107 年

人工生殖施行結果分析報告

The Assisted Reproductive Technology Summary 2018 National Report of Taiwan

衛生福利部國民健康署
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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 107 年 1 月 1 日至 107 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 107 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 2018 in which the case had received assisted reproductive technology; 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"; for example, a subject who is 34 years and 9 months old shall be categorized and calculated in the age group of 34 years.
5. Cycles of in which fresh and frozen embryos 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 2018 are also available.
   (website: http://www.hpa.gov.tw)

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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 109 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 107 年於 88 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 107 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。

人工生殖方法

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。

ZIFT/TET：Zygote Intrafallopian Transfer/Tubal Embryo Transfer 受精卵/胚胎輸卵管植入術。

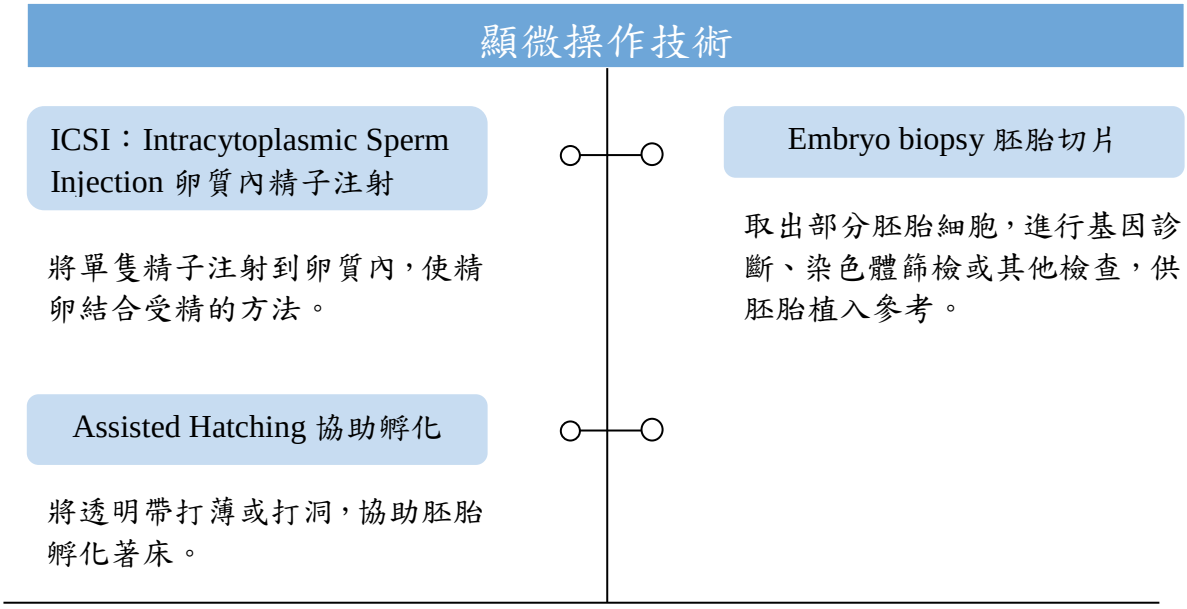
精子和卵子在體外受精後植入輸卵管內，讓受精卵/胚胎自然由輸卵管進到子宮著床。

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。

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



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 107 年的 88 家人工生殖機構定期通報的資料。

第一節、治療週期數

107 年人工生殖之週期（含未完成取卵或植入之週期）共有 39,840 週期（表 1）。36,153 週期為配偶間人工生殖（占 90.7%），3,687 週期為使用捐贈精卵人工生殖（占 9.3%）。其中，使用捐卵之受術妻其年齡分布如表 2。

表 1　107 年人工生殖治療週期類別

單位：週期

週期類別	人工生殖治療週期數	
使用捐贈精卵	3,687	
使用捐精		406
使用捐卵		3,281
使用配偶精卵	36,153	
全部治療週期	**39,840**	

表 2　107 年人工生殖使用捐卵之受術妻年齡別

單位：週期/%

受術女性年齡	治療週期數	百分比
<25	8	0.3
25-29	148	4.5
30-34	334	10.2
35-39	587	17.9
40-44	969	29.5
45-49	1,004	30.6
≥50	231	7.0
使用捐卵治療週期	**3,281**	**100.0**

第二節、接受人工生殖治療者之年齡

在所有接受治療之受術妻中，其年齡介於 35 歲到 39 歲之間占最多數，為 39.2% (表 3)，其中，又以 35 歲的婦女接受人工生殖治療週期為最多，占所有治療週期之 8.3%，其次為 36 歲婦女，占所有治療週期之 8.0%。

表 3　107 年人工生殖受術妻之年齡別

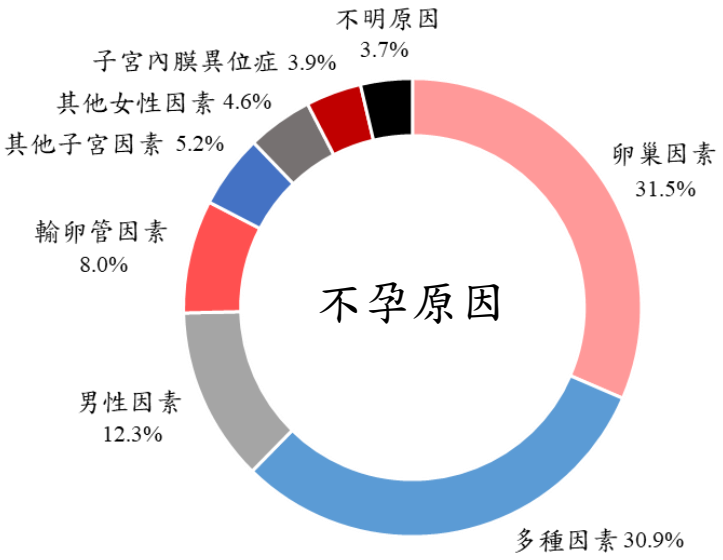
單位：週期/%

受術妻年齡	治療週期數	百分比
<25	161	0.4
25-29	1,956	5.0
30-34	9,101	22.8
35-39	15,634	39.2
40-44	10,253	25.7
45-49	2,450	6.2
≥50	285	0.7
全部治療週期	**39,840**	**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，其中以卵巢因素所占比例 31.5%為最高，多種因素 30.9%占第二位，男性因素 12.3%居第三位(圖 1)。

圖 1　107 年人工生殖個案不孕之原因 (母數： 39,840 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 39,840 治療週期中，77.3%週期有使用顯微操作技術(表 4)。

表 4　107 年人工生殖個案治療週期之使用顯微操作技術情形

單位：週期/%

顯微操作使用情形	治療週期數	百分比
使用	30,810	77.3
卵質內精子注射(ICSI)	16,287	40.9
協助孵化(Assisted Hatching)	10,674	26.8
胚胎著床前染色體篩檢(PGT-A)	2,150	5.4
胚胎著床前基因診斷(PGT-M)	98	0.2
其他(含合併多種技術)	1,601	4.0
未使用	9,030	22.7
全部治療週期	**39,840**	**100.0**

第六節、植入週期數與胚胎數

人工生殖植入週期數共 22,766 週期，有 26.5%採用配偶間的精卵所形成的新鮮胚胎，62.7%使用配偶間的冷凍胚胎，0.9%使用捐贈精卵形成的新鮮胚胎，9.9%使用捐贈精卵的冷凍胚胎（表 5）。

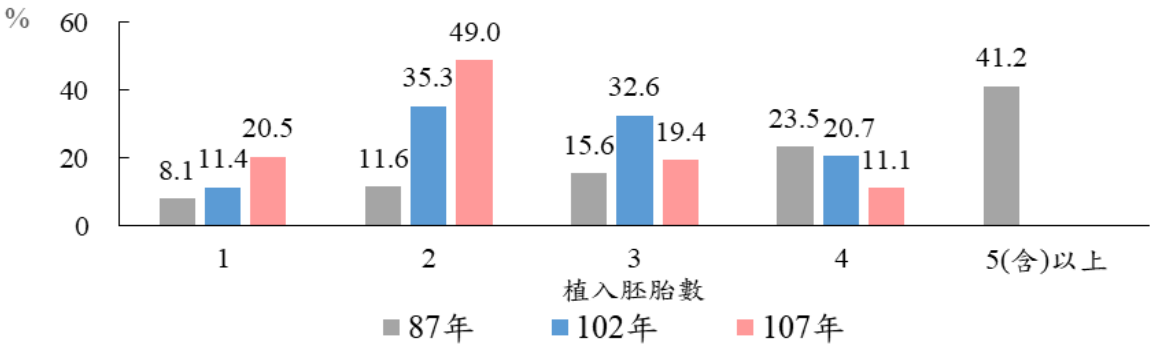
表 5　107 年人工生殖植入類型百分比

單位：週期/%

植入類型		植入週期數	百分比
配偶間胚胎	新鮮	6,042	26.5
	冷凍	14,263	62.7
捐贈精卵之胚胎	新鮮	199	0.9
	冷凍	2,262	9.9
全部植入週期		**22,766**	**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。107 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 69.5%(106 年為 65.4%，105 年為 63.7%)(圖 2)。

圖2　人工生殖胚胎植入數百分比

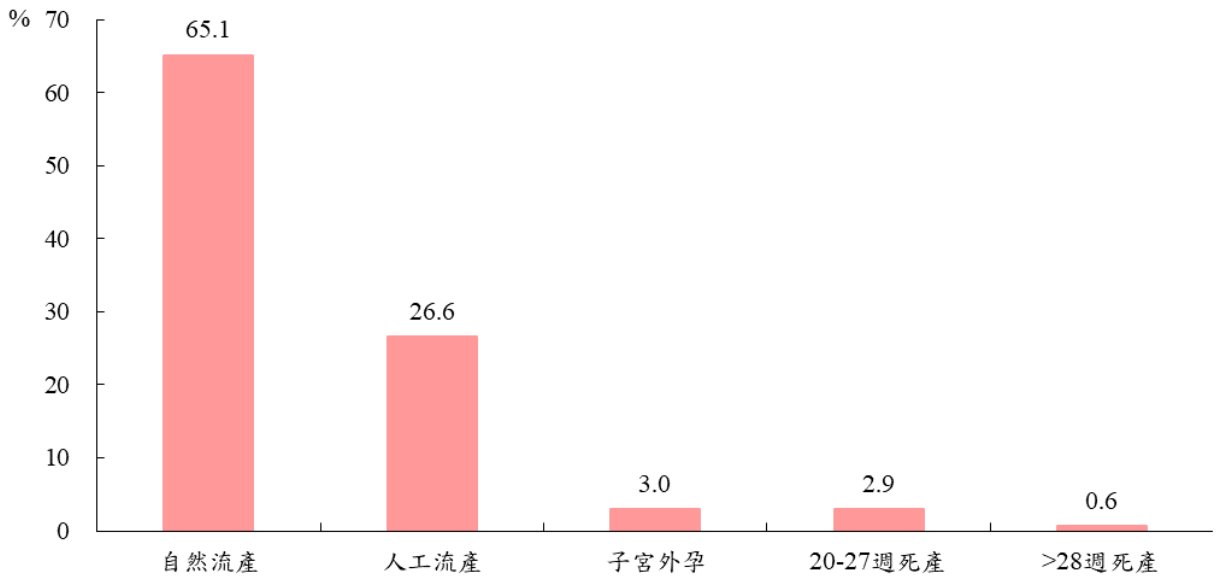


第七節、懷孕與活產情形

人工生殖 39,840 治療週期中，有植入的計 22,766 週期，有懷孕的計 10,797 個週期，有活產的計 8,113 週期，共有 10,236 個嬰兒誕生(26%活產週期為多胎生產)，較 106 年增加了 646 個嬰兒誕生。

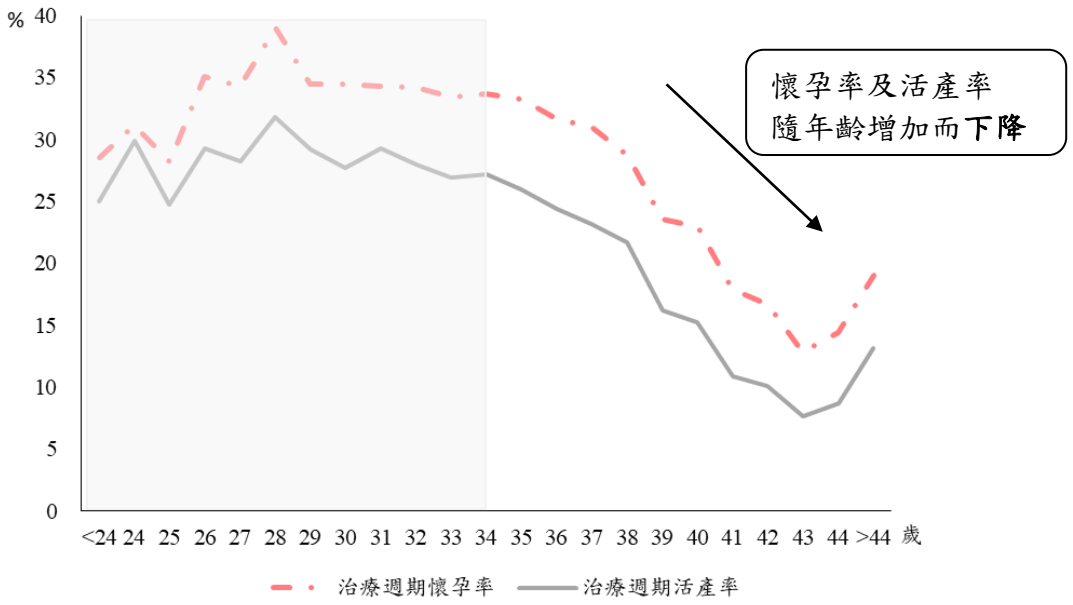
在 2,684 個懷孕但無活產紀錄之週期中，1,748 週期為自然流產 (占 65.1%)，713 週期為人工流產(含 20 週前無胎心音；占 26.6%)，80 週期為子宮外孕(占 3.0%)，94 週期為死產(占 3.5%)(少數週期同時具有自然流產、人工流產、子宮外孕、20-27 週死產或>28 週死產中兩種以上情形) (圖 3)。

圖 3　107 年人工生殖懷孕週期無活產紀錄分析 (母數：2,684 懷孕但無活產之週期)



107 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 20.4%(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4　107年人工生殖受術妻年齡與懷孕率及活產率關係圖 (母數：39,840治療週期數)



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

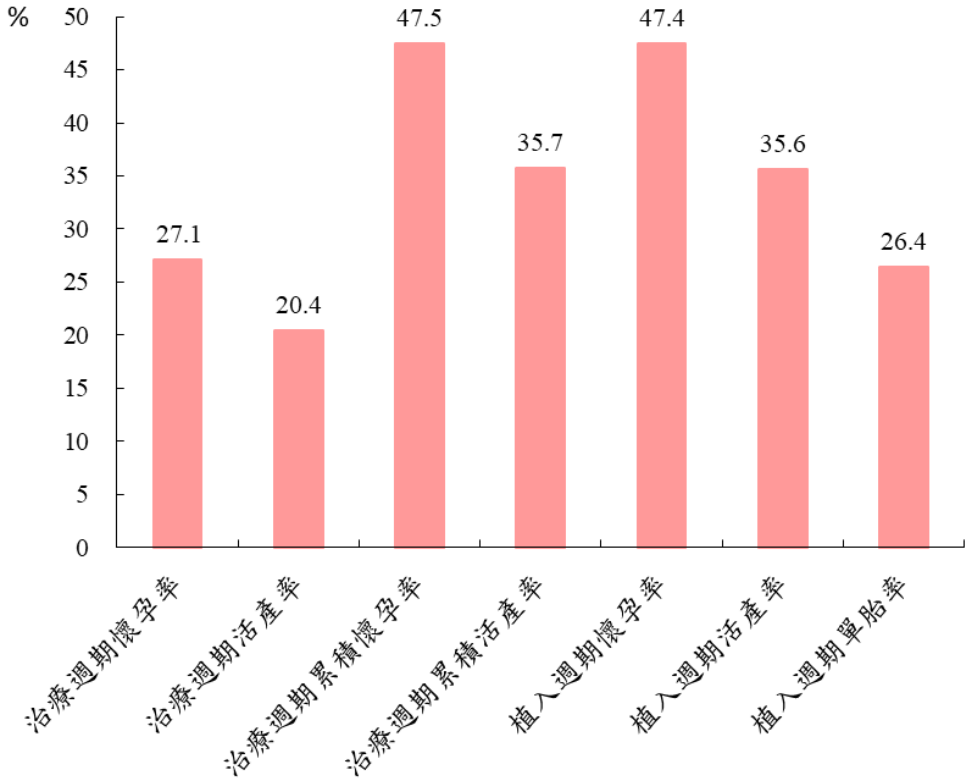
因近年人工生殖技術成熟，越來越多進行全胚冷凍，使得治療週期數增加，但該週期並未進行植入，故以治療週期累積懷孕率、治療週期累積活產率較能真實呈現人工生殖技術的品質。

圖 5 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。107 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。107 年治療週期活產率為 20.4%。
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: [新鮮胚胎懷孕週期數＋冷凍胚胎懷孕週期數＋(新鮮胚胎＋冷凍胚胎)懷孕週期數]÷[新鮮胚胎治療週期數＋(新鮮胚胎＋冷凍胚胎)治療週期數]。107 年之治療週期累積懷孕率為 47.5%。
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: [新鮮胚胎活產週期數＋冷凍胚胎活產週期數＋(新鮮胚胎＋冷凍胚胎)活產週期數]÷[新鮮胚胎治療週期數＋(新鮮胚胎＋冷凍胚胎)治療週期數]。107 年之治療週期累積活產率為 35.7%，未滿 38 歲前治療週期累積活產率則為 49.6%。

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。107 年植入週期懷孕率為 47.4%。其中，植入新鮮胚胎的懷孕率為 39.4%，而植入冷凍胚胎的懷孕率為 50.5%。
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。107 年植入週期活產率為 35.6%，其中，植入新鮮胚胎的活產率為 28.6%，而植入冷凍胚胎的活產率為 38.3%。
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。107 年之植入週期單胎率為 26.4%。

圖 5　107 年人工生殖成功率分析



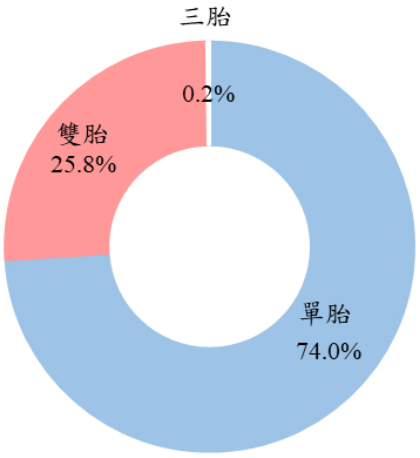
第八節、出生嬰兒狀況

一、活產胎數

在 8,113 個活產週期中，74.0%為單胎生產、25.8%為雙胎生產、0.2%為三胎生產（圖 6）。

於 107 年間接受人工生殖治療後，生產的嬰兒共有 10,236 人。其中，男嬰有 5,349 人，女嬰有 4,887 人(表 6)。

圖 6　107 年人工生殖活產週期之胎數百分比 (母數：8,113 活產週期)



二、體重、懷孕週數與先天缺陷

觀察 10,236 個活產嬰兒中(1 活產嬰兒出生體重及週數未知)，出生體重低於 1,500 公克者，占所有活產嬰兒總數之 3.6%，體重介於 1,500-2,499 公克占所有出生嬰兒總數之 30.2%，體重大於等於 2,500 公克者，占 66.2%；另懷孕週數小於 37 週者占所有活產嬰兒週期之 36.3%，週數介於 37-41 週，占 63.6%，大於等於 42 週者，占 0.1%；而外觀明顯先天缺陷的嬰兒比率為 0.8%(表 6)。

表 6　107 年人工生殖出生嬰兒體重、週數與先天缺陷（活產嬰兒總數 10,236 個)

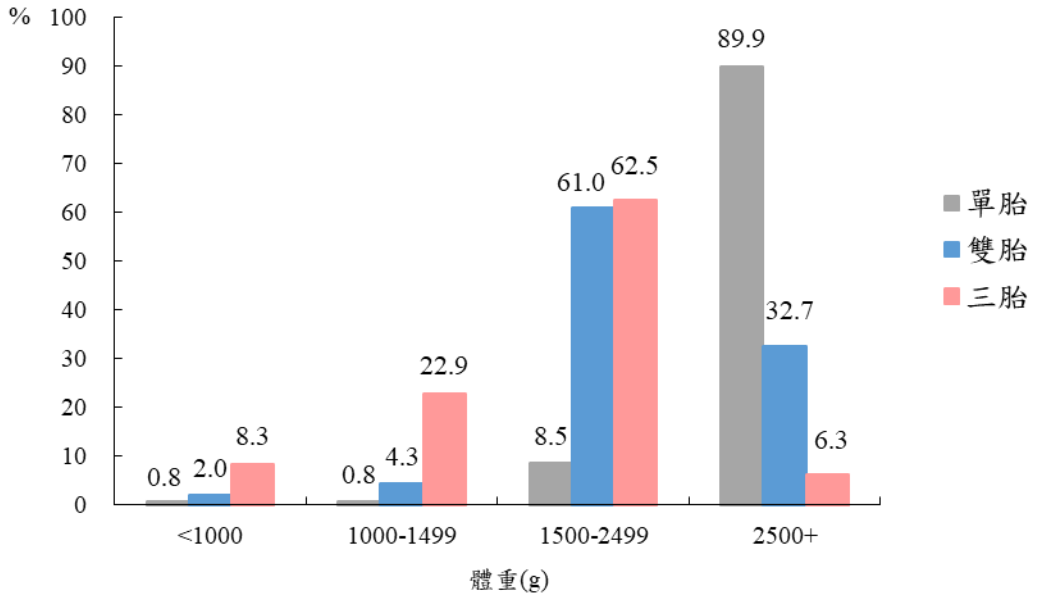
單位：數量/%

嬰　兒　狀　況	活產嬰兒數	百分比
性別		
男	5,349	52.3
女	4,887	47.7
體重		
<1500 公克	373	3.6
1500-2499 公克	3,092	30.2
≥2500 公克	6,770	66.2
懷孕週數		
<37 週	3,712	36.3
37-41 週	6,514	63.6
≥42 週	9	0.1
外觀明顯先天缺陷	79	0.8

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 89.9%。雙胎生產則以 1,500 到 2,499 公克新生兒占 61.0%，為最大比例，其次為 2,500 公克以上者占 32.7%。而三胎生產，體重小於 1,000 公克新生兒占 8.3%，體重介於 1,000 到 1,499 公克者占 22.9%，體重在 1,500 到 2,499 新生兒占 62.5%，體重超過 2,500 公克者占 6.3%。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 7)。

圖 7　107 年人工生殖活產週期之胎數別與體重之關係百分比 (母數：10,236 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 36,153 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 90.7%。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 7　107 年配偶間人工生殖受術妻年齡別

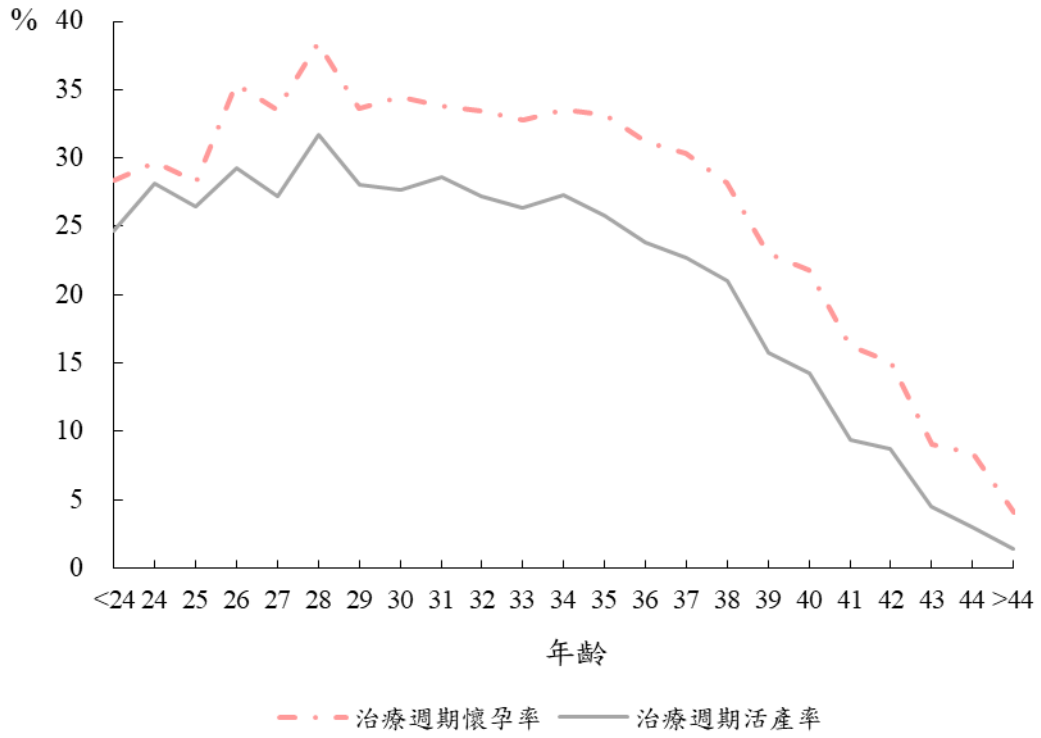
單位：週期/%

受術妻年齡	治療週期數	百分比
<25	145	0.4
25-29	1,749	4.8
30-34	8,656	23.9
35-39	14,900	41.2
40-44	9,216	25.5
45-49	1,435	4.0
>50	52	0.2
全部治療週期	**36,153**	**100.0**

二、各年齡之懷孕率、活產率及流產率

配偶間人工生殖之治療週期懷孕率為 26.0%，治療週期活產率為 19.4%(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 8)。

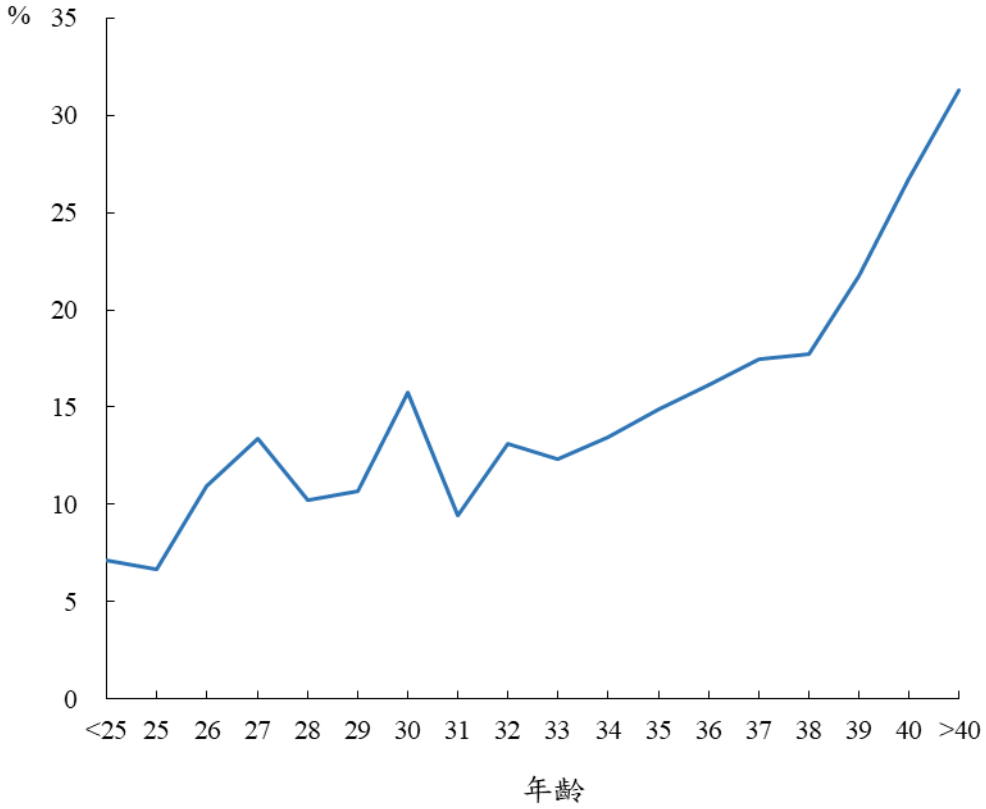
圖 8　107 年配偶間人工生殖受術妻年齡與懷孕率及活產率關係(母數：36,153 治療週期數)



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 31.3%(圖 9)。

圖 9　107 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：9,390 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

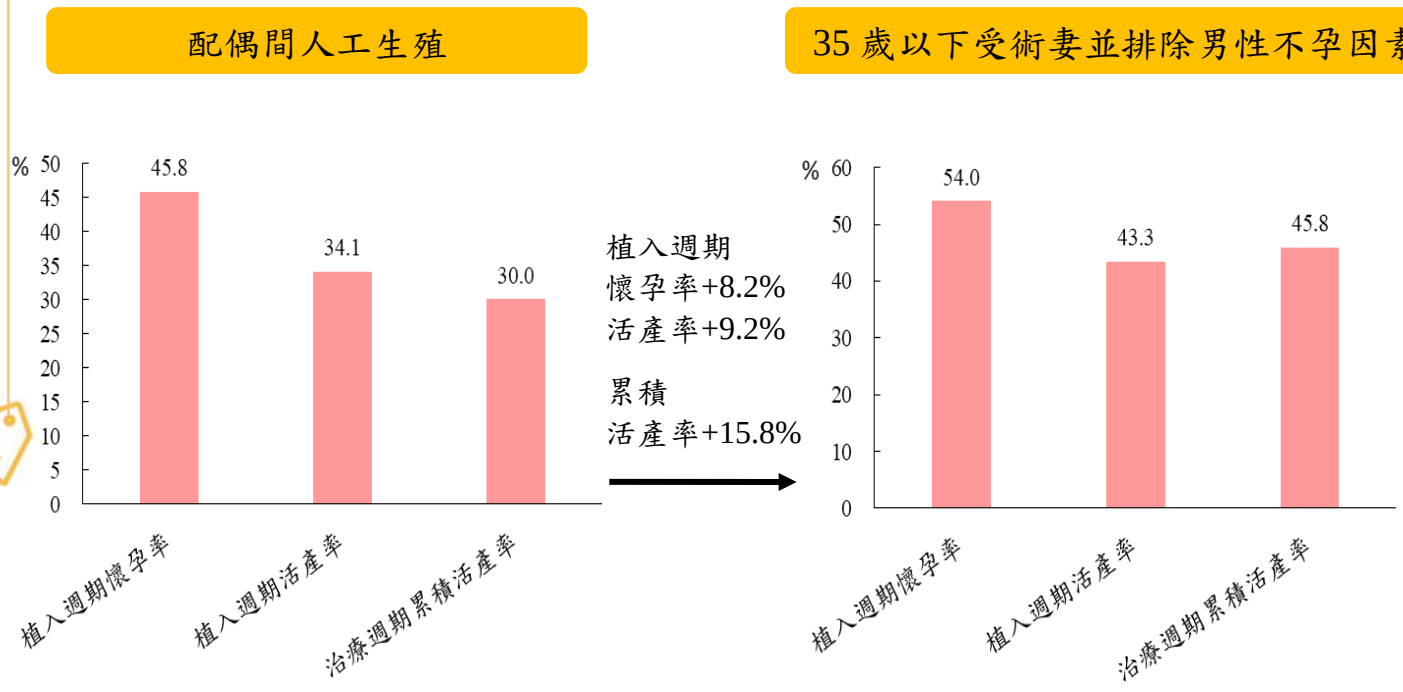
本節針對配偶間人工生殖施行試管嬰兒(IVF/ET)方式進行分析。

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 18,768 週期，其中懷孕週期 8,597 週期，活產週期 6,395 週期。其植入週期懷孕率為 45.8%，植入週期活產率為 34.1%，治療週期累積活產率為 30.0%(未滿 38 歲治療週期累積活產率為 44.3%)，其中單胎比例占 73.1%，雙胞胎占 26.7%，三胞胎則占 0.2%。

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 54.0%，植入週期活產率提高到 43.3%，而治療週期累積活產率提高到 45.8%(圖 10)。

圖 10　107 年配偶間人工生殖與排除男性不孕因素之 35 歲以下受術妻施行試管嬰兒之成功率比較



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 6,395 活產週期中，有 56.1%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 38.8%(圖 12)，但相對的，其活產週期產生多胞胎的比例也高達 33.2%(圖 13)。

圖11　107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

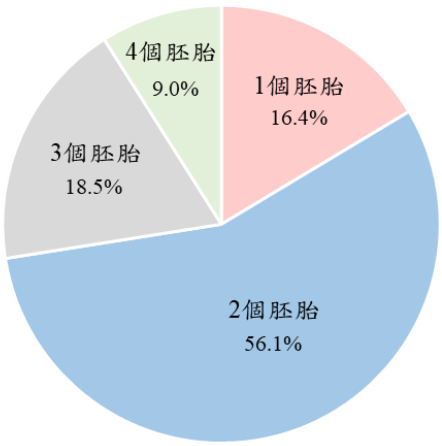


圖 12　107 年配偶間人工生殖施行試管嬰兒方式植入胚胎數之活產率

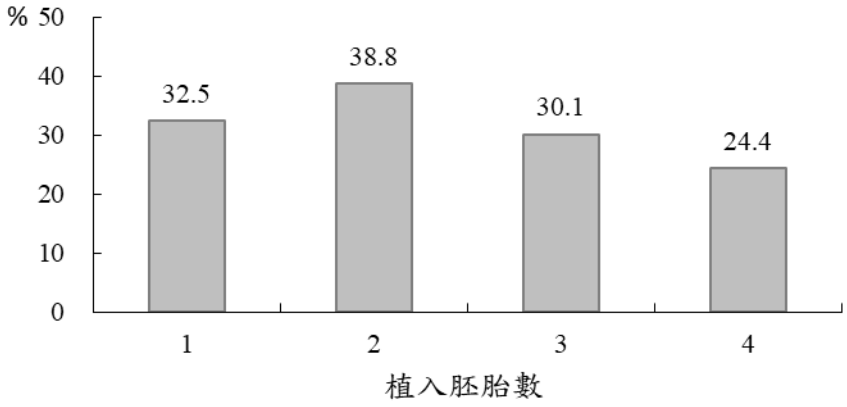
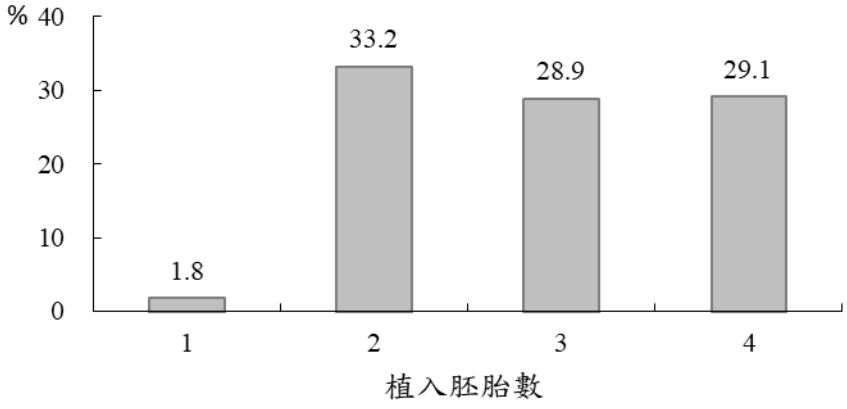


圖 13　107 年配偶間人工生殖施行試管嬰兒方式活產週期中植入胚胎數與多胞胎比例的關係



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 6,042 週期及植入冷凍胚胎共 14,263 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 38.6%及 49.5%；其活產率則為 27.8%及 37.4%，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 48.1%及 58.3%，但超過 40 歲之懷孕率僅剩下 21.4%及 28.0%；而植入新鮮胚胎週期活產率更是由小於 35 歲之 39.0%降低到大於 40 歲之 9.5%，植入冷凍胚胎週期活產率則是由 47.7%降低到 16.0%。（圖 15）

圖 14　107 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

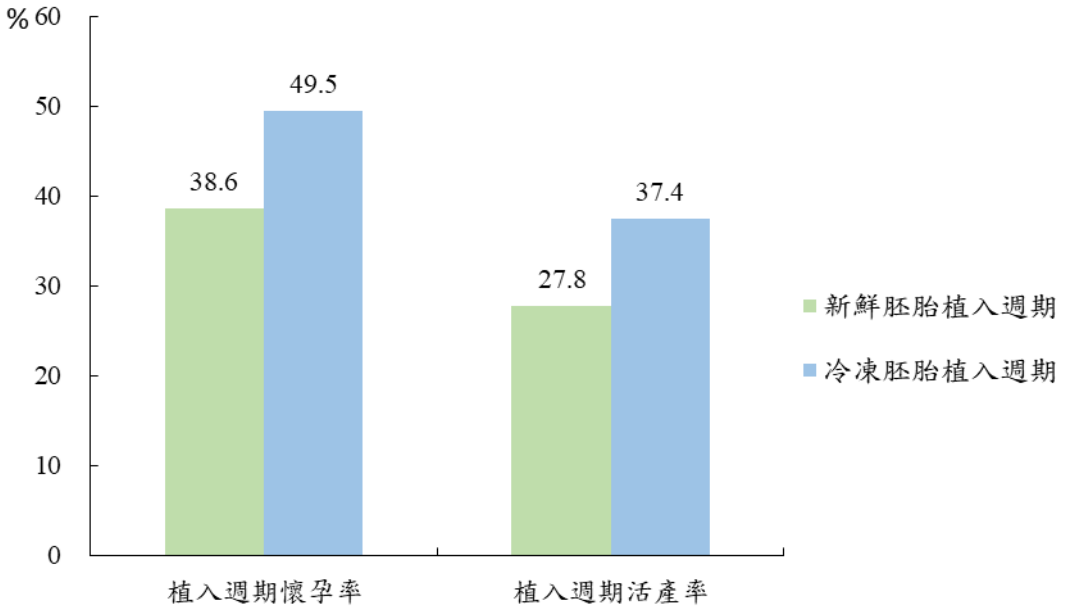
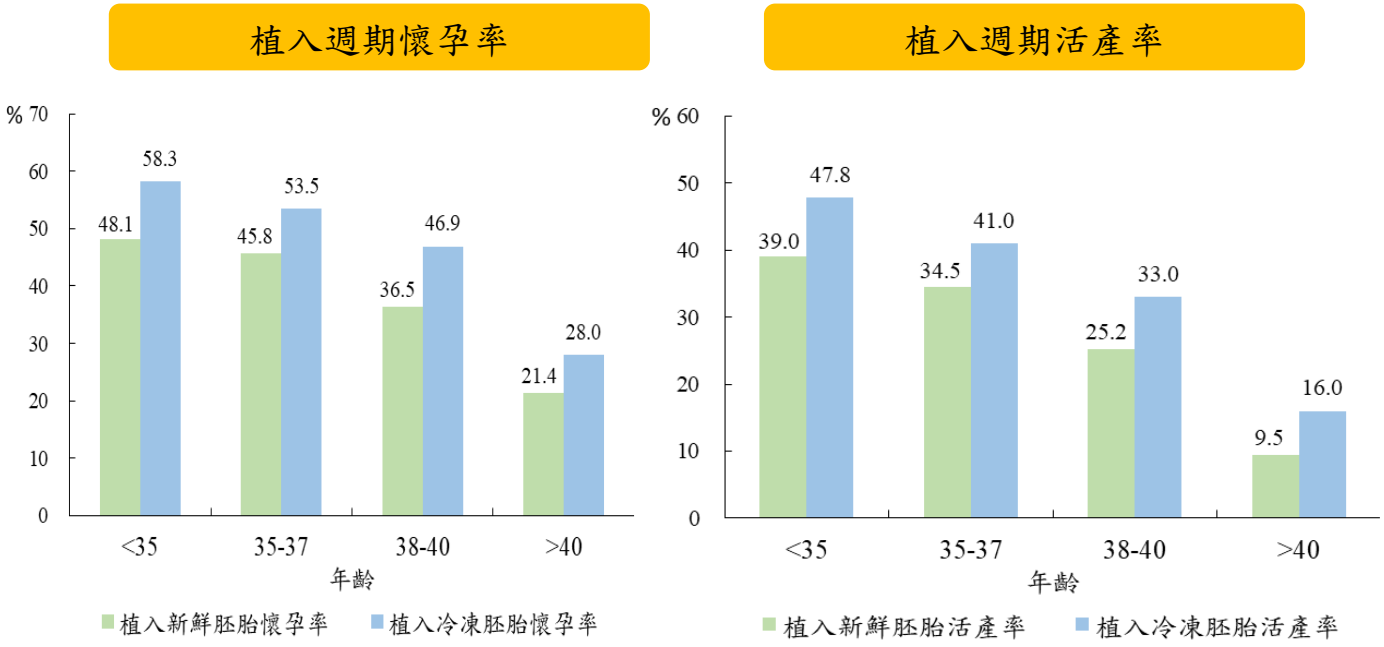
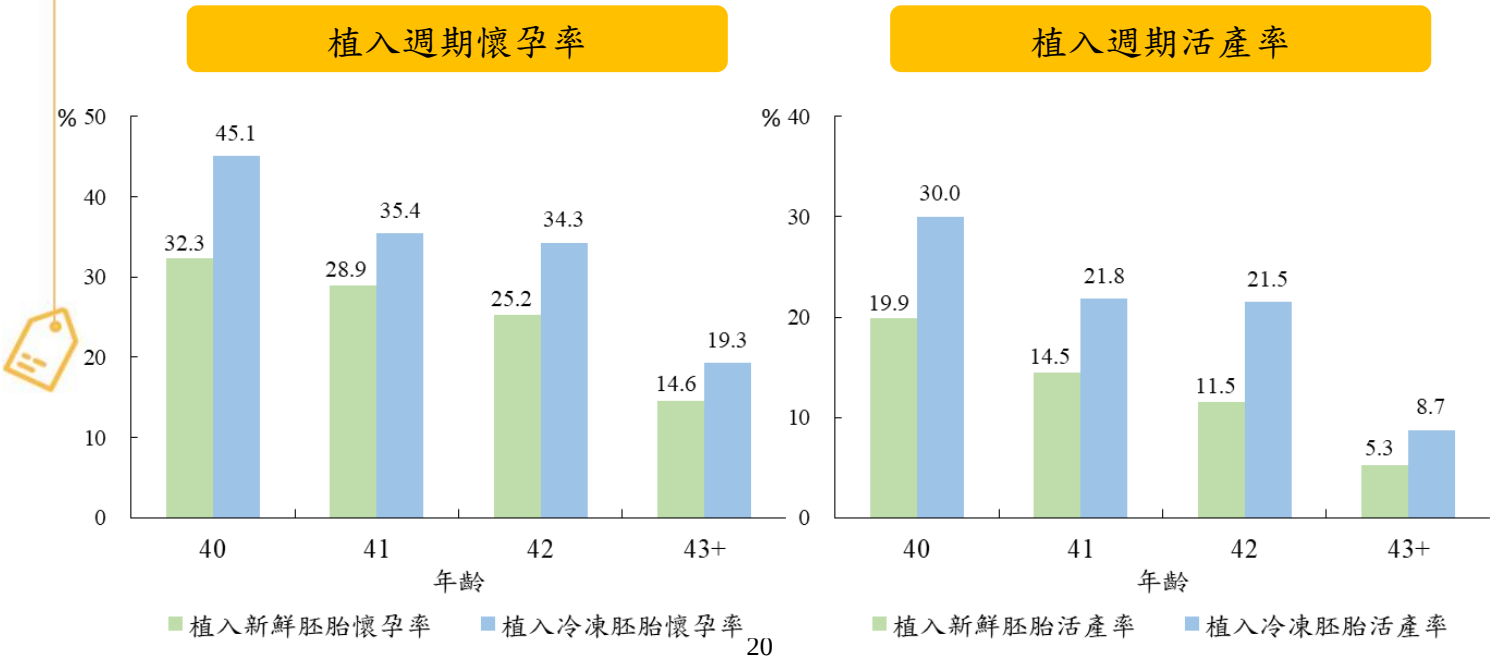


圖 15　107 年配偶間人工生殖植入新鮮胚胎及冷凍胚胎之受術妻年齡別成功率



以受術妻年齡大於(含)40 歲者(共 5,007 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 32.3%及 45.1%，但其活產率卻降至 19.9%及 30.0%。42 歲以後，植入週期成功率明顯下降，43 歲以上植入新鮮胚胎及冷凍胚胎週期懷孕率為 14.6%及 19.3%，而其活產率僅剩 5.3%及 8.7%(圖 16)。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 16　107 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 歲者之年齡別成功率



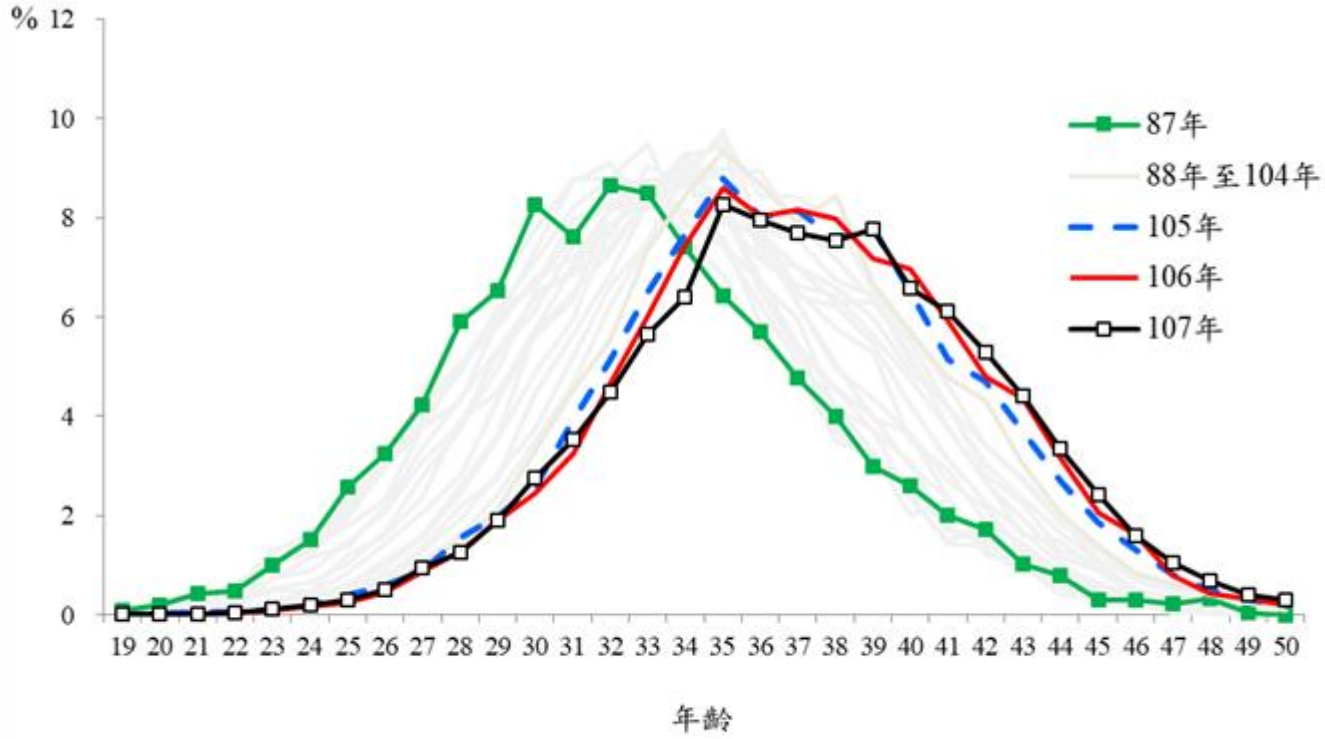
第四章　人工生殖趨勢（87 年-107 年）

第一節、 人工生殖治療週期趨勢

一、治療者之年齡

87 年至 107 年接受人工生殖之受術妻年齡有逐年增長趨勢，87 年年齡的中位數及平均數為 32 歲及 32.7 歲；105 年為 37 歲及 36.8 歲；106 年為 37 歲及 37.2 歲；107 年為 37 歲及 37.3 歲(圖 17)。

圖 17　87 年至 107 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 107 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，107 年為 39,840 週期，相對於 106 年的 37,849 週期增加了 5.3%(表 8-1)。

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 位新生兒誕生；94 年以後則每年約 2,800 位新生兒誕生，97 年有 3,093 位，107 年有 10,236 位，較 106 年 9,590 位增加了 646 個新生兒誕生(表 8 及圖 18)。

表 8　87 年至 107 年人工生殖治療週期數、活產週期數與活產嬰兒數

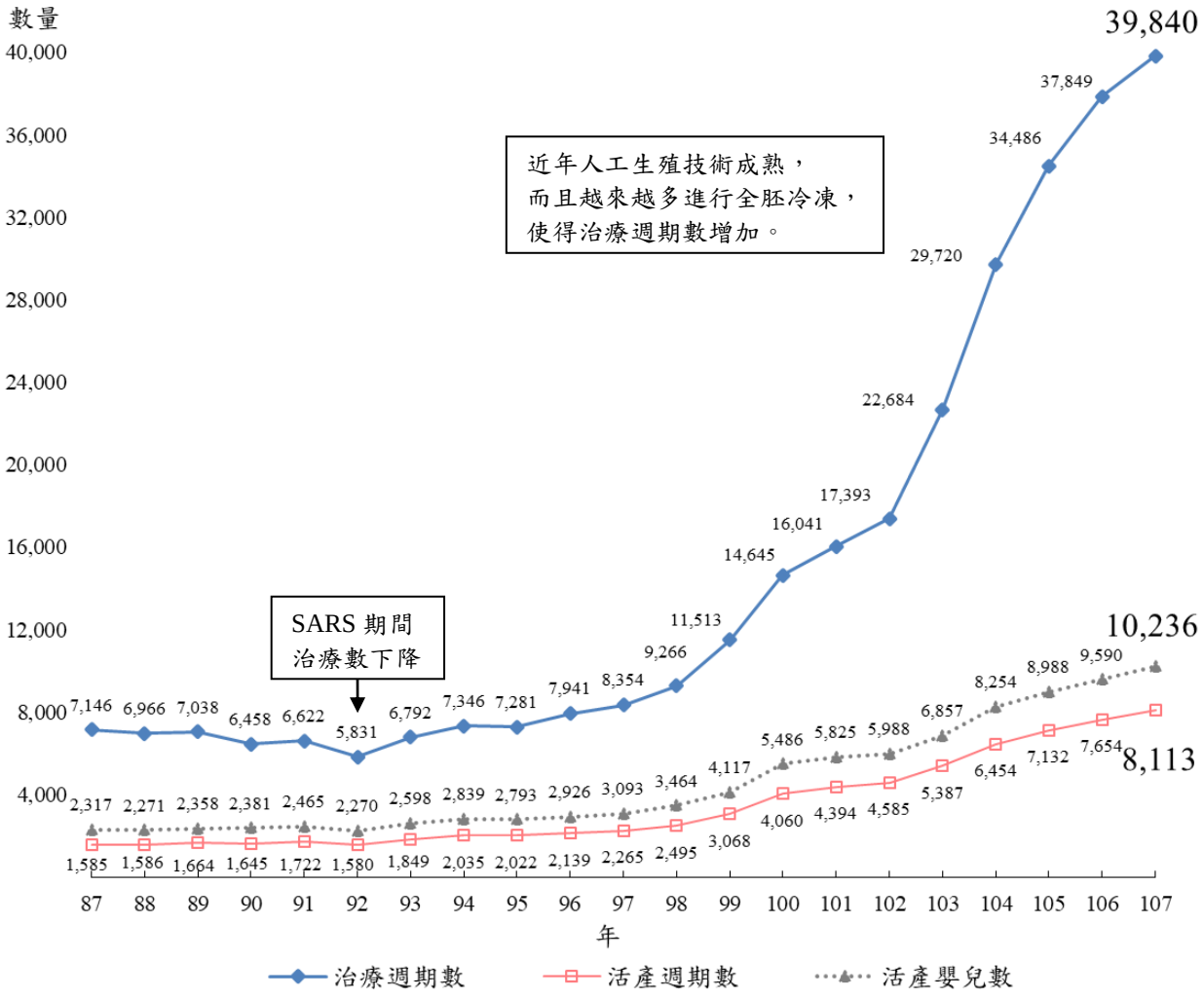
年	治療週期數（單位：週期）	活產週期數（單位：週期）	活產嬰兒數（單位：個）
87	7,146	1,585	2,317
88	6,966	1,586	2,271
89	7,038	1,664	2,358
90	6,458	1,645	2,381
91	6,622	1,722	2,465
92	5,831	1,580	2,270
93	6,792	1,849	2,598
94	7,346	2,035	2,839
95	7,281	2,022	2,793
96	7,941	2,139	2,926
97	8,354	2,265	3,093
98	9,266	2,495	3,464
99	11,513	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
107	39,840	8,113	10,236
合計	**311,212**	**73,434**	**97,116**

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。

表 8-1　87 年至 107 年人工生殖治療週期數成長率

年	治療週期數（單位：週期）	成長率（%）
87	7,146	-
88	6,966	-2.5
89	7,038	1.0
90	6,458	-8.2
91	6,622	2.5
92	5,831	-1.2
93	6,792	1.6
94	7,346	8.2
95	7,281	-0.9
96	7,941	9.1
97	8,354	5.2
98	9,266	10.9
99	11,513	24.2
100	14,645	27.2
101	16,041	9.5
102	17,393	8.4
103	22,684	30.4
104	29,720	31.0
105	34,486	16.0
106	37,849	9.7
107	39,840	5.3
合計	**311,212**	-

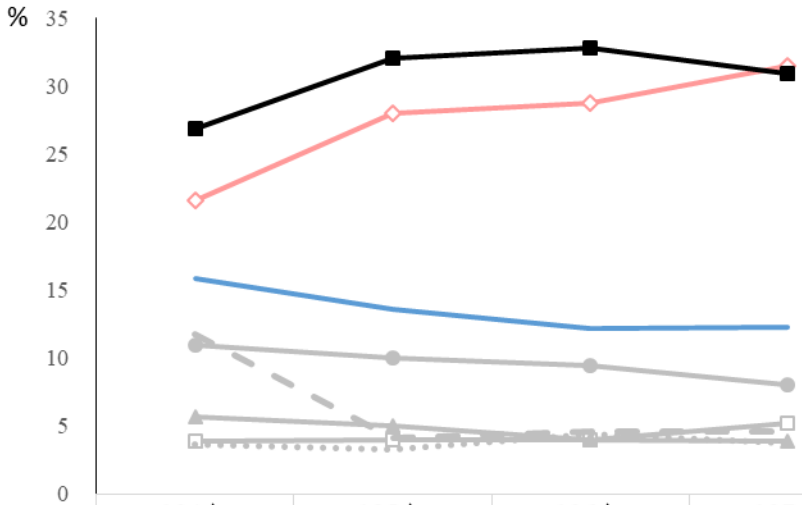
圖 18　87 年至 107 年人工生殖治療週期數、活產週期數與活產嬰兒數



三、治療者之不孕原因

104 年修正人工生殖資料及管理辦法，將不孕原因自五項細分為八項，增列卵巢因素、子宮內膜異位症及其他子宮因素。近 4 年不孕原因前三位為卵巢因素、多種因素及男性因素，107 年以卵巢因素為最高(圖 19)。

圖 19　近 4 年（104 年至 107 年）人工生殖之不孕原因百分比



	104年	105年	106年	107年
卵巢因素	21.6	28.0	28.7	31.5
多種因素	26.8	32.0	32.8	30.9
男性因素	15.8	13.6	12.2	12.3
輸卵管因素	10.9	10.0	9.4	8.0
其他子宮因素	3.9	4.0	4.0	5.2
其他女性因素	11.7	4.1	4.6	4.6
子宮內膜異位症	5.7	5.0	4.0	3.9
不明原因	3.6	3.3	4.4	3.7

四、懷孕率與活產率

圖 20 顯示 87 年至 107 年人工生殖之治療週期懷孕率以 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，107 年分別為 27.1%及 20.4%。因近年人工生殖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。

治療週期累積懷孕率由 87 年的 37.2%，107 年提升至 47.5%；治療週期累積活產率則由 87 年的 27.0%，提升至 107 年的 35.7%(圖 21)。

圖 20　87 年至 107 年人工生殖之治療週期懷孕率及活產率

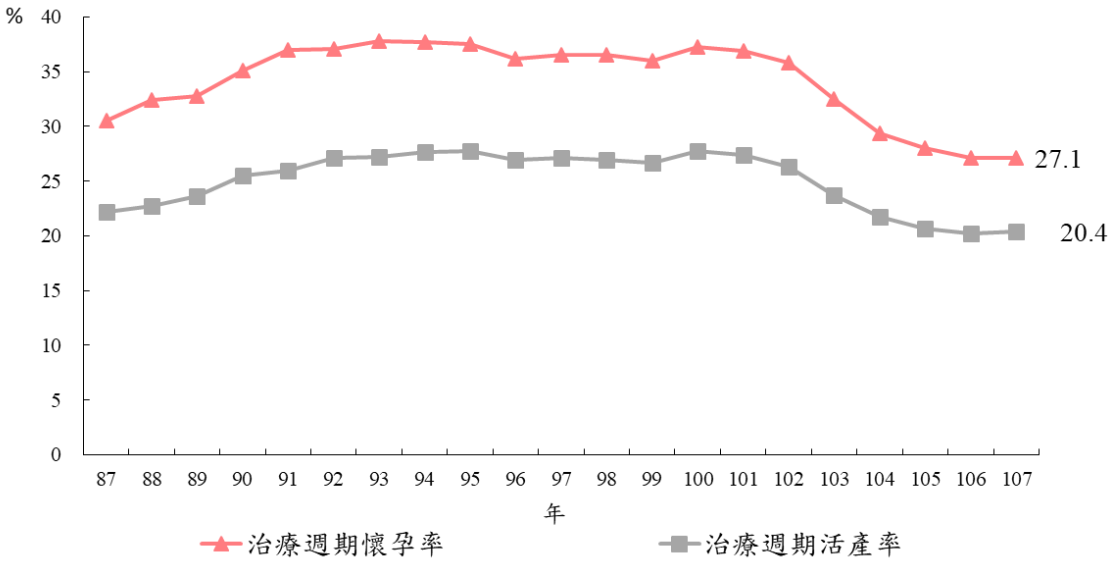
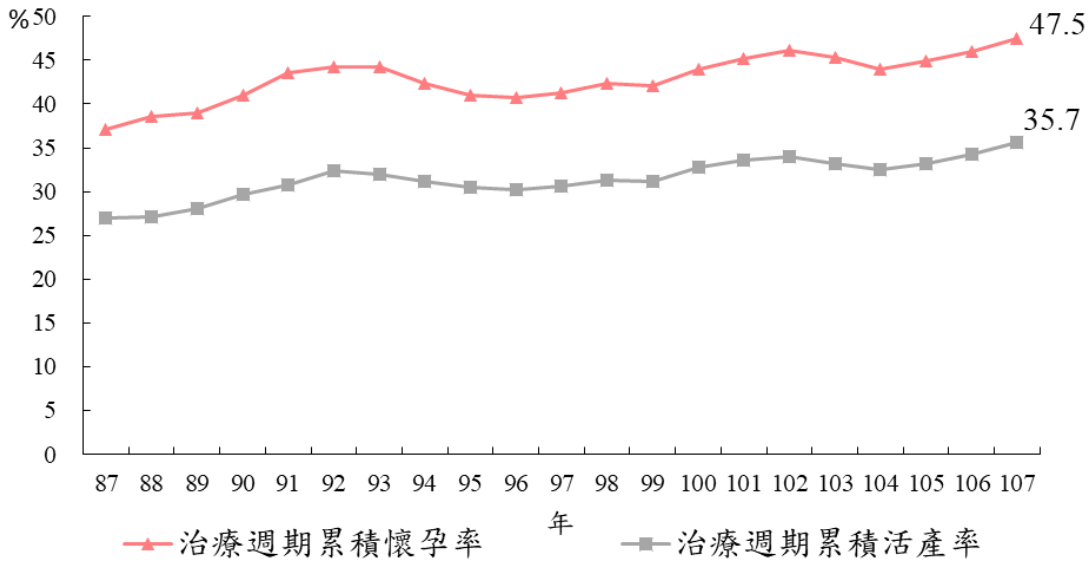


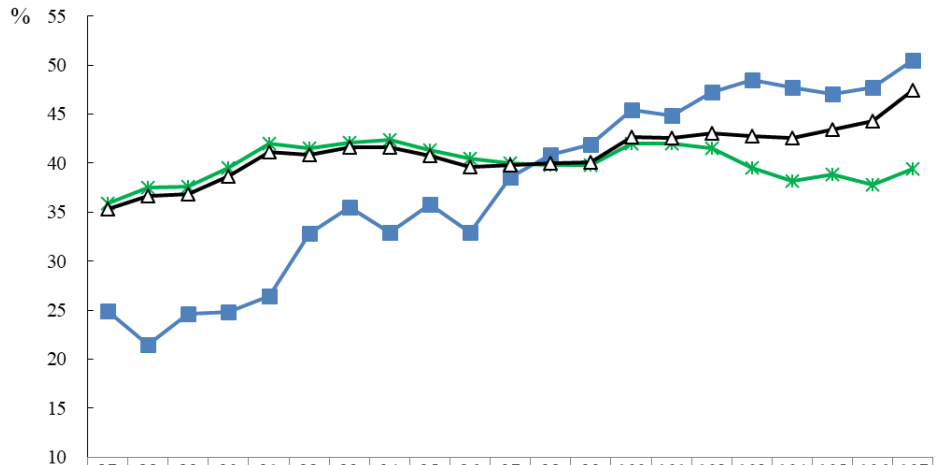
圖 21　87 年至 107 年人工生殖之治療週期累積懷孕率及累積活產率



第二節、 植入週期成功率趨勢

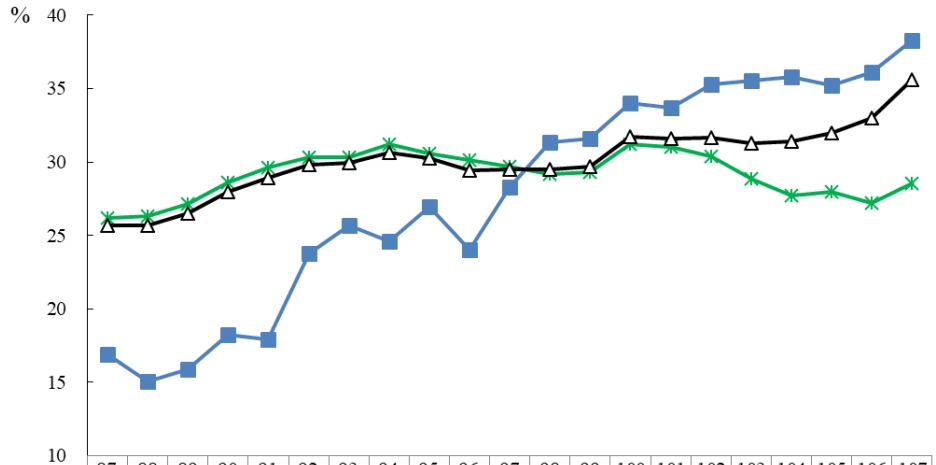
植入新鮮胚胎的懷孕率及活產率由 87 年 35.9%及 26.2%，提高到 94 年為 42.4%及 31.2%後呈現波動趨勢，107 年為 39.4%及 28.6%。植入冷凍胚胎的懷孕率及活產率在前幾年呈現波動趨勢，但 92 年以後有明顯的提高，107 年為 50.5%及 38.3%。98 年以後植入冷凍胚胎之懷孕率及活產率皆高於植入新鮮胚胎之懷孕率及活產率(圖 22 及圖 23)。

圖 22　87 年至 107 年植入新鮮胚胎與冷凍胚胎之植入週期懷孕率



	87年	88年	89年	90年	91年	92年	93年	94年	95年	96年	97年	98年	99年	100年	101年	102年	103年	104年	105年	106年	107年
植入新鮮胚胎週期	35.9	37.5	37.6	39.5	42.0	41.5	42.1	42.4	41.3	40.4	40.0	39.8	39.8	42.0	42.0	41.6	39.5	38.2	38.8	37.8	39.4
植入冷凍胚胎週期	24.9	21.5	24.6	24.9	26.4	32.8	35.5	32.9	35.8	32.9	38.6	40.8	41.9	45.4	44.8	47.3	48.5	47.7	47.0	47.7	50.5
植入胚胎週期	35.3	36.6	36.8	38.6	41.1	40.8	41.6	41.6	40.8	39.6	39.8	40.0	40.1	42.6	42.6	43.0	42.8	42.5	43.4	44.2	47.4

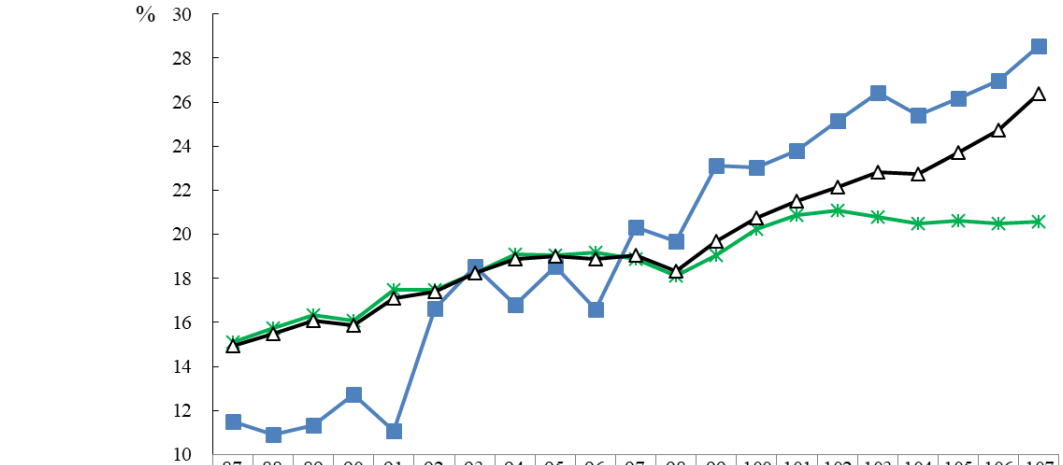
圖 23　87 年至 107 年植入新鮮胚胎與冷凍胚胎之植入週期活產率



	87年	88年	89年	90年	91年	92年	93年	94年	95年	96年	97年	98年	99年	100年	101年	102年	103年	104年	105年	106年	107年
植入新鮮胚胎週期	26.2	26.3	27.1	28.6	29.6	30.3	30.3	31.2	30.6	30.2	29.7	29.2	29.3	31.2	31.0	30.4	28.9	27.7	28.0	27.2	28.6
植入冷凍胚胎週期	16.9	15.1	15.9	18.2	17.9	23.8	25.7	24.6	27.0	24.0	28.3	31.4	31.6	34.0	33.7	35.3	35.5	35.8	35.2	36.1	38.3
植入胚胎週期	25.7	25.7	26.5	28.0	28.9	29.8	30.0	30.6	30.2	29.4	29.5	29.5	29.7	31.7	31.6	31.7	31.3	31.4	32.0	33.0	35.6

植入新鮮胚胎的單胎率自 87 年以來呈現上升趨勢，87 年為 15.1%，107 年達 20.6%；而植入冷凍胚胎的單胎率，在 93 年明顯增加為 18.5%，107 年為 28.6%。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 107 年植入新鮮胚胎與冷凍胚胎之植入週期單胎率

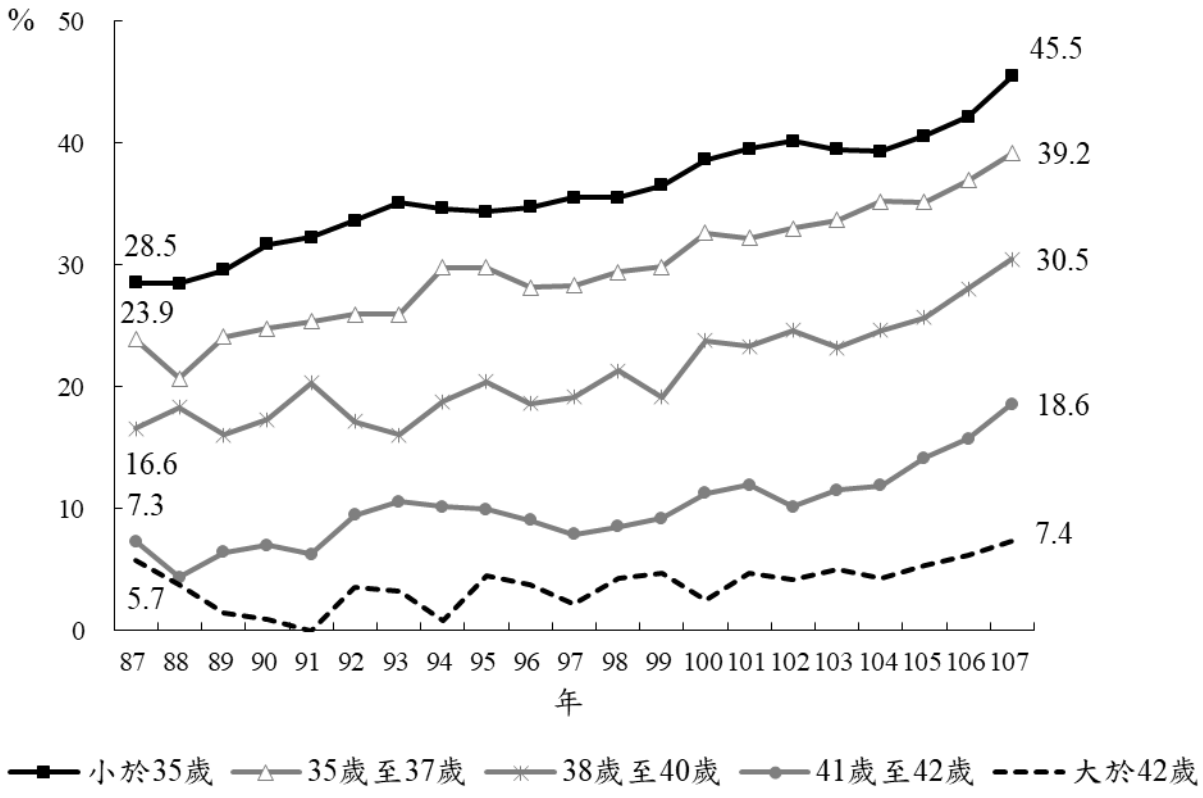


	87年	88年	89年	90年	91年	92年	93年	94年	95年	96年	97年	98年	99年	100年	101年	102年	103年	104年	105年	106年	107年
植入新鮮胚胎週期	15.1	15.7	16.4	16.1	17.5	17.5	18.2	19.1	19.0	19.2	18.9	18.1	19.1	20.3	20.9	21.1	20.8	20.5	20.6	20.5	20.6
植入冷凍胚胎週期	11.5	10.9	11.3	12.7	11.1	16.6	18.5	16.8	18.5	16.6	20.3	19.7	23.1	23.0	23.8	25.2	26.4	25.4	26.2	27.0	28.6
植入胚胎週期	14.9	15.5	16.1	15.9	17.1	17.4	18.2	18.9	19.0	18.9	19.0	18.3	19.7	20.7	21.5	22.1	22.8	22.8	23.7	24.7	26.4

第三節、各年齡層之植入週期成功率趨勢

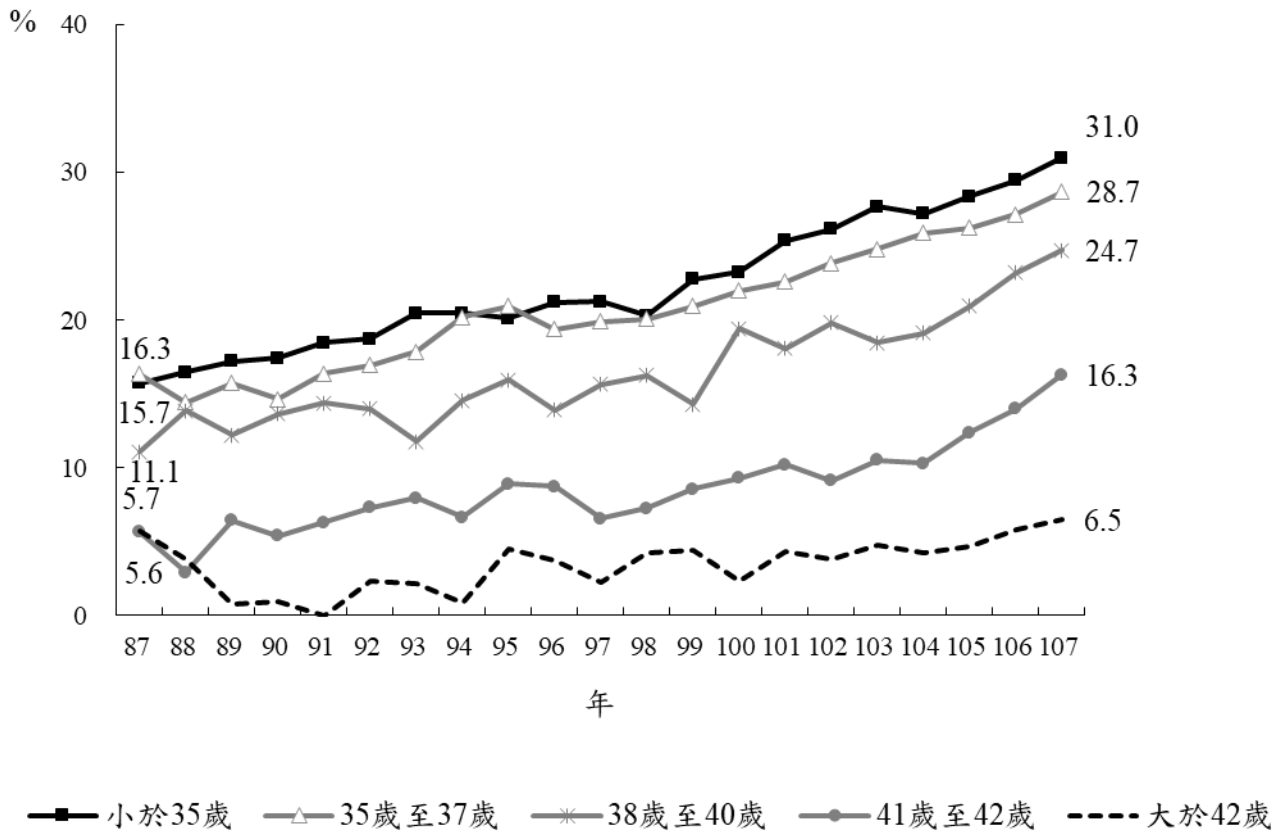
植入週期活產率使用捐贈卵子會受捐贈者年齡影響，所以僅分析配偶間人工生殖之植入週期活產率。受術妻在未滿 35 歲者之植入週期活產率由 87 年的 28.5%提高到 107 年的 45.5%，同樣的時期，35 到 37 歲年齡層提高 15.3 個百分點，於 38 到 40 歲提高 13.9 個百分點，於 41 到 42 歲提高 11.3 個百分點，而年齡大於 42 歲之受術妻則提高 1.7 個百分點(圖 25)。

圖 25　87 年至 107 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 107 年的 31.0%。同樣的時期，植入週期單胎率在 35 到 37 歲年齡層提高 12.4 個百分點，於 38 到 40 歲提高 13.6 個百分點，於 41-42 歲提高 10.7 個百分點，而在年齡大於 42 歲之受術妻則提高 0.8 個百分點(圖 26)。

圖 26　87 年至 107 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）

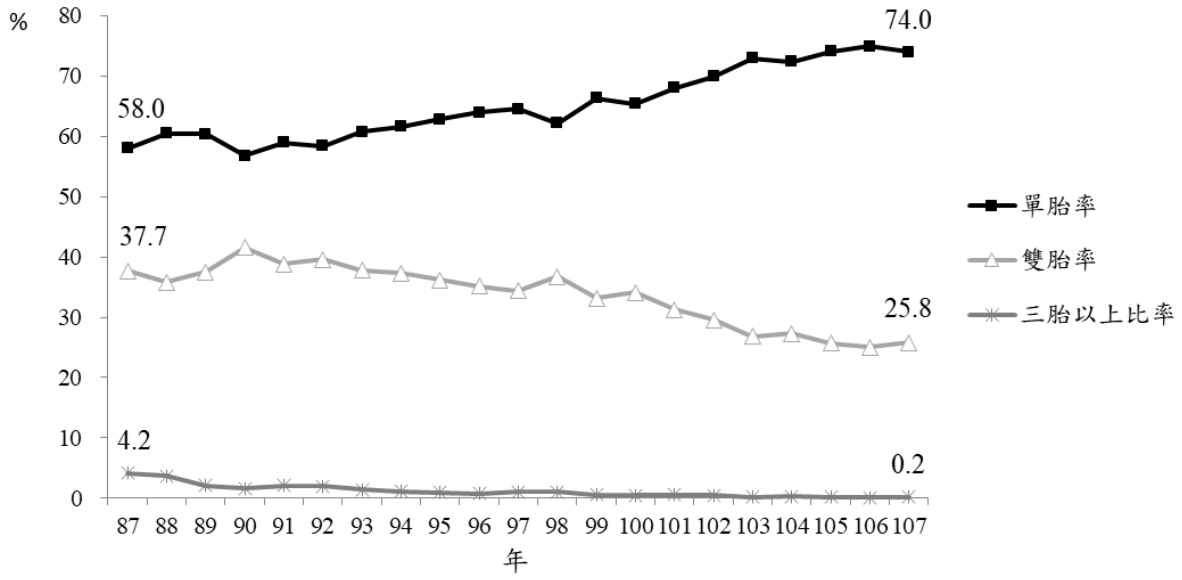


第四節、活產週期出生胎數、體重與週數

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 107 年的 74.0%；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 107 年的 25.8%及 0.2%(圖 27)。

圖 27　87 年至 107 年活產週期胎數百分比



人工生殖活產嬰兒中，出生體重低於 1,500 公克者，87 年占所有活產嬰兒 7.5%，107 年下降至 3.6%；1,500 公克至 2,499 公克則從 87 年 35.9%下降至 107 年 30.2%；而大於等於 2,500 公克者，則從 87 年 56.9%上升至 107 年 66.2%(圖 28)。另，87 年出生週數小於 37 週者占 42.9%，107 年下降至 36.3%；37 週至 41 週從 87 年占 57%上升至 107 年 63.6%，大於等於 42 週者則從 87 年 0.2%下降至 107 年 0.1%(圖 29)。

圖 28　87 年至 107 年活產嬰兒之出生體重百分比

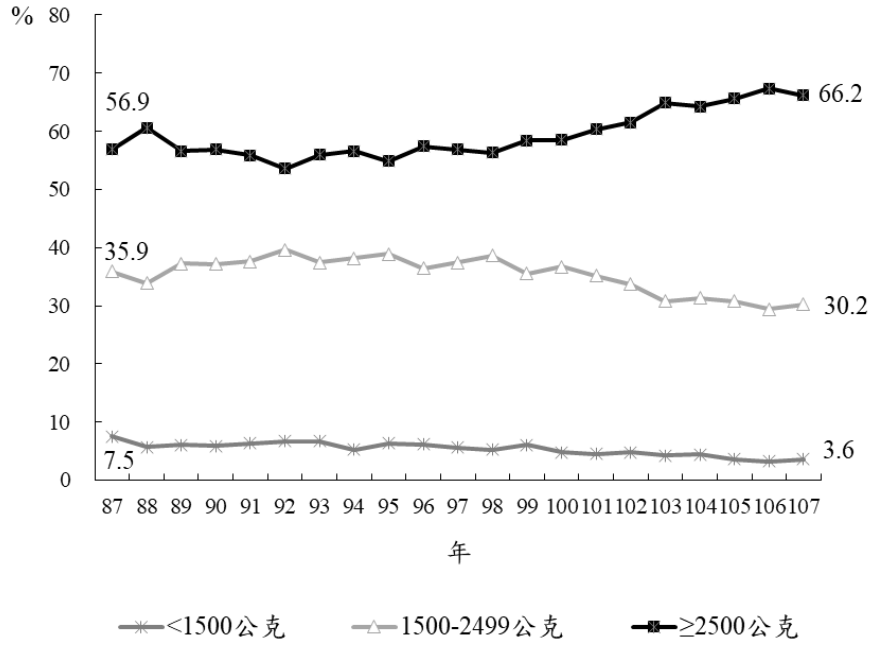
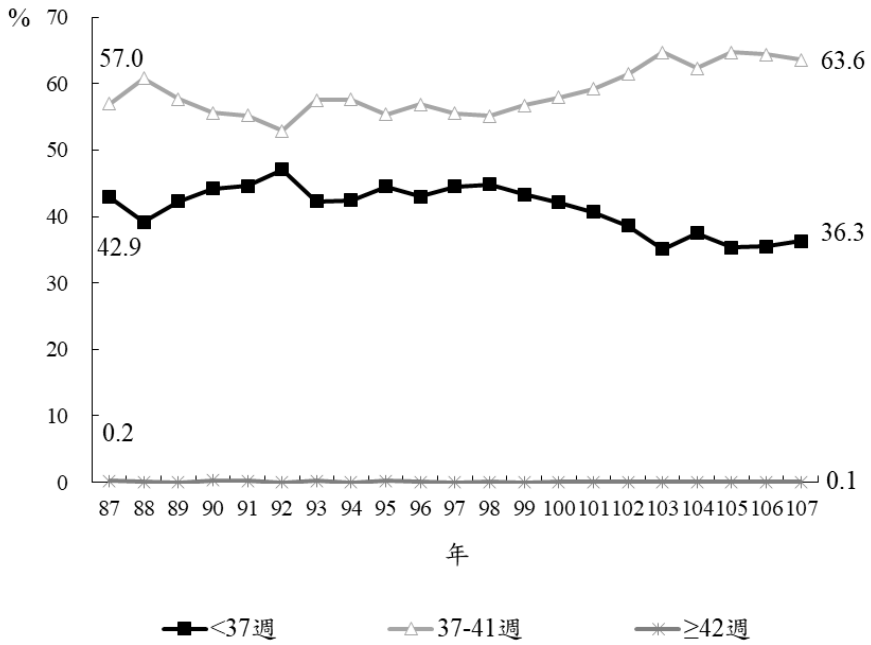


圖 29　87 年至 107 年活產嬰兒之出生週數百分比



附錄 1　107 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	99.9%	使用 ICSI	41%	輸卵管因素	8%
ZIFT/TET	<1%	無刺激排卵	21%	卵巢因素	31%
AID	<1%			子宮內膜異位症	4%
				其他子宮因素	5%
				其他女性因素	5%
				男性因素	12%
				多種因素	31%
				不明原因	4%

懷孕成功率

週期類型	女性年齡				
人工生殖之新鮮胚胎	**<35**	**35-37**	**38-40**	**>40**	**合計**
治療週期數	5,961	5,079	5,167	6,545	22,752
懷孕週期百分比	13.9	14.4	10.7	5.3	10.8
活產週期百分比	11.3	10.8	7.5	2.7	7.8
植入週期數	1,704	1,577	1,494	1,466	6,241
植入週期之懷孕率	48.5	46.4	36.9	23.7	39.4
植入週期之活產率	39.4	34.9	25.8	11.9	28.6
植入週期之單胎活產率	26.1	25.3	19.7	10.1	20.6
取消百分比	72.6	70.0	72.1	79.0	73.7
平均植入胚胎數	2.1	2.4	2.7	2.8	2.5
活產週期之多胞胎百分比	33.9	27.5	23.6	15.3	27.9

人工生殖之冷凍胚胎	**<35**	**35-37**	**38-40**	**>40**	**合計**
治療週期數	5,257	4,449	3,558	3,824	17,088
懷孕週期百分比	57.0	52.1	46.2	36.0	48.8
活產週期百分比	46.9	40.2	32.8	23.8	37.0
植入週期數	5,108	4,307	3,430	3,860	16,705
植入週期之懷孕率	58.7	53.8	48.0	37.4	50.5
植入週期之活產率	48.3	41.4	34.0	24.8	38.3
植入週期之單胎活產率	33.4	30.5	27.8	20.4	28.6
取消百分比	2.8	3.2	3.6	3.8	3.3
平均植入胚胎數	1.9	2.1	2.3	2.2	2.1
活產週期之多胞胎百分比	30.9	26.5	18.3	17.8	25.4

非捐贈卵子之新鮮胚胎	**<35**	**35-37**	**38-40**	**>40**	**合計**
治療週期數	5,766	4,953	5,001	5,872	21,592
懷孕週期百分比	14.0	14.5	10.8	5.1	10.9
活產週期百分比	11.4	10.8	7.5	2.3	7.9
植入週期數	1,684	1,557	1,479	1,395	6,115
植入週期之懷孕率	48.1	46.1	36.5	21.3	38.7
植入週期之活產率	39.1	34.5	25.4	9.5	27.8
植入週期之單胎活產率	25.9	25.3	19.3	8.2	20.1
取消百分比	71.9	69.5	71.4	77.5	72.8
平均植入胚胎數	2.1	2.4	2.7	2.8	2.5
活產週期之多胞胎百分比	33.7	26.6	24.0	14.3	27.8

非捐贈卵子之冷凍胚胎	**<35**	**35-37**	**38-40**	**>40**	**合計**
治療週期數	4,962	4,264	3,294	2,447	14,967
懷孕週期百分比	56.6	51.7	45.3	26.6	47.8
活產週期百分比	46.5	39.7	31.8	15.2	36.2
植入週期數	4,815	4,126	3,171	2,333	14,445
植入週期之懷孕率	58.4	53.5	47.0	27.9	49.6
植入週期之活產率	47.9	41.1	33.0	15.9	37.5
植入週期之單胎活產率	32.9	30.1	27.3	14.0	27.8
取消百分比	3.0	3.2	3.7	4.7	3.5
平均植入胚胎數	2.0	2.1	2.3	2.5	2.2
活產週期之多胞胎百分比	31.3	26.6	17.5	11.9	25.8

非捐贈精子之新鮮胚胎	**<35**	**35-37**	**38-40**	**>40**	**合計**
治療週期數	5,884	5,033	5,127	6,495	22,539
懷孕週期百分比	13.8	14.3	10.7	5.3	10.8
活產週期百分比	11.2	10.8	7.4	2.7	7.8
植入週期數	1,677	1,560	1,481	1,450	6,168
植入週期之懷孕率	48.5	46.1	36.9	23.9	39.3
植入週期之活產率	39.4	34.9	25.7	11.9	28.5
植入週期之單胎活產率	26.1	25.3	19.6	10.1	20.6
取消百分比	72.5	70.0	72.1	79.0	73.7
平均植入胚胎數	2.1	2.4	2.7	2.8	2.5
活產週期之多胞胎百分比	33.7	27.4	23.7	15.6	27.8

非捐贈精子之冷凍胚胎	**<35**	**35-37**	**38-40**	**>40**	**合計**
治療週期數	5,156	4,397	3,534	3,808	16,895
懷孕週期百分比	57.0	52.1	46.2	36.1	48.8
活產週期百分比	46.8	40.1	32.7	23.9	37.0
植入週期數	5,014	4,255	3,408	3,666	16,343
植入週期之懷孕率	58.6	53.8	47.9	37.5	50.4
植入週期之活產率	48.1	41.5	33.9	24.8	38.2
植入週期之單胎活產率	33.2	30.4	27.8	20.4	28.5
取消百分比	2.8	3.2	3.6	3.7	3.3
平均植入胚胎數	1.9	2.1	2.3	2.2	2.1
活產週期之多胞胎百分比	31.0	26.6	18.2	17.8	25.5

配偶間之新鮮胚胎	<35	35-37	38-40	>40	合計
治療週期數	5,689	4,907	4,961	5,822	21,379
懷孕週期百分比	14.0	14.4	10.8	5.1	10.9
活產週期百分比	11.4	10.8	7.4	2.3	7.9
植入週期數	1,657	1,540	1,466	1,379	6,042
植入週期之懷孕率	48.1	45.8	36.5	21.4	38.6
植入週期之活產率	39.0	34.5	25.2	9.6	27.8
植入週期之單胎活產率	26.0	25.3	19.2	8.1	20.1
取消百分比	71.8	69.5	71.4	77.5	72.7
平均植入胚胎數	2.1	2.4	2.7	2.8	2.5
活產週期之多胞胎百分比	33.5	26.6	24.1	14.5	27.8

配偶間之冷凍胚胎	<35	35-37	38-40	>40	合計
治療週期數	4,861	4,212	3,270	2,431	14,774
懷孕週期百分比	56.6	51.7	45.2	26.7	47.8
活產週期百分比	46.4	39.7	31.7	15.3	36.1
植入週期數	4,721	4,074	3,149	2,319	14,263
植入週期之懷孕率	58.3	53.5	46.9	28.0	49.5
植入週期之活產率	47.8	41.0	33.0	16.0	37.4
植入週期之單胎活產率	32.8	30.0	27.2	14.1	27.7
取消百分比	2.9	3.3	3.7	4.6	3.5
平均植入胚胎數	2.0	2.1	2.3	2.5	2.2
活產週期之多胞胎百分比	31.4	26.8	17.4	11.9	25.9

所有年齡合計

捐贈卵子	新鮮胚胎	冷凍胚胎
植入週期數	126	2,080
植入週期之活產週期百分比	62.7	43.8
平均植入胚胎數	1.9	1.7

捐贈精子	新鮮胚胎	冷凍胚胎
植入週期數	73	182
植入週期之活產率	32.9	46.2
平均植入胚胎數	2.6	1.9

配偶間	新鮮胚胎	冷凍胚胎
植入週期數	6,042	14,263
植入週期之活產率	27.8	37.4
平均植入胚胎數	2.5	2.2

植入胚胎數及活產單胞胎率

35 歲以下

	植入胚胎數			
	1	2	3	4
植入週期數	1,378	4,442	783	205
植入週期懷孕率	52	59	50	49
胎心音單胞胎率	90	58	60	60
活產單胞胎率	98	61	64	65

35-37 歲

	植入胚胎數			
	1	2	3	4
植入週期數	1,127	2,982	1,327	448
植入週期懷孕率	48	55	50	46
胎心音單胞胎率	89	61	63	56
活產單胞胎率	98	68	67	65

38-40 歲

	植入胚胎數			
	1	2	3	4
植入週期數	936	1,896	1,285	806
植入週期懷孕率	44	48	42	43
胎心音單胞胎率	87	66	69	60
活產單胞胎率	98	77	78	69

40 歲以上

	植入胚胎數			
	1	2	3	4
植入週期數	1,219	1,844	1,012	1,071
植入週期懷孕率	36	38	30	26
胎心音單胞胎率	85	61	61	57
活產單胞胎率	100	72	77	82

通報資料之人工生殖機構數：88

附錄 2　107 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	347	72.6	27.4	0.0	17.9	38.4	18.7	18.4	6.6
臺北市	國立臺灣大學醫學院附設醫院	1,356	30.3	40.1	29.6	8.0	27.1	15.7	37.3	11.9
	長庚醫療財團法人台北長庚紀念醫院	273	30.8	69.2	0.0	0.0	12.1	2.9	85.0	0.0
	臺北榮民總醫院	1,638	89.0	11.0	0.0	9.8	40.9	24.0	18.1	7.2
	國防醫學院三軍總醫院	224	50.4	49.6	0.0	7.1	36.2	16.5	40.2	0.0
	台灣基督長老教會馬偕醫療財團法人馬偕紀念醫院	937	55.7	44.3	0.0	6.2	27.5	29.4	20.5	16.4
	國泰醫療財團法人國泰綜合醫院	223	67.3	32.7	0.0	14.3	66.0	8.5	11.2	0.0
	中山醫療社團法人中山醫院	345	42.0	15.4	42.6	8.4	43.6	7.2	33.6	7.2
	新光醫療財團法人新光吳火獅紀念醫院	199	55.8	44.2	0.0	18.6	46.7	13.1	17.6	4.0
	基督復臨安息日會醫療財團法人臺安醫院	343	84.0	16.0	0.0	1.5	69.3	8.7	19.0	1.5
	臺北醫學大學附設醫院	2,497	45.2	54.8	0.0	10.4	66.6	12.3	8.5	2.2
	生泉婦產科診所	203	67.0	33.0	0.0	14.8	53.2	17.2	3.0	11.8
	宏孕診所	522	21.3	78.7	0.0	4.4	47.1	9.2	34.7	4.6
	祈新婦產科診所	478	64.2	35.8	0.0	2.1	66.5	1.9	28.2	1.3
	愛群婦產科診所	2,133	42.2	23.8	34.0	8.4	43.8	16.5	26.4	4.9
	黃建榮婦產科診所	911	60.2	39.8	0.0	10.0	31.7	14.3	30.6	13.4
	王家瑋婦產科診所	2,164	65.2	34.8	0.0	11.6	34.9	15.7	37.8	0.0
	生基婦產科診所	189	18.5	35.4	46.0	7.9	45.1	6.3	40.7	0.0
	臺北市立聯合醫院仁愛院區	94	7.4	60.6	31.9	4.3	40.4	6.4	31.9	17.0
	華育婦產科診所	44	56.8	43.2	0.0	20.5	63.6	0.0	15.9	0.0
	送子鳥 11 診所	2	50.0	50.0	0.0	0.0	100.0	0.0	0.0	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
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	260	55.0	45.0	0.0	8.5	26.2	20.4	38.4	6.5
	蔡佳璋婦幼聯合診所	186	65.6	34.4	0.0	8.6	55.3	18.8	15.1	2.2
	衛生福利部雙和醫院	8	62.5	37.5	0.0	12.5	12.5	25.0	50.0	0.0
	佛教慈濟醫療財團法人台北慈濟醫院	106	61.3	38.7	0.0	7.5	26.4	21.7	33.1	11.3
	星孕國際診所	86	54.7	45.3	0.0	7.0	58.2	8.1	24.4	2.3
	基生婦產科診所	53	39.6	60.4	0.0	0.0	51.0	9.4	28.3	11.3
桃園市	長庚醫療財團法人林口長庚紀念醫院	1,341	47.2	52.8	0.0	4.0	40.0	3.1	52.3	0.6
	衛生福利部桃園醫院	139	25.9	26.6	47.5	5.8	53.2	2.2	38.8	0.0
	敏盛綜合醫院	76	59.2	40.8	0.0	30.2	15.8	5.3	22.4	26.3
	宏其婦幼醫院	580	45.9	54.1	0.0	23.8	57.8	17.2	1.2	0.0
	惠生婦產科診所	158	75.9	24.1	0.0	10.8	31.6	16.5	29.7	11.4
新竹市	江婦產科診所	46	63.0	34.8	2.2	8.7	82.6	8.7	0.0	0.0
	送子鳥診所	2,638	59.0	40.8	0.2	0.3	95.8	3.7	0.0	0.2
	台灣基督長老教會馬偕醫療財團法人新竹馬偕紀念醫院	260	34.2	65.8	0.0	4.2	18.8	32.3	42.4	2.3
	林正凱好孕診所	340	68.8	31.2	0.0	4.7	30.6	10.9	53.2	0.6
新竹縣	艾微芙診所	1,316	52.9	47.1	0.0	1.2	36.3	11.9	47.7	2.9
苗栗縣	大千綜合醫院	56	94.6	5.4	0.0	39.2	39.3	5.4	3.6	12.5
臺中市	中國醫藥大學附設醫院	564	17.7	82.3	0.0	12.8	30.8	15.8	28.2	12.4
	中山醫學大學附設醫院	150	46.7	53.3	0.0	0.7	2.0	0.7	96.6	0.0
	茂盛醫院	4,243	53.6	46.4	0.0	7.1	10.8	4.2	77.9	0.0
	臺中榮民總醫院	790	82.9	17.0	0.1	12.9	51.5	15.4	17.8	2.4
	澄清綜合醫院中港分院	46	84.8	15.2	0.0	37.0	45.6	17.4	0.0	0.0
	林新醫療社團法人林新醫院	127	41.7	58.3	0.0	27.6	52.8	10.2	9.4	0.0
	劉忠俊婦產科診所	248	44.4	55.6	0.0	7.3	48.7	12.9	23.4	7.7
	美村婦產科診所	68	25.0	75.0	0.0	11.8	42.6	17.6	26.5	1.5

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	謝耀元婦產科診所	9	11.1	88.9	0.0	0.0	77.8	22.2	0.0	0.0
	大新婦產科診所	328	18.0	36.0	46.0	4.0	58.5	1.2	36.3	0.0
	佛教慈濟醫療財團法人台中慈濟醫院	36	91.7	8.3	0.0	22.2	61.1	11.1	5.6	0.0
	張帆婦產科診所	326	50.0	50.0	0.0	3.7	26.4	8.0	45.9	16.0
	童綜合醫療社團法人童綜合醫院	56	60.6	39.4	0.0	18.2	60.5	6.1	9.1	6.1
彰化縣	彰化基督教醫療財團法人彰化基督教醫院	883	56.5	43.5	0.0	7.9	52.6	13.0	22.0	4.5
	彰化基督教醫療財團法人漢銘基督教醫院	13	92.3	7.7	0.0	38.4	30.8	7.7	23.1	0.0
	博元婦產科診所	506	54.7	45.3	0.0	7.7	74.7	9.9	7.7	0.0
	秀傳醫療財團法人彰濱秀傳紀念醫院	16	68.8	31.2	0.0	12.5	56.3	6.2	0.0	25.0
雲林縣	國立臺灣大學醫學院附設醫院雲林分院	5	60.0	40.0	0.0	40.0	60.0	0.0	0.0	0.0
嘉義市	戴德森醫療財團法人嘉義基督教醫院	106	72.6	27.4	0.0	19.8	44.3	18.9	8.5	8.5
	嘉安婦幼診所	103	5.8	94.2	0.0	13.6	68.8	11.7	1.0	4.9
嘉義縣	長庚醫療財團法人嘉義長庚紀念醫院	81	92.6	7.4	0.0	19.8	38.3	11.1	14.8	16.0
臺南市	國立成功大學醫學院附設醫院	491	77.6	22.4	0.0	5.5	35.0	16.1	41.2	2.2
	郭綜合醫院	108	68.5	31.5	0.0	1.9	43.5	19.4	31.5	3.7
	許朝欽婦產科診所	132	66.7	33.3	0.0	5.3	57.6	10.6	24.2	2.3
	台灣基督長老教會新樓醫療財團法人台南新樓醫院	99	1.0	99.0	0.0	19.2	44.4	6.1	24.2	6.1
	安安婦幼診所	1,050	84.0	15.8	0.2	9.0	60.9	15.0	15.1	0.0
	奇美醫療財團法人奇美醫院	588	59.5	40.5	0.0	1.2	11.7	31.6	55.5	0.0
	璟馨婦幼醫院	400	5.8	94.2	0.0	21.0	25.0	35.8	18.2	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	243	58.0	42.0	0.0	14.0	65.0	8.2	7.0	5.8
	健新醫院	696	4.6	95.4	0.0	4.0	49.5	21.6	24.9	0.0
	阮綜合醫療社團法人阮綜合醫院	67	82.1	17.9	0.0	14.9	56.7	16.4	6.0	6.0
	高雄榮民總醫院	590	55.6	44.4	0.0	5.6	44.7	6.9	30.3	12.5
	張榮州婦產科診所	28	78.6	14.3	7.1	3.6	89.3	7.1	0.0	0.0
	好韻診所	166	75.9	24.1	0.0	5.4	68.7	6.0	19.9	0.0
	生生不息婦產科診所	406	18.2	81.8	0.0	10.3	54.7	16.3	18.5	0.2
	義大醫療財團法人義大大昌醫院	112	69.6	30.4	0.0	8.0	81.3	10.7	0.0	0.0
	長庚醫療財團法人高雄長庚紀念醫院	676	89.8	10.1	0.1	19.5	40.8	11.4	19.1	9.2
	同喬眼科診所	232	71.1	28.9	0.0	8.2	53.4	9.9	25.9	2.6
	義大醫療財團法人義大醫院	110	8.2	91.8	0.0	0.0	10.9	8.2	80.9	0.0
屏東縣	屏基醫療財團法人屏東基督教醫院	27	63.0	37.0	0.0	29.6	7.4	3.7	59.3	0.0
宜蘭縣	醫療財團法人羅許基金會羅東博愛醫院	23	17.4	82.6	0.0	4.3	34.8	13.0	47.9	0.0
花蓮縣	佛教慈濟醫療財團法人花蓮慈濟醫院	93	32.3	14.0	53.7	28.0	33.3	11.8	16.1	10.8
金門縣	衛生福利部金門醫院	606	78.7	21.3	0.0	3.3	90.6	2.3	3.3	0.5

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 as 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 patients undergoing treatment, success rates, causes of infertility, and the types of 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 88 assisted reproductive institutions in Taiwan (2018). 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 1998-2018.

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.

Assisted Reproduction Methods

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.

ZIFT/TET：Zygote Intrafallopian Transfer/Tubal Embryo Transfer

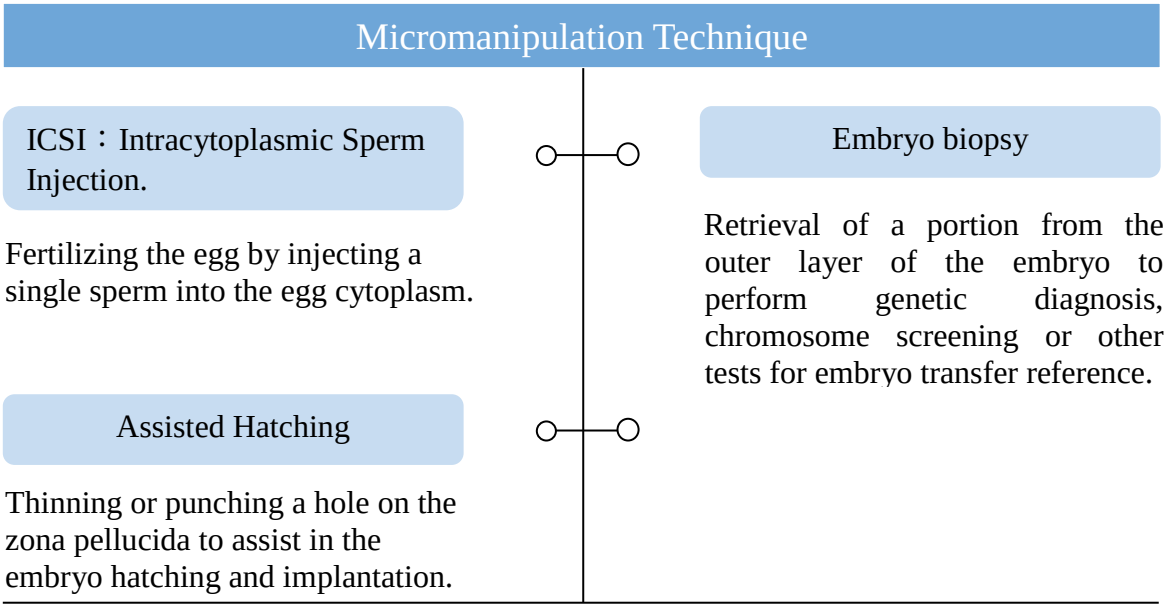
Sperm and eggs are fertilized in vitro and then transferred back into the fallopian tube to enable the zygote or embryo to be naturally transferred from the fallopian tube to the uterus for implantation

GIFT：Gamete Intrafallopian Transfer

Placing sperm with the extracted eggs back into the fallopian tube by laparoscopy and fertilizing them by in vivo fertilization.

AID：Artificial Insemination Using Donor’s Semen

Inject the donor’s sperm directly into the uterus.



The stipulation of Article 5 of the ARA does not apply to cases of Artificial 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 88 assisted reproduction institutions of Taiwan in the year 2018.

Section 1 The Number of Treatment Cycles

A total of 39,840 cycles (including the cycles in which egg retrieval or embryo transfer not performed) were conducted in 2018 (Table 1);36,153 cycles used nondonor gametes and embryos(90.7%), and 3,687 cycles used donated sperm and eggs(9.3%). among which, the age distribution of the recipient women using donated eggs is shown in Table 2.

Table 1 ART Cycles in 2018

Unit: Cycle

Type of Cycle	Number of ART Cycles	
Use of Donated Sperm and Eggs	3,687	
Use of Donor Sperm		406
Use of Donor Eggs		3,281
Use of Nondonor Sperm,Eggs or Embryos	36,153	
Total ART Cycles	**39,840**	

Table 2 Age-Specific Recipient Women Using Donated Eggs in ART in 2018

Unit: Cycle/%

Age of Recipient Women	The Number of Treatment Cycles	Percentage
<25	8	0.3
25-29	148	4.5
30-34	334	10.2
35-39	587	17.9
40-44	969	29.5
45-49	1,004	30.6
≥50	231	7.0
Treatment Cycles of Using Donated Eggs	**3,281**	**100.0**

Section 2 Ages of Women Receiving ART

The largest group of women receiving ART was that between 35 and 39 years of age, accounting for 39.2% of all ART cycles performed in 2018 (Table 3), among which women of age 35 had received the most ART cycles, accounting for 8.3% of the total ART cycles, followed by 8.0% in women of age 36.

Table 3 Age-Specific Recipient Women in ART in 2018

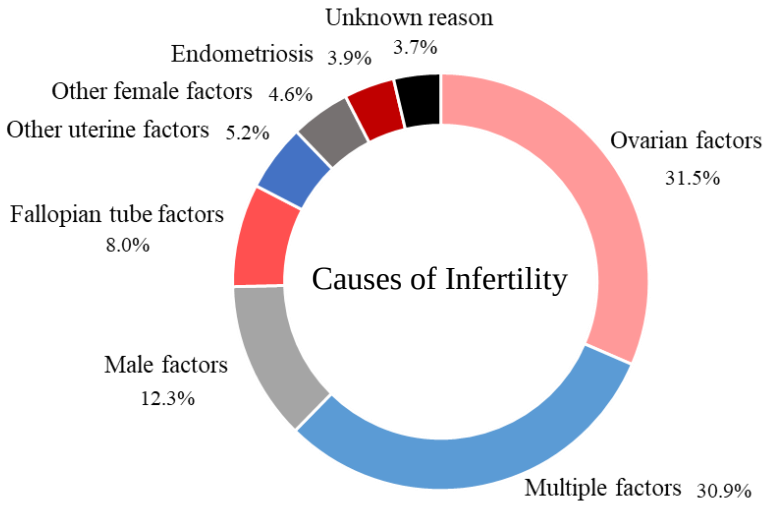
Unit: Cycle/%

Age of Recipient Women	The Number of Treatment Cycles	Percentage
<25	161	0.4
25-29	1,956	5.0
30-34	9,101	22.8
35-39	15,634	39.2
40-44	10,253	25.7
45-49	2,450	6.2
>50	285	0.7
Total ART Cycles	**39,840**	**100.0**

Section 3 Causes of Infertility

The causes of infertility in ART cases may be congenital, acquired or environmental. Figure 1 shows the causes of infertility, among which ovarian factors occupies the highest proportion, accounting for 31.5% of all infertility cases, followed by 30.9% from multiple factors ranking as second and 12.3% from male factors ranking as third.

Figure 1 Causes of Infertility in ART in 2018 (Parameter: 39,840 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 accounted for less than 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 77.3% of the 39,840 ART cycles performed (Table 4).

Table 4 Status of Micromanipulation Technique Application in ART Case Cycles in 2018

Unit: Cycle/%

Cases Using Micromanipulation	The Number of Treatment Cycles	Percentage
Procedure applied	30,810	77.3
Intracytoplasmic sperm injection (ICSI)	16,287	40.9
Assisted Hatching	10,674	26.8
Preimplantation genetic testing for aneuploidy (PGT-A)	2,150	5.4
Preimplantation genetic testing for monogenic/ single-gene disorders (PGT-M)	98	0.2
Other (including combined multiple techniques)	1,601	4.0
Procedure not applied	9,030	22.7
Total ART Cycles	**39,840**	**100.0**

Section 6 The Number of Transfer Cycles and Embryos Transferred

The number of assisted reproductive transfer cycles was 22,766, among which 26.5% were fresh embryos formed from nondonor sperm and eggs, 62.7% used frozen embryos formed from nondonor sperm and eggs, 0.9% used fresh embryos formed from donated sperm or eggs, and 9.9% used frozen embryos formed from donated sperm or eggs (Table 5).

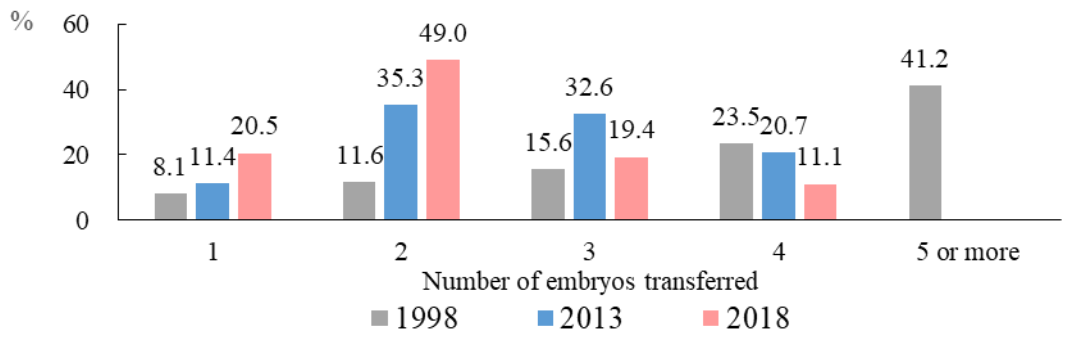
Table 5 Percentage of Transfer Type in ART in 2018

Unit: Cycle/%

Transfer Type		Transfer Cycles	Percentage
Using nondonor embryo	Fresh	6,042	26.5
	Frozen	14,263	62.7
Using embryo formed from donated sperm or eggs	Fresh	199	0.9
	Frozen	2,262	9.9
All Transfer Cycles		**22,766**	**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 transferred within current permit period” into the monitoring index in 2014. Assisted reproductive treatment cycles transferring two or less embryos accounted for 69.5% of all embryo transfer cycles in 2018 (65.4% in 2017 and 63.7% in 2016) (Fig. 2).

Figure 2 Percentage of Number of Embryos Transferred in ART Cycles

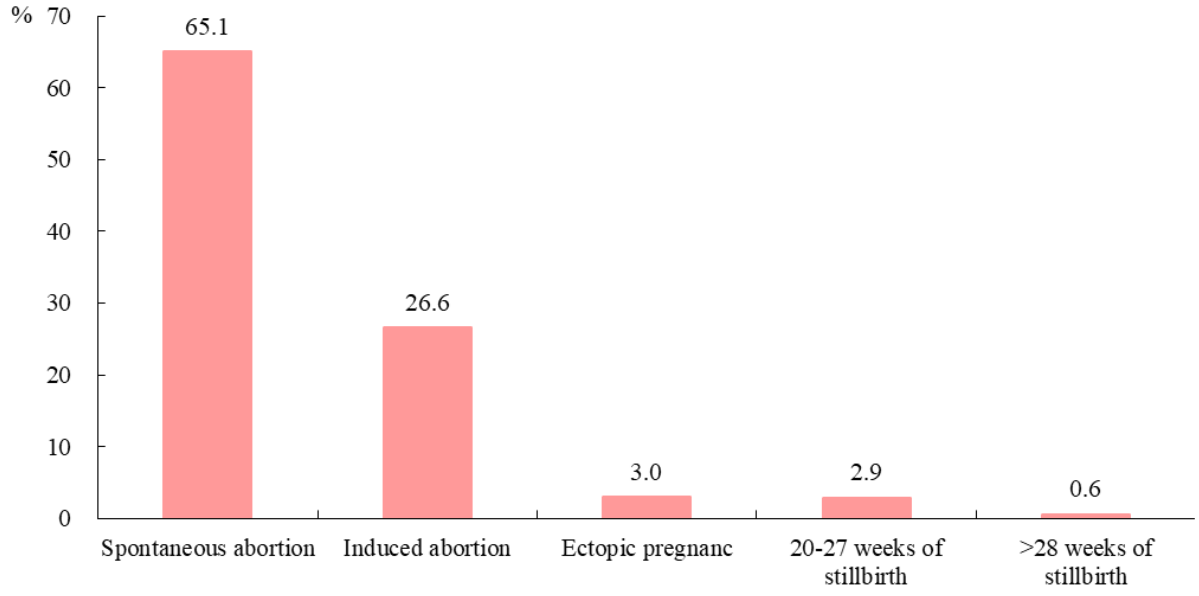


Section 7 Status of Pregnancy and Live Births

Of 39,840 ART cycles in 2018, 22,766 cycles were performed with transfer at least one embryo, and 10,797 cycles successfully led to pregnancy of which 8,113 cycles resulted in live births. A total of 10,236 infants were born (26% of live birth cycles were multiple births) with an increase of 646 infants born compared to 2017.

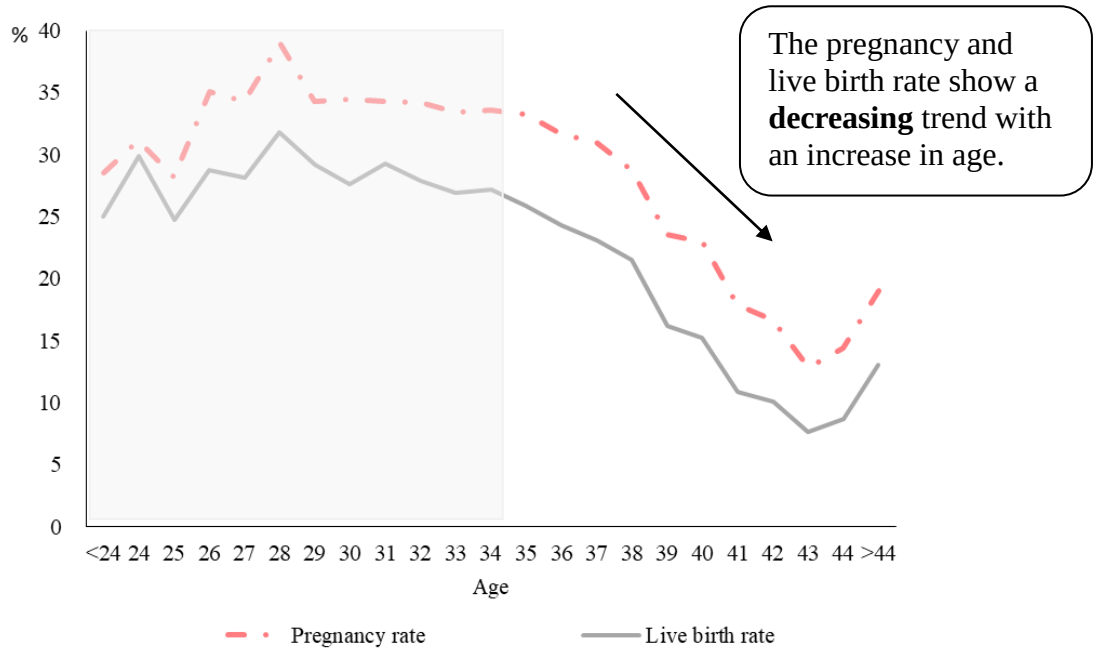
In the 2,684 cycles of pregnancy with no live birth, 1,748 cycles ended up with spontaneous abortions (65.1%), 713 cycles were treated by induced abortions (including absence of fetal heart sound before 20 weeks; 26.6%), 80 cycles were ectopic pregnancy (3.0%), and 94 cycles were stillbirth (3.5%) (a few cycles simultaneously had 2 or more conditions of spontaneous abortion, induced abortion, ectopic pregnancy, and either condition of stillbirth between 20 and 27 weeks or after 28 weeks) (Figure 3).

Figure 3 Analyses on Pregnancy with No Live Birth Cycles of ART in 2018
(Parameter: 2,695 pregnancy cycles without live birth cycles)



In 2018, the pregnancy rate of ART cycles was 27.1%, while the live birth rate of treatment cycles accounted for 20.4% (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 rate 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 for individual ages and was performed in a combined fashion. The pregnancy and live birth rate after age 34 decrease as the age of the female receiving the treatment increases.

Figure 4 Correlation between Women's Age and Pregnancy/Live Birth Rate of ART in 2018 (Parameter: 39,840 treatment 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 5 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:

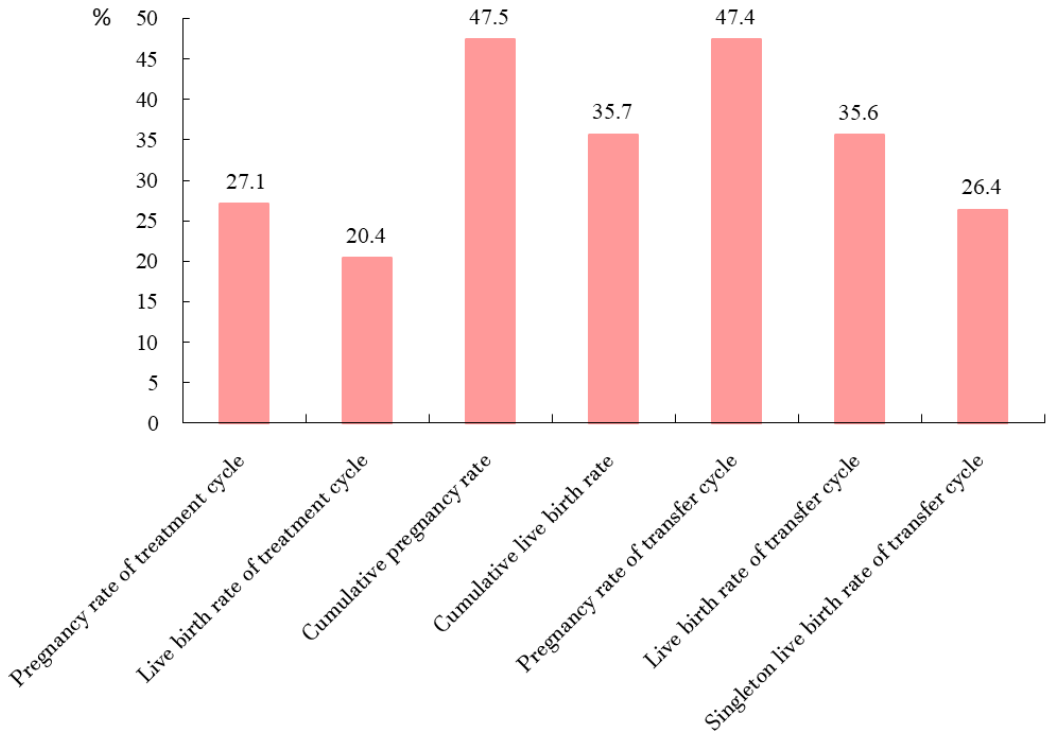
1. Pregnancy rate of treatment cycle: this rate is generally referred to as the "pregnancy rate." It refers to the percentage of pregnancies during the ART cycle. Since some pregnancies resulted into spontaneous abortion, stillbirth, etc., this rate will be higher than the live birth rate for a treatment cycle. The pregnancy rate of treatment cycles was 27.1% in 2018.
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 20.4% in 2018.
3. Cumulative pregnancy rate: this rate reflects the percentage of pregnancy in each egg retrieval cycle; it is calculated as [number of fresh embryo pregnancy cycles + number of frozen embryo pregnancy cycles + number of (fresh embryo + frozen embryo) pregnancy cycles] ÷ [the number of fresh embryo treatment cycles + number of (fresh embryo + frozen embryo) treatment cycles]. The cumulative pregnancy rate was 47.5% in 2018.

4. Cumulative live birth rate: reflects 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 [the number of fresh embryo live birth cycles + the number of frozen embryo live birth cycles + number of (fresh embryo + frozen embryo) live birth cycles] ÷ [number of fresh embryo treatment cycles + number of (fresh embryo + frozen embryo) treatment cycles]. The cumulative live birth rate was 35.7% in 2018, and the cumulative live birth rate in women below 38 years of age was 49.6%.

5. Pregnancy rate of transfer cycle: the percentage of pregnancies during the ART transfer cycles. The pregnancy rate of transfer cycles was 47.4% in 2018. Among them, the pregnancy rate of fresh embryo transfer was 39.4%, and the pregnancy rate of frozen embryo transfer was 50.5%.
6. Live birth rate of transfer cycle: the percentage of live births during the ART transfer cycles. The live birth rate of transfer cycles was 35.6% in 2018, in which the live birth rate of fresh embryo transfer was 28.6%, and the live birth rate of frozen embryo transfer was 38.3%.
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 26.4% in 2018.

Figure 5 Analysis of ART Success Rate in 2018



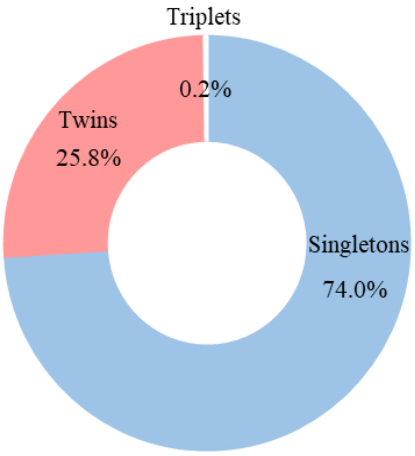
Section 8: Status of New-Born Infants

1. The number of live births

Of the 8,113 live birth cycles, 74.0% were singletons, 25.8% were twins, and 0.2% were triplets (Figure 6).

The patients undergoing ART treatment in 2018 gave birth to a total of 10,236 infants, among which 5,349 were boys and 4,887 were girls (Table 6).

Figure 6 Percentages of Fetus Numbers of the ART Live Birth Cycles in 2018
(Parameter: 8,113 live birth cycles)



2. Weight, gestational weeks and congenital defect

Observing 10,236 live births (1 live birth infant's birth weight and gestational weeks was unknown), infants with birth weight less than 1,500 grams accounted for 3.6%, between 1,500 and 2,499 grams accounted for 30.2%, and greater than or equal to 2,500 grams accounted for 66.2%; infants born before 37 gestational weeks accounted for 36.3%, between 37 and 41 weeks accounted for 63.6%, greater than or equal to 42 weeks accounted for 0.1%; the proportion of infants with apparent congenital defects was 0.8% (Table 6).

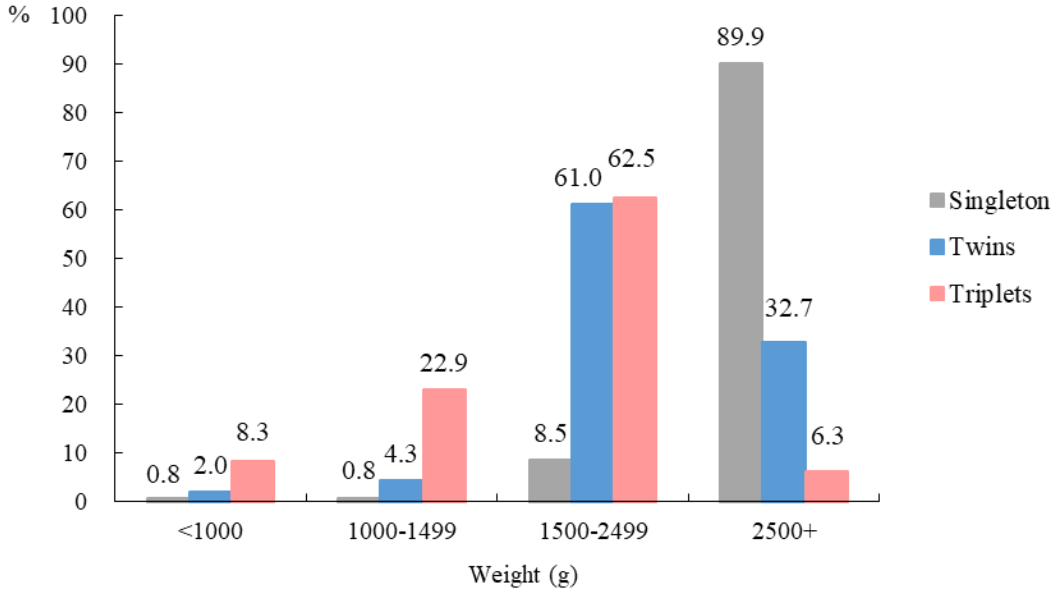
Table 6 Weight, gestational weeks and Congenital Defect of ART Born Infants in 2018

Infant status	Number of live births	Percentage
Gender		
Male	5,349	52.3
Female	4,887	47.7
Weight		
<1500 g	373	3.6
1500-2499g	3,092	30.2
≥2500g	6,770	66.2
Gestational weeks		
<37weeks	3,712	36.3
37-41weeks	6,514	63.6
≥42weeks	9	0.1
Apparent or visible congenital defects	79	0.8

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

Most(89.9%) of the singletons delivered had birth weight more than 2,500 grams. The largest proportion of twins born had birth weight between 1,500 and 2,499 grams, followed by 2,500 grams or more, accounting for 61.0% and 32.7%, respectively. The birthweight of triplets born weighing less than 1,000 grams accounted for 8.3%, between 1,000 and 1,499 grams were 22.9%, between 1,500 and 2,499 grams were 62.5% and 2,500 grams and above were 6.3%. Statistical analysis of the results showed a negative correlation between the number of births and the weight of the infants ($P < 0.0001$), that is, the greater the number of births, the more likely it is to deliver low birth weight infants (Figure 7).

Figure 7 Correlation between Number of Births and Birth Weight of Live Birth Cycles in 2018 (Parameter: 10,235 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 36,153 cycles were conducted using nondonor sperm, eggs or frozen embryos, accounting for 90.7% 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 45).

Table 7 Age Distribution of Women Receiving ART Using Nondonor Eggs, Sperm, or Embryos in 2018

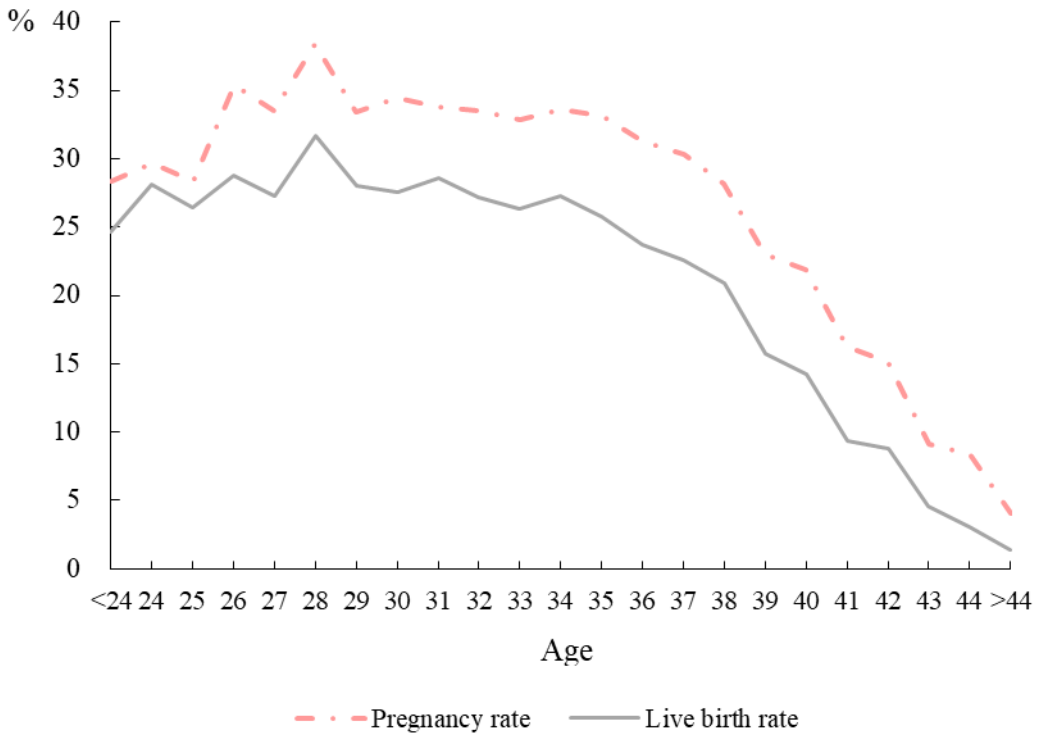
Unit: Cycle/%

Age of Recipient Women	The Number of Treatment Cycles	Percentage
<25	145	0.4
25-29	1,749	4.8
30-34	8,656	23.9
35-39	14,900	41.2
40-44	9,216	25.5
45-49	1,435	4.0
>50	52	0.2
ART Cycle	**36,153**	**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 26.0% and 19.4%, 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 for each individual ages and was performed in a combined fashion (Figure 8).

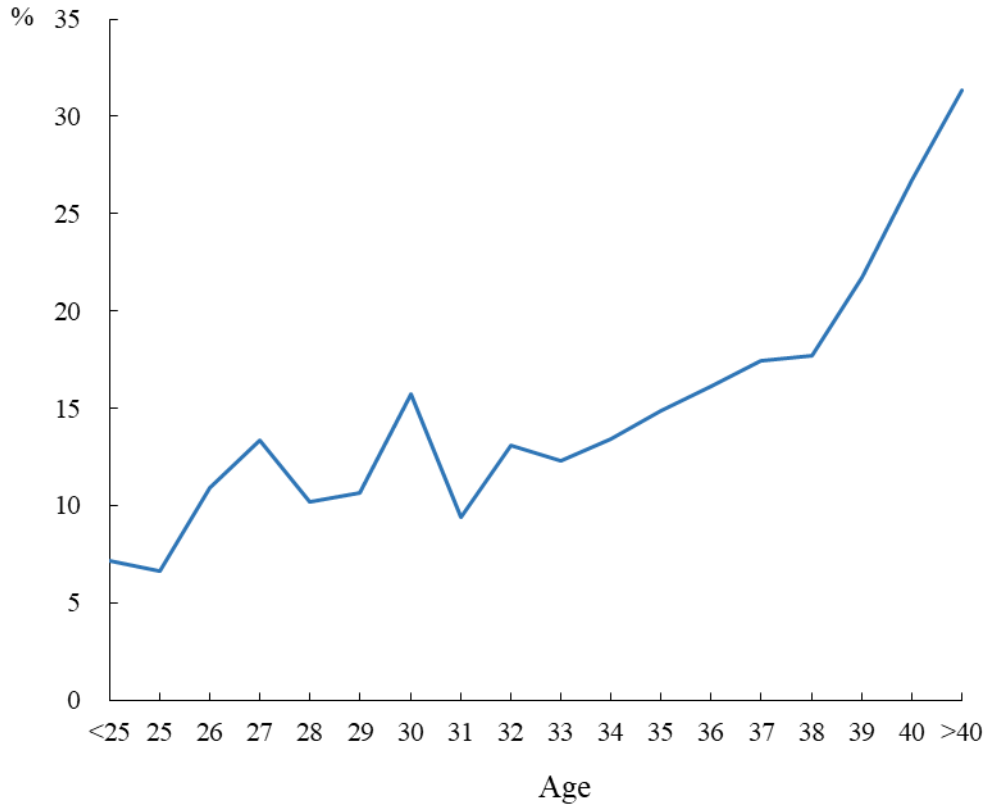
Figure 8 Correlation between Women's Age and Rates of Pregnancy and Live Birth, of Nondonor ART in 2018 (Parameter: 36,153 treatment cycles)



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 31.3% (Figure 9).

Figure 9 Correlation between Age and Miscarriage Rate of the Pregnant Women after ART Using Nondonor Eggs, Sperm,or Embryos in 2018
(Parameter: Number of pregnancy cycles was 9,390 from nondonor ART)



Section 2 Pregnancy and Live Birth Using IVF

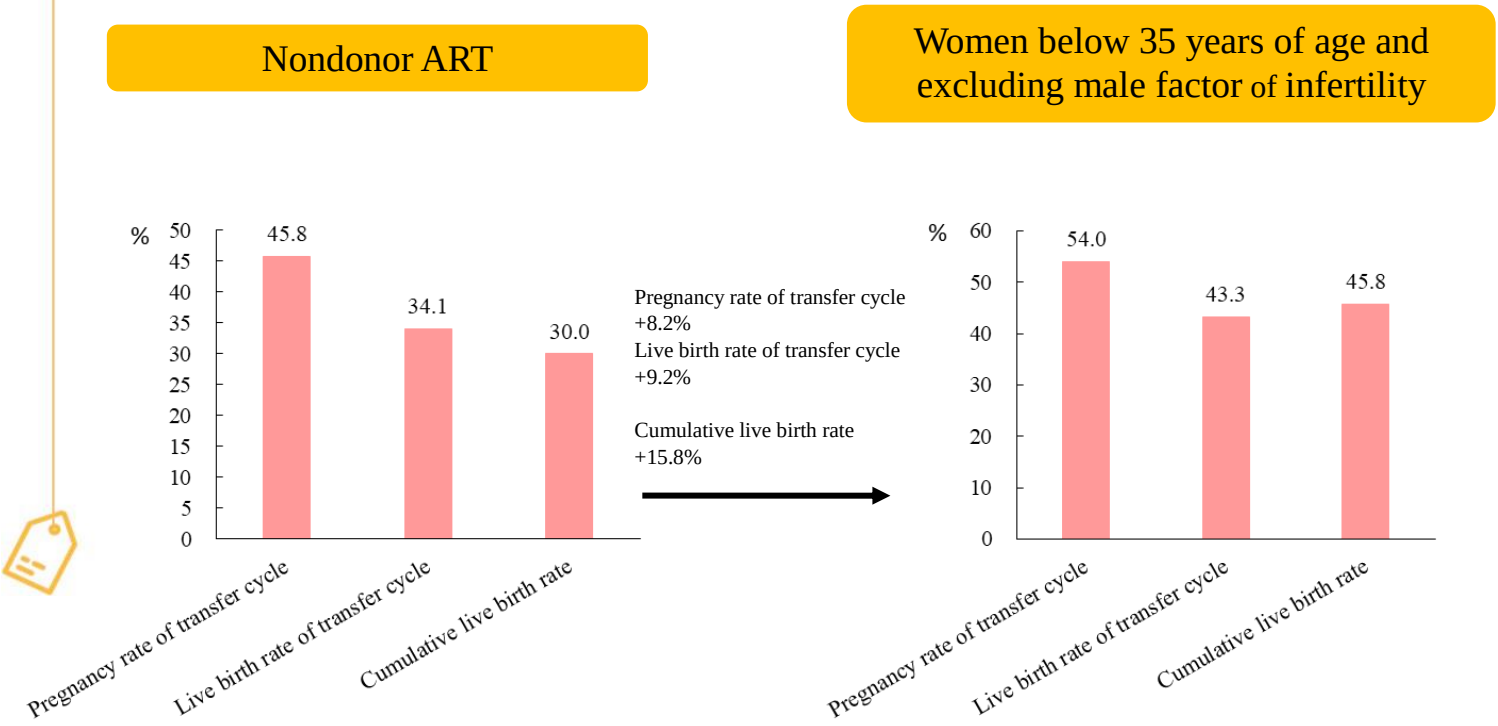
This section deals with the analysis on nondonor ART through IVF/ET.

1. Pregnancy rate and live birth rate

A total of 18,768 transfer cycles were conducted using nondonor egg, sperm or embryos, among which 8,597 cycles led to pregnancies and 6,395 cycles resulted in live births, with a pregnancy rate per transfer of 45.8% and live birth rate per transfer of 34.1%. The cumulative live birth rate was 30.0%, and the cumulative live birth rate of women less than 38 years old was 44.3%. The proportion of singletons accounted for 73.1%, twins accounted for 26.7%, and triplets or more accounted for 0.2%.

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 54.0%, 43.3% and 45.8%, respectively (Figure 10).

Figure 10 Nondonor ART success rate in overall cases vs. in women below 35 years of age and excluding cases with male factor infertility in 2018.



2. The number of embryos transferred and live birth rate

In the 6,395 nondonor IVF cycles with live birth, the largest proportion (56.1%) of the cycles had two embryos transferred (Fig. 11). In general, the more embryos are transferred, the greater were the chances of delivering two or more infants. It was also observed that the live birth rate after transferring two embryos transferred was 38.8% (Fig. 12), but the multiple birth rate in the live birth cycles after transferring two embryos was also as high as 33.2% (Fig. 13).

Figure 11 The Proportion of Live Birth Cycles Based on the Number of Embryos Transferred during Nondonor IVF Procedure in 2018.

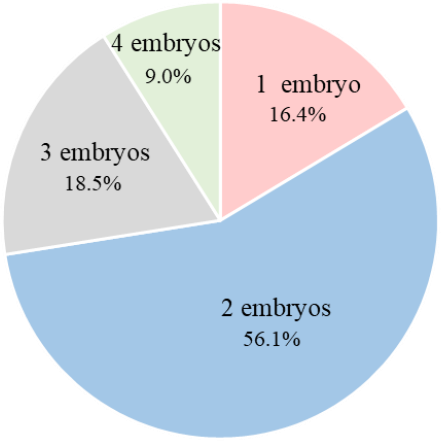


Figure 12 Correlation Between Live Birth Rates and Number of Embryos Transferred during Nondonor IVF Procedure in 2018

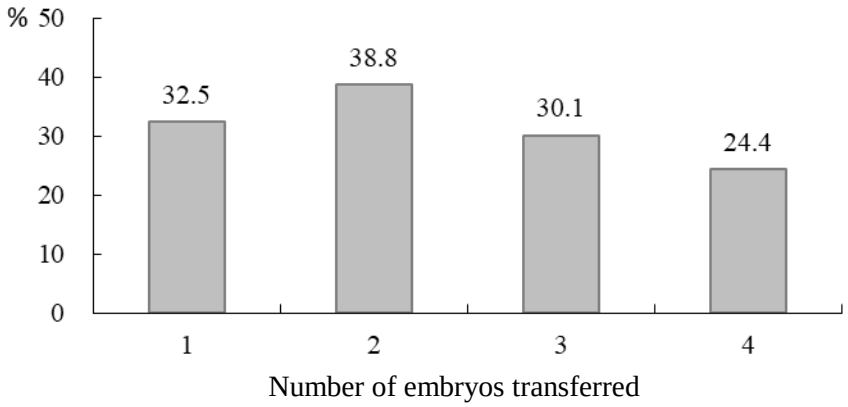
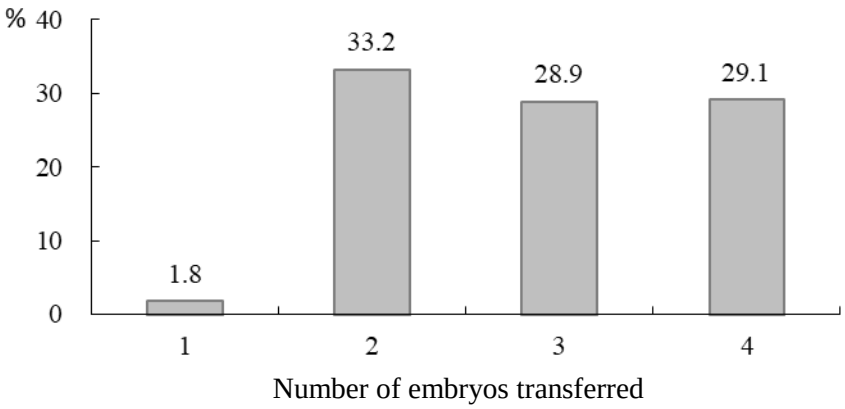


Figure 13 Correlation Between Multiple Birth Rates and Number of Embryos Transferred during Nondonor IVF Procedure in 2018.



Section 3 Fresh and Frozen Embryo Transfer in Nondonor ART

This section compares the ART treatment cycles between the 6,042 fresh embryo transfer cycles and 14,263 frozen embryo transfer cycles. The statistical results showed that the pregnancy rate of fresh and frozen embryo transfer cycles was 38.6% and 49.5%, respectively, and live birth rate was 27.8% and 37.4%, 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 48.1% and 58.3%, respectively, whereas for women above 40 years the pregnancy rate for fresh and frozen embryo transfer was only 21.4% and 28.0%, respectively. The live birth rate for fresh embryo transfer in women below 35 years was 39.0%, and decreased to 9.5% in women above 40 years of age; similarly, the live birth rate for frozen embryo transfer decreased from 47.7% in women below 35 years to 16.0% in women above 40 years of age. (Figure 15)

Figure 14 Comparison of the Success Rate between Fresh Embryo and Frozen Embryo Transfer from Nondonor Gametes in 2018

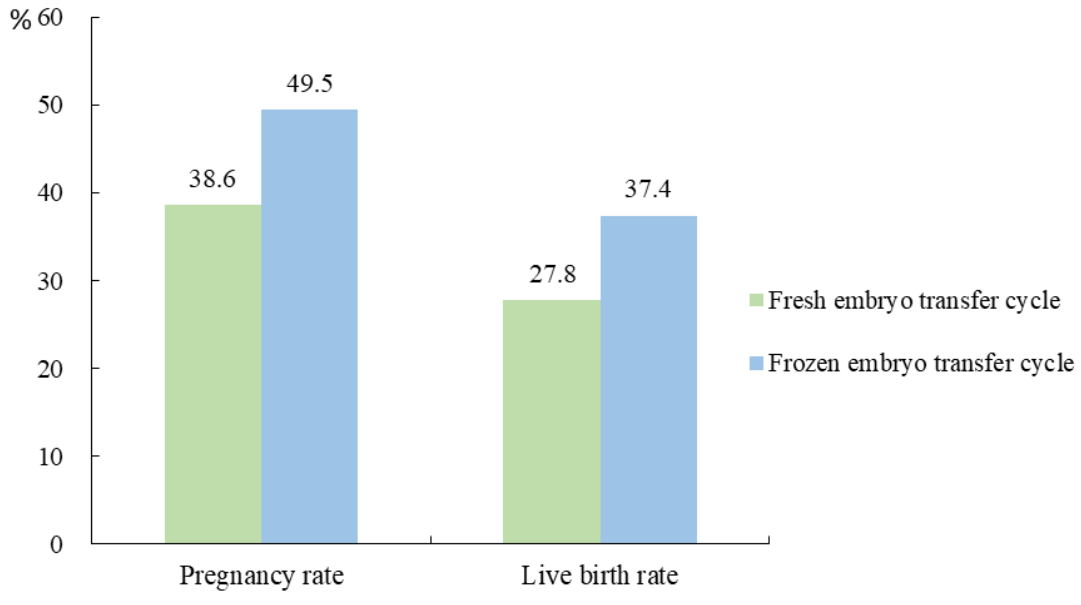
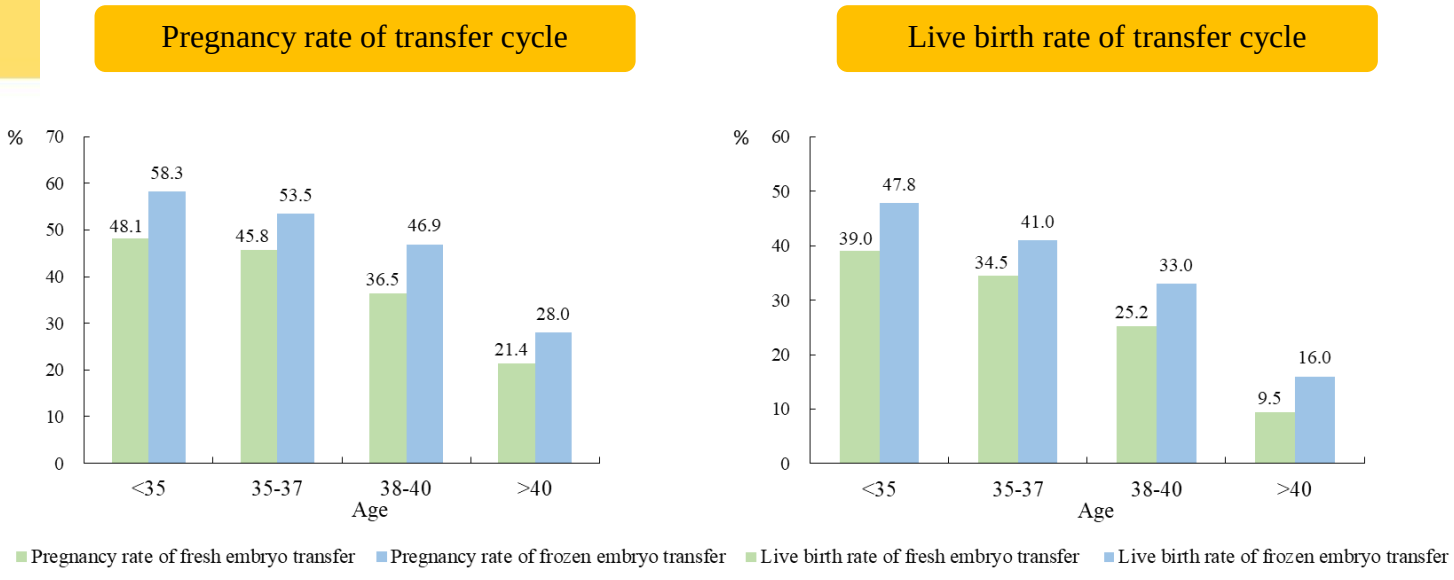
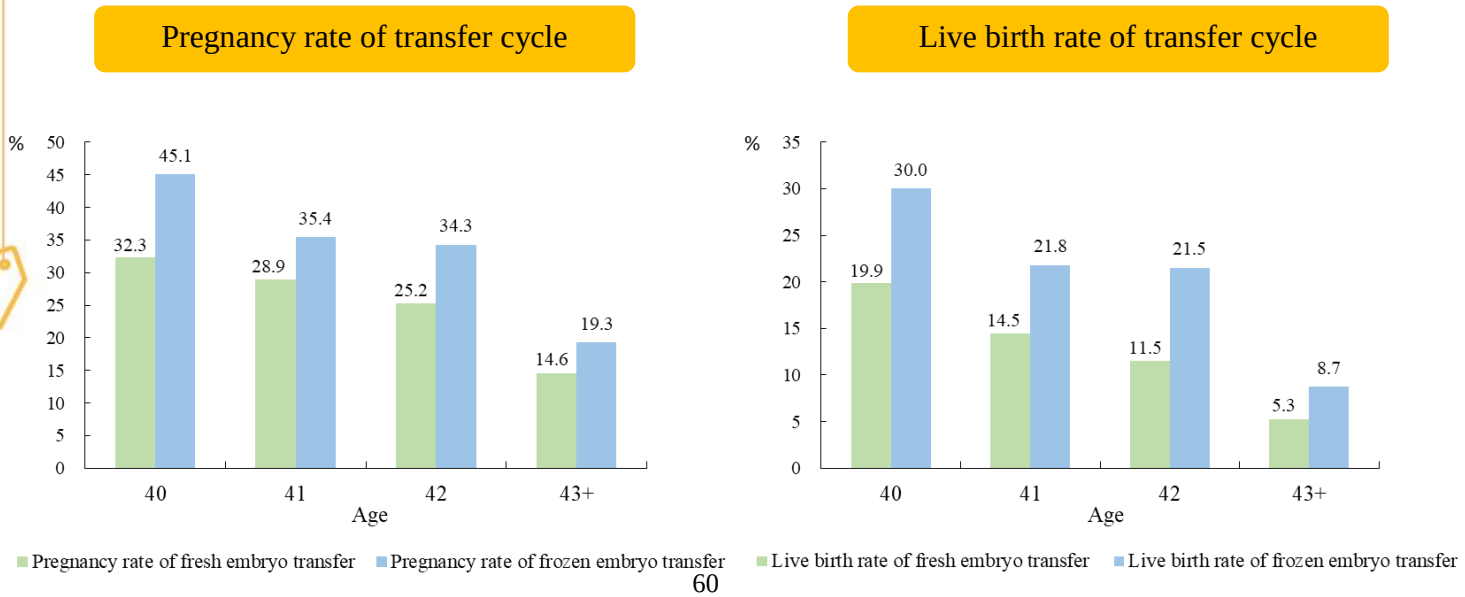


Figure 15 Age-Specific Pregnancy and Live Birth Rate of Fresh and Frozen Embryo Transfer from Nondonor Gametes in 2018



This section delineates the analysis on women of 40 years and above (5,007 transfer cycles). The pregnancy rate of fresh and frozen embryo transfer in women of age 40 was 32.4% and 45.1%, respectively; however, their live birth rate dropped to 19.9% and 30.0%, 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 was 14.6% and 19.3%, respectively, while the live birth rate was only 5.3% and 8.7%, respectively (Figure 16). 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 16 Age-Specific Pregnancy and Live birth Rate of Fresh and Frozen Embryo Transfer in Women at Age 40 and above from Nondonor Gametes in 2018



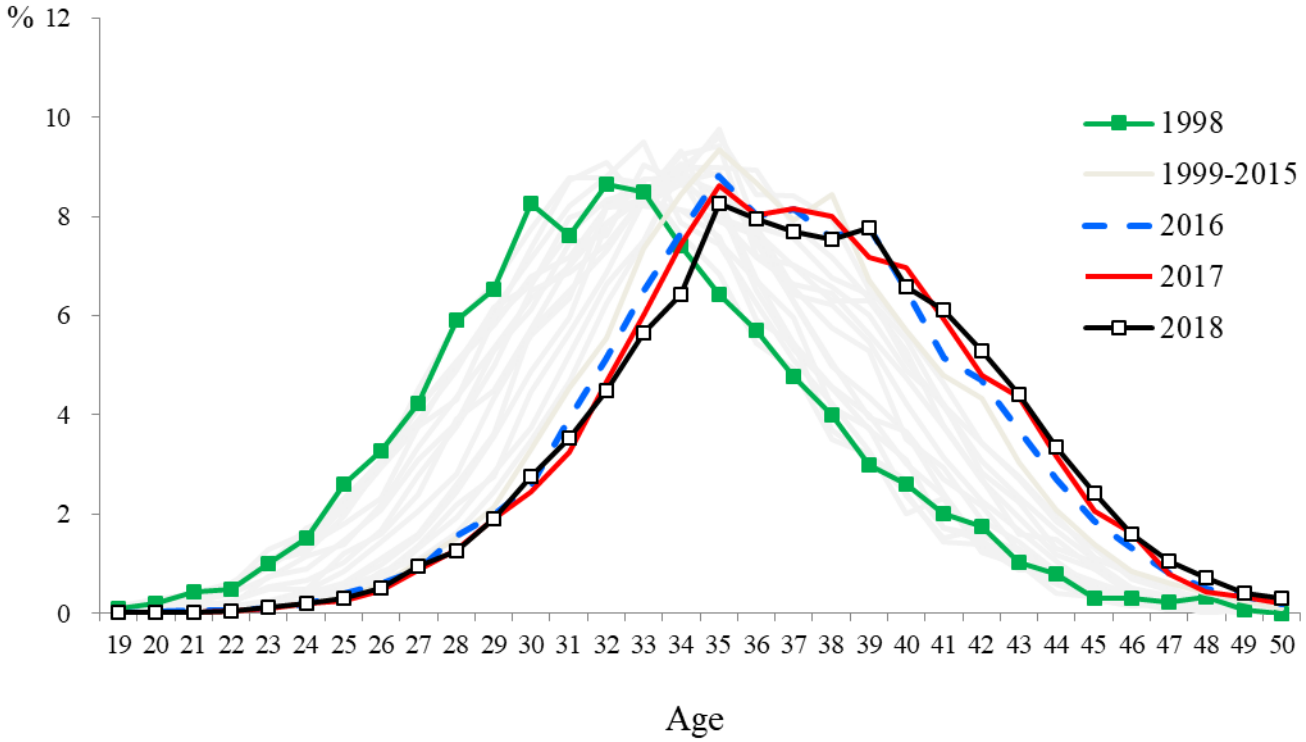
CHAPTER 4 Trend of Assisted Reproduction (1998–2018)

Section 1 Trends of ART Cycles

1. Patient age

The age distribution of women receiving assisted reproduction shows an increasing trend from 1998 to 2018.The median age and average age of recipient women in 1998 was 32 and 32.7, respectively; in 2016 was 37 and 36.8 years, respectively; in 2017 was 37 and 37.2, respectively; and in 2018 was 37 and 37.3, respectively.

Figure 17 Age Distribution of Women receiving ART from 1998 to 2018



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 2018. 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 2003 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 2018, it reached 39,840 cycles, with an increase of 5.3% compared to the 37,849 cycles in 2017 (Table 8-1).

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 and this figure reached 3,093 in 2008 and 10,236 in 2018, with an increase of 646 newborns compared with 9,590 in 2017 (Table 8 and Figure 18).

Table 8 The Number of ART Cycles, Live Birth Cycles, and Live Births from 1998 to 2018

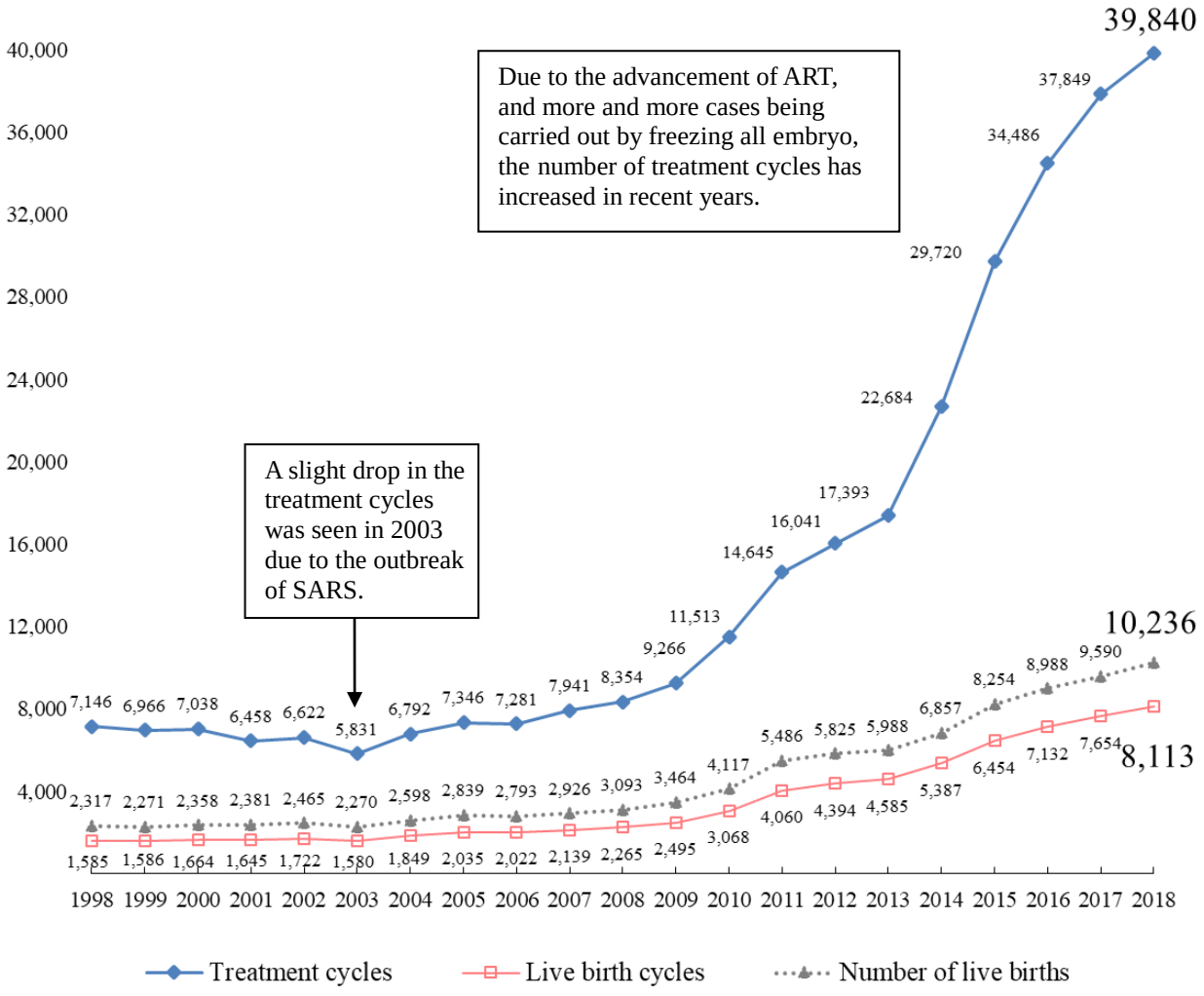
Year	Treatment cycles （unit: cycle）	Live birth cycles (unit: cycle)	Number of live births (unit: infant)
1998	7,146	1,585	2,317
1999	6,966	1,586	2,271
2000	7,038	1,664	2,358
2001	6,458	1,645	2,381
2002	6,622	1,722	2,465
2003	5,831	1,580	2,270
2004	6,792	1,849	2,598
2005	7,346	2,035	2,839
2006	7,281	2,022	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
2018	39,840	8,113	10,236
Total	**311,212**	**73,434**	**97,116**

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

Table 8-1 Growth Rate of Treatment Cycles from 1998 to 2018

Year	Treatment cycles （unit: cycle）	Growth Rate (%)
1998	7,146	-
1999	6,966	-2.5
2000	7,038	1.0
2001	6,458	-8.2
2002	6,622	2.5
2003	5,831	-1.2
2004	6,792	1.6
2005	7,346	8.2
2006	7,281	-0.9
2007	7,941	9.1
2008	8,354	5.2
2009	9,266	10.9
2010	11,513	24.2
2011	14,645	27.2
2012	16,041	9.5
2013	17,393	8.4
2014	22,684	30.4
2015	29,720	31.0
2016	34,486	16.0
2017	37,849	9.7
2018	39,840	5.3
Total	**311,212**	-

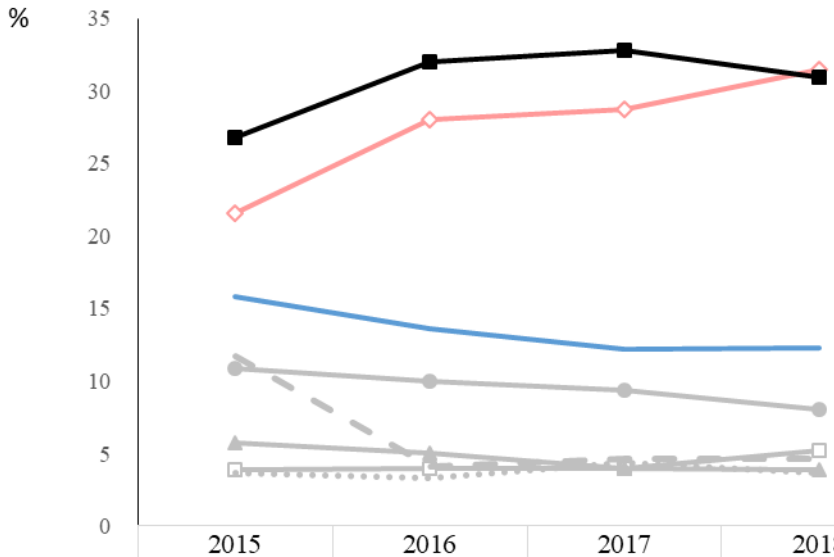
Figure 18 The Number of ART Cycles, Live Birth Cycles and Live Births from 1998 to 2018



3. Causes of Infertility in ART recipients

The Regulations for Assisted Reproduction Information Notification and Administration was amended in 2015, with the addition of ovarian factors, endometriosis and other uterine factors as the causes of infertility the number of which was raised from 5 to 8. In the past 4 years, the top 3 causes of infertility are ovarian factors, multiple factors and male factors; and in 2018, ovarian factors ranked as the highest cause of infertility (Figure 19).

Figure 19 Causes of Infertility in ART recipients from 1998 to 2018



	2015	2016	2017	2018
Ovarian factors	21.6	28.0	28.7	31.5
Multiple factors	26.8	32.0	32.8	30.9
Male factors	15.8	13.6	12.2	12.3
Fallopian tube factors	10.9	10.0	9.4	8.0
Other uterine factors	3.9	4.0	4.0	5.2
Other female factors	11.7	4.1	4.6	4.6
Endometriosis	5.7	5.0	4.0	3.9
Unknown reason	3.6	3.3	4.4	3.7

4. Pregnancy rate and live birth rate

Figure 20 shows the pregnancy rate and live birth rate of ART from 1998 to 2018, where the pregnancy rate reached the highest (37.8%) in 2004, and live birth rate reached the highest (27.8%) in 2006. The pregnancy and live birth rate started to decline in 2011 and they were 27.1% and 20.4% in 2018, respectively. Because more and more cases were carried out by freezing all embryo in recent years, the number of treatment cycles has increased. However, embryo transfer was not performed in those freeze-all cycles; therefore, and only the cumulative pregnancy rate and the cumulative live birth rate during the treatment cycles can truly express the quality of ART.

The cumulative pregnancy rate increased from 37.2% in 1998 to 47.5% in 2018; the cumulative live birth rate increased from 27.0% in 1998 to 35.7% in 2018 (Figure 21).

Figure 20 Pregnancy Rate and Live Birth Rate of ART from 1998 to 2018

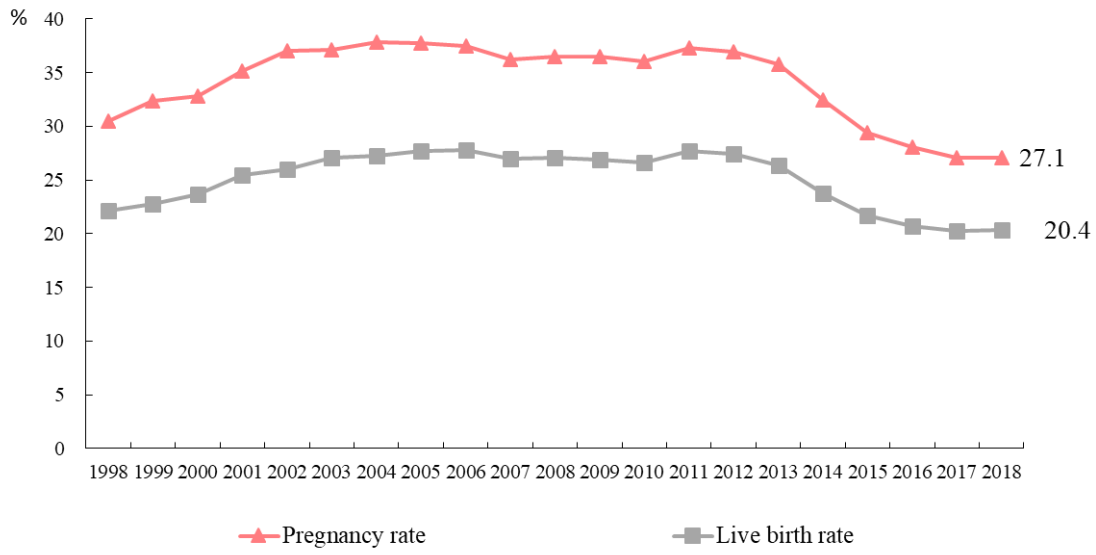
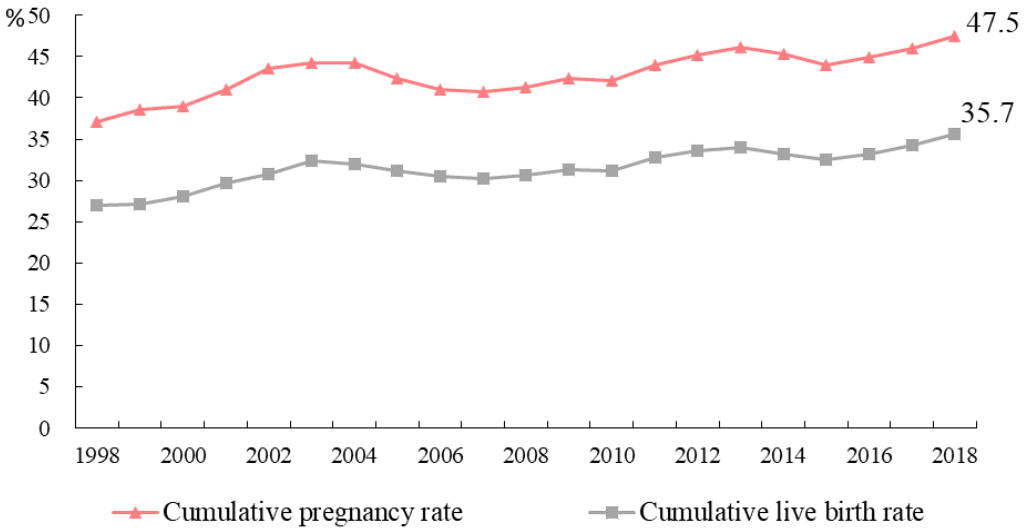


Figure 21 Cumulative Pregnancy Rate and Cumulative Live Birth Rate of the ART Cycles from 1998 to 2018

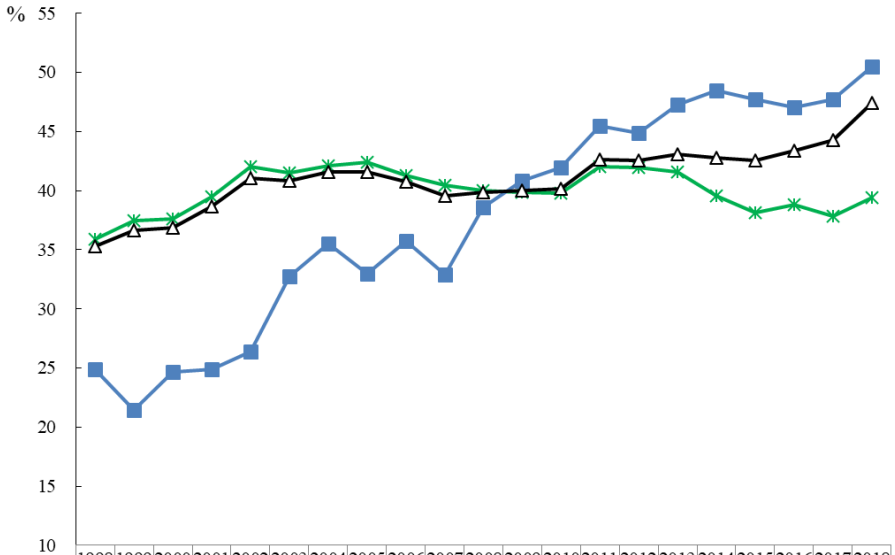


Section 2 Trends in Success Rates of Transfer Cycles

The Pregnancy rate and live birth rate of transfer cycles

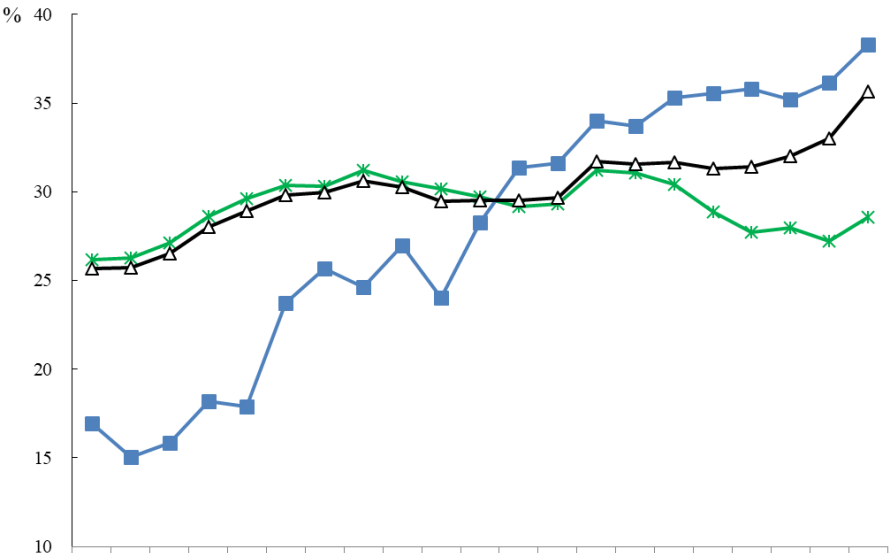
The pregnancy rate and live birth rate of fresh embryo transfer cycles increased from 35.9% and 26.2% in 1998 to 42.4% and 31.2% in 2005, followed by a fluctuating trend, and, in 2018, they were 39.4% and 28.6%, respectively. During the initial few years, the pregnancy rate and live birth rate of frozen embryo transfer cycles showed a fluctuating trend, but there was a significant increase after 2003, with pregnancy and live birth rates reaching 50.5% and 38.3% in 2018, respectively. After 2009, the pregnancy and live birth rate of frozen embryo transfer cycles were always higher than those of fresh embryo transfer cycles (Fig.22 and Fig.23).

Figure 22 Pregnancy Rate of Transfer Cycles Using Fresh and Frozen Embryos from 1998 to 2018



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Cycle of fresh embryo tranfer	35.9	37.5	37.6	39.5	42.0	41.5	42.1	42.4	41.3	40.4	40.0	39.8	39.8	42.0	42.0	41.6	39.5	38.2	38.8	37.8	39.4
Cycle of frozen embryo transfer	24.9	21.5	24.6	24.9	26.4	32.8	35.5	32.9	35.8	32.9	38.6	40.8	41.9	45.4	44.8	47.3	48.5	47.7	47.0	47.7	50.5
Cycle of embyo transfer	35.3	36.6	36.8	38.6	41.1	40.8	41.6	41.6	40.8	39.6	39.8	40.0	40.1	42.6	42.6	43.0	42.8	42.5	43.4	44.2	47.4

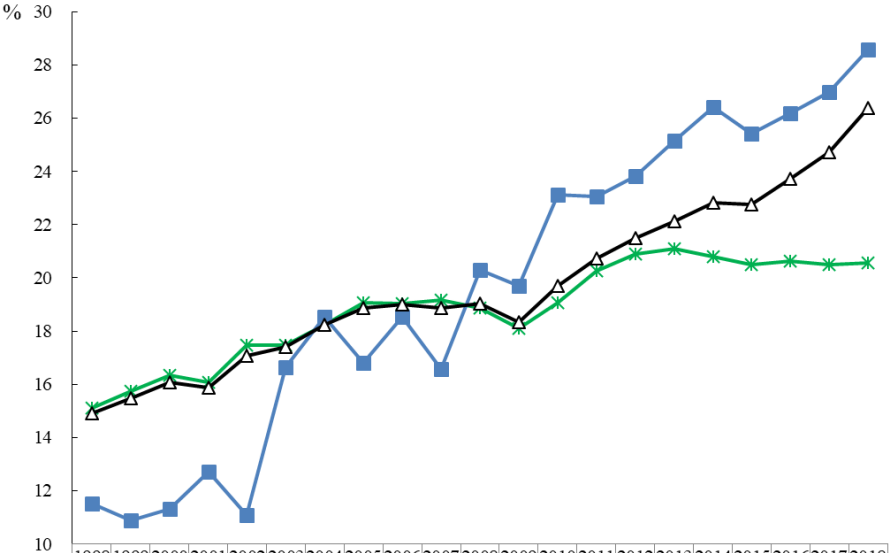
Figure 23 Live Birth Rate of Transfer Cycles Using Fresh and Frozen Embryos from 1998 to 2018



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Cycle of fresh embryo tranfer	26.2	26.3	27.1	28.6	29.6	30.3	30.3	31.2	30.6	30.2	29.7	29.2	29.3	31.2	31.0	30.4	28.9	27.7	28.0	27.2	28.6
Cycle of frozen embryo transfer	16.9	15.1	15.9	18.2	17.9	23.8	25.7	24.6	27.0	24.0	28.3	31.4	31.6	34.0	33.7	35.3	35.5	35.8	35.2	36.1	38.3
Cycle of embyo transfer	25.7	25.7	26.5	28.0	28.9	29.8	30.0	30.6	30.2	29.4	29.5	29.5	29.7	31.7	31.6	31.7	31.3	31.4	32.0	33.0	35.6

The singleton live birth rate of fresh embryo transfer cycles has increased from 15.1% in 1998 to 20.6% in 2018. The singleton live birth rate of frozen embryo transfer cycle increased significantly to 18.5% in 2004 and 28.6% in 2018. After 2008, the singleton live birth rate of frozen embryo transfer cycles was always higher than that of fresh embryo transfer cycles(Fig. 24).

Figure 24 Singleton Live Birth Rate of Transfer Cycles Using Fresh and Frozen Embryos from 1998 to 2018

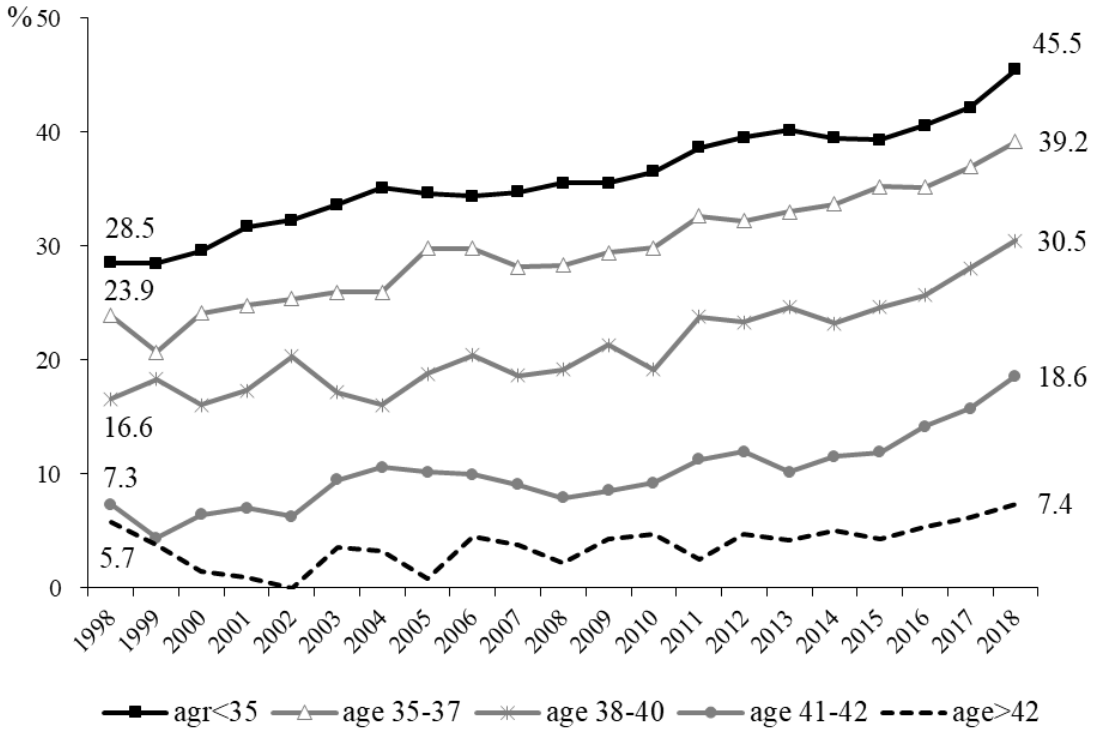


	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Cycle of fresh embryo tranfer	15.1	15.7	16.4	16.1	17.5	17.5	18.2	19.1	19.0	19.2	18.9	18.1	19.1	20.3	20.9	21.1	20.8	20.5	20.6	20.5	20.6
Cycle of frozen embryo transfer	11.5	10.9	11.3	12.7	11.1	16.6	18.5	16.8	18.5	16.6	20.3	19.7	23.1	23.0	23.8	25.2	26.4	25.4	26.2	27.0	28.6
Cycle of embyo transfer	14.9	15.5	16.1	15.9	17.1	17.4	18.2	18.9	19.0	18.9	19.0	18.3	19.7	20.7	21.5	22.1	22.8	22.8	23.7	24.7	26.4

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

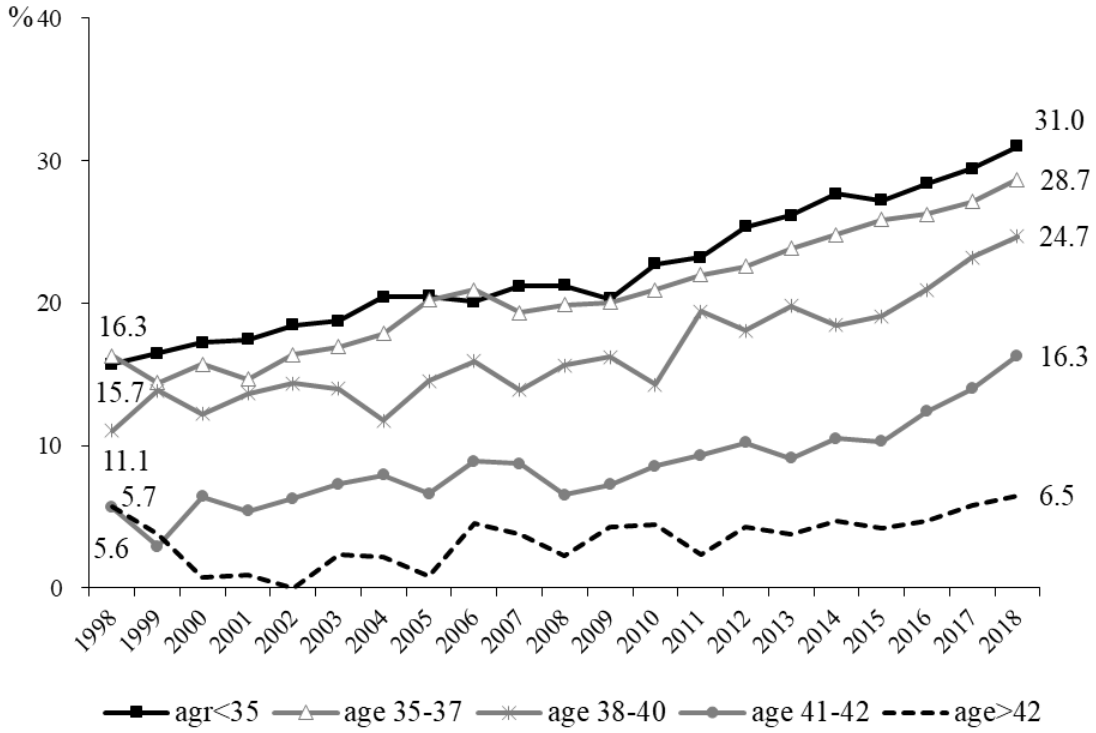
As the live birth rate of transfer cycles using donated eggs tends to be affected by the age of the donors, therefore, only the live birth rate of transfer cycles using nondonor gametes was analyzed. The live birth rate of women under the age of 35 increased from 28.5% in 1998 to 45.5% in 2018. In the same period, this rate increased by 15.3 percentage points in the 35 to 37 years age group, 13.9 percentage points in the 38 to 40 years age group, 11.3 percentage points in the 41 to 42 years age group, and 1.7 percentage points in women older than 42 years (Figure 25).

Figure 25 Live Birth Rate of Transfer Cycles Using Nondonor Gametes from 1998 to 2018 (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 31.0% in 2018. In the same period, this rate increased by 12.4 percentage points in the 35 to 37 years age group, 13.6 percentage points in the 38 to 40 years age group, and 10.7 percentage points in the 41 to 42 years age group. The singleton live birth rate in women older than 42 years increased by 0.8 percentage points (Figure 26).

Figure 26 Singleton Live Birth Rates of Transfer Cycles Using Nondonor Gametes from 1998 to 2018
(For Age-Specific Women Undergoing ART)

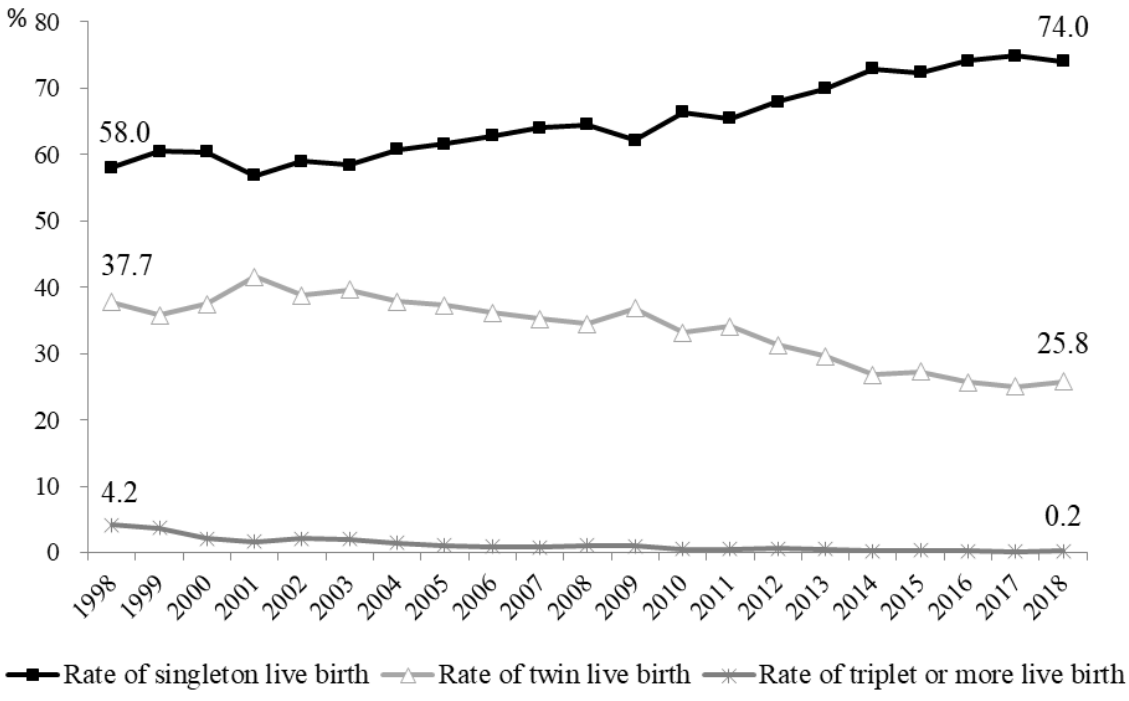


Section 4 Number of Fetuses in Live Birth Cycles, Birth Weights, and Weeks of Gestation

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 transferred 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 74.0% in 2018; while the live birth rate of twins and that of triplets and more has decreased from 37.7% and 4.2% in 1998 to 25.8% and 0.2% in 2018 (Figure 27).

Figure 27 Number of Fetus in Live Birth Cycles between 1998 and 2018



Among the live births from ART, birth weight less than 1500 gm accounted for 7.5% of the total live births in 1998, and this figure decreased to 3.6% in 2018; similarly, birth weight between 1500 to 2499 gm also decreased from 35.9% in 1998 to 30.2% in 2018. However, live birth weight of 2500 gm and above increased from 56.9% in 1998 to 66.2% in 2018 (Figure 28). In addition, live births with gestational age of less than 37 weeks accounted for 42.9% in 1998, and this figure decreased to 36.3% in 2018; whereas, live births with gestational age between 37 to 41 weeks increased from 57% in 1998 to 63.6% in 2018, and live births with gestational age of 42 weeks and above decreased from 0.2% in 1998 to 0.1% in 2018 (Figure 29).

Figure 28 Live birth weight of ART from 1998 and 2018

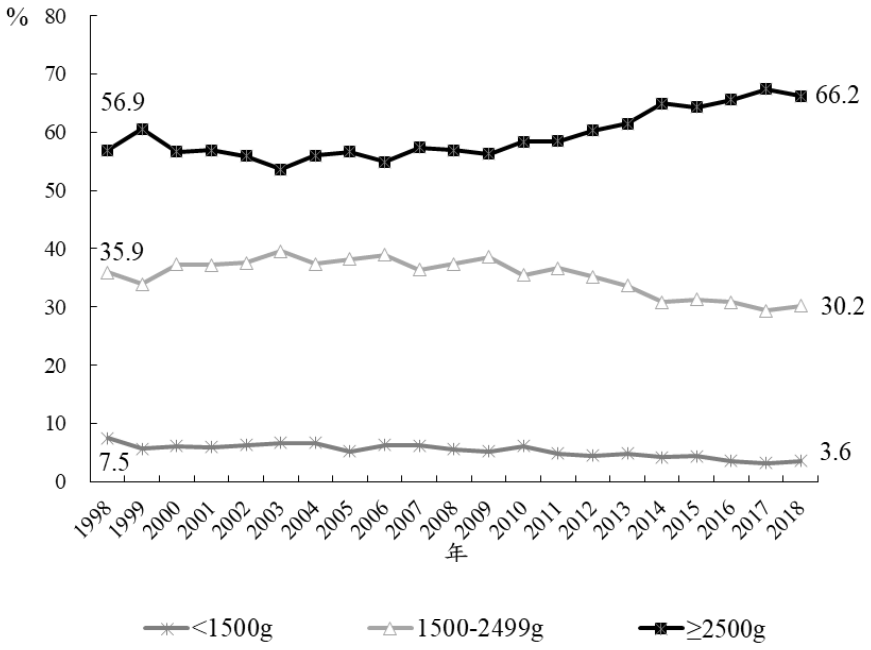
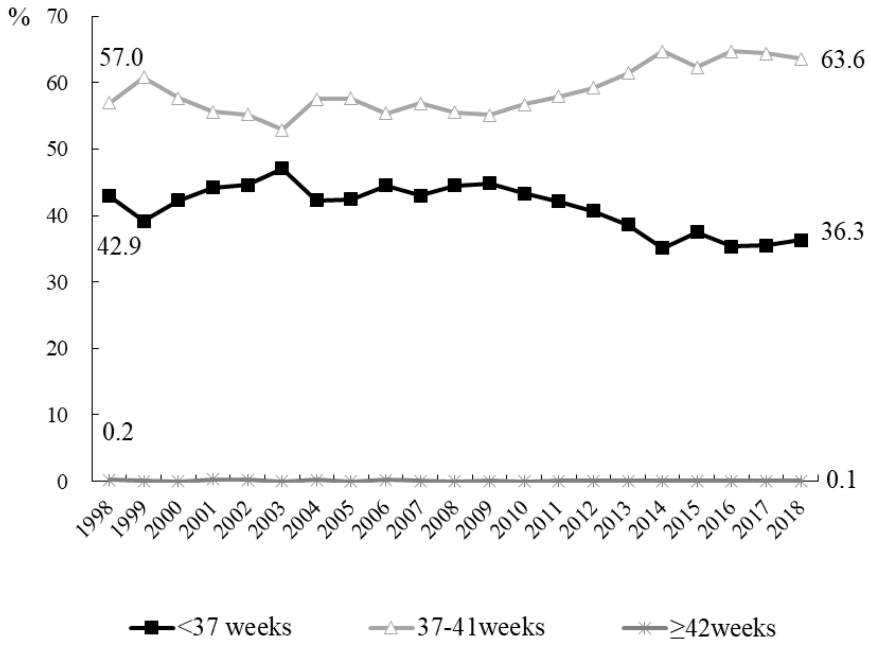


Figure 29 Gestational weeks of ART from 1998 and 2018



Appendix 1 Summary of Assisted Reproduction Statistics in 2018

Profile

Assisted Reproduction Method	
IVF/ET	99.9%
ZIFT/TET	<1%
AID	<1%

Procedural Factors	
Use ICSI	41%
Unstimulated	21%

Causes of Infertility (%)	
Fallopian tube factor	8%
Ovarian factor	31%
Endometriosis	4%
Other uterine factors	5%
Other female factors	5%
Male factor	12%
Multiple factors	31%
Unknown reason	4%

Pregnancy success rates

Type of Cycle — **Women age**

Fresh embryo of ART Cycles	**<35**	**35-37**	**38-40**	**>40**	**Total**
Number of treatment cycles	5,961	5,079	5,167	6,545	22,752
Percentage of pregnancy cycles	13.9	14.4	10.7	5.3	10.8
Percentage of live birth cycles	11.3	10.8	7.5	2.7	7.8
Number of Transfer Cycles	1,704	1,577	1,494	1,466	6,241
Pregnancy rate of transfer cycles	48.5	46.4	36.9	23.7	39.4
Live birth rate of transfer cycles	39.4	34.9	25.8	11.9	28.6
Singleton live birth rate of transfer cycles	26.1	25.3	19.7	10.1	20.6
Percentage of cancellations	72.6	70.0	72.1	79.0	73.7
Average number of embryos transferred	2.1	2.4	2.7	2.8	2.5
Percentage of multiple births in live birth cycles	33.9	27.5	23.6	15.3	27.9

Frozen embryo of ART Cycles	**<35**	**35-37**	**38-40**	**>40**	**Total**
Number of treatment cycles	5,257	4,449	3,558	3,824	17,088
Percentage of pregnancy cycles	57.0	52.1	46.2	36.0	48.8
Percentage of live birth cycles	46.9	40.2	32.8	23.8	37.0
Number of Transfer Cycles	5,108	4,307	3,430	3,860	16,705
Pregnancy rate of transfer cycles	58.7	53.8	48.0	37.4	50.5
Live birth rate of transfer cycles	48.3	41.4	34.0	24.8	38.3
Singleton live birth rate of transfer cycles	33.4	30.5	27.8	20.4	28.6
Percentage of cancellations	2.8	3.2	3.6	3.8	3.3
Average number of embryos transferred	1.9	2.1	2.3	2.2	2.1
Percentage of multiple births in live birth cycles	30.9	26.5	18.3	17.8	25.4

Fresh embryos from nondonor eggs	**<35**	**35-37**	**38-40**	**>40**	**Total**
Number of treatment cycles	5,766	4,953	5,001	5,872	21,592
Percentage of pregnancy cycles	14.0	14.5	10.8	5.1	10.9
Percentage of live birth cycles	11.4	10.8	7.5	2.3	7.9
Number of Transfer Cycles	1,684	1,557	1,479	1,395	6,115
Pregnancy rate of transfer cycles	48.1	46.1	36.5	21.3	38.7
Live birth rate of transfer cycles	39.1	34.5	25.4	9.5	27.8
Singleton live birth rate of transfer cycles	25.9	25.3	19.3	8.2	20.1
Percentage of cancellations	71.9	69.5	71.4	77.5	72.8
Average number of embryos transferred	2.1	2.4	2.7	2.8	2.5
Percentage of multiple births in live birth cycles	33.7	26.6	24.0	14.3	27.8

Frozen embryos from nondonor eggs	**<35**	**35-37**	**38-40**	**>40**	**Total**
Number of treatment cycles	4,962	4,264	3,294	2,447	14,967
Percentage of pregnancy cycles	56.6	51.7	45.3	26.6	47.8
Percentage of live birth cycles	46.5	39.7	31.8	15.2	36.2
Number of Transfer Cycles	4,815	4,126	3,171	2,333	14,445
Pregnancy rate of transfer cycles	58.4	53.5	47.0	27.9	49.6
Live birth rate of transfer cycles	47.9	41.1	33.0	15.9	37.5
Singleton live birth rate of transfer cycles	32.9	30.1	27.3	14.0	27.8
Percentage of cancellations	3.0	3.2	3.7	4.7	3.5
Average number of embryos transferred	2.0	2.1	2.3	2.5	2.2
Percentage of multiple births in live birth cycles	31.3	26.6	17.5	11.9	25.8

Fresh embryos from nondonor sperm	**<35**	**35-37**	**38-40**	**>40**	**Total**
Number of treatment cycles	5,884	5,033	5,127	6,495	22,539
Percentage of pregnancy cycles	13.8	14.3	10.7	5.3	10.8
Percentage of live birth cycles	11.2	10.8	7.4	2.7	7.8
Number of Transfer Cycles	1,677	1,560	1,481	1,450	6,168
Pregnancy rate of transfer cycles	48.5	46.1	36.9	23.9	39.3
Live birth rate of transfer cycles	39.4	34.9	25.7	11.9	28.5
Singleton live birth rate of transfer cycles	26.1	25.3	19.6	10.1	20.6
Percentage of cancellations	72.5	70.0	72.1	79.0	73.7
Average number of embryos transferred	2.1	2.4	2.7	2.8	2.5
Percentage of multiple births in live birth cycles	33.7	27.4	23.7	15.6	27.8

Frozen embryos from nondonor sperm	**<35**	**35-37**	**38-40**	**>40**	**Total**
Number of treatment cycles	5,156	4,397	3,534	3,808	16,895
Percentage of pregnancy cycles	57.0	52.1	46.2	36.1	48.8
Percentage of live birth cycles	46.8	40.1	32.7	23.9	37.0
Number of Transfer Cycles	5,014	4,255	3,408	3,666	16,343
Pregnancy rate of transfer cycles	58.6	53.8	47.9	37.5	50.4
Live birth rate of transfer cycles	48.1	41.5	33.9	24.8	38.2
Singleton live birth rate of transfer cycles	33.2	30.4	27.8	20.4	28.5
Percentage of cancellations	2.8	3.2	3.6	3.7	3.3
Average number of embryos transferred	1.9	2.1	2.3	2.2	2.1
Percentage of multiple births in live birth cycles	31.0	26.6	18.2	17.8	25.5

Fresh embryos from nondonor gametes	**<35**	**35-37**	**38-40**	**>40**	**Total**
Number of treatment cycles	5,689	4,907	4,961	5,822	21,379
Percentage of pregnancy cycles	14.0	14.4	10.8	5.1	10.9
Percentage of live birth cycles	11.4	10.8	7.4	2.3	7.9
Number of Transfer Cycles	1,657	1,540	1,466	1,379	6,042
Pregnancy rate of transfer cycles	48.1	45.8	36.5	21.4	38.6
Live birth rate of transfer cycles	39.0	34.5	25.2	9.6	27.8
Singleton live birth rate of transfer cycles	26.0	25.3	19.2	8.1	20.1
Percentage of cancellations	71.8	69.5	71.4	77.5	72.7
Average number of embryos transferred	2.1	2.4	2.7	2.8	2.5
Percentage of multiple births in live birth cycles	33.5	26.6	24.1	14.5	27.8

Frozen embryos from nondonor gametes	**<35**	**35-37**	**38-40**	**>40**	**Total**
Number of treatment cycles	4,861	4,212	3,270	2,431	14,774
Percentage of pregnancy cycles	56.6	51.7	45.2	26.7	47.8
Percentage of live birth cycles	46.4	39.7	31.7	15.3	36.1
Number of Transfer Cycles	4,721	4,074	3,149	2,319	14,263
Pregnancy rate of transfer cycles	58.3	53.5	46.9	28.0	49.5
Live birth rate of transfer cycles	47.8	41.0	33.0	16.0	37.4
Singleton live birth rate of transfer cycles	32.8	30.0	27.2	14.1	27.7
Percentage of cancellations	2.9	3.3	3.7	4.6	3.5
Average number of embryos transferred	2.0	2.1	2.3	2.5	2.2
Percentage of multiple births in live birth cycles	31.4	26.8	17.4	11.9	25.9

	Total for all ages	
Donor eggs	Fresh embryos	Frozen embryos
Number of Transfer Cycles	126	2,080
Percentage of live birth cycle in the transfer cycles	62.7	43.8
Average number of embryos transferred	1.9	1.7
Donor sperm	Fresh embryos	Frozen embryos
Number of Transfer Cycles	73	182
Live birth rate of transfer cycles	32.9	46.2
Average number of embryos transferred	2.6	1.9
Embryos from nondonor gametes	Fresh embryos	Frozen embryos
Number of Transfer Cycles	6,042	14,263
Live birth rate of transfer cycles	27.8	37.4
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	1,378	4,442	783	205
Pregnancy rate of transfer cycles	52	59	50	49
Singleton with fetal heart sound in all pregnancies	90	58	60	60
Singleton rate in all live birth	98	61	64	65

35-37 age group	**Number of transferred embryos**			
	1	2	3	4
Number of transfer cycles	1,127	2,982	1,327	448
Pregnancy rate of transfer cycles	48	55	50	46
Singleton with fetal heart sound in all pregnancies	88	61	63	56
Singleton rate in all live birth	98	68	67	65

38-40 age group	**Number of transferred embryos**			
	1	**2**	**3**	**4**
Number of transfer cycles	936	1,896	1,285	806
Pregnancy rate of transfer cycles	44	48	42	43
Singleton with fetal heart sound in all pregnancies	87	66	69	60
Singleton rate in all live birth	98	77	78	69

>40 age group	**Number of transferred embryos**			
	1	**2**	**3**	**4**
Number of transfer cycles	1,219	1,844	1,012	1,071
Pregnancy rate of transfer cycles	36	38	30	26
Singleton with fetal heart sound in all pregnancies	85	61	61	57
Singleton rate in all live birth	100	72	77	82

Number of reporting ART institutions: 88

Appendix 2 Statistical Data on Individual ART Institutions in 2018

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	347	72.6	27.4	0.0	17.9	38.4	18.7	18.4	6.6
Taipei City	National Taiwan University Hospital	1,356	30.3	40.1	29.6	8.0	27.1	15.7	37.3	11.9
	Taipei Chang Gung Memorial Hospital, Chang Gung Medical Foundation	273	30.8	69.2	0.0	0.0	12.1	2.9	85.0	0.0
	Taipei Veterans General Hospital	1,638	89.0	11.0	0.0	9.8	40.9	24.0	18.1	7.2
	Tri-Service General Hospital	224	50.4	49.6	0.0	7.1	36.2	16.5	40.2	0.0
	MacKay Memorial Hospital	937	55.7	44.3	0.0	6.2	27.5	29.4	20.5	16.4
	Cathy General Hospital	223	67.3	32.7	0.0	14.3	66.0	8.5	11.2	0.0
	Chung Shan Hospital	345	42.0	15.4	42.6	8.4	43.6	7.2	33.6	7.2
	Shin Kong Wu Ho-Su Memorial Hospital	199	55.8	44.2	0.0	18.6	46.7	13.1	17.6	4.0
	Taiwan Adventist Hospital	343	84.0	16.0	0.0	1.5	69.3	8.7	19.0	1.5
	Taipei Medical University Hospital	2,497	45.2	54.8	0.0	10.4	66.6	12.3	8.5	2.2
	Pan's Ladies Clinic & Infertility Center	203	67.0	33.0	0.0	14.8	53.2	17.2	3.0	11.8
	Honji Fertility Center	522	21.3	78.7	0.0	4.4	47.1	9.2	34.7	4.6
	Hope Fertility & PGD Center	478	64.2	35.8	0.0	2.1	66.5	1.9	28.2	1.3
	IHMED Reproductive Med Center	2,133	42.2	23.8	34.0	8.4	43.8	16.5	26.4	4.9
	Huang, Jian-Rong Obstetrics and Gynecology Clinic	911	60.2	39.8	0.0	10.0	31.7	14.3	30.6	13.4
	Dr. Wang Reproductive Fertility Center	2,164	65.2	34.8	0.0	11.6	34.9	15.7	37.8	0.0
	Taipei Branch of Gene Infertility Medical Center	189	18.5	35.4	46.0	7.9	45.1	6.3	40.7	0.0
	Renai Branch of Taipei City Hospitals	94	7.4	60.6	31.9	4.3	40.4	6.4	31.9	17.0
	HuaYu Fertility Center	44	56.8	43.2	0.0	20.5	63.6	0.0	15.9	0.0
	Stork 11 Fertility Center Taipei	2	50.0	50.0	0.0	0.0	100.0	0.0	0.0	0.0

Appendix 2 Statistics Data on Individual ART Institution in 2018

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
New Taipei City	Far Eastern Memorial Hospital	260	55.0	45.0	0.0	8.5	26.2	20.4	38.4	6.5
	Art Baby	186	65.6	34.4	0.0	8.6	55.3	18.8	15.1	2.2
	Taipei Medical University-Shuang Ho Hospital, Ministry of Health and Welfare	8	62.5	37.5	0.0	12.5	12.5	25.0	50.0	0.0
	Taipei Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation	106	61.3	38.7	0.0	7.5	26.4	21.7	33.1	11.3
	Star International Fertility Center	86	54.7	45.3	0.0	7.0	58.2	8.1	24.4	2.3
	Banqiao Branch of Gene Infertility Medical Center	53	39.6	60.4	0.0	0.0	51.0	9.4	28.3	11.3
Taoyuan City	Linkou Chang Gung Memorial Hospital, Chang Gung Medical Foundation	1,341	47.2	52.8	0.0	4.0	40.0	3.1	52.3	0.6
	Tao Yuan General Hospital, Ministry of Health and Welfare	139	25.9	26.6	47.5	5.8	53.2	2.2	38.8	0.0
	Min-Sheng General Hospital	76	59.2	40.8	0.0	30.2	15.8	5.3	22.4	26.3
	Hungchi Women & Children's Hospital	580	45.9	54.1	0.0	23.8	57.8	17.2	1.2	0.0
	Hueish Sheng Obstetrics Clinic	158	75.9	24.1	0.0	10.8	31.6	16.5	29.7	11.4
Hsinchu City	Jiang's OBS & GYN Clinic	46	63.0	34.8	2.2	8.7	82.6	8.7	0.0	0.0
	Stork Fertility Center	2,638	59.0	40.8	0.2	0.3	95.8	3.7	0.0	0.2
	Hsinchu MacKay Memorial Hospital	260	34.2	65.8	0.0	4.2	18.8	32.3	42.4	2.3
	Cheng-Kai Lin Babymake Clinic	340	68.8	31.2	0.0	4.7	30.6	10.9	53.2	0.6
Hsinchu County	Taiwan IVF Group	1,316	52.9	47.1	0.0	1.2	36.3	11.9	47.7	2.9
Miaoli County	Da-Chien Health Medical System	56	94.6	5.4	0.0	39.2	39.3	5.4	3.6	12.5
Taichung City	China Medical University Hospital	564	17.7	82.3	0.0	12.8	30.8	15.8	28.2	12.4
	Chung Shan Medical University Hospital	150	46.7	53.3	0.0	0.7	2.0	0.7	96.6	0.0
	Lee Women's Hospital	4,243	53.6	46.4	0.0	7.1	10.8	4.2	77.9	0.0
	Taichung Veterans General Hospital	790	82.9	17.0	0.1	12.9	51.5	15.4	17.8	2.4

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	Cheng Ching Hospital Chung Kang Branch	46	84.8	15.2	0.0	37.0	45.6	17.4	0.0	0.0
	Lin Shin Hospital	127	41.7	58.3	0.0	27.6	52.8	10.2	9.4	0.0
	Liu,Zhong-Jun Women and Children Clinic	248	44.4	55.6	0.0	7.3	48.7	12.9	23.4	7.7
	Mei Tsun Women and Children Clinic	68	25.0	75.0	0.0	11.8	42.6	17.6	26.5	1.5
	Hsieh,Yao-Yuan Women and Children's Clinic	9	11.1	88.9	0.0	0.0	77.8	22.2	0.0	0.0
	Dashin Women and Children's Clinic	328	18.0	36.0	46.0	4.0	58.5	1.2	36.3	0.0
	Taichung Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation	36	91.7	8.3	0.0	22.2	61.1	11.1	5.6	0.0
	Chang's Fertility Center	326	50.0	50.0	0.0	3.7	26.4	8.0	45.9	16.0
	Tungs' Taichung MetroHarbor Hospital	56	60.6	39.4	0.0	18.2	60.5	6.1	9.1	6.1
Changhua County	Changhua Christian Hospital	883	56.5	43.5	0.0	7.9	52.6	13.0	22.0	4.5
	Han-Ming Hospital	13	92.3	7.7	0.0	38.4	30.8	7.7	23.1	0.0
	Dr. Tsai & Dr. Chen's Women Clinic	506	54.7	45.3	0.0	7.7	74.7	9.9	7.7	0.0
	Chang Bing Show Chwan Memorial Hospital	16	68.8	31.2	0.0	12.5	56.3	6.2	0.0	25.0
Yunlin county	National Taiwan University Hospital Yunlin Branch	5	60.0	40.0	0.0	40.0	60.0	0.0	0.0	0.0
Chiayi City	Ditmanson Medical Foundation Chia-Yi Christian Hospital	106	72.6	27.4	0.0	19.8	44.3	18.9	8.5	8.5
	Jie-An Mother & Children Clinic	103	5.8	94.2	0.0	13.6	68.8	11.7	1.0	4.9
Chiayi County	Chiayi Chang Gung Memorial Hospital, Chang Gung Medical Foundation	81	92.6	7.4	0.0	19.8	38.3	11.1	14.8	16.0
Tainan City	National Cheng Kung University Hospital	491	77.6	22.4	0.0	5.5	35.0	16.1	41.2	2.2
	Kuo General Hospital	108	68.5	31.5	0.0	1.9	43.5	19.4	31.5	3.7
	Tube Infertility Clinic. Taiwan IVF Center	132	66.7	33.3	0.0	5.3	57.6	10.6	24.2	2.3

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	Sin-Lau Medical Foundation, the Presbyterian church in Taiwan	99	1.0	99.0	0.0	19.2	44.4	6.1	24.2	6.1
	An-An Women and Children Clinic	1,050	84.0	15.8	0.2	9.0	60.9	15.0	15.1	0.0
	Chi Mei Medical Center	588	59.5	40.5	0.0	1.2	11.7	31.6	55.5	0.0
	Jin -Sin Women and Children's Hospital	400	5.8	94.2	0.0	21.0	25.0	35.8	18.2	0.0
Kaohsiung City	Kaohsiung Medical University Chung-Ho Memorial Hospital	243	58.0	42.0	0.0	14.0	65.0	8.2	7.0	5.8
	Chien Shin Hospital	696	4.6	95.4	0.0	4.0	49.5	21.6	24.9	0.0
	Yuan's General Hospital	67	82.1	17.9	0.0	14.9	56.7	16.4	6.0	6.0
	Kaohsiung Veterans General Hospital	590	55.6	44.4	0.0	5.6	44.7	6.9	30.3	12.5
	Jung-Chou Chang Women and Children Clinic	28	78.6	14.3	7.1	3.6	89.3	7.1	0.0	0.0
	Kuo Hong-Chang GYN & IVF Clinic	166	75.9	24.1	0.0	5.4	68.7	6.0	19.9	0.0
	Makebaby Reproductive Center	406	18.2	81.8	0.0	10.3	54.7	16.3	18.5	0.2
	E-Da Dachang Hospital, E-Da Healthcare Group	112	69.6	30.4	0.0	8.0	81.3	10.7	0.0	0.0
	Kaohsiung Chang Gung Memorial Hospital, Chang Gung Medical Foundation	676	89.8	10.1	0.1	19.5	40.8	11.4	19.1	9.2
	Tung Chiao Eye Center	232	71.1	28.9	0.0	8.2	53.4	9.9	25.9	2.6
	E-Da Hospital, E-Da Healthcare Group	110	8.2	91.8	0.0	0.0	10.9	8.2	80.9	0.0
Pingtung County	Pingtung Christian Hospital	27	63.0	37.0	0.0	29.6	7.4	3.7	59.3	0.0
Yilan County	Lotung Poh-Ai Hospital, Lo-Hsu Medical Foundation,	23	17.4	82.6	0.0	4.3	34.8	13.0	47.9	0.0
Hualien County	Hualien Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation	93	32.3	14.0	53.7	28.0	33.3	11.8	16.1	10.8
Kinmen County	Kinmen Hospital, Ministry of Health and Welfare	606	78.7	21.3	0.0	3.3	90.6	2.3	3.3	0.5

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