

108 年

人工生殖施行結果分析報告

**The Assisted Reproductive
Technology Summary**

2019 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 108 年 1 月 1 日至 108 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 108 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 2019 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 2019 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 110 年 4 月止，通過許可之醫療機構共有 93 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 108 年於 87 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 108 年的趨勢進行分析。



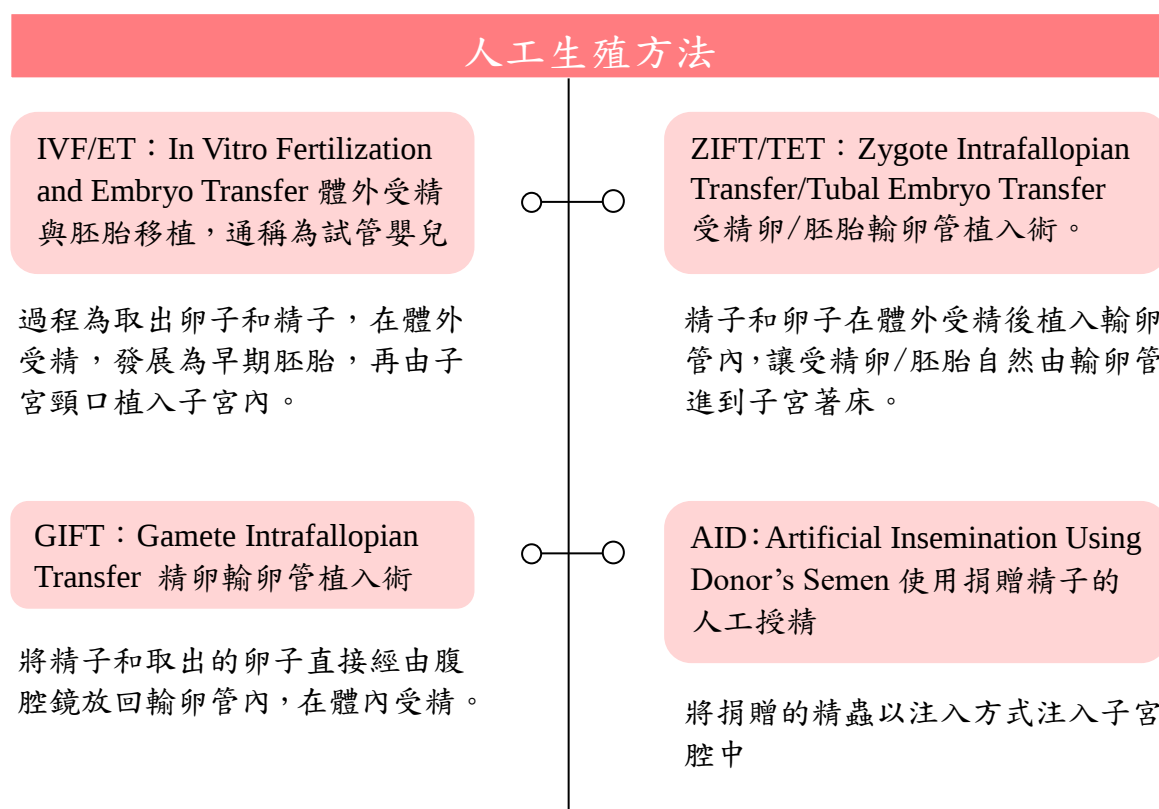
第一節、人工生殖治療週期

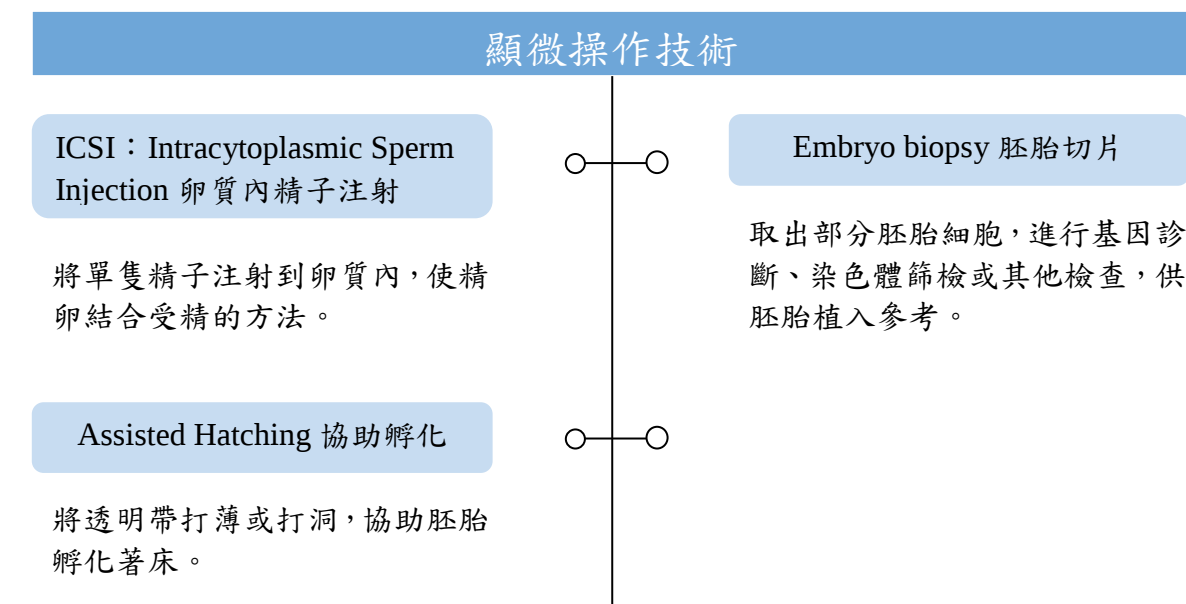
茲因人工生殖包含長達近兩週或更久的數個步驟，故於資料分析時以「週期（cycle）」為單位考量會比單一時間點的考量要來得妥切。以這種方式計算，在統計分析時，同一對接受人工生殖治療之夫妻將可能貢獻一個或一個以上的週期。

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。





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 108 年的 87 家人工生殖機構定期通報的資料。

第一節、治療週期數

108 年人工生殖之週期（含未完成取卵或植入之週期）共有 44,256 週期（表 1）。40,076 週期為配偶間人工生殖（占 90.6%），4,180 週期為使用捐贈精卵人工生殖（占 9.4%）。其中，使用捐卵之受術妻其年齡分布如表 2。

表 1 108 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	4,180
使用捐精	426
使用捐卵	3,754
使用配偶精卵	40,076
全部治療週期	44,256

表 2 108 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	11	0.3
25-29	159	4.2
30-34	472	12.6
35-39	574	15.3
40-44	1,137	30.3
45-49	1,162	30.9
≥50	239	6.4
使用捐卵治療週期	3,754	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 38.6% (表 3)，其中，又以 39 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 8.0%，其次為 36 歲婦女，占所有治療週期之 7.7%。

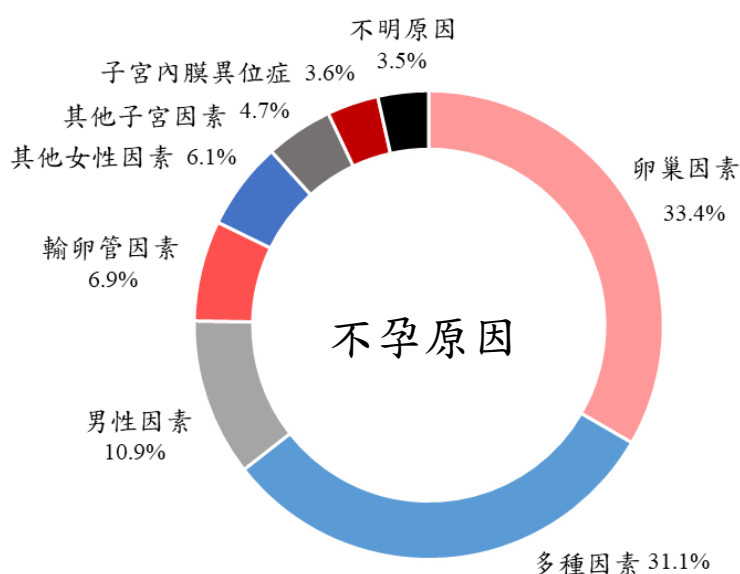
表 3 108 年人工生殖受術妻之年齡別

受術妻年齡	治療週期數	單位：週期/%
		百分比
<25	211	0.5
25-29	2,076	4.7
30-34	9,520	21.5
35-39	17,093	38.6
40-44	12,039	27.2
45-49	3,015	6.8
≥50	302	0.7
全部治療週期	44,256	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 33.4%為最高，多種因素 31.1%占第二位，男性因素 10.9%居第三位(圖 1)。

圖 1 108 年人工生殖個案不孕之原因 (母數：44,256 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 44,256 治療週期中，79.7%週期有使用顯微操作技術(表 4)。

表 4 108 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	治療週期數	單位：週期/%
		百分比
使用	35,266	79.7
卵質內精子注射(ICSI)	16,965	38.3
協助孵化(Assisted Hatching)	12,685	28.7
胚胎著床前染色體篩檢(PGT-A)	2,526	5.7
胚胎著床前基因診斷(PGT-M)	98	0.2
其他(含合併多種技術)	2,992	6.8
未使用	8,990	20.3
全部治療週期	44,256	100.0

第六節、植入週期數與胚胎數

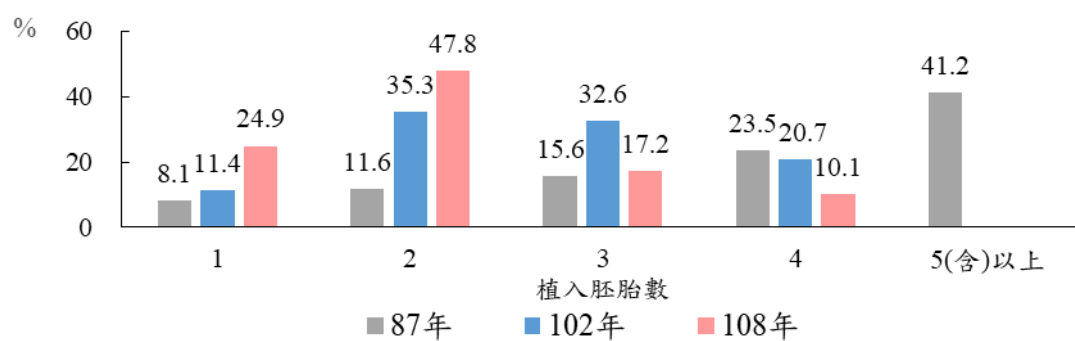
人工生殖植入週期數共 23,761 週期，有 21.2%採用配偶間的精卵所形成的新鮮胚胎，67.3%使用配偶間的冷凍胚胎，0.8%使用捐贈精卵形成的新鮮胚胎，10.7%使用捐贈精卵的冷凍胚胎（表 5）。

表 5 108 年人工生殖植入類型百分比

植入類型		單位：週期/%	
		植入週期數	百分比
配偶間胚胎	新鮮	5,045	21.2
	冷凍	15,975	67.3
捐贈精卵之胚胎	新鮮	188	0.8
	冷凍	2,553	10.7
全部植入週期		23,761	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。108 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 72.7%(107 年為 69.5%，106 年為 65.4%)(圖 2)。108 年人工生殖機構通報之卵巢過度刺激症候群輕、中及重度占治療週期數比率分別為 2.84%、0.11%及 0.06%(表 6)。

圖2 人工生殖胚胎植入數百分比



註：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。

表 6 108 年卵巢過度刺激症候群週期數 (母數：44,256 治療週期)

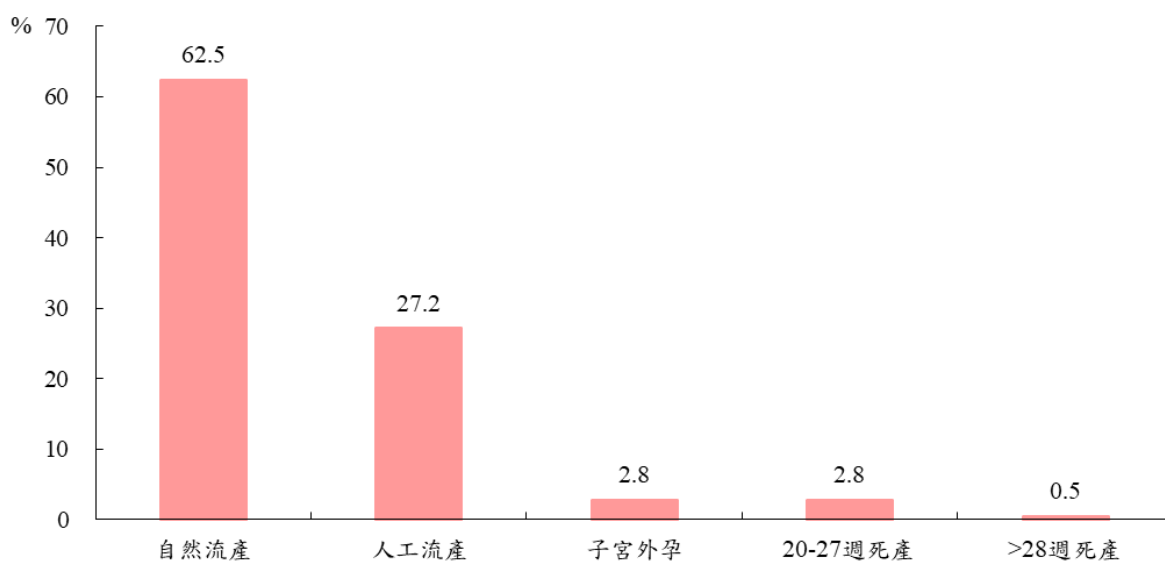
單位：週期/%		
程度	治療週期數	百分比
輕度	1,257	2.84
中度	48	0.11
重度	7	0.06
全部治療週期	1,312	2.96

第七節、懷孕與活產情形

人工生殖 44,256 治療週期中，有植入的計 23,761 週期，有懷孕的計 11,402 個週期，有減胎的計 135 週期，有活產的計 8,583 週期，共有 10,678 個嬰兒誕生(24.1%活產週期為多胎生產)，較 107 年增加了 442 個嬰兒誕生。

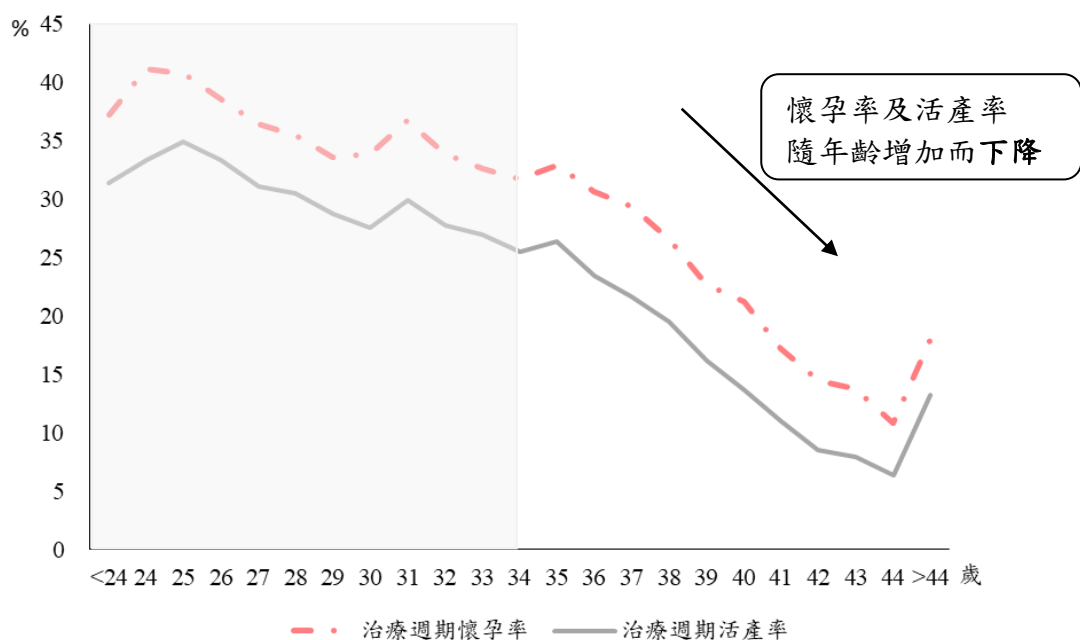
在 2,819 個懷孕但無活產紀錄之週期中，1,761 週期為自然流產 (占 62.5%)，767 週期為人工流產(含 20 週前無胎心音；占 27.2%)，80 週期為子宮外孕(占 2.8%)，94 週期為死產(占 3.3%)(少數週期同時具有自然流產、人工流產、子宮外孕、20-27 週死產或>28 週死產中兩種以上情形)(圖 3)。

圖 3 108 年人工生殖懷孕週期無活產紀錄分析 (母數：2,819 懷孕但無活產之週期)



108年接受人工生殖之治療週期懷孕率為25.8%，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4 108年人工生殖受術妻年齡與懷孕率及活產率關係圖 (母數：44,256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

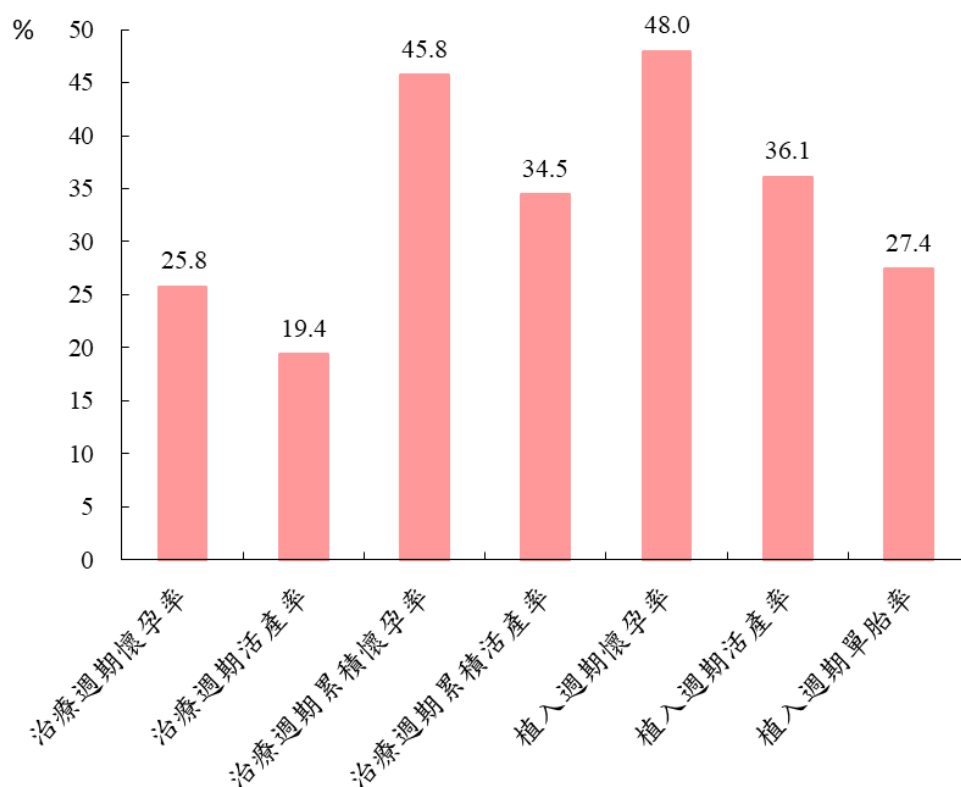
因近年人工生殖技術成熟，越來越多進行全胚冷凍，使得治療週期數增加，但該週期並未進行植入，故以治療週期累積懷孕率、治療週期累積活產率較能真實呈現人工生殖技術的品質。

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。108 年之治療週期懷孕率為 25.8%。
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。108 年治療週期活產率為 19.4%。
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：
$$\frac{\text{新鮮胚胎懷孕週期數} + \text{冷凍胚胎懷孕週期數}}{\text{新鮮胚胎治療週期數} + (\text{新鮮胚胎} + \text{冷凍胚胎})\text{懷孕週期數}}$$
。108 年之治療週期累積懷孕率為 45.8%。
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：
$$\frac{\text{新鮮胚胎活產週期數} + \text{冷凍胚胎活產週期數} + (\text{新鮮胚胎} + \text{冷凍胚胎})\text{活產週期數}}{\text{新鮮胚胎治療週期數} + (\text{新鮮胚胎} + \text{冷凍胚胎})\text{治療週期數}}$$
。108 年之治療週期累積活產率為 34.5%，未滿 38 歲前治療週期累積活產率則為 50.1%。

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。108 年植入週期懷孕率為 48.0%。其中，植入新鮮胚胎的懷孕率為 39.2%，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。108 年植入週期活產率為 36.1%，其中，植入新鮮胚胎的活產率為 27.8%，而植入冷凍胚胎的活產率為 38.5%。
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。108 年之植入週期單胎率為 27.4%。

圖 5 108 年人工生殖成功率分析



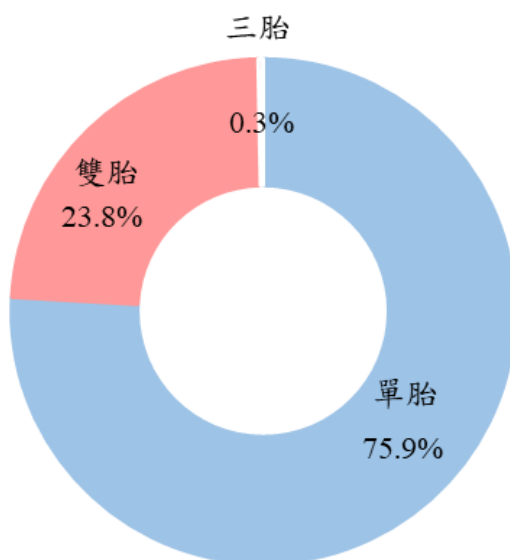
第八節、出生嬰兒狀況

一、活產胎數

在 8,583 個活產週期中，75.9%為單胎生產、23.8%為雙胎生產、0.3%為三胎生產（圖 6）。

於 108 年間接受人工生殖治療後，生產的嬰兒共有 10,678 人。其中，男嬰有 5,673 人，女嬰有 5,005 人(表 7)。

圖 6 108 年人工生殖活產週期之胎數百分比 (母數：8,583 活產週期)



二、體重、懷孕週數與先天缺陷

觀察 10,678 個活產嬰兒中，出生體重低於 1,500 公克者占有所有活產嬰兒總數之 3.6%，體重介於 1,500-2,499 公克者占 28.8%，體重大於等於 2,500 公克者占 67.6%；另懷孕週數小於 37 週者占有所有活產嬰兒週期之 35.4%，週數介於 37-41 週者占 64.5%，大於等於 42 週者占 0.1%(表 7)；而外觀明顯先天缺陷的嬰兒比率為 0.7% (表 8)。

表 7 108 年人工生殖出生嬰兒體重及週數 (活產嬰兒總數 10,678 個)

		單位：數量/%	
嬰兒狀況	活產嬰兒數	百分比	
性別			
男	5,673	53.1	
女	5,005	46.9	
體重			
<1500 公克	387	3.6	
1500-2499 公克	3,078	28.8	
≥2500 公克	7,213	67.6	
懷孕週數			
<37 週	3,783	35.4	
37-41 週	6,889	64.5	
≥42 週	6	0.1	

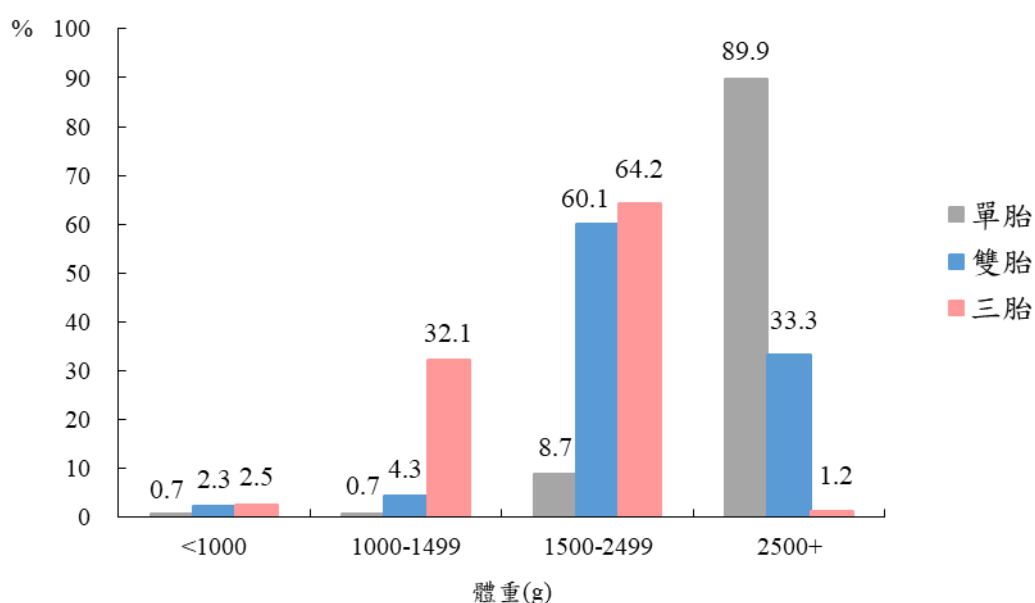
表 8 108 年人工生殖出生嬰兒外觀明顯先天缺陷數及占活產嬰兒比率
(活產嬰兒總數 10,678 個)

		單位：數量/%	
出生體重	外觀明顯先天缺陷 嬰兒數	活產嬰兒數	百分比
<1500 公克	30	387	7.8
1500-2499 公克	24	3,078	0.8
≥2500 公克	26	7,213	0.4
合計	80	10,678	0.7

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，佔所有單胎生產之 89.9%。雙胎生產則以 1,500 到 2,499 公克新生兒佔 60.1%，為最大比例，其次為 2,500 公克以上者佔 33.3%。而三胎生產中，體重小於 1,000 公克新生兒佔 2.5%，體重介於 1,000 到 1,499 公克者佔 32.1%，體重在 1,500 到 2,499 新生兒佔 64.2%，體重超過 2,500 公克者佔 1.2%。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 7 108 年人工生殖活產週期之胎數別與體重之關係百分比 (母數：10,678 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 40,076 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 90.6%。其受術妻年齡分布如表 9，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。

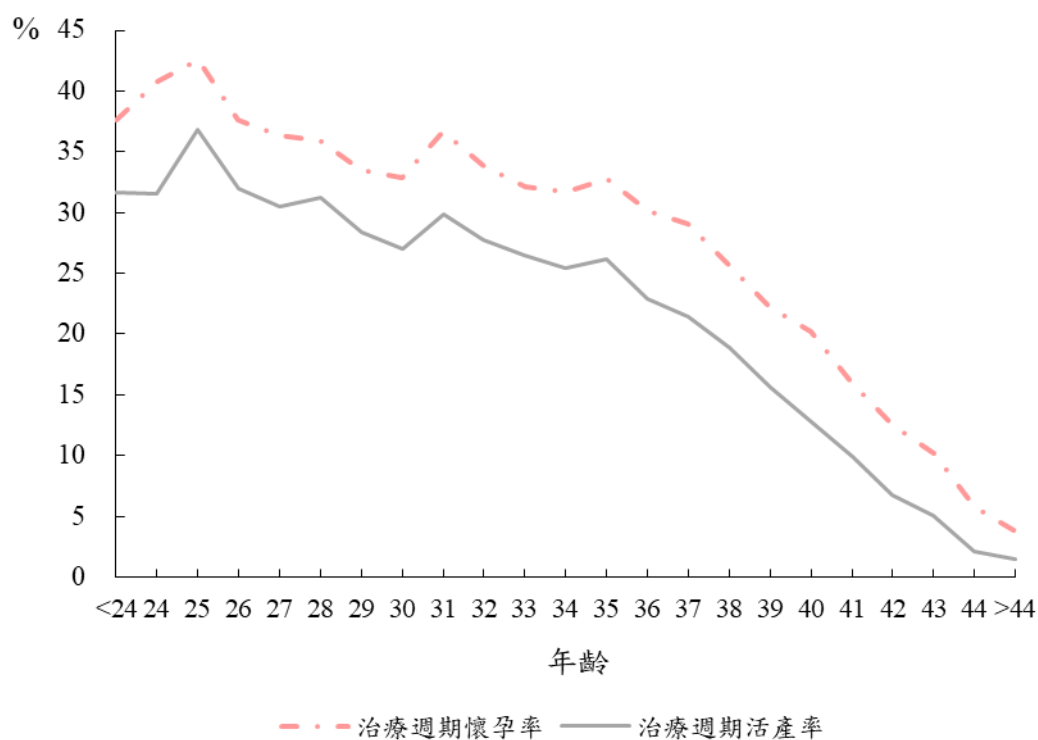
表 9 108 年配偶間人工生殖受術妻年齡別

受術妻年齡	治療週期數	單位：週期/%
		百分比
<25	193	0.5
25-29	1,858	4.6
30-34	8,921	22.3
35-39	16,379	40.8
40-44	10,825	27.0
45-49	1,839	4.6
>50	61	0.2
全部治療週期	40,076	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 24.7%，治療週期活產率為 18.4% (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)。

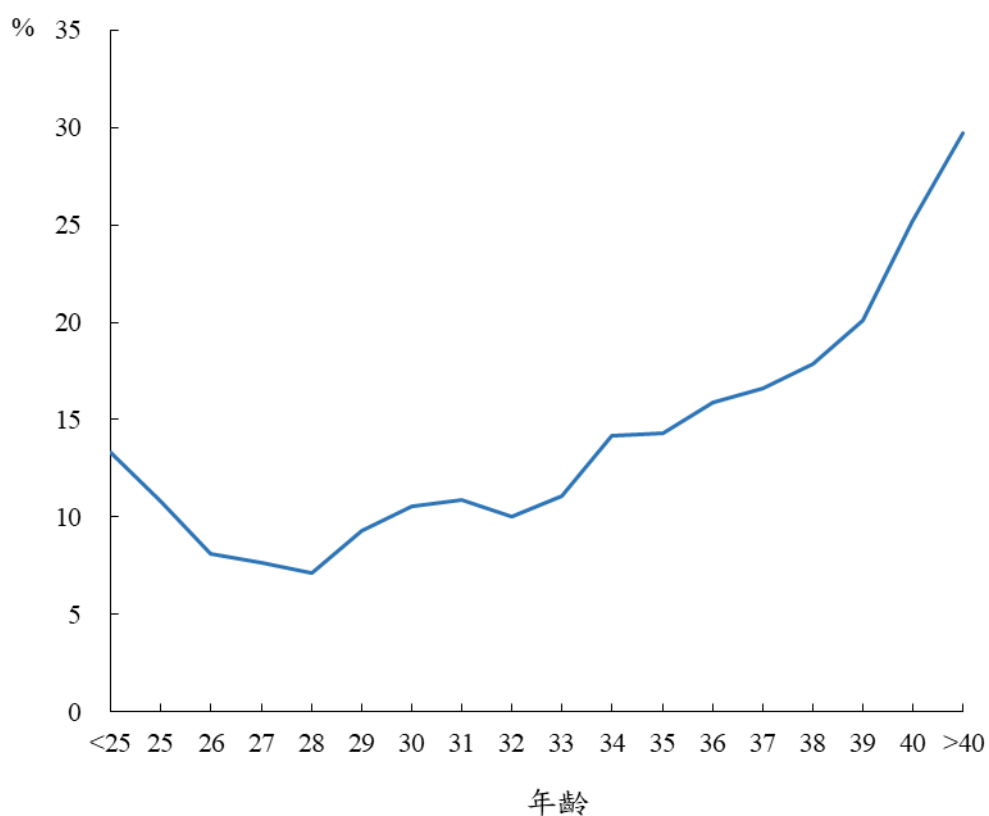
圖 8 108 年配偶間人工生殖受術妻年齡與懷孕率及活產率關係(母數：40,076 治療週期數)



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29.7%(圖9)。

圖9 108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：9,880 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

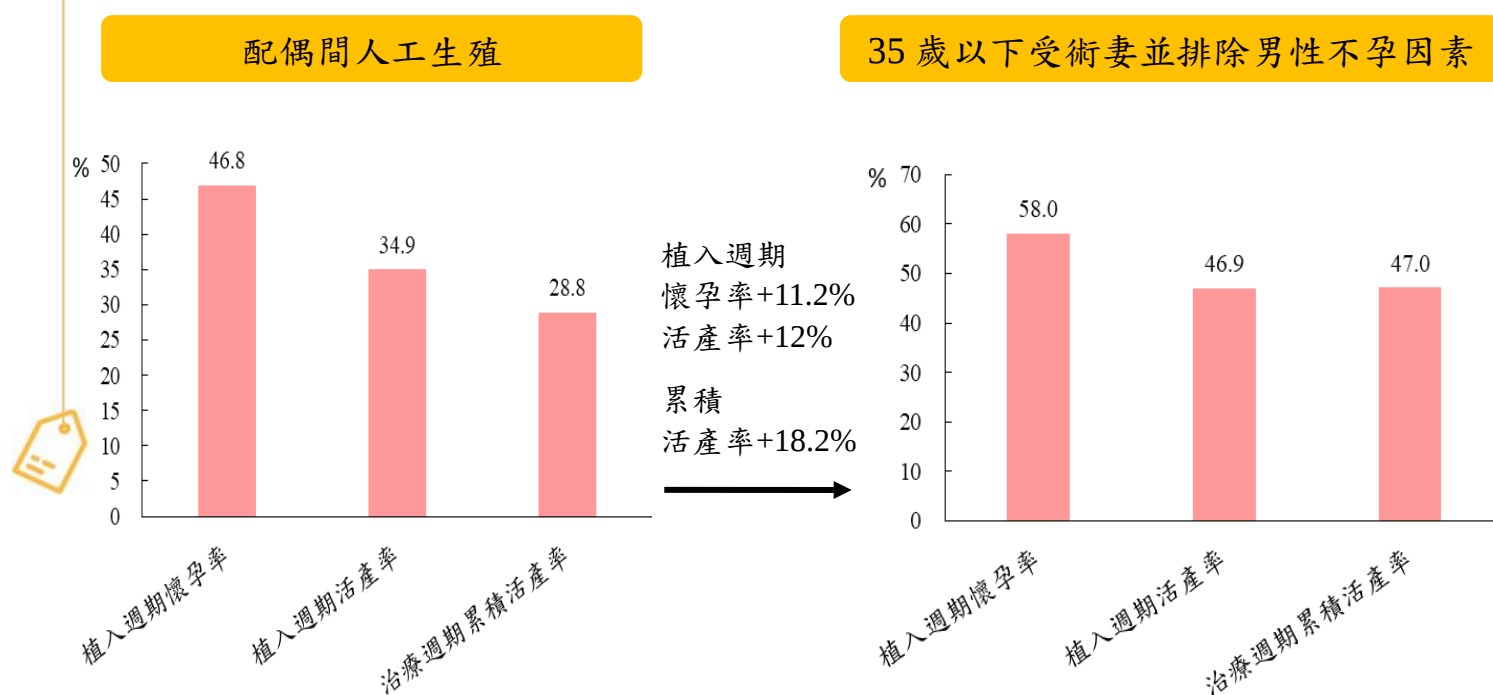
本節針對配偶間人工生殖施行試管嬰兒(IVF/ET)方式進行分析。

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 19,218 週期，其中懷孕週期 8,988 週期，活產週期 6,711 週期。其植入週期懷孕率為 46.8%，植入週期活產率為 34.9%，治療週期累積活產率為 28.8%(未滿 38 歲治療週期累積活產率為 44.7%)，其中單胎比例占 74.8%，雙胞胎占 24.9%，三胞胎則占 0.3%。

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 58.0%，植入週期活產率提高到 46.9%，而治療週期累積活產率提高到 47.0%(圖 10)。

圖 10 108 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

108 年配偶間人工生殖治療週期植入 2 個以下胚胎者，35 歲(含)以下占 84.9%；36 歲(含)以上占 61% (圖 11、圖 12)。配偶間人工生殖施行試管嬰兒方式之 6,711 活產週期中，有 56.2% 的週期植入 2 個胚胎，占最大比例(圖 13)。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 40.0%(圖 14)，但相對的，其活產週期產生多胞胎的比例也高達 32.0%(圖 15)。

圖11 108年配偶間人工生殖35歲(含)以下受術妻植入數百分比

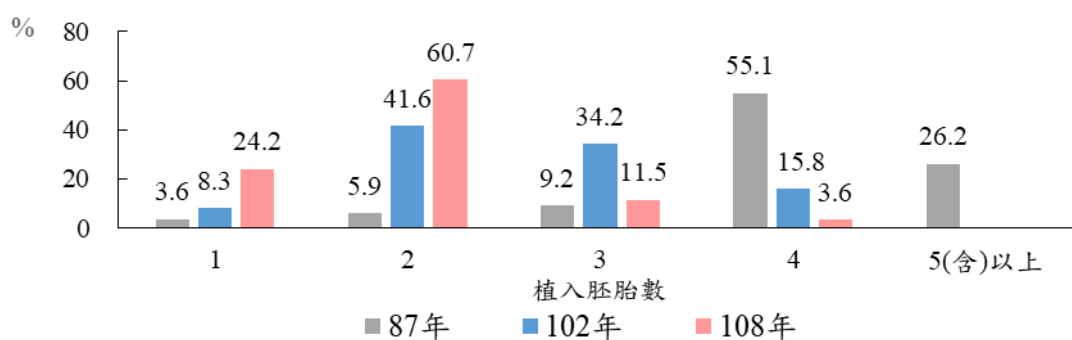


圖12 108年配偶間人工生殖36歲(含)以上受術妻植入數百分比

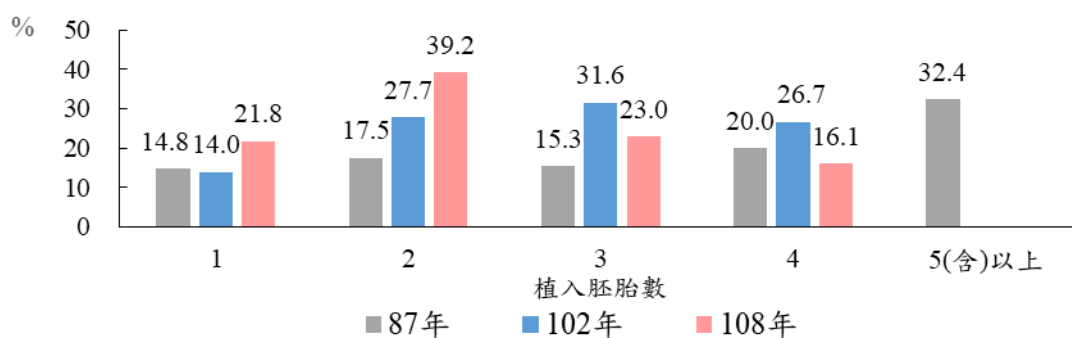


圖13 108年配偶間人工生殖施行試管嬰兒方式活產週期中植入胚胎數之分布

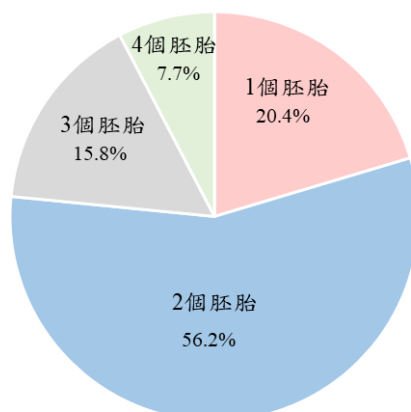


圖 14 108 年配偶間人工生殖施行試管嬰兒方式植入胚胎數之活產率

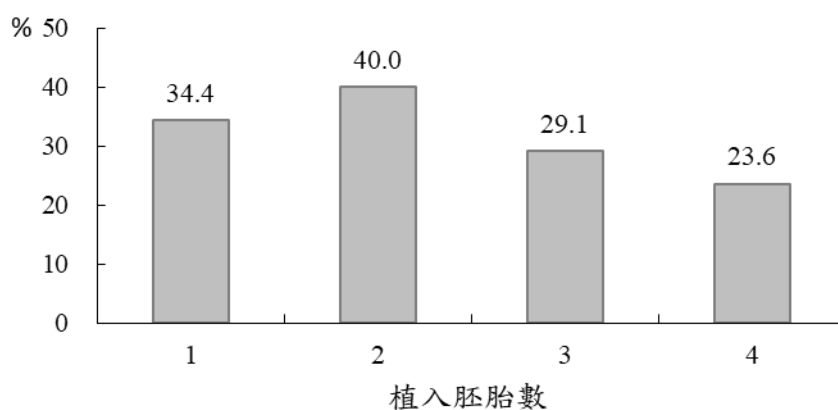
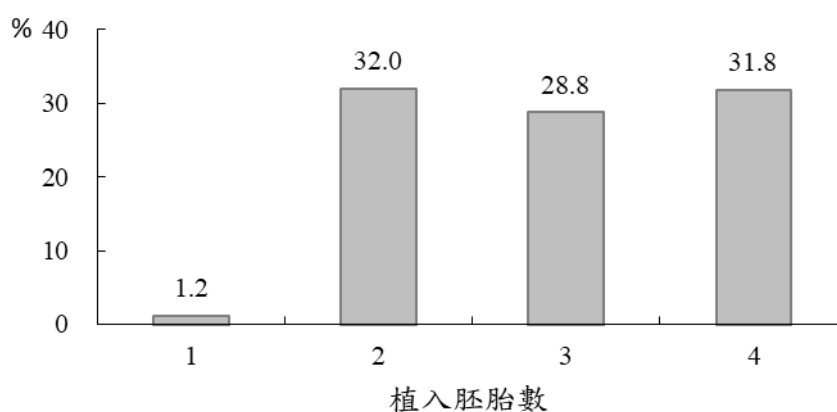


圖 15 108 年配偶間人工生殖施行試管嬰兒方式活產週期中植入胚胎數與多胞胎比例的關係



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 5,045 週期及植入冷凍胚胎共 15,975 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 38.4% 及 49.7%；其活產率則為 27.0% 及 37.8%，兩者均達顯著差異 ($P < 0.0001$) (圖 16)。

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 49.7% 及 60.2%，但超過 40 歲之懷孕率僅剩下 18.6% 及 28.5%；而植入新鮮胚胎週期活產率更是由小於 35 歲之 40.7% 降低到大於 40 歲之 8.6%，植入冷凍胚胎週期活產率則是由 49.5% 降低到 16.2%。

(圖 17)

圖 16 108 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

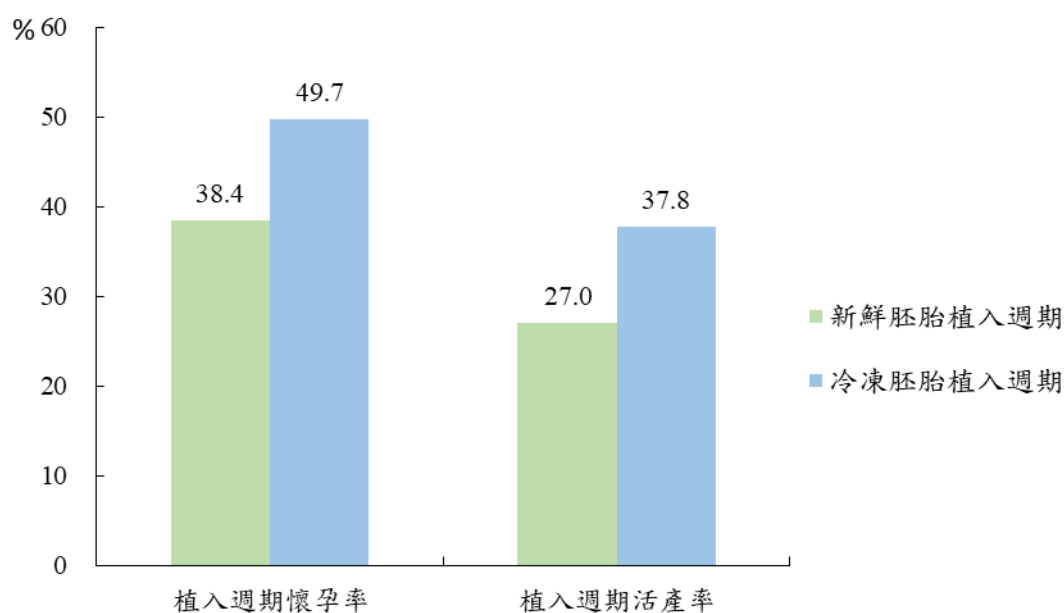
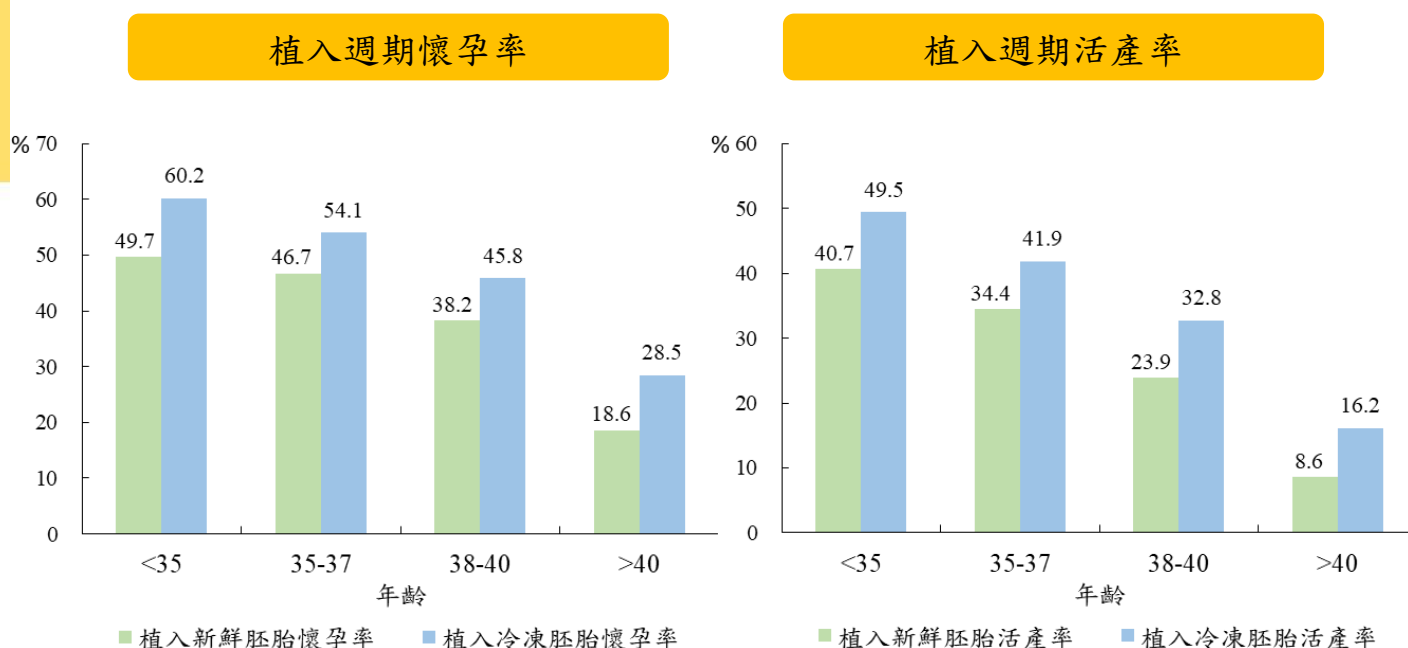
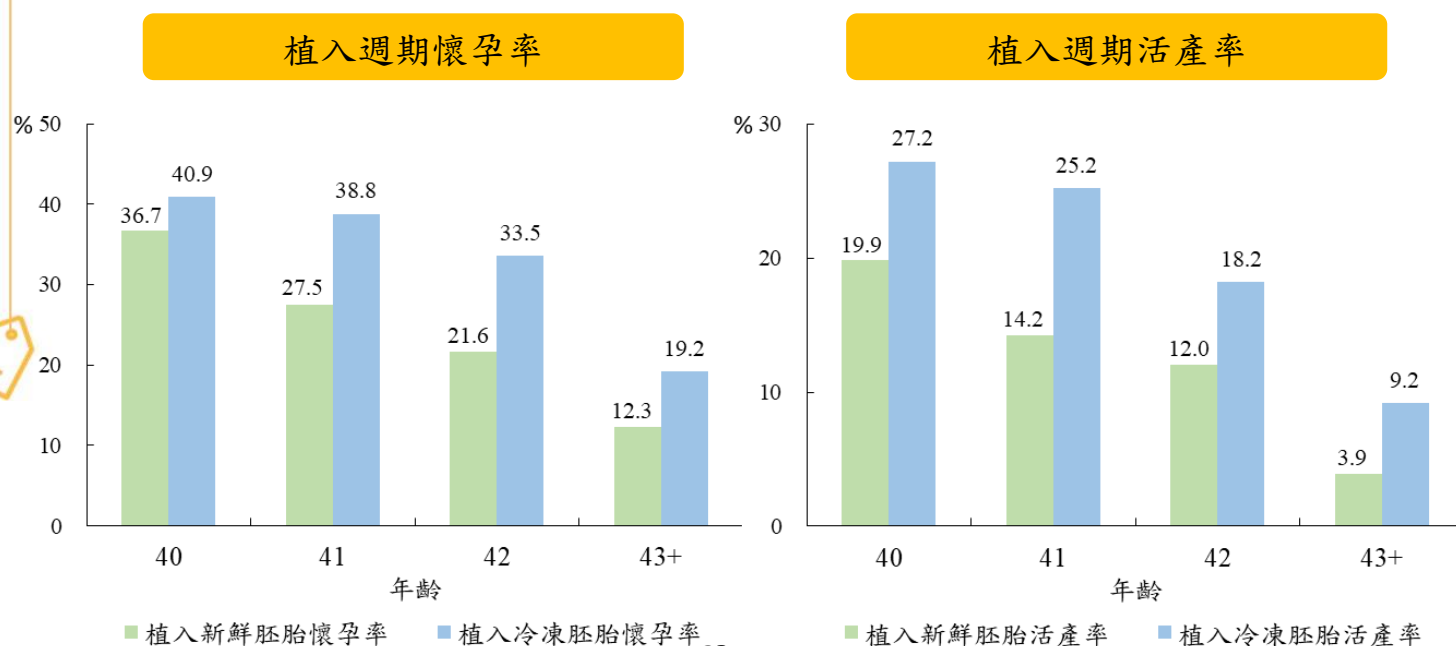


圖 17 108 年配偶間人工生殖植入新鮮胚胎及冷凍胚胎之受術妻年齡別成功率



以受術妻年齡大於(含)40 歲者(共 5,515 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 36.7%及 40.9%，但其活產率卻降至 19.9%及 27.2%。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 12.3%及 19.2%，而其活產率僅剩 3.9%及 9.2%(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 18 108 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



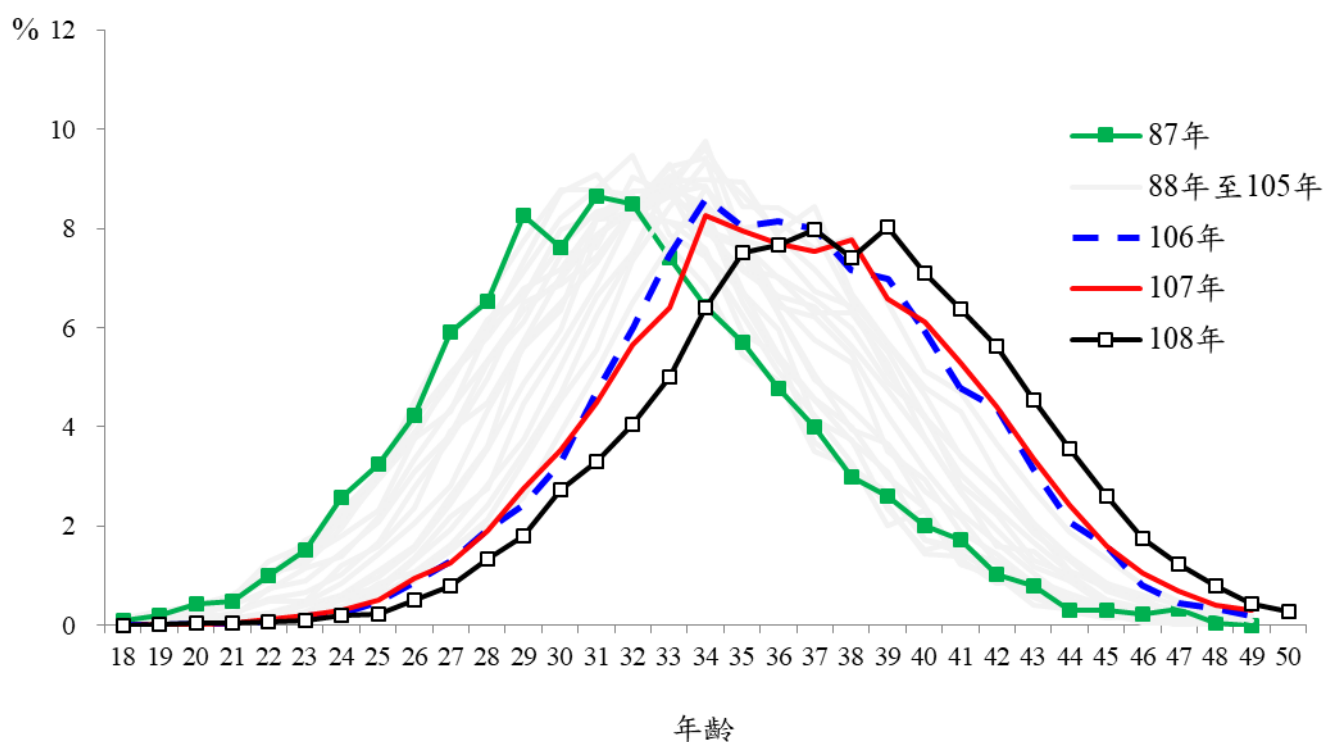
第四章 人工生殖趨勢 (87 年-108 年)

第一節、人工生殖治療週期趨勢

一、治療者之年齡

87 年至 108 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；106 年為 37 歲及 37.2 歲；107 年為 37 歲及 37.3 歲；108 年為 38 歲及 37.5 歲(圖 19)。

圖 19 87 年至 108 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 108 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，108 年為 44,256 週期，相對於 107 年的 39,840 週期增加了 11.1%(表 10-1)。

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，108 年有 10,678 位，較 107 年 10,236 位增加了 442 個新生兒誕生(表 10 及圖 20)。

表 10 87 年至 108 年人工生殖治療週期數、活產週期數與活產嬰兒數

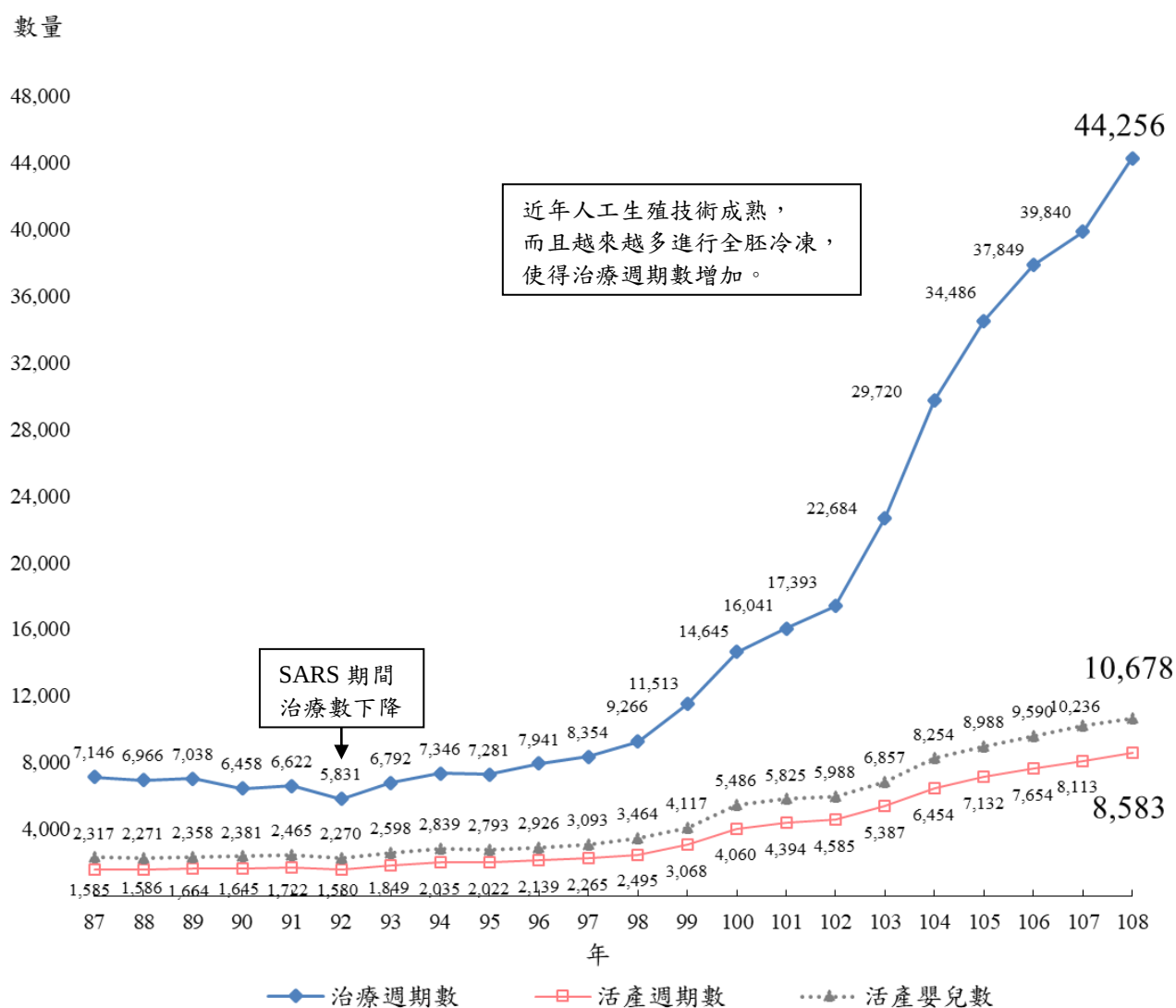
年	治療週期數 (單位：週期)	活產週期數 (單位：週期)	活產嬰兒數 (單位：個)	國內活產嬰兒數 (單位：個)
87	7,146	1,585	2,317	-
88	6,966	1,586	2,271	-
89	7,038	1,664	2,358	-
90	6,458	1,645	2,381	-
91	6,622	1,722	2,465	-
92	5,831	1,580	2,270	-
93	6,792	1,849	2,598	-
94	7,346	2,035	2,839	-
95	7,281	2,022	2,793	-
96	7,941	2,139	2,926	-
97	8,354	2,265	3,093	3,062
98	9,266	2,495	3,464	3,385
99	11,513	3,068	4,117	4,039
100	14,645	4,060	5,486	5,392
101	16,041	4,394	5,825	5,689
102	17,393	4,585	5,988	5,799
103	22,684	5,387	6,857	6,611
104	29,720	6,454	8,254	7,818
105	34,486	7,132	8,988	8,214
106	37,849	7,654	9,590	8,474
107	39,840	8,113	10,236	8,585
108	44,256	8,583	10,678	8,585
合計	355,468	82,017	107,794	-

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 10-1 87 年至 108 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
108	44,256	11.1
合計	355,468	-

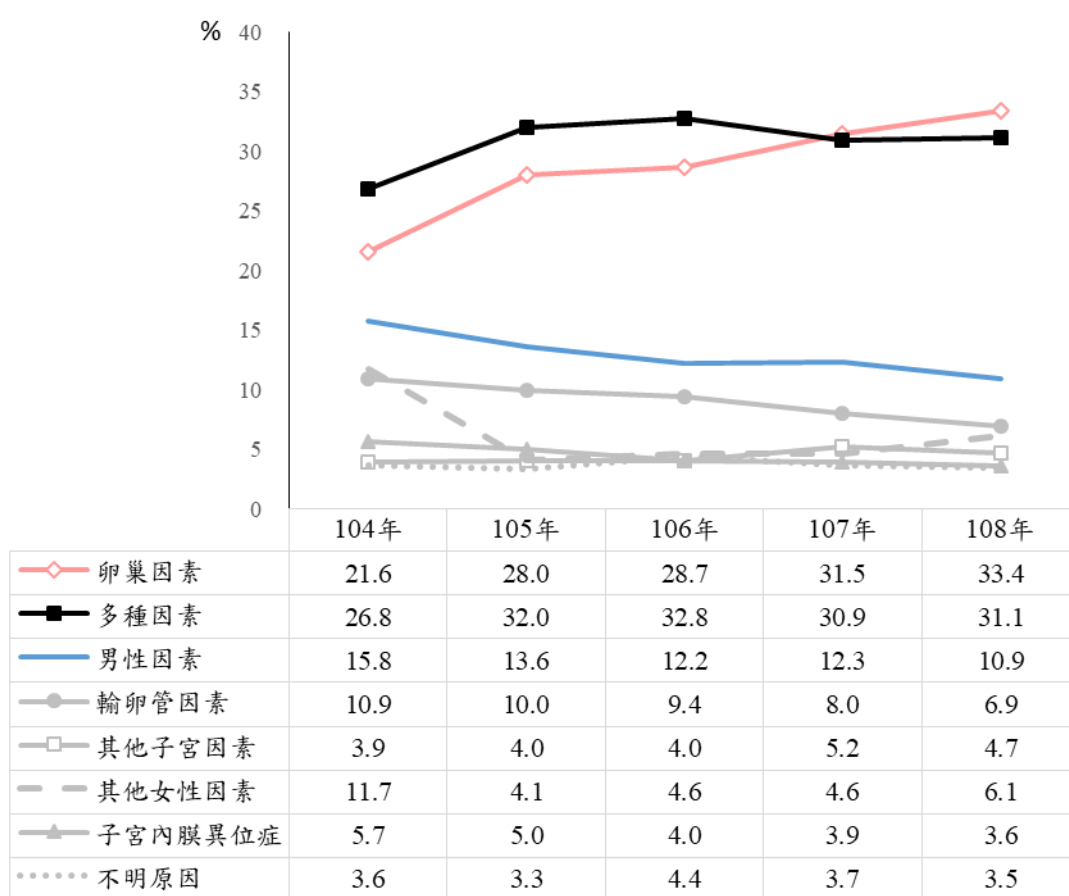
圖 20 87 年至 108 年人工生殖治療週期數、活產週期數與活產嬰兒數



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 5 年不孕原因前三位為卵巢因素、多種因素及男性因素，108 年以卵巢因素為最高(圖 19)。

圖 19 近 5 年（104 年至 108 年）人工生殖之不孕原因百分比



四、懷孕率與活產率

圖 22 顯示 87 年至 108 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，108 年分別為 25.8% 及 19.4%。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%，108 年提升至 45.8%；治療週期累積活產率則由 87 年的 27.0%，提升至 108 年的 34.5% (圖 23)。

圖 22 87 年至 108 年人工生殖之治療週期懷孕率及活產率

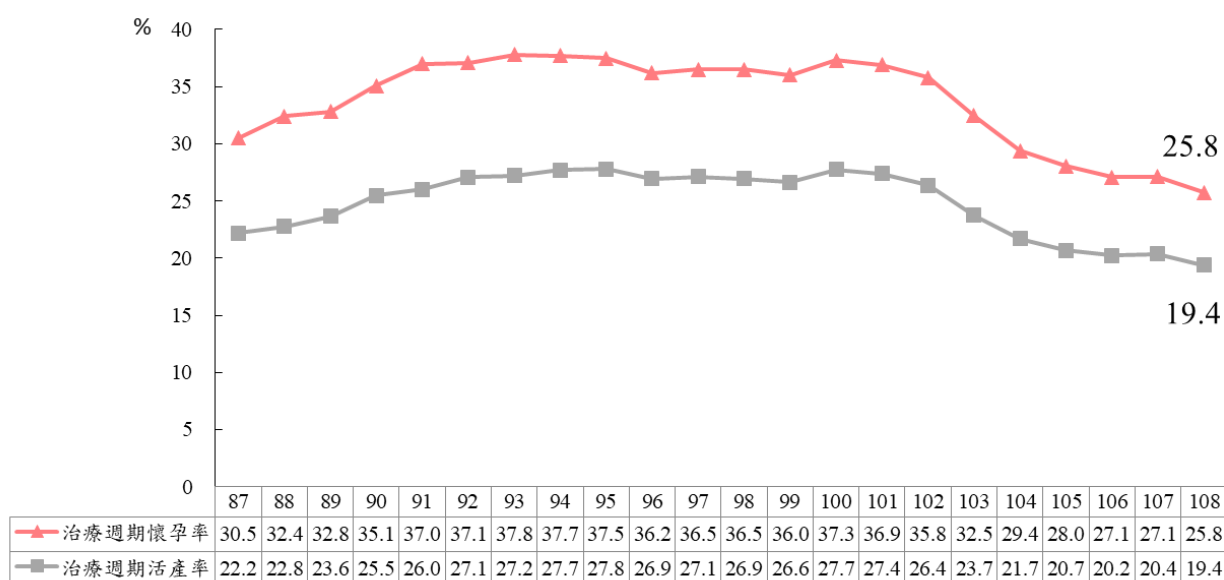
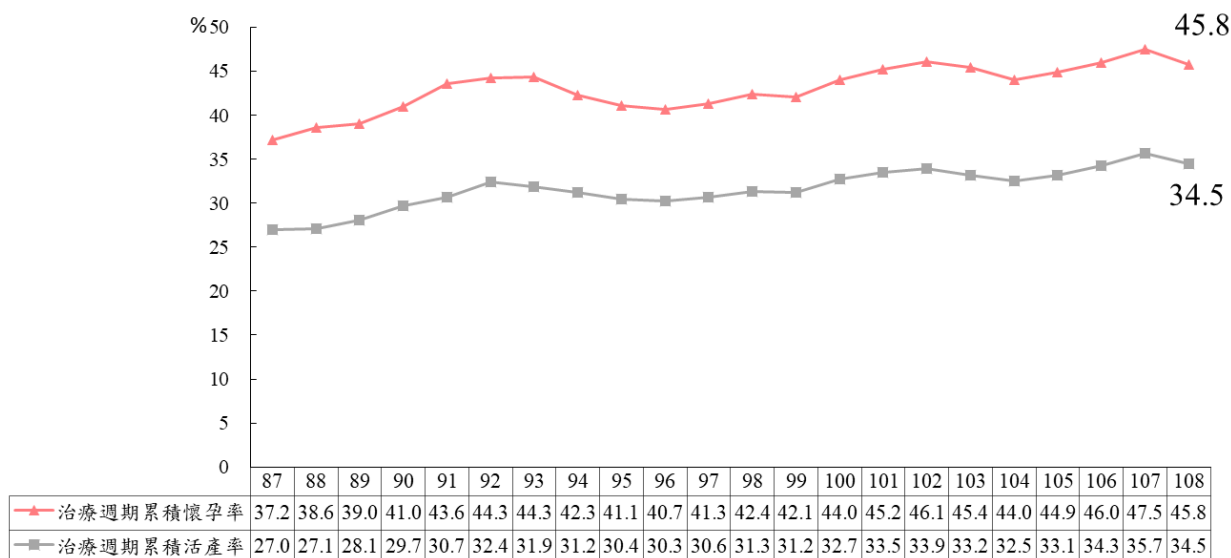


圖 23 87 年至 108 年人工生殖之治療週期累積懷孕率及累積活產率



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，108 年為 39.2% 及 27.8%。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，108 年為 50.5% 及 38.5%。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 24 及圖 25)。

圖 24 87 年至 108 年植入新鮮胚胎與冷凍胚胎之植入週期懷孕率

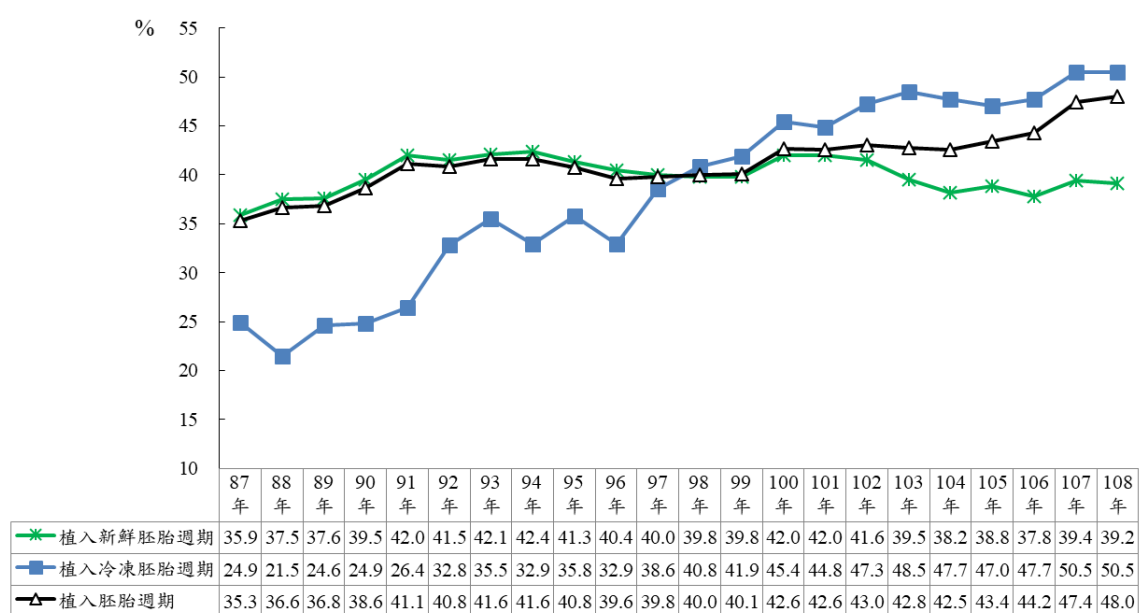
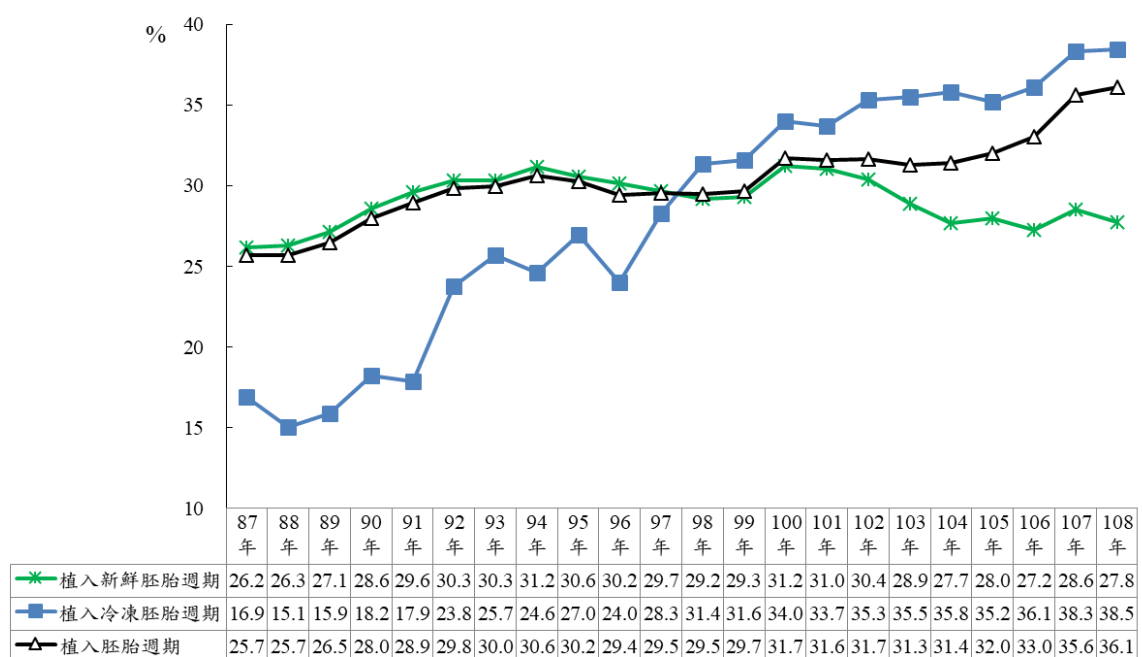
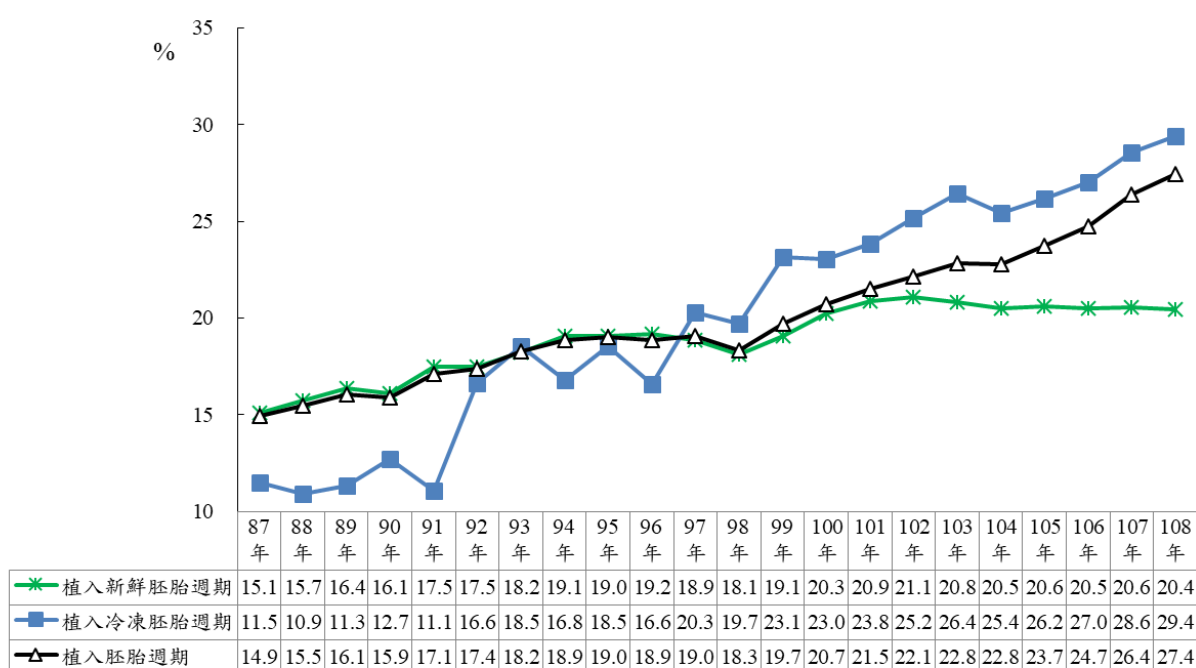


圖 25 87 年至 108 年植入新鮮胚胎與冷凍胚胎之植入週期活產率



植入新鮮胚胎的單胎率自 87 年以來呈現上升趨勢，87 年為 15.1%，108 年達 20.4%；而植入冷凍胚胎的單胎率，在 93 年明顯增加為 18.5%，108 年為 29.4%。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 26）。

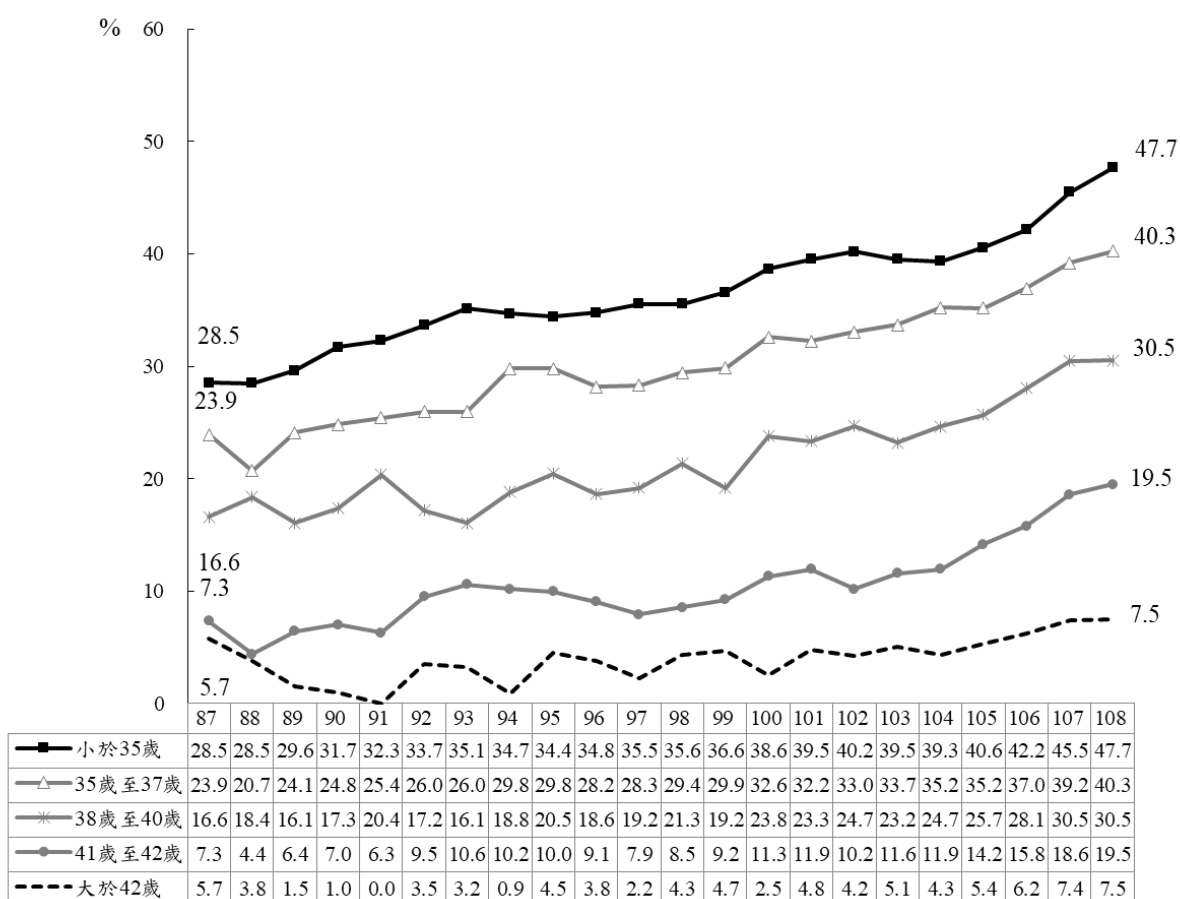
圖 26 87 年至 108 年植入新鮮胚胎與冷凍胚胎之植入週期單胎率



第三節、各年齡層之植入週期成功率趨勢

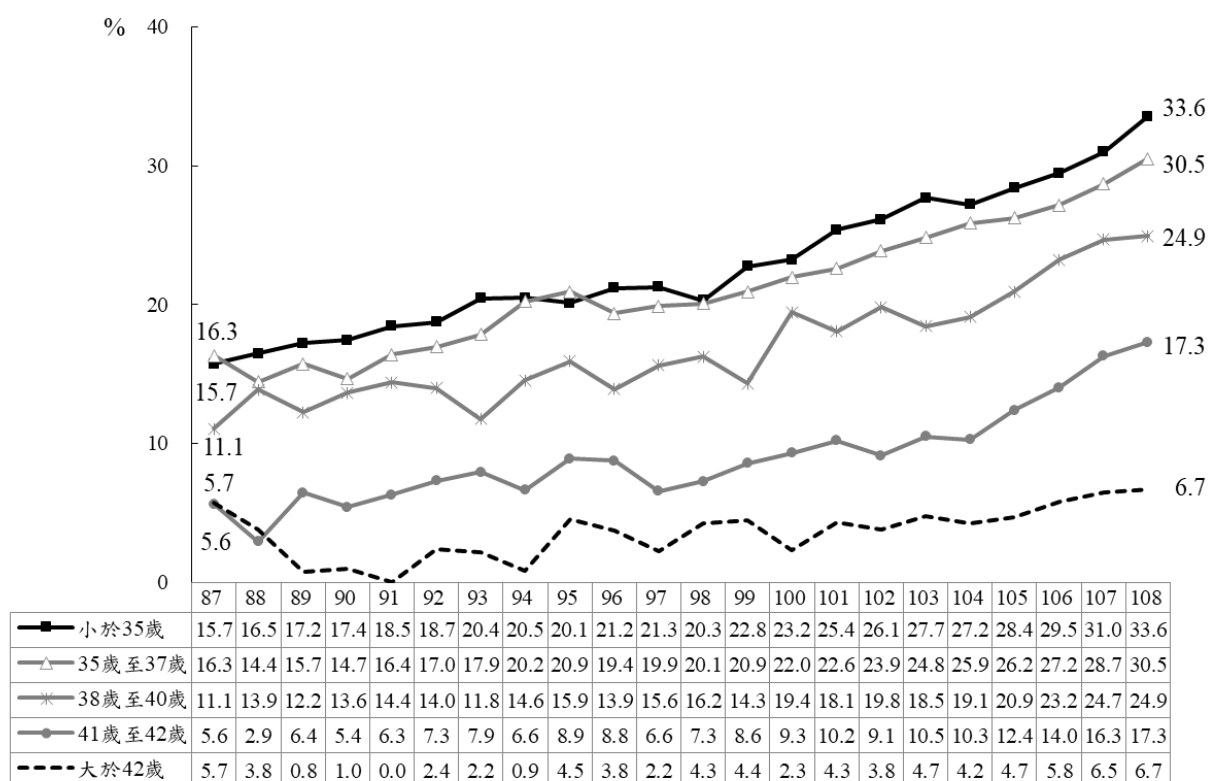
植入週期活產率使用捐贈卵子會受捐贈者年齡影響，所以僅分析配偶間人工生殖之植入週期活產率。受術妻在未滿 35 歲者之植入週期活產率由 87 年的 28.5% 提高到 108 年的 47.7%，同樣的時期，35 到 37 歲年齡層提高 16.4 個百分點，於 38 到 40 歲提高 13.9 個百分點，於 41 到 42 歲提高 12.2 個百分點，而年齡大於 42 歲之受術妻則提高 1.8 個百分點(圖 27)。

圖 27 87 年至 108 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 108 年的 33.6%。同樣的時期，植入週期單胎率在 35 到 37 歲年齡層提高 14.2 個百分點，於 38 到 40 歲提高 13.8 個百分點，於 41-42 歲提高 11.7 個百分點，而在年齡大於 42 歲之受術妻則提高 1 個百分點(圖 28)。

圖 28 87 年至 108 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）

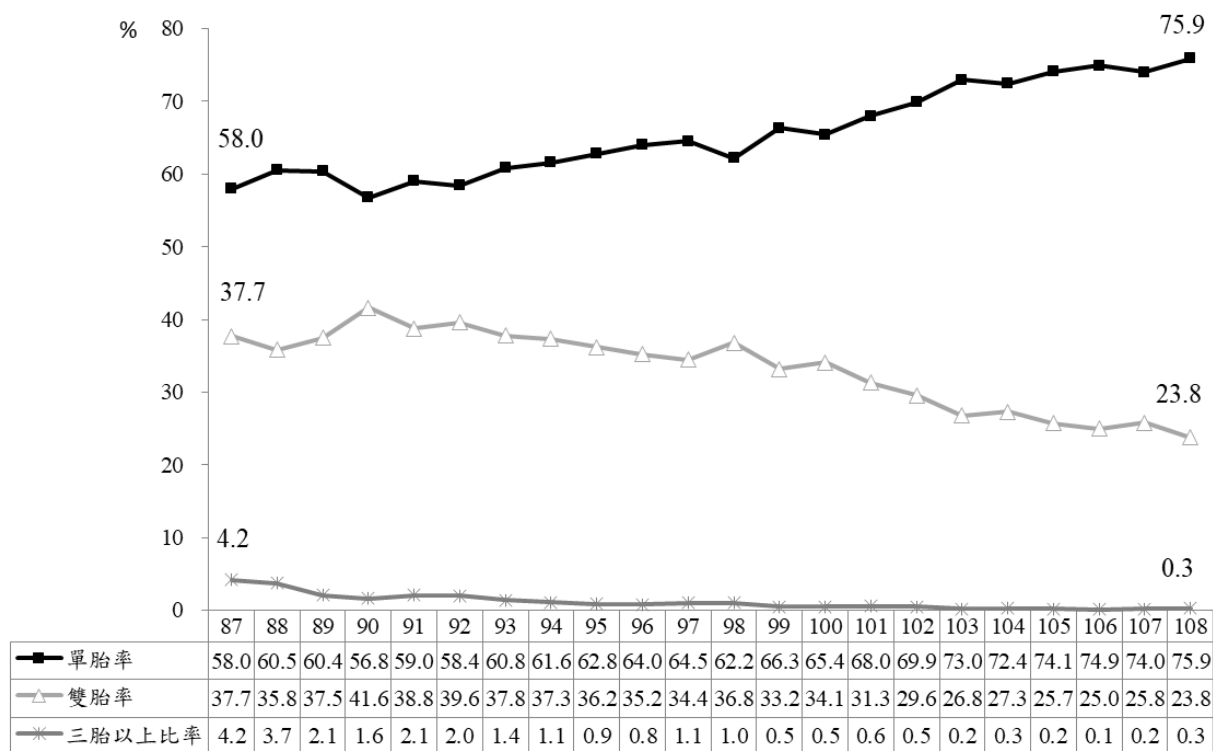


第四節、活產週期出生胎數、體重與週數

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 108 年的 75.9%；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 108 年的 23.8% 及 0.3% (圖 29)。

圖 29 87 年至 108 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 年占有所有活產嬰兒 7.5%，108 年下降至 3.6%；1,500 公克至 2,499 公克則從 87 年 35.9%下降至 108 年 28.8%；而大於等於 2,500 公克者，則從 87 年 56.9%上升至 108 年 67.6%(圖 30)。另，87 年出生週數小於 37 週者占 42.9%，108 年下降至 35.4%；37 週至 41 週從 87 年占 57%上升至 108 年 64.5%，大於等於 42 週者則從 87 年 0.2%下降至 108 年 0.1%(圖 31)。

圖 30 87 年至 108 年活產嬰兒之出生體重百分比

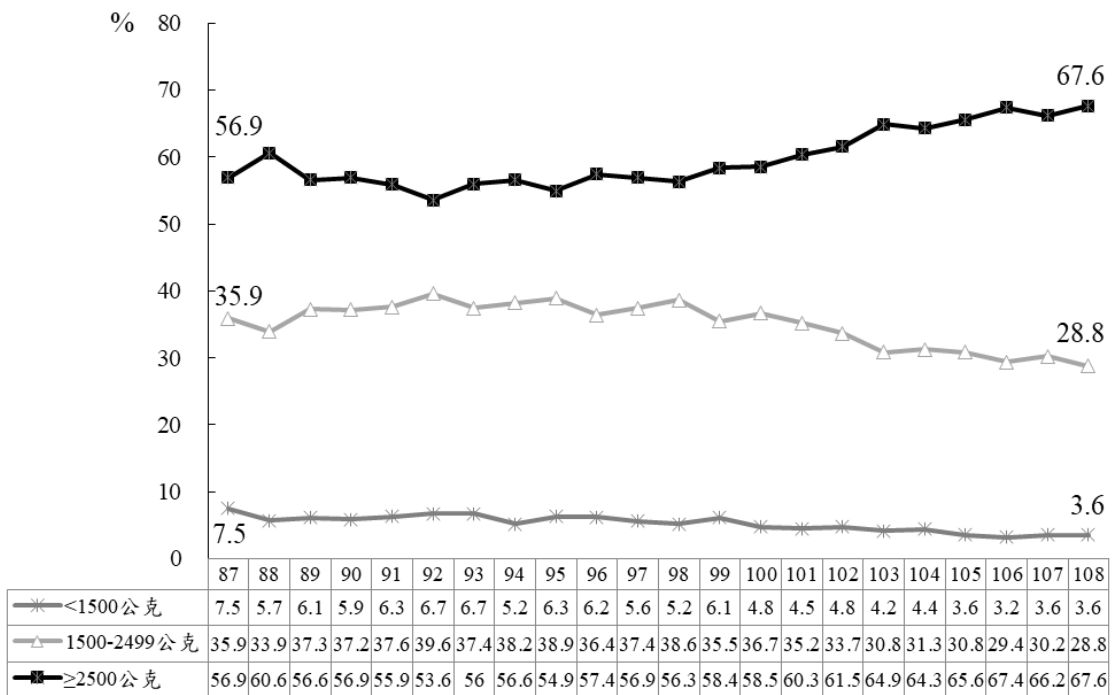
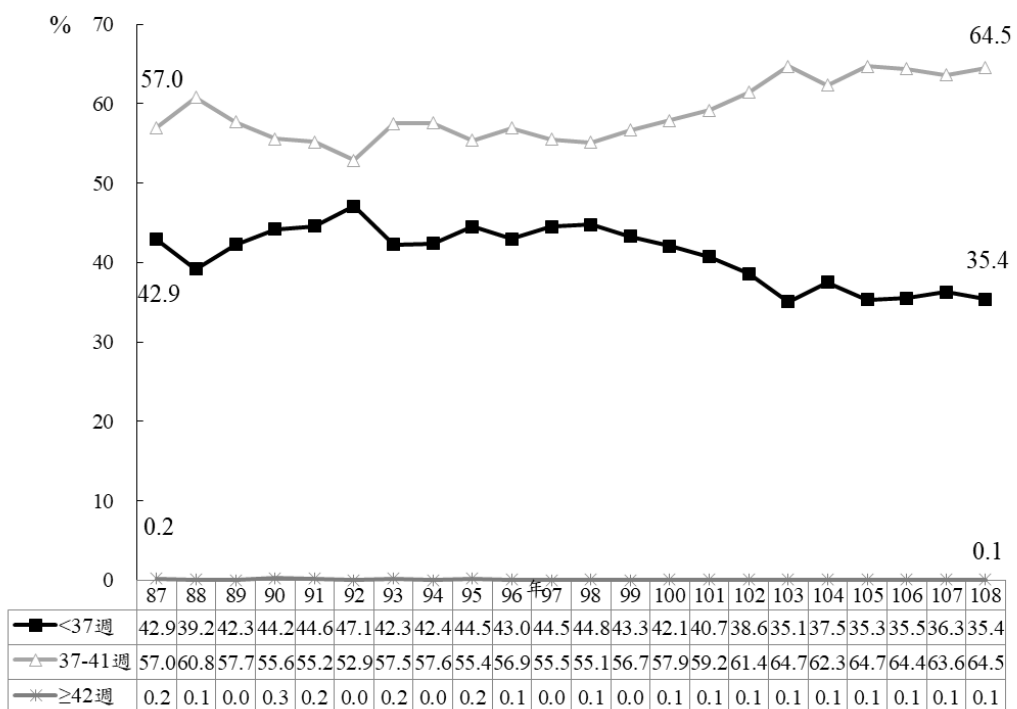


圖 31 87 年至 108 年活產嬰兒之出生週數百分比



附錄 1 108 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	38%	輸卵管因素	7%
ZIFT/TET	<1%			卵巢因素	33%
AID	<1%			子宮內膜異位症	4%
				其他子宮因素	5%
				其他女性因素	6%
				男性因素	11%
				多種因素	31%
				不明原因	3%

懷孕成功率

週期類型	女性年齡				
	<35	35-37	38-40	>40	合計
人工生殖之新鮮胚胎					
治療週期數	6,077	5,347	5,823	7,666	24,913
懷孕週期百分比	10.9	11.1	8.6	3.8	8.2
活產週期百分比	8.9	8.2	5.4	2.1	5.8
植入週期數	1,333	1,262	1,284	1,354	5,233
植入週期之懷孕率	49.7	47.1	38.8	21.7	39.2
植入週期之活產率	40.7	34.7	24.5	11.7	27.8
植入週期之單胎活產率	28.6	25.1	18.9	9.5	20.4
取消百分比	79.4	77.6	79.2	84.0	80.4
平均植入胚胎數	2.0	2.4	2.6	2.7	2.4
活產週期之多胞胎百分比	29.7	27.6	22.9	18.4	26.4
人工生殖之冷凍胚胎					
治療週期數	5,730	4,914	4,154	4,545	19,343
懷孕週期百分比	58.2	52.5	44.4	35.1	48.4
活產週期百分比	47.9	40.7	32.0	23.3	36.9
植入週期數	5,532	4,751	3,953	4,292	18,528
植入週期之懷孕率	60.2	54.3	46.6	37.2	50.5
植入週期之活產率	49.6	42.1	33.6	24.6	38.5
植入週期之單胎活產率	35.2	32.4	27.4	20.5	29.4
取消百分比	3.5	3.3	4.8	5.6	4.2
平均植入胚胎數	1.9	2.0	2.2	2.2	2.0
活產週期之多胞胎百分比	29.1	23.1	18.6	16.7	23.6

非捐贈卵子之新鮮胚胎	<35	35-37	38-40	>40	合計
治療週期數	5,827	5,237	5,685	6,871	23,620
懷孕週期百分比	11.2	11.2	8.5	3.4	8.3
活產週期百分比	9.2	8.2	5.3	1.6	5.8
植入週期數	1,315	1,249	1,261	1,264	5,089
植入週期之懷孕率	49.6	46.8	38.3	18.5	38.4
植入週期之活產率	40.6	34.6	23.9	8.5	27.0
植入週期之單胎活產率	28.5	25.0	18.9	7.7	20.1
取消百分比	78.6	77.3	78.9	83.0	79.6
平均植入胚胎數	2.0	2.4	2.6	2.7	2.4
活產週期之多胞胎百分比	29.8	27.8	21.2	10.2	25.7

非捐贈卵子之冷凍胚胎	<35	35-37	38-40	>40	合計
治療週期數	5,338	4,705	3,874	2,965	16,882
懷孕週期百分比	58.3	52.3	43.6	26.9	47.7
活產週期百分比	47.9	40.4	31.1	15.3	36.2
植入週期數	5,161	4,554	3,686	2,779	16,180
植入週期之懷孕率	60.3	54.0	45.8	28.7	49.8
植入週期之活產率	49.5	41.8	32.7	16.3	37.8
植入週期之單胎活產率	35.0	32.0	27.0	14.4	28.8
取消百分比	3.3	3.2	4.9	6.3	4.2
平均植入胚胎數	1.9	2.0	2.2	2.4	2.1
活產週期之多胞胎百分比	29.4	23.4	17.5	11.5	23.9

非捐贈精子之新鮮胚胎	<35	35-37	38-40	>40	合計
治療週期數	5,988	5,312	5,779	7,623	24,702
懷孕週期百分比	10.9	11.1	8.6	3.9	8.2
活產週期百分比	8.9	8.2	5.4	2.1	5.8
植入週期數	1,309	1,256	1,278	1,346	5,189
植入週期之懷孕率	49.9	47.0	38.7	21.8	39.2
植入週期之活產率	40.8	34.6	24.5	11.7	27.7
植入週期之單胎活產率	28.6	25.0	18.9	9.6	20.4
取消百分比	79.4	77.5	79.1	84.0	80.4
平均植入胚胎數	2.0	2.4	2.6	2.7	2.4
活產週期之多胞胎百分比	29.8	27.6	22.7	18.4	26.3

非捐贈精子之冷凍胚胎	<35	35-37	38-40	>40	合計
治療週期數	5,626	4,862	4,119	4,521	19,128
懷孕週期百分比	58.1	52.6	44.4	35.0	48.3
活產週期百分比	47.8	40.8	32.1	23.2	36.8
植入週期數	5,432	4,699	3,922	4,270	18,323
植入週期之懷孕率	60.2	54.4	46.7	37.1	50.4
植入週期之活產率	49.5	42.2	33.7	24.6	38.4
植入週期之單胎活產率	35.0	32.5	27.4	20.5	29.4
取消百分比	3.4	3.4	4.8	5.6	4.2
平均植入胚胎數	1.9	2.0	2.2	2.2	2.0
活產週期之多胞胎百分比	29.3	23.1	18.6	16.6	23.7

配偶間之新鮮胚胎	<35	35-37	38-40	>40	合計
治療週期數	5,738	5,202	5,641	6,828	23,409
懷孕週期百分比	11.2	11.2	8.5	3.4	8.3
活產週期百分比	9.2	8.2	5.3	1.6	5.8
植入週期數	1,291	1,243	1,255	1,256	5,045
植入週期之懷孕率	49.7	46.7	38.2	18.6	38.4
植入週期之活產率	40.7	34.4	23.9	8.6	27.0
植入週期之單胎活產率	28.6	24.9	18.9	7.7	20.1
取消百分比	78.6	77.2	78.8	82.9	0.8
平均植入胚胎數	2.0	2.4	2.6	2.7	2.4
活產週期之多胞胎百分比	29.8	27.8	21.0	10.2	25.7
配偶間之冷凍胚胎	<35	35-37	38-40	>40	合計
治療週期數	5,234	4,653	3,839	2,941	16,667
懷孕週期百分比	58.2	52.3	43.6	26.7	47.7
活產週期百分比	47.8	40.5	31.2	15.2	36.2
植入週期數	5,061	4,502	3,655	2,757	15,975
植入週期之懷孕率	60.2	54.1	45.8	28.5	49.7
植入週期之活產率	49.5	41.9	32.8	16.2	37.8
植入週期之單胎活產率	34.8	32.1	27.0	14.4	28.7
取消百分比	3.3	3.2	4.8	6.3	4.2
平均植入胚胎數	1.9	2.0	2.2	2.4	2.1
活產週期之多胞胎百分比	29.6	23.4	17.5	11.2	23.9

	所有年齡合計	
捐贈卵子	新鮮胚胎	冷凍胚胎
植入週期數	144	2,348
植入週期之活產率	53.5	43.1
平均植入胚胎數	1.9	1.6
捐贈精子	新鮮胚胎	冷凍胚胎
植入週期數	44	205
植入週期之活產率	31.8	42.0
平均植入胚胎數	2.3	1.9
配偶間	新鮮胚胎	冷凍胚胎
植入週期數	5,045	15,975
植入週期之活產率	27.0	37.8
平均植入胚胎數	2.4	2.1

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	1756	4268	649	191
植入週期懷孕率	55	61	53	46
胎心音單胞胎率	91	60	57	63
活產單胞胎率	99	62	63	62

35-37 歲

	植入胚胎數			
	1	2	3	4
植入週期數	1476	2955	1140	442
植入週期懷孕率	51	56	49	49
胎心音單胞胎率	91	65	61	51
活產單胞胎率	98	71	68	56

38-40 歲

	植入胚胎數			
	1	2	3	4
植入週期數	1159	2162	1174	742
植入週期懷孕率	43	46	46	42
胎心音單胞胎率	91	68	63	60
活產單胞胎率	99	77	74	71

40 歲以上

	植入胚胎數			
	1	2	3	4
植入週期數	1535	1974	1122	1015
植入週期懷孕率	39	36	28	25
胎心音單胞胎率	85	59	67	56
活產單胞胎率	99	69	83	82

通報資料之人工生殖機構數：87

附錄 2 108 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	387	67.4	32.6	0.0	14.7	49.9	13.7	15.5	6.2
臺北市	國立臺灣大學醫學院附設醫院	1,357	54.8	36.5	8.7	7.8	26.0	13.6	45.6	7.0
	長庚醫療財團法人 台北長庚紀念醫院	265	20.0	80.0	0.0	0.0	10.6	0.0	89.4	0.0
	臺北榮民總醫院	699	84.5	15.5	0.0	6.6	42.9	32.9	12.3	5.3
	國防醫學院三軍總醫院	235	61.7	38.3	0.0	9.8	38.3	7.7	43.3	0.9
	台灣基督長老教會 馬偕醫療財團法人 馬偕紀念醫院	887	56.6	43.4	0.0	6.4	24.4	27.5	29.2	12.5
	國泰醫療財團法人 國泰綜合醫院	287	76.7	23.3	0.0	21.3	57.4	9.8	11.5	0.0
	中山醫療社團法人 中山醫院	897	43.6	13.2	43.3	8.2	54.0	8.2	23.2	6.4
	新光醫療財團法人 新光吳火獅紀念醫院	165	61.2	38.8	0.0	10.9	48.5	18.2	13.9	8.5
	基督復臨安息日會 醫療財團法人臺安醫院	400	84.0	16.0	0.0	0.2	58.8	8.0	32.0	1.0
	臺北醫學大學附設醫院	2227	55.8	44.2	0.0	10.7	65.8	14.8	5.2	3.5
	生泉婦產科診所	151	71.5	28.5	0.0	15.9	41.7	23.2	7.3	11.9
	宏孕診所	404	31.7	68.3	0.0	0.7	43.4	15.1	35.6	5.2
	祈新婦產科診所	504	69.0	31.0	0.0	1.0	62.8	5.0	29.8	1.4
	愛群婦產科診所	2711	38.3	27.5	34.2	7.1	48.3	13.1	28.5	3.0
	黃建榮婦產科診所	822	30.0	70.0	0.0	8.6	33.8	19.2	27.5	10.9
	王家瑋婦產科診所	1751	65.8	34.2	0.0	7.4	21.1	11.7	59.8	0.0
	生基婦產科診所	413	44.1	13.6	42.4	3.4	70.0	7.0	19.6	0.0
	臺北市立聯合醫院 仁愛院區	193	28.0	40.9	31.1	5.7	47.6	4.7	30.6	11.4
	華育婦產科診所	696	58.3	41.7	0.0	15.5	54.3	9.5	3.2	17.5
	送子鳥 11 診所	720	63.2	36.8	0.0	0.0	96.7	3.3	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
臺北市	佑昇診所	899	82.8	17.2	0.0	12.1	63.6	11.1	6.3	6.9
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	267	43.4	56.6	0.0	9.7	30.3	18.0	34.9	7.1
	蔡佳璋婦幼聯合診所	176	65.9	34.1	0.0	4.5	69.4	10.2	15.3	0.6
	衛生福利部雙和醫院	21	61.9	38.1	0.0	14.3	38.1	0.0	14.3	33.3
	佛教慈濟醫療財團法人台北慈濟醫院	95	64.2	35.8	0.0	12.6	31.6	15.8	18.9	21.1
	星孕國際診所	127	46.5	53.5	0.0	0.8	37.8	4.7	56.7	0.0
	基生婦產科診所	243	45.3	54.7	0.0	4.1	63.7	12.8	12.8	6.6
桃園市	長庚醫療財團法人林口長庚紀念醫院	1476	51.2	48.8	0.0	4.5	45.7	3.5	46.0	0.3
	衛生福利部桃園醫院	159	20.1	30.8	49.1	10.1	54.0	3.8	30.8	1.3
	敏盛綜合醫院	146	61.0	39.0	0.0	18.5	39.7	11.0	8.2	22.6
	宏其婦幼醫院	605	46.8	53.2	0.0	14.9	45.2	14.4	25.5	0.0
	惠生婦產科診所	121	81.8	18.2	0.0	14.9	33.1	14.0	25.6	12.4
新竹市	江婦產科診所	46	50.0	50.0	0.0	2.2	78.2	19.6	0.0	0.0
	送子鳥診所	2712	65.7	34.3	0.0	0.5	95.8	3.5	0.1	0.1
	台灣基督長老教會馬偕醫療財團法人新竹馬偕紀念醫院	319	39.8	60.2	0.0	5.3	14.7	35.1	44.0	0.9
	林正凱好孕診所	322	67.1	32.9	0.0	2.8	26.7	6.2	64.0	0.3
新竹縣	艾微笑診所	1282	64.4	35.6	0.0	0.9	34.9	8.0	52.5	3.7
	中國醫藥大學新竹附設醫院	40	57.5	42.5	0.0	20.0	42.5	25.0	10.0	2.5
苗栗縣	大千綜合醫院	42	71.4	28.6	0.0	35.7	42.9	0.0	21.4	0.0
臺中市	中國醫藥大學附設醫院	441	24.3	75.7	0.0	11.1	34.9	15.2	29.3	9.5
	中山醫學大學附設醫院	174	51.1	48.9	0.0	0.0	1.1	0.6	98.3	0.0
	茂盛醫院	4883	56.7	43.3	0.0	3.3	12.6	2.4	81.6	0.1
	臺中榮民總醫院	923	81.4	18.6	0.0	12.5	53.6	13.9	18.0	2.0
	澄清綜合醫院中港分院	50	78.0	22.0	0.0	34.0	64.0	2.0	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
臺中市	林新醫療社團法人 林新醫院	112	51.8	48.2	0.0	33.9	38.4	13.4	14.3	0.0
	劉忠俊婦產科診所	266	50.4	49.6	0.0	5.3	42.0	19.2	22.6	10.9
	美村婦產科診所	63	11.1	88.9	0.0	7.9	58.8	12.7	19.0	1.6
臺中市	謝耀元婦產科診所	35	5.7	94.3	0.0	14.3	62.8	22.9	0.0	0.0
	大新婦產科診所	365	21.9	30.7	47.4	4.7	44.1	3.0	48.2	0.0
	佛教慈濟醫療財團 法人台中慈濟醫院	32	81.2	9.4	9.4	34.4	34.4	12.5	15.6	3.1
	張帆婦產科診所	429	65.0	34.7	0.2	5.6	21.7	7.0	45.7	20.0
	童綜合醫療社團法 人童綜合醫院	26	46.2	53.8	0.0	34.6	30.8	19.2	15.4	0.0
彰化縣	彰化基督教醫療財 團法人彰化基督教 醫院	953	57.4	42.6	0.0	9.5	58.8	10.3	18.7	2.7
	彰化基督教醫療財 團法人漢銘基督教 醫院	19	73.7	26.3	0.0	21.1	42.0	10.5	21.1	5.3
	博元婦產科診所	459	56.2	43.8	0.0	13.3	69.2	12.9	4.6	0.0
	秀傳醫療財團法人 彰濱秀傳紀念醫院	36	75.0	25.0	0.0	16.7	63.9	11.1	8.3	0.0
雲林縣	國立臺灣大學醫學 院附設醫院雲林分 院	69	43.5	56.5	0.0	18.8	52.3	17.4	7.2	4.3
嘉義市	戴德森醫療財團法 人嘉義基督教醫院	14	71.4	28.6	0.0	0.0	28.6	42.8	0.0	28.6
	嘉安婦幼診所	122	10.7	89.3	0.0	13.9	54.1	26.2	2.5	3.3
嘉義縣	長庚醫療財團法人 嘉義長庚紀念醫院	77	100.0	0.0	0.0	24.7	22.1	7.8	7.8	37.6
臺南市	國立成功大學醫學 院附設醫院	477	85.3	14.7	0.0	5.9	36.3	14.3	41.6	1.9
	郭綜合醫院	113	72.6	27.4	0.0	7.1	54.8	18.6	13.3	6.2
	許朝欽婦產科診所	162	72.2	27.8	0.0	6.8	53.7	16.0	21.6	1.9
	台灣基督長老教會 新樓醫療財團法人 台南新樓醫院	84	4.8	95.2	0.0	8.3	55.9	4.8	29.8	1.2
	安安婦幼診所	1047	86.1	13.6	0.4	6.2	64.2	17.8	11.8	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
臺南市	奇美醫療財團法人 奇美醫院	577	56.0	44.0	0.0	1.0	11.8	28.1	59.1	0.0
	璟馨婦幼醫院	451	41.5	57.6	0.9	16.2	34.1	31.9	12.9	4.9
高雄市	財團法人私立高雄 醫學大學附設中和 紀念醫院	253	68.4	31.6	0.0	9.5	65.3	7.5	13.0	4.7
	健新醫院	992	7.4	92.6	0.0	7.4	64.0	15.3	12.5	0.8
	阮綜合醫療社團法 人阮綜合醫院	101	85.1	14.9	0.0	9.9	62.4	16.8	6.9	4.0
	高雄榮民總醫院	841	57.4	42.6	0.0	7.0	48.7	6.9	26.3	11.1
	張榮州婦產科診所	35	60.0	40.0	0.0	2.9	80.0	5.7	11.4	0.0
	好韻診所	165	84.2	15.8	0.0	6.1	64.2	10.3	19.4	0.0
	生生不息婦產科診 所	559	26.1	73.9	0.0	16.5	57.6	14.1	9.8	2.0
	義大醫療財團法人 義大大昌醫院	153	47.7	52.3	0.0	3.9	84.3	11.8	0.0	0.0
	長庚醫療財團法人 高雄長庚紀念醫院	734	89.8	10.2	0.0	12.4	46.4	9.8	21.5	9.9
	同喬眼科診所	258	80.2	19.8	0.0	10.5	48.7	7.0	26.0	7.8
	義大醫療財團法人 義大醫院	165	24.2	75.8	0.0	3.6	13.9	14.5	68.0	0.0
屏東縣	屏基醫療財團法人 屏東基督教醫院	17	100.0	0.0	0.0	17.6	11.8	5.9	64.7	0.0
宜蘭縣	醫療財團法人羅許 基金會羅東博愛醫 院	29	20.7	79.3	0.0	10.3	31.0	3.4	51.9	3.4
花蓮縣	佛教慈濟醫療財團 法人花蓮慈濟醫院	71	36.6	11.3	52.1	32.4	32.4	19.7	7.0	8.5
金門縣	衛生福利部金門醫 院	747	91.4	8.2	0.4	1.9	96.3	1.2	0.5	0.1

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, 2021, the number of licensed medical institutions had reached 93 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 87 assisted reproductive institutions in Taiwan (2019). 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 1998-2019.

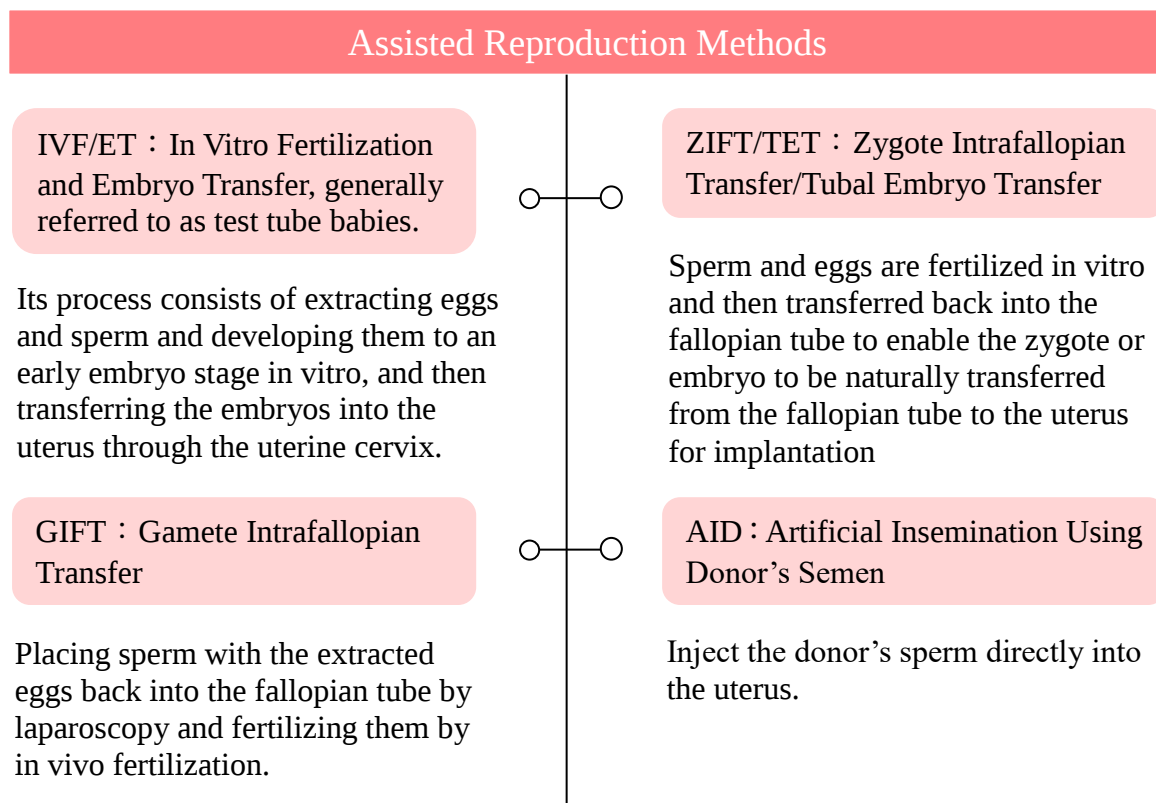
Section 1 Assisted Reproduction Treatment Cycles

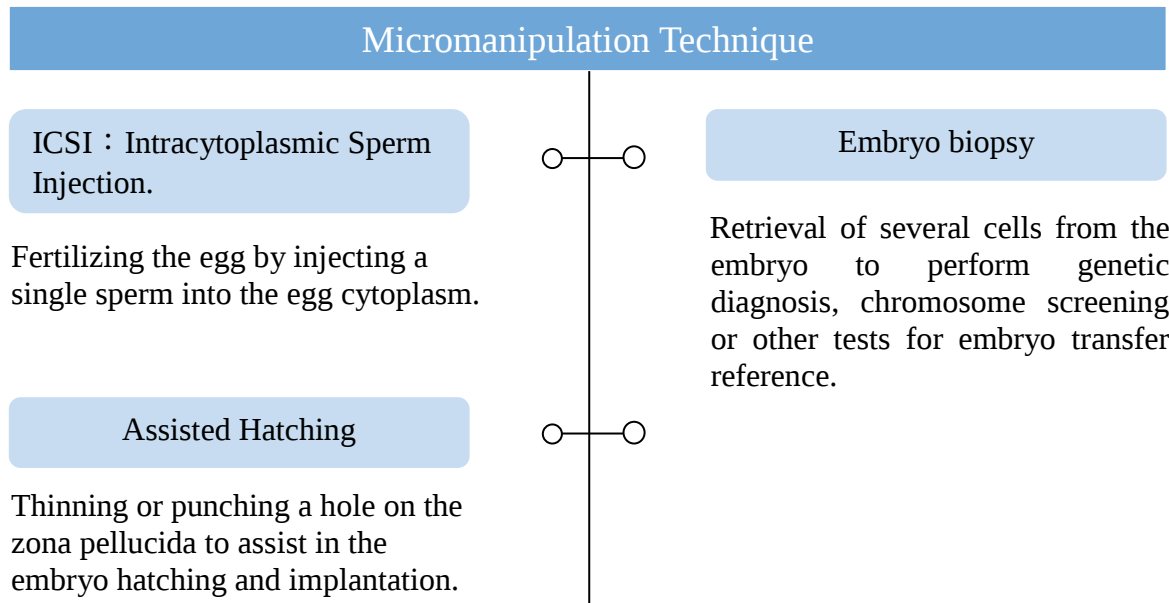
As the process of assisted reproduction comprises a series of steps which need a period of around two weeks or more to complete, using “cycle” as the unit will be more appropriate than a single time point in analyzing the data. In the course of statistical analysis conducted under such calculation, a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





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 87 assisted reproduction institutions of Taiwan in the year 2019.

Section 1 The Number of Treatment Cycles

A total of 44,256 cycles (including the cycles in which egg retrieval or embryo transfer not performed) were conducted in 2019 (Table 1); 40,076 cycles used nondonor gametes and embryos (90.6%), and 4,180 cycles used donated sperm and eggs (9.4%). among which, the age distribution of the recipient women using donated eggs is shown in Table 2.

Table 1 ART Cycles in 2019

Unit: Cycle	
Type of Cycle	Number of ART Cycles
Use of Donated Sperm and Eggs	4,180
Use of Donor Sperm	426
Use of Donor Eggs	3,754
Use of Nondonor Sperm, Eggs or Embryos	40,076
Total ART Cycles	44,256

Table 2 Age-Specific Recipient Women Using Donated Eggs in ART in 2019

Unit: Cycle/%		
Age of Recipient Women	The Number of Treatment Cycles	Percentage
<25	11	0.3
25-29	159	4.2
30-34	472	12.6
35-39	574	15.3
40-44	1,137	30.3
45-49	1,162	30.9
≥50	239	6.4
Treatment Cycles of Using Donated Eggs	3,754	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 38.6% of all ART cycles performed in 2019 (Table 3), among which women of age 39 had received the most ART cycles, accounting for 8.0% of the total ART cycles, followed by 7.7% in women of age 36.

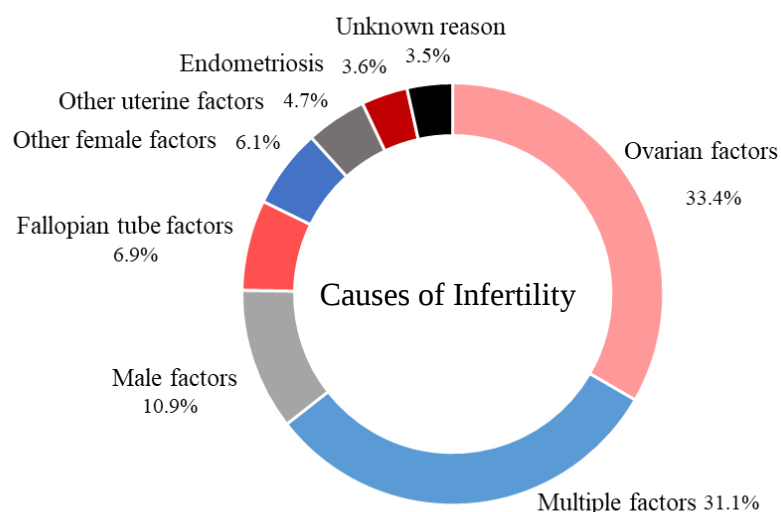
Table 3 Age-Specific Recipient Women in ART in 2019

Age of Recipient Women	The Number of Treatment Cycles	Unit: Cycle/%
		Percentage
<25	211	0.5
25-29	2,076	4.7
30-34	9,520	21.5
35-39	17,093	38.6
40-44	12,039	27.2
45-49	3,015	6.8
>50	302	0.7
Total ART Cycles	44,256	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 33.4% of all infertility cases, followed by 31.1% from multiple factors ranking as second and 10.9% from male factors ranking as third.

Figure 1 Causes of Infertility in ART in 2019 (Parameter: 44,256 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 79.7% of the 44,256 ART cycles performed (Table 4).

Table 4 Status of Micromanipulation Technique Application in ART Case Cycles in 2019

Cases Using Micromanipulation	The Number of Treatment Cycles	Unit: Cycle/%
		Percentage
Procedure applied	35,266	79.7
Intracytoplasmic sperm injection (ICSI)	16,965	38.3
Assisted Hatching	12,685	28.7
Preimplantation genetic testing for aneuploidy (PGT-A)	2,526	5.7
Preimplantation genetic testing for monogenic/single-gene disorders (PGT-M)	98	0.2
Other (including combined multiple techniques)	2,992	6.8
Procedure not applied	8,990	20.3
Total ART Cycles	44,256	100.0

Section 6 The Number of Transfer Cycles and Embryos Transferred

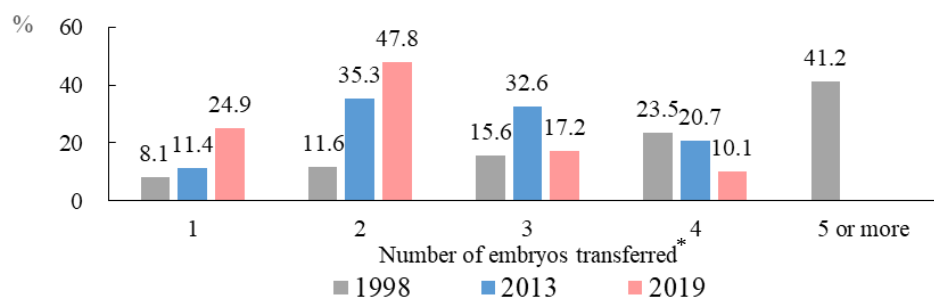
The number of assisted reproductive transfer cycles was 23,761, among which 21.2% were fresh embryos formed from nondonor sperm and eggs, 67.3% used frozen embryos formed from nondonor sperm and eggs, 0.8% used fresh embryos formed from donated sperm or eggs, and 10.7% used frozen embryos formed from donated sperm or eggs (Table 5).

Table 5 Percentage of Transfer Type in ART in 2019

Transfer Type		Unit: Cycle/%	
		Transfer Cycles	Percentage
Using nondonor embryo	Fresh	5,045	21.2
	Frozen	15,975	67.3
Using embryo formed from donated sperm or eggs	Fresh	188	0.8
	Frozen	2,553	10.7
All Transfer Cycles		23,761	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 72.7% of all embryo transfer cycles in 2019 (69.5% in 2018 and 65.4% in 2017) (Fig. 2). In 2019, the rate of mild, moderate and severe ovarian hyperstimulation syndrome (OHSS) in treatment cycle was 2.84%, 0.11% and 0.06%, respectively, which was reported by the assisted reproduction institutions in Taiwan (Table 6).

Figure 2 Percentage of Number of Embryos Transferred in ART Cycles



*the government promulgated and implemented the ARA in 2007 which specifically limits the maximum number of embryos transferred to be four in each ART.

Table 6 Degree of ovarian hyperstimulation syndrome in ART Case Cycles in 2019
(Parameter: 44,256 treatment cycles)

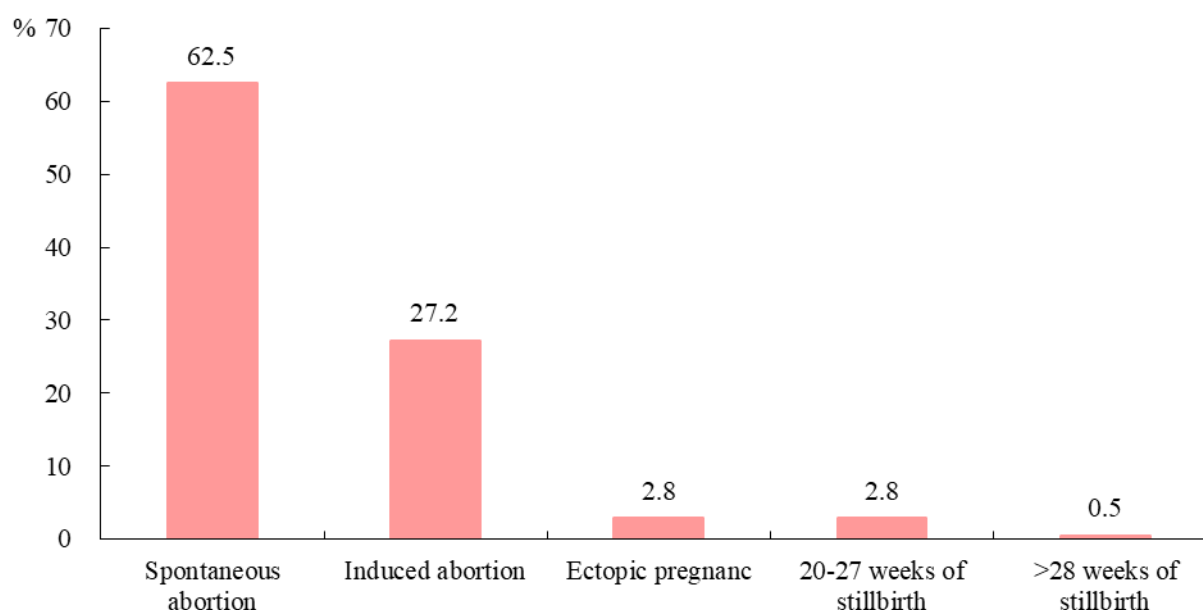
Unit: Cycle/%		
Degree of OHSS	The Number of Treatment Cycles	Percentage
mild	1,257	2.84
moderate	48	0.11
severe	7	0.06
Total	1,312	2.96

Section 7 Status of Pregnancy and Live Births

Of 44,256 ART cycles in 2019, 23,761 cycles were performed with transfer of at least one embryo, and 11,402 cycles successfully led to pregnancy of which 135 cycles underwent fetal reduction. Among the successful pregnancy cycles, 8,583 cycles resulted in live births. A total of 10,678 infants were born (24.1% of live birth cycles were multiple births) with an increase of 442 infants born compared to 2018.

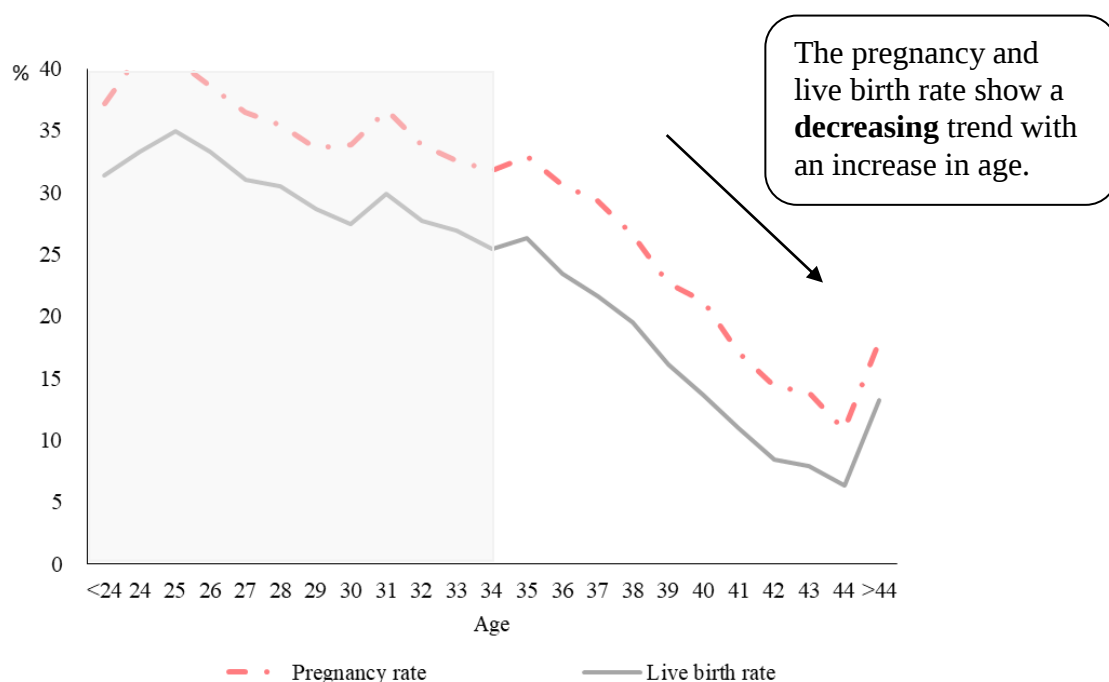
In the 2,819 cycles of pregnancy with no live birth, 1,761 cycles ended up with spontaneous abortions (62.5%), 767 cycles were treated by induced abortions (including absence of fetal heart sound before 20 weeks; 27.2%), 80 cycles were ectopic pregnancy (2.8%), and 94 cycles were stillbirth (3.3%) (a 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 2019
(Parameter: 2,819 pregnancy cycles without live birth cycles)



In 2019, the pregnancy rate of ART cycles was 25.8%, while the live birth rate of treatment cycles accounted for 19.4% (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 2019
(Parameter: 44,256 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; therefore, only the cumulative pregnancy rate and the cumulative live birth rate during the treatment cycle can truly reflect the quality of ART.

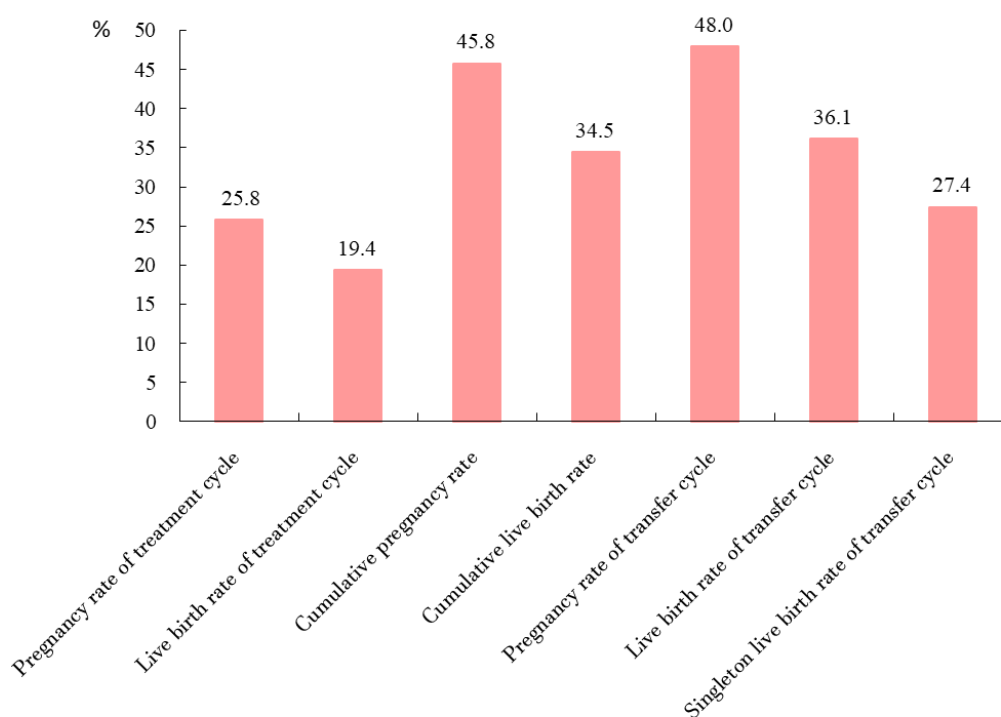
Figure 5 shows the results using the seven different methods of measuring the success rate of ART, including: pregnancy rate of treatment cycles, live birth rate of treatment cycles, cumulative pregnancy rate, cumulative live birth rate, pregnancy rate of transfer cycle, live birth rate of transfer cycle 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 25.8% in 2019.
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 19.4% in 2019.
3. Cumulative pregnancy rate: this rate reflects 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 45.8% in 2019.



4. Cumulative live birth rate: It 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 34.5% in 2019, and the cumulative live birth rate in women below 38 years of age was 50.1%.
5. Pregnancy rate of transfer cycle: the percentage of pregnancies during the ART transfer cycles. The pregnancy rate of transfer cycles was 48.0% in 2019. Among them, the pregnancy rate of fresh embryo transfer was 39.2%, 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 36.1% in 2019, in which the live birth rate of fresh embryo transfer was 27.8%, and the live birth rate of frozen embryo transfer was 38.5%.
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, since delivery of a single infant has lower neonatal health risks, including preterm birth, low birth weight, birth defects and infant mortality, as compared to multiple births. The singleton live birth rate of transfer cycle was 27.4% in 2019.

Figure 5 Analysis of ART Success Rate in 2019



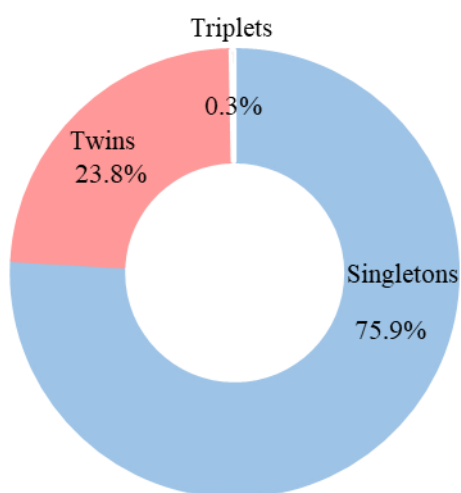
Section 8: Status of New-Born Infants

1. The number of live births

Of the 8,583 live birth cycles, 75.9% were singletons, 23.8% were twins, and 0.3% were triplets (Figure 6).

The patients undergoing ART treatment in 2019 gave birth to a total of 10,678 infants, among which 5,673 were boys and 5,005 were girls (Table 7).

Figure 6 Percentages of Fetus Numbers of the ART Live Birth Cycles in 2019
(Parameter: 8,583 live birth cycles)



2. Weight, gestational weeks and congenital defect

Observing 10,678 live births, infants with birth weight less than 1,500 grams accounted for 3.6%, between 1,500 and 2,499 grams accounted for 28.8%, and greater than or equal to 2,500 grams accounted for 67.6%; infants born before 37 gestational weeks accounted for 35.4%, between 37 and 41 weeks accounted for 64.5%, greater than or equal to 42 weeks accounted for 0.1% (Table 7); the proportion of infants with apparent congenital defects was 0.7% (Table 8).

Table 7 Weight and gestational weeks of ART Born Infants in 2019

Infant status	Number of live births	Percentage
Gender		
Male	5,673	53.1
Female	5,005	46.9
Weight		
<1500 g	387	3.6
1500-2499g	3,078	28.8
≥2500g	7,213	67.6
Gestational weeks		
<37weeks	3,783	35.4
37-41weeks	6,889	64.5
≥42weeks	6	0.1

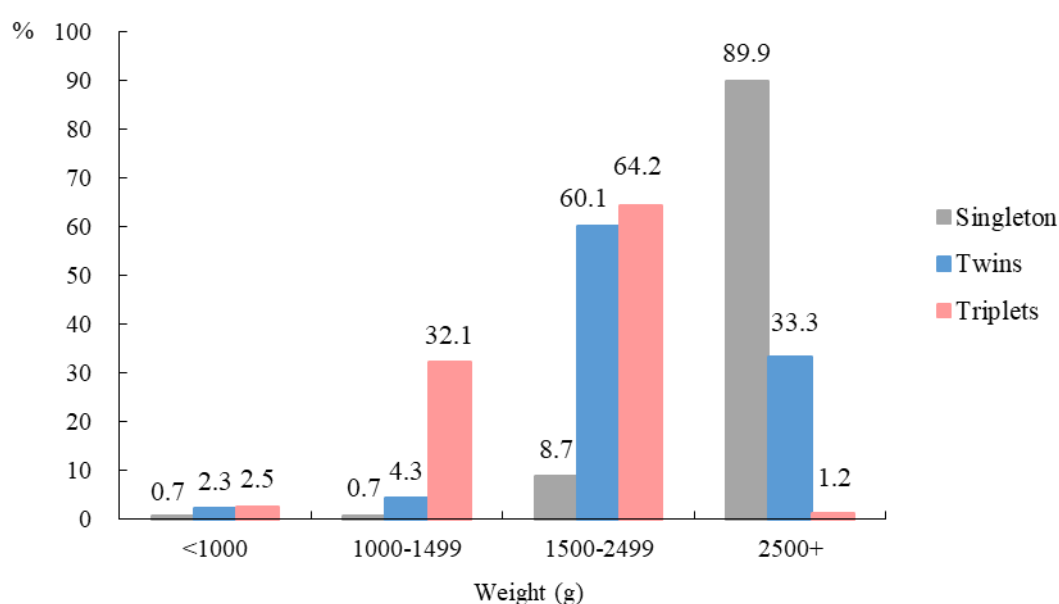
Table 8 The number of infants with congenital birth defect born from ART and their proportion among live births in 2019.

Weight	Apparent or visible congenital defects	Number of live births	Percentage
<1500 g	30	387	7.8
1500-2499g	24	3,078	0.8
≥2500g	26	7,213	0.4
Total	80	10,678	0.7

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 60.1% and 33.3%, respectively. The birthweight of triplets born weighing less than 1,000 grams accounted for 2.5%, between 1,000 and 1,499 grams were 32.1%, between 1,500 and 2,499 grams were 64.2% and 2,500 grams and above were 1.2%. 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 2019
(Parameter: 10,678 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 40,076 cycles were conducted using nondonor sperm, eggs or frozen embryos, accounting for 90.6% 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 9, which is similar to the age distribution of women undergoing all kinds of ART (Table 3 of page 47).

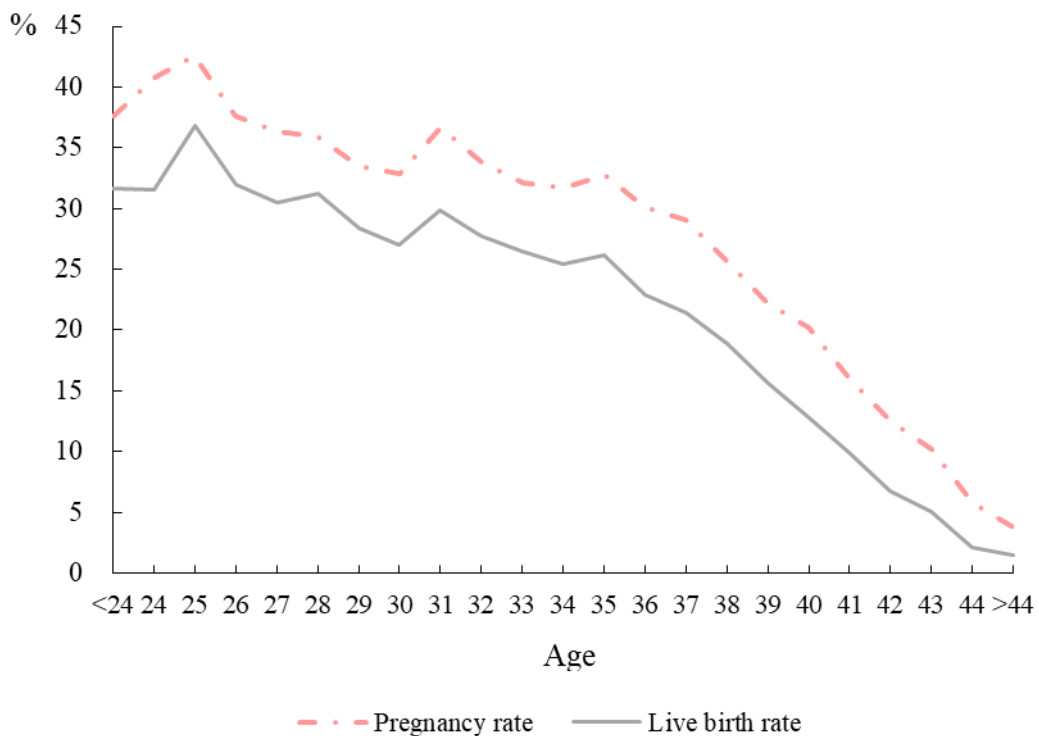
Table 9 Age Distribution of Women Receiving ART Using Nondonor Eggs, Sperm, or Embryos in 2019

Unit: Cycle/%		
Age of Recipient Women	The Number of Treatment Cycles	Percentage
<25	193	0.5
25-29	1,858	4.6
30-34	8,921	22.3
35-39	16,379	40.9
40-44	10,825	27.0
45-49	1,839	4.6
>50	61	0.2
ART Cycle	40,076	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 24.7% and 18.4%, 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).

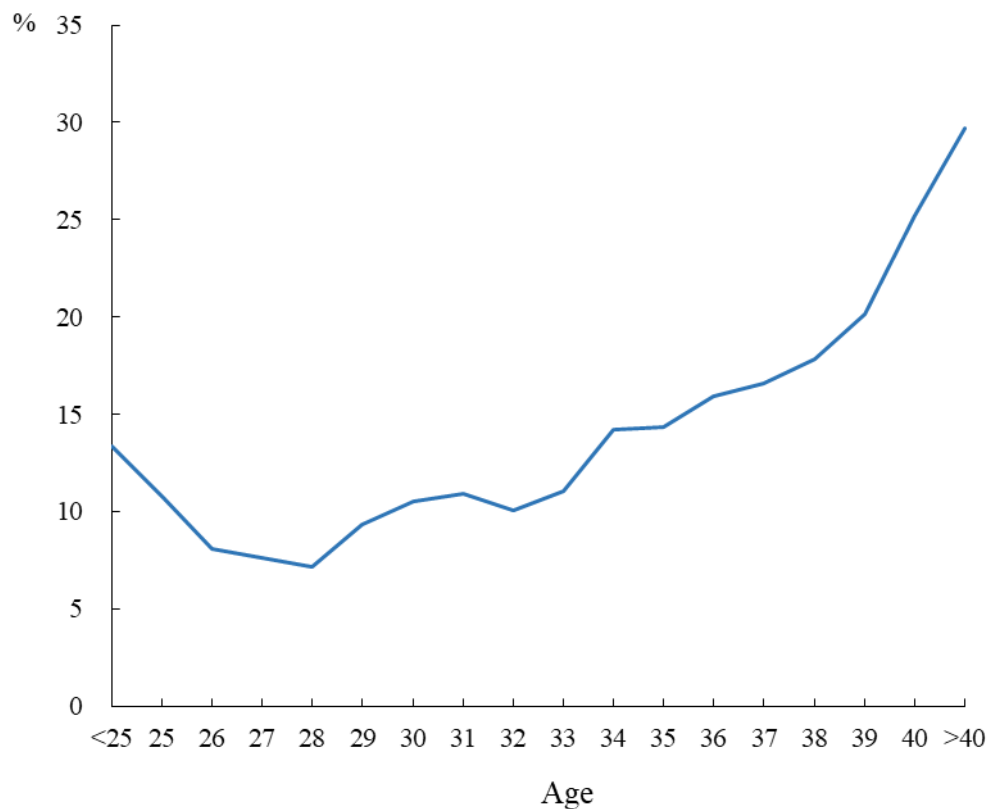
Figure 8 Correlation between Women's Age and Rates of Pregnancy and Live Birth, of Nondonor ART in 2019 (Parameter: 40,076 treatment cycles)



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 29.7% (Figure 9).

Figure 9 Correlation between Age and Miscarriage Rate of the Pregnant Women after ART Using Nondonor Eggs, Sperm, or Embryos in 2019
(Parameter: Number of pregnancy cycles was 9,880 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

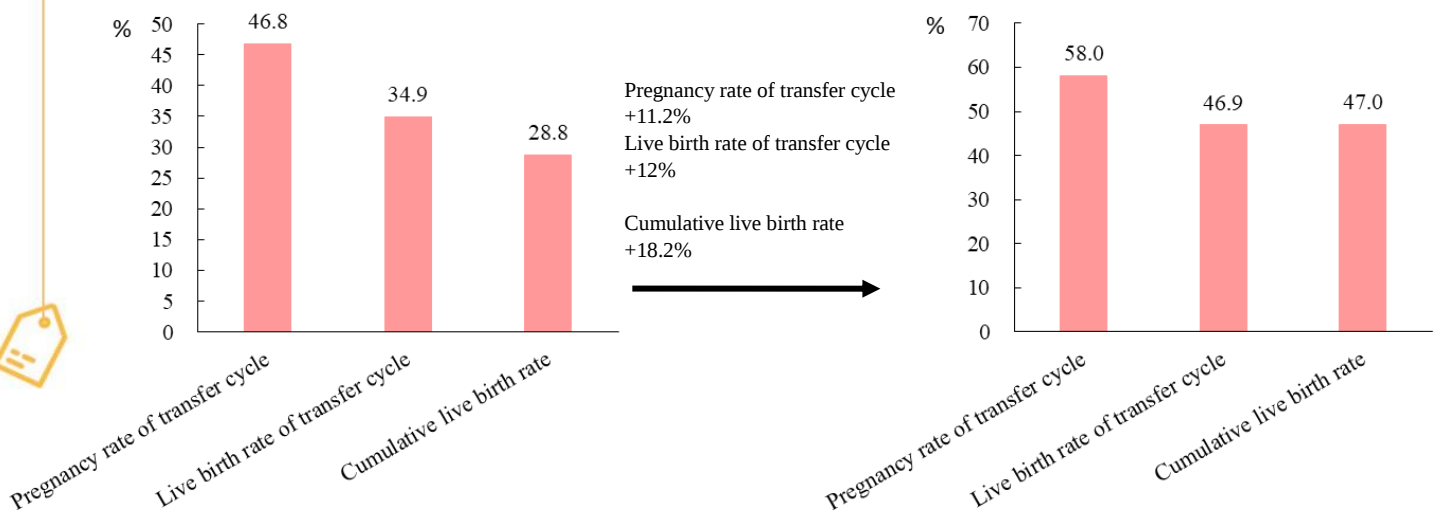
A total of 19,218 transfer cycles were conducted using nondonor egg, sperm or embryos, among which 8,988 cycles led to pregnancies and 6,711 cycles resulted in live births, with a pregnancy rate per transfer of 46.8% and live birth rate per transfer of 34.9%. The cumulative live birth rate was 28.8%, and the cumulative live birth rate of women less than 38 years old was 44.7%. The proportion of singletons accounted for 74.8%, twins accounted for 24.9%, and triplets or more accounted for 0.3%.

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 58.0%, 46.9% and 47.0%, 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 2019.

Nondonor ART

Women below 35 years of age and excluding male factor of infertility



2. The number of embryos transferred and live birth rate

Assisted reproductive using nondonor embryos and transferring two or less embryos in women of 35 years and below and in women of 36 years and above accounted for 84.9% and 61% of all embryo transfer cycles, respectively in 2019 (Fig. 11&12). In the 6,711 nondonor IVF cycles with live birth, the largest proportion (56.2%) of the cycles had two embryos transferred (Fig. 13). 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 40.0% (Fig. 14), but the multiple birth rate in the live birth cycles after transferring two embryos was also as high as 32.0% (Fig. 15).

Figure 11 Percentage of Number of using Nondonor Embryos Transferred in women of 35 years and below in 2019

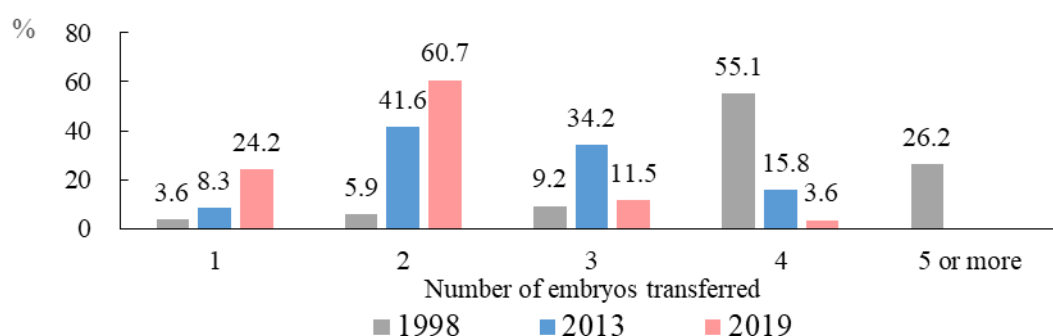


Figure 12 Percentage of Number of using Nondonor Embryos Transferred in women of 36 years and above in 2019

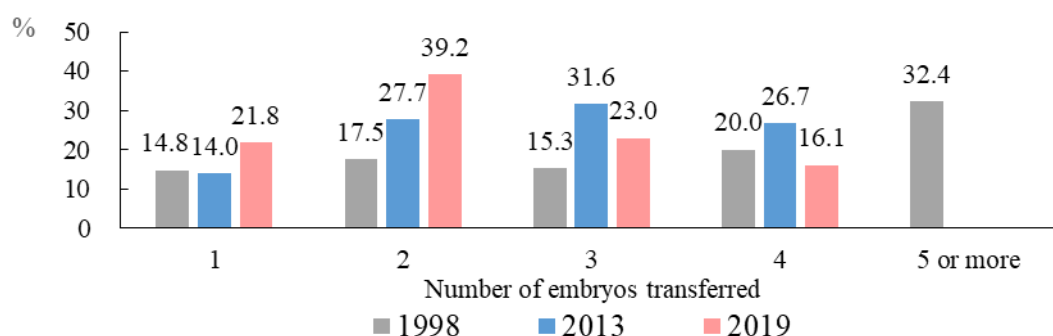


Figure 13 The Proportion of Live Birth Cycles Based on the Number of Embryos Transferred during Nondonor IVF Procedure in 2019.

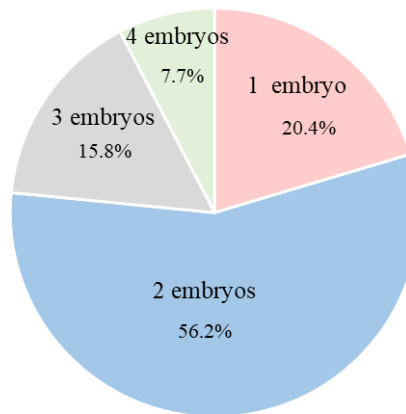


Figure 14 Correlation Between Live Birth Rates and Number of Embryos Transferred during Nondonor IVF Procedure in 2019

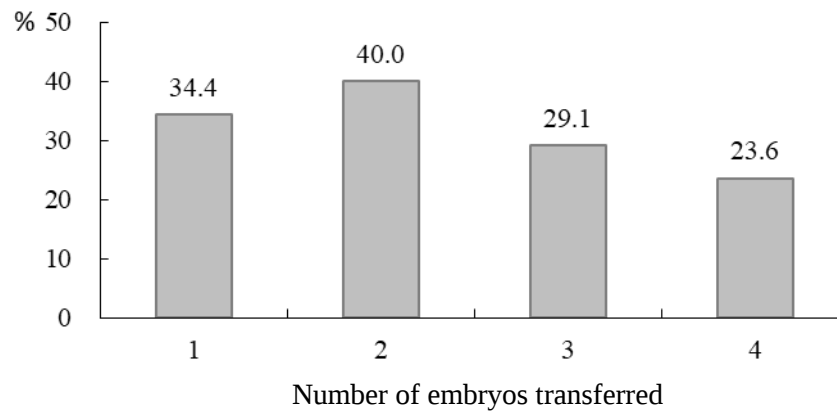
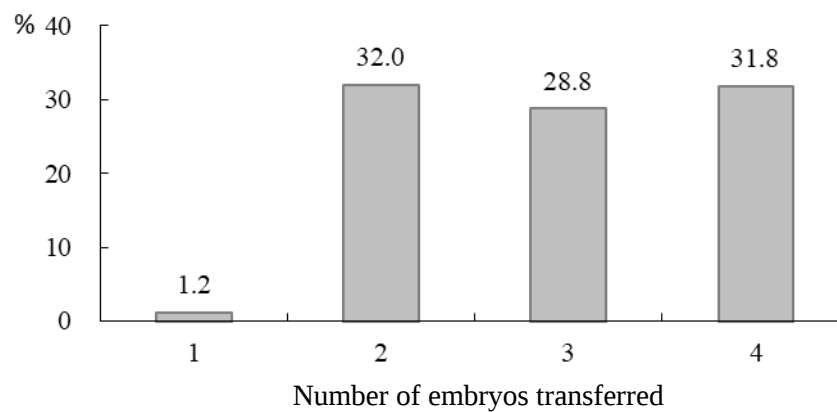


Figure 15 Correlation Between Multiple Birth Rates and Number of Embryos Transferred during Nondonor IVF Procedure in 2019.



Section 3 Fresh and Frozen Embryo Transfer in Nondonor ART

This section compares the ART treatment cycles between the 5,045 fresh embryo transfer cycles and 15,975 frozen embryo transfer cycles. The statistical results showed that the pregnancy rate of fresh and frozen embryo transfer cycles was 38.4% and 49.7%, respectively, and live birth rate was 27.0% and 37.8%, respectively, and statistical significant difference was found between the two groups in both pregnancy and live birth rates ($P < 0.0001$) (Fig.16).

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 49.7% and 60.2%, respectively, whereas for women above 40 years the pregnancy rate for fresh and frozen embryo transfer was only 18.6% and 28.5%, respectively. The live birth rate for fresh embryo transfer in women below 35 years was 40.7%, and decreased to 8.6% in women above 40 years of age; similarly, the live birth rate for frozen embryo transfer decreased from 49.5% in women below 35 years to 16.2% in women above 40 years of age. (Figure 17)

Figure 16 Comparison of the Success Rate between Fresh Embryo and Frozen Embryo Transfer from Nondonor Gametes in 2019

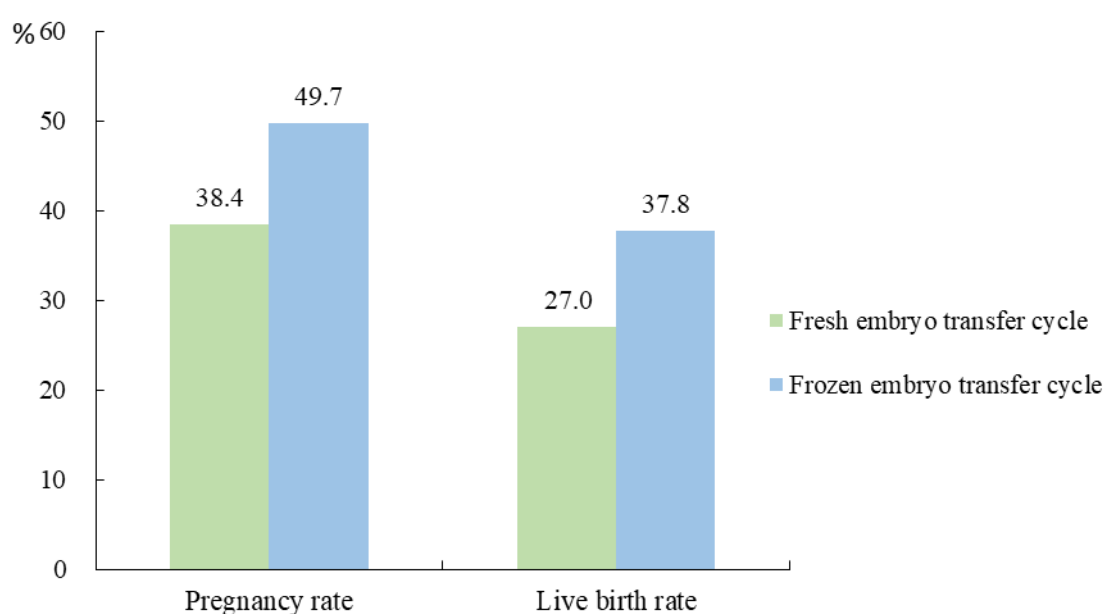
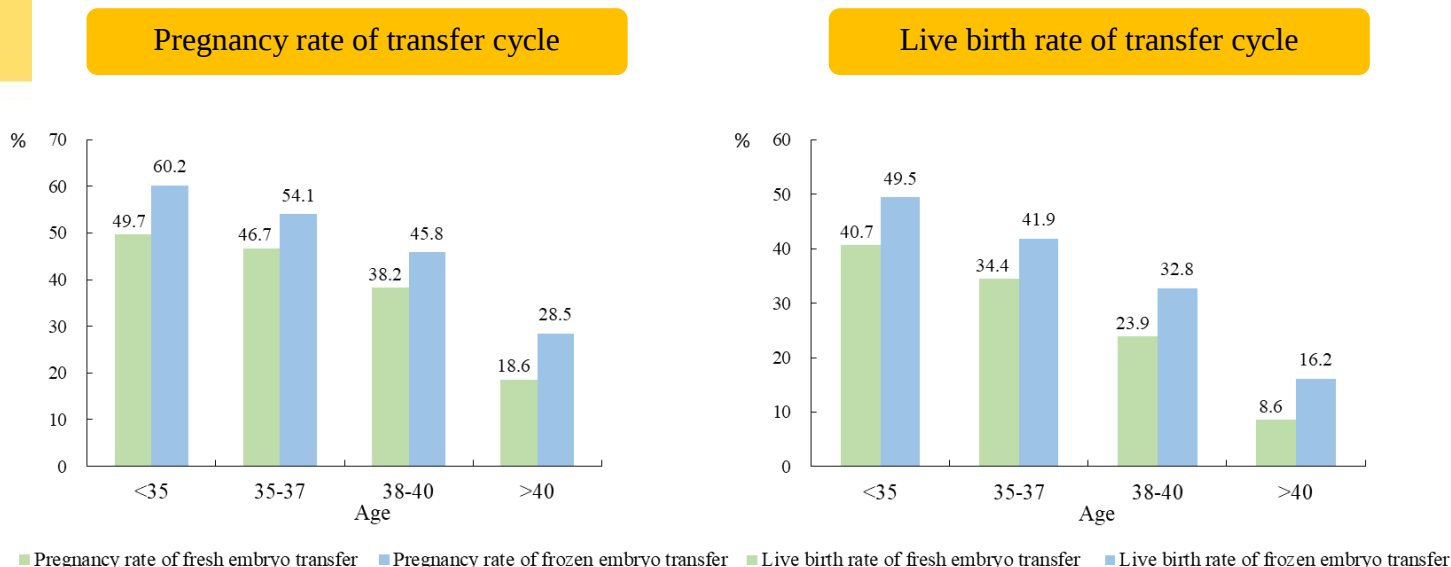
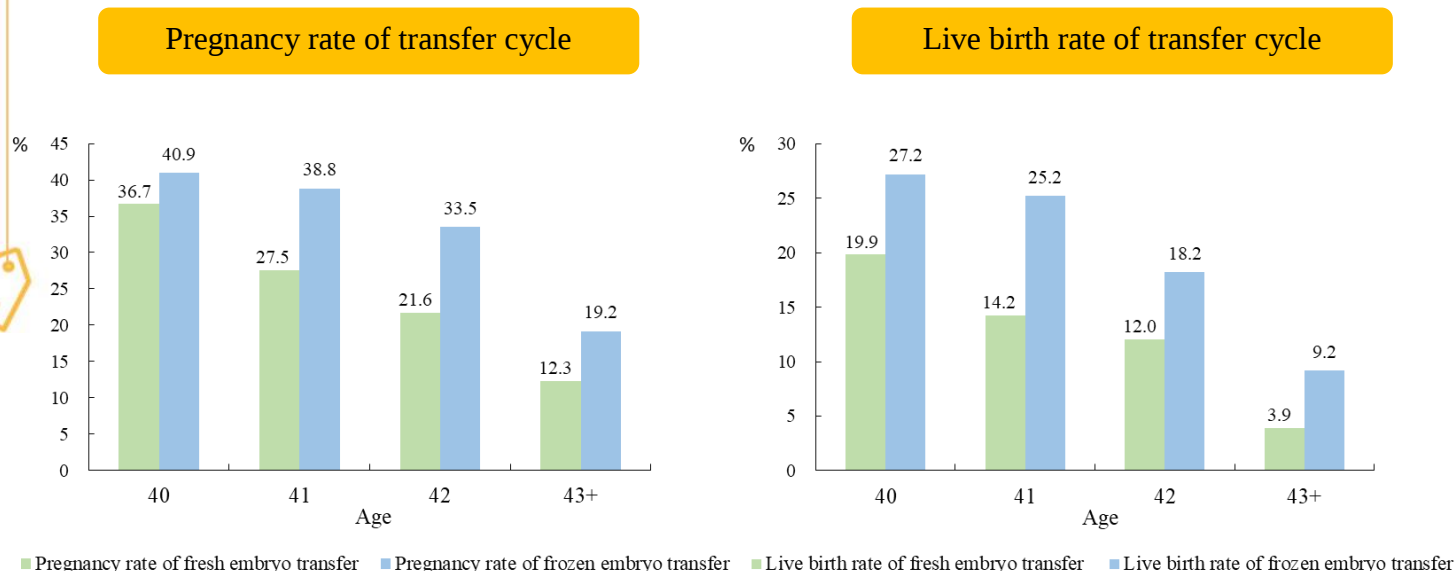


Figure 17 Age-Specific Pregnancy and Live Birth Rate of Fresh and Frozen Embryo Transfer from Nondonor Gametes in 2019



This section delineates the analysis on women of 40 years and above (5,515 transfer cycles). The pregnancy rate of fresh and frozen embryo transfer in women of age 40 was 36.7% and 40.9%, respectively; however, their live birth rate dropped to 19.9% and 27.2%, 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 12.3% and 19.2%, respectively, while the live birth rate was only 3.9% and 9.2%, respectively (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 18 Age-Specific Pregnancy and Live birth Rate of Fresh and Frozen Embryo Transfer in Women at Age 40 and above from Nondonor Gametes in 2019



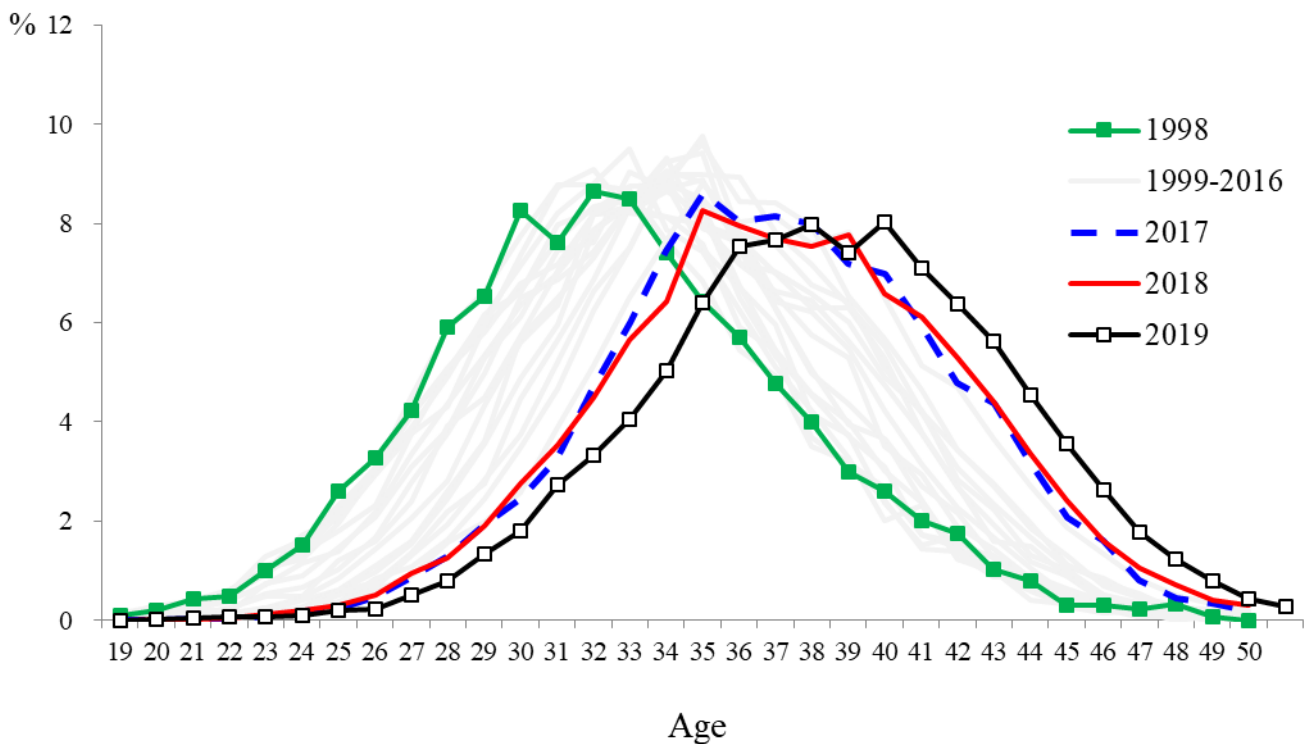
CHAPTER 4 Trend of Assisted Reproduction (1998–2019)

Section 1 Trends of ART Cycles

1. Patient age

The age distribution of women receiving assisted reproduction shows an increasing trend from 1998 to 2019. The median age and average age of recipient women in 1998 was 32 and 32.7, respectively; in 2017 was 37 and 37.2 years, respectively; in 2018 was 37 and 37.3, respectively; and in 2019 was 38 and 37.5, respectively.

Figure 19 Age Distribution of Women receiving ART from 1998 to 2019



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 2019. 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 2019, it reached 44,256 cycles, with an increase of 11.1% compared to the 39,840 cycles in 2018 (Table 10-1).

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 10,678 in 2019, with an increase of 442 newborns compared with 10,236 in 2018 (Table 10 and Figure 20).

Table 10 The Number of ART Cycles, Live Birth Cycles, and Live Births from 1998 to 2019

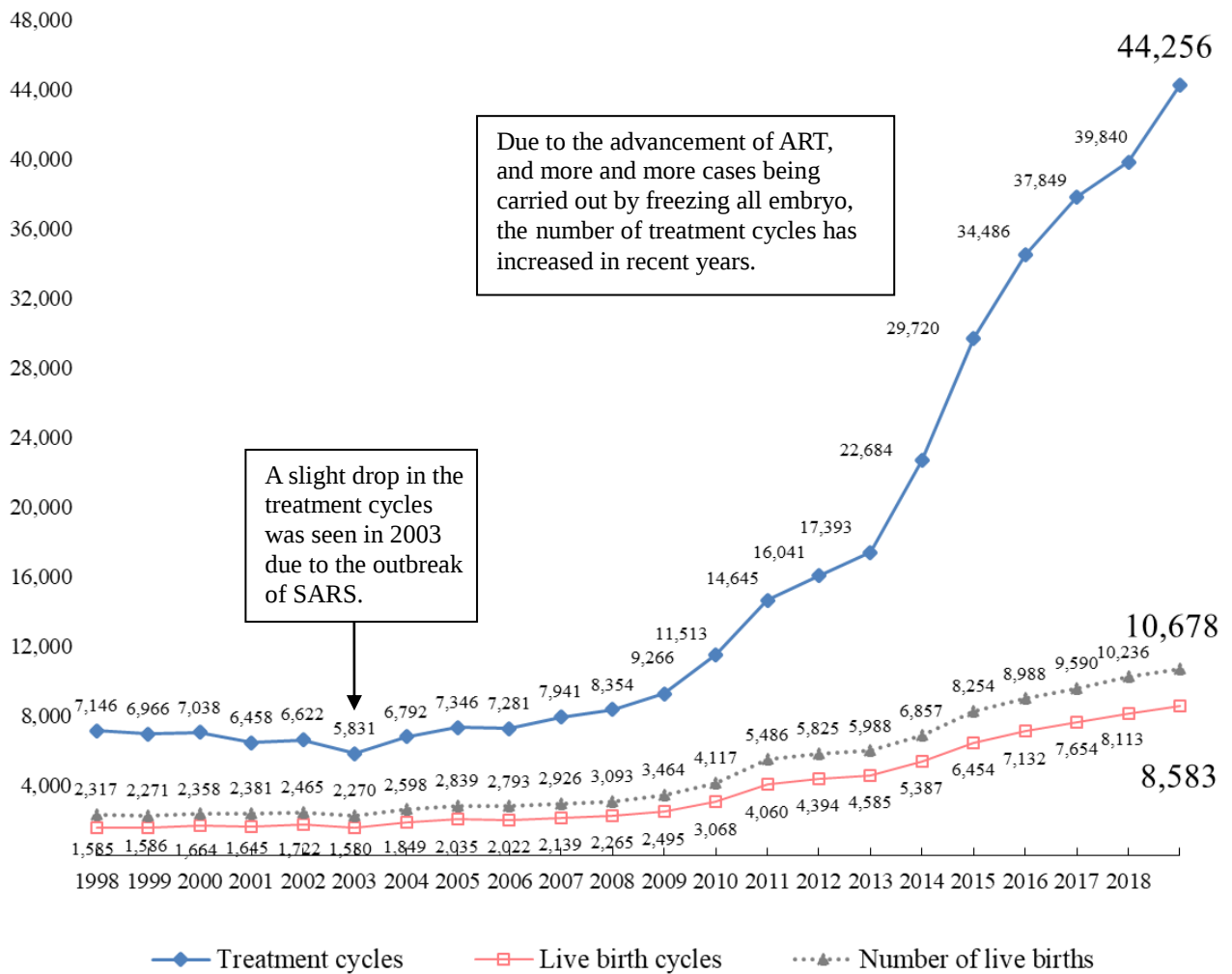
Year	Treatment cycles (unit: cycle)	Live birth cycles (unit: cycle)	Number of live births (unit: infant)	Number of live births (with Taiwanese nationality) (unit: infant)
1998	7,146	1,585	2,317	-
1999	6,966	1,586	2,271	-
2000	7,038	1,664	2,358	-
2001	6,458	1,645	2,381	-
2002	6,622	1,722	2,465	-
2003	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	3,062
2009	9,266	2,495	3,464	3,385
2010	11,513	3,068	4,117	4,039
2011	14,645	4,060	5,486	5,392
2012	16,041	4,394	5,825	5,689
2013	17,393	4,585	5,988	5,799
2014	22,684	5,387	6,857	6,611
2015	29,720	6,454	8,254	7,818
2016	34,486	7,132	8,988	8,214
2017	37,849	7,654	9,590	8,474
2018	39,840	8,113	10,236	8,585
2019	44,256	8,583	10,678	8,585
Total	355,468	82,017	107,794	-

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

Table 10-1 Growth Rate of Treatment Cycles from 1998 to 2019

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
2019	55,256	11.1
Total	355,468	-

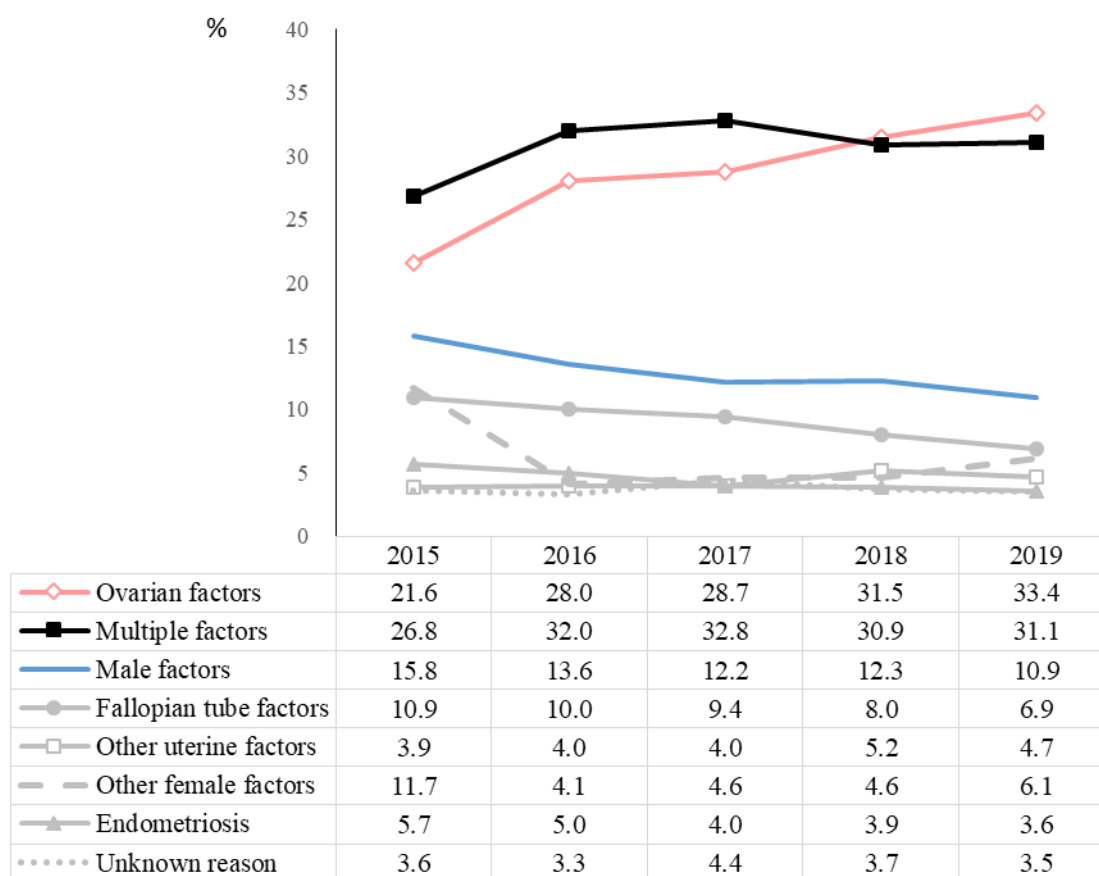
Figure 20 The Number of ART Cycles, Live Birth Cycles and Live Births from 1998 to 2019



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 5 years, the top 3 causes of infertility are ovarian factors, multiple factors and male factors; and in 2019, ovarian factors ranked as the highest cause of infertility (Figure 21).

Figure 21 Causes of Infertility in ART recipients from 2015 to 2019



4. Pregnancy rate and live birth rate

Figure 22 shows the pregnancy rate and live birth rate of ART from 1998 to 2019, 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 25.8% and 19.4% in 2019, respectively. Because more and more cases were carried out by freezing all embryos 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 can truly express the quality of ART.

The cumulative pregnancy rate increased from 37.2% in 1998 to 45.8% in 2019; the cumulative live birth rate increased from 27.0% in 1998 to 34.5% in 2019 (Figure 23).

Figure 22 Pregnancy Rate and Live Birth Rate of ART from 1998 to 2019

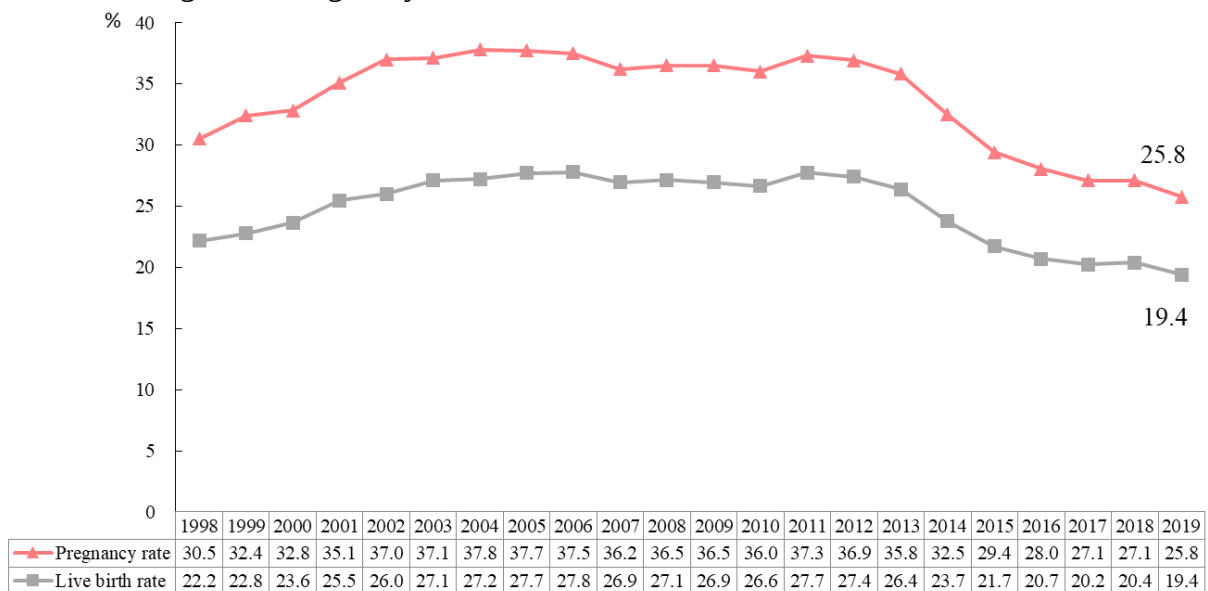
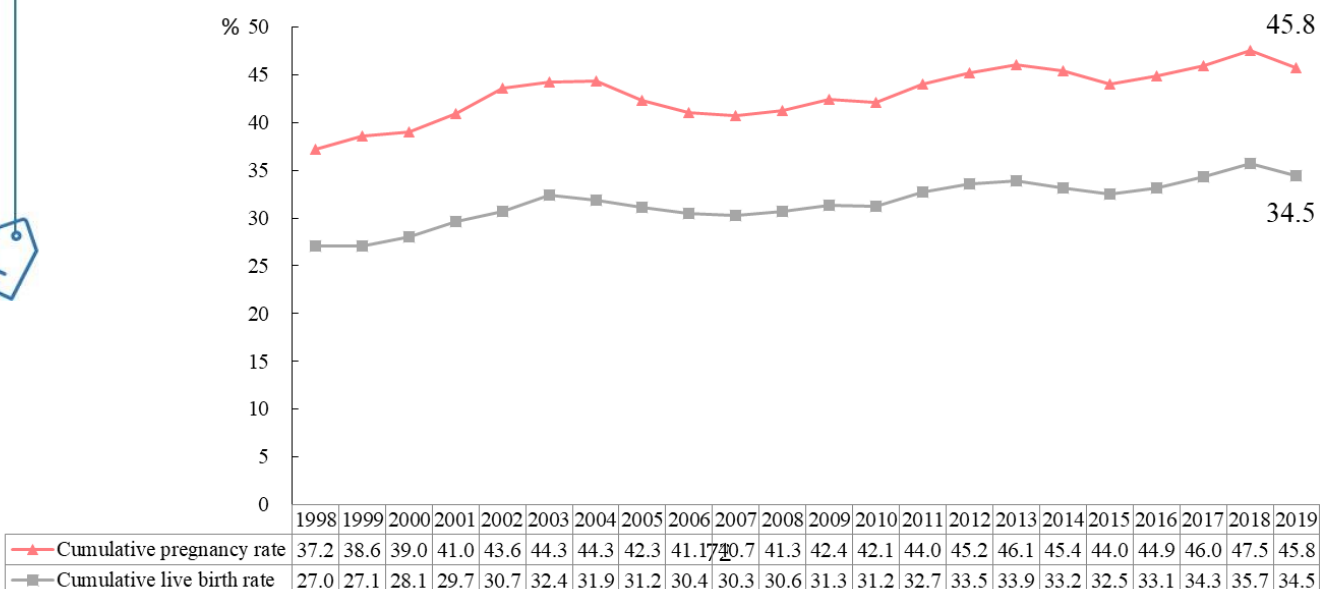


Figure 23 Cumulative Pregnancy Rate and Cumulative Live Birth Rate of the ART Cycles from 1998 to 2019



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 2019, they were 39.2% and 27.8%, 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 38.5% in 2019, 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.24 and Fig.25).

Figure 24 Pregnancy Rate of Transfer Cycles Using Fresh and Frozen Embryos from 1998 to 2019

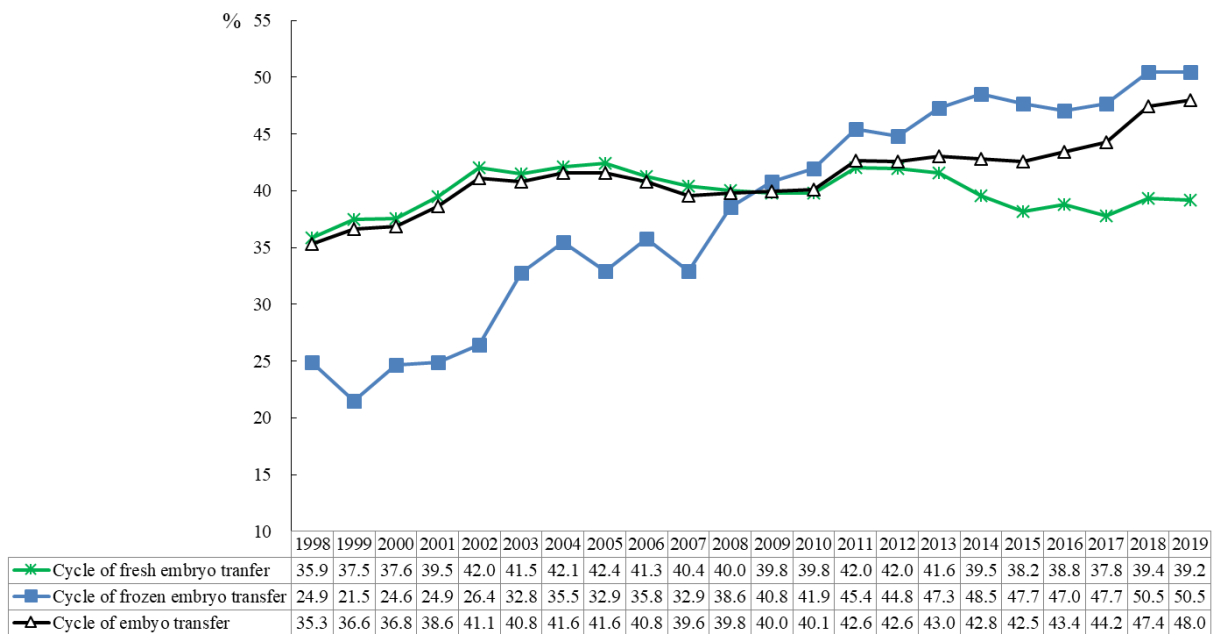
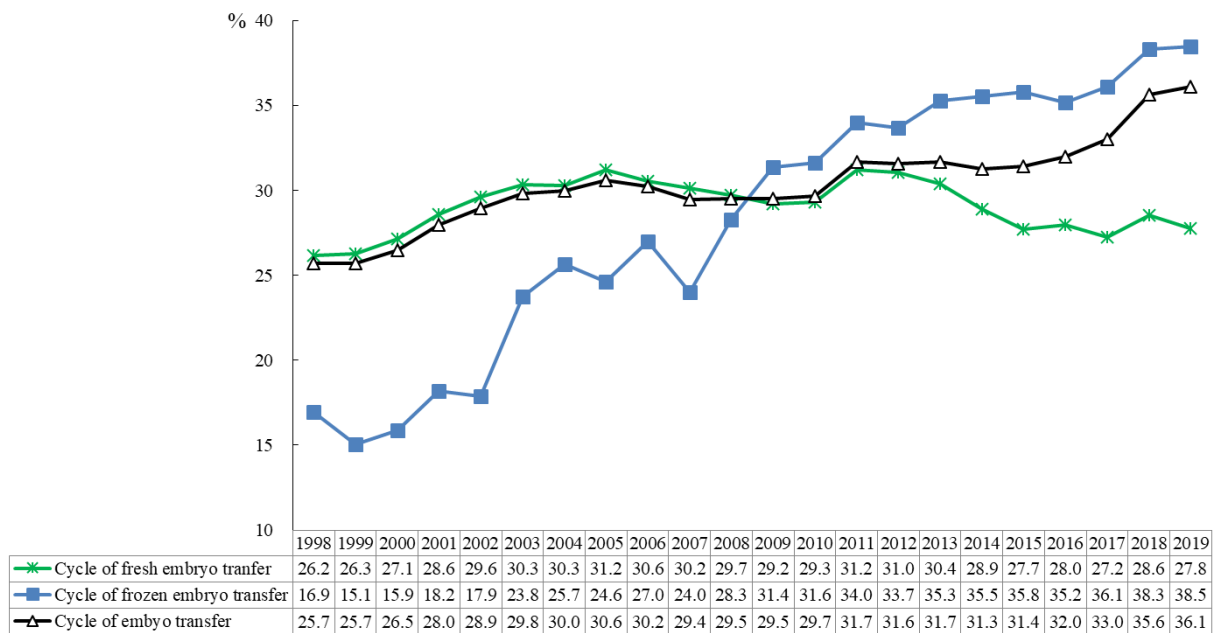
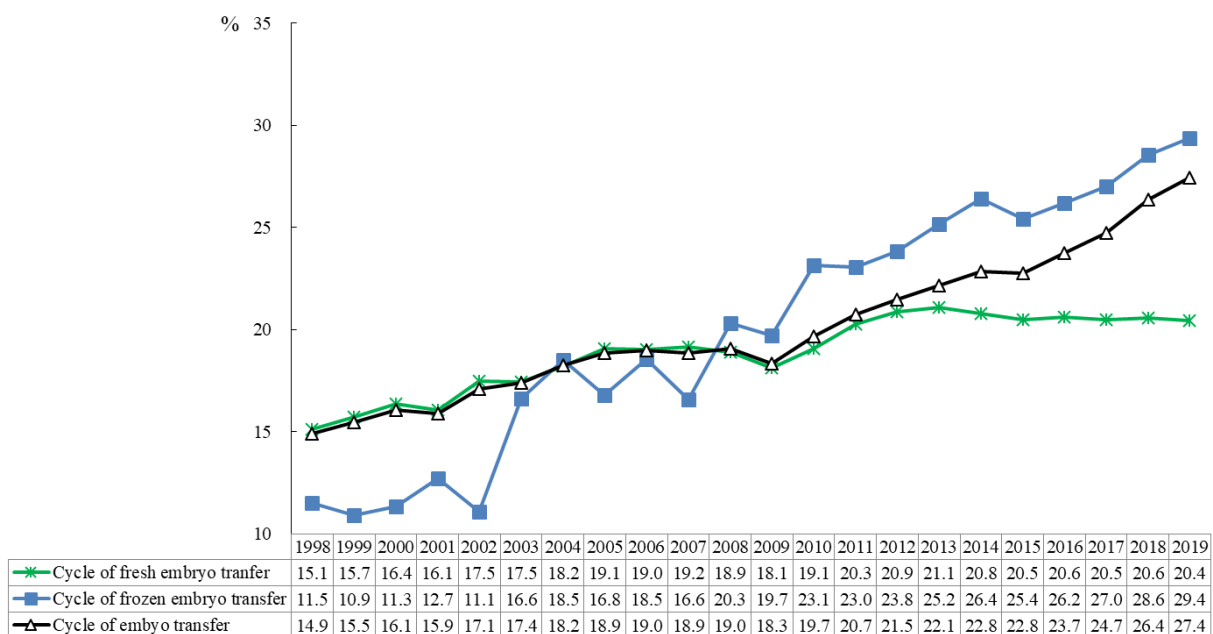


Figure 25 Live Birth Rate of Transfer Cycles Using Fresh and Frozen Embryos from 1998 to 2019



The singleton live birth rate of fresh embryo transfer cycles has increased from 15.1% in 1998 to 20.4% in 2019. The singleton live birth rate of frozen embryo transfer cycle increased significantly to 18.5% in 2004 and 29.4% in 2019. After 2008, the singleton live birth rate of frozen embryo transfer cycles was always higher than that of fresh embryo transfer cycles(Fig. 26).

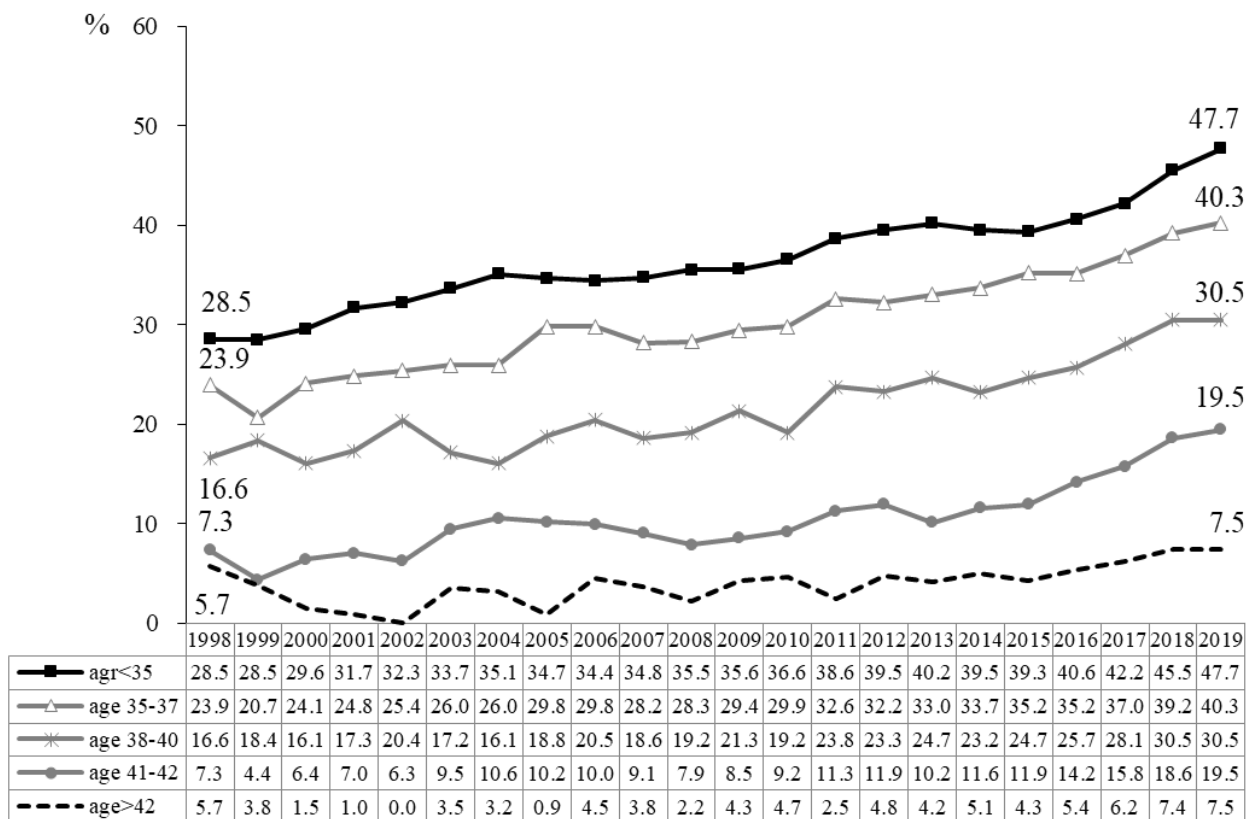
Figure 26 Singleton Live Birth Rate of Transfer Cycles Using Fresh and Frozen Embryos from 1998 to 2019



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

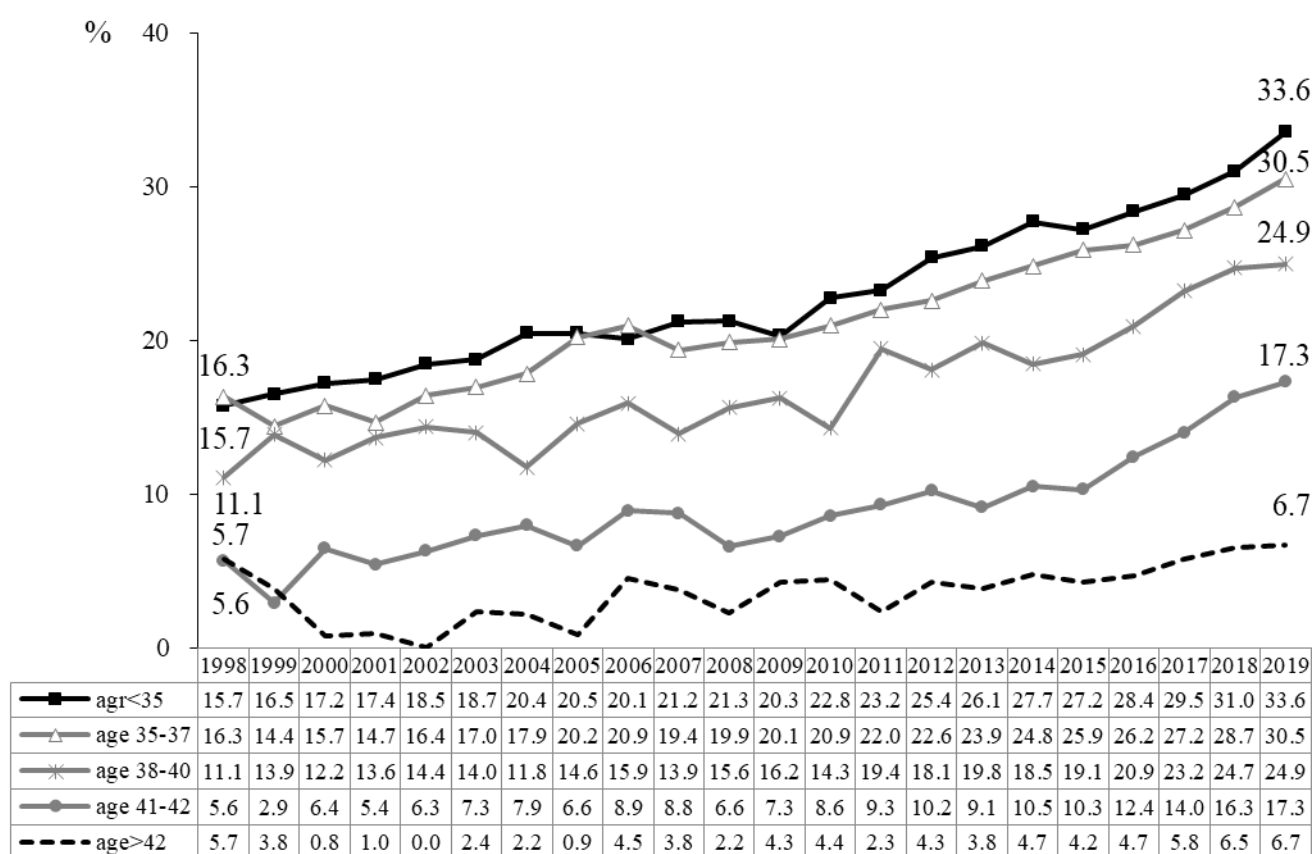
As the live birth rate of transfer cycles using donated eggs tends to be affected by the age of the donors, only the live birth rate of transfer cycles using nondonor gametes was analyzed. The live birth rate of women under the age of 35 increased from 28.5% in 1998 to 47.7% in 2019. In the same period, this rate increased by 16.4 percentage points in the 35 to 37 years age group, 13.9 percentage points in the 38 to 40 years age group, 12.2 percentage points in the 41 to 42 years age group, and 1.8 percentage points in women older than 42 years (Figure 27).

Figure 27 Live Birth Rate of Transfer Cycles Using Nondonor Gametes from 1998 to 2019
(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 33.6% in 2019. In the same period, this rate increased by 14.2 percentage points in the 35 to 37 years age group, 13.8 percentage points in the 38 to 40 years age group, and 11.7 percentage points in the 41 to 42 years age group. The singleton live birth rate in women older than 42 years increased by 1 percentage points (Figure 28).

Figure 28 Singleton Live Birth Rates of Transfer Cycles Using Nondonor Gametes from 1998 to 2019
(For Age-Specific Women Undergoing ART)

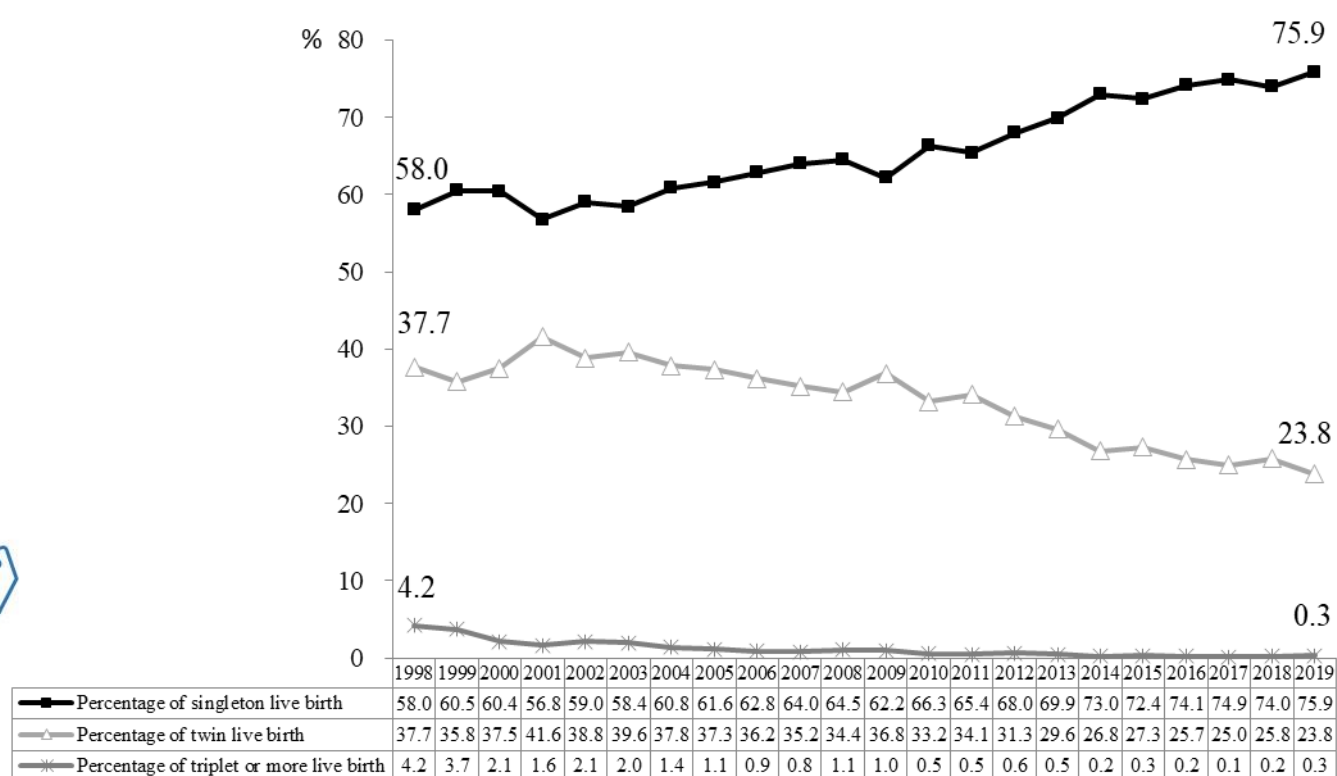


Section 4 Number of Fetuses in Live Birth Cycles, Birth Weights, and Weeks of Gestation

Singleton Live birth percentage 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 percentage 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.

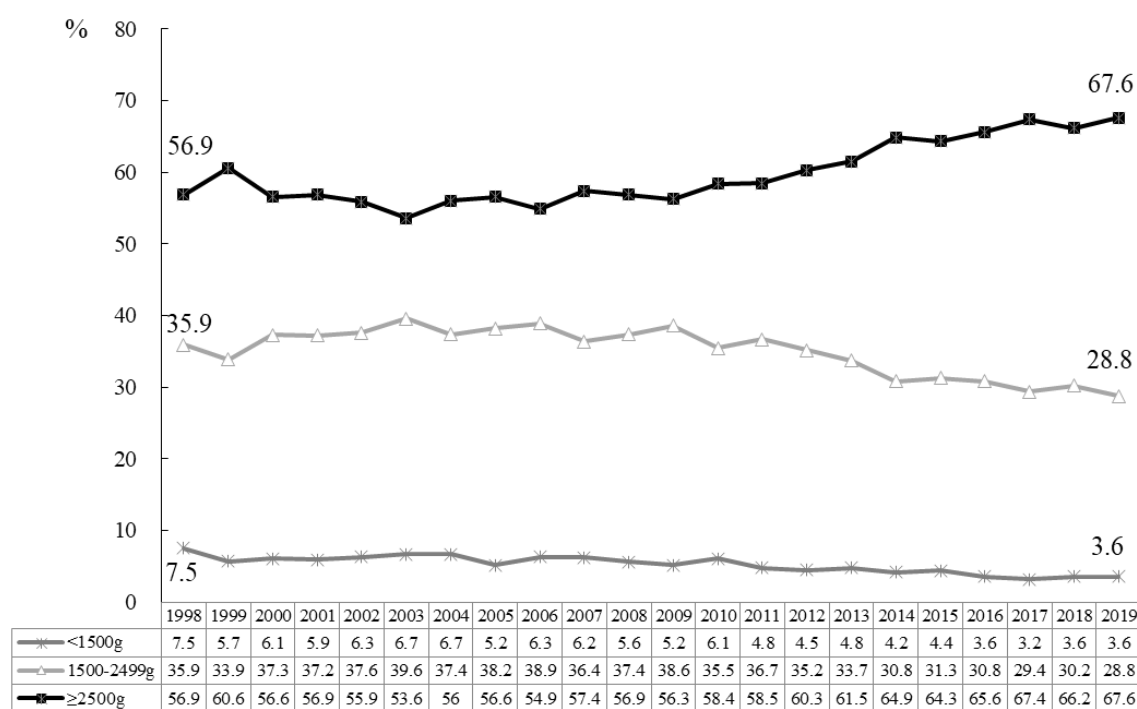
The singleton live birth rate percentage has increased from 58% in 1998 to 75.9% in 2019; while the live birth rate percentage of twins and that of triplets and more has decreased from 37.7% and 4.2% in 1998 to 23.8% and 0.3% in 2019, respectively(Figure 29).

Figure 29 Number of Fetuses in Live Birth Cycles between 1998 and 2019



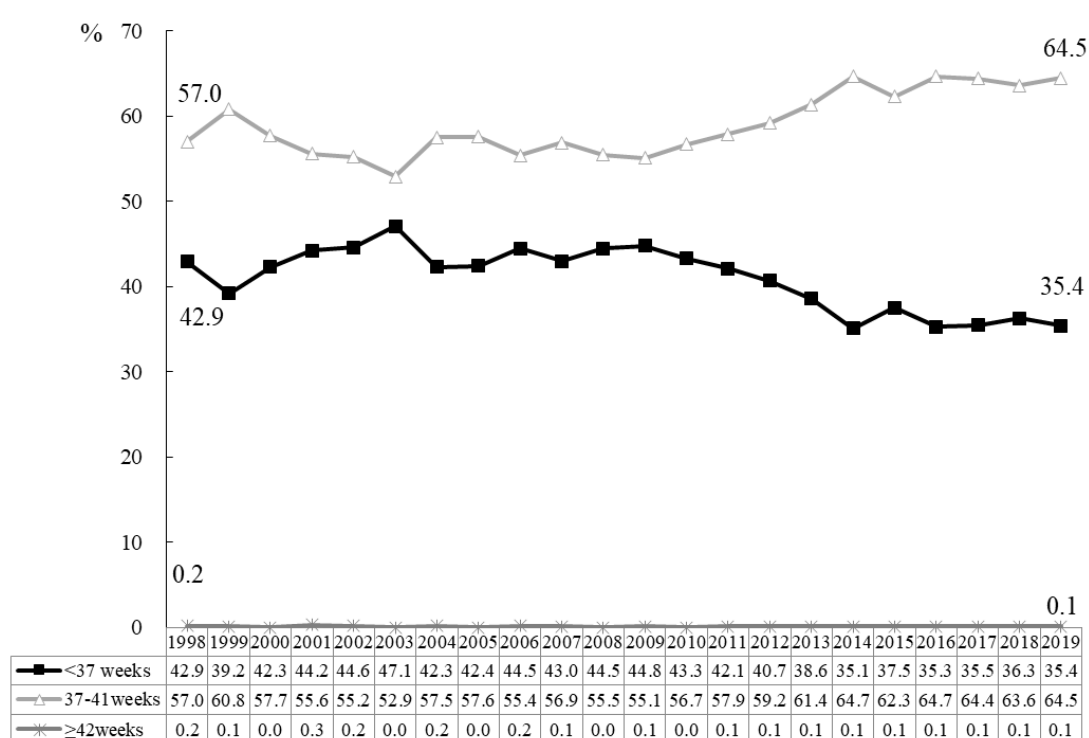
Among the live births from ART, birth weight less than 1500 gm accounted for 7.5% of the total live births in 1998, and this figure decreased to 3.6% in 2019; similarly, birth weight between 1500 to 2499 gm also decreased from 35.9% in 1998 to 28.8% in 2019. However, live birth weight of 2500 gm and above increased from 56.9% in 1998 to 67.6% in 2019 (Figure 30).

Figure 30 Birth Weight in Live Birth Cycles from 1998 to 2019



In addition, live births with gestational age of less than 37 weeks accounted for 42.9% in 1998, and this figure decreased to 35.4% in 2019; whereas, live births with gestational age between 37 to 41 weeks increased from 57% in 1998 to 64.5% in 2019, and live births with gestational age of 42 weeks and above decreased from 0.2% in 1998 to 0.1% in 2019 (Figure 31).

Figure 31 Gestational Weeks of Live Birth Cycles from 1998 to 2019



Appendix 1 Summary of Assisted Reproduction Statistics in 2019

Profile

Assisted Reproduction Method		Procedural Factors	
IVF/ET	99.9%	Use ICSI	38%
ZIFT/TET	<1%		
AID	<1%		

Causes of Infertility (%)	
Fallopian tube factor	7%
Ovarian factor	33%
Endometriosis	4%
Other uterine factors	5%
Other female factors	6%
Male factor	11%
Multiple factors	31%
Unknown reason	3%

Pregnancy success rates

Type of Cycle	Women age				
	<35	35-37	38-40	>40	Total
Fresh embryo of ART Cycles					
Number of treatment cycles	6,077	5,347	5,823	7,666	24,913
Percentage of pregnancy cycles	10.9	11.1	8.6	3.8	8.2
Percentage of live birth cycles	8.9	8.2	5.4	2.1	5.8
Number of Transfer Cycles	1,333	1,262	1,284	1,354	5,233
Pregnancy rate of transfer cycles	49.7	47.1	38.8	21.7	39.2
Live birth rate of transfer cycles	40.7	34.7	24.5	11.7	27.8
Singleton live birth rate of transfer cycles	28.6	25.1	18.9	9.5	20.4
Percentage of cancellations	79.4	77.6	79.2	84.0	80.4
Average number of embryos transferred	2.0	2.4	2.6	2.7	2.4
Percentage of multiple births in live birth cycles	29.7	27.6	22.9	18.4	26.4
Frozen embryo of ART Cycles					
Number of treatment cycles	5,730	4,914	4,154	4,545	19,343
Percentage of pregnancy cycles	58.2	52.5	44.4	35.1	48.4
Percentage of live birth cycles	47.9	40.7	32.0	23.3	36.9
Number of Transfer Cycles	5,532	4,751	3,953	4,292	18,528
Pregnancy rate of transfer cycles	60.2	54.3	46.6	37.2	50.5
Live birth rate of transfer cycles	49.6	42.1	33.6	24.6	38.5
Singleton live birth rate of transfer cycles	35.2	32.4	27.4	20.5	29.4
Percentage of cancellations	3.5	3.3	4.8	5.6	4.2
Average number of embryos transferred	1.9	2.0	2.2	2.2	2.0
Percentage of multiple births in live birth cycles	29.1	23.1	18.6	16.7	23.6
Fresh embryos from nondonor eggs					
Number of treatment cycles	5,827	5,237	5,685	6,871	23,620
Percentage of pregnancy cycles	11.2	11.2	8.5	3.4	8.3
Percentage of live birth cycles	9.2	8.2	5.3	1.6	5.8
Number of Transfer Cycles	1,315	1,249	1,261	1,264	5,089
Pregnancy rate of transfer cycles	49.6	46.8	38.3	18.5	38.4
Live birth rate of transfer cycles	40.6	34.6	23.9	8.5	27.0
Singleton live birth rate of transfer cycles	28.5	25.0	18.9	7.7	20.1
Percentage of cancellations	78.6	77.3	78.9	83.0	79.6
Average number of embryos transferred	2.0	2.4	2.6	2.7	2.4
Percentage of multiple births in live birth cycles	29.8	27.8	21.2	10.2	25.7

Appendix 1 Summary of Assisted Reproduction Statistics in 2019

Frozen embryos from nondonor eggs	<35	35-37	38-40	>40	Total
Number of treatment cycles	5,338	4,705	3,874	2,965	16,882
Percentage of pregnancy cycles	58.3	52.3	43.6	26.9	47.7
Percentage of live birth cycles	47.9	40.4	31.1	15.3	36.2
Number of Transfer Cycles	5,161	4,554	3,686	2,779	16,180
Pregnancy rate of transfer cycles	60.3	54.0	45.8	28.7	49.8
Live birth rate of transfer cycles	49.5	41.8	32.7	16.3	37.8
Singleton live birth rate of transfer cycles	35.0	32.0	27.0	14.4	28.8
Percentage of cancellations	3.3	3.2	4.9	6.3	4.2
Average number of embryos transferred	1.9	2.0	2.2	2.4	2.1
Percentage of multiple births in live birth cycles	29.4	23.4	17.5	11.5	23.9
Fresh embryos from nondonor sperm	<35	35-37	38-40	>40	Total
Number of treatment cycles	5,988	5,312	5,779	7,623	24,702
Percentage of pregnancy cycles	10.9	11.1	8.6	3.9	8.2
Percentage of live birth cycles	8.9	8.2	5.4	2.1	5.8
Number of Transfer Cycles	1,309	1,256	1,278	1,346	5,189
Pregnancy rate of transfer cycles	49.9	47.0	38.7	21.8	39.2
Live birth rate of transfer cycles	40.8	34.6	24.5	11.7	27.7
Singleton live birth rate of transfer cycles	28.6	25.0	18.9	9.6	20.4
Percentage of cancellations	79.4	77.5	79.1	84.0	80.4
Average number of embryos transferred	2.0	2.4	2.6	2.7	2.4
Percentage of multiple births in live birth cycles	29.8	27.6	22.7	18.4	26.3
Frozen embryos from nondonor sperm	<35	35-37	38-40	>40	Total
Number of treatment cycles	5,626	4,862	4,119	4,521	19,128
Percentage of pregnancy cycles	58.1	52.6	44.4	35.0	48.3
Percentage of live birth cycles	47.8	40.8	32.1	23.2	36.8
Number of Transfer Cycles	5,432	4,699	3,922	4,270	18,323
Pregnancy rate of transfer cycles	60.2	54.4	46.7	37.1	50.4
Live birth rate of transfer cycles	49.5	42.2	33.7	24.6	38.4
Singleton live birth rate of transfer cycles	35.0	32.5	27.4	20.5	29.4
Percentage of cancellations	3.4	3.4	4.8	5.6	4.2
Average number of embryos transferred	1.9	2.0	2.2	2.2	2.0
Percentage of multiple births in live birth cycles	29.3	23.1	18.6	16.6	23.7
Fresh embryos from nondonor gametes	<35	35-37	38-40	>40	Total
Number of treatment cycles	5,738	5,202	5,641	6,828	23,409
Percentage of pregnancy cycles	11.2	11.2	8.5	3.4	8.3
Percentage of live birth cycles	9.2	8.2	5.3	1.6	5.8
Number of Transfer Cycles	1,291	1,243	1,255	1,256	5,045
Pregnancy rate of transfer cycles	49.7	46.7	38.2	18.6	38.4
Live birth rate of transfer cycles	40.7	34.4	23.9	8.6	27.0
Singleton live birth rate of transfer cycles	28.6	24.9	18.9	7.7	20.1
Percentage of cancellations	78.6	77.2	78.8	82.9	0.8
Average number of embryos transferred	2.0	2.4	2.6	2.7	2.4
Percentage of multiple births in live birth cycles	29.8	27.8	21.0	10.2	25.7

Appendix 1 Summary of Assisted Reproduction Statistics in 2019

Frozen embryos from nondonor gametes	<35	35-37	38-40	>40	Total
Number of treatment cycles	5,234	4,653	3,839	2,941	16,667
Percentage of pregnancy cycles	58.2	52.3	43.6	26.7	47.7
Percentage of live birth cycles	47.8	40.5	31.2	15.2	36.2
Number of Transfer Cycles	5,061	4,502	3,655	2,757	15,975
Pregnancy rate of transfer cycles	60.2	54.1	45.8	28.5	49.7
Live birth rate of transfer cycles	49.5	41.9	32.8	16.2	37.8
Singleton live birth rate of transfer cycles	34.8	32.1	27.0	14.4	28.7
Percentage of cancellations	3.3	3.2	4.8	6.3	4.2
Average number of embryos transferred	1.9	2.0	2.2	2.4	2.1
Percentage of multiple births in live birth cycles	29.6	23.4	17.5	11.2	23.9

	Total for all ages	
Donor eggs	Fresh embryos	Frozen embryos
Number of Transfer Cycles	144	2,348
Live birth rate of transfer cycles	53.5	43.1
Average number of embryos transferred	1.9	1.6
Donor sperm	Fresh embryos	Frozen embryos
Number of Transfer Cycles	44	205
Live birth rate of transfer cycles	31.8	42.0
Average number of embryos transferred	2.3	1.9
Embryos from nondonor gametes	Fresh embryos	Frozen embryos
Number of Transfer Cycles	5,045	15,975
Live birth rate of transfer cycles	27.0	37.8
Average number of embryos transferred	2.4	2.1

Number of embryos transferred and singleton live birth percentage**<35 age group**

	Number of transferred embryos			
	1	2	3	4
Number of transfer cycles	1,756	4,268	649	191
Pregnancy rate of transfer cycles	55	61	53	46
Singleton with fetal heart sound in all pregnancies	91	60	57	63
Singleton percentage in all live birth	99	62	63	62

35-37 age group

	Number of transferred embryos			
	1	2	3	4
Number of transfer cycles	1,476	2,955	1,140	442
Pregnancy rate of transfer cycles	51	56	49	49
Singleton with fetal heart sound in all pregnancies	91	65	61	51
Singleton percentage in all live birth	98	71	68	56

38-40 age group

	Number of transferred embryos			
	1	2	3	4
Number of transfer cycles	1159	2,162	1,174	742
Pregnancy rate of transfer cycles	43	46	46	42
Singleton with fetal heart sound in all pregnancies	91	68	63	60
Singleton percentage in all live birth	99	77	74	71

>40 age group

	Number of transferred embryos			
	1	2	3	4
Number of transfer cycles	1,535	1,974	1,122	1,015
Pregnancy rate of transfer cycles	39	36	28	25
Singleton with fetal heart sound in all pregnancies	85	59	67	56
Singleton percentage in all live birth	99	69	83	82

Number of reporting ART institutions: 87

Appendix 2 Statistical Data on Individual ART Institutions in 2019

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	387	67.4	32.6	0.0	14.7	49.9	13.7	15.5	6.2
Taipei City	National Taiwan University Hospital	1,357	54.8	36.5	8.7	7.8	26.0	13.6	45.6	7.0
	Taipei Chang Gung Memorial Hospital, Chang Gung Medical Foundation	265	20.0	80.0	0.0	0.0	10.6	0.0	89.4	0.0
	Taipei Veterans General Hospital	699	84.5	15.5	0.0	6.6	42.9	32.9	12.3	5.3
	Tri-Service General Hospital	235	61.7	38.3	0.0	9.8	38.3	7.7	43.3	0.9
	MacKay Memorial Hospital	887	56.6	43.4	0.0	6.4	24.4	27.5	29.2	12.5
	Cathy General Hospital	287	76.7	23.3	0.0	21.3	57.4	9.8	11.5	0.0
	Chung Shan Hospital	897	43.6	13.2	43.3	8.2	54.0	8.2	23.2	6.4
	Shin Kong Wu Ho-Su Memorial Hospital	165	61.2	38.8	0.0	10.9	48.5	18.2	13.9	8.5
	Taiwan Adventist Hospital	400	84.0	16.0	0.0	0.2	58.8	8.0	32.0	1.0
	Taipei Medical University Hospital	2,227	55.8	44.2	0.0	10.7	65.8	14.8	5.2	3.5
	Pan's Ladies Clinic & Infertility Center	151	71.5	28.5	0.0	15.9	41.7	23.2	7.3	11.9
	Honji Fertility Center	404	31.7	68.3	0.0	0.7	43.4	15.1	35.6	5.2
	Hope Fertility & PGD Center	504	69.0	31.0	0.0	1.0	62.8	5.0	29.8	1.4
	IHMED Reproductive Med Center	2,711	38.3	27.5	34.2	7.1	48.3	13.1	28.5	3.0
	Huang, Jian-Rong Obstetrics and Gynecology Clinic	822	30.0	70.0	0.0	8.6	33.8	19.2	27.5	10.9
	Dr. Wang Reproductive Fertility Center	1,751	65.8	34.2	0.0	7.4	21.1	11.7	59.8	0.0
	Taipei Branch of Gene Infertility Medical Center	413	44.1	13.6	42.4	3.4	70.0	7.0	19.6	0.0
	Renai Branch of Taipei City Hospitals	193	28.0	40.9	31.1	5.7	47.6	4.7	30.6	11.4
	HuaYu Fertility Center	696	58.3	41.7	0.0	15.5	54.3	9.5	3.2	17.5

Appendix 2 Statistics Data on Individual ART Institution in 2019

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	Stork 11 Fertility Center Taipei	720	63.2	36.8	0.0	0.0	96.7	3.3	0.0	0.0
	Usoon Fertility Center	899	82.8	17.2	0.0	12.1	63.6	11.1	6.6	6.9
New Taipei City	Far Eastern Memorial Hospital	267	43.4	56.6	0.0	9.7	30.3	18.0	34.9	7.1
	Art Baby	176	65.9	34.1	0.0	4.5	69.4	10.2	15.3	0.6
	Taipei Medical University-Shuang Ho Hospital, Ministry of Health and Welfare	21	61.9	38.1	0.0	14.3	38.1	0.0	14.3	33.3
	Taipei Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation	95	64.2	35.8	0.0	12.6	31.6	15.8	18.9	21.1
	Star International Fertility Center	127	46.5	53.5	0.0	0.8	37.8	4.7	56.7	0.0
	Banqiao Branch of Gene Infertility Medical Center	243	45.3	54.7	0.0	4.1	63.7	12.8	12.8	6.6
Taoyuan City	Linkou Chang Gung Memorial Hospital, Chang Gung Medical Foundation	1,476	51.2	48.8	0.0	4.5	45.7	3.5	46.0	0.3
	Tao Yuan General Hospital, Ministry of Health and Welfare	159	20.1	30.8	49.1	10.1	54.0	3.8	30.8	1.3
	Min-Sheng General Hospital	146	61.0	39.0	0.0	18.5	39.7	11.0	8.2	22.6
	Hungchi Women & Children's Hospital	605	46.8	53.2	0.0	14.9	45.2	14.4	25.5	0.0
	Hueish Sheng Obstetrics Clinic	121	81.8	18.2	0.0	14.9	33.1	14.0	25.6	12.4
Hsinchu City	Jiang's OBS & GYN Clinic	46	50.0	50.0	0.0	2.2	78.2	19.6	0.0	0.0
	Stork Fertility Center	2,712	65.7	34.3	0.0	0.5	95.8	3.5	0.1	0.1
	Hsinchu MacKay Memorial Hospital	319	39.8	60.2	0.0	5.3	14.7	35.1	44.0	0.9
	Cheng-Kai Lin Babymake Clinic	322	67.1	32.9	0.0	2.8	26.7	6.2	64.0	0.3
Hsinchu County	Taiwan IVF Group	1,282	64.4	35.6	0.0	0.9	34.9	8.0	52.5	3.7
	China Medical University Hsinchu Hospital	40	57.5	42.5	0.0	20.0	42.5	25.0	10.0	2.5

Appendix 2 Statistics Data on Individual ART Institution in 2019

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
Miaoli County	Da-Chien Health Medical System	42	71.4	28.6	0.0	35.7	42.9	0.0	21.4	0.0
Taichung City	China Medical University Hospital	441	24.3	75.7	0.0	11.1	34.9	15.2	29.3	9.5
	Chung Shan Medical University Hospital	174	51.1	48.9	0.0	0.0	1.1	0.6	98.3	0.0
	Lee Women's Hospital	4,883	56.7	43.3	0.0	3.3	12.6	2.4	81.6	0.1
	Taichung Veterans General Hospital	923	81.4	18.6	0.0	12.5	53.6	13.9	18.0	2.0
Taichung City	Cheng Ching Hospital Chung Kang Branch	50	78.0	22.0	0.0	34.0	64.0	2.0	0.0	0.0
	Lin Shin Hospital	112	51.8	48.2	0.0	33.9	38.4	13.4	14.3	0.0
	Liu,Zhong-Jun Women and Children Clinic	266	50.4	49.6	0.0	5.3	42.0	19.2	22.6	10.9
	Mei Tsun Women and Children Clinic	63	11.1	88.9	0.0	7.9	58.8	12.7	19.0	1.6
	Hsieh,Yao-Yuan Women and Children's Clinic	35	5.7	94.3	0.0	14.3	62.8	22.9	0.0	0.0
	Dashin Women and Children's Clinic	365	21.9	30.7	47.4	4.7	44.1	3.0	48.2	0.0
	Taichung Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation	32	81.2	9.4	9.4	34.4	34.4	12.5	15.6	3.1
	Chang's Fertility Center	429	65.0	34.7	0.2	5.6	21.7	7.0	45.7	20.0
	Tungs' Taichung MetroHarbor Hospital	26	46.2	53.8	0.0	34.6	30.8	19.2	15.4	0.0
Changhua County	Changhua Christian Hospital	953	57.4	42.6	0.0	9.5	58.8	10.3	18.7	2.7
	Han-Ming Hospital	19	73.7	26.3	0.0	21.1	42.0	10.5	21.1	5.3
	Dr. Tsai & Dr. Chen's Women Clinic	459	56.2	43.8	0.0	13.3	69.2	12.9	4.6	0.0
	Chang Bing Show Chwan Memorial Hospital	36	75.0	25.0	0.0	16.7	63.9	11.1	8.3	0.0
Yunlin county	National Taiwan University Hospital Yunlin Branch	69	43.5	56.5	0.0	18.8	52.3	17.4	7.2	4.3

Appendix 2 Statistics Data on Individual ART Institution in 2019

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
Chiayi City	Ditmanson Medical Foundation Chia-Yi Christian Hospital	14	71.4	28.6	0.0	0.0	28.6	42.8	0.0	28.6
	Jie-An Mother & Children Clinic	122	10.7	89.3	0.0	13.9	54.1	26.2	2.5	3.3
Chiayi County	Chiayi Chang Gung Memorial Hospital, Chang Gung Medical Foundation	77	100.0	0.0	0.0	24.7	22.1	7.8	7.8	37.6
Tainan City	National Cheng Kung University Hospital	477	85.3	14.7	0.0	5.9	36.3	14.3	41.6	1.9
	Kuo General Hospital	113	72.6	27.4	0.0	7.1	54.8	18.6	13.3	6.2
	Tube Infertility Clinic. Taiwan IVF Center	162	72.2	27.8	0.0	6.8	53.7	16.0	21.6	1.9
Tainan City	Sin-Lau Medical Foundation, the Presbyterian church in Taiwan	84	4.8	95.2	0.0	8.3	55.9	4.8	29.8	1.2
	An-An Women and Children Clinic	1,047	86.1	13.6	0.4	6.2	64.2	17.8	11.8	0.0
	Chi Mei Medical Center	577	56.0	44.0	0.0	1.0	11.8	28.1	59.1	0.0
	Jin -Sin Women and Children's Hospital	451	41.5	57.6	0.9	16.2	34.1	31.9	12.9	4.9
Kaohsiung City	Kaohsiung Medical University Chung-Ho Memorial Hospital	253	68.4	31.6	0.0	9.5	65.3	7.5	13.0	4.7
	Chien Shin Hospital	992	7.4	92.6	0.0	7.4	64.0	15.3	12.5	0.8
	Yuan's General Hospital	101	85.1	14.9	0.0	9.9	62.4	16.8	6.9	4.0
	Kaohsiung Veterans General Hospital	841	57.4	42.6	0.0	7.0	48.7	6.9	26.3	11.1
	Jung-Chou Chang Women and Children Clinic	35	60.0	40.0	0.0	2.9	80.0	5.7	11.4	0.0
	Kuo Hong-Chang GYN & IVF Clinic	165	84.2	15.8	0.0	6.1	64.2	10.3	19.4	0.0
	Makebaby Reproductive Center	559	26.1	73.9	0.0	16.5	57.6	14.1	9.8	2.0
	E-Da Dachang Hospital, E-Da Healthcare Group	153	47.7	52.3	0.0	3.9	84.3	11.8	0.0	0.0
	Kaohsiung Chang Gung Memorial Hospital, Chang Gung Medical Foundation	676	89.8	10.2	0.0	12.4	46.4	9.8	21.5	9.9

Appendix 2 Statistics Data on Individual ART Institution in 2019

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
Kaohsiung City	Tung Chiao Eye Center	232	80.2	19.8	0.0	10.5	48.7	7.0	26.0	7.8
	E-Da Hospital, E-Da Healthcare Group	110	24.2	75.8	0.0	3.6	13.9	14.5	68.0	0.0
Pingtung County	Pingtung Christian Hospital	17	100.0	0.0	0.0	17.6	11.8	5.9	64.7	0.0
Yilan County	Lotung Poh-Ai Hospital, Lo-Hsu Medical Foundation,	29	20.7	79.3	0.0	10.3	31.0	3.4	51.9	3.4
Hualien County	Hualien Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation	71	36.6	11.3	52.1	32.4	32.4	19.7	7.0	8.5
Kinmen County	Kinmen Hospital, Ministry of Health and Welfare	747	91.4	8.2	0.4	1.9	96.3	1.2	0.5	0.1

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/>

