

SARA
Report

2013

SOUTH AFRICAN REGISTRY FOR
ASSISTED REPRODUCTIVE TECHNIQUES



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Introduction

Dear Colleagues



The 2013 SARA report is the 5th annual report produced by the IVF data analysis arm of our Reproductive Medicine Society, SASREG. The SARA (South African Registry for Assisted Reproductive Techniques) committee is chaired by Professor Silke Dyer, and we congratulate her on this ongoing excellent achievement.

Starting a project is usually easy, but keeping the momentum going over many years and continually improving the final report is a great task. This report is more detailed than previous reports, and we get more answers to our questions with the enhanced input and analysis. The layout of the data and graphics in this report is also improved, to aid ease of reading.

In this report, there is detailed attention focused on the differentiation between the IVF and ICSI techniques. Fertility units can use this data when counselling patients about the success rates of the different techniques, and also look critically at which techniques they recommend to patients. In low cost IVF units that do not have expensive micromanipulation equipment, the SARA data from conventional IVF will be useful to guide patients.

The clinical pregnancy rates for IVF / ICSI have remained consistent over the last 5 years, and the egg donation clinical pregnancy rates remain high at 43%. More accurate data demonstrate a twin rate of over 20%, and our aim to do more single embryo transfers needs to receive more attention in future.

Thank you to everyone who has contributed to this report.

Dr Paul le Roux

SASREG President 2014-2017

SARA Committee

Dear Colleagues



Another year has gone by and it is time again for an exciting new SARA report. For me, it always signals a time of reflection, what we have achieved and what we still can improve and strive for. It has been great to be part of a team so passionate about ART data and its role to unite our community. I would like to thank Professor Silke Dyer for her leadership and ongoing dedication to this task.

The past year has been filled with new developments in SARA's format for data collection in the coming years. Many of us have been introduced to the new case by case data collection system and software program and another workshop will follow in Gauteng later this year. With this new program and our combined efforts within our clinics, we can expect even more detailed results giving us better and better feedback of our ART treatments.

The 2013 SARA report provides additional details in the tables, like aspirations with oocytes retrieved, retrievals resulting in positive fertilisation and positive fetal hearts. It is good to see that less embryo transfers are done with 3 or more embryos; and hopefully there may be further improvement since multiple pregnancy rates in our young age group are still high. The use of embryo cryopreservation has increased, and I think we can expect that our frozen embryo data will increase in numbers and effectiveness since vitrification techniques have become a huge role player during this time.

I would like to acknowledge every embryologist and colleague who put in a lot of hours and work into collecting their data and would like to encourage more embryologists and clinics to do so. It is really worthwhile to receive "the bigger picture report" of our service excellence to our patients and to ourselves. It encourages us to do better in our own settings, as well as improving our service delivery on a national level as our data provide a strong foundation for development strategies. In future, with more and more information added to our data, the SARA report will become an even wider benchmark for our field.

Well done all and keep up the great work.

Ms Lydia Els-Smit (Embryologist)

SARA and SASREG Committee member

Dear Colleagues



As in previous years, our 5th SARA report is the result of many people working together for the common goal of generating national data on availability, effectiveness and utilisation of ART in our country. Without data there can be no development plan or strategy either within individual ART centres or at a national level.

I gratefully acknowledge the enormous work and the contribution of data from all participating ART centres. I also wish to thank Dr Fernando Zegers-Hochschild, Ms Carolina Musri and the entire team of the Latin American Register for their ongoing collaboration and selfless assistance to the cause of data collection in our region. As always the SASREG secretariat provided valuable administrative support.

Reading through the list of participating centres, we are sadly reminded of the tragic death of Dr Herman Netshidzivhani. SASREG will continue to mourn the loss of our friend and colleague.

The data presented in this report speak for themselves. Each year the quality of reporting is improving and we are receiving better and more comprehensive data. Actual numbers might fluctuate as new centres join while others may temporarily be unable to add their data to the pool for operational reasons. Two findings deserve brief mentioning however: It is of interest that the fertilisation rate per aspiration with at least one oocyte is the same for IVF (95.3%; Table 2) and ICSI (94.9%; Table 5). Secondly, there is a marked change in the multiple pregnancy rate in the very last table: from 14.4% in 2012 to 26.6% in 2013. The data were double checked and are correct in both instances. I speculate that we are not seeing a true change, that is increase, in our multiple pregnancy rate but better reporting of outcomes. The SARA data make our collective work in ART visible – and while this work is captured in numbers, graphs and figures, we remain mindful that every data point captures an important moment in the lives of our patients and those delivering reproductive health care.

Prof Silke Dyer

Chair: SARA Committee

SASREG Committee member

Explanatory comments

- Not all participating centres completed all tables; therefore the number of centres that submitted data are reported in each table and figure heading.
- All reported pregnancies are clinical pregnancies. Biochemical pregnancies are not reported.
- If both IVF and ICSI were done in the same cycle, the cycle is reported according to which embryo(s) were transferred; if both IVF and ICSI embryos were transferred, the cycle is reported under ICSI.
- Embryo transfer: Data refer to fresh embryo transfers unless stated otherwise.
- Oocyte donation: Five centres reported oocyte donations as part of the general IVF and ICSI data. These centres included oocyte donor aspirations and embryo transfers under the age of the DONOR and not the recipient. The remaining centres reported oocyte donation in separate tables (Tables 10-12).

Definitions¹:

- **Aspirations:** The number of cycles resulting in attempted oocyte retrieval irrespective of whether oocytes were retrieved or not.
- **Clinical pregnancy:** A pregnancy diagnosed by ultrasonographic visualization of one or more gestational sacs or definitive clinical signs of pregnancy. It includes all intra- and extra-uterine pregnancies except biochemical pregnancies.
- **Delivery:** The complete expulsion or extraction from a woman of one or more fetuses, after at least 22 completed weeks of gestational age, irrespective of whether they are live births or stillbirths. A delivery of either a single or multiple new-born is considered as **one** delivery. If more than one new-born is delivered, it is one delivery with multiple births. A twin delivery is one delivery resulting in two births.

Abbreviations:

- **EPL** Early pregnancy loss
- **ET** Embryo transfer
- **FET** Frozen embryo transfer
- **FHB** Fetal heart beat
- **GS** Gestational sac
- **HMG** Human menopausal gonadotrophin
- **OD** Oocyte donation
- **P** Pregnancy
- **PR** Pregnancy rate
- **TF** Transfer

1. Adapted from the ICMART/WHO revised Glossary on ART Terminology, Reference: Zegers-Hochschild, work in progress.

Participating ART Centres

CAPE FERTILITY CLINIC

Apologies presented for 2013 data, but will be participating again in 2014.

CARE CLINIC

21 Jan Hofmeyer Road, Westville, 3630 - KwaZulu Natal

Phone 031 267 7920
 Fax 031 267 7928
 Email careoffice@ion.za.net
 Website www.careoffice.co.za
 Clinicians Dr A Ramdeo
 Embryologists Mr K K Naidoo, Ms S Umarsingh
 Nurses Sr K Harilall, Sr V Dicks

DRS AEVITAS INCORPORATED

Vincent Pallotti Hospital, Park Road, Pinelands - Cape Town

Phone 021 531 6999
 Fax 021 531 7919
 Email medici@aevitas.co.za
 Website www.aevitas.co.za
 Clinicians Dr JP Van der Merwe, Prof TF Kruger, Prof TI Siebert, Dr V Hulme
 Embryologists Dr ML Windt, Mr GM Tinney, Ms N Lans, Ms C Thwaites
 Nurses Sr S Botha, Sr T Fourie, Sr A Mans, Sr L Zonneveld

DURBAN FERTILITY CLINIC

607 Kingsway Rd, Kingsway Hospital, Amanzimtoti, 4125 - KwaZulu Natal

Phone 031 904 3980
 Fax 031 904 3980
 Email sags@intekom.co.za, mahesh@mbhana.co.za, neville@durbanfertilityclinic.co.za
 Clinicians Dr Sagie Naidu, Dr Mahesh Bhana
 Embryologists Mr Neville S Moodley

FEMBRYO FERTILITY CLINIC

St Georges Medical Suites

40A Park Drive, Central Port Elizabeth - Eastern Cape

Phone 041 373 0771
 Fax 041 374 2006
 Email info@fembryo.co.za
 Website www.fembryo.co.za
 Clinicians Dr Danie Botha
 Embryologists Dr Michelle Rijdsijk, Mr Wilhelm Schoeman

GENESIS REPRODUCTIVE CENTRE

Suite G20 Kloof Medi-Clinic, 511 Jochemus Street, Erasmuskloof Ext 3, Pretoria - Gauteng

Phone 012 367 4378
 Fax 012 367 4379
 Email lourensjt@mweb.co.za, drabri@webmail.co.za
 Clinicians Dr Abri de Bruin, Dr Johan Pentz
 Embryologists Mr J Lourens, Mr O Ozturk, Mrs R van Staden

HART CAPE TOWN FERTILITY CLINIC

Christiaan Barnard Chambers, 87 Loop Street, Cape Town, 8001

Phone 021 424 0670
 Fax 021 424 8343
 Email info@hartcapetown.co.za
 Website www.fertilityspecialist.co.za
 Clinicians Dr Sascha Edelstein, Dr Paul Dalmeyer
 Embryologists Roxanne Gentis
 Nurses Inari Mulke, Sheila Correia

MEDFEM CLINIC

Corner Peter Place and Nursery Road, 1st Floor, Bryanston - Gauteng

Phone 011 540 3440
 Fax 011 463 1875 / 0866 521 977
 Email ivflab@medfem.co.za
 Website www.medfem.co.za
 Clinicians Dr Van Rensburg, Dr Van Schouwenburg, Dr Rodrigues, Dr Clark, Dr Divanovic
 Embryologists Ms Edolene Bosman, Ms Vicky Wolf, Miss Esmari Du Plessis, Miss Bianca Faber, Sasha De Oliveira (Reznichenko)
 Nurses Sr Heather Sparrow, Sr Krina Von Molendorff, Sr Hanlie Monerry, Sr Cornie van der Merwe, Eleanor Magardi, Sr Christina Cross
 Counsellors Dr Mandy Wolf (Clinical Psychologist)

PARKLANE FERTILITY CENTRE

Corner Junction and Park Lane Avenue, Parktown - Gauteng

Phone 011 480 4143
 Fax 011 480 4316
 Email sacide07@gmail.com
 Website www.parklanefertilitycentre.co.za
 Clinicians Dr N H Netshidzivhani
 Embryologists Ms Sacide Karadasli
 Nurses Sr Doreen Donny Leseke

PRETORIA FERTILITY CENTER

Suite M19 Pretoria East Hospital, Pretoria - Gauteng

Phone 012 998 8854/5
 Fax 012 998 8856
 Email info@ptafertilitycen.co.za
 Website www.ptafertility.co.za
 Clinicians Dr MA Trouw
 Embryologists Ms Elsie Mc Donald, Ms Linmarié Venter
 Nurses Sr Lizette White, Sr Rhynette van Rensburg

REPRODUCTIVE MEDICINE UNIT GROOTE SCHUUR HOSPITAL

Department of Obstetrics & Gynaecology,

Groote Schuur Hospital and Faculty of Health Sciences, UCT
 Maternity Building F Floor, Observatory, 7925 - Western Cape

Phone 021 404 6027/8
 Fax 021 404 6016
 Email obs-infertility@uct.ac.za
 Clinicians Prof S Dyer, Dr M Patel, Dr M Matjila, Dr L Walmsley, Prof Z van der Spuy
 Embryologists Mrs M Vienings, Ms L Cindi, Ms B Wager

TYGERBERG HOSPITAL FERTILITY CLINIC

Department of Obstetrics & Gynaecology, 3rd Floor, Green Avenue, Room 29

Tygerberg Hospitaal, Francie Van Zijl Drive, Parow 7505

Phone 021 938 5487
 Fax 086 471 4827
 Email tygerberg.fc@gmail.com
 Clinicians Dr T Matsaseng, Dr S Norsaka
 Embryologists Dr ML Windt de Beer, Ms E Erasmus, D Pillay, R Burger

SANDTON FERTILITY CENTRE

13 Scott Street, Waverley, Johannesburg - Gauteng

Centre of Advanced Medicine

South Campus, 2nd Floor

Phone 011 883 1776, 0861 442 211
 Fax 011 784 6886
 Email info@sandtonfertility.com
 Website www.sandtonfertility.com
 Clinicians Dr GH Mohamed, Dr M Faesen, Dr R Patel
 Embryologists Sacide Karadasli
 Nurses Sr Iris Davids

VITALAB FERTILITY UNIT

Inner Circle, 159 Rivonia Road, Morningside, Sandton - Gauteng

Phone 011 911 4700

Fax 011 911 4744

Email stephanv@vitalab.com

Website www.vitalab.com

Clinicians Dr Stephan Volschenk & Partners, Dr MJ Jacobson, Dr L Gobetz, Dr C Venter,
Dr Unterslak

Embryologists Jeandri Roos, Jenna Jardim, Chantel Gouveia, Elina Romaine, Gloria Randani

Nurses Sr Anne Hacking, Sr Joy Lawrence, Sr Veli Maseko, Sr Catharine Maema,
Sr Esme Willians

WIJNLAND FERTILITY

9 Oewerpark, Die Boord, Stellenbosch

Phone 021 882 9666

Fax 086 566 1701

Email info@wijnlandfertility.co.za

Website www.wijnlandfertility.co.za

Clinicians Dr Johannes van Waart, Dr Paul Dalmeyer, Dr Candice J Morrison

Embryologists Lydia Els-Smit, Birgit Wager

Nurses Anéll Prins, Celéste Louw, Andrea Hattingh

Psychologist Lizanne van Waart, Jana van der Walt

A. Grand totals and national coverage

Table 1. Total IVF, ICSI and oocyte donation (14 centres)

	N/%
Aspirations	4659
Fresh embryo transfers	3919
Pregnancies	1393
PR/aspiration	29.9%
PR/ET	35.5%

National Coverage ART cycles

Estimated need for ART: 1500 cycles/million population/year¹

South Africa: 4659 aspirations/51.8 million people²/year

= 90 aspirations/million people/year

Or

6% of estimated optimal ART coverage

References:

1. Collins, Hum Reprod Update 2002: 8, 265
2. Census 2011, Statistics South Africa (www.statssa.gov.za) (accessed May 2016)

B. IVF

Table 2. IVF: Procedures and pregnancies by age (Ten centres; Note: Three centres reported exclusively ICSI data) (Figures are numbers unless percentages specified).

IVF	< 35 y	35-39y	> 39y	Total
Cycles initiated	491	383	239	1113
Aspirations	491	376	225	1092
Aspirations with oocyte retrieval	462	356	207	1025
Cycles with ≥ 1 fertilised oocytes	443	339	195	977
Fresh embryo transfers	390	290	158	838
Pregnancies	139	74	38	251
Fertilization rate/aspirations with oocytes	95.9%	95.2%	94.2%	95.3%
PR/aspiration	28.3%	19.7%	16.9%	23.0%
PR/embryo transfer	35.6%	25.5%	24.1%	30.0%

Figure 1. IVF: Distribution (in percentages) of procedures and pregnancies by women's age.

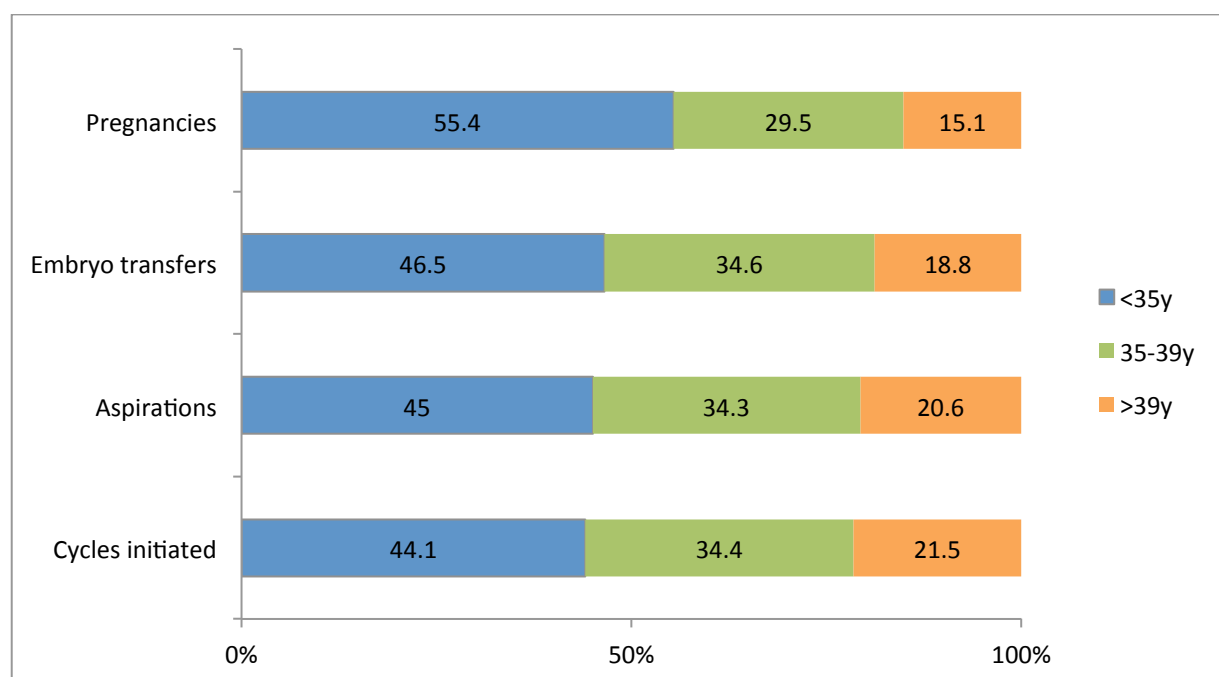


Table 3. IVF: Transfer cycles and pregnancies (in brackets) by number of embryos/blastocysts transferred and women's age (Nine centres). (Note: Pregnancy rates are only calculated for TF≥100).

IVF	<35 y		35-39y		>39 y		Total	
	TF (P)	PR	TF (P)	PR	TF (P)	PR (%)	TF (P)	PR
One								
Embryo	20 (4)	-	19 (4)	-	12 (0)	-	51 (8)	-
Blastocyst	41 (11)	-	39 (9)	-	25 (5)	-	105 (25)	23.8%
Total	61 (15)	-	58 (13)	-	37 (5)	-	156 (33)	21.2%
Two								
Embryos	45 (8)	-	35 (9)	-	26 (7)	-	106 (24)	22.6%
Blastocysts	207 (95)	45.9%	118 (34)	28.8%	45 (11)	-	370 (140)	37.8%
Total	252 (103)	40.9%	153 (43)	28.1%	71 (18)	-	476 (164)	34.5%
Three								
Embryos	44 (12)	-	48 (12)	-	25 (6)	-	117 (30)	25.6%
Blastocysts	13 (3)	-	13 (1)	-	13 (4)	-	39 (8)	-
Total	57 (15)	-	61 (13)	-	38 (10)	-	156 (38)	24.4%
≥ Four								
Embryos	4 (1)	-	12 (3)	-	7 (4)	-	23 (8)	-
Blastocysts	2 (1)	-	0	-	2 (0)	-	4 (1)	-
Total	6 (2)	-	12 (3)	-	9 (4)	-	27 (9)	-
Total								
Embryos	113 (25)	22.1%	114 (28)	24.6%	70 (17)	-	297 (70)	23.6%
Blastocysts	263 (110)	41.8%	170 (44)	25.9%	85 (20)	-	518 (174)	33.6%
Total	376 (135)	35.9%	284 (72)	25.4%	155 (37)	23.9%	815 (244)	29.9%
Mean No. embryos ¹	2.3		2.5		2.4		2.4	
Mean No. Blastocysts ¹	1.9		1.8		1.9		1.9	

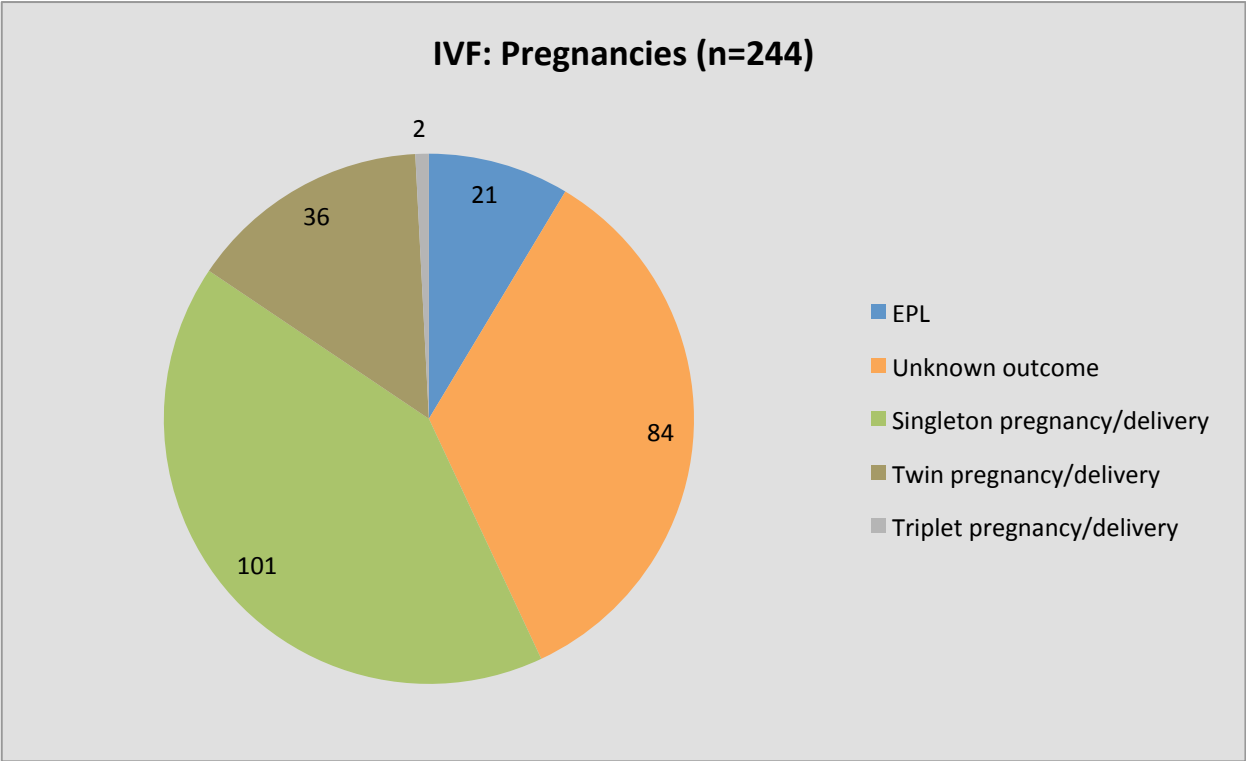
1. Refers to mean number of embryos/blastocysts replaced per transfer

Table 4. IVF: Outcome of pregnancies by women's age (Nine centres).

IVF	<35	35-39y	>39	Total
Transfer cycles	376	284	155	815
Pregnancies	135	72	37	244
Early pregnancy loss (EPL)				
Loss of IU pregnancy < 20 weeks	9	4	4	17
Ectopic pregnancy	1	3	0	4
Ongoing pregnancy				
Singleton	32	23	8	63
Twin	19	5	1	25
Triplet or more	0	0	0	0
Delivery ¹				
Singleton	25	10	3	38
Twin	9	1	1	11
Triplet or more	1	1	0	2
Outcome unknown ²	39	25	20	84
Singleton and multiple pregnancy or delivery				
Singleton	57	33	11	101
Twin	28	6	2	36
Triplet	1	1	0	2
Total	86	40	13	139
Rates				
EPL rate per all pregnancies	7.4%	9.7%	10.8%	8.6%
EPL rate per pregnancies with known outcome	10.4%	14.9%	23.5%	13.1%
Singleton pregnancy or delivery ³	66.3%	82.5%	84.6%	72.7%
Twin pregnancy or delivery ³	32.6%	15.0%	15.4%	25.9%
Triplet or more pregnancy or delivery ³	1.2%	2.5%	0.0%	1.4%
Pregnancy outcome unknown ⁴	28.9%	34.7%	54.1%	34.4%

1. Delivery is the event of a woman giving birth. A delivery of twins is counted as one delivery but two births.
2. Outcome unknown refers to all pregnancies with no information beyond establishment of a clinical pregnancy. It does *not* include ongoing pregnancies with one or more fetal heart beats.
3. Calculated as all ongoing pregnancies or deliveries with one, two, or three or more fetus(es)/baby(ies) over all ongoing pregnancies and deliveries
4. Calculated as pregnancies with unknown outcome over all pregnancies.

Figure 2. IVF: Pregnancy outcome (Nine centres) (Note: results presented in numbers not percentages).



C. ICSI

Table 5. ICSI: Procedures and pregnancies by women's age (Thirteen centres)

(Figures are numbers unless percentages indicated).

ICSI	< 35 y	35-39y	> 39y	Total
Cycles initiated	1094	731	476	2301
Aspirations	1079	719	463	2261
Aspirations with oocyte retrieval	1073	706	432	2211
Cycles with ≥ 1 fertilised oocytes	1038	666	395	2099
Fresh embryo transfers	943	614	365	1922
Pregnancies	373	185	82	640
Fertilisation-rate/aspirations with oocytes	96.7%	94.3%	91.4%	94.9%
PR/aspiration	34.6%	25.7%	17.7%	28.3%
PR/embryo transfer	39.6%	30.1%	22.5%	33.3%

Figure 3. ICSI: Distribution (in percentages) of procedures and pregnancies by women's age

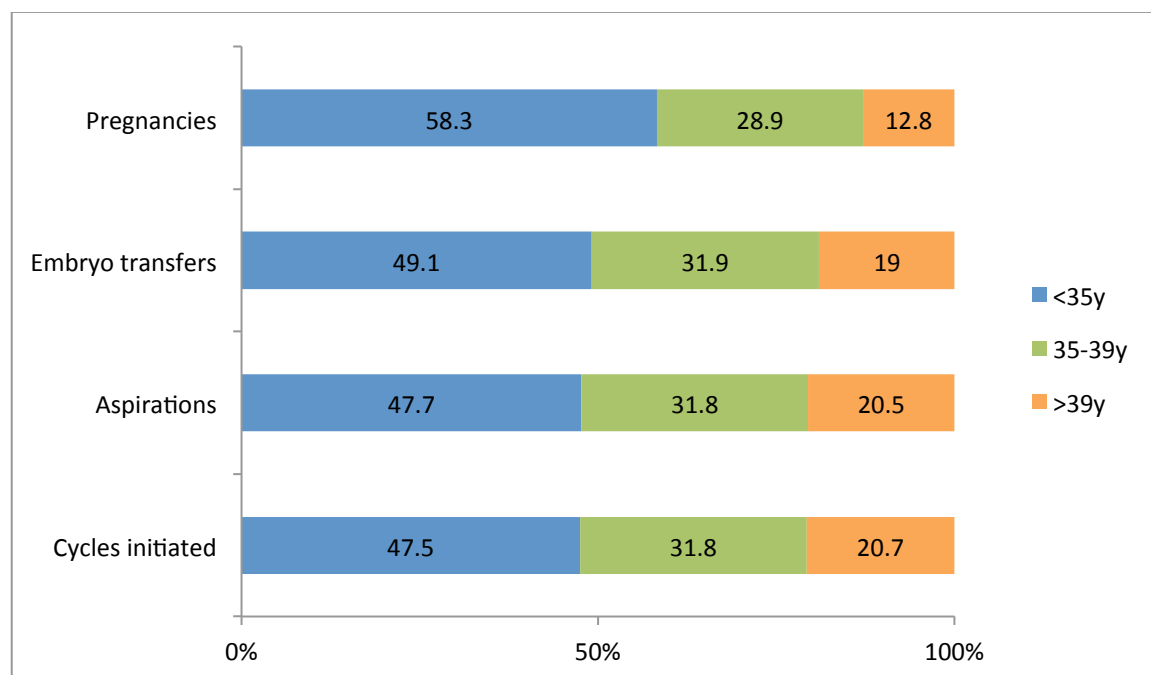


Table 6. ICSI: Transfer cycles and pregnancies (in brackets) by number of embryos/blastocysts transferred and women's age (Twelve Centres). (Note: Pregnancy rates are only calculated for TF≥100).

ICSI	<35 y		35-39y		>39 y		Total	
	TF (P)	PR	TF (P)	PR	TF (P)	PR	TF (P)	PR
One								
Embryo	50 (5)	-	54 (6)	-	40 (2)	-	144 (13)	9.0%
Blastocyst	48 (17)	-	58 (12)	-	19 (6)	-	125 (35)	28.0%
Total	98 (22)	-	112 (18)	16.1%	59 (8)	-	269 (48)	17.8%
Two								
Embryos	129 (46)	35.7%	118 (36)	30.5%	64 (11)	-	311 (93)	29.9%
Blastocysts	397 (176)	44.3%	185 (66)	35.7%	45 (14)	-	627 (256)	40.8%
Total	526 (222)	42.2%	303 (102)	33.7%	109 (25)	22.9%	938 (349)	37.2%
Three								
Embryos	131 (42)	32.1%	117 (38)	32.5%	104 (24)	23.1%	352 (104)	29.5%
Blastocysts	58 (33)	-	29 (13)	-	30 (11)	-	117 (57)	48.7%
Total	189 (75)	39.7%	146 (51)	34.9%	134 (35)	26.1%	469 (161)	34.3%
≥ Four								
Embryos	28 (6)		30 (6)		56 (13)		114 (25)	21.9%
Blastocysts	14 (8)		7 (2)		2 (0)		23 (10)	43.5%
Total	42 (14)		37 (8)		58 (13)		137 (35)	25.5%
Total								
Embryos	338 (99)	29.3%	319 (86)	27.0%	264(50)	18.9%	921 (235)	25.5%
Blastocysts	517 (234)	45.3%	279 (93)	33.3%	96(31)	32.3%	892 (358)	40.1%
Total	855 (333)	38.9%	598 (179)	29.9%	360(81)	22.5%	1813 (593)	32.7%
Mean No. Embryos ¹	2.4		2.4		2.7		2.5	
Mean No. Blastocysts ¹	2.1		1.9		2.2		2.0	

1. Mean number of embryos/blastocysts replaced per transfer

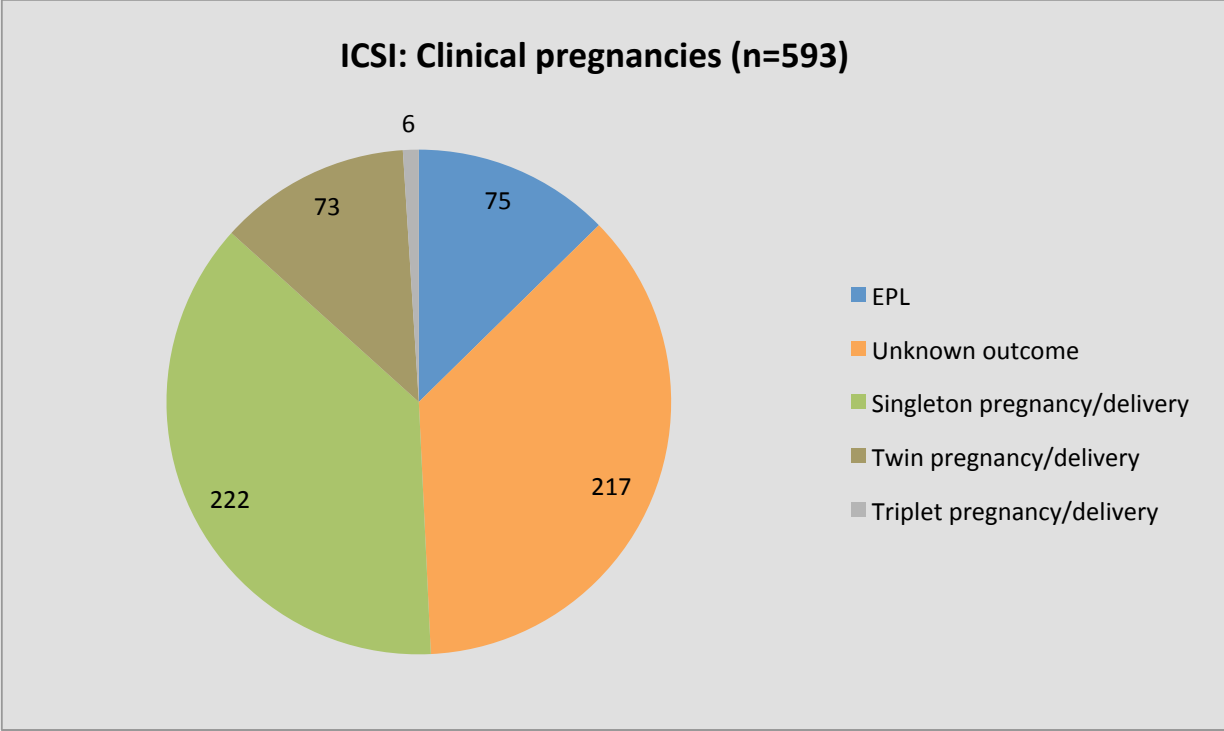
Table 7. ICSI: Outcome of pregnancies by women's age (Twelve centres).

ICSI	<35	35-39y	>39	Total
Transfer cycles	855	598	360	1813
Clinical pregnancies	333	179	81	593
Early Pregnancy Loss (EPL)				
Loss of IU pregnancy < 20 weeks	32	32	11	75
Ectopic pregnancy	0	0	0	0
Ongoing pregnancy				
Singleton	43	22	5	70
Twin	16	8	0	24
Triplet or more	2	0	0	2
Delivery				
Singleton	89	47	16	152
Twin	32	13	4	49
Triplet or more	3	1	0	4
Outcome unknown	116	56	45	217
Singleton and Multiple Pregnancy & Delivery				
Singleton	132	69	21	222
Twin	48	21	4	73
Triplet	5	1	0	6
Total	185	91	25	301
Rates				
EPL rate per all P with known outcome	14.7%	26.0%	30.6%	19.9%
Singleton pregnancy or delivery ¹	71.4%	75.8%	84.0%	73.8%
Twin pregnancy or delivery ¹	25.9%	23.1%	16.0%	24.3%
Triplet or more pregnancy or delivery ¹	2.7%	1.1%	0.0%	2.0%
P with outcome unknown	34.8%	31.3%	55.6%	36.6%

1. Calculated as all ongoing pregnancies and all deliveries in the category (one, two, or three or more) over all ongoing pregnancies and deliveries.

Figure 4. ICSI: Clinical pregnancy outcome. (Twelve centres)

(Note: results presented in numbers not percentages).



D. IVF and ICSI: Combined data

Figure 5. IVF and ICSI: Cause (in percentages) of infertility (Eight centres).

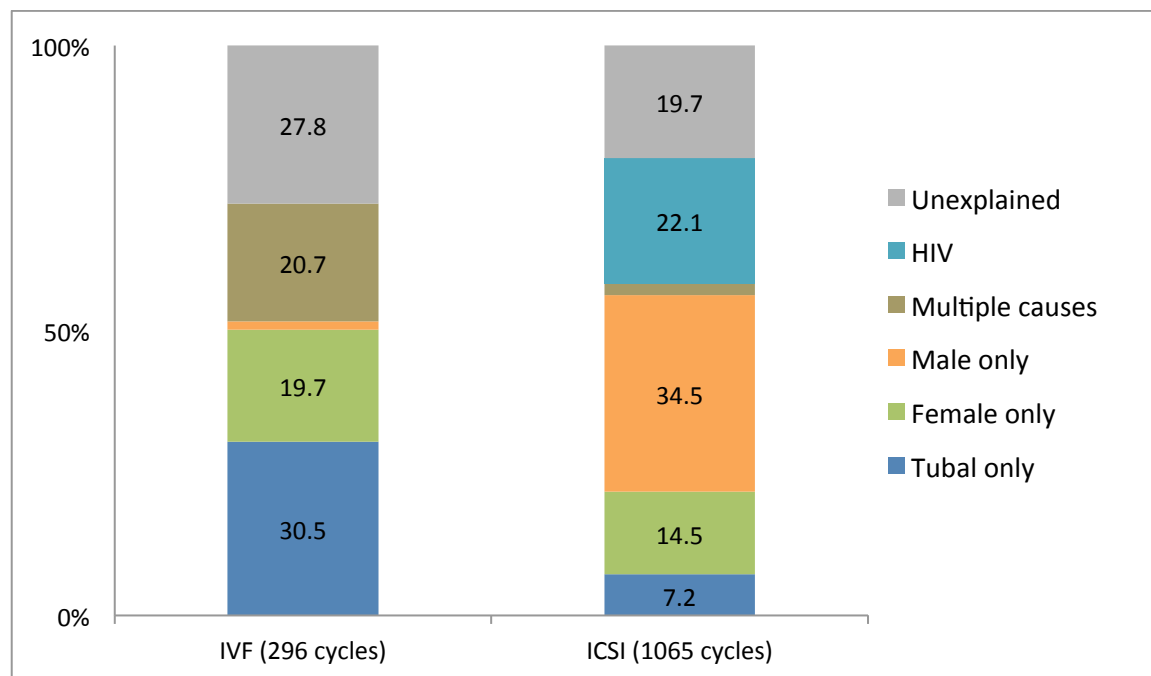


Table 8. IVF and ICSI: Ovarian stimulation (Six centres).

	IVF	ICSI	Total (N)	Total (%)
Agonist cycles & FSH/LH/HMG	66	237	303	24.7
Antagonist cycles & FSH/LH/HMG/Clomiphene	143	657	800	65.2
FSH/LH/HMG	0	0	0	0
Clomiphene +/- FSH/LH/HMG	55	47	102	8.3
Others	4	18	22	1.8
Total	268	959	1227	100

Figure 6a: Ovarian stimulation for IVF (Five Centres)

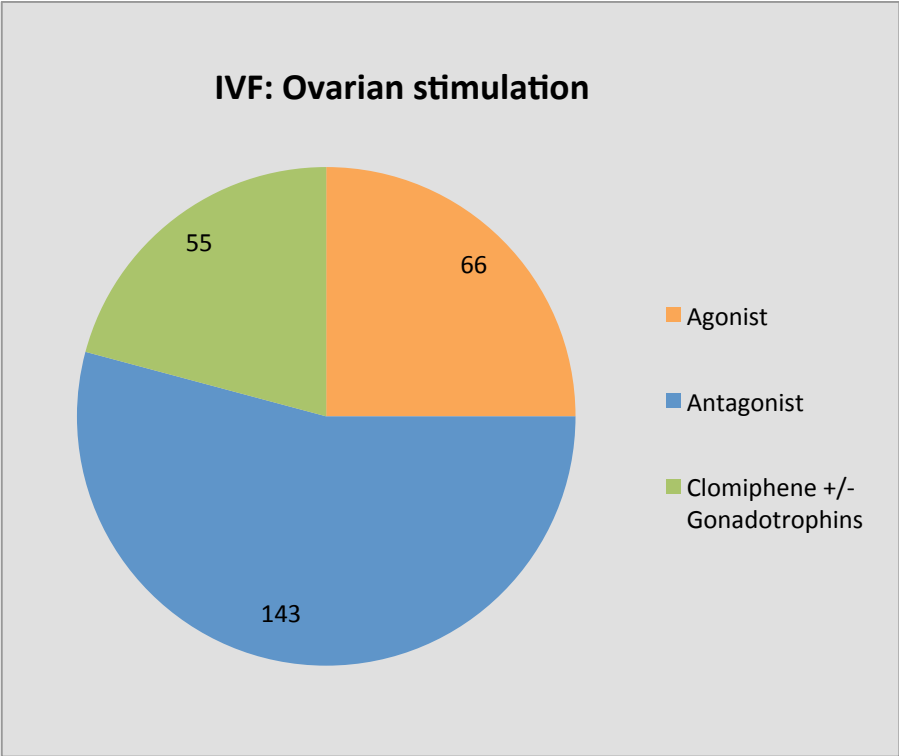


Figure 6b: Ovarian stimulation for ICSI (Six centres)

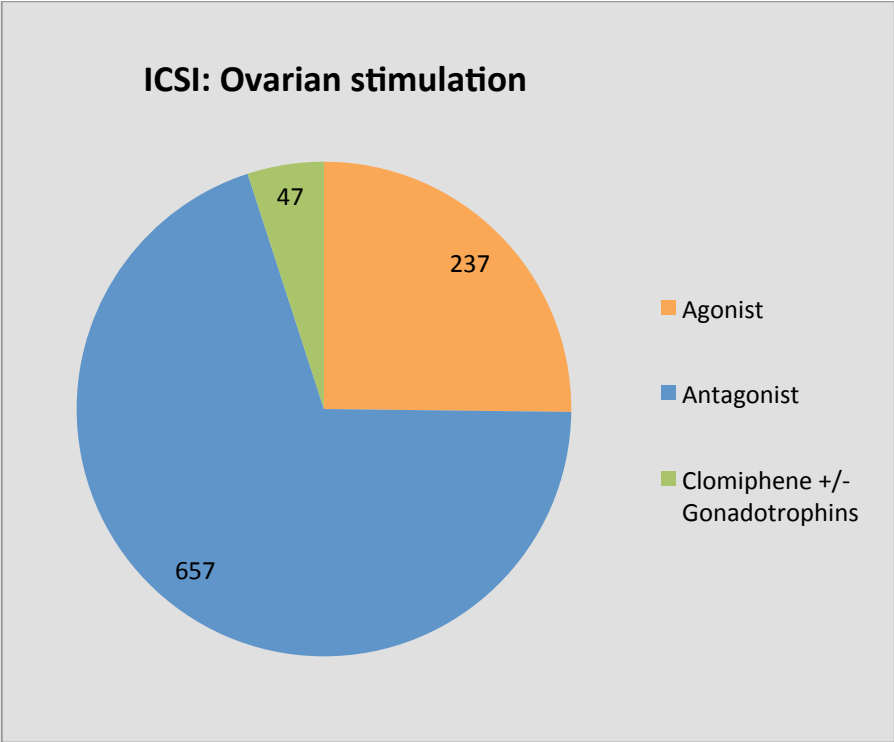


Figure 7. IVF and ICSI: Distribution of procedures and pregnancies (Thirteen centres).

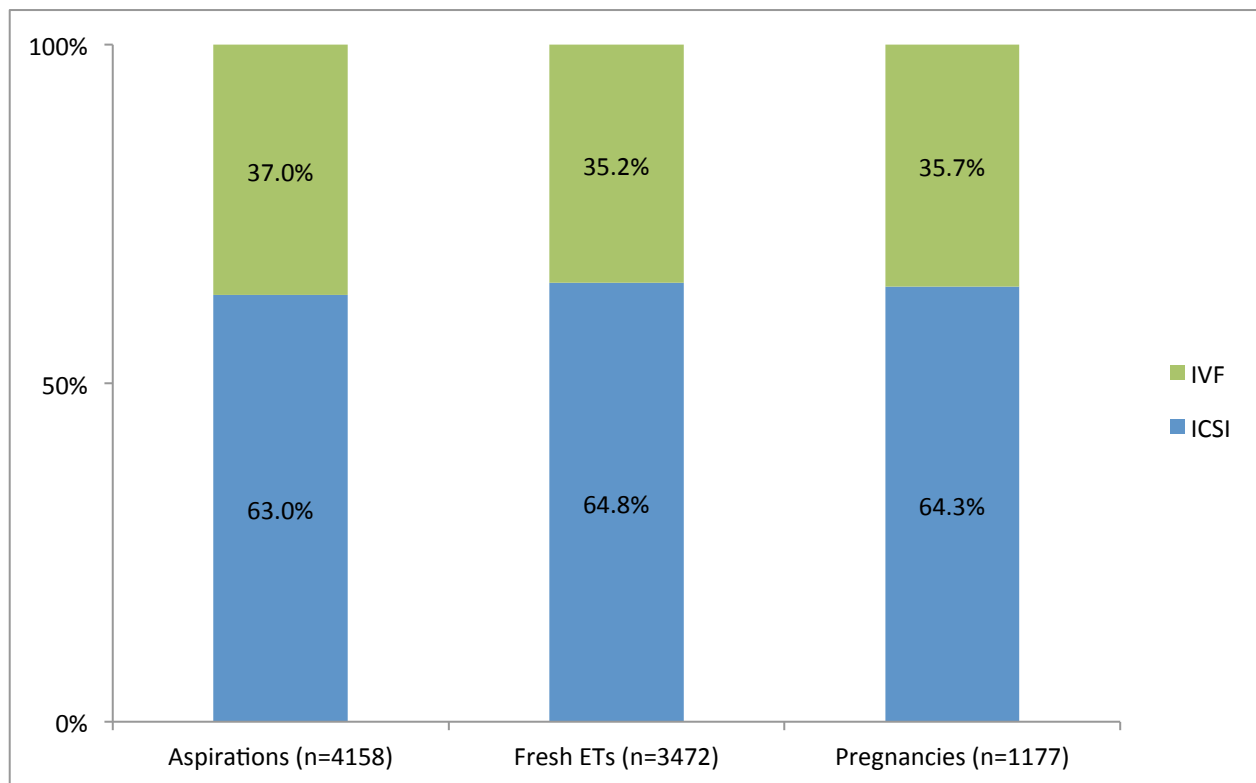
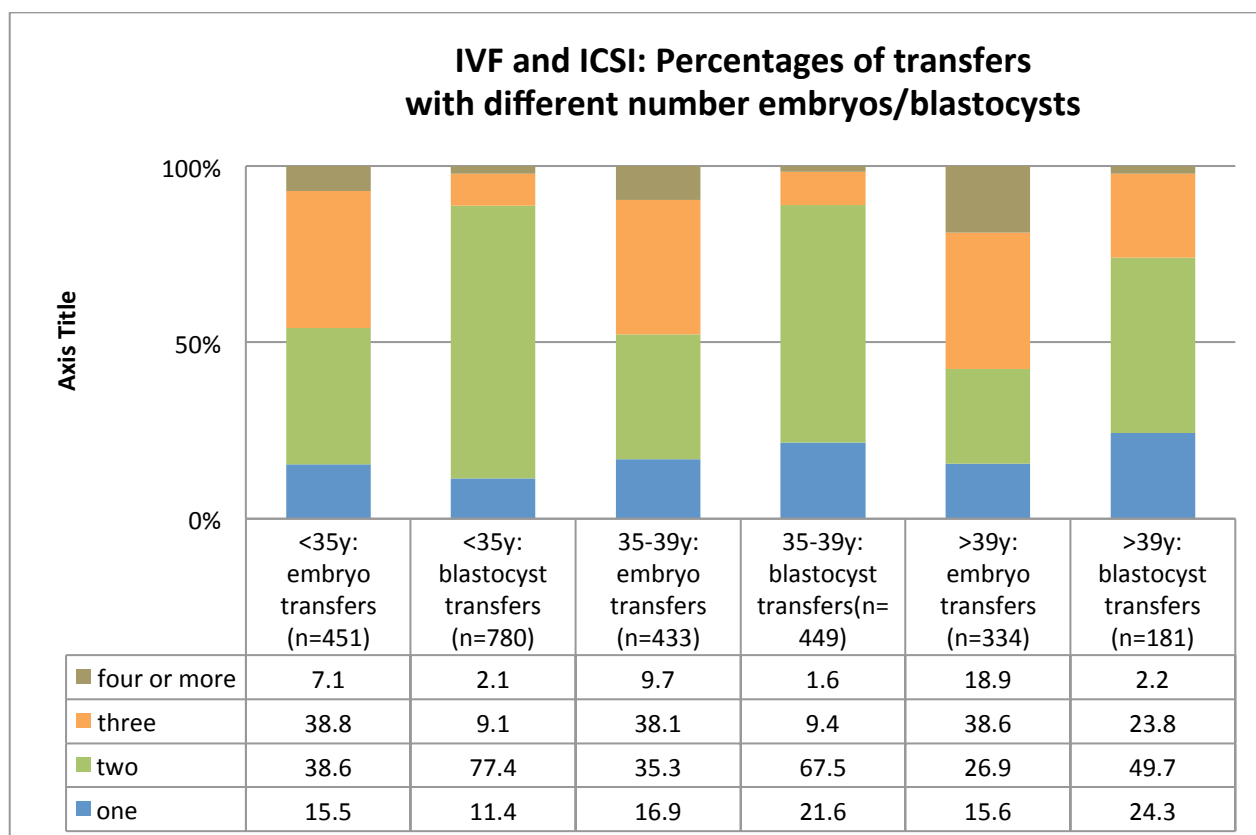


Figure 8. IVF and ICSI: Distribution of number of embryos and blastocysts transferred by women’s age (Twelve centres).



E. FROZEN EMBRYO TRANSFER

Table 9. Number of procedures and outcome of clinical pregnancies (Eleven centres of which ten reported pregnancy outcome).

FET	< 35 y	35-39y	> 39y	Total
Aspiration cycles resulting in embryo ¹ freezing				682
Cycles initiated	257	153	62	472
Cycles with embryos ¹ thawed	254	151	61	466
Embryo transfers ^{1,2}	239	136	56	431
Mean no. embryos transferred ¹	1.9	1.9	2.1	2.0
Transfer cycles with reported outcomes	225	128	56	409
Pregnancies (n)	71	25	16	125
Loss < 20 weeks	5	3	1	9
Outcome of P unknown	44	15	8	67
Ongoing pregnancy				
Singleton	11	1	3	15
Twin	5	3	0	8
Triplet or more	0	0	0	0
Delivery				0
Singleton	14	6	4	24
Twin	1	0	1	2
Triplet or more	0	1	0	1
Singleton and Multiple Pregnancy & Delivery				
Singleton	25	7	7	39
Twin	6	3	1	10
Triplet	0	1	0	1
Total	31	11	8	50
Rates				
PR per FET	31.6%	19.5%	28.6%	27.4%
EPL rate per all Ps with known outcome	18.5%	30.0%	12.5%	20.0%
Singleton pregnancy/delivery	80.6%	63.6%	87.5%	78.0%
Multiple pregnancy/delivery	19.4%	36.4%	12.5%	22.0%

1. Comprises both embryos and blastocysts.
2. 88.8% of transfers were blastocyst transfers.

F. OOCYTE DONATION

Table 10. Oocyte donation overview (Nine centres) (Note: 97.2% of all aspirations were in donors below age 35, hence numbers are not stratified by age of donor) .

Oocyte donation cycles	N/%
Cycles initiated	514
Aspirations	501
Aspirations with oocyte retrieval	499
Cycles with fertilisation by ICSI (%)	65.3%
Embryo transfers	447
Pregnancies	216
PR/aspiration	43.1%
PR/transfer	48.3%

Table 11. Fresh oocyte donation: Pregnancy outcome by age of recipient (Nine centres) Note: Table 11 is missing data from table 10 comprising 31 embryo transfers and 20 pregnancies. (Fields are blank if numbers too small for analysis).

Oocyte donation	< 35 y	35-39y	> 39y	Total
Embryo transfers ¹	45	80	291	416
Mean no. embryos transferred ¹				2.0
Pregnancies	22	35	139	196
PR/transfer	-	-	-	47.1%
Loss < 20 weeks	1	5	18	24
Outcome of P unknown	4	5	28	37
Ongoing pregnancy				
Singleton	2	6	28	36
Twin	3	2	11	16
Triplet or more	0	0	1	1
Delivery				
Singleton	8	14	36	58
Twin	3	3	17	23
Triplet or more	1	0	0	1
Singleton and Multiple Pregnancy & Delivery				
Singleton	10	20	64	94
Twin	6	5	28	39
Triplet	1	0	1	2
Total	17	25	93	135
Rates				
EPL rate ²	-	-	16.2%	15.1%
Singleton pregnancy/delivery	-	-	57.7%	59.1%
Multiple pregnancy/delivery	-	-	26.1%	25.8%

1. Comprises both embryos and blastocysts.

2. Calculated as all reported EPLs over all pregnancies minus pregnancies with unknown outcome.

Table 12. Frozen embryo transfer following oocyte donation by age of female recipient (Six centres).

FET: Oocyte donation	< 35 y	35-39y	> 39y	Total
Aspiration cycles resulting in embryo ¹ freezing				109
FET cycles initiated	9	9	64	82
Cycles with embryos ¹ thawed	9	9	63	81
Embryo transfers ^{1,2}	9	9	54	72
Pregnancies (n)	1	5	21	31
PR/FET				43.7%

1. Comprises both embryos and blastocysts.

H. OVERVIEW 2009-2013

Table 13. Procedures and outcomes for the years 2009 - 2013.

	2009	2010	2011	2012	2013
Total no. centres	12	14	15	13	14
Aspirations (Total)	4512	4923	5643	4991	4659
Fresh embryo transfers	3872	4319	4802	4193	3919
Mean number of embryos ¹ transferred					
Fresh non-donor IVF				1.9	2.1
Fresh non-donor ICSI				2.1	2.1
Multiple pregnancy rate (autologous IVF and ICSI ²)				14.4%	26.6%
Pregnancies	1303	1595	1794	1567	1393
PR/aspiration					
PR/aspiration IVF	31.9%	30.8%	30.2%	28.2%	23.0%
PR/aspiration ICSI	27.9%	32.3%	30.7%	27.8%	28.3%
PR/aspiration OD	-	-	42%	41.6%	43.1%
PR/fresh embryo transfer					
PR/ET IVF	38.5%	36.8%	36.5%	35.5%	30.0%
PR/ET ICSI	32.2%	36.5%	36.5%	34.3%	33.3%
PR/ET OD	-		43.3%	45.9%	47.1%
ICSI: Percentage of fresh ETs	63.2%	68.3%	70.1%	71.3%	64.8%
Frozen non-donor transfers				541	431
PR/non donor FET				29.6%	27.4%

1. Comprises both embryos and blastocysts

2. Calculated as all multiple pregnancies over all pregnancies in which number of fetuses/babies per pregnancy reported