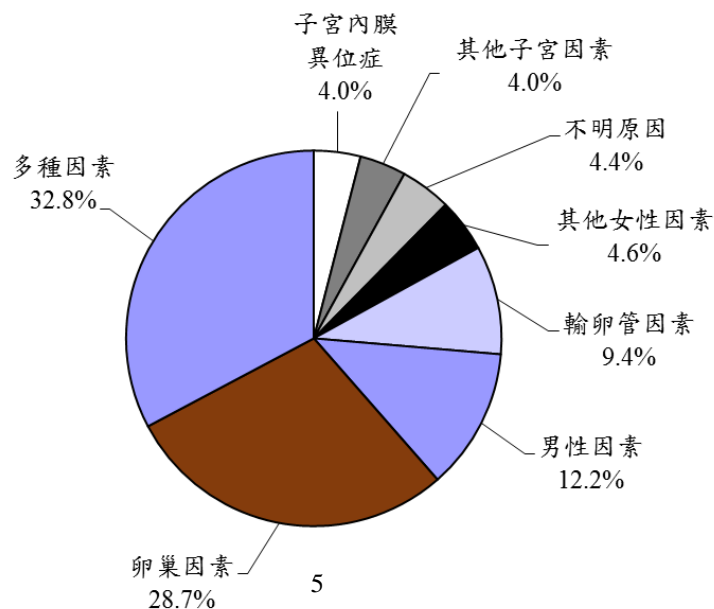
表 3 106 年人工生殖受術妻之年齡別

受術妻年齡	治療週期數	單位：週期/%
		百分比
<25	129	0.3
25-29	1,806	4.8
30-34	9,024	23.8
35-39	15,130	40.0
40-44	9,557	25.3
45-49	1,986	5.2
>50	217	0.6
人工生殖之治療週期	37,849	100.0

第三節、不孕原因分析

人工生殖治療個案不孕之原因可能是先天、後天或外在環境所導致，不孕原因以疾病分類所占比例如圖 1，其中以多種因素所占比例 32.8% 為最高，卵巢因素 28.7% 占第二位，男性因素 12.2% 居第三位(圖 1)。

圖 1 106 年人工生殖個案不孕之原因 (母數：37,849 治療週期數)



第四節、使用人工生殖方法

所有人工生殖治療方法中，以使用試管嬰兒方法的比例為最多，占 99.96%，其餘方法含 GIFT、ZIFT/TET 及 AID 等方法之比例均不超過 1%。對於試管嬰兒這種多數週期所選擇使用的人工生殖治療方法，將在第三章第二節中，特別針對配偶間使用試管嬰兒的治療情形與懷孕結果進行討論。

第五節、顯微操作技術

人工生殖 37,849 治療週期中，76.2%週期有使用顯微操作技術(表 4)。至於顯微操作技術 ICSI 之使用與懷孕率及活產率之關係，將於第七節中討論。

表 4 106 年人工生殖個案治療週期之使用顯微操作技術情形

顯微操作使用情形	單位：週期/%	
	治療週期數	百分比
使用	28,846	76.2
卵質內精子注射(ICSI)	16,983	44.9
協助孵化(Assisted Hatching)	9,641	25.5
胚胎著床前染色體篩檢(PGS)	1,460	3.9
胚胎著床前基因診斷(PGD)	111	0.3
其他	651	1.7
未使用	9,003	23.8
全部治療週期	37,849	100.0

第六節、植入週期數與胚胎數

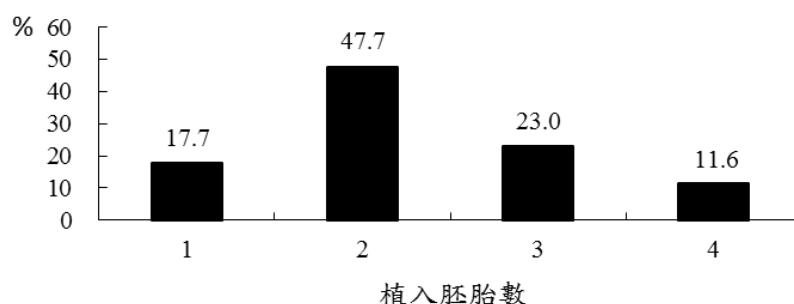
人工生殖植入週期數共 23,183 週期，有 34.0%採用配偶間的精卵所形成的新鮮胚胎，57.2%使用配偶間的冷凍胚胎，1.1%使用捐贈精卵形成的新鮮胚胎，7.7%使用捐贈精卵的冷凍胚胎（表 5）。

表 5 106 年人工生殖植入類型百分比

植入類型	植入週期數	單位：週期/%	
		百分比	
配偶間胚胎	新鮮	7,873	34.0
	冷凍	13,274	57.2
捐贈精卵之胚胎	新鮮	255	1.1
	冷凍	1,781	7.7
全部植入週期	23,183	100.0	

為使人工生殖機構在植入胚胎數方面有所依循，避免植入過多胚胎，造成雙胞胎或多胞胎的機率增加，不僅成為家庭經濟的負擔，也將影響社會人口之結構，96 年公布施行之人工生殖法中，即明定機構實施人工生殖時，每次植入 4 個以下之胚胎為之，明確限縮胚胎的植入數目，且訂有相關罰則。另多胞胎妊娠其生產風險較單胎高，為達母嬰均安，103 年修訂人工生殖機構許可辦法，將「未滿 35 歲之植入 2 個以下胚胎之比率」納入監測指標之一。106 年人工生殖治療週期植入 2 個以下胚胎者占全部植入胚胎週期數 65.4%(105 年為 63.7%，104 年為 60.3%)(圖 2)。

圖2 106年人工生殖胚胎植入數百分比（母數：23,183植入胚胎週期數）

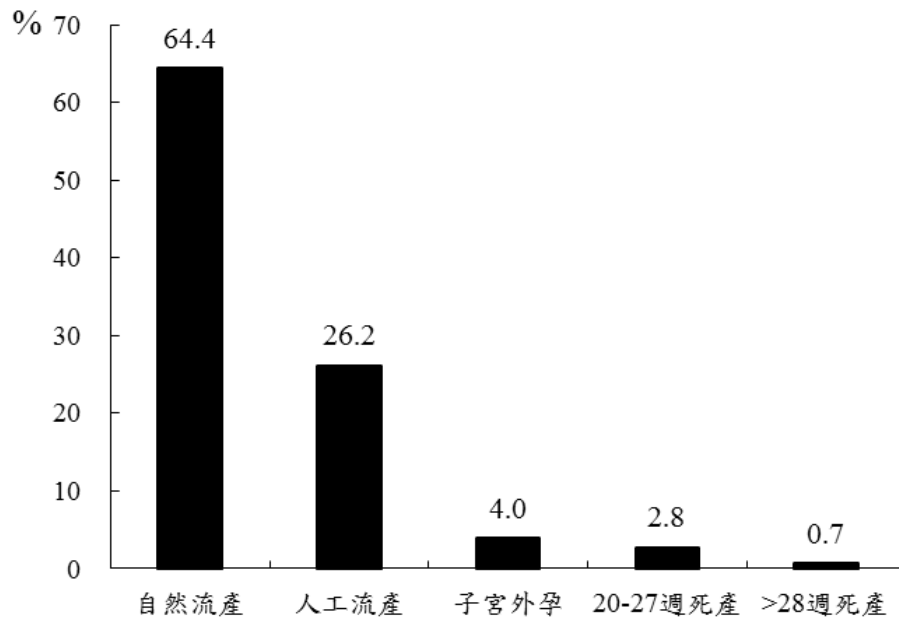


第七節、懷孕與活產情形

人工生殖 37,849 治療週期中，有植入的計 23,183 週期，有懷孕的計 10,255 個週期，有活產的計 7,654 週期，共有 9,590 個嬰兒誕生(部分週期為多胎生產)，較 105 年增加了 602 個嬰兒誕生。

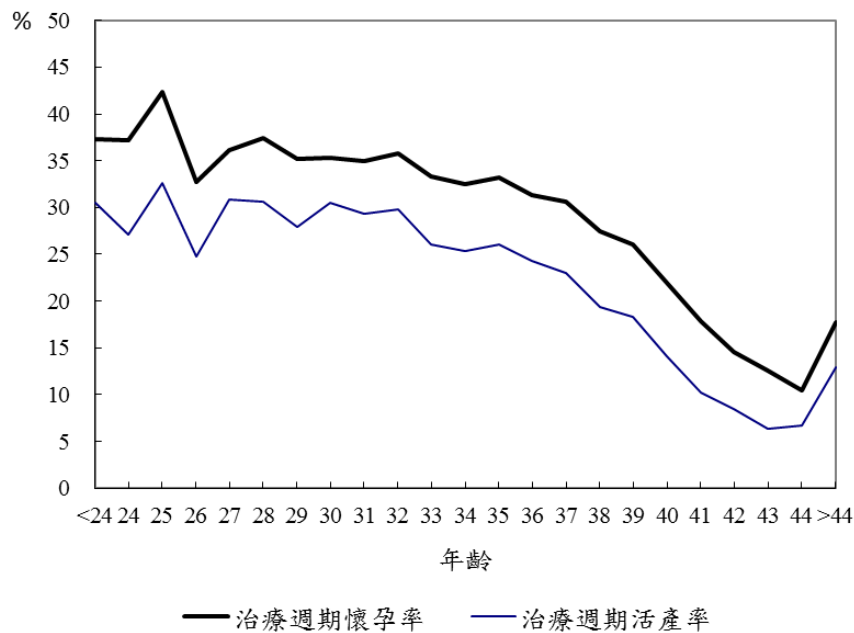
在 2,601 個懷孕但無活產紀錄之週期中，1,674 週期為自然流產(占 64.4%)，681 週期為人工流產(含 20 週前無胎心音；占 26.2%)，103 週期為子宮外孕(占 4.0%)，91 週期為死產(占 3.5%)(少數週期同時具有自然流產、人工流產、子宮外孕、20-27 週死產或>28 週死產中兩種以上情形)(圖 3)。

圖 3 106 年人工生殖懷孕週期無活產紀錄分析 (母數：2,601 懷孕但無活產之週期)



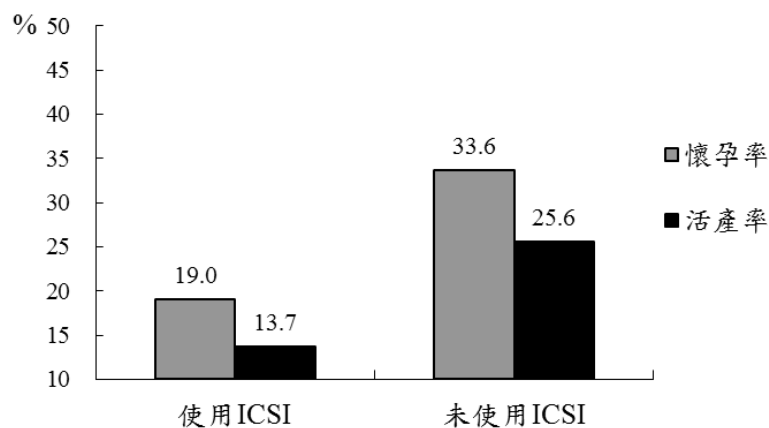
106 年接受人工生殖之治療週期懷孕率為 27.1%，治療週期活產率為 20.2%(須注意：若採取全部胚胎冷凍合併解凍胚胎植入，則冷凍胚胎及解凍胚胎植入各算一個治療週期，這有可能導致上述懷孕率及活產率之低估)。而受術妻年齡與懷孕率及活產率關係如圖 4，年齡小於 24 歲和年齡大於 44 歲的部分，由於週期數過少，故未再細分年齡層，採合併計算方式統計，34 歲以後，懷孕率與活產率隨著接受治療者女性的年齡增加而下降。

圖4 106年人工生殖受術妻年齡與懷孕率及活產率關係圖（母數：37,849治療週期數）



使用顯微操作技術ICSI與懷孕率及活產率之關係，懷孕率方面，使用ICSI為 19.0%，未使用ICSI為33.6%，而活產率方面，使用ICSI為13.7%，未使用ICSI為25.6%(圖5)。

圖5 106年人工生殖使用或未使用顯微操作技術 ICSI 與懷孕率及活產率之關係 (使用 ICSI 治療週期數共 16,983 週期，未使用 ICSI 治療週期數共 20,866 週期)



本節另外再針對人工生殖的成功率、懷孕結果及其相關問題分析。

七種成功率分析

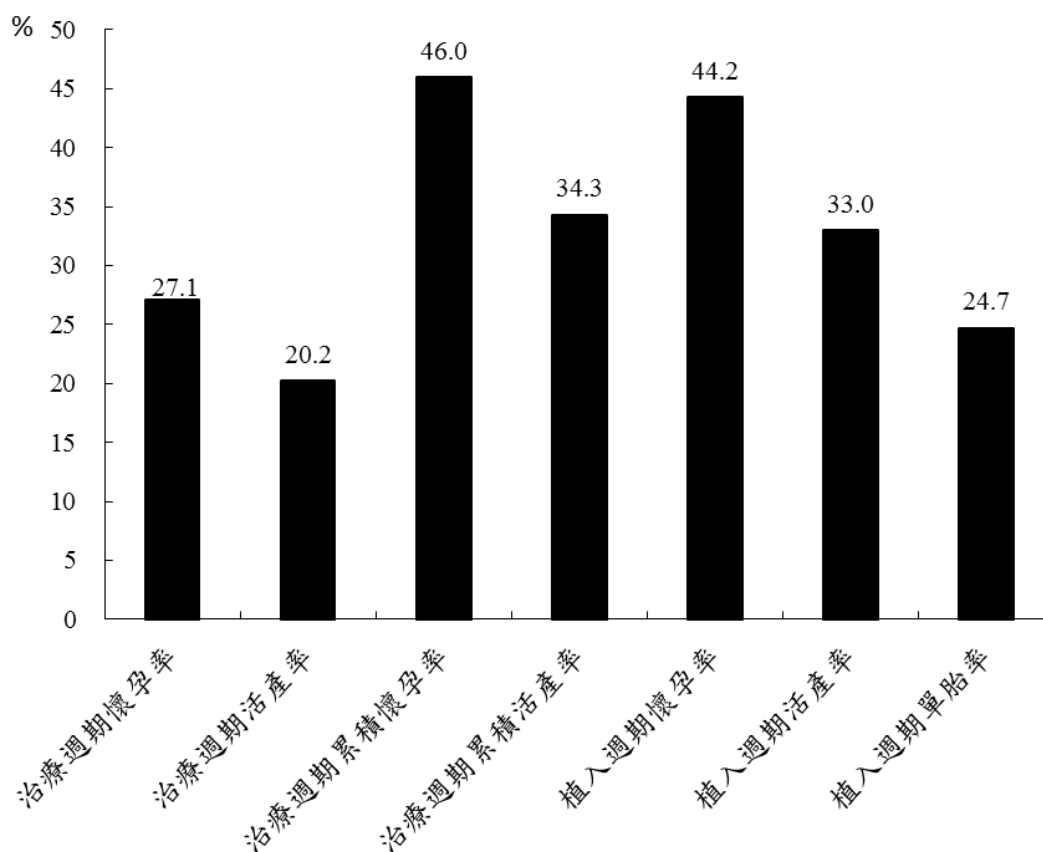
因近年人工生殖技術成熟，越來越多進行全胚冷凍，使得治療週期數增加，但該週期並未進行植入，故以治療週期累積懷孕率、治療週期累積活產率較能真實呈現人工生殖技術的品質。

圖 6 以七種測量方式呈現人工生殖之成功率，包括：治療週期懷孕率、治療週期活產率、治療週期累積懷孕率、治療週期累積活產率、植入週期懷孕率、植入週期活產率與植入週期單胎率等，分別描述如下：

1. 治療週期懷孕率：此率為一般所稱的「懷孕率」。意指人工生殖治療週期中，有懷孕的週期之百分比。由於部分懷孕結果會產生流產、死產等結果，因此，此率會高於治療週期活產率。106 年之治療週期懷孕率為 27.1%。
2. 治療週期活產率：此率為一般所稱的「活產率」，指人工生殖治療週期中，有活產的週期之百分比（不論生產單胎或多胎，均只視為一次活產）。這是大多數人較關心的比率，因為它呈現了以人工生殖方法得到活產嬰兒的機會。106 年治療週期活產率為 20.2%。
3. 治療週期累積懷孕率：意指人工生殖治療週期中，每次取卵週期有懷孕之百分比，計算公式：
$$\frac{[\text{新鮮胚胎懷孕週期數} + \text{冷凍胚胎懷孕週期數} + (\text{新鮮胚胎} + \text{冷凍胚胎})\text{懷孕週期數}]}{[\text{新鮮胚胎治療週期數} + (\text{新鮮胚胎} + \text{冷凍胚胎})\text{治療週期數}]}$$
。106 年之治療週期累積懷孕率為 46.0%。
4. 治療週期累積活產率：指人工生殖治療週期中，每次取卵週期有活產之百分比（不論生產單胎或多胎，均只視為一次活產），計算公式：
$$\frac{[\text{新鮮胚胎活產週期數} + \text{冷凍胚胎活產週期數} + (\text{新鮮胚胎} + \text{冷凍胚胎})\text{活產週期數}]}{[\text{新鮮胚胎治療週期數} + (\text{新鮮胚胎} + \text{冷凍胚胎})\text{治療週期數}]}$$
。106 年之治療週期累積活產率為 34.3%，未滿 38 歲前治療週期累積活產率則為 48.0%。

5. 植入週期懷孕率：人工生殖有植入的週期中，其懷孕週期之百分比。106年植入週期懷孕率為44.2%。其中，植入新鮮胚胎的懷孕率為37.8%，而植入冷凍胚胎的懷孕率為47.7%。
6. 植入週期活產率：人工生殖有植入的週期中，其活產週期之百分比。106年植入週期活產率為33.0%，其中，植入新鮮胚胎的活產率為27.2%，而植入冷凍胚胎的活產率為36.1%。
7. 植入週期單胎率：人工生殖有植入的週期中，單胎活產的週期百分比。單胎的活產是人工生殖技術成功的一項重要測量值，因為與多胎生產比較起來，單胎生產在新生兒健康方面有較低的風險，這些可能風險包括：早產、低體重、缺陷和死亡。106年之植入週期單胎率為24.7%。

圖 6 106 年人工生殖成功率分析



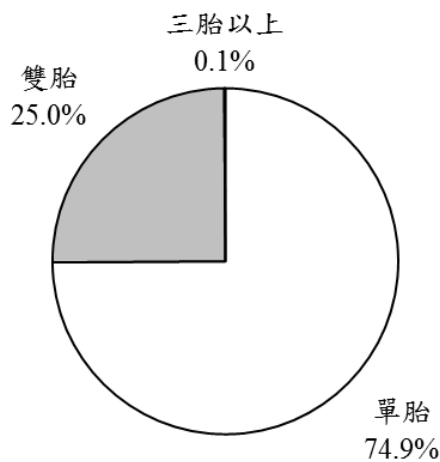
第八節、出生嬰兒狀況

一、活產胎數

在 7,654 個活產週期中，74.9%為單胎生產、25.0%為雙胎生產、0.1%為三胎以上生產(1 活產週期為四胎生產)(圖 7)。

於 106 年間接受人工生殖治療後，生產的嬰兒共有 9,590 人。其中，男嬰有 5,010 人，女嬰有 4,580 人。

圖 7 106 年人工生殖活產週期之胎數百分比 (母數：7,654 活產週期)



二、體重與先天缺陷

觀察 9,590 個活產嬰兒中，出生體重低於 1,500 公克者，占所有活產嬰兒總數之 3.2%，體重介於 1,500-2,499 公克占所有出生嬰兒總數之 29.4%，體重大於等於 2,500 公克者，占 67.4%；而外觀明顯先天缺陷的嬰兒比率為 1.1%(表 6)。

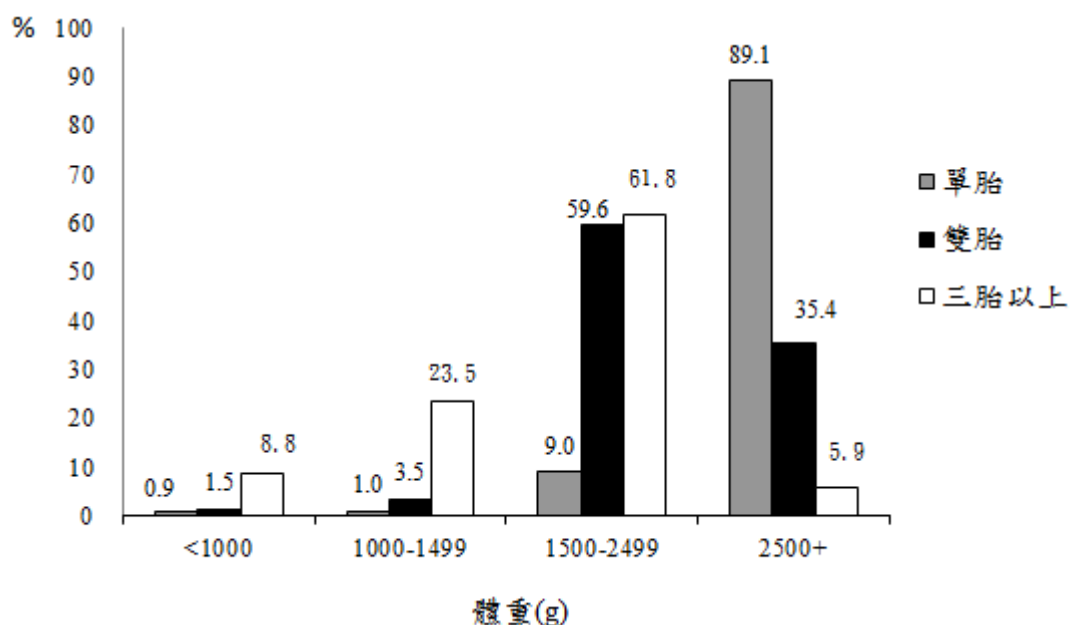
表 6 106 年人工生殖出生嬰兒體重與先天缺陷 (活產嬰兒總數 9,590 個)

嬰兒狀況	活產嬰兒數	百分比
性別		
男	5,010	52.2
女	4,580	47.8
體重		
<1500 公克	309	3.2
1500-2499 公克	2,818	29.4
≥2500 公克	6,463	67.4
外觀明顯先天缺陷	108	1.1

三、胎數別與體重之關係

單胎生產中，體重大都超過 2,500 公克，占所有單胎生產之 89.1%。雙胎生產則以 1,500 到 2,499 公克新生兒占 59.6%，為最大比例，其次為 2,500 公克以上者占 35.4%。而三胎以上之生產，體重小於 1,000 公克新生兒占 8.8%，體重介於 1,000 到 1,499 公克者占 23.5%，體重在 1,500 到 2,499 新生兒占 61.8%，體重超過 2,500 公克者占 5.9%。檢定結果顯示胎數與嬰兒體重之間呈現負相關 ($P < 0.0001$)，亦即胎數愈多，愈易產生低體重兒(圖 8)。

圖 8 106 年人工生殖活產週期之胎數別與體重之關係百分比 (母數:9,590 個活產嬰兒)



第三章 配偶間人工生殖

第一節、配偶間人工生殖情形

本節統計配偶間精卵或冷凍胚胎利用各種治療方法進行人工生殖之情形（不包括配偶間的人工授精 AIH 資料）。

一、年齡分布

配偶間人工生殖治療週期共 34,877 週期，占總治療週期（包含配偶間的人工生殖及接受精卵捐贈之人工生殖週期）之 92.1%。其受術妻年齡分布如表 7，與所有接受人工生殖治療者之年齡分布（表 3，第 5 頁）型態相似。

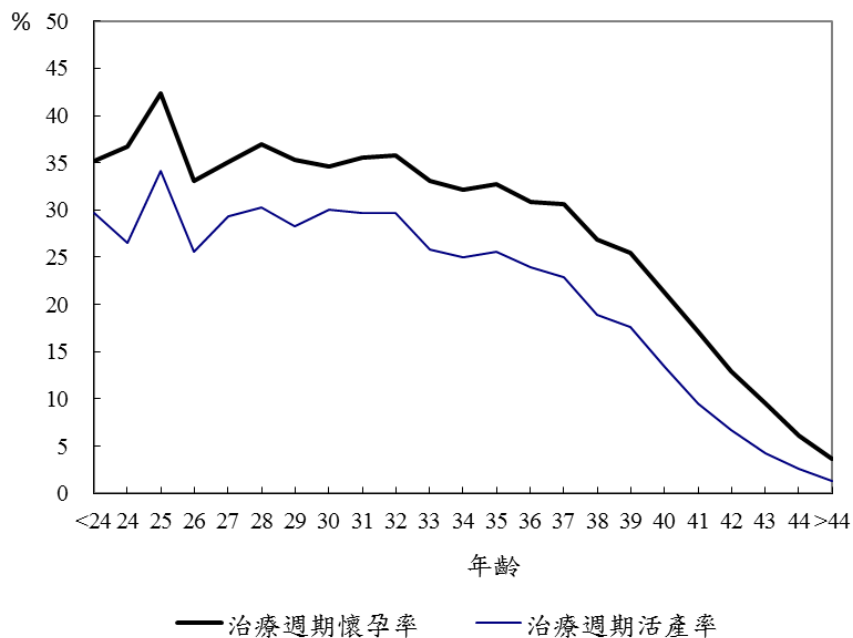
表 7 106 年配偶間人工生殖受術妻年齡別

受術妻年齡	單位：週期/%	
	治療週期數	百分比
<25	122	0.3
25-29	1,647	4.7
30-34	8,575	24.6
35-39	14,521	41.6
40-44	8,737	25.1
45-49	1,228	3.5
>50	47	0.1
人工生殖之治療週期	34,877	100.0

二、各年齡之懷孕率與活產率

配偶間人工生殖之治療週期懷孕率為 26.3%，治療週期活產率為 19.5% (須注意：若採取全部胚胎冷凍合併解凍胚胎植入，則冷凍胚胎及解凍胚胎植入各算一個治療週期，這有可能導致上述懷孕率及活產率之低估)，而受術妻年齡與懷孕率及活產率關係在 34 歲以後，隨著年齡之增加而下降；年齡小於 24 歲和年齡大於 44 歲的部分，由於週期數過少，故未再細分年齡層，採合併計算方式統計(圖 9)。

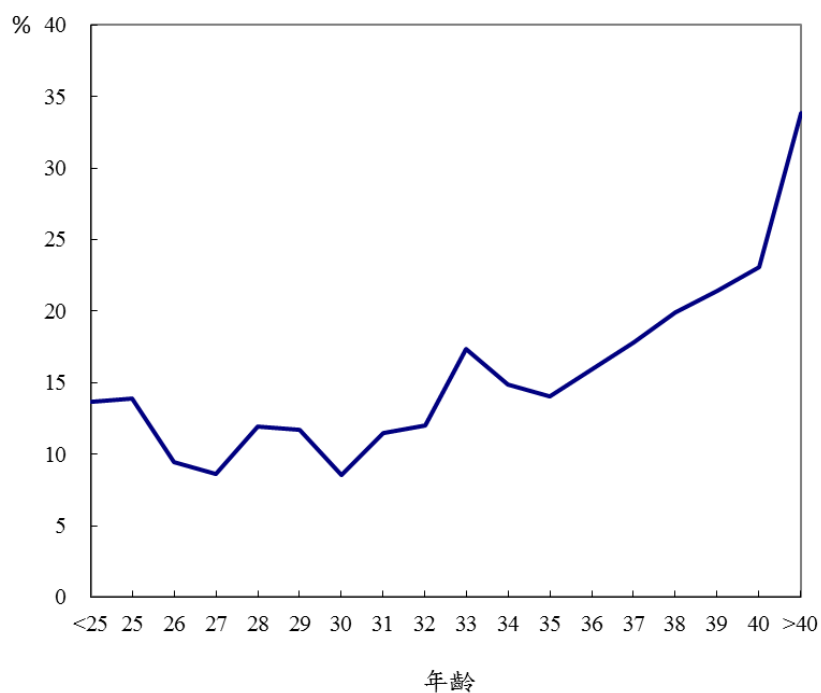
圖 9 106 年配偶間人工生殖受術妻年齡與懷孕率及活產率關係 (母數:34,877 治療週期數)



三、流產率

配偶間人工生殖植入胚胎懷孕後，受術妻年齡與自然流產率之關係，34歲以後，自然流產率隨年齡增加而增加，年齡大於40歲的平均自然流產率為33.9%(圖10)。

圖10 106年配偶間人工生殖植入胚胎懷孕後受術妻年齡與自然流產率關係
(母數：9,170 配偶間植入胚胎之懷孕週期數)



第二節、試管嬰兒懷孕與活產情形

本節針對配偶間人工生殖施行試管嬰兒(IVF/ET)方式進行分析。

一、懷孕率與活產率

配偶間人工生殖施行試管嬰兒方式之植入週期共 19,939 週期，其中懷孕週期 8,551 週期，活產週期 6,323 週期。其植入週期懷孕率為 42.9%，植入週期活產率為 31.7%，治療週期累積活產率為 29.9%(未滿 38 歲治療週期累積活產率為 44.0%)，其中單胎比例占 74.8%，雙胞胎占 25.1%，三胞胎以上則占 0.1%。

若針對 35 歲以下受術妻，排除男性因素而不孕的個案，其植入週期懷孕率提高到 51.2%，植入週期活產率提高到 40.8%，而治療週期累積活產率提高到 46.0%。

二、胚胎植入數與活產率

配偶間人工生殖施行試管嬰兒方式之 6,323 活產週期中，有 54.4% 的週期植入 2 個胚胎，占最大比例(圖 11)。一般而言，胚胎植入數愈多，相對的產生二胞胎(含)以上的機率也愈大。另可觀察到植入 2 個胚胎的活產率達 36.8%(圖 12)，但相對的，其活產週期產生多胞胎的比例也高達 29.4%(圖 13)。

圖11 106年配偶間人工生殖施行試管嬰兒方式活產週期中植入胚胎數之分布

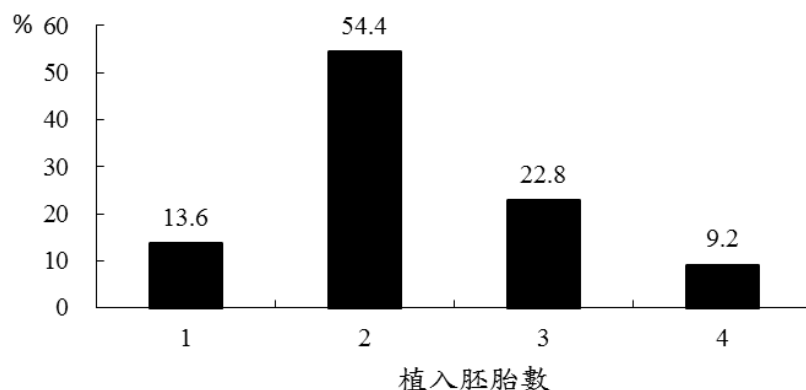


圖 12 106 年配偶間人工生殖施行試管嬰兒方式植入胚胎數之活產率

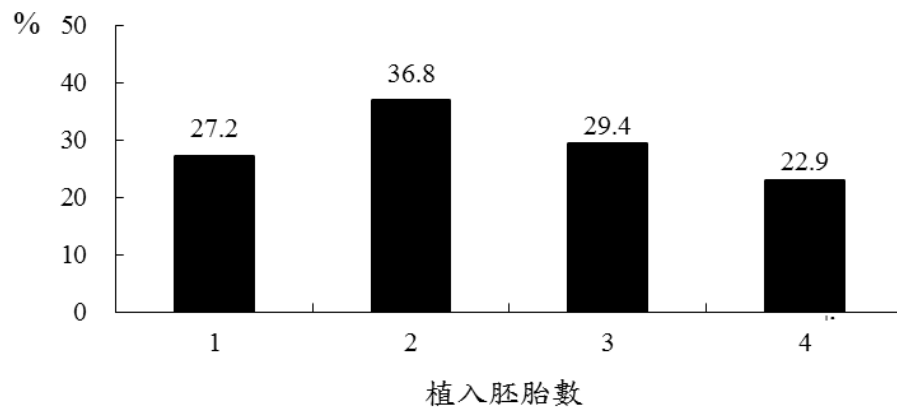
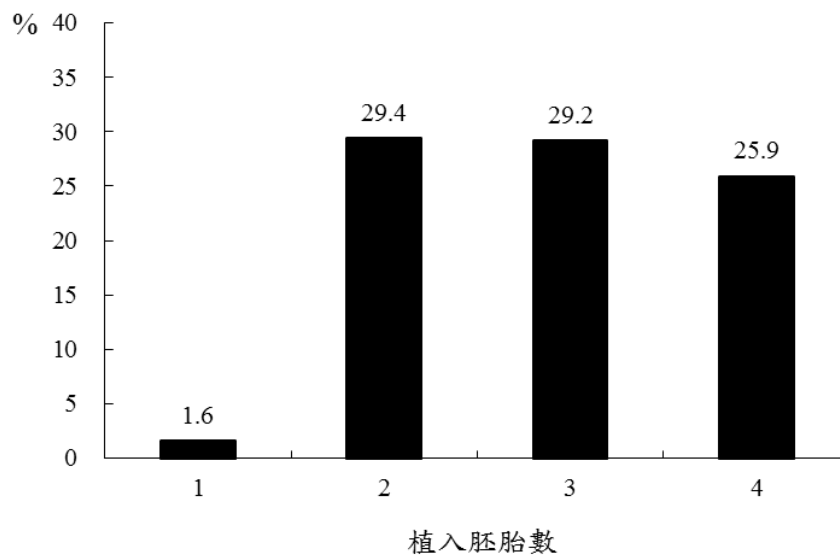


圖 13 106 年配偶間人工生殖施行試管嬰兒方式植入胚胎數之多胞胎活產率



三、顯微操作技術 ICSI

配偶間人工生殖施行試管嬰兒方式使用顯微操作技術 ICSI 共有 15,552 週期(占 41.1%)。懷孕率方面，使用 ICSI 為 18.9%，未使用 ICSI 為 31.1%，而活產率方面，使用 ICSI 為 13.5%，未使用 ICSI 為 23.4%。

第三節、配偶間植入新鮮胚胎及冷凍胚胎之人工生殖情形比較

本節針對配偶間人工生殖治療週期中，植入新鮮胚胎共 7,873 週期及植入冷凍胚胎共 13,274 週期進行比較。統計結果發現，植入新鮮胚胎與冷凍胚胎週期之懷孕率分別為 37.2% 及 47.0%；其活產率則為 26.6% 及 35.4%，兩者均達顯著差異 ($P < 0.0001$) (圖 14)。

懷孕率與活產率的高低明顯和受術妻的年齡有關，特別是年齡超過 40 歲的受術妻其成功率呈現明顯低落。以年齡分析，小於 35 歲其植入新鮮胚胎及冷凍胚胎懷孕率分別為 46.5% 及 55.0%，但超過 40 歲 (41~59 歲) 之懷孕率僅剩下 18.8% 及 25.5% (圖 15)；而植入新鮮胚胎週期活產率更是由小於 35 歲之 37.6% 降低到大於 40 歲之 8.2%，植入冷凍胚胎週期活產率則是由 44.4% 降低到 14.1%。(圖 16)

圖 14 106 年配偶間人工生殖植入新鮮胚胎及冷凍胚胎之成功率比較

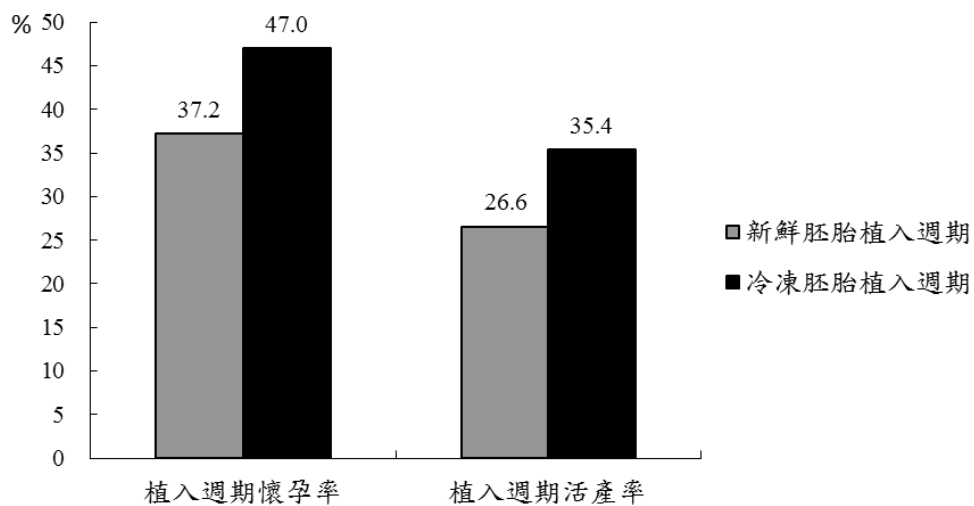


圖 15 106 年配偶間人工生殖植入新鮮胚胎及冷凍胚胎之受術妻年齡別懷孕率

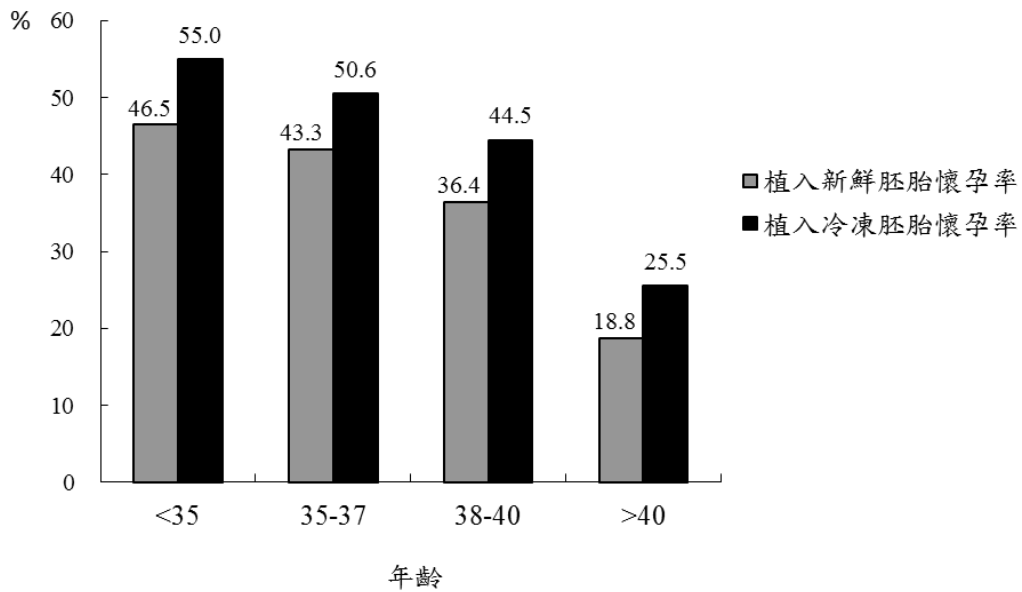
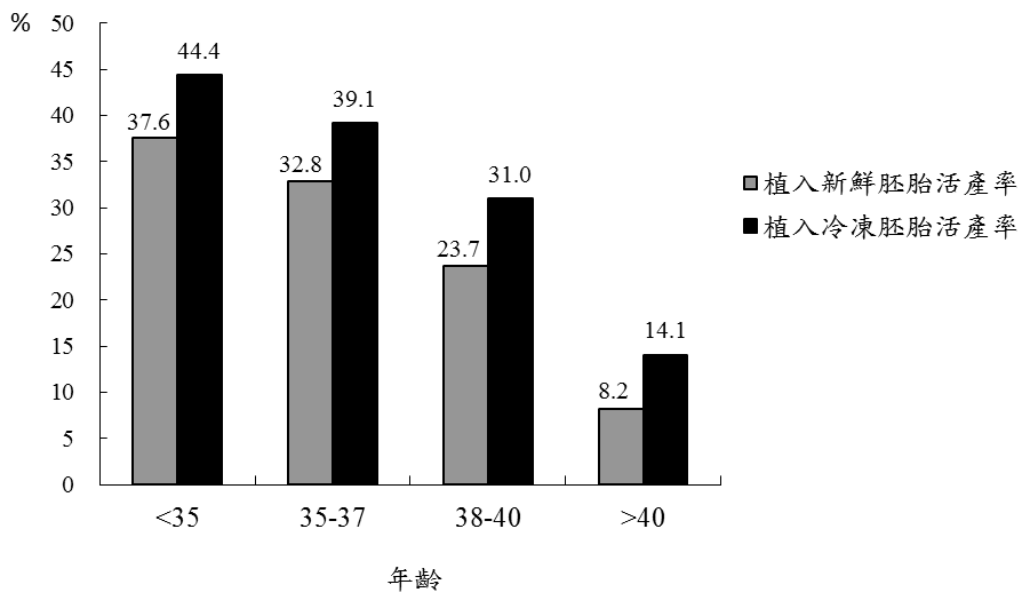


圖 16 106 年配偶間人工生殖植入新鮮胚胎及冷凍胚胎之受術妻年齡別活產率



以受術妻年齡大於(含)40 歲者(共 5,132 植入週期)進行分析，年齡 40 歲之植入新鮮胚胎及冷凍胚胎週期懷孕率分別為 32.9%及 40.2%，但其活產率卻降至 19.7%及 26.0%。42 歲以後，植入週期成功率明顯下降，43 歲以上(43~59 歲)植入新鮮胚胎及冷凍胚胎週期懷孕率為 10.9%及 17.9%，而其活產率僅剩 4.4%及 8.0%(圖 17 及圖 18)。整體看來，在各年齡層植入冷凍胚胎週期之懷孕率及活產率均較植入新鮮胚胎週期為高。

圖 17 106 年配偶間人工生殖植入新鮮胚胎及冷凍胚胎之受術妻年齡大於(含)40 歲者之年齡別懷孕率

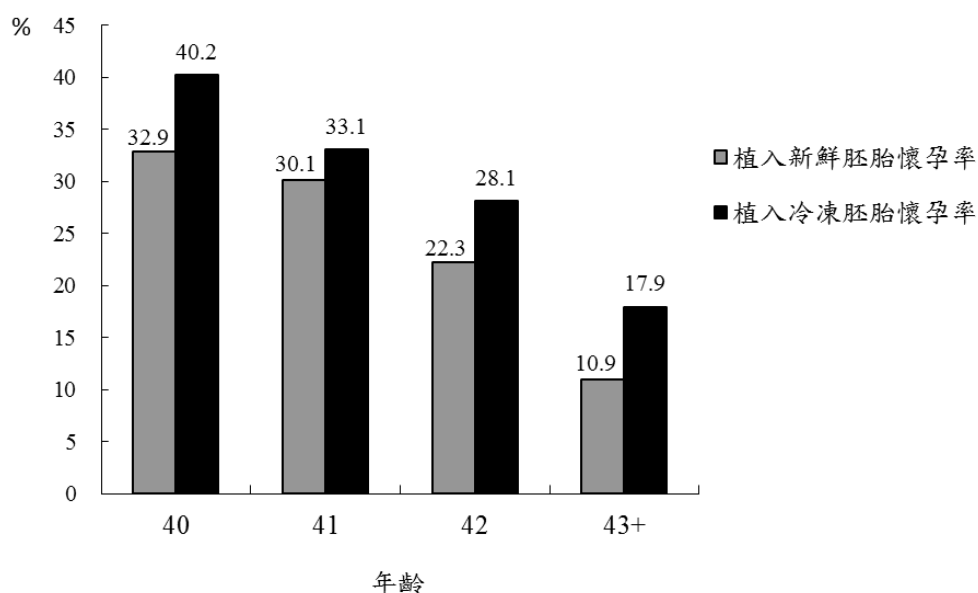
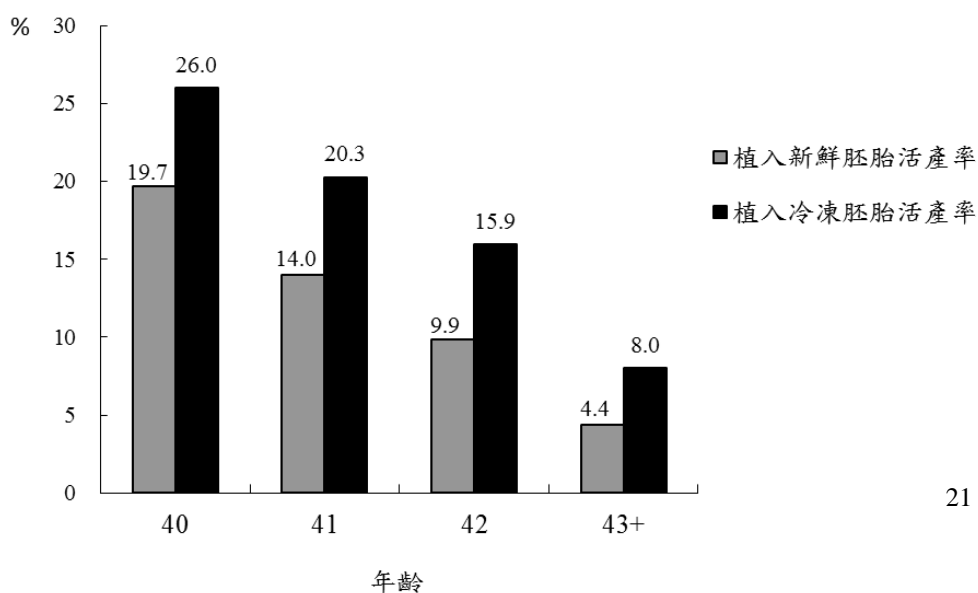


圖 18 106 年配偶間人工生殖植入新鮮胚胎及冷凍胚胎之受術妻年齡大於(含)40 歲者之年齡別活產率



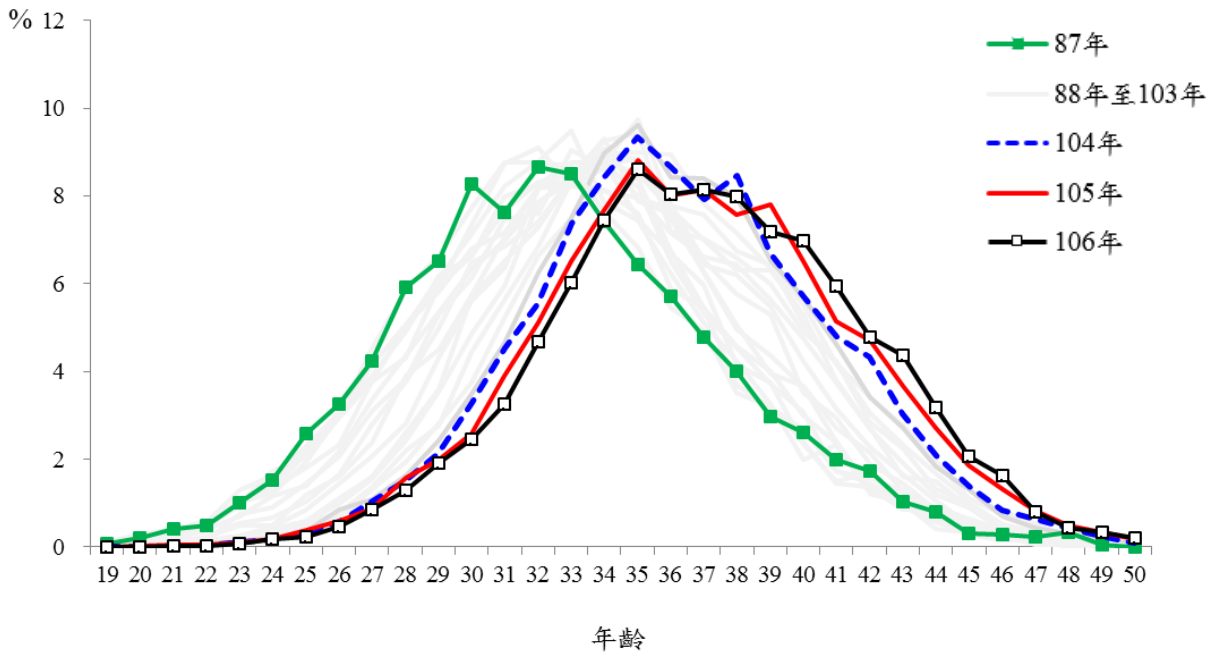
第四章 人工生殖趨勢 (87年-106年)

第一節、人工生殖治療週期趨勢

一、治療者之年齡

87年至106年接受人工生殖受術妻之年齡百分比分布，87年以30歲到33歲為多；106年則以35歲到38歲為多，年齡有逐年增長的趨勢(圖19)。

圖19 87年至106年人工生殖受術妻之年齡百分比分布



二、治療週期數、活產週期數與活產嬰兒數

87年至106年接受人工生殖治療之週期數、活產週期數以及活產嬰兒數之情形。治療週期數除了92年可能受到嚴重急性呼吸道症候群(SARS)事件之影響，接受治療的週期有明顯的減少外，於90到93年均維持於6,500週期至6,700週期之間，94年後則超過7,200週期，並逐年增加，106年為37,849週期，相對於105年的34,486週期增加了9.8%。

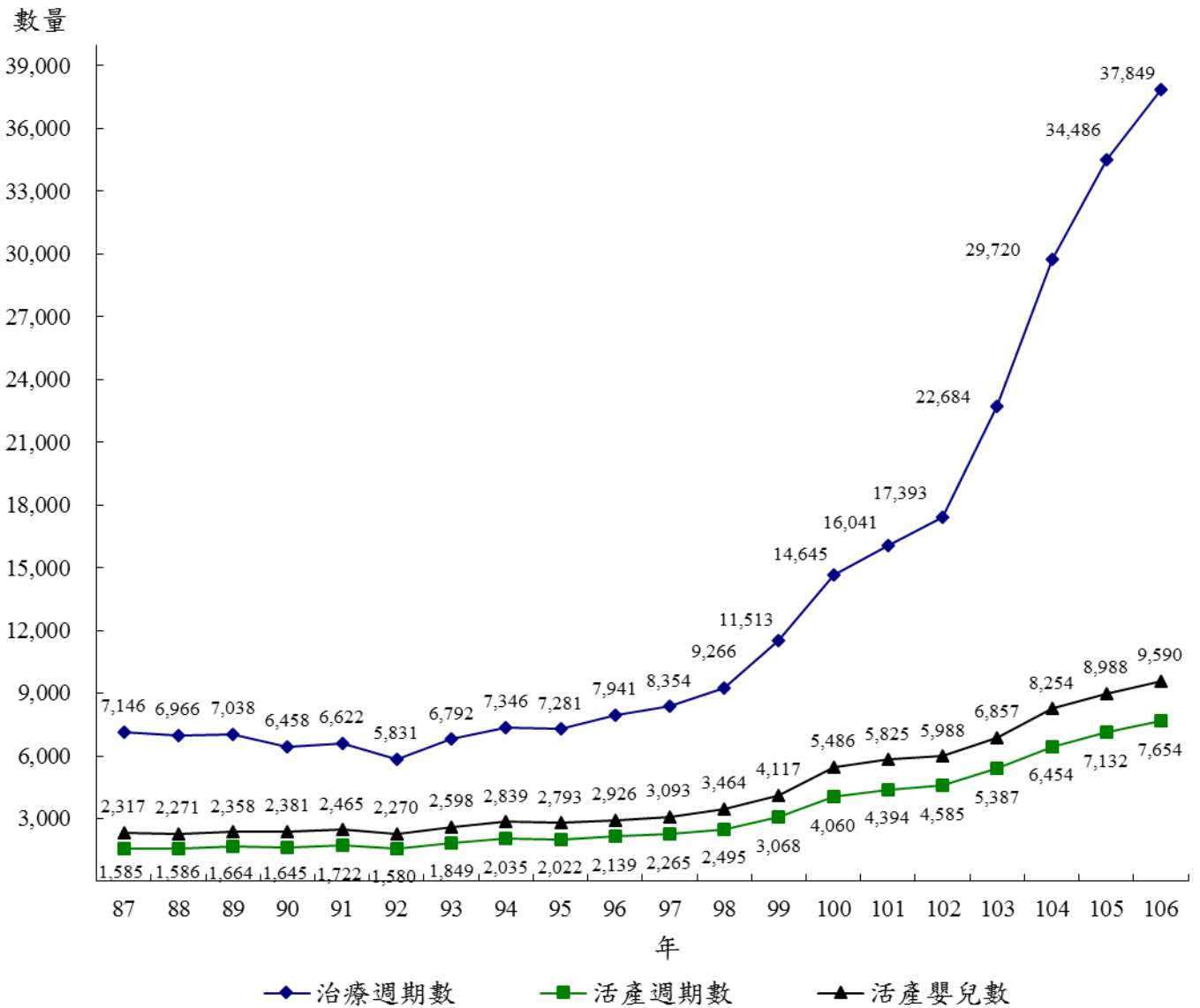
活產週期數在 93 年以前，維持於 1,500 週期至 1,800 週期間，94 年後則超過 2,000 週期，這可歸因於 94 年以後接受人工生殖治療週期數的增加，以及國內人工生殖技術之成熟所致。活產嬰兒數則維持穩定的數值，於 90 至 93 年，每年約有 2,400 到 2,600 個新生兒誕生；94 年以後則每年約 2,800 個新生兒誕生，97 年有 3,093 個，106 年有 9,590 個，較 105 年 8,988 個增加了 602 個新生兒誕生(表 8 及圖 20)。

表 8 87 年至 106 年人工生殖治療週期數、活產週期數與活產嬰兒數

年	治療週期數 (單位：週期)	活產週期數 (單位：週期)	活產嬰兒數 (單位：個)
87	7,146	1,585	2,317
88	6,966	1,586	2,271
89	7,038	1,664	2,358
90	6,458	1,645	2,381
91	6,622	1,722	2,465
92	5,831	1,580	2,270
93	6,792	1,849	2,598
94	7,346	2,035	2,839
95	7,281	2,022	2,793
96	7,941	2,139	2,926
97	8,354	2,265	3,093
98	9,266	2,495	3,464
99	11,513	3,068	4,117
100	14,645	4,060	5,486
101	16,041	4,394	5,825
102	17,393	4,585	5,988
103	22,684	5,387	6,857
104	29,720	6,454	8,254
105	34,486	7,132	8,988
106	37,849	7,654	9,590
合計	271,372	65,321	86,880

註：以當年度治療者為統計對象，故活產嬰兒數非該年度全國人工生殖出生嬰兒數。

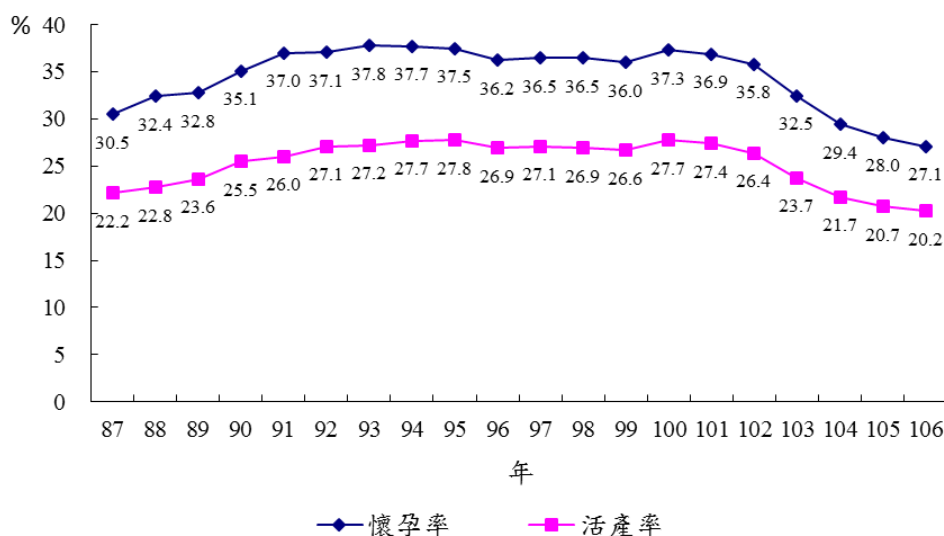
圖 20 87 年至 106 年人工生殖治療週期數、活產週期數與活產嬰兒數



三、懷孕率與活產率

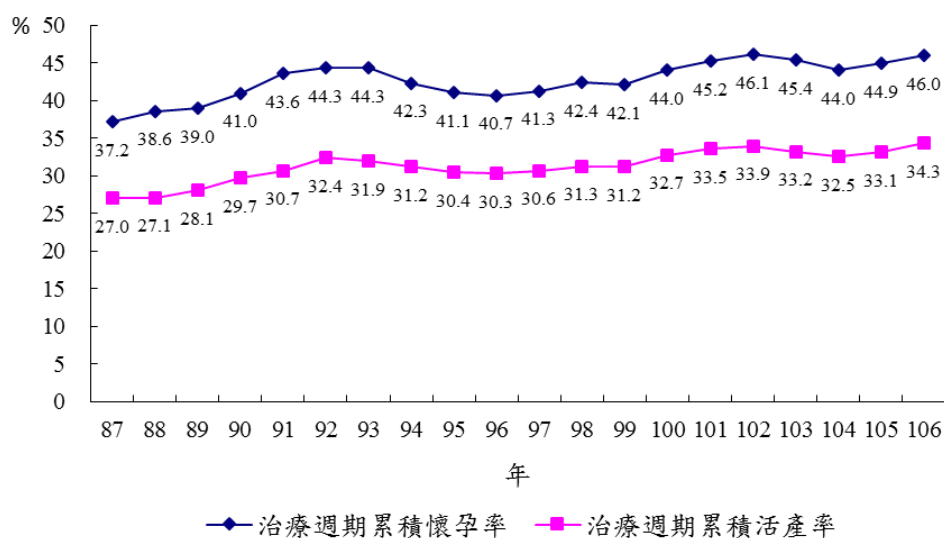
87年至106年人工生殖之懷孕率以93年37.8%達最高，活產率以95年27.8%達最高。懷孕率及活產率於100年開始有下降的趨勢，106年分別為27.1%及20.2%(圖21)。因近年人工生殖技術成熟，越來越多進行全胚冷凍，使得治療週期數增加，但該週期並未進行植入，故以治療週期累積懷孕率、治療週期累積活產率較能真實呈現人工生殖技術品質。

圖 21 87年至106年人工生殖之治療週期懷孕率與活產率



治療週期累積懷孕率由87年的37.2%，106年提升至46.0%；治療週期累積活產率則由87年的27.0%，提升至106年的34.3% (圖22)。

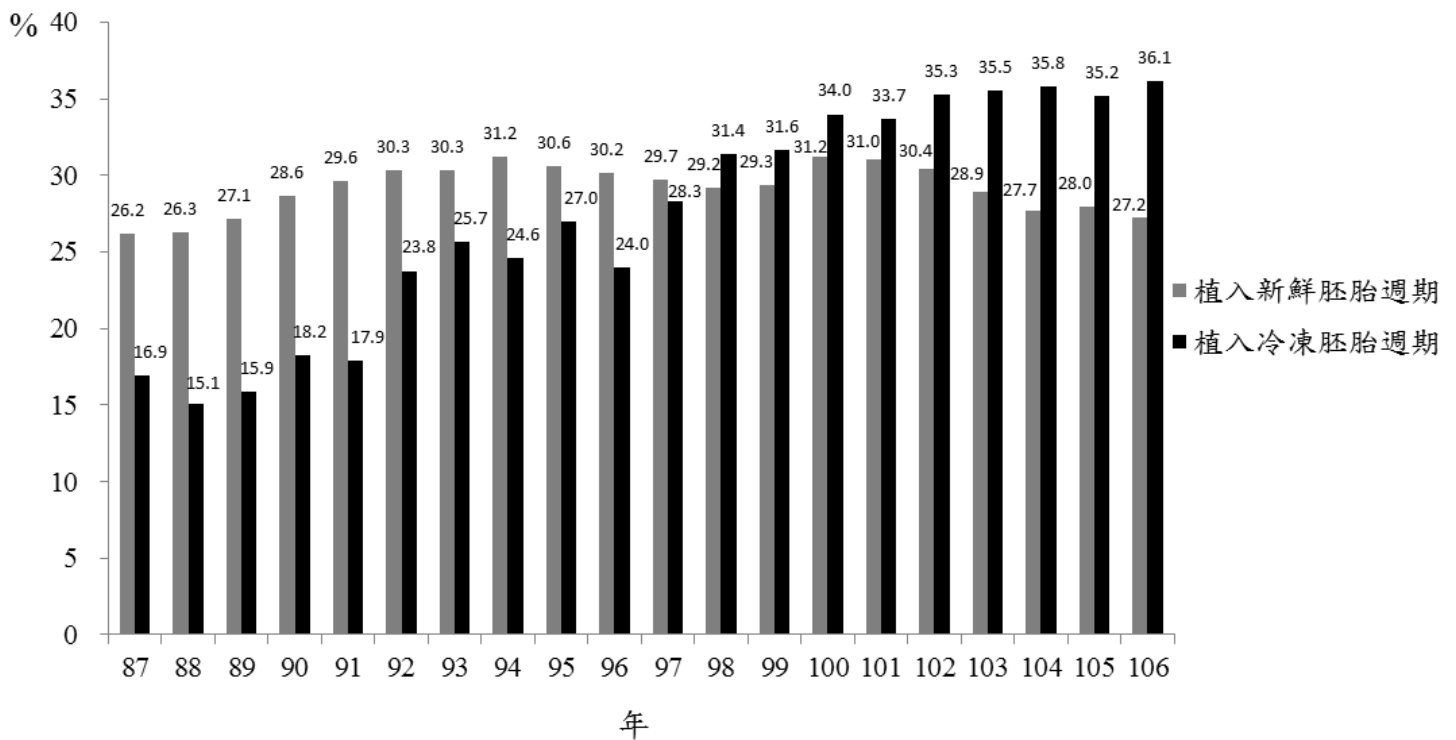
圖 22 87年至106年人工生殖之治療週期累積懷孕率與累積活產率



第二節、植入週期成功率趨勢

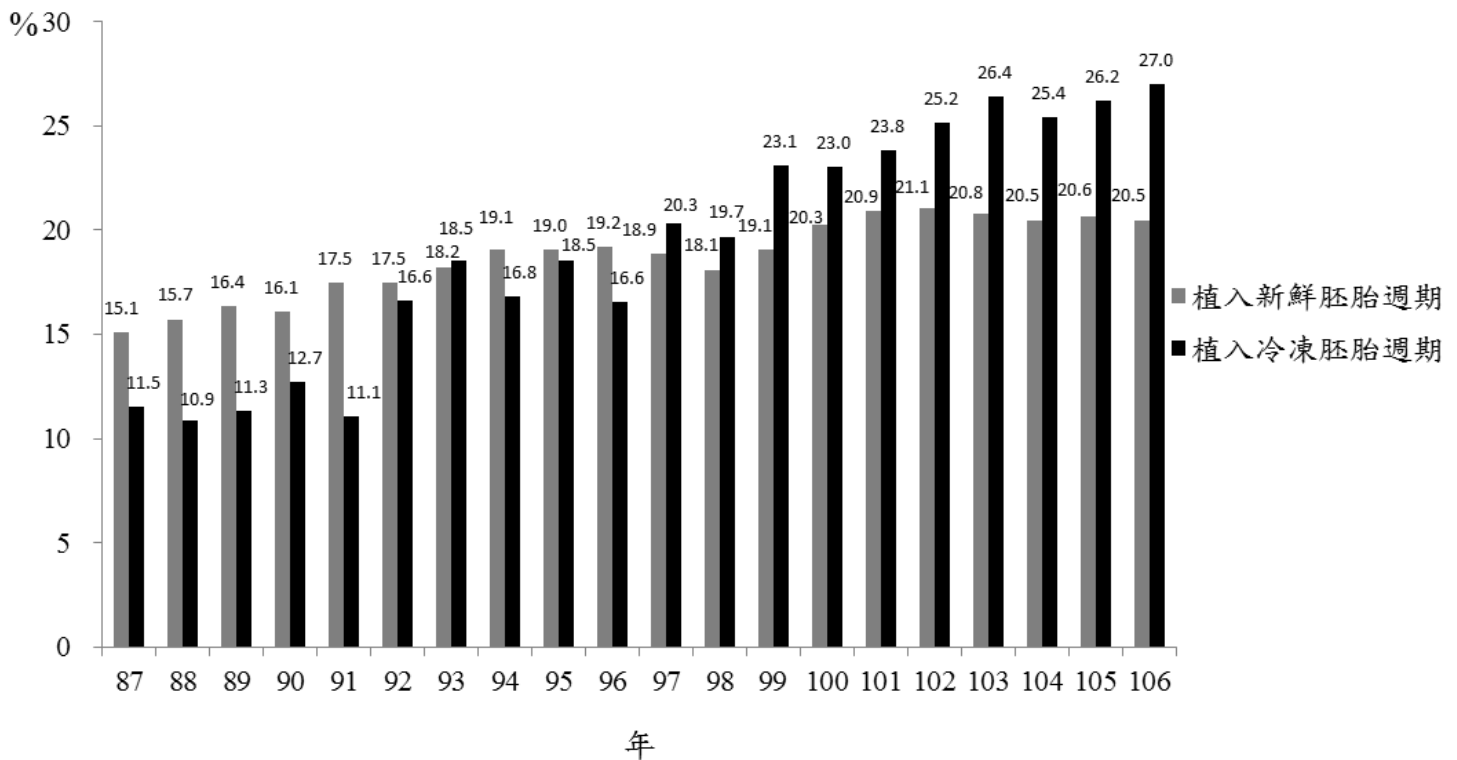
植入新鮮胚胎的活產率由 87 年 26.2% 提高到 94 年為 31.2% 後呈現波動趨勢，106 年為 27.2%。植入冷凍胚胎的活產率在前幾年呈現波動趨勢，但 92 年以後有明顯的提高，106 年為 36.1%。98 年以後植入冷凍胚胎之活產率皆高於植入新鮮胚胎之活產率(圖 23)。

圖 23 87 年至 106 年植入新鮮胚胎與冷凍胚胎之植入週期活產率



植入新鮮胚胎的單胎率自 87 年以來，每年幾乎呈現上升趨勢，87 年為 15.1%，106 年達 20.5%；而植入冷凍胚胎的單胎率，在 93 年明顯增加為 18.5%，106 年為 27.0%。97 年以後，植入冷凍胚胎之單胎率皆高於植入新鮮胚胎之單胎率（圖 24）。

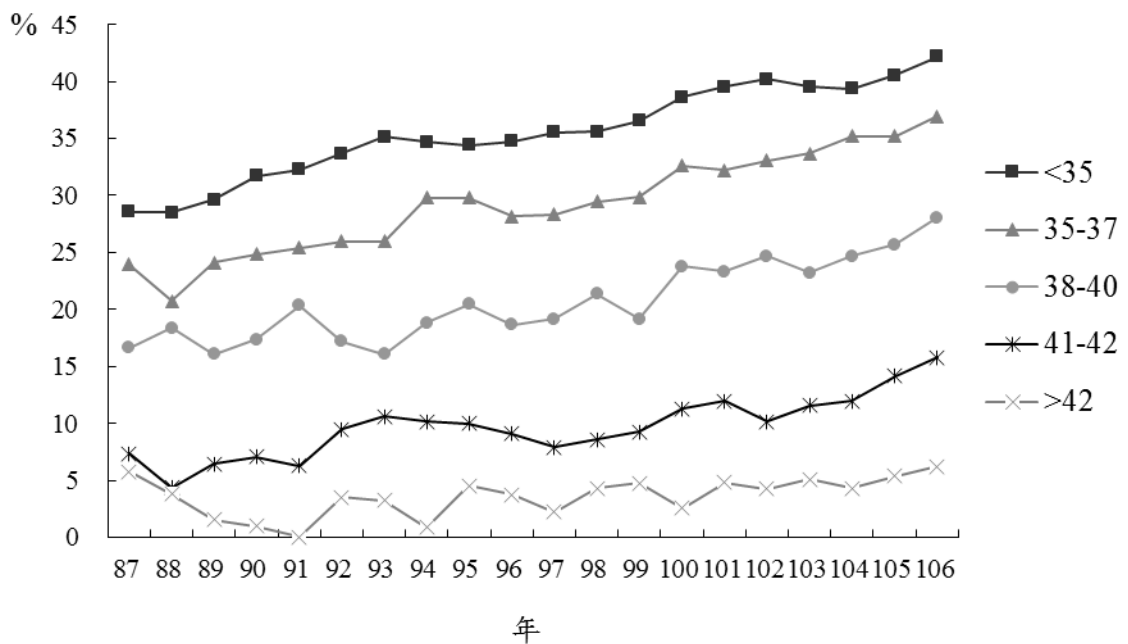
圖 24 87 年至 106 年植入新鮮胚胎與冷凍胚胎之植入週期單胎率



第三節、各年齡層之植入週期成功率趨勢

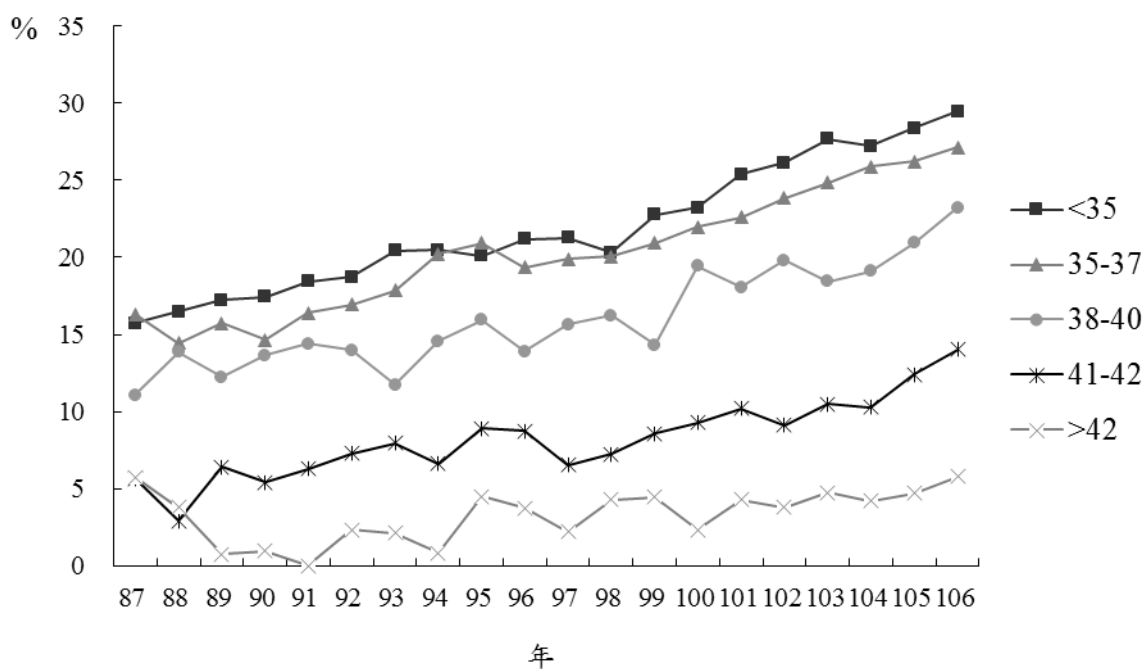
植入週期活產率使用捐贈卵子會受捐贈者年齡影響，所以僅分析配偶間人工生殖之植入週期活產率。受術妻在未滿 35 歲者之植入週期活產率由 87 年的 28.5% 提高到 106 年的 42.2%，同樣的時期，35 到 37 歲年齡層提高 13.1 個百分點，於 38 到 40 歲提高 11.5 個百分點，於 41 到 42 歲提高 6.9 個百分點，而年齡大於 42 歲之受術妻則提高 0.5 個百分點(圖 25)。

圖 25 87 年至 106 年使用配偶間精卵之植入週期活產率 (為受術妻年齡層區分)



受術妻年齡在未滿 35 歲者之植入單胎率由 87 年的 15.7% 提高到 106 年的 29.5%。同樣的時期，植入週期單胎率在 35 到 37 歲年齡層提高 10.9 個百分點，於 38 到 40 歲提高 12.1 個百分點，於 41-42 歲提高 8.4 個百分點，而在年齡大於 42 歲之受術妻則提高 0.1 個百分點(圖 26)。

圖 26 87 年至 106 年使用配偶間精卵之植入週期單胎率 (為受術妻年齡層區分)

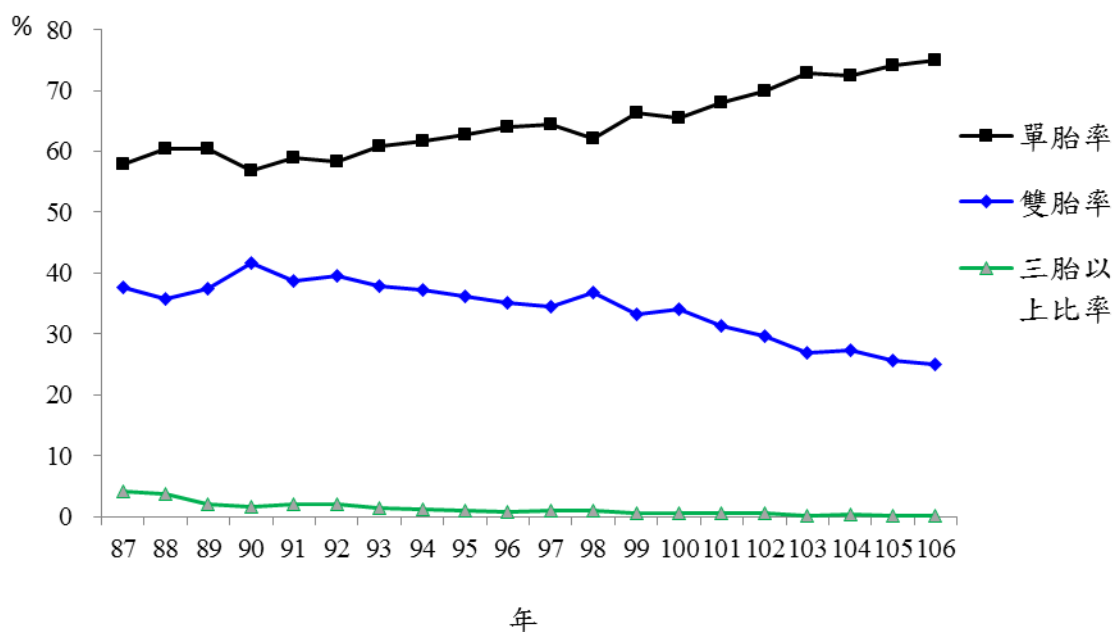


第四節、活產週期胎數百分比

單胎率是測量成功率很重要的一項指標，因為單胎生產比多胞胎生產有較低的危險性，包括早產、低體重兒、先天性缺陷以及死亡等。為了有效輔導人工生殖機構減少多胞胎率，本署於 103 年將「未滿 35 歲之植入 2 個以下胚胎之比率」納入人工生殖機構許可監測指標之一。

人工生殖治療之活產週期中，單胎率從 87 年的 58% 上升到 106 年的 74.9%；而雙胞胎及三胞胎以上比率則從 87 年的 37.7% 及 4.2%，下降至 106 年的 25.0% 及 0.1% (圖 27)。

圖 27 87 年至 106 年活產週期胎數百分比



附錄 1 106 年人工生殖統計摘要

概廓

人工生殖方法		施術過程		不孕原因	
IVF/ET	99%	使用 ICSI	45%	輸卵管因素	9%
GIFT	<1%	無刺激排卵	20%	卵巢因素	29%
ZIFT/TET	<1%			子宮內膜異位症	4%
AID	<1%			其他子宮因素	4%
IVF/ET+GIFT	<1%			其他女性因素	5%
				男性因素	12%
				多種因素	33%
				不明原因	4%

懷孕成功率

週期類型	女性年齡			
	<35	35-37	38-40	>40
人工生殖之新鮮胚胎				
治療週期數	5,912	5,224	5,176	6,001
懷孕週期百分比	18.0	17.4	13.8	6.4
活產週期百分比	14.5	13.2	9.0	3.2
植入週期數	2,270	2,087	1,952	1,819
植入週期之懷孕率	46.8	43.7	36.6	21.2
植入週期之活產率	37.9	33.1	24.0	10.7
植入週期之單胎活產率	26.9	24.2	19.5	9.2
取消百分比	62.5	61.0	63.6	71.2
平均植入胚胎數	2.2	2.4	2.7	2.7
活產週期之多胞胎百分比	29.0	26.8	18.6	13.8
人工生殖之冷凍胚胎				
治療週期數	5,047	4,164	3,209	3,116
懷孕週期百分比	53.6	49.7	43.8	32.2
活產週期百分比	43.3	38.6	30.9	21.1
植入週期數	4,900	4,051	3,098	3,006
植入週期之懷孕率	55.2	51.1	45.4	33.4
植入週期之活產率	44.6	39.7	32.0	21.9
植入週期之單胎活產率	31.1	29.0	26.3	18.3
取消百分比	2.9	2.7	3.5	3.5
平均植入胚胎數	2.0	2.2	2.3	2.4
活產週期之多胞胎百分比	30.2	26.9	17.7	16.6

非捐贈卵子之新鮮胚胎	<35	35-37	38-40	>40
治療週期數	5,727	5,108	5,058	5,471
懷孕週期百分比	18.2	17.5	13.9	5.9
活產週期百分比	14.7	13.3	9.0	2.6
植入週期數	2,240	2,063	1,930	1,722
植入週期之懷孕率	46.6	43.3	36.3	18.7
植入週期之活產率	37.5	32.8	23.6	8.2
植入週期之單胎活產率	26.7	24.2	19.4	7.3
取消百分比	61.8	60.5	63.1	69.8
平均植入胚胎數	2.2	2.4	2.7	2.7
活產週期之多胞胎百分比	28.9	26.3	17.8	10.6

非捐贈卵子之冷凍胚胎	<35	35-37	38-40	>40
治療週期數	4,784	4,032	3,006	2,098
懷孕週期百分比	53.3	49.2	43.0	24.2
活產週期百分比	43.0	38.1	30.0	13.3
植入週期數	4,640	3,924	2,900	2,006
植入週期之懷孕率	55.0	50.6	44.6	25.3
植入週期之活產率	44.4	39.2	31.1	14.0
植入週期之單胎活產率	30.7	28.7	25.8	12.6
取消百分比	3.0	2.7	3.5	4.4
平均植入胚胎數	2.0	2.2	2.4	2.6
活產週期之多胞胎百分比	30.9	26.7	17.0	9.6

非捐贈精子之新鮮胚胎	<35	35-37	38-40	>40
治療週期數	5,837	5,168	5,139	5,969
懷孕週期百分比	18.0	17.4	13.8	6.4
活產週期百分比	14.6	13.2	9.1	3.3
植入週期數	2,243	2,060	1,936	1,807
植入週期之懷孕率	46.8	43.6	36.6	21.3
植入週期之活產率	37.9	33.1	24.1	10.8
植入週期之單胎活產率	26.9	24.2	19.6	9.3
取消百分比	62.3	61.1	63.6	71.2
平均植入胚胎數	2.2	2.4	2.7	2.7
活產週期之多胞胎百分比	28.9	26.8	18.7	13.8

非捐贈精子之冷凍胚胎	<35	35-37	38-40	>40
治療週期數	4,955	4,111	3,174	3,089
懷孕週期百分比	53.6	49.6	43.7	32.4
活產週期百分比	43.3	38.6	30.8	21.3
植入週期數	4,812	3,998	3,064	2,985
植入週期之懷孕率	55.2	51.1	45.3	33.6
植入週期之活產率	44.6	39.6	31.9	22.0
植入週期之單胎活產率	31.2	29.0	26.3	18.4
取消百分比	2.9	2.7	3.5	3.4
平均植入胚胎數	2.0	2.2	2.3	2.4
活產週期之多胞胎百分比	30.0	26.8	17.6	16.6

配偶間之新鮮胚胎	<35	35-37	38-40	>40
治療週期數	5,652	5,052	5,021	5,439
懷孕週期百分比	18.2	17.4	13.9	5.9
活產週期百分比	14.7	13.2	9.0	2.6
植入週期數	2,213	2,036	1,914	1,710
植入週期之懷孕率	46.5	43.3	36.4	18.8
植入週期之活產率	37.6	32.8	23.7	8.2
植入週期之單胎活產率	26.7	24.2	19.4	7.4
取消百分比	61.6	60.6	63.2	69.8
平均植入胚胎數	2.2	2.4	2.7	2.7
活產週期之多胞胎百分比	28.9	26.3	17.9	10.6

配偶間之冷凍胚胎	<35	35-37	38-40	>40
治療週期數	4,692	3,979	2,971	2,071
懷孕週期百分比	53.4	49.2	42.9	24.4
活產週期百分比	43.1	38.1	29.9	13.5
植入週期數	4,552	3,871	2,866	1,985
植入週期之懷孕率	55.0	50.6	44.5	25.5
植入週期之活產率	44.4	39.1	31.0	14.1
植入週期之單胎活產率	30.8	28.7	25.8	12.7
取消百分比	3.0	2.7	3.5	4.2
平均植入胚胎數	2.0	2.2	2.4	2.6
活產週期之多胞胎百分比	30.6	26.6	16.9	9.7

所有年齡合計

捐贈卵子	新鮮胚胎	冷凍胚胎
植入週期數	173	1,585
植入週期之活產週期百分比	57.8	41.8
平均植入胚胎數	1.8	1.8

捐贈精子	新鮮胚胎	冷凍胚胎
植入週期數	82	196
植入週期之活產率	25.6	37.8
平均植入胚胎數	2.4	2.0

配偶間	新鮮胚胎	冷凍胚胎
植入週期數	7,873	13,274
植入週期之活產率	26.6	35.4
平均植入胚胎數	2.5	2.2

植入胚胎數及活產單胞胎率

	植入胚胎數			
	1	2	3	4
35歲以下				
植入週期數	1,226	4,594	1,141	206
植入週期懷孕率	47	55	48	47
胎心音單胞胎率	90	62	56	58
活產單胞胎率	98	66	61	58
35-37歲				
植入週期數	999	3,024	1,654	461
植入週期懷孕率	41	52	47	47
胎心音單胞胎率	91	63	61	56
活產單胞胎率	99	69	70	60
38-40歲				
植入週期數	892	1,779	1,460	919
植入週期懷孕率	38	45	41	42
胎心音單胞胎率	83	69	63	66
活產單胞胎率	98	81	76	79
40歲以上				
植入週期數	990	1,653	1,085	1,097
植入週期懷孕率	31	34	24	24
胎心音單胞胎率	85	64	58	65
活產單胞胎率	97	77	78	90

通報資料之人工生殖機構數：84

附錄 2 106 年個別人工生殖機構統計資料

縣市	機構名稱	治療週期數	人工生殖方法(%)			不孕原因(%)				
			IVF 體外受精	ICSI (含 IVF+ICSI) 卵質內 精子注射	其他	輸卵管 因素	其他女 性因素	男性 因素	多種 因素	不明 原因
基隆市	健安婦產科診所	367	76.6	23.4	0.0	26.2	40.8	16.3	12.3	4.4
臺北市	國立臺灣大學醫學院附設醫院	1,424	36.2	42.8	21.0	7.3	27.7	13.1	42.5	9.4
	長庚醫療財團法人台北長庚紀念醫院	276	33.7	66.3	0.0	1.1	12.0	0.7	86.2	0.0
	臺北榮民總醫院	1,554	88.0	11.9	0.1	11.3	46.3	23.4	11.3	7.7
	國防醫學院三軍總醫院	152	52.6	47.4	0.0	15.8	28.3	13.8	42.1	0.0
	台灣基督長老教會馬偕醫療財團法人馬偕紀念醫院	919	54.0	46.0	0.0	7.1	23.4	23.1	14.4	32.0
	國泰醫療財團法人國泰綜合醫院	252	43.3	56.7	0.0	15.5	62.3	8.7	13.5	0.0
	中山醫療社團法人中山醫院	361	40.7	13.3	46.0	7.5	26.0	7.2	48.5	10.8
	新光醫療財團法人新光吳火獅紀念醫院	227	51.5	48.5	0.0	19.8	34.0	12.3	23.8	10.1
	基督復臨安息日會醫療財團法人臺安醫院	346	82.1	17.9	0.0	0.6	72.8	13.3	11.0	2.3
	臺北醫學大學附設醫院	2,430	39.6	60.3	0.0	11.1	61.4	12.4	15.1	0.0
	劉志鴻婦產科診所	630	95.2	4.8	0.0	7.9	61.2	12.1	18.3	0.5
	生泉婦產科診所	204	64.2	35.8	0.0	21.6	48.0	15.2	6.4	8.8
	臺北市立萬芳醫院-委託財團法人臺北醫學大學辦理	197	56.9	43.1	0.0	21.3	49.3	8.1	9.1	12.2
	宏孕診所	461	19.7	80.3	0.0	4.1	49.3	8.2	30.4	8.0
	臺北市立聯合醫院忠孝院區	92	12.0	56.5	31.5	6.5	34.8	3.3	38.0	17.4
	祈新婦產科診所	387	53.5	46.5	0.0	0.0	65.3	1.6	29.2	3.9
	愛群婦產科診所	1,497	33.8	32.9	33.3	7.0	35.4	12.4	41.1	4.1
	黃建榮婦產科診所	1,110	80.1	19.9	0.0	14.1	35.7	14.9	24.2	11.1
王家瑋婦產科診所	2,497	44.3	55.7	0.0	17.4	15.0	11.6	56.0	0.0	

縣市	機構名稱	治療週期數	人工生殖方法(%)			不孕原因(%)				
			IVF 體外受精	ICSI (含 IVF+ICSI) 卵質內 精子注射	其他	輸卵管 因素	其他女 性因素	男性 因素	多種 因素	不明 原因
臺北市	生基婦產科診所	74	35.1	40.5	24.3	10.8	62.1	4.1	23.0	0.0
	君蔚婦產科診所	13	7.7	92.3	0.0	15.4	61.5	7.7	15.4	0.0
新北市	醫療財團法人徐元智先生醫藥基金會亞東紀念醫院	254	35.0	65.0	0.0	11.8	34.3	10.6	36.2	7.1
	蔡佳璋婦幼聯合診所	219	63.9	36.1	0.0	8.2	52.1	18.7	19.2	1.8
	衛生福利部雙和醫院	6	66.7	33.3	0.0	16.7	66.6	16.7	0.0	0.0
	佛教慈濟醫療財團法人台北慈濟醫院	107	47.7	52.3	0.0	9.3	35.6	18.7	22.4	14.0
	星孕國際診所	20	35.0	65.0	0.0	10.0	60.0	5.0	25.0	0.0
桃園市	長庚醫療財團法人林口長庚紀念醫院	1281	46.2	53.7	0.1	4.2	37.0	3.6	54.4	0.8
	衛生福利部桃園醫院	122	45.9	8.2	45.9	9.0	39.3	6.6	42.6	2.5
	敏盛綜合醫院	90	53.3	46.7	0.0	30.0	22.2	11.1	21.1	15.6
	宏其婦幼醫院	493	40.2	59.8	0.0	30.6	50.1	19.3	0.0	0.0
	惠生婦產科診所	170	78.8	21.2	0.0	15.9	31.2	15.3	18.2	19.4
新竹市	江婦產科診所	46	52.2	47.8	0.0	8.7	63.1	23.9	4.3	0.0
	送子鳥診所	2,251	58.5	41.5	0.0	0.4	93.6	5.3	0.2	0.5
	國泰醫療財團法人新竹國泰綜合醫院	175	64.6	35.4	0.0	4.6	28.6	36.5	28.0	2.3
	台灣基督長老教會馬偕醫療財團法人新竹馬偕紀念醫院	206	29.6	70.4	0.0	1.9	18.0	36.4	40.8	2.9
	林正凱好孕診所	455	66.8	33.2	0.0	2.4	31.6	10.3	54.4	1.3
新竹縣	東元綜合醫院	14	85.7	14.3	0.0	0.0	42.9	50.0	7.1	0.0
	艾微笑診所	1,402	50.2	49.8	0.0	1.6	38.7	9.4	45.9	4.4
苗栗縣	大千綜合醫院	39	89.7	10.3	0.0	17.9	36.0	12.8	5.1	28.2
臺中市	中國醫藥大學附設醫院	552	10.7	89.3	0.0	10.3	22.1	15.9	41.6	10.1
	中山醫學大學附設醫院	171	35.7	64.3	0.0	0.0	0.6	1.2	97.6	0.6
	茂盛醫院	3,680	49.0	51.0	0.0	9.1	13.3	7.1	70.4	0.1
	臺中榮民總醫院	766	80.8	19.2	0.0	16.6	46.9	17.1	17.1	2.3
	澄清綜合醫院中港分院	35	88.6	11.4	0.0	45.8	37.1	11.4	5.7	0.0

縣市	機構名稱	治療週期數	人工生殖方法(%)			不孕原因(%)				
			IVF 體外受精	ICSI (含 IVF+ICSI) 卵質內 精子注射	其他	輸卵管 因素	其他女 性因素	男性 因素	多種 因素	不明 原因
臺中市	林新醫療社團法人 林新醫院	138	47.8	52.2	0.0	26.1	42.8	15.2	12.3	3.6
	劉忠俊婦產科診所	331	44.4	55.6	0.0	7.9	42.2	11.5	25.1	13.3
	美村婦產科診所	104	26.9	73.1	0.0	12.5	45.3	16.3	22.1	3.8
	謝耀元婦產科診所	33	21.2	78.8	0.0	6.1	84.8	9.1	0.0	0.0
	大新婦產科診所	371	21.8	33.2	45.0	7.3	49.6	5.1	38.0	0.0
	佛教慈濟醫療財團 法人台中慈濟醫院	40	77.5	22.5	0.0	22.5	30.0	20.0	20.0	7.5
	張帆婦產科診所	365	51.0	49.0	0.0	6.0	29.3	11.0	43.8	9.9
	童綜合醫療社團法 人童綜合醫院	46	43.5	54.3	2.2	28.3	56.5	6.5	8.7	0.0
彰化縣	彰化基督教醫療財 團法人彰化基督教 醫院	805	49.1	50.9	0.0	9.1	43.0	17.3	24.5	6.1
	漢銘醫院	12	100.0	0.0	0.0	16.7	75.0	0.0	8.3	0.0
	博元婦產科診所	493	62.9	37.1	0.0	10.5	71.8	11.0	6.7	0.0
	秀傳醫療財團法人 彰濱秀傳紀念醫院	12	58.3	41.7	0.0	24.9	16.7	16.7	16.7	25.0
嘉義市	林裕益婦產科診所	9	88.9	0.0	11.1	11.1	33.4	33.3	0.0	22.2
	戴德森醫療財團法 人嘉義基督教醫院	39	41.0	59.0	0.0	10.3	35.9	12.8	38.4	2.6
	嘉安婦幼診所	80	33.8	66.2	0.0	20.0	47.5	11.2	7.5	13.8
嘉義縣	長庚醫療財團法人 嘉義長庚紀念醫院	18	100.0	0.0	0.0	11.1	11.1	0.0	33.3	44.5
臺南市	國立成功大學醫學 院附設醫院	476	67.0	33.0	0.0	4.0	31.3	19.3	42.9	2.5
	郭綜合醫院	152	68.4	31.6	0.0	5.3	33.6	15.8	36.1	9.2
	許朝欽婦產科診所	129	61.2	38.8	0.0	0.0	54.3	11.6	31.0	3.1
	台灣基督長老教會 新樓醫療財團法人 台南新樓醫院	103	1.0	99.0	0.0	12.6	48.5	1.0	31.1	6.8
	安安婦幼診所	917	83.5	16.4	0.1	11.2	59.3	15.3	14.2	0.0
	奇美醫療財團法人 奇美醫院	567	58.6	41.4	0.0	2.3	8.3	27.7	61.7	0.0
	環馨婦幼醫院	285	1.4	98.6	0.0	15.1	34.7	39.7	10.5	0.0

縣市	機構名稱	治療週期數	人工生殖方法(%)			不孕原因(%)				
			IVF 體外受精	ICSI (含 IVF+ICSI) 卵質內 精子注射	其他	輸卵管 因素	其他女 性因素	男性 因素	多種 因素	不明 原因
高雄市	財團法人私立高雄醫學大學附設中和紀念醫院	297	57.2	42.8	0.0	10.8	74.3	6.4	6.1	2.4
	健新醫院	678	3.8	96.2	0.0	2.2	39.7	10.9	47.2	0.0
	阮綜合醫療社團法人阮綜合醫院	50	68.0	32.0	0.0	16.0	50.0	14.0	10.0	10.0
	高雄榮民總醫院	612	56.9	43.1	0.0	7.8	44.8	6.5	26.0	14.9
	張榮州婦產科診所	19	84.2	15.8	0.0	10.5	84.2	0.0	5.3	0.0
	好韻診所	165	67.3	32.7	0.0	4.2	69.1	10.9	15.8	0.0
	生安婦產小兒科醫院	510	35.7	64.3	0.0	1.0	56.6	1.2	40.4	0.8
	生生不息婦產科診所	375	17.9	82.1	0.0	18.1	43.8	20.5	16.3	1.3
	義大醫療財團法人義大大昌醫院	62	46.8	53.2	0.0	6.5	85.4	8.1	0.0	0.0
	長庚醫療財團法人高雄長庚紀念醫院	654	89.8	10.1	0.2	18.0	36.5	11.9	16.8	16.8
	同喬眼科診所	288	83.7	16.3	0.0	14.2	42.0	16.7	22.6	4.5
義大醫療財團法人義大醫院	85	10.6	89.4	0.0	1.2	17.6	2.4	76.4	2.4	
屏東縣	屏基醫療財團法人屏東基督教醫院	34	79.4	20.6	0.0	23.5	14.7	0.0	61.8	0.0
宜蘭縣	醫療財團法人羅許基金會羅東博愛醫院	27	11.1	88.9	0.0	14.8	14.8	3.7	66.7	0.0
花蓮縣	佛教慈濟醫療財團法人花蓮慈濟醫院	93	28.0	26.9	45.2	26.9	23.7	29.0	11.8	8.6
金門縣	衛生福利部金門醫院	351	42.2	57.8	0.0	3.1	95.5	1.4	0.0	0.0

CHAPTER 1 Overview

The Assisted Reproduction Act (ARA) was promulgated and implemented on March 21, 2007 with the aim to perfect the development of assisted reproduction technology (hereinafter referred to the “ART”) and to safeguard the rights of infertile couples, children born under assisted reproduction and donors, as well as to uphold public ethics and health. According to the provisions of Article 27 of the ARA, assisted reproduction institutions are obliged to report relevant information regarding the number of recipient patients undergoing treatment, success rates, causes of infertility, and the ART adopted. The competent authority shall establish an assisted reproduction database and periodically conduct statistical analyses as well as publish updated data accordingly.

Relevant laws and regulations governing the management of the practices and database of assisted reproduction in Taiwan has been gradually formulated since 1995. By early 1998, a total of 48 assisted reproduction institutions were established in Taiwan; by April, 2019, the number of licensed medical institutions had reached 85 in total. In accordance with the provisions of the ARA, these medical institutions are required to apply for approval from the competent authority to engage in ART practices and provision of acceptance, storage and provision of donated gametes. In order to maintain the quality of ART performed in medical institutions, the Health Promotion Administration, Ministry of Health and Welfare (hereinafter referred to the “HPA”) regularly carries out permit reviews on all licensed assisted reproduction institutions.

This report focuses on the statistical analysis of cases that had been treated in 84 assisted reproductive institutions in Taiwan (2017). Chapter 1 briefly introduces the definitions of assisted reproductive methods and treatment cycles. Chapter 2 presents the statistics for all treatment cycles, including data from nondonor gametes and embryos as well as sperm/eggs recipients. Chapter 3 conducts an analysis of data from nondonor gametes and embryos. Chapter 4 presents an analysis of the trends in the ART practices from 1998-2017.

Section 1 Assisted Reproduction Treatment Cycles

As the process of assisted reproduction comprises a series of steps which need a period of around two weeks or more to complete, using “cycle” as the unit will be more appropriate than a single time point in analyzing the data. In the course of statistical analysis conducted under such calculation, a particular couple receiving assisted reproductive treatment may contribute more than one cycle.

The calculation of a cycle begins when ovarian stimulation is initiated or when an examination for embryo transfer is conducted. Its goal is to enable birth of healthy infants smoothly. Even though not all treatment cycles are successful and continue to give birth, they will still be included in the statistics of treatment cycles.

Section 2 Assisted Reproductive Technology

This section delves into several assisted reproductive methods and micromanipulation techniques used in ART.

I. Assisted Reproduction Methods

1. IVF/ET : In Vitro Fertilization and Embryo Transfer, generally referred to as test tube babies.
Its process consists of extracting eggs and sperm and developing them to an early embryo stage in vitro, and then transferring the embryos into the uterus through the uterine cervix.
2. GIFT: Gamete Intra-fallopian Transfer.
Placing sperm with the extracted eggs back into the fallopian tube by laparoscopy and fertilizing them by in vivo fertilization.
3. ZIFT/TET: Zygote Intra-fallopian Transfer/Tubal Embryo Transfer.
Sperm and eggs are fertilized in vitro and then transferred back into the fallopian tube to enable the zygote or embryo to be naturally transferred from the fallopian tube to the uterus for implantation.
4. AID: The Artificial Insemination by Using Donor’s Sperm.
Inject the donor’s sperm directly into the uterus.

II. Micromanipulation Technique

1. ICSI: Intracytoplasmic Sperm Injection.

Fertilizing the egg by injecting a single sperm into the egg cytoplasm.

2. Assisted Hatching.

Thinning or punching a hole on the zona pellucida to assist in the embryo hatching and implantation.

3. Embryo biopsy.

Retrieval of a portion from the outer layer of the embryo to perform genetic diagnosis, chromosome screening or other tests for embryo transfer reference.

The stipulation of Article 5 of the ARA does not apply to cases of Assisted Insemination Using Husband's Semen, except for the provisions prohibiting the embryo's gender selection and relevant penalties listed in Paragraph 3, Article 16 of the ARA. As the practice of AIH treatment is not limited to assisted reproduction institutions, these case data are not required to be reported. Hence, the term "assisted reproduction case" stated in this paper and all analytical data does not include assisted reproduction cases using the AIH procedure.

CHAPTER 2 Overall ART Cycle Statistics

The data collection period listed in this paper is based on the time point at which each cycle begins. All data compiled for analysis came from the regular data reported by the 84 assisted reproduction institutions of Taiwan in the year 2017.

Section 1 The Number of Treatment Cycles

34,877 cycles used nondonor gametes and embryos (92.1%), and 2,972 cycles used donated sperm and eggs. A total of 37,849 cycles (including the cycles of incomplete egg retrieval or transfer) were conducted in 2017 (Table 1); among which, the age distribution of the recipient women using the donated egg is shown in Table 2.

Table 1 ART Cycles in 2017

Type of Cycle	Number of ART Cycles	Unit: Cycle
Use of Donated Sperm and Eggs	2,972	
Use of Donor Sperm		407
Use of Donor Eggs		2,565
Use of Nondonor Sperm, Eggs or Embryos	34,877	
Total ART Cycles	37,849	

Table 2 Age-Specific Recipient Women Using Donated Eggs in ART in 2017

Age of Recipient Women	The Number of Treatment Cycles	Percentage	Unit: Cycle/%
<25	1	0.1	
25-29	114	4.4	
30-34	333	13.0	
35-39	450	17.5	
40-44	748	29.2	
45-49	749	29.2	
≥50	170	6.6	
Treatment Cycles of Using Donated Eggs	2,565	100.0	

Section 2 Ages of Women Receiving ART

The largest group of women receiving ART were between 35 to 39 years of age, accounting for 40% of all ART cycles performed in 2017 (Table 3), among which women of age 35 had received the most ART cycles, accounting for 8.6% of the total ART cycles, followed by 8.2% in women of age 37.

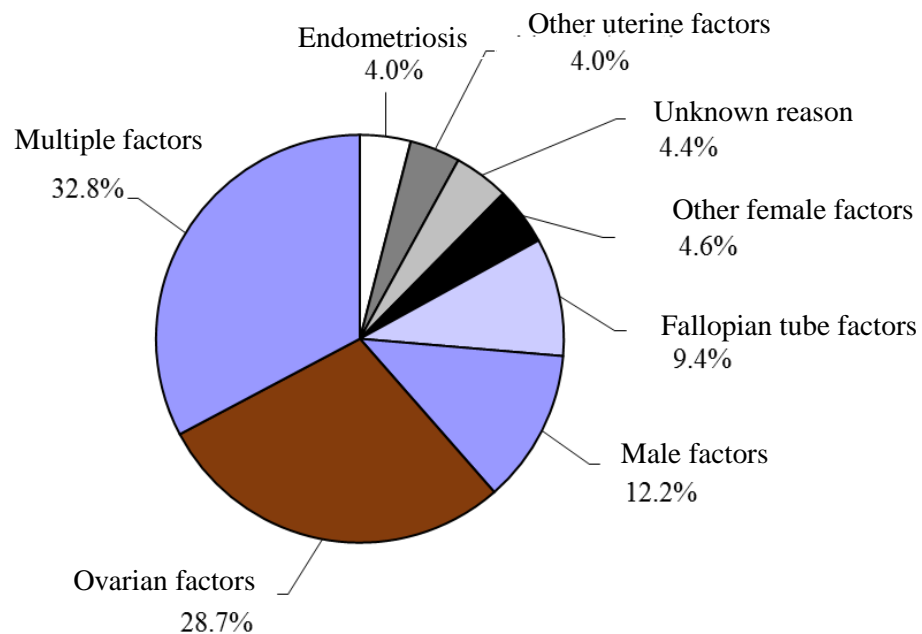
Table 3 Age-Specific Recipient Women in ART in 2017

Age of Recipient Women	The Number of Treatment Cycles	Percentage
<25	129	0.3
25-29	1,806	4.8
30-34	9,024	23.8
35-39	15,130	40.0
40-44	9,557	25.3
45-49	1,986	5.2
>50	217	0.6
ART Cycles	37,849	100.0

Section 3 Causes of Infertility

The causes of infertility in ART cases may be congenital, acquired or from the external environment. Figure 1 shows the causes of infertility, among which multiple factors occupies the highest proportion, accounting for 32.8% of all infertility cases, followed by 28.7% from ovarian factors ranking as second and 12.2% from male factors ranking as third.

Figure 1 Causes of Infertility in ART in 2017 (Parameter: 37,849 treatment cycles)



Section 4 Types of ART Used

Among the types of ART used, the most popular procedure was the IVF method, accounting for 99.96% of the total. Other methods such as GIFT, ZIFT/TET, and AID did not exceed 1% of the total. Since IVF is the most commonly used ART procedure, treatment conditions and pregnancy outcomes of IVF treatment cases using nondonor eggs, sperm or embryos will be presented in Section 2 of Chapter 3.

Section 5 Micromanipulation Technique

The micromanipulation technique was applied to 76.2% of the 37,849 ART cycles performed (Table 4). The correlation between pregnancy/live birth rates and ICSI micromanipulation technique is further discussed in Section 7.

Table 4 Status of Micromanipulation Technique Application in ART Case Cycles in 2017

Cases Using Micromanipulation	The Number of Treatment Cycles	Unit: Cycle/%
		Percentage
Procedure applied	28,846	76.2
Intracytoplasmic sperm injection (ICSI)	16,983	44.9
Assisted Hatching	9,641	25.5
Preimplantation genetic screening (PGS)	1,460	3.9
Preimplantation genetic diagnosis (PGD)	111	0.3
Other	651	1.7
Procedure not applied	9,003	23.8
Total ART Cycles	37,849	100.0

Section 6 The Number of Transfer Cycles and Embryos Transferred

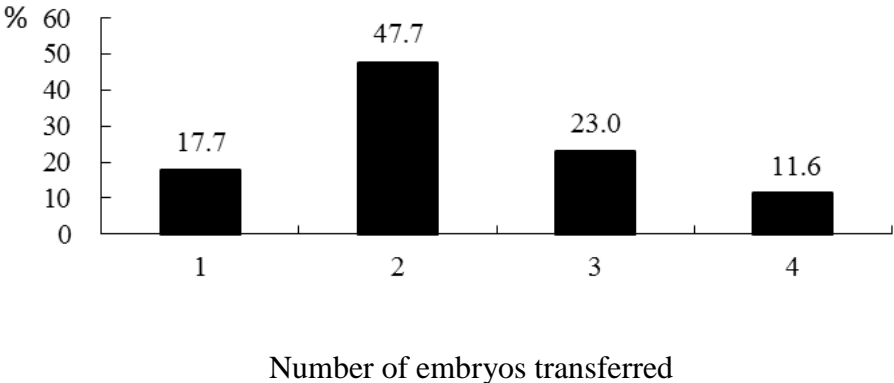
The number of assisted reproductive transfer cycles was 23,183, among which 34.0% were fresh embryos formed from nondonor sperm and eggs, 57.2% used frozen embryos formed from nondonor sperm and eggs, 1.1% used fresh embryos formed from donated sperm or eggs, and 7.7% used frozen embryos formed from donated sperm or eggs. (Table 5)

Table 5 Percentage of Transfer Type in ART in 2017

Transfer Type	Transfer Cycles	Unit: Cycle/%
		Percentage
Using nondonor embryo	Fresh	7,873
	Frozen	13,274
Using embryo formed from donated sperm or eggs	Fresh	255
	Frozen	1,781
All Transfer Cycles	23,183	100.0

In order to provide guidance for ART institutions to avoid transferring too many embryos which may increase the probability of twins or multiple births that not only generates an economic burden on the family but also affects the social structure, the government promulgated and implemented the ARA in 2007 which specifically limits the maximum number of embryos transferred to be four in each ART. The Act further defines pertinent penalty provisions for the violation of such law. In addition, because the risk of multiple pregnancy is higher than that of singleton and considering the safety of mothers and children, Regulations for Assisted Reproduction Institution Permit was revised to include “The ratio of women under the age of 35 who have had less than two embryos implanted within current permit period” into the monitoring index in 2014. Assisted reproductive treatment cycle transferred two or less embryos accounted for 65.4% of all transferred embryo cycles in 2017 (63.7% in 2016 and 60.3% in 2015) (Fig. 2).

Figure 2 Percentage of Number of Embryos Transferred in ART Cycles in 2017
(Parameter: 23,183 embryo transfer cycles)

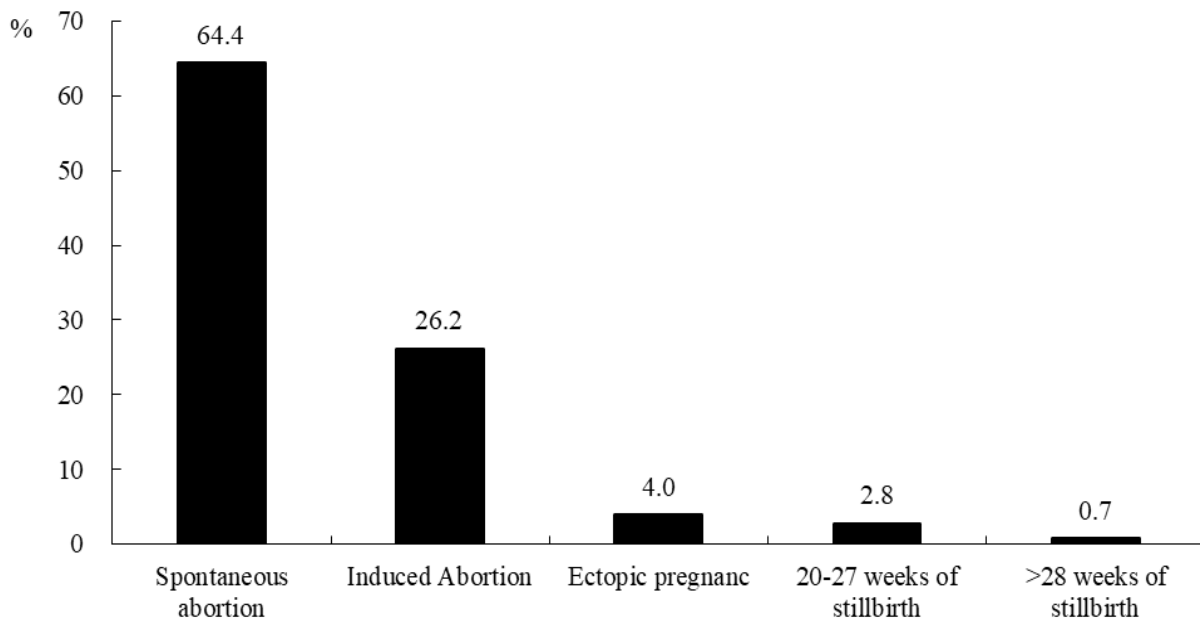


Section 7 Status of Pregnancy and Live Births

Of 37,849 ART cycles in 2017, 23,183 cycles were performed with transfer at least one embryo, 10,255 cycles successfully led to pregnancy of which 7,654 cycles resulted in live births. A total of 9,590 infants were born (partial cycles were multiple births) with an increase of 602 infants born compared to 2016.

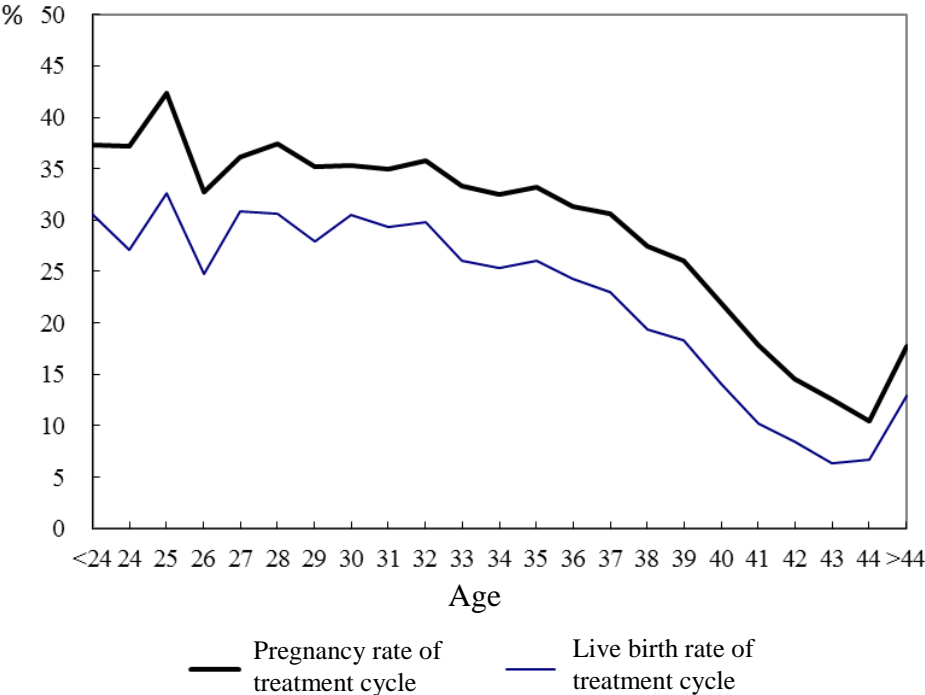
In the 2,601 cycles of pregnancy with no live birth, 1,674 cycles were spontaneous abortions (64.4%), 681 cycles were induced abortions (including no fetal heart sound before 20 weeks; 26.2%), 103 cycles were ectopic pregnancy (4.0%), and 91 cycles were stillbirth (3.5%) (a few cycles simultaneously had 2 or more conditions of spontaneous abortion, induced abortion, ectopic pregnancy, and either condition of stillbirth between 20 to 27 weeks or after 28 weeks) (Figure 3).

Figure 3 Analyses on Pregnancy with No Live Birth Cycles of ART in 2017
(Parameter: 2,601 pregnancy with no live birth cycles)



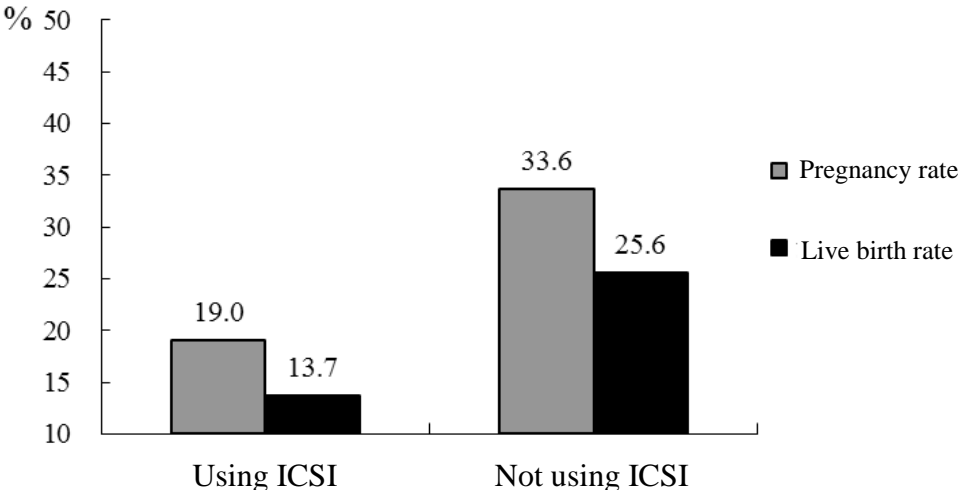
In 2017, the pregnancy rate of ART cycles was 27.1%, while the live birth rate of treatment cycles accounted for 20.2% (Note: When freezing all embryos and frozen-thawed embryo transfer was used, the embryo freezing and thawed embryo transfer were separately counted as 1 treatment cycle, this might have resulted in underestimation of the aforementioned pregnancy and live birth rate). The pregnancy and live birth rates among the age-specific women undergoing ART are shown in Figure 4. As the number of ART cycles in women of “Age less than 24” and “age over 44” were too small, analysis on these two groups was not carried out separately and their data was used in the combined statistical calculations. The pregnancy rates and live birth rates after age 34 seem to decline following the increase in age of the female receiving the treatments.

Figure 4 Correlation between Women’s Age and Pregnancy/Live Birth Rate of ART in 2017
(Parameter: 37,849 treatment cycles)



Regarding the correlation between the usage of micromanipulation technique (ICSI) and both pregnancy rate and live birth rate, the pregnancy rate with and without ICSI usage was 19.0% and 33.6%, respectively whereas the live birth rate with and without the usage of ICSI was 13.7% and 25.6, respectively (Figure 5).

Figure 5 Correlation between the Usage of Micromanipulation Technique (ICSI) and both Pregnancy and Live Birth Rates in ART in 2017
 (The number of treatment cycles using ICSI was 16,983 cycles, and the number of cycles not using ICSI treatment was 20,866 cycles)



This section additionally analyzes the success rate, pregnancy outcomes and related issues of assisted reproduction.

Analysis on seven types of success rates :

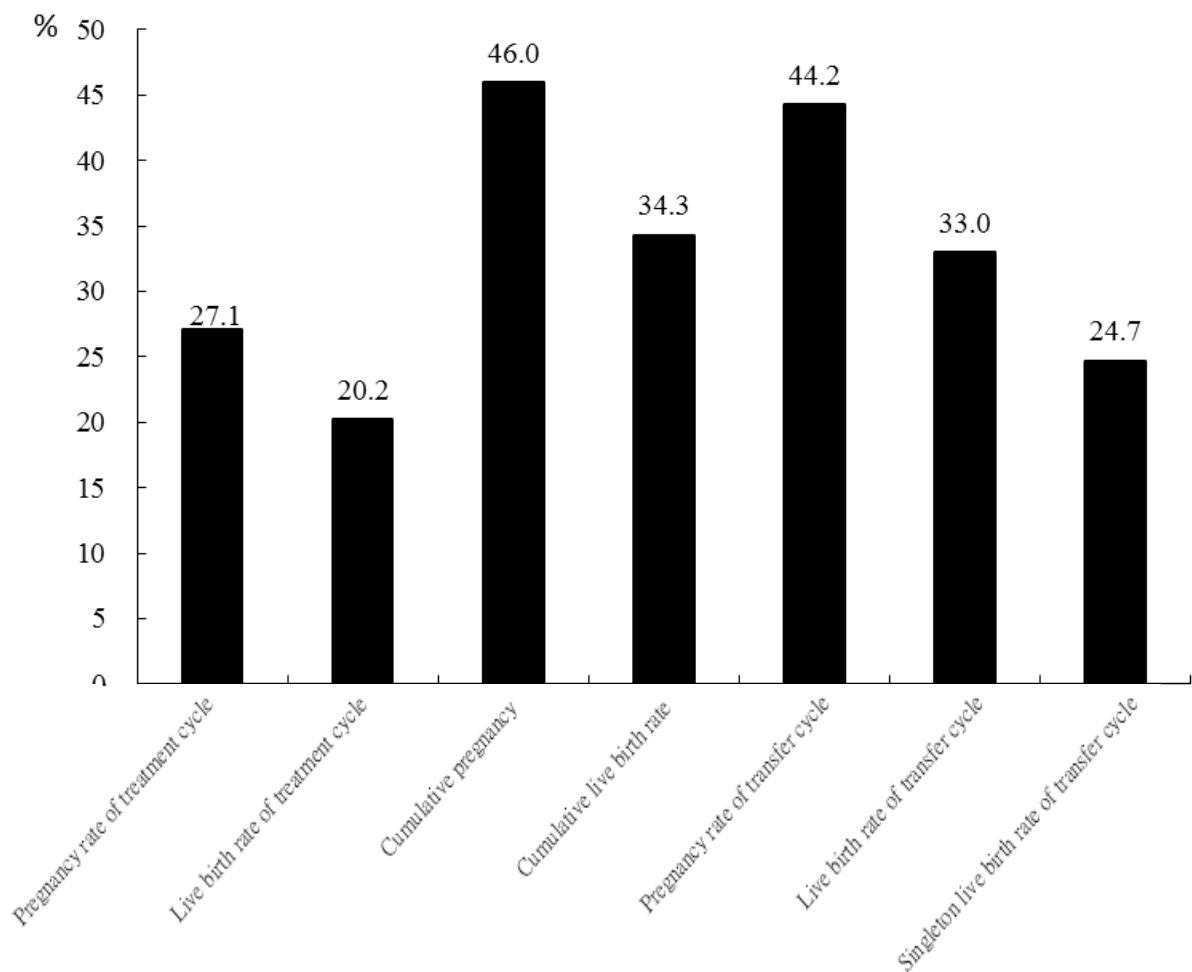
Due to the advancement of ART in recent years, more and more cases were carried out by freezing all embryo, which has increased the number of treatment cycles. However, not all cycles led to the transfer of embryo, and only the cumulative pregnancy rate and the cumulative live birth rate during the treatment cycle can truly reflect the quality of ART.

Figure 6 shows the seven different methods of measuring the success rate of ART, including: pregnancy rate of treatment cycles, live birth rate of treatment cycles, cumulative pregnancy rate, cumulative live birth rate, pregnancy rate of transfer cycle, live birth rate of transfer cycle and the singleton live birth rate of the transfer cycle, which are described as follows:

1. Pregnancy rate of treatment cycle: this rate is generally referred to as the "pregnancy rate." It refers to the percentage of successful pregnancies during the ART cycle. Since some pregnancies resulted into spontaneous abortion, stillbirth, etc., this rate will be higher than the live birth rate for a treatment cycle. The pregnancy rate of treatment cycles was 27.1% in 2017.
2. Live birth rate of treatment cycle: this rate is generally referred to as the "live birth rate", which refers to the percentage of live births during the ART cycle (regardless of whether there are singleton or multiple births, both are considered as only one live birth). This is the ratio that most people care about because it presents the opportunity to get a live birth infant by assisted reproduction. The live birth rate of treatment cycles was 20.2% in 2017.
3. Cumulative pregnancy rate: this rate means the percentage of pregnancy in each egg retrieval cycle; it is calculated as $[\text{number of fresh embryo pregnancy cycles} + \text{number of frozen embryo pregnancy cycles} + \text{number of (fresh embryo + frozen embryo) pregnancy cycles}] \div [\text{the number of fresh embryo treatment cycles} + \text{number of (fresh embryo + frozen embryo) treatment cycles}]$. The cumulative pregnancy rate was 46.0% in 2017.
4. Cumulative live birth rate: refers to the percentage of live births in each egg retrieval cycle (regardless of whether there are singleton or multiple births, both are considered as only one live birth); it is calculated as $[\text{the number of fresh embryo live birth cycles} + \text{the number of frozen embryo live birth cycles} + \text{number of (fresh embryo + frozen embryo) live birth cycles}] \div [\text{number of fresh embryo treatment cycles} + \text{number of (fresh embryo + frozen embryo) treatment cycles}]$. The cumulative live birth rate was 34.3% in 2017, and the cumulative live birth rate in women below 38 years of age was 48.0%.
5. Pregnancy rate of transfer cycle: the percentage of successful pregnancies during the ART transfer cycles. The pregnancy rate of transfer cycles was 44.2% in 2017. Among them, the pregnancy rate of fresh embryo transfer was 37.8%, and the pregnancy rate of frozen embryo transfer was 47.7%.

6. Live birth rate of transfer cycle: the percentage of live birth during the ART transfer cycles. The live birth rate of transfer cycles was 33.0% in 2017, in which the live birth rate of fresh embryo transfer was 27.2%, and the live birth rate of frozen embryo transfer was 36.1%.
7. Singleton live birth rate of transfer cycle: the percentage of singleton live births during the ART transfer cycles. Singleton live birth is an important measure of the success of assisted reproduction techniques, delivery of a single infant has lower risks in terms of neonatal health compared to multiple births, including: preterm birth, low birth weight, birth defects and infant mortality. The singleton live birth rate of transfer cycle was 24.7% in 2017.

Figure 6 Analysis of ART Success Rate in 2017



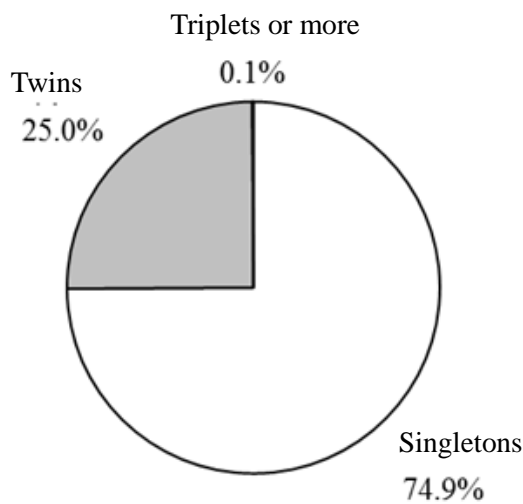
Section 8: Status of New-Born Infants

1. The number of live births

Of the 7,654 live birth cycles, 74.9% were singletons, 25.0% were twins, and 0.1% were triplets or more (one live birth was quadruplets) (Figure 7).

The recipients of ART treatment in 2017 gave birth to a total of 9,590 infants, among which 5,010 were boys and 4,580 were girls.

Figure 7 Percentages of Fetus Numbers of the ART Live Birth Cycles in 2017
(Parameter: 7,654 live birth cycles)



2. Weight and congenital defect

Observing 9,590 live births, birth weight less than 1,500 grams accounted for 3.2%, between 1,500-2,499 grams accounted for 29.4%, and greater than or equal to 2,500 grams accounted for 67.4%; the proportion of infants with apparent congenital defects was 1.1% (Table 6).

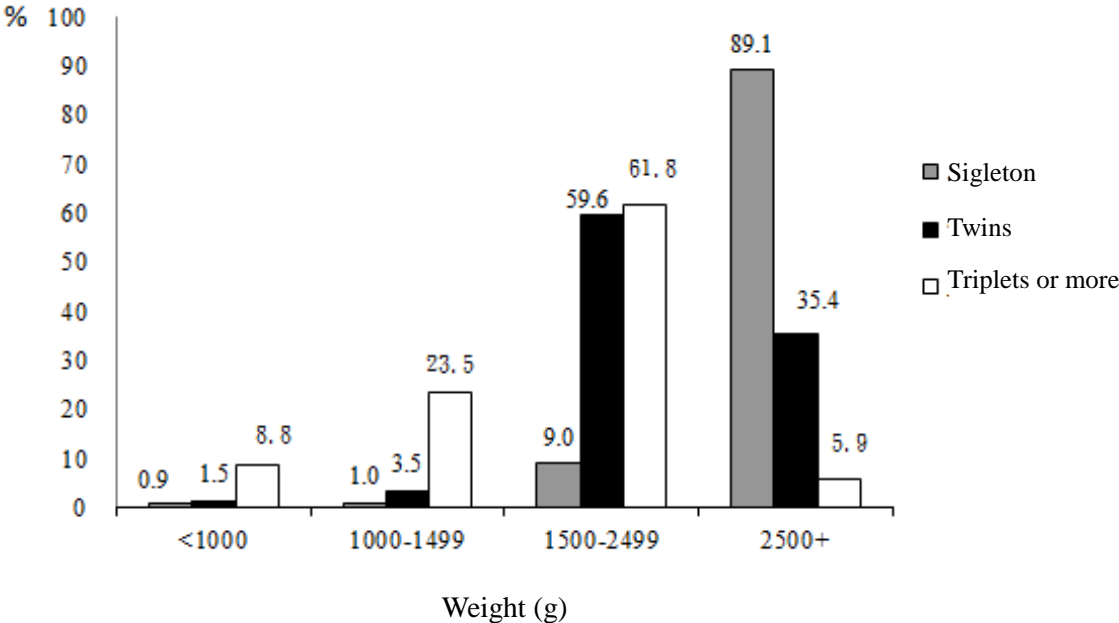
Table 6 Weight and Congenital Defect of ART Born Infants in 2017 (Total live births: 9,590)

Infant status	Number of live births	Percentage
Gender		
Male	5,010	52.2
Female	4,580	47.8
Weight (g)		
<1500 g	309	3.2
1500-2499	2,818	29.4
≥2500	6,463	67.4
Apparent or visible congenital defects	108	1.1

3. Correlation between the number of births (single or multiple) and birth weight

The birth weight of majority of the singletons delivered was more than 2,500 grams, which accounted for 89.1% of all singletons. The largest proportion of twins born were between 1,500 to 2,499 grams, followed by 2,500 grams or more, accounting for 59.6% and 35.4%, respectively. The birthweight of triplets or more born weighing less than 1,000 grams accounted for 8.8%, between 1,000 – 1,499 grams were 23.5%, between 1,500 – 2,499 grams were 61.8% and 2,500 grams and above were 5.9%. Statistical analysis of the results showed a negative correlation between the number of births and the weight of the infant ($P < 0.0001$), that is, the greater the number of births, the more likely it is to deliver low birth weight infants (Figure 8).

Figure 8 Correlation between Number of Births and Birth Weight of Live Birth Cycles in 2017
(Parameter: 9,590 live birth infants)



CHAPTER 3 ART Cycles Using Nondonor Eggs, Sperm, or Embryos

Section 1 Status of ART Cycles Using Nondonor Eggs, Sperm, or Embryos

This section describes the statistics of various treatments for assisted reproduction using nondonor sperm, eggs or frozen embryos (excluding AIH)

1. Age distribution

A total of 34,877 cycles were conducted using nondonor sperm, eggs or frozen embryos, accounting for 92.1% of the total treatment cycles (including assisted reproduction using donated sperm or eggs). The age distribution of women undergoing non-donor ART is shown in Table 7, which is similar to the age distribution of women undergoing all kinds of ART (Table 3 of page 43).

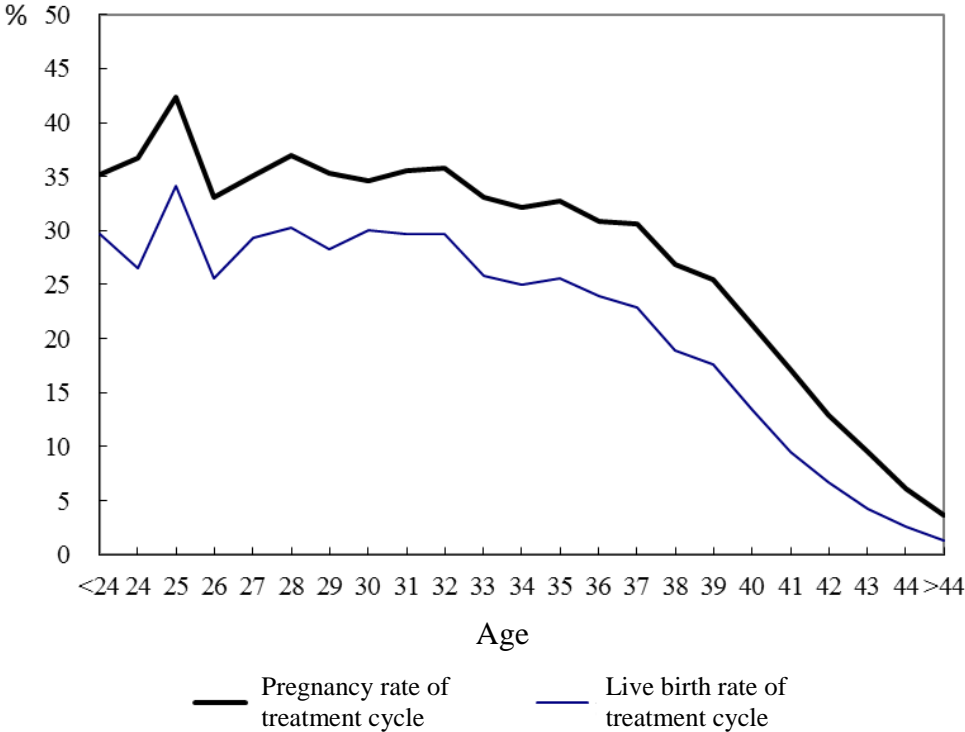
Table 7 Age Distribution of Women Receiving ART Using Nondonor Eggs, Sperm, or Embryos in 2017

Unit: Cycle/%		
Age of Recipient Women	The Number of Treatment Cycles	Percentage
<25	122	0.3
25-29	1,647	4.7
30-34	8,575	24.6
35-39	14,521	41.6
40-44	8,737	25.1
45-49	1,228	3.5
>50	47	0.1
ART Cycle	34,877	100.0

2. The pregnancy rate and live birth rate at different ages

The pregnancy rate and live birth rate of ART cycles using nondonor eggs, sperm or embryos were 26.3% and 19.5%, respectively. (Note: When freezing all embryos and frozen-thawed embryo transfer was used, the embryo freezing and thawed embryo transfer were separately counted as 1 treatment cycle, this might have resulted in underestimation of the aforementioned pregnancy and live birth rate). The correlation between the age of women undergoing ART and both the pregnancy rate and the live birth rate shows that the pregnancy rate and live birth rate of women of age 34 and above decreased as the age increases, and as the number of ART cycles in women of age less than 24 and above 44 were too small, analysis on these two groups was not carried out separately and their data was used in the combined statistical calculations (Figure 9).

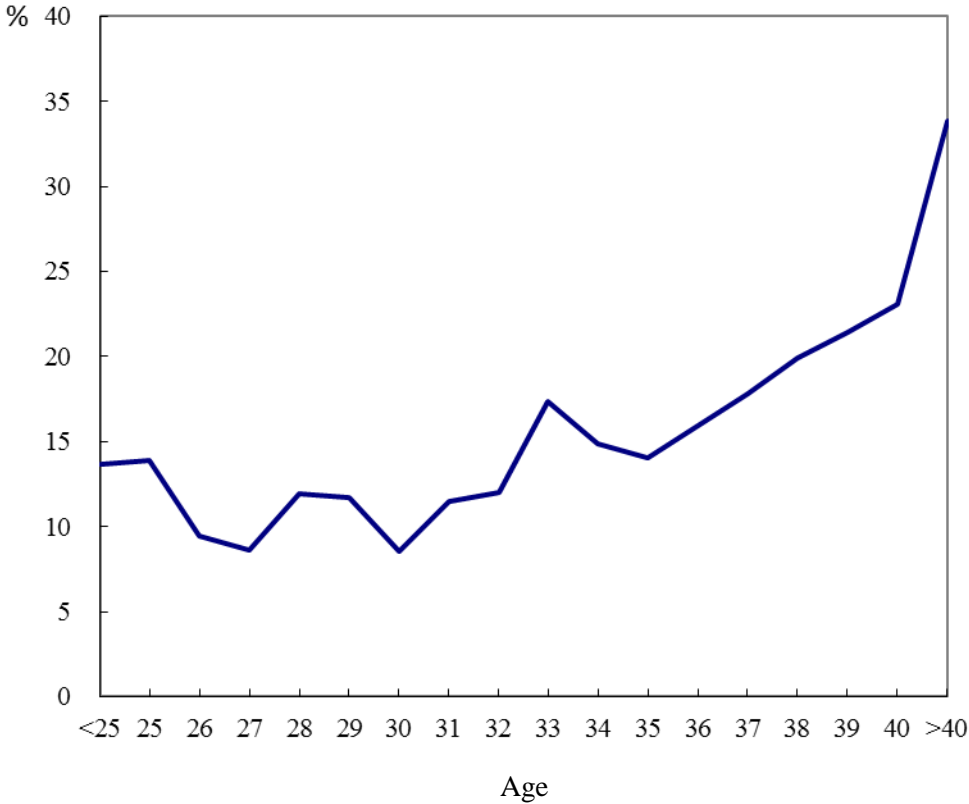
Figure 9 Correlation between Women’s Age and both Rates of Pregnancy and Live Birth of Nondonor ART in 2017
(Parameter: 34,877 treatment cycles)



3. Miscarriage rate

Following a successful pregnancy by nondonor ART transfer cycle, the miscarriage rate of women of age 34 and above increased with age, among which the average miscarriage rate of women of age 40 and above was 33.9% (Figure 10).

Figure 10 Correlation between Age and Miscarriage Rate of the Pregnant Women after ART Using Nondonor Eggs, Sperm, or Embryo in 2017 (Parameter: Number of pregnancy cycles was 9,170 from nondonor ART)



Section 2 Pregnancy and Live Birth Using IVF

This section deals with the analysis on nondonor ART through IVF/ET.

1. Pregnancy rate and live birth rate

A total of 19,939 transfer cycles were conducted using nondonor egg, sperm or embryos, among which 8,551 cycles led to a successful pregnancy and 6,323 cycles resulted into live births, with a pregnancy rate per transfer of 42.9% and live birth rate per transfer of 31.7%. The cumulative live birth rate was 29.9%, and the cumulative live birth rate of women less than 38 years old was 44.0%. The proportion of singletons accounted for 74.8%, twins accounted for 25.1%, and triplets or more accounted for 0.1%.

In addition, when infertility cases due to male factors were excluded in women under the age of 35, the pregnancy rate per transfer, live birth rate per transfer and cumulative live birth rate increased to 51.2%, 40.8% and 46.0%, respectively.

2. The number of embryos transferred and live birth rate

In the 6,323 live birth of the nondonor IVF cycles, 54.4% accounting for the largest proportion of the cycles had two embryos transferred (Fig. 11). In general, the more embryos are transferred, the greater the chances of delivering two or more infants. It was also observed that the live birth rate for two embryos transferred was 36.8% (Fig. 12), but the proportion of multiple births in the live birth cycle was also high reaching 29.4% (Fig. 13).

3. ICSI Micromanipulation Technique

A total of 15,552 cycles (41.1%) used ICSI micromanipulation technique during the IVF treatment cycles. The pregnancy rate in cycles with and without the use of ICSI was 18.9% and 31.1%, respectively. Furthermore, the live birth rate in cycles with and without the use of ICSI was 13.5% and 23.4%, respectively.

Figure 11 The Proportion of Live Birth Distributed across the Number of Embryos Transferred during Nondonor IVF Procedure in 2017.

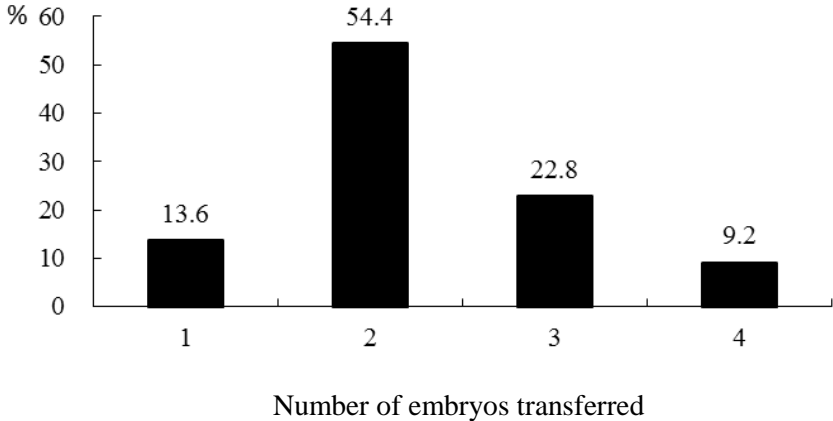


Figure 12 Live Birth Rates of Number of Embryos Transferred during Nondonor IVF Procedure in 2017

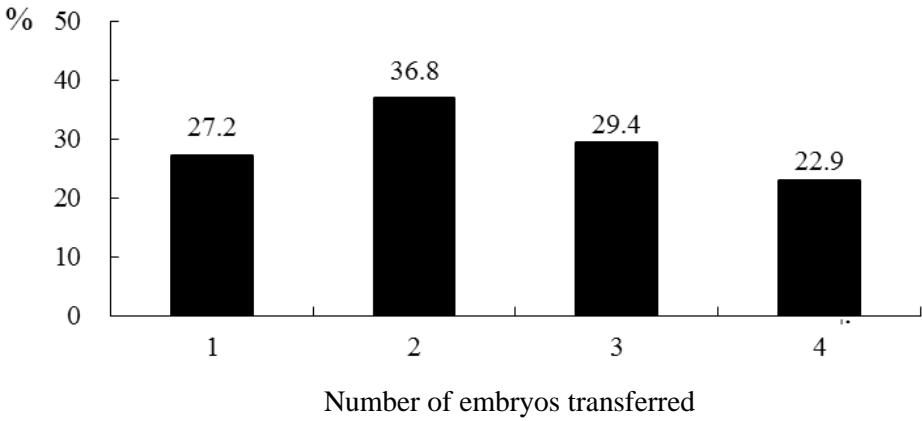
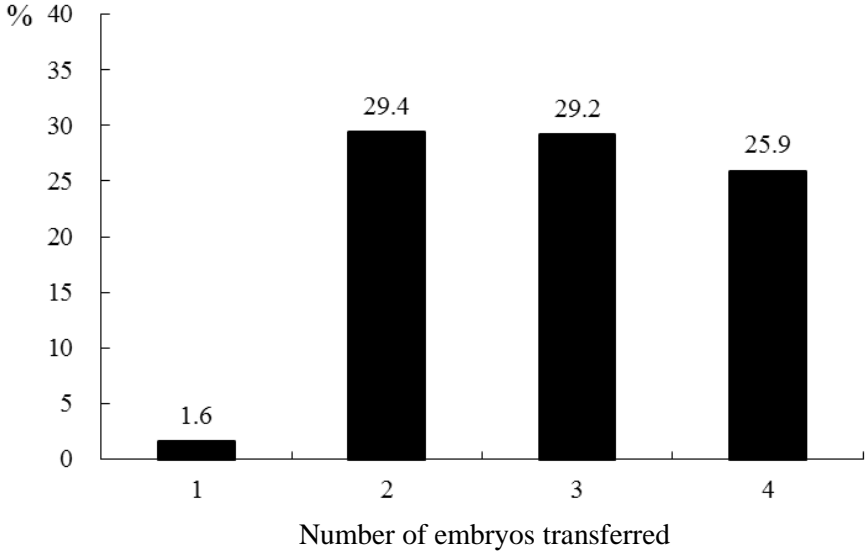


Figure 13 Multiple Birth Rates of Number of Embryos Transferred during Nondonor IVF Procedure in 2017.



Section 3 Fresh and Frozen Embryo Transfer in Nondonor ART

This section compares the ART treatment cycles between the 7,873 fresh embryo transfer cycles and 13,274 frozen embryo transfer cycles. The statistical results showed that the pregnancy rate of fresh and frozen embryo transfer cycles was 37.2% and 47%, respectively, and live birth rate was 26.6% and 35.4%, respectively, and statistical significant difference was found between the two groups in both pregnancy and live birth rates ($P < 0.0001$) (Fig.14).

The pregnancy and live birth rates were evidently seen to be related to the age of the women, especially the significantly lower success rate observed in women over 40 years of age. Age distribution analysis showed that the pregnancy rate of fresh and frozen embryo transfer in women below 35 years of age was 46.5% and 55.0%, respectively, whereas for women above 40 years (41-59 years old) the pregnancy rate for fresh and frozen embryo transfer was only 18.8% and 25.5%, respectively (Figure 15). The live birth rate for fresh embryo transfer in women below 35 years was 37.6%, and decreased to 8.2% in women above 40 years of age; similarly, the live birth rate for frozen embryo transfer decreased from 44.4% in women below 35 years to 14.1% in women above 40 years of age. (Figure 16)

Figure 14 Comparison of the Success Rate between Fresh Embryo and Frozen Embryo Transfer from Nondonor Gametes in 2017

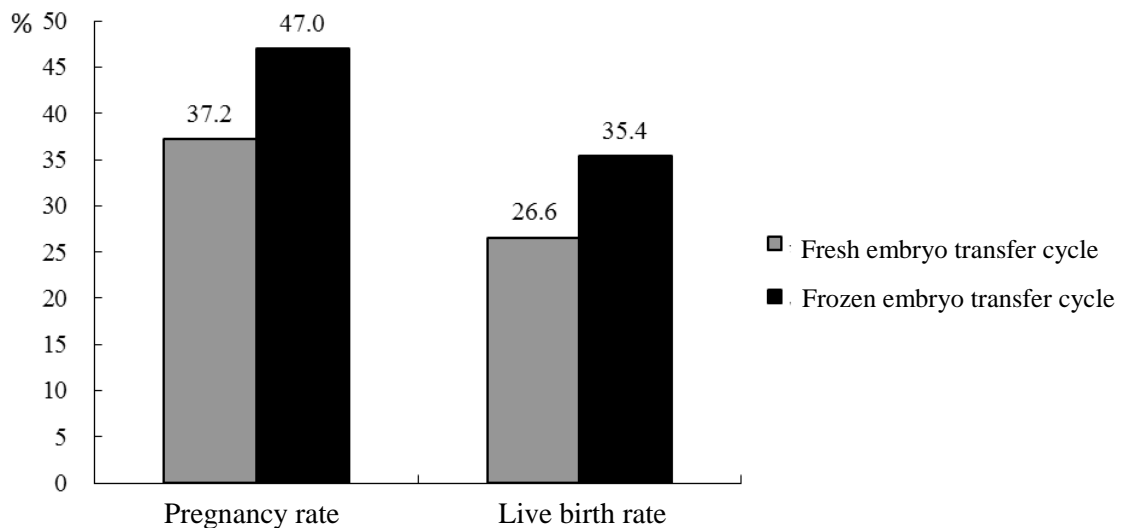


Figure 15 Age-Specific Pregnancy Rate of Fresh and Frozen Embryo Transfer from Nondonor Gametes in 2017

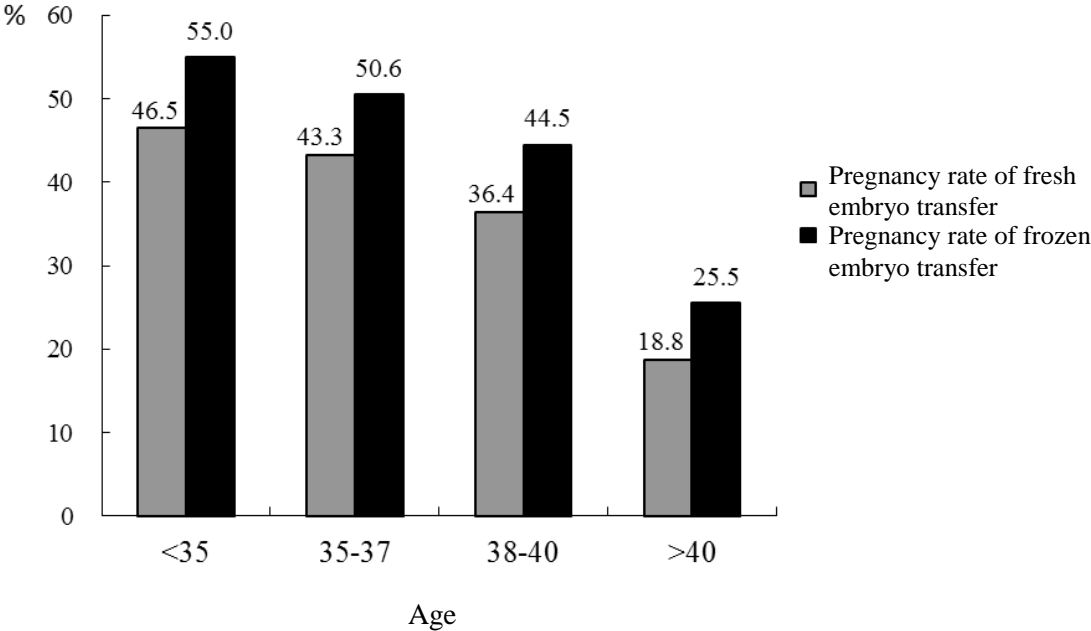
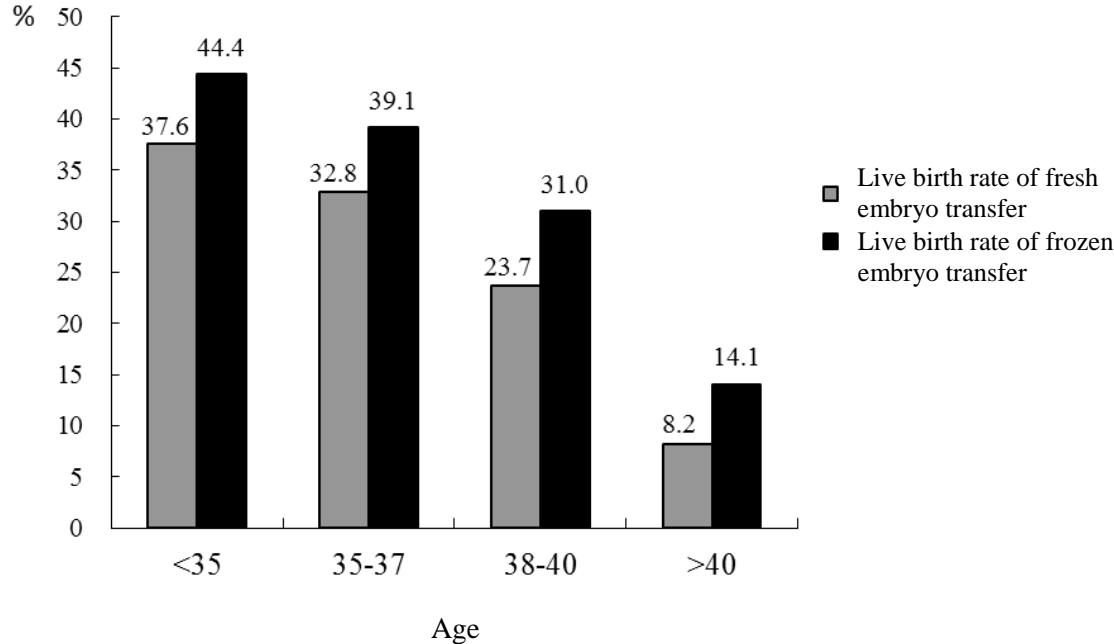


Figure 16 Age-Specific Live Birth Rate of Fresh and Frozen Embryo Transfer from Nondonor Gametes in 2017



This section delineates the analysis on women of 40 years and above (5,132 transfer cycles). The pregnancy rate of fresh and frozen embryo transfer in women of age 40 was 32.9% and 40.2%, respectively; however, their live birth rate dropped to 19.7% and 26.0%, respectively. After the age of 42, the success rate of the transfer cycles decreased significantly. The pregnancy rate of fresh and frozen embryo transfer at age 43 and above (43-59 years old) was 10.9% and 17.9%, respectively, while the live birth rate was only 4.4% and 8.0%, respectively (Figure 17 and Figure 18). Overall, the pregnancy rate and live birth rate of frozen embryo cycles in all age groups were higher than those of the fresh embryo cycles.

Figure 17 Age-Specific Pregnancy Rate of Fresh and Frozen Embryo Transfer in Women at Age 40 and above from Nondonor Gametes in 2017

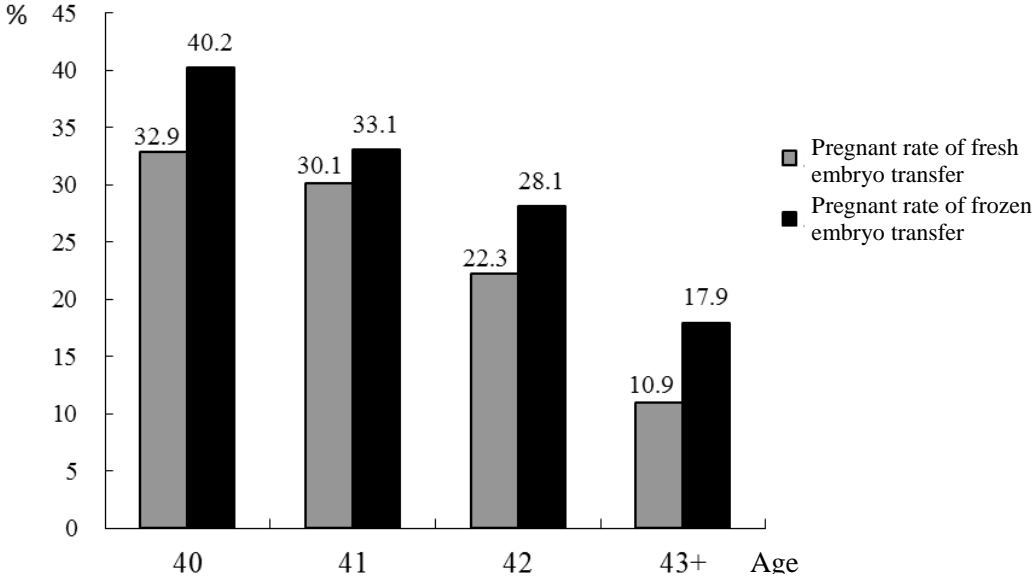
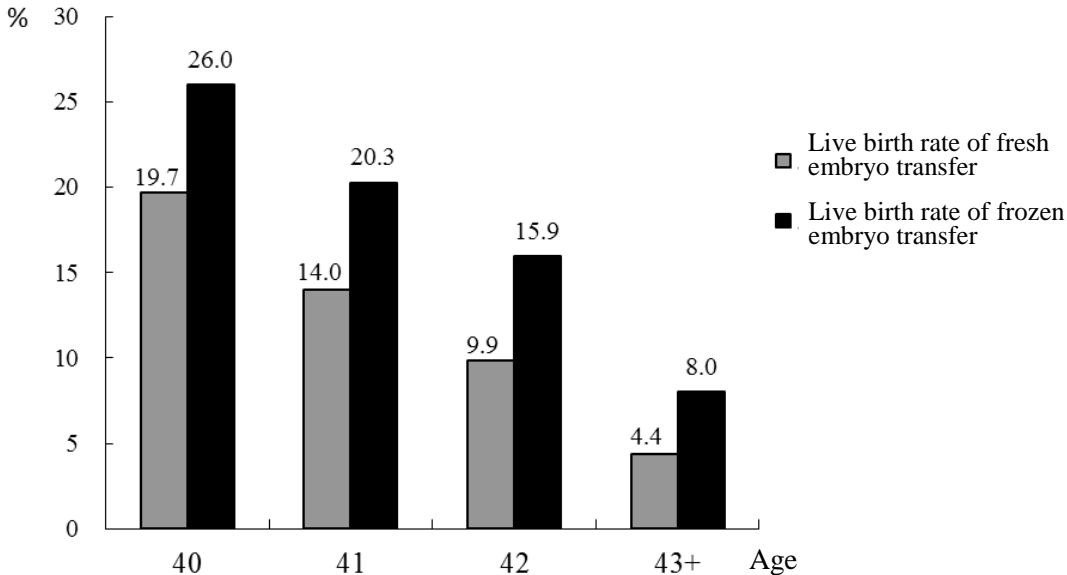


Figure 18 Age-Specific Live Birth Rate of Fresh and Frozen Embryo Transfer in Women at Age 40 and above from Nondonor Gametes in 2017



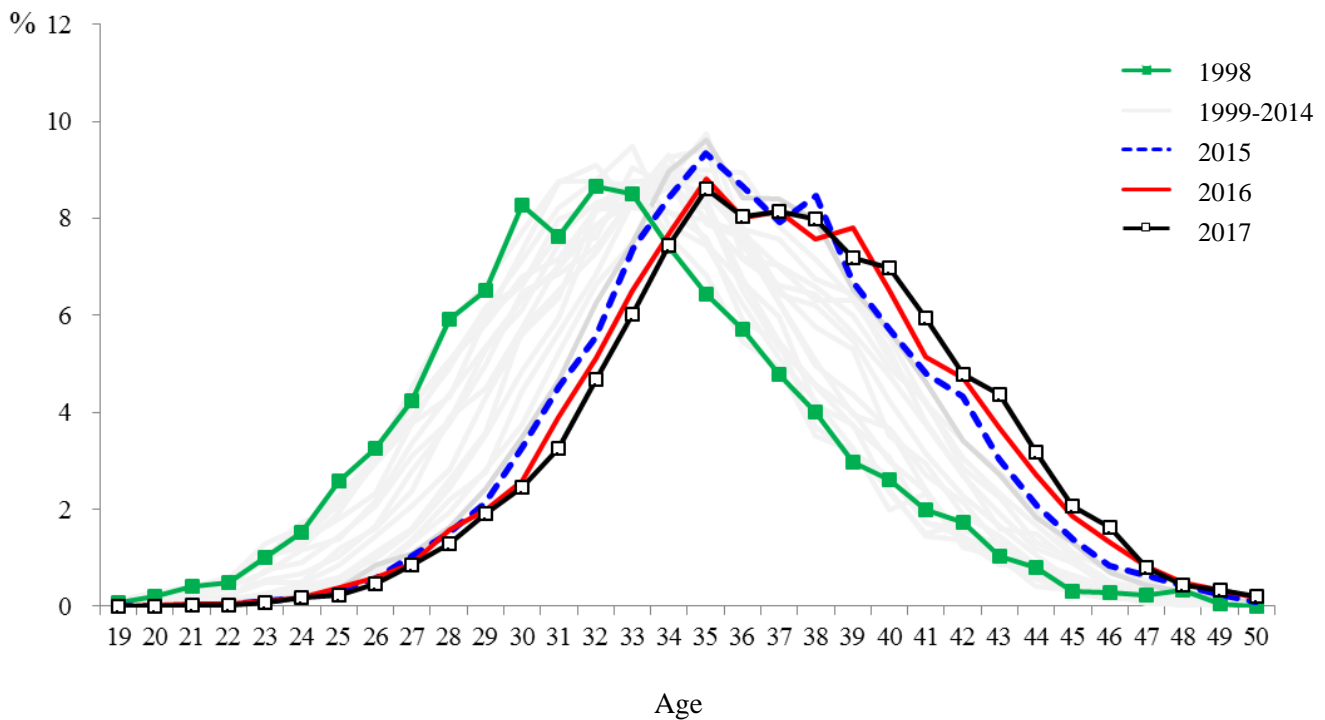
CHAPTER 4 Trend of Assisted Reproduction (1998 –2017)

Section 1 Trends of ART Cycles

1. Patient age

The age distribution of women receiving assisted reproduction from 1998 to 2017 shows that those between 30 to 33 years old accounted for the most in 1998; whereas in 2017 women between 35 to 38 years old accounted for the most to receive ART, which indicates that the age tends to increase year by year (Figure 19).

Figure 19 Age Distribution of Women receiving ART from 1998 to 2017



2. The number of treatment cycles, live birth cycles and live births

This section describes the number of treatment cycles, live birth cycles and live births between 1998 and 2017. From 2001 to 2004, the number of treatment cycles was maintained between 6,500 and 6,700, with the exception of the significantly low treatment cycles in 2013 that might have been due to the outbreak of severe acute respiratory syndrome (SARS). After 2005, the treatment cycles exceeded 7,200 showing an annual increasing trend. In 2017, it reached 37,849 cycles, with an increase of 9.8% compared to the 34,486 cycles in 2016.

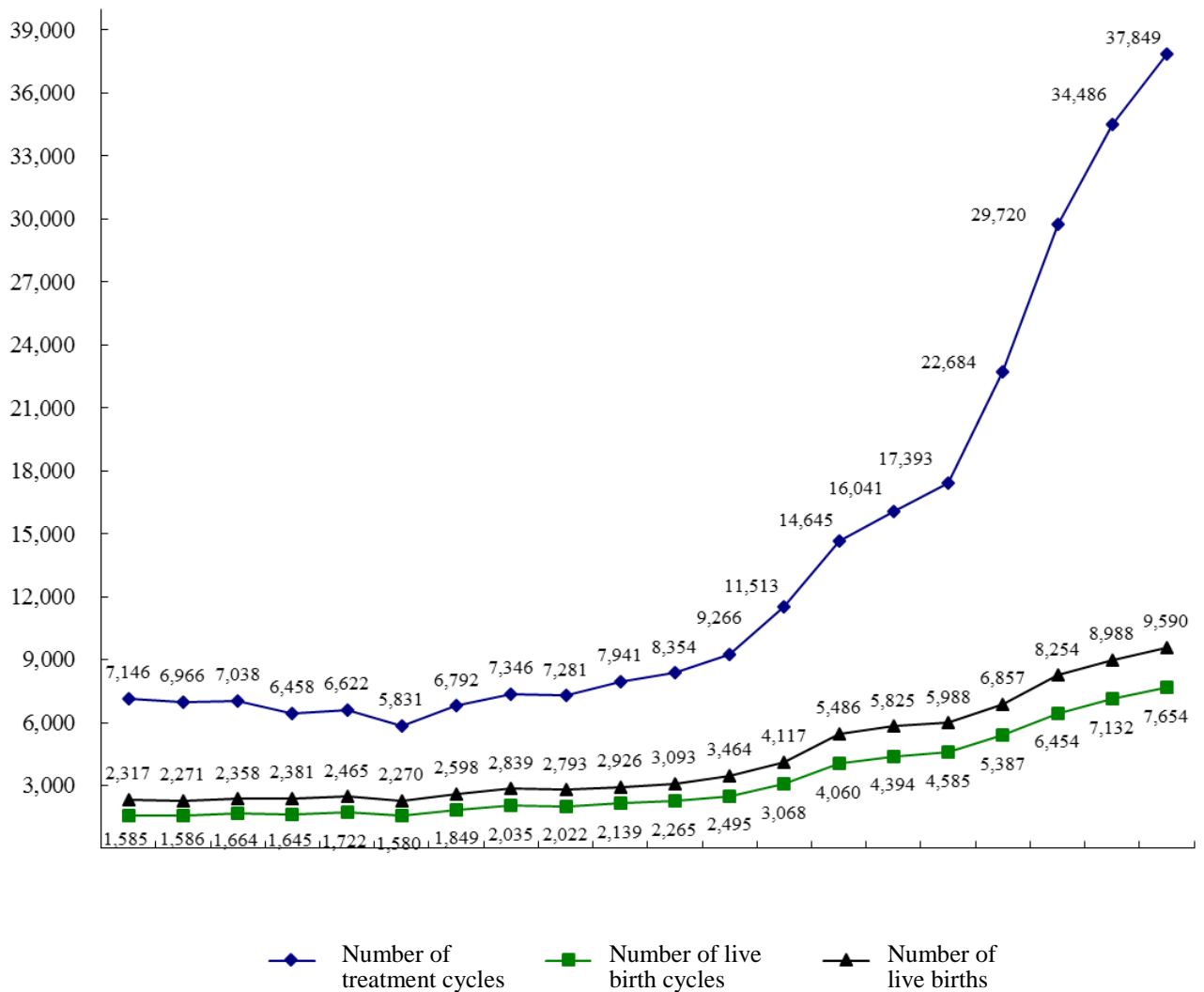
The number of live birth cycles was maintained between 1,500 and 1,800 cycles before 2004. After 2005, this number exceeded 2000 cycles, which can be attributed to the increase in the number of ART cycles after 2005 and the advancement in assisted reproductive technology in Taiwan. The number of live births remained stable between 2001 and 2004, with approximately 2,400 to 2,600 newborns born each year. After 2005, more than 2,800 newborns were born each year that reached 3,093 in 2008 and 9,590 in 2017, which was an increase of 602 newborns compared with 8,988 in 2016 (Table 8 and Figure 20).

Table 8 The Number of ART Cycles, Live Birth Cycles, and Live Births from 1998 to 2017

Year	Treatment cycles (unit: cycle)	Live birth cycles (unit: cycle)	Number of live births (unit: infant)
1998	7,146	1,585	2,317
1999	6,966	1,586	2,271
2000	7,038	1,664	2,358
2001	6,458	1,645	2,381
2002	6,622	1,722	2,465
2003	5,831	1,580	2,270
2004	6,792	1,849	2,598
2005	7,346	2,035	2,839
2006	7,281	2,022	2,793
2007	7,941	2,139	2,926
2008	8,354	2,265	3,093
2009	9,266	2,495	3,464
2010	11,513	3,068	4,117
2011	14,645	4,060	5,486
2012	16,041	4,394	5,825
2013	17,393	4,585	5,988
2014	22,684	5,387	6,857
2015	29,720	6,454	8,254
2016	34,486	7,132	8,988
2017	37,849	7,654	9,590
Total	271,372	65,321	86,880

Note: The number of live births is based on the patients' treatment year but not their actual year of birth

Figure 20 The Number of ART Cycles, Live Birth Cycles and Live Births from 1998 to 2017



3. Pregnancy rate and live birth rate

From 1998 to 2017, the pregnancy rate of ART reached the highest of 37.8% in 2004, and the live birth rate reached the highest of 27.8% in 2006. The pregnancy rate and live birth rate started to decline in 2011 and in 2017, and it was 27.1% and 20.2% in 2017, respectively (Figure 21). Due to the advancement of ART in recent years, more and more cases were carried out by freezing all embryo, which has increased the number of treatment cycles. However, embryo transfer was not performed in those freeze-all cycles, and only the cumulative pregnancy rate and the cumulative live birth rate during the treatment cycle can truly express the quality of ART.

The cumulative pregnancy rate increased from 37.2% in 1998 to 46.0% in 2017; the cumulative live birth rate increased from 27.0% in 1998 to 34.3% in 2017 (Figure 22).

Figure 21 Pregnancy Rate and Live Birth Rate of ART from 1998 to 2017

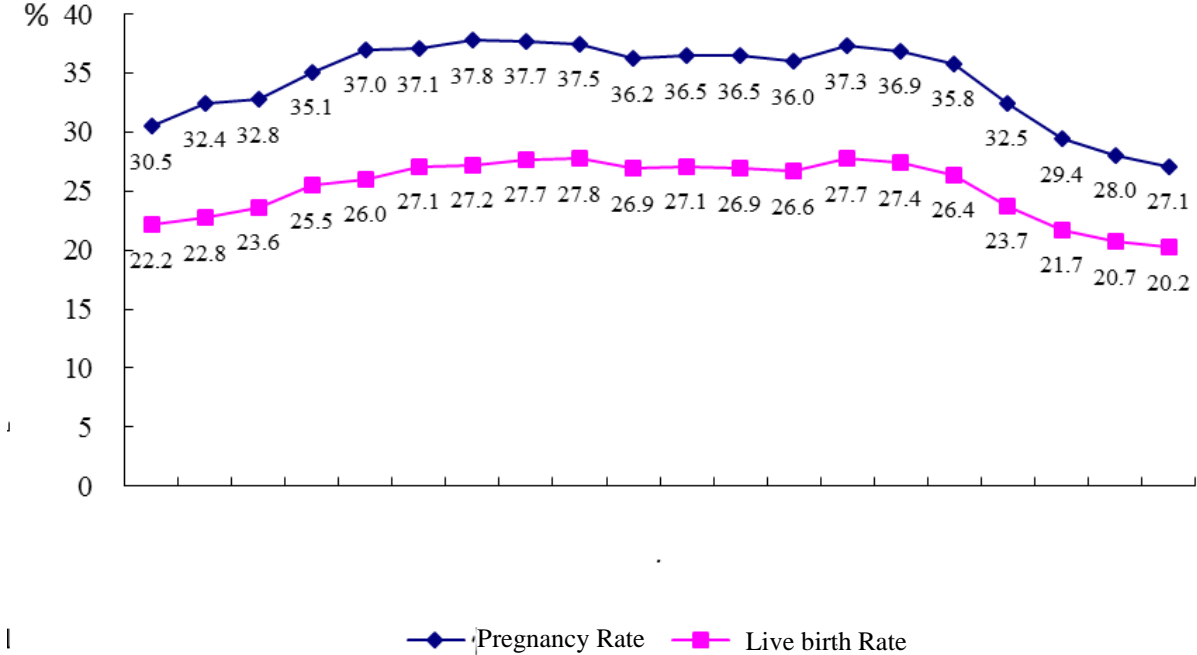
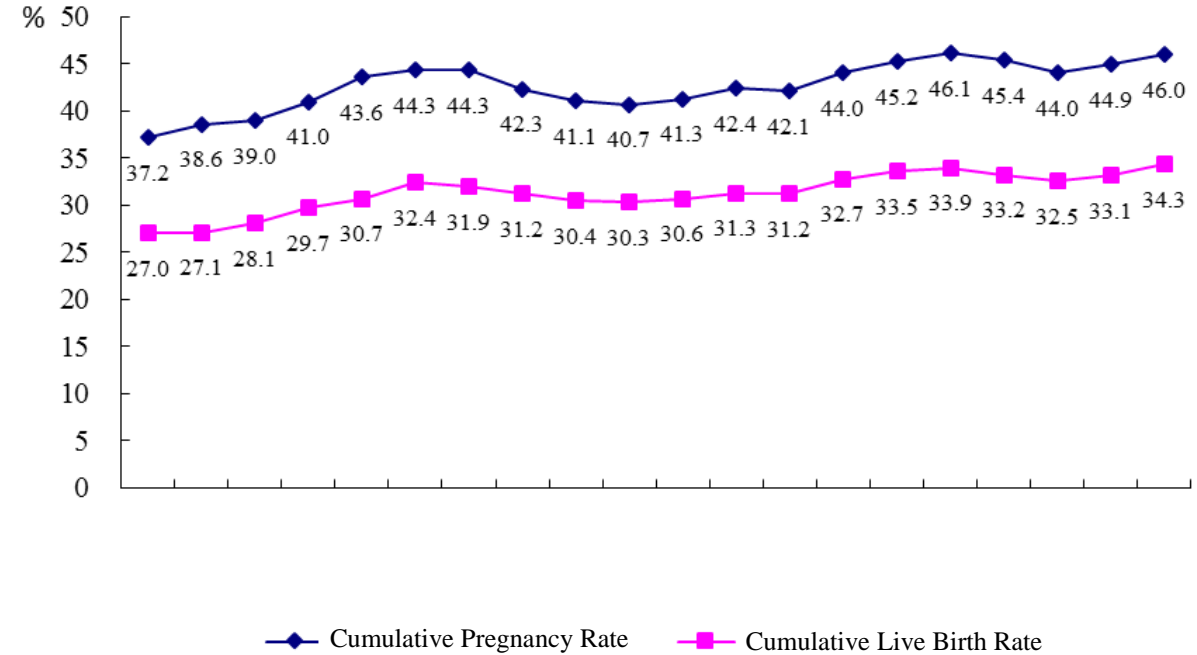


Figure 22 Cumulative Pregnancy Rate and Cumulative Live Birth Rate of the ART Cycles from 1998 to 2017

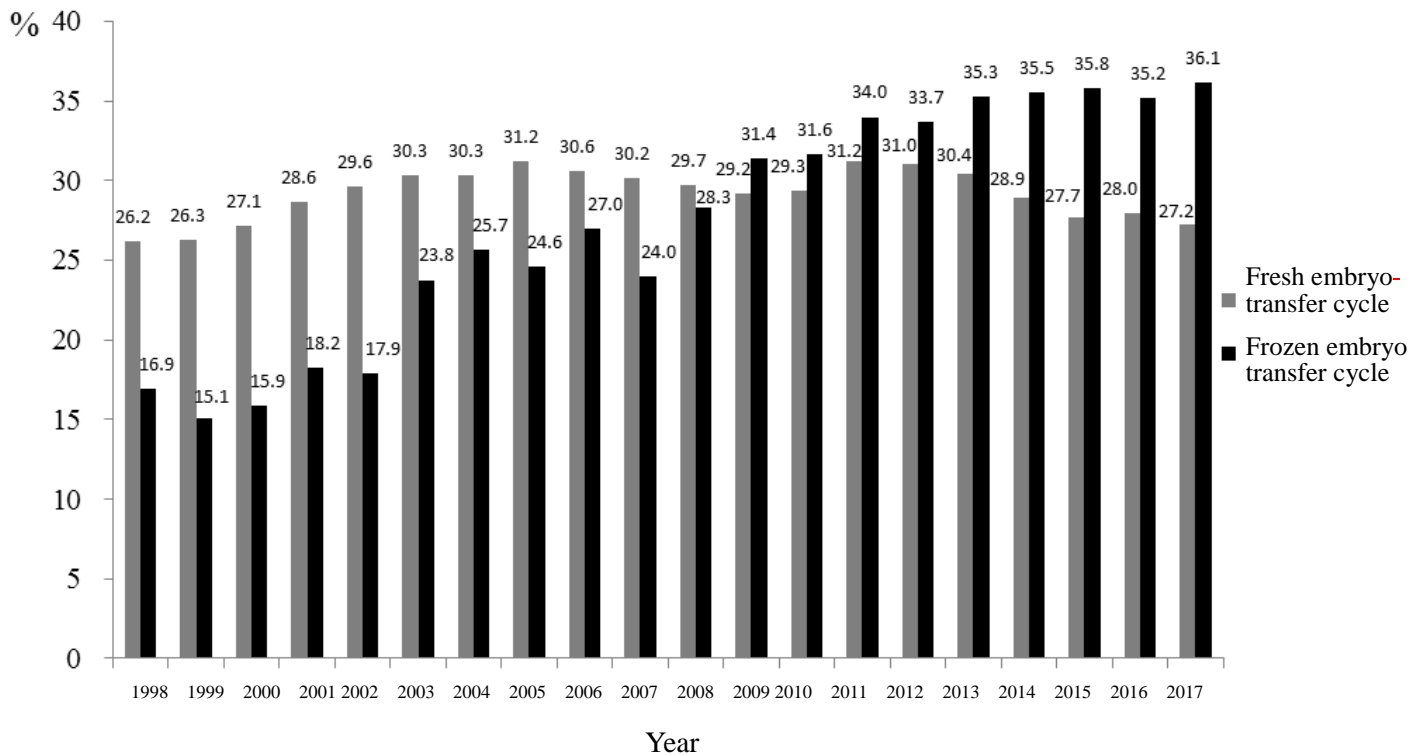


Section 2 Trends in Success Rates of Transfer Cycles

The live birth rate of transfer cycles

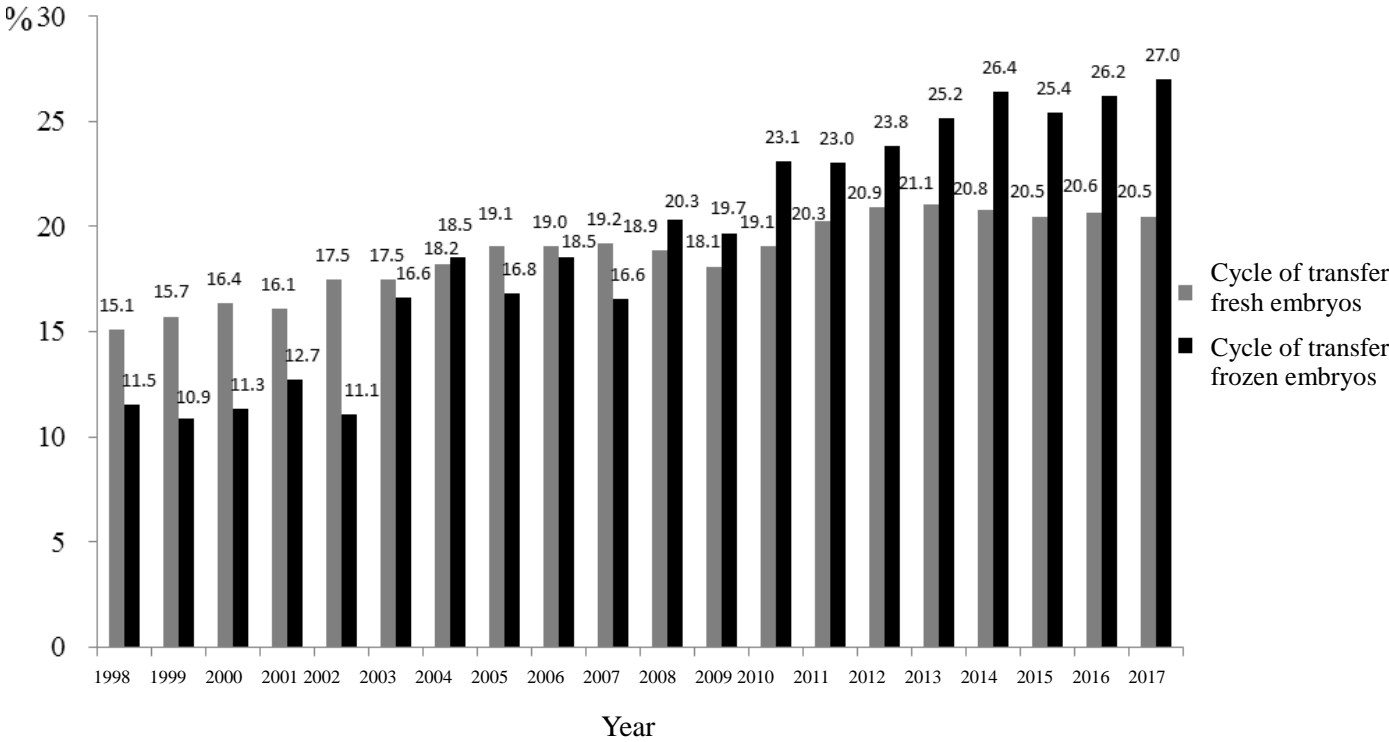
The live birth rate of fresh embryo transfer cycle increased from 26.2% in 1998 to 31.2% in 2005 with a fluctuating trend, and, in 2017, it was 27.2%. During the initial few years, the live birth rate of frozen embryo transfer cycle showed a fluctuating trend, but there was a significant increase after 2003, which reached 36.1% in 2017. The live birth rate of frozen embryo transfer cycle after 2009 was higher than that of fresh embryo transfer cycle (Fig.23).

Figure 23 Live Birth Rate of Transfer Cycle Using Fresh and Frozen Embryos from 1998 to 2017



The singleton live birth rate of fresh embryo transfer cycle has increased almost every year since 1998, reaching 15.1% in 1998 and 20.5% in 2017. The singleton live birth rate of frozen embryo transfer cycle increased significantly to 18.5% in 2004 and 27.0% in 2017. After 2008, the singleton live birth rate of frozen embryo transfer cycle has been higher than that of fresh embryo transfer (Fig. 24).

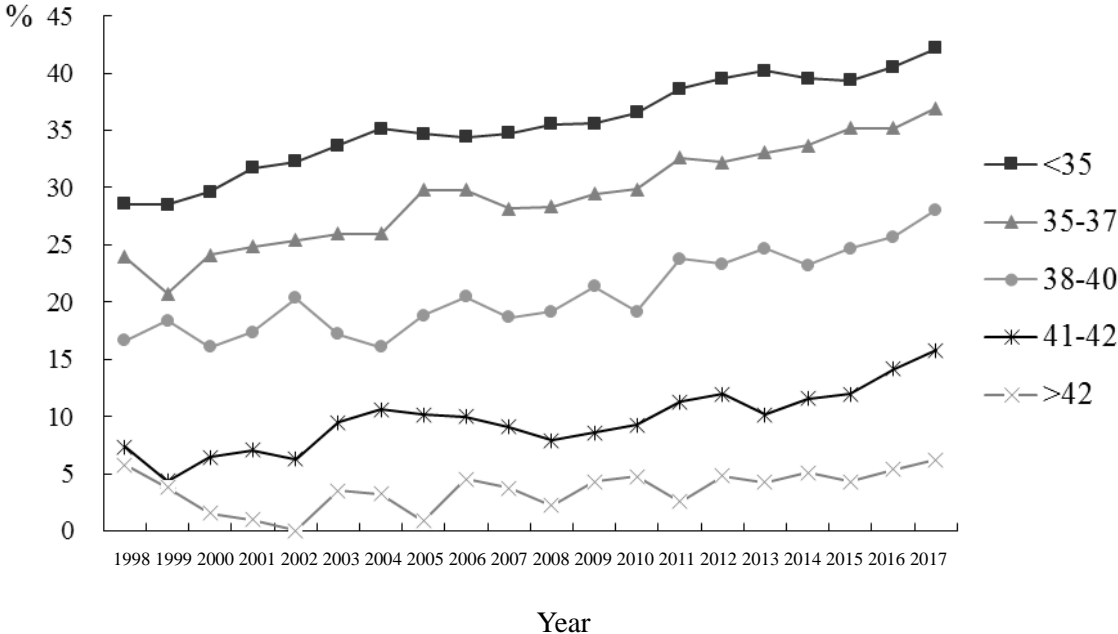
Figure 24 Singleton Live Birth Rate of Transfer Cycle Using Fresh and Frozen Embryos from 1998 to 2017



Section 3 Trends in Success Rates of Transfer Cycles by Age-Specific Groups

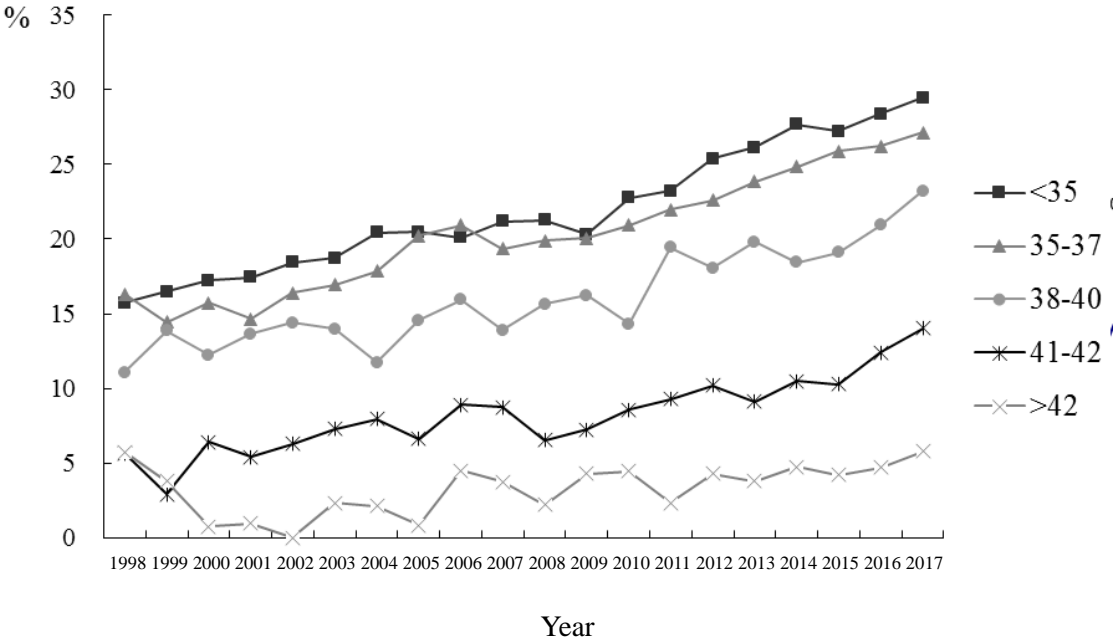
As the live birth rate of transfer cycles using donated eggs tends to be affected by the age of the donors, therefore, only the live birth rate of transfer cycles using nondonor embryos was analyzed. The live birth rate of women under the age of 35 increased from 28.5% in 1998 to 42.2% in 2017. In the same period, this rate increased by 13.1 percentage points in the 35 to 37 years age group, 11.5 percentage points in the 38 to 40 years age group, 6.9 percentage points in the 41 to 42 years age group, and the live birth rate in women older than 42 years increased by 0.5 percentage points (Figure 25).

Figure 25 Live Birth Rate of Transfer Cycles Using Nondonor Embryos from 1998 to 2017 (For Age-Specific Women Undergoing ART)



The singleton live birth rate of transfer cycles of women under age of 35 increased from 15.7% in 1998 to 29.5% in 2017. In the same period, this rate increased by 10.9 percentage points in the 35 to 37 years age group, 12.1 percentage points in the 38 to 40 years age group, and 8.4 percentage points in the 41 to 42 years age group. The singleton live birth rate in women older than 42 years increased by 0.1 percentage points (Figure 26).

Figure 26 Singleton Live Birth Rates of Transfer Cycles Using Nondonor Embryos from 1998 to 2017
(For Age-Specific Women Undergoing ART)

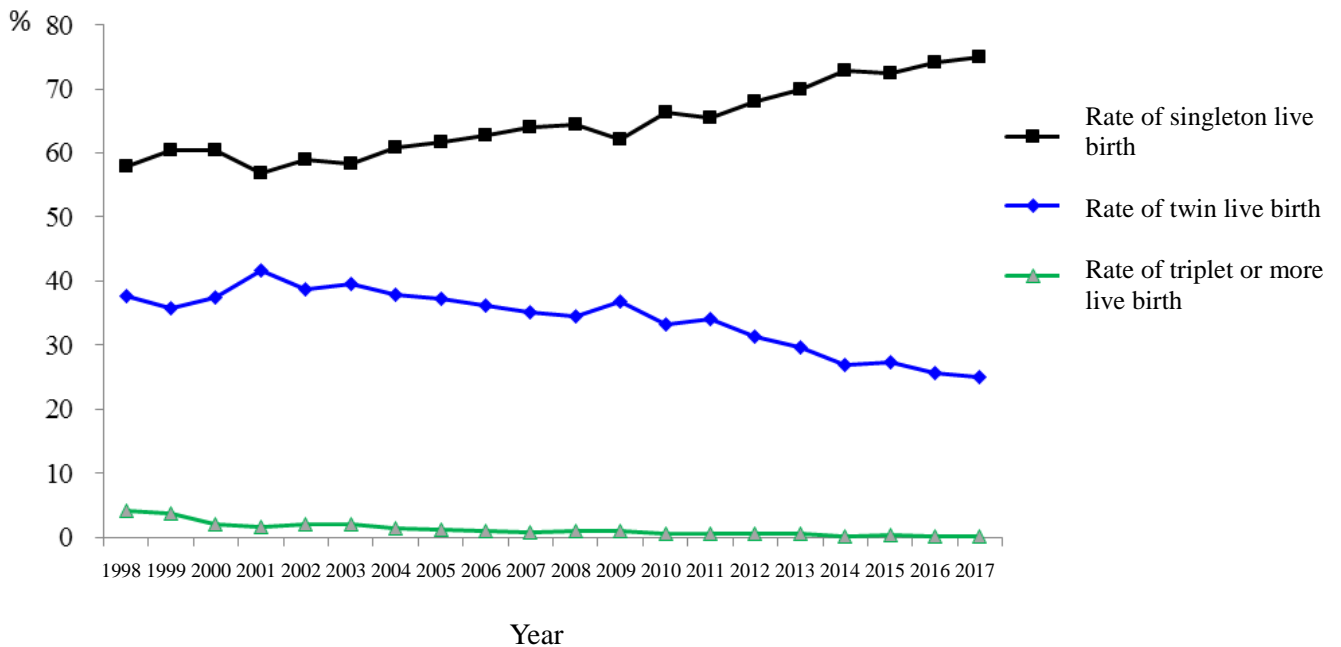


Section 4 Number of Fetus in Live Birth Cycles

Singleton Live birth rate is an important indicator in measuring the success rate because singleton live birth has lower risks than multiple birth, including preterm birth, low birth weight, congenital defects, and mortality etc. In order to effectively support ART institutions to reduce the rate of multiple births, the HPA has included “The ratio of women under the age of 35 who have had less than two embryos implanted within current permit period” as one of the indicator for permit evaluation of ART institutions.

The singleton live birth rate has increased from 58% in 1998 to 74.9% in 2017; while the live birth rate of twins and that of triplets and more has decreased from 37.7% and 4.2% in 1998 to 25.0% and 0.1% in 2017 (Figure 27).

Figure 27 Number of Fetus in Live Birth Cycles between 1998 and 2017



Appendix 1 Summary of Assisted Reproduction Statistics in 2017

Profile

Assisted Reproduction Method		Procedural Factors		Causes of Infertility (%)	
IVF/ET	99%	Use ICSI	45%	Fallopian tube factor	9%
GIFT	<1%	Unstimulated	20%	Ovarian factor	29%
ZIFT/TET	<1%			Endometriosis	4%
AID	<1%			Other uterine factors	4%
IVF/ET+GIFT	<1%			Other female factors	5%
				Male factor	12%
				Multiple factors	33%
				Unknown reason	4%

Pregnancy success rates

Type of Cycle	Women age			
	<35	35-37	38-40	>40
Fresh embryo of ART Cycles				
Number of treatment cycles	5,912	5,224	5,176	6,001
Percentage of pregnancy cycles	18.0	17.4	13.8	6.4
Percentage of live birth cycles	14.5	13.2	9.0	3.2
Number of Transfer Cycles	2,270	2,087	1,952	1,819
Pregnancy rate of transfer cycles	46.8	43.7	36.6	21.2
Live birth rate of transfer cycles	37.9	33.1	24.0	10.7
Singleton live birth rate of transfer cycles	26.9	24.2	19.5	9.2
Percentage of cancellations	62.5	61.0	63.6	71.2
Average number of embryos transferred	2.2	2.4	2.7	2.7
Percentage of multiple births in live birth cycles	29.0	26.8	18.6	13.8
Frozen embryo of ART Cycles				
Number of treatment cycles	5,047	4,164	3,209	3,116
Percentage of pregnancy cycles	53.6	49.7	43.8	32.2
Percentage of live birth cycles	43.3	38.6	30.9	21.1
Number of Transfer Cycles	4,900	4,051	3,098	3,006
Pregnancy rate of transfer cycles	55.2	51.1	45.4	33.4
Live birth rate of transfer cycles	44.6	39.7	32.0	21.9
Singleton live birth rate of transfer cycles	31.1	29.0	26.3	18.3
Percentage of cancellations	2.9	2.7	3.5	3.5
Average number of embryos transferred	2.0	2.2	2.3	2.4
Percentage of multiple births in live birth cycles	30.2	26.9	17.7	16.6
Fresh embryos from nondonor eggs				
Number of treatment cycles	5,727	5,108	5,058	5,471
Percentage of pregnancy cycles	18.2	17.5	13.9	5.9
Percentage of live birth cycles	14.7	13.3	9.0	2.6
Number of Transfer Cycles	2,240	2,063	1,930	1,722
Pregnancy rate of transfer cycles	46.6	43.3	36.3	18.7
Live birth rate of transfer cycles	37.5	32.8	23.6	8.2
Singleton live birth rate of transfer cycles	26.7	24.2	19.4	7.3
Percentage of cancellations	61.8	60.5	63.1	69.8
Average number of embryos transferred	2.2	2.4	2.7	2.7
Percentage of multiple births in live birth cycles	28.9	26.3	17.8	10.6

Frozen embryos from nondonor eggs	<35	35-37	38-40	>40
Number of treatment cycles	4,784	4,032	3,006	2,098
Percentage of pregnancy cycles	53.3	49.2	43.0	24.2
Percentage of live birth cycles	43.0	38.1	30.0	13.3
Number of Transfer Cycles	4,640	3,924	2,900	2,006
Pregnancy rate of transfer cycles	55.0	50.6	44.6	25.3
Live birth rate of transfer cycles	44.4	39.2	31.1	14.0
Singleton live birth rate of transfer cycles	30.7	28.7	25.8	12.6
Percentage of cancellations	3.0	2.7	3.5	4.4
Average number of embryos transferred	2.0	2.2	2.4	2.6
Percentage of multiple births in live birth cycles	30.9	26.7	7.0	9.6
Fresh embryos from nondonor sperm	<35	35-37	38-40	>40
Number of treatment cycles	5,837	5,168	5,139	5,969
Percentage of pregnancy cycles	18.0	17.4	13.8	6.4
Percentage of live birth cycles	14.6	13.2	9.1	3.3
Number of Transfer Cycles	2,243	2,060	1,936	1,807
Pregnancy rate of transfer cycles	46.8	43.6	36.6	21.3
Live birth rate of transfer cycles	37.9	33.1	24.1	10.8
Singleton live birth rate of transfer cycles	26.9	24.2	19.6	9.3
Percentage of cancellations	62.3	61.1	63.6	71.2
Average number of embryos transferred	2.2	2.4	2.7	2.7
Percentage of multiple births in live birth cycles	28.9	26.8	18.7	13.8
Frozen embryos from nondonor sperm	<35	35-37	38-40	>40
Number of treatment cycles	4,955	4,111	3,174	3,089
Percentage of pregnancy cycles	53.6	49.6	43.7	32.4
Percentage of live birth cycles	43.3	38.6	30.8	21.3
Number of Transfer Cycles	4,812	3,998	3,064	2,985
Pregnancy rate of transfer cycles	55.2	51.1	45.3	33.6
Live birth rate of transfer cycles	44.6	39.6	31.9	22.0
Singleton live birth rate of transfer cycles	31.2	29.0	26.3	18.4
Percentage of cancellations	2.9	2.7	3.5	3.4
Average number of embryos transferred	2.0	2.2	2.3	2.4
Percentage of multiple births in live birth cycles	30.0	26.8	17.6	16.6
Fresh embryos from nondonor gametes	<35	35-37	38-40	>40
Number of treatment cycles	5,652	5,052	5,021	5,439
Percentage of pregnancy cycles	18.2	17.4	13.9	5.9
Percentage of live birth cycles	14.7	13.2	9.0	2.6
Number of transfer cycles	2,213	2,036	1,914	1,710
Pregnancy rate of transfer cycles	46.5	43.3	36.4	18.8
Live birth rate of transfer cycles	37.6	32.8	23.7	8.2
Singleton live birth rate of transfer cycles	26.7	24.2	19.4	7.4
Percentage of cancellations	61.6	60.6	63.2	69.8
Average number of embryos transferred	2.2	2.4	2.7	2.7
Percentage of multiple births in live birth cycles	28.9	26.3	17.9	10.6

Frozen embryos from nondonor gametes	<35	35-37	38-40	>40
Number of treatment cycles	4,692	3,979	2,971	2,071
Percentage of pregnancy cycles	53.4	49.2	42.9	24.4
Percentage of live birth cycles	43.1	38.1	29.9	13.5
Number of Transfer Cycles	4,552	3,871	2,866	1,985
Pregnancy rate of transfer cycles	55.0	50.6	44.5	25.5
Live birth rate of transfer cycles	44.4	39.1	31.0	14.1
Singleton live birth rate of transfer cycles	30.8	28.7	25.8	12.7
Percentage of cancellations	3.0	2.7	3.5	4.2
Average number of embryos transferred	2.0	2.2	2.4	2.6
Percentage of multiple births in live birth cycles	30.6	26.6	16.9	9.7

Total for all ages

Donor eggs	Fresh embryos	Frozen embryos
Number of Transfer Cycles	173	1,585
Percentage of live birth cycle in the transfer cycles	57.8	41.8
Average number of embryos transferred	1.8	1.8
Donor sperm	Fresh embryos	Frozen embryos
Number of Transfer Cycles	82	196
Live birth rate of transfer cycles	25.6	37.8
Average number of embryos transferred	2.4	2.0
Embryos from nondonor gametes	Fresh embryos	Frozen embryos
Number of Transfer Cycles	7,873	13,274
Live birth rate of transfer cycles	26.6	35.4
Average number of embryos transferred	2.5	2.2

Number of embryos transferred and singleton live birth rate

<35 age group

	Number of transferred embryos			
	1	2	3	4
Number of transfer cycles	1,226	4,594	1,141	206
Pregnancy rate of transfer cycles	47	55	48	47
Singleton with fetal heart sound in all pregnancies	90	62	56	58
Singleton rate in all live birth	98	66	61	58

35-37 age group

	Number of transferred embryos			
	1	2	3	4
Number of transfer cycles	999	3,024	1,654	461
Pregnancy rate of transfer cycles	41	52	47	47
Singleton with fetal heart sound in all pregnancies	91	63	61	56
Singleton rate in all live birth	99	69	70	60

38-40 age group

	Number of transferred embryos			
	1	2	3	4
Number of transfer cycles	892	1,779	1,460	919
Pregnancy rate of transfer cycles	38	45	41	42
Singleton with fetal heart sound in all pregnancies	83	69	63	66
Singleton rate in all live birth	98	81	76	79

>40 age group

	Number of transferred embryos			
	1	2	3	4
Number of transfer cycles	990	1,653	1,085	1,097
Pregnancy rate of transfer cycles	31	34	24	24
Singleton with fetal heart sound in all pregnancies	85	64	58	65
Singleton rate in all live birth	97	77	78	90

Number of reporting ART institutions: 84

Appendix 2 Statistical Data on Individual ART Institutions in 2017

County/City	Name of Institution	Treatment Cycles	Assisted Reproduction Methods(%)		Causes of infertility (%)					
			IVF	ICSI (Including IVF+ICSI)	Other	Fallopian tube factor	Other female factors	Male factor	Multiple factors	Unknown reason
Keelung City	Jian-An Fertility Center	367	76.6	23.4	0.0	26.2	40.8	16.3	12.3	4.4
Taipei City	National Taiwan University Hospital	1,424	36.2	42.8	21.0	7.3	27.7	13.1	42.5	9.4
	Taipei Chang Gung Memorial Hospital, Chang Gung Medical Foundation	276	33.7	66.3	0.0	1.1	12.0	0.7	86.2	0.0
	Taipei Veterans General Hospital	1,554	88.0	11.9	0.1	11.3	46.3	23.4	11.3	7.7
	Tri-Service General Hospital	152	52.6	47.4	0.0	15.8	28.3	13.8	42.1	0.0
	MacKay Memorial Hospital	919	54.0	46.0	0.0	7.1	23.4	23.1	14.4	32.0
	Cathy General Hospital	252	43.3	56.7	0.0	15.5	62.3	8.7	13.5	0.0
	Chung Shan Hospital	361	40.7	13.3	46.0	7.5	26.0	7.2	48.5	10.8
	Shin Kong Wu Ho-Su Memorial Hospital	227	51.5	48.5	0.0	19.8	34.0	12.3	23.8	10.1
	Taiwan Adventist Hospital	346	82.1	17.9	0.0	0.6	72.8	13.3	11.0	2.3
	Taipei Medical University Hospital	2,430	39.6	60.3	0.0	11.1	61.4	12.4	15.1	0.0
	Liu Zhi-hong Obstetrics and Gynecology Clinic	630	95.2	4.8	0.0	7.9	61.2	12.1	18.3	0.5
	Pan's Ladies Clinic & Infertility Center	204	64.2	35.8	0.0	21.6	48.0	15.2	6.4	8.8
	Taipei Municipal Wanfang Hospital (Managed by Taipei Medical University)	197	56.9	43.1	0.0	21.3	49.3	8.1	9.1	12.2
	Honji Fertility Center	461	19.7	80.3	0.0	4.1	49.3	8.2	30.4	8.0
	Zhongxiao Branch of Taipei City Hospitals	92	12.0	56.5	31.5	6.5	34.8	3.3	38.0	17.4
	Hope Fertility & PGD Center	387	53.5	46.5	0.0	0.0	65.3	1.6	29.2	3.9
	IHMED Reproductive Med Center	1,497	33.8	32.9	33.3	7.0	35.4	12.4	41.1	4.1
	Huang, Jian-Rong Obstetrics and Gynecology Clinic	1,110	80.1	19.9	0.0	14.1	35.7	14.9	24.2	11.1
Dr. Wang Reproductive Fertility Center	2,497	44.3	55.7	0.0	17.4	15.0	11.6	56.0	0.0	

County/City	Name of Institution	Treatment Cycles	Assisted Reproduction Methods(%)		Causes of infertility (%)					
			IVF	ICSI (Including IVF+ICSI)	Other	Fallopian tube factor	Other female factors	Male factor	Multiple factors	Unknown reason
Taipei City	Gene Infertility Medical Center	74	35.1	40.5	24.3	10.8	62.1	4.1	23.0	0.0
	Dream Way Center for Reproductive Medicine	13	7.7	92.3	0.0	15.4	61.5	7.7	15.4	0.0
New Taipei City	Far Eastern Memorial Hospital	254	35.0	65.0	0.0	11.8	34.3	10.6	36.2	7.1
	Art Baby	219	63.9	36.1	0.0	8.2	52.1	18.7	19.2	1.8
	Taipei Medical University-Shuang Ho Hospital, Ministry of Health and Welfare	6	66.7	33.3	0.0	16.7	66.6	16.7	0.0	0.0
	Taipei Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation	107	47.7	52.3	0.0	9.3	35.6	18.7	22.4	14.0
	Star International Fertility Center	20	35.0	65.0	0.0	10.0	60.0	5.0	25.0	0.0
Taoyuan City	Linkou Chang Gung Memorial Hospital, Chang Gung Medical Foundation	1281	46.2	53.7	0.1	4.2	37.0	3.6	54.4	0.8
	Tao Yuan General Hospital, Ministry of Health and Welfare	122	45.9	8.2	45.9	9.0	39.3	6.6	42.6	2.5
	Min-Sheng General Hospital	90	53.3	46.7	0.0	30.0	22.2	11.1	21.1	15.6
	Hungchi Women & Children's Hospital	493	40.2	59.8	0.0	30.6	50.1	19.3	0.0	0.0
	Hueish Sheng Obstetrics Clinic	170	78.8	21.2	0.0	15.9	31.2	15.3	18.2	19.4
Hsinchu City	Jiang's OBS & GYN Clinic	46	52.2	47.8	0.0	8.7	63.1	23.9	4.3	0.0
	Stork Fertility Center	2,251	58.5	41.5	0.0	0.4	93.6	5.3	0.2	0.5
	Hsinchu Cathay General Hospital	175	64.6	35.4	0.0	4.6	28.6	36.5	28.0	2.3
	Hsinchu MacKay Memorial Hospital	206	29.6	70.4	0.0	1.9	18.0	36.4	40.8	2.9
	Cheng-Kai Lin Babymake Clinic	455	66.8	33.2	0.0	2.4	31.6	10.3	54.4	1.3
Hsinchu County	Ton-Yen General Hospital	14	85.7	14.3	0.0	0.0	42.9	50.0	7.1	0.0
	Taiwan IVF Group	1,402	50.2	49.8	0.0	1.6	38.7	9.4	45.9	4.4
Miaoli County	Da-Chien Health Medical System	39	89.7	10.3	0.0	17.9	36.0	12.8	5.1	28.2
Taichung City	China Medical University Hospital	552	10.7	89.3	0.0	10.3	22.1	15.9	41.6	10.1
	Chung Shan Medical University Hospital	171	35.7	64.3	0.0	0.0	0.6	1.2	97.6	0.6

County/City	Name of Institution	Treatment Cycles	Assisted Reproduction Methods(%)		Causes of infertility (%)					
			IVF	ICSI (Including IVF+ICSI)	Other	Fallopian tube factor	Other female factors	Male factor	Multiple factors	Unknown reason
Taichung City	Lee Women's Hospital	3,680	49.0	51.0	0.0	9.1	13.3	7.1	70.4	0.1
	Taichung Veterans General Hospital	766	80.8	19.2	0.0	16.6	46.9	17.1	17.1	2.3
	Cheng Ching Hospital Chung Kang Branch	35	88.6	11.4	0.0	45.8	37.1	11.4	5.7	0.0
	Lin Shin Hospital	138	47.8	52.2	0.0	26.1	42.8	15.2	12.3	3.6
	Liu,Zhong-Jun Women and Children Clinic	331	44.4	55.6	0.0	7.9	42.2	11.5	25.1	13.3
	Mei Tsun Women and Children Clinic	104	26.9	73.1	0.0	12.5	45.3	16.3	22.1	3.8
	Hsieh,Yao-Yuan Women and Children's Clinic	33	21.2	78.8	0.0	6.1	84.8	9.1	0.0	0.0
	Dashin Women and Children's Clinic	371	21.8	33.2	45.0	7.3	49.6	5.1	38.0	0.0
	Taichung Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation	40	77.5	22.5	0.0	22.5	30.0	20.0	20.0	7.5
	Chang's Fertility Center	365	51.0	49.0	0.0	6.0	29.3	11.0	43.8	9.9
Tungs' Taichung MetroHarbor Hospital	46	43.5	54.3	2.2	28.3	56.5	6.5	8.7	0.0	
Changhua County	Changhua Christian Hospital	805	49.1	50.9	0.0	9.1	43.0	17.3	24.5	6.1
	Han-Ming Hospital	12	100.0	0.0	0.0	16.7	75.0	0.0	8.3	0.0
	Dr. Tsai & Dr. Chen's Women Clinic	493	62.9	37.1	0.0	10.5	71.8	11.0	6.7	0.0
	Chang Bing Show Chwan Memorial Hospital	12	58.3	41.7	0.0	24.9	16.7	16.7	16.7	25.0
Chiayi City	Lin, Yu-I Women and Children's Clinic	9	88.9	0.0	11.1	11.1	33.4	33.3	0.0	22.2
	Ditmanson Medical Foundation Chia-Yi Christian Hospital	39	41.0	59.0	0.0	10.3	35.9	12.8	38.4	2.6
	Jie-An Mother & Children Clinic	80	33.8	66.2	0.0	20.0	47.5	11.2	7.5	13.8
Chiayi County	Chiayi Chang Gung Memorial Hospital, Chang Gung Medical Foundation	18	100.0	0.0	0.0	11.1	11.1	0.0	33.3	44.5
Tainan City	National Cheng Kung University Hospital	476	67.0	33.0	0.0	4.0	31.3	19.3	42.9	2.5
	Kuo General Hospital	152	68.4	31.6	0.0	5.3	33.6	15.8	36.1	9.2

County/City	Name of Institution	Treatment Cycles	Assisted Reproduction Methods(%)		Causes of infertility (%)					
			IVF	ICSI (Including IVF+ICSI)	Other	Fallopian tube factors	Other female factors	Male factors	Multiple factors	Unknown causes
Tainan City	Tube Infertility Clinic, Taiwan IVF Center	129	61.2	38.8	0.0	0.0	54.3	11.6	31.0	3.1
	Sin-Lau Medical Foundation, the Presbyterian church in Taiwan	103	1.0	99.0	0.0	12.6	48.5	1.0	31.1	6.8
	An-An Women and Children Clinic	917	83.5	16.4	0.1	11.2	59.3	15.3	14.2	0.0
	Chi Mei Medical Center	567	58.6	41.4	0.0	2.3	8.3	27.7	61.7	0.0
	Jin -Sin Women and Children's Hospital	285	1.4	98.6	0.0	15.1	34.7	39.7	10.5	0.0
Kaohsiung City	Kaohsiung Medical University Chung-Ho Memorial Hospital	297	57.2	42.8	0.0	10.8	74.3	6.4	6.1	2.4
	Chien Shin Hospital	678	3.8	96.2	0.0	2.2	39.7	10.9	47.2	0.0
	Yuan's General Hospital	50	68.0	32.0	0.0	16.0	50.0	14.0	10.0	10.0
	Kaohsiung Veterans General Hospital	612	56.9	43.1	0.0	7.8	44.8	6.5	26.0	14.9
	Jung-Chou Chang Women and Children Clinic	19	84.2	15.8	0.0	10.5	84.2	0.0	5.3	0.0
	Kuo Hong-Chang GYN & IVF Clinic	165	67.3	32.7	0.0	4.2	69.1	10.9	15.8	0.0
	SAN-AN HOSPITAL	510	35.7	64.3	0.0	1.0	56.6	1.2	40.4	0.8
	Makebaby Reproductive Center	375	17.9	82.1	0.0	18.1	43.8	20.5	16.3	1.3
	E-Da Dachang Hospital, E-Da Healthcare Group	62	46.8	53.2	0.0	6.5	85.4	8.1	0.0	0.0
	Kaohsiung Chang Gung Memorial Hospital, Chang Gung Medical Foundation	654	89.8	10.1	0.2	18.0	36.5	11.9	16.8	16.8
	Tung Chiao Eye Center	288	83.7	16.3	0.0	14.2	42.0	16.7	22.6	4.5
E-Da Hospital, E-Da Healthcare Group	85	10.6	89.4	0.0	1.2	17.6	2.4	76.4	2.4	
Pingtung County	Pingtung Christian Hospital	34	79.4	20.6	0.0	23.5	14.7	0.0	61.8	0.0
Yilan County	Lotung Poh-Ai Hospital, Lo-Hsu Medical Foundation,	27	11.1	88.9	0.0	14.8	14.8	3.7	66.7	0.0
Hualien County	Hualien Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation	93	28.0	26.9	45.2	26.9	23.7	29.0	11.8	8.6
Kinmen County	Kinmen Hospital, Ministry of Health and Welfare	351	42.2	57.8	0.0	3.1	95.5	1.4	0.0	0.0

參考網站 Reference Websites

1. 衛生福利部國民健康署 Health Promotion Administration, Ministry of Health and Welfare : <http://www.hpa.gov.tw/>
2. 台灣生殖醫學會 Taiwanese Society for Reproductive Medicine : <http://www.tsrn.org.tw/>
3. 中華民國生育醫學會 Fertility Society, ROC : [http:// fs.org.tw/](http://fs.org.tw/)
4. American Society for Reproductive Medicine : <http://www.asrm.org/>
5. Centers for Disease Control and Prevention : <http://www.cdc.gov/>