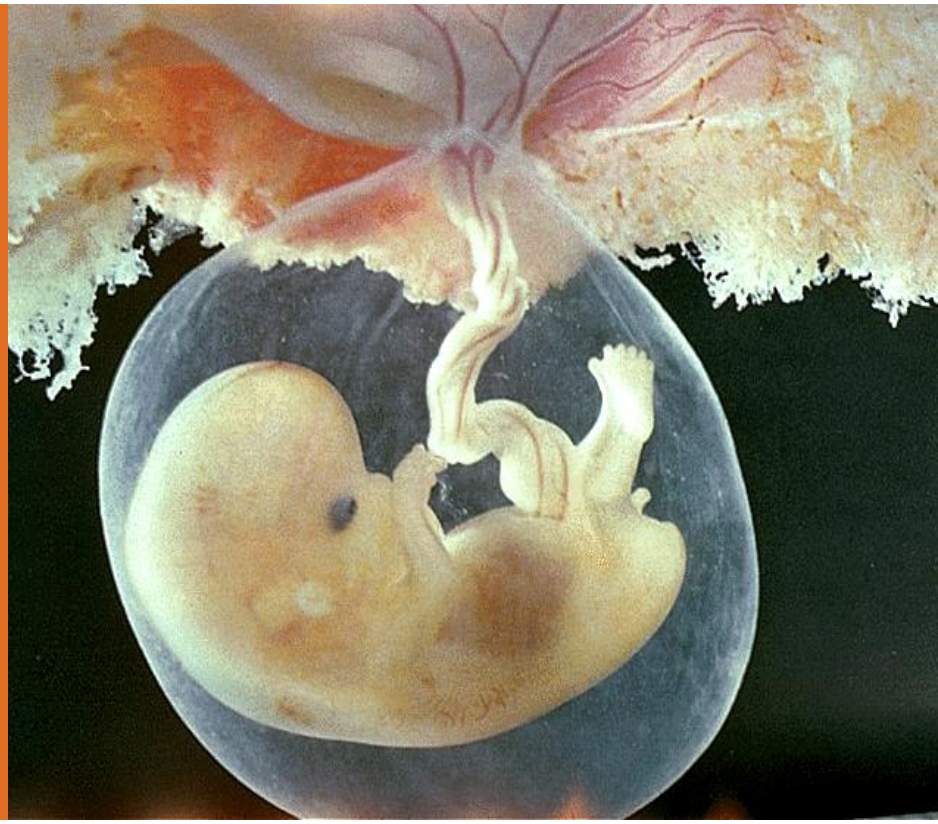
Canadian Assisted Reproductive Technologies Register Plus (CARTR Plus)



Canadian Fertility and Andrology Society

67th Annual Meeting - Vancouver

September 23 – 25, 2021

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List of abbreviations

CS	Cycle start
RET	Oocyte retrieval
ET	Embryo transfer
IVF	In vitro fertilization
FET	Frozen embryo transfer
PGT-A/PGT-M	Preimplantation Genetic Testing for Aneuploidy/Monogenic (Single Gene) Diseases
IVM	In vitro maturation
OHSS	Ovarian hyperstimulation syndrome
eSET	Elective single embryo transfer
neSET	Non-elective single embryo transfer
eDET	Elective double embryo transfer
neDET	Non-elective double embryo transfer

Disclaimer

- This report is based on data submitted by assisted reproductive technology clinics from across Canada to the CARTR Plus database. Although significant effort has been made to ensure the accuracy of the information presented in this report, neither the authors nor BORN Ontario nor any other parties make any representation or warranties as to the accuracy, reliability or completeness of the information contained herein.
- Permission is granted for the reproduction of these materials solely for non-commercial and educational purposes.

Suggested citations

Canadian Assisted Reproductive Technologies Registry (CARTR) Plus. Final treatment cycle and pregnancy outcome data for 2019. Better Outcomes Registry & Network Ontario. Ottawa ON, September 2021.

Canadian Assisted Reproductive Technologies Registry (CARTR) Plus. Preliminary treatment cycle data for 2020. Better Outcomes Registry & Network Ontario. Ottawa ON, September 2021.

Notes

- **Ontario data current as of March 2021; Rest of Canada data current as of June 2021**

- **Treatment cycle outcomes for 2020 cycle starts**
  - Based on 36 clinics

- **Birth outcomes for 2019 cycle starts**
  - Based on 36 clinics

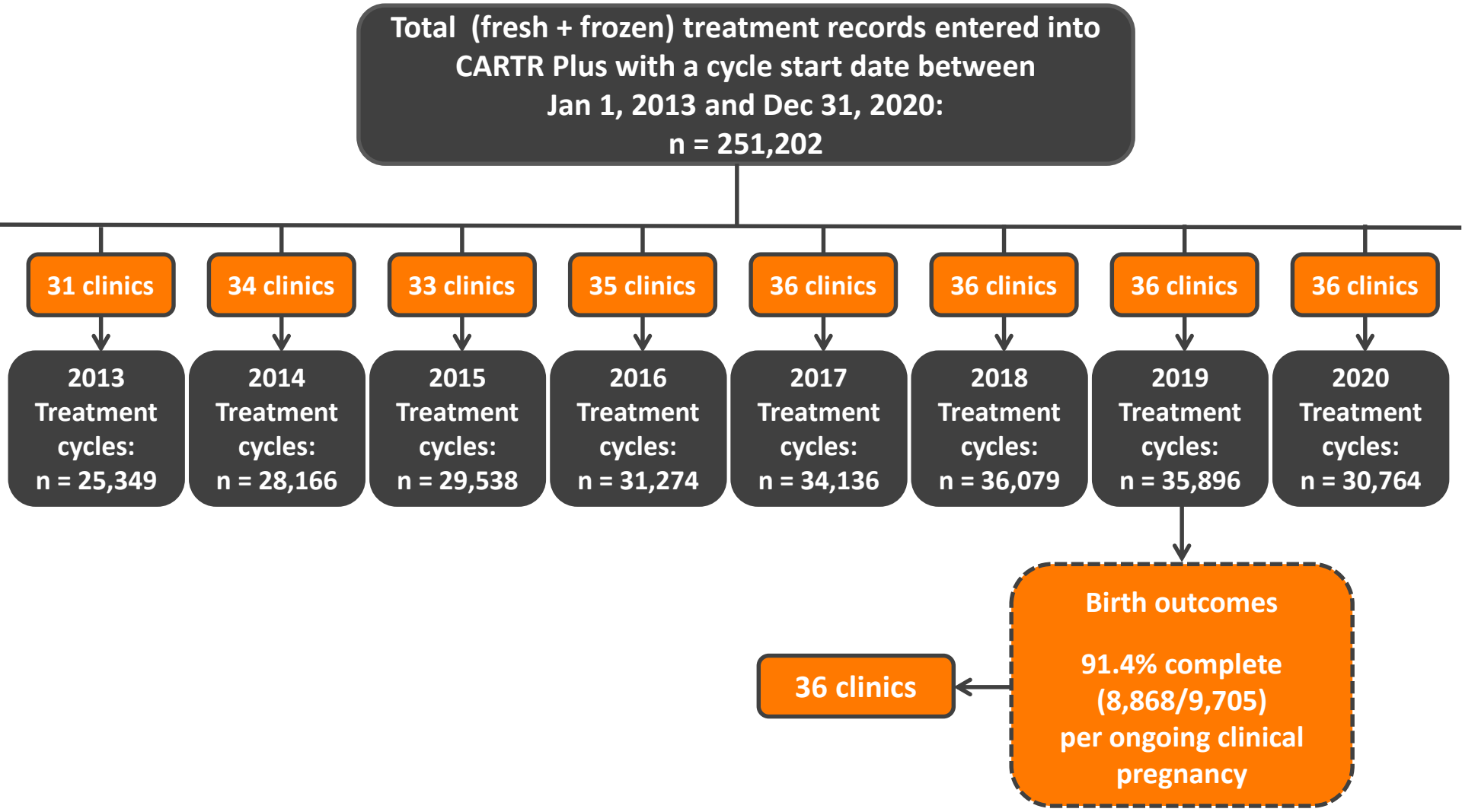
Notes

- These slides present descriptive estimates on which no formal statistical tests have been carried out; therefore, differences across treatment cycles, patient characteristics or embryo transfer characteristics may not be statistically significant and should be interpreted cautiously
- Unless otherwise specified, denominators for birth outcomes are based on the pregnancy level

INTRODUCTION

All ART treatment cycles (fresh and frozen)

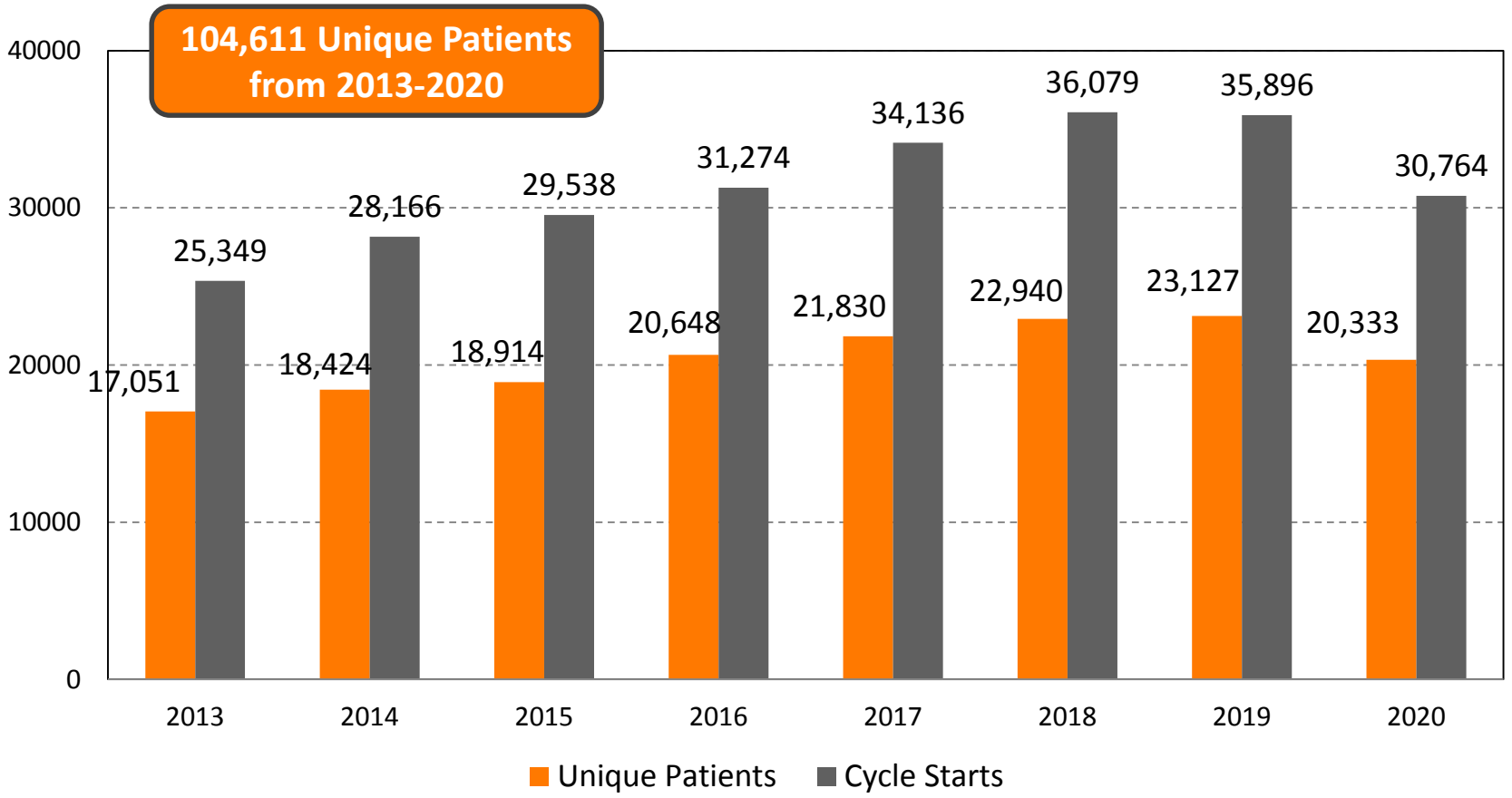
CARTR Plus records extracted June 2021



** Unacknowledged records were included if they were "submitted" or if they linked to an outcome*

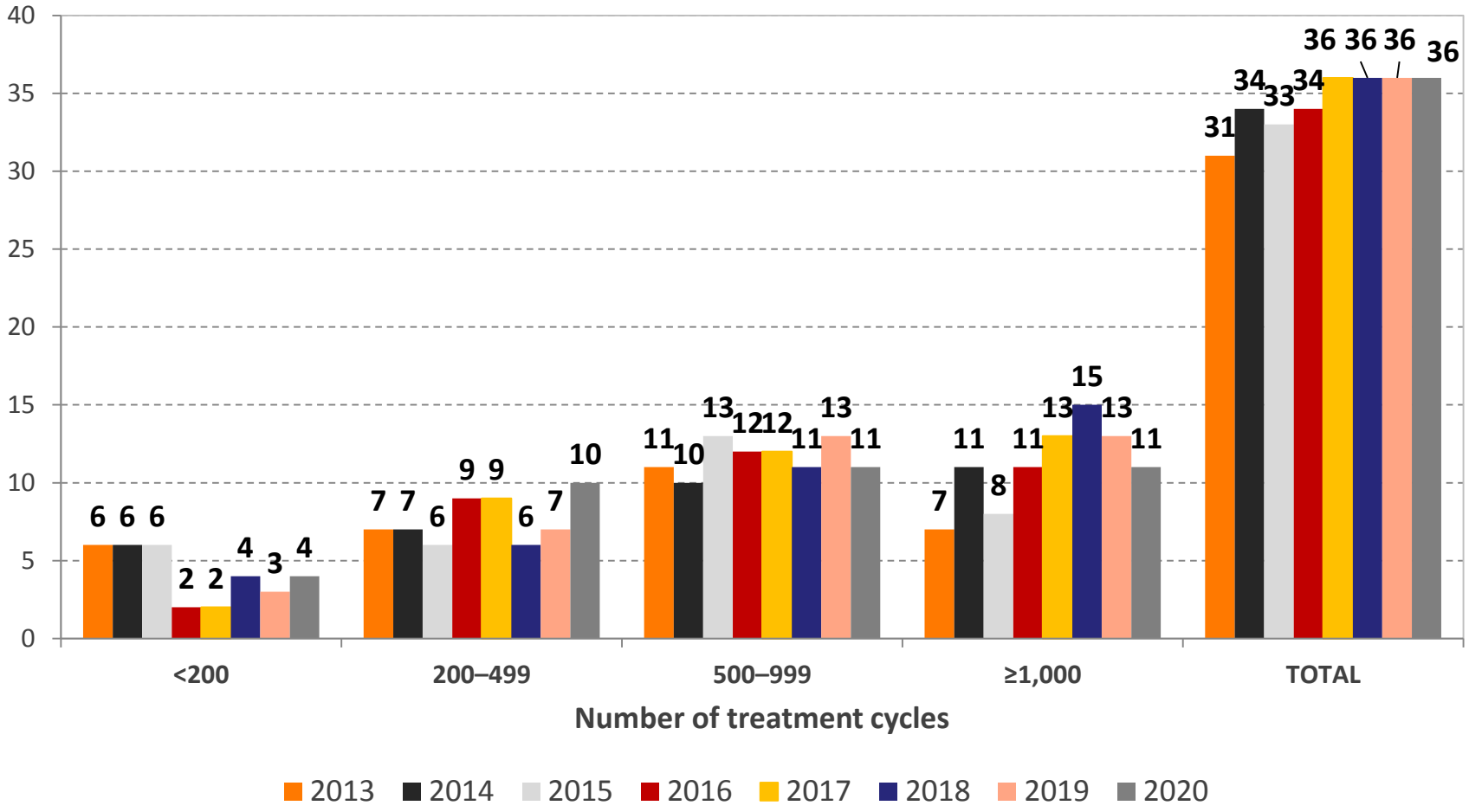
Number of unique patients over time

All ART treatment cycles



Volume of treatment cycles by clinic

All ART treatment cycles



CARTR Plus | Canadian Assisted Reproductive Technologies Register

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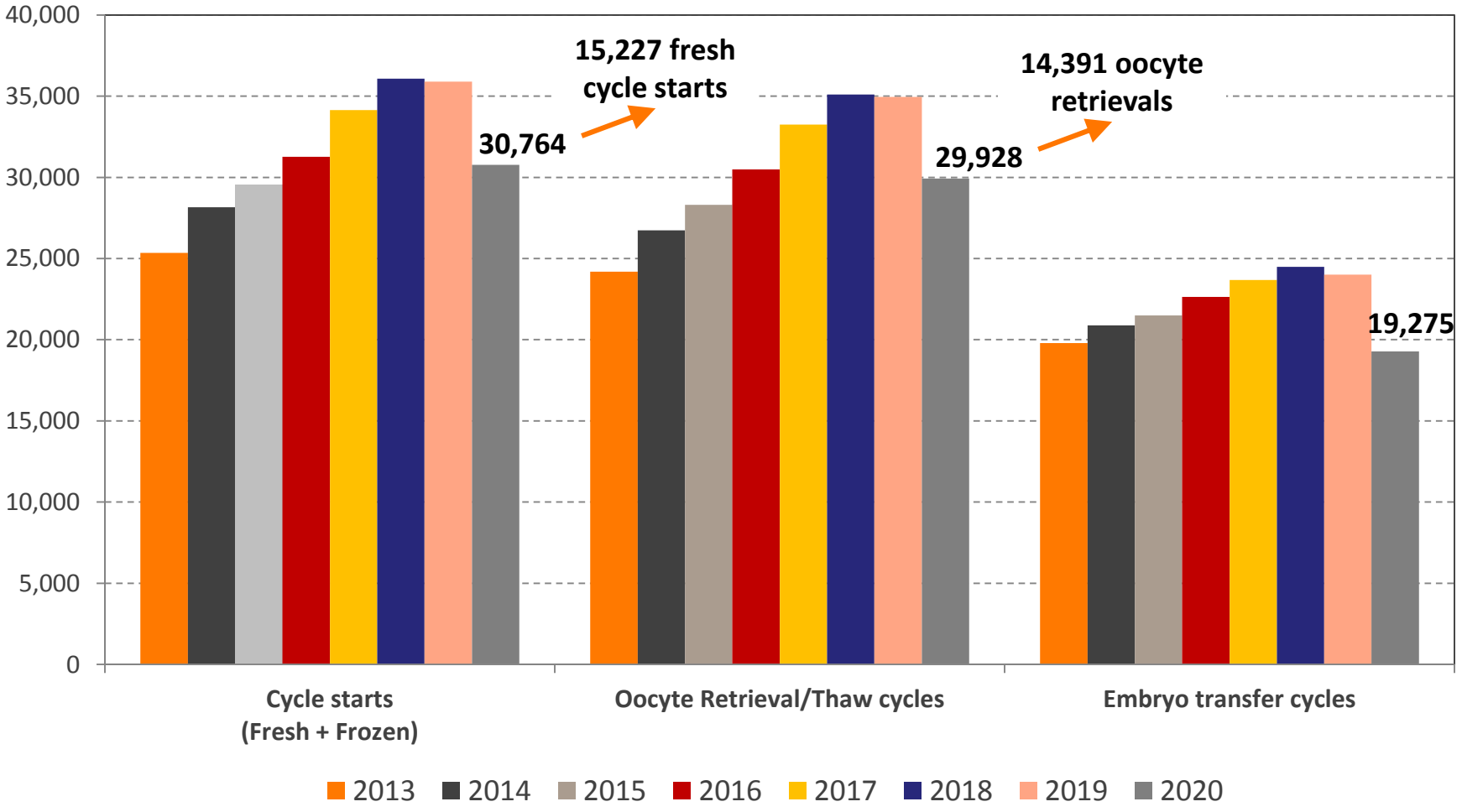
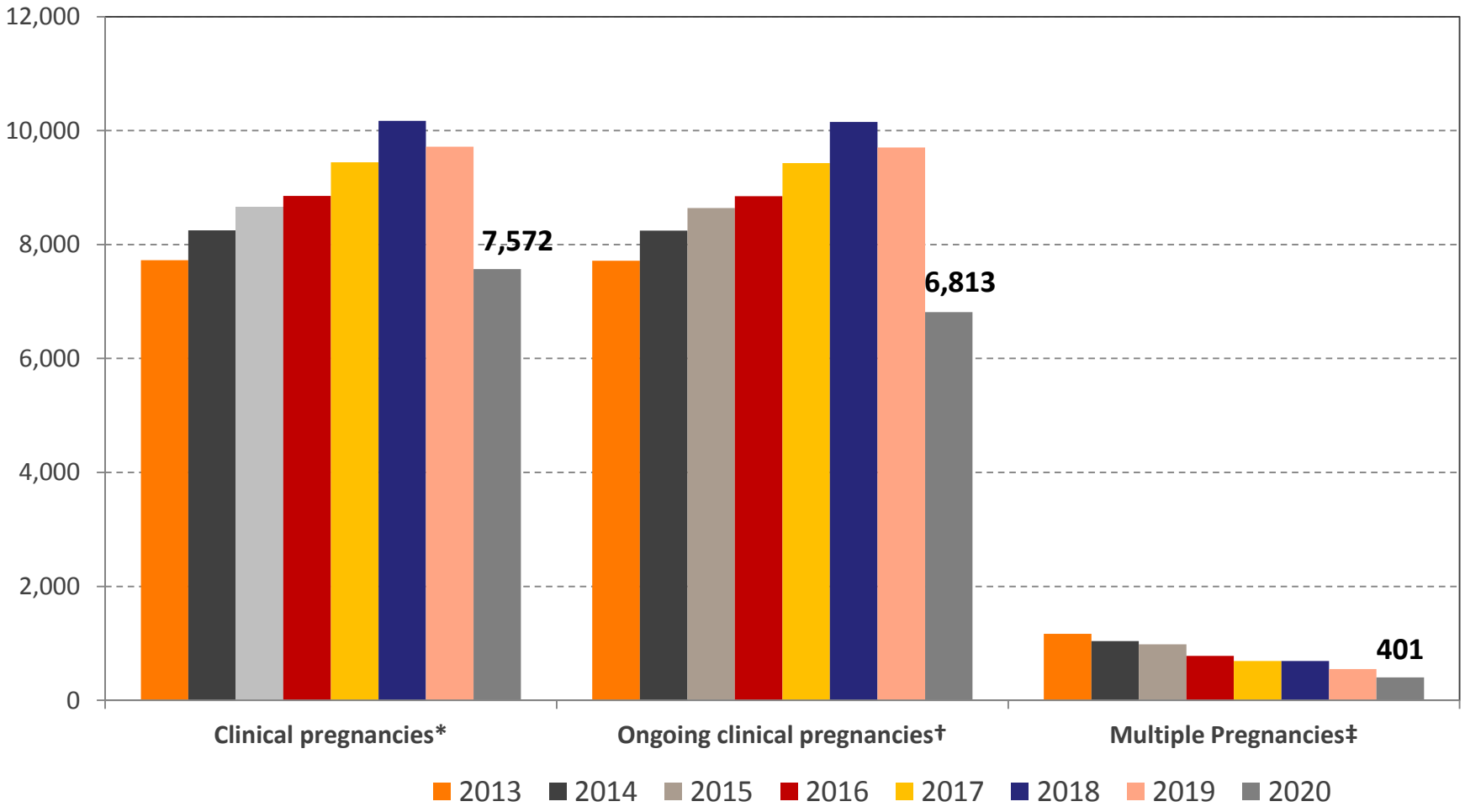
Number of cycles over time

All ART treatment cycles



Number of clinical pregnancies over time

All ART treatment cycles



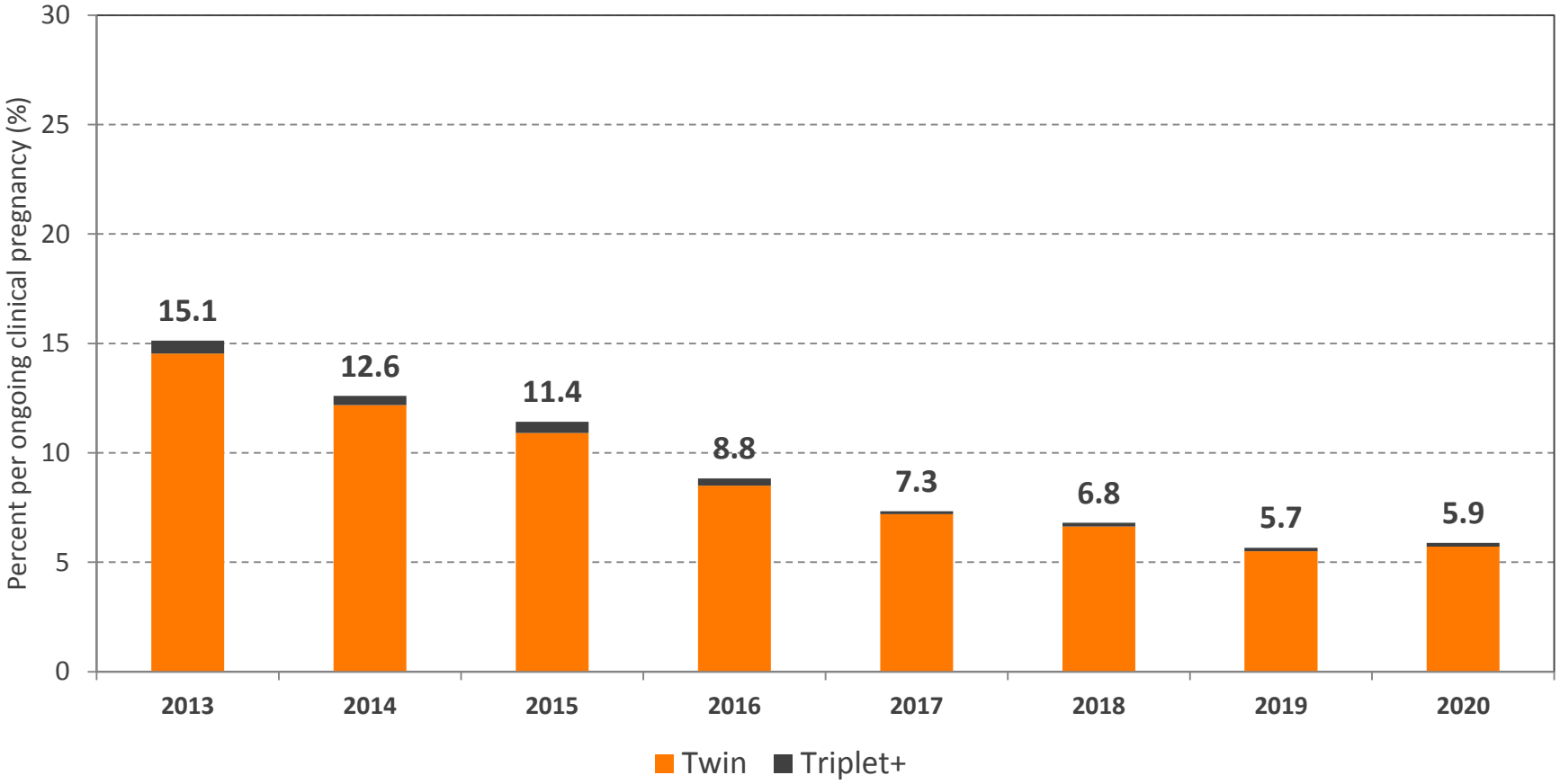
** Clinical pregnancy: clinical intrauterine, heterotopic, or ectopic pregnancy*

† Ongoing clinical pregnancy: clinical pregnancy with ≥1 fetal heart beat on ultrasound

‡ Multiple pregnancy: ongoing clinical pregnancy with >1 fetal heart beat on ultrasound

Percentage of multiple pregnancies over time

All ART treatment cycles



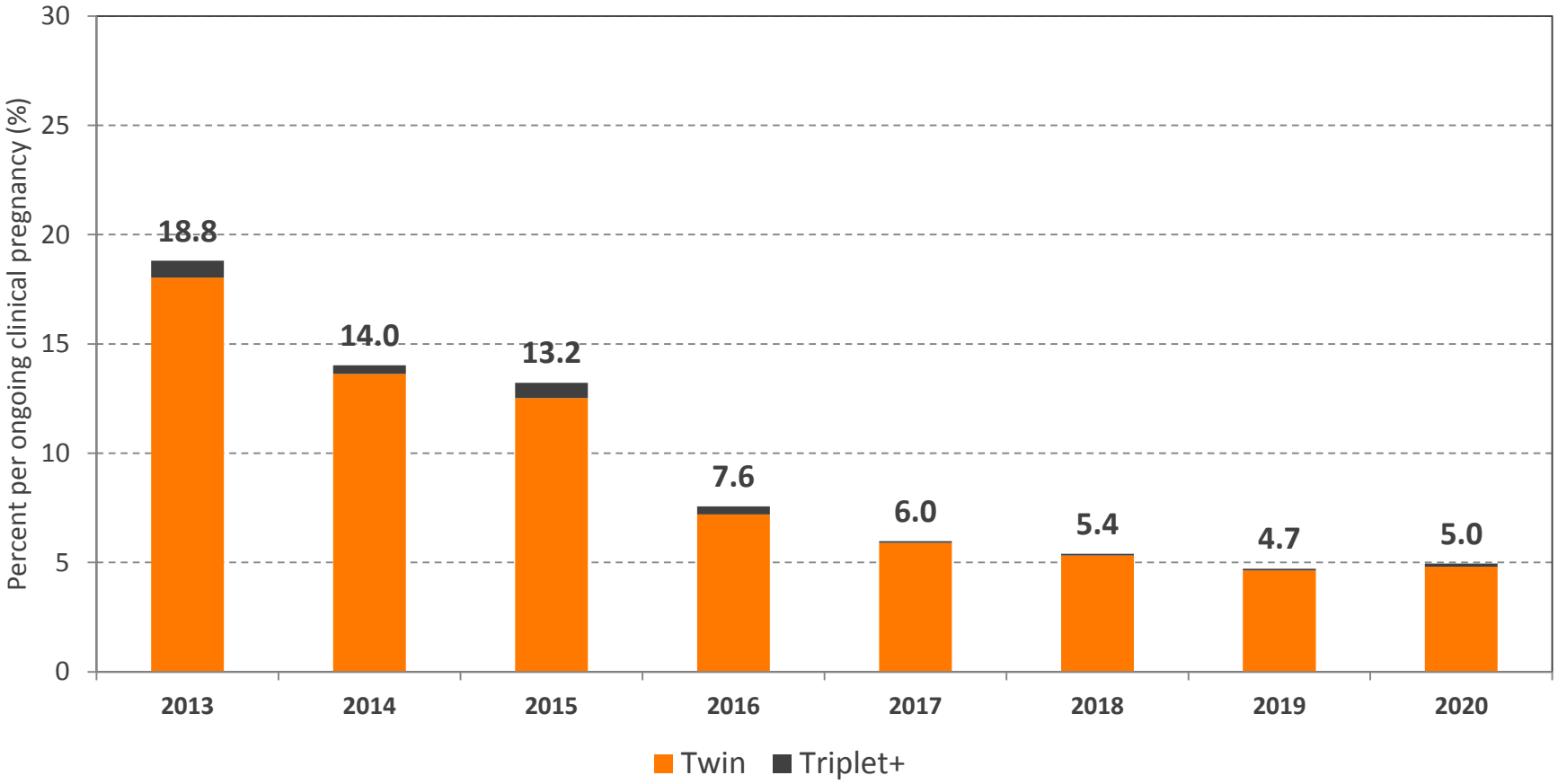
	2013	2014	2015	2016	2017	2018	2019	2020
Twin	1,122	1,005	943	752	679	674	534	389
Triplet +	45	34	44	29	12	17	16	12

** Ongoing clinical pregnancy: clinical pregnancy with ≥1 fetal heart beat on ultrasound*

† Multiple pregnancy: ongoing clinical pregnancy with >1 fetal heart beat on ultrasound

Percentage of multiple pregnancies in Ontario

All ART treatment cycles



	2013	2014	2015	2016	2017	2018	2019	2020
Twin	585	449	398	307	292	283	223	158
Triplet +	25	13	22	16	4	4	4	5

** Ongoing clinical pregnancy: clinical pregnancy with ≥1 fetal heart beat on ultrasound*

† Multiple pregnancy: ongoing clinical pregnancy with >1 fetal heart beat on ultrasound

Specialized services

All ART treatment cycles (fresh and frozen), 2020

Description	Number of cycles
Gestational carrier	457
PGT-A/PGT-M	7,643
Oocyte or embryo banking due to cancer treatment	386
Oocyte or embryo banking due to non-cancer/non-medical reasons	837
Any use of donor oocytes or embryos	2,353
Frozen oocyte IVF	479

Oocyte or embryo freezing for non-medical reasons

2013 – 2020

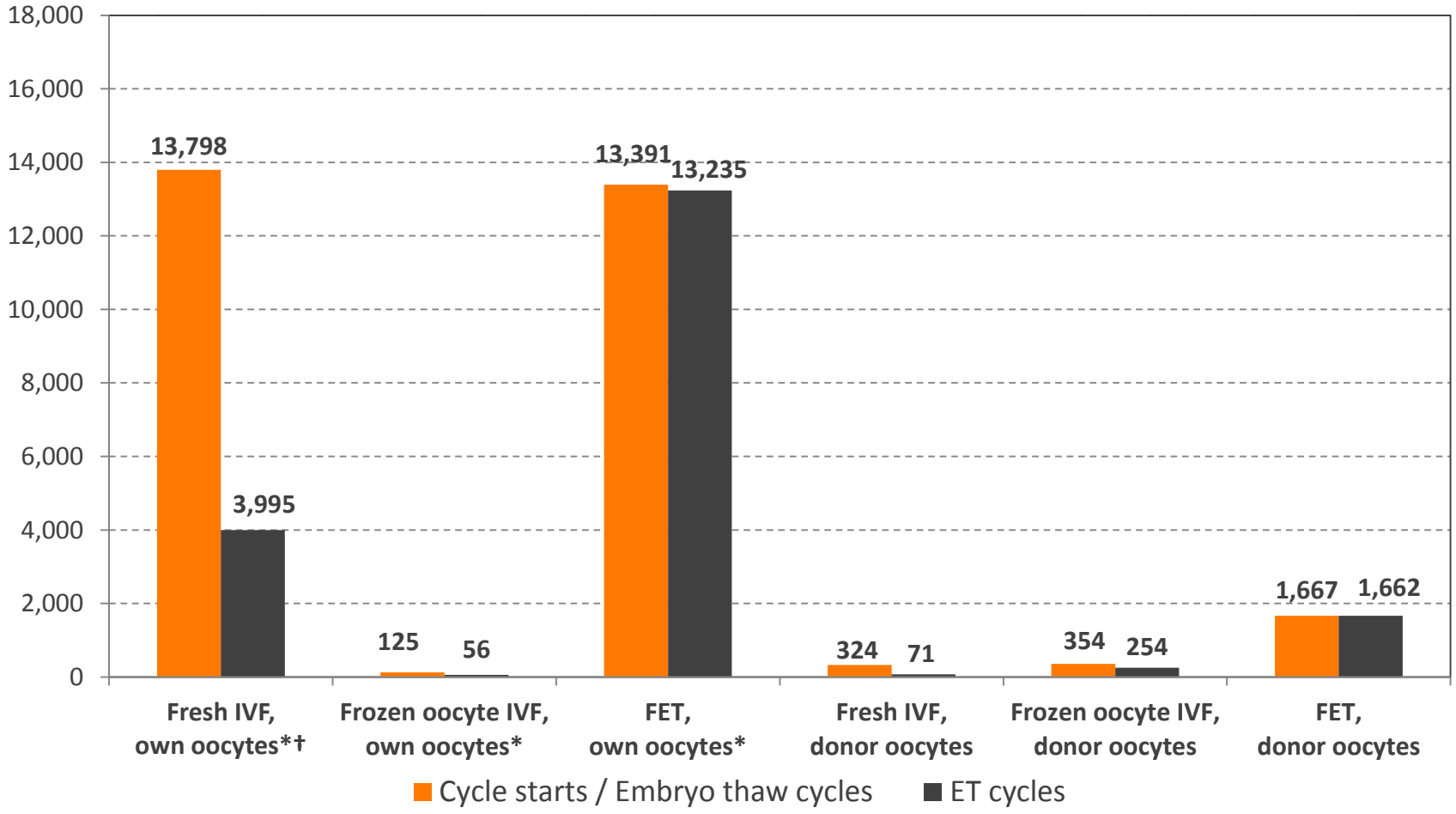
Year	Oocyte Freezing	Embryo Freezing
2013	94	40
2014	135	40
2015	204	80
2016	280	52
2017	357	64
2018	548	111
2019	642	109
2020	627	217
Overall	2,887	713

TREATMENT CYCLES FOR 2020

All ART treatment cycles (fresh and frozen)

Number of treatment cycles by type

2020

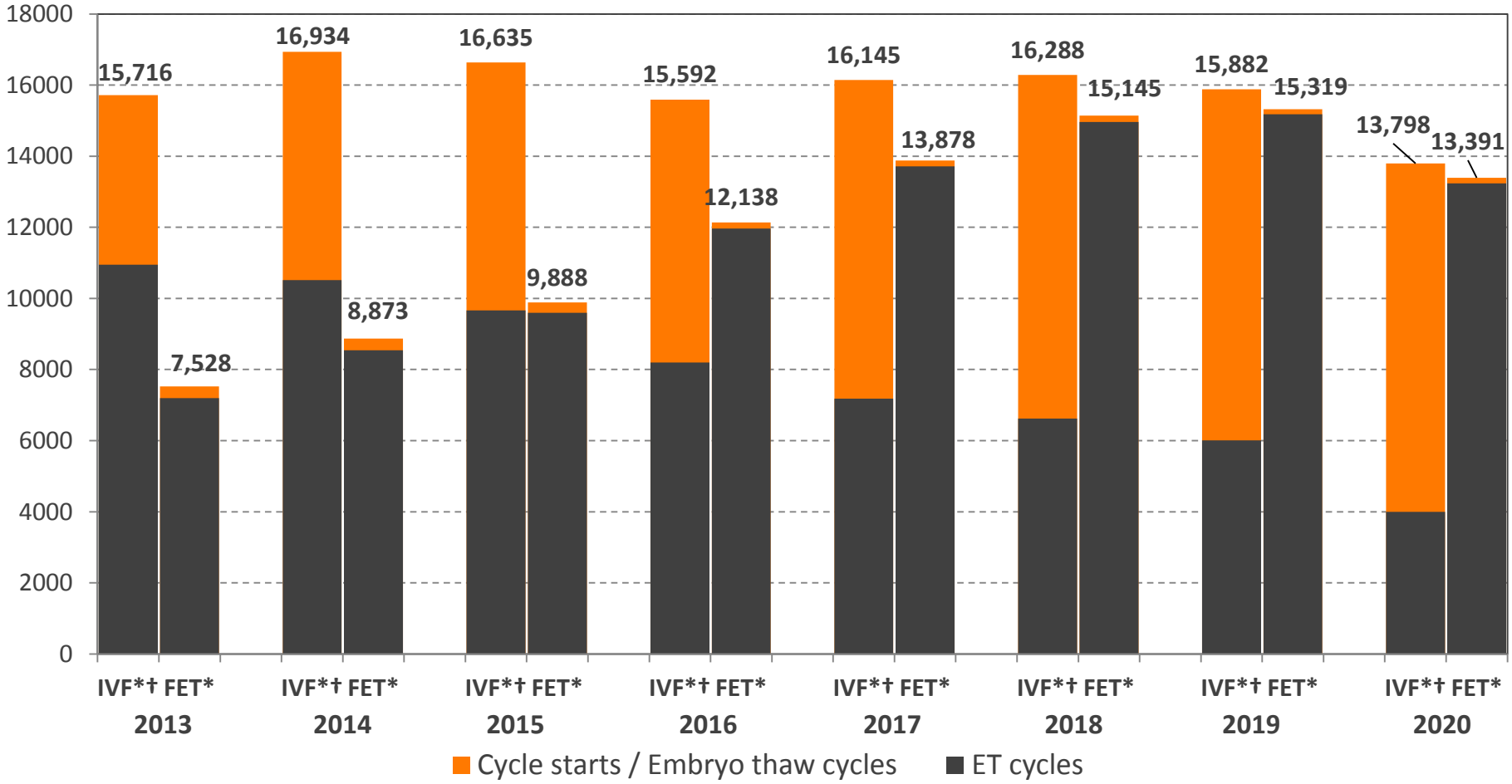


** Own oocytes exclusively*

† Includes Natural & Modified Natural IVF, own oocytes

Number of treatment cycles by year

IVF and FET – own oocytes, 2013 – 2020

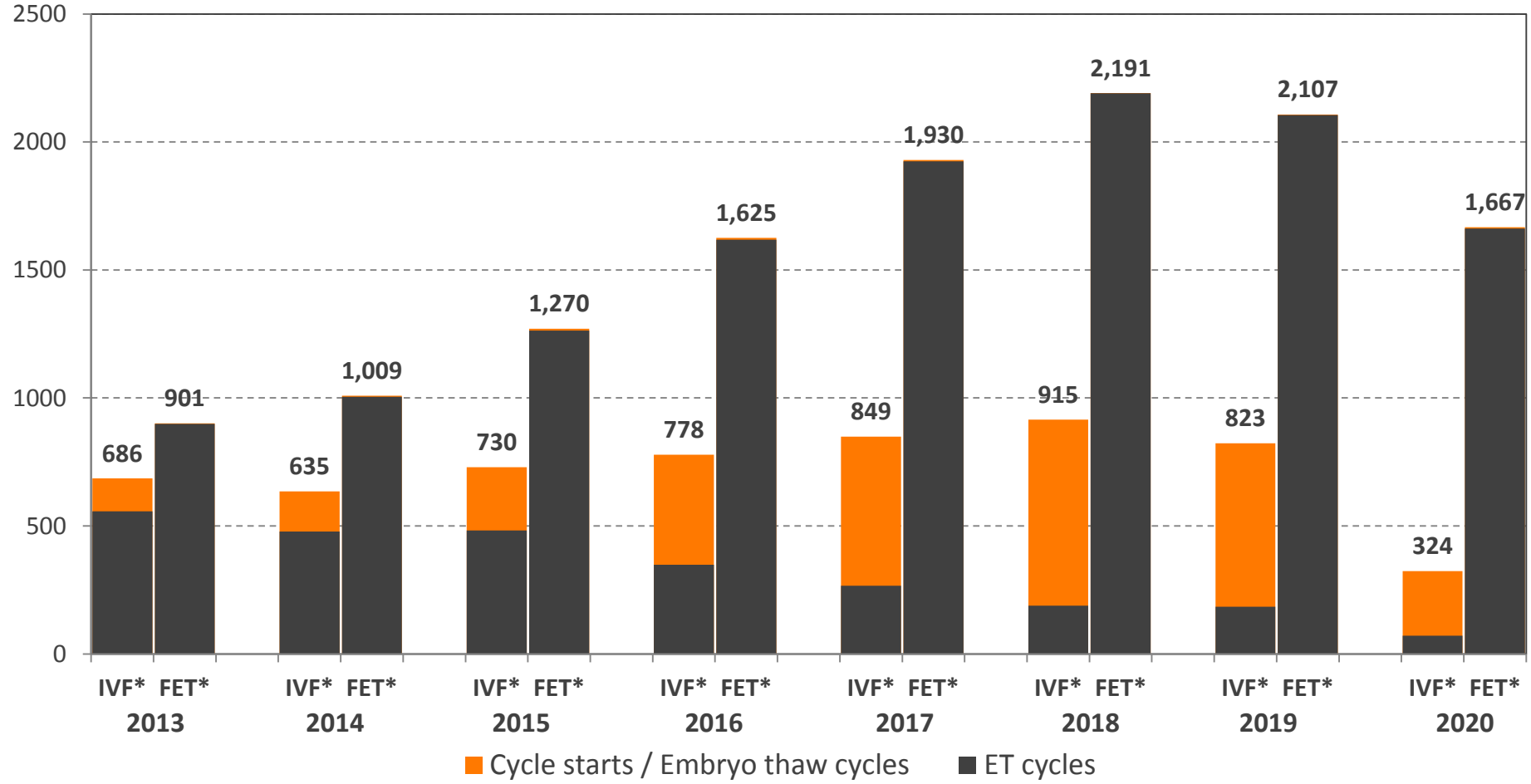


** Own oocytes exclusively*

† Includes Natural & Modified Natural IVF, own oocytes

Number of treatment cycles by year

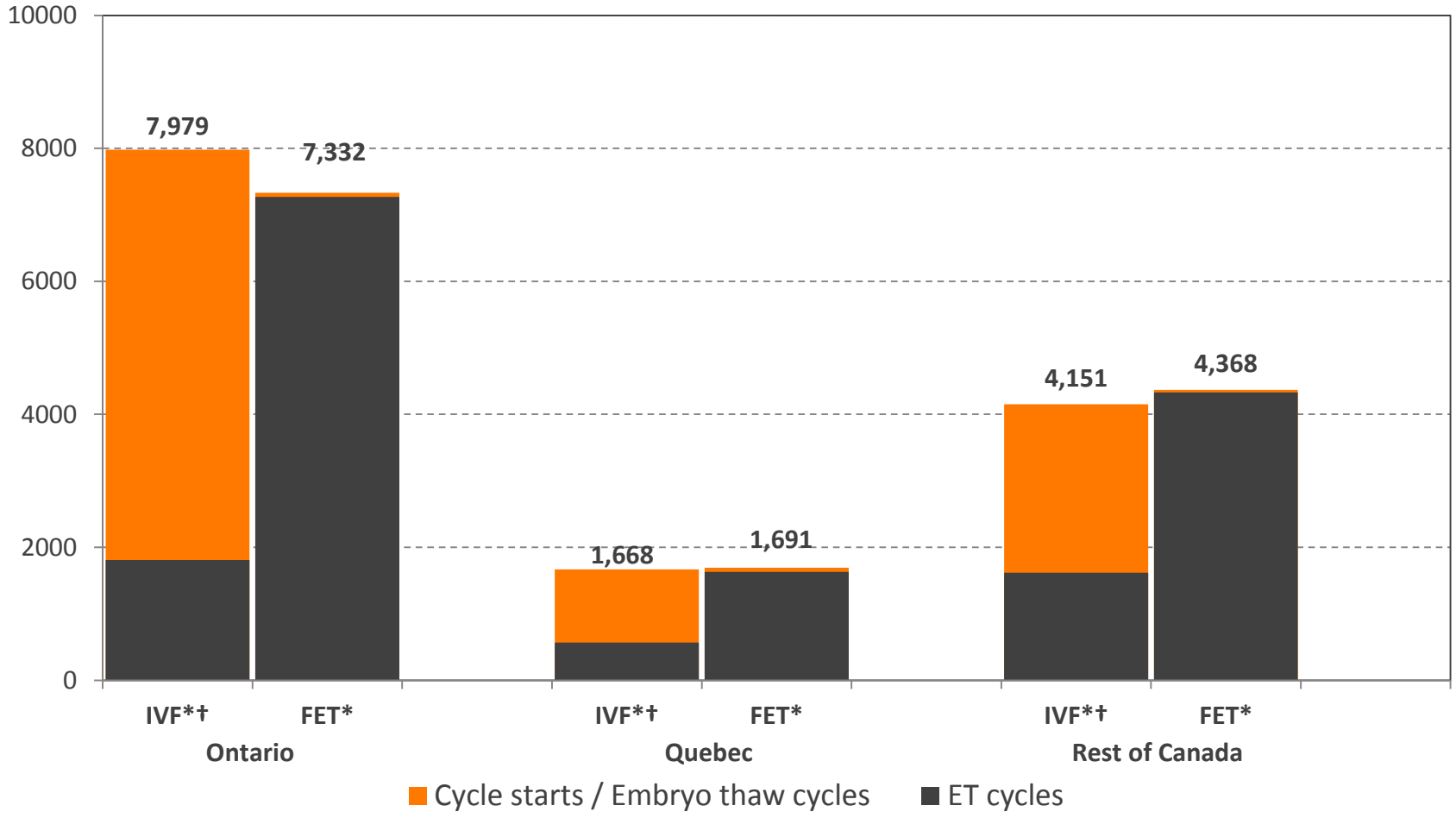
IVF and FET – donor oocytes, 2013 – 2020



** Any donor oocytes*

Number of treatment cycles by province

IVF and FET – own oocytes, 2020

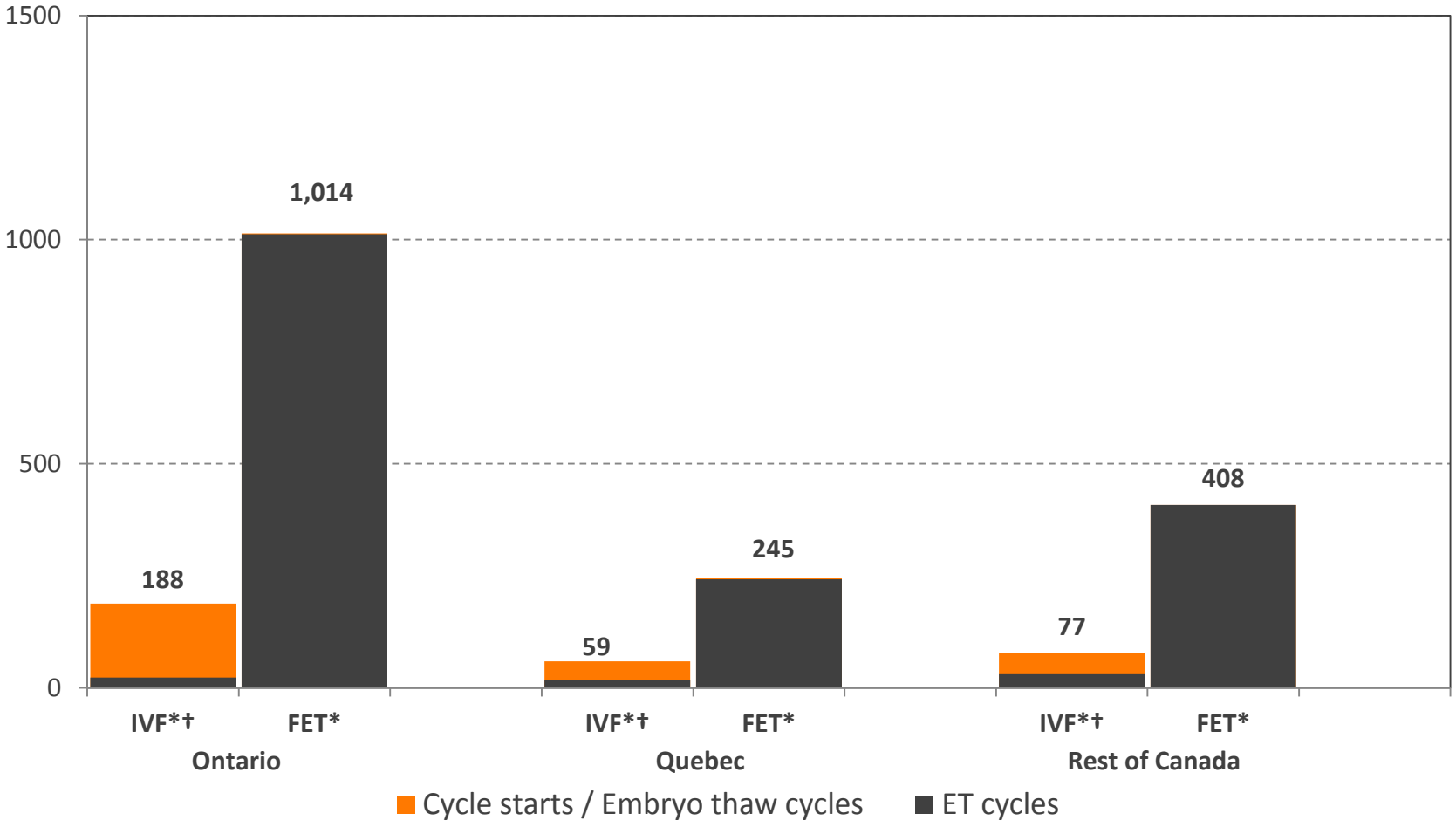


** Own oocytes exclusively*

† Includes Natural & Modified Natural IVF, own oocytes

Number of treatment cycles by province

IVF and FET – donor oocytes, 2020



** Own oocytes exclusively*

† Includes Natural & Modified Natural IVF, own oocytes

Type of treatment cycle per cycle start

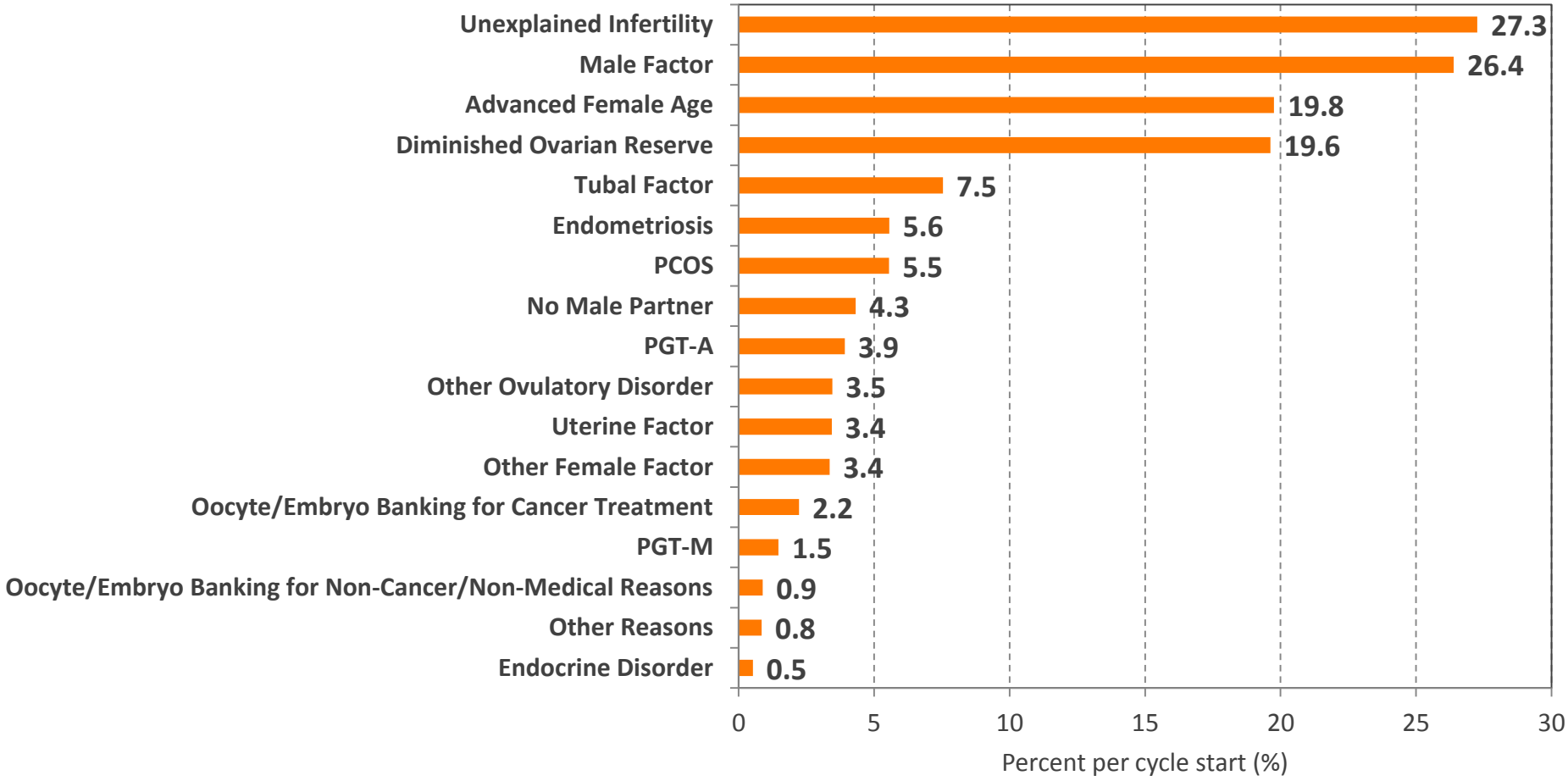
All ART treatment cycles (fresh and frozen), 2020

Type of treatment cycle	Number	Percent
IVF – own oocytes*†	13,798	44.9
Frozen oocyte IVF – own oocytes*	125	0.4
FET – own oocytes*	13,391	43.5
IVF – donor oocytes	324	1.1
Frozen oocyte IVF – donor oocytes	354	1.2
FET – donor oocytes	1,667	5.4
Oocyte banking	1,095	3.6
IVM	10	0.03
TOTAL TREATMENT CYCLES	30,764	100.0

** Own oocytes exclusively*
† Includes Natural & Modified Natural IVF, own oocytes

Reasons for treatment

ART cycles using IVF, 2020

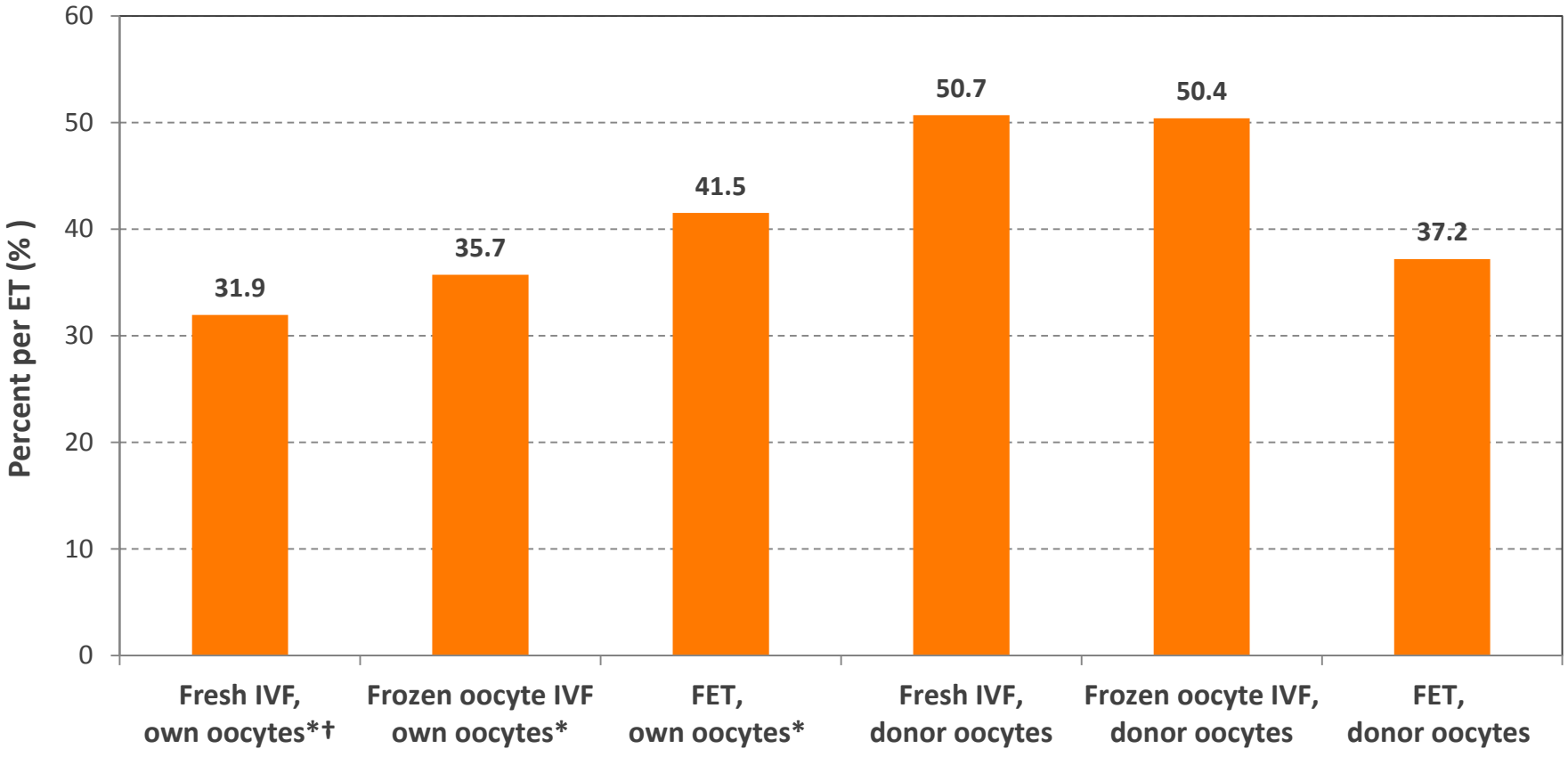


** Categories are not mutually exclusive*

† Other reasons include: gonadotoxic therapy, no female partner and peritoneal factor or severe adhesions

Clinical pregnancy rate by type of treatment cycle

2020



Clinical pregnancies‡	1,276	20	5,494	36	128	618

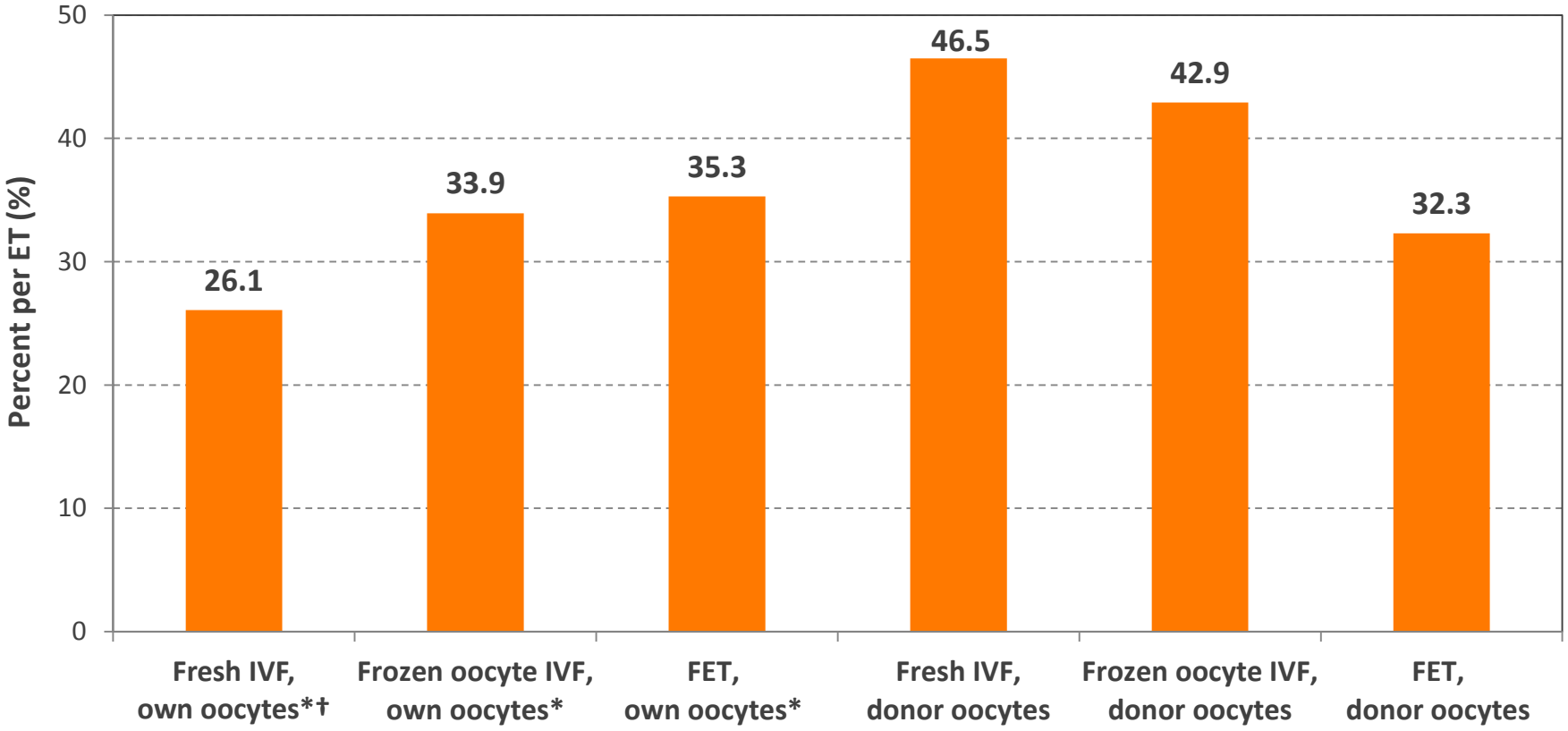
** Own oocytes exclusively*

† Includes Natural & Modified Natural IVF, own oocytes

‡ Clinical pregnancy: clinical intrauterine, heterotopic, or ectopic pregnancy

Singleton ongoing clinical pregnancy rate by type of treatment cycle

2020



Singleton pregnancies‡	1,042	19	4,672	33	109	537

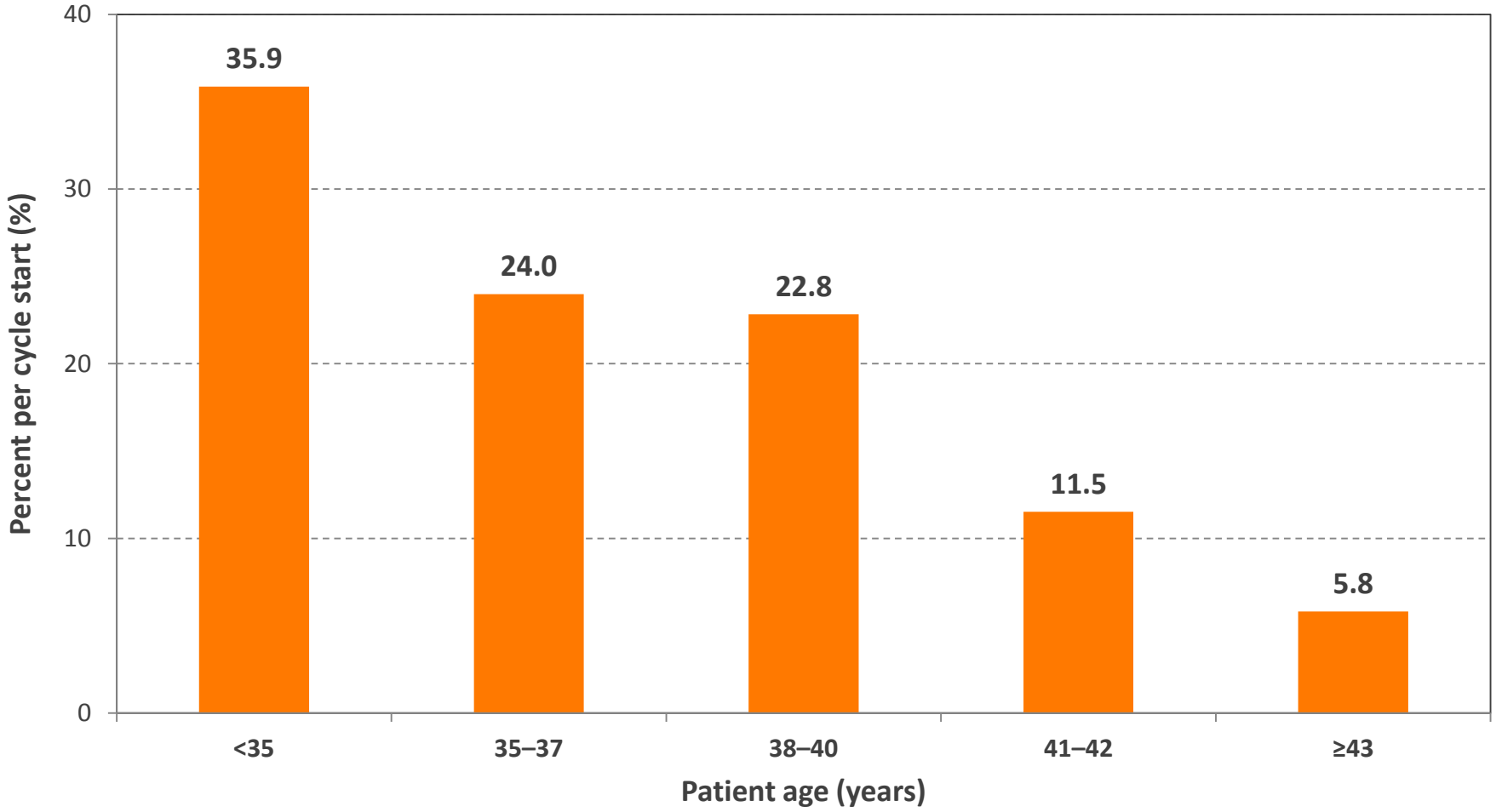
** Own oocytes exclusively*

† Includes Natural & Modified Natural IVF, own oocytes

‡ Singleton pregnancy: ongoing clinical pregnancy with only one fetal heart beat on ultrasound

Patient age

ART cycles using IVF – own oocytes, 2020

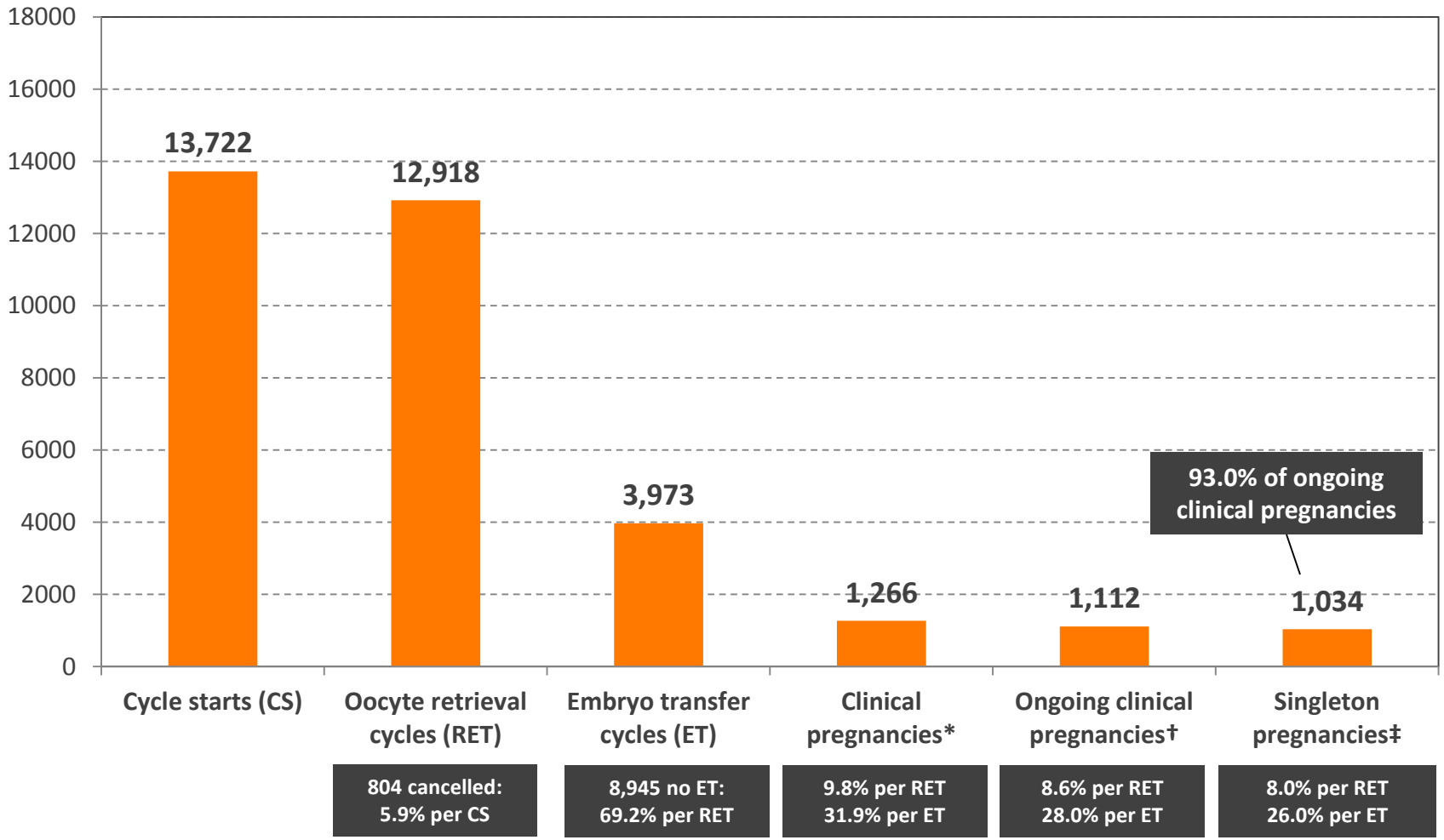


TREATMENT CYCLES FOR 2020

ART cycles using IVF – own oocytes

Stage of treatment and treatment outcomes

ART cycles using IVF – own oocytes, 2020



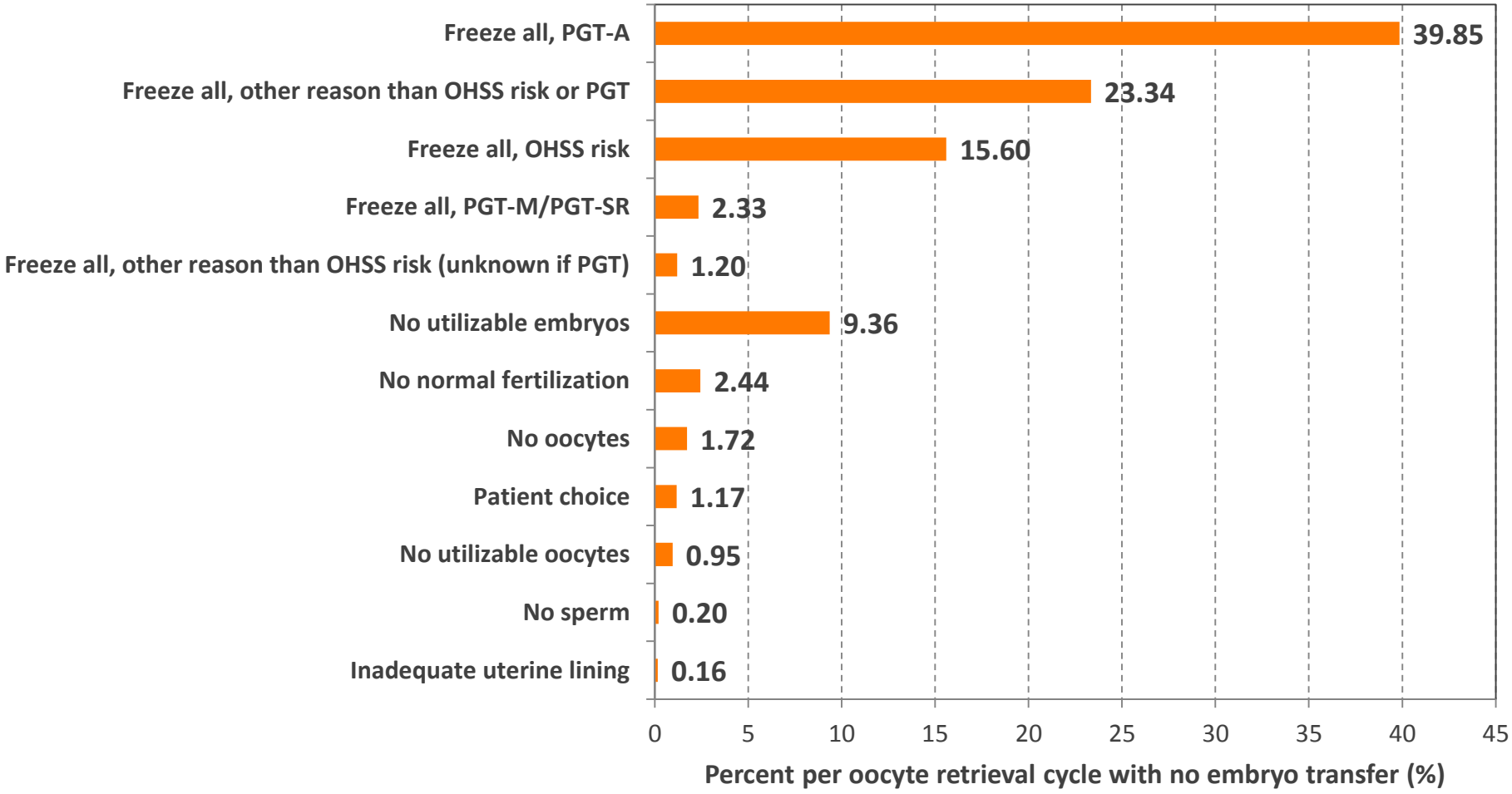
** Clinical pregnancy: clinical intrauterine, heterotopic, or ectopic pregnancy*

† Ongoing clinical pregnancy: clinical pregnancy with ≥1 fetal heart beat on ultrasound

‡ Singleton pregnancy: ongoing clinical pregnancy with only one fetal heart beat on ultrasound

Reasons for no embryo transfer

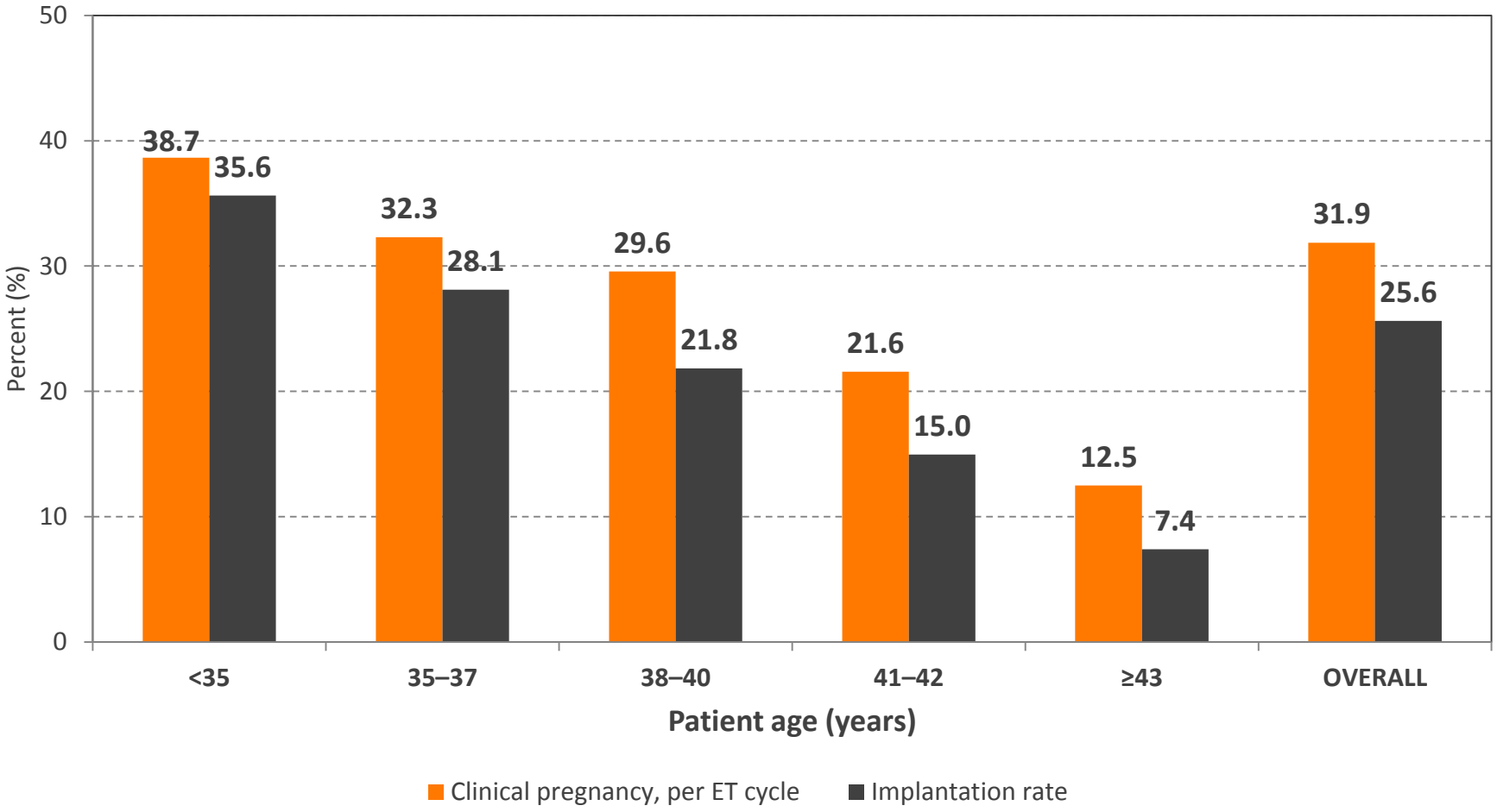
ART cycles using IVF – own oocytes, 2020



** Categories are mutually exclusive*

Clinical pregnancy and implantation rate

ART cycles using IVF – own oocytes, 2020

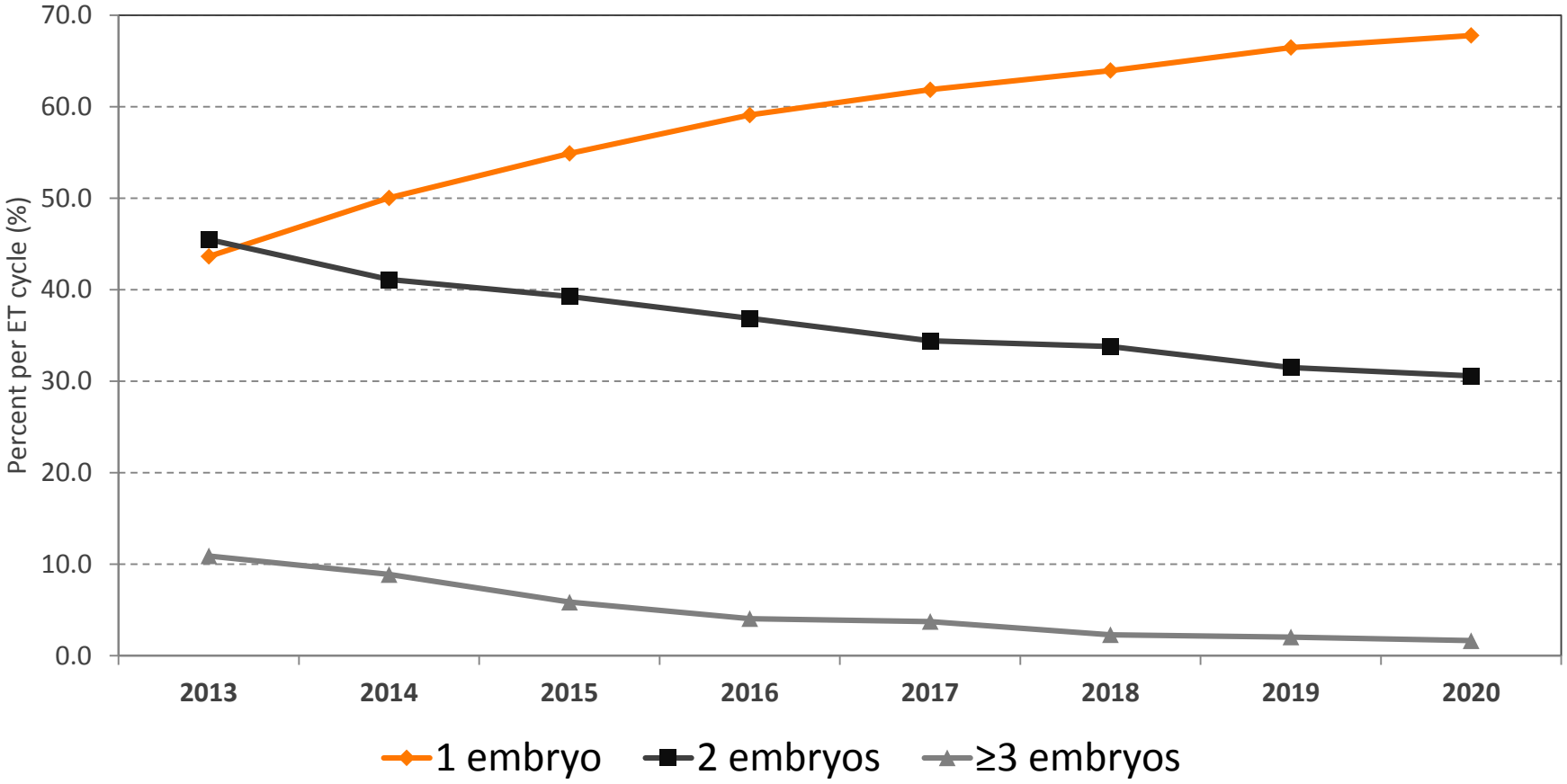


** Clinical pregnancy: clinical intrauterine, heterotopic, or ectopic pregnancy*

† Implantation rate: number of gestational sacs observed on ultrasound, divided by the total number of embryos transferred

Number of embryos transferred, by year

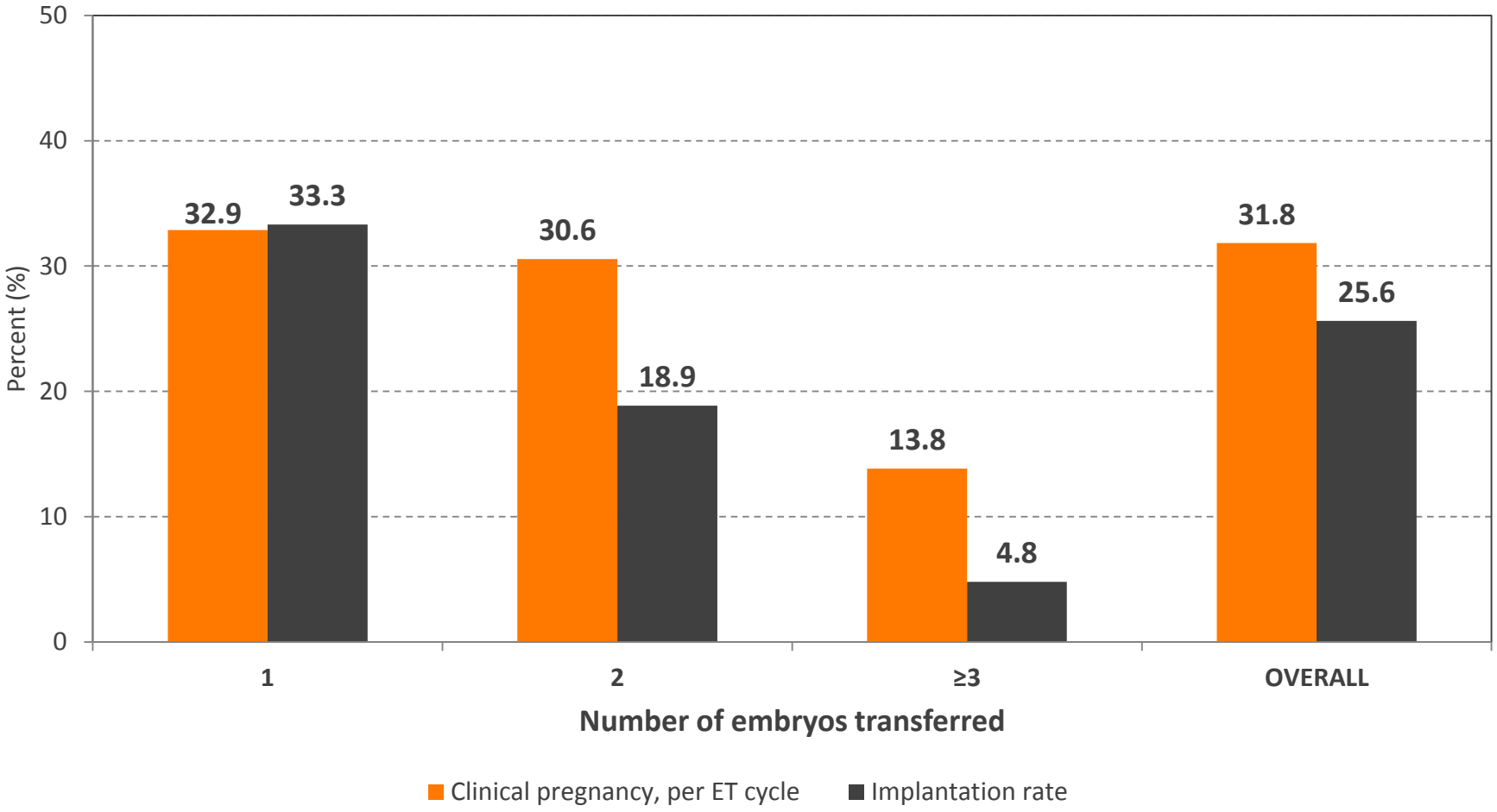
ART cycles using IVF – own oocytes, 2013 – 2020



** Excludes records with missing number of embryos transferred*

Clinical pregnancy and implantation rate

ART cycles using IVF – own oocytes, 2020

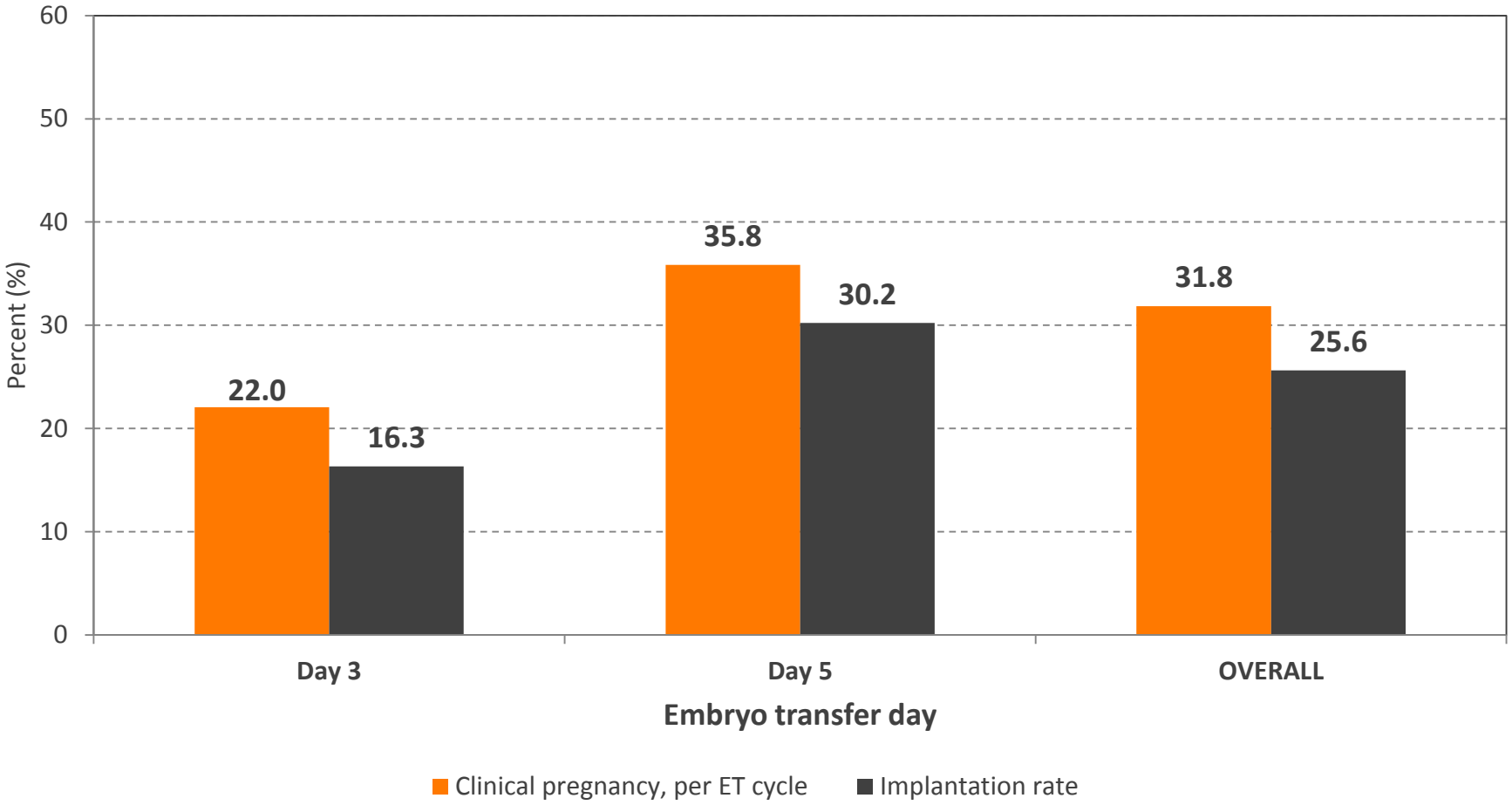


** Clinical pregnancy: clinical intrauterine, heterotopic, or ectopic pregnancy*

† Implantation rate: number of gestational sacs observed on ultrasound, divided by the total number of embryos transferred

Clinical pregnancy and implantation rate

ART cycles using IVF – own oocytes, 2020

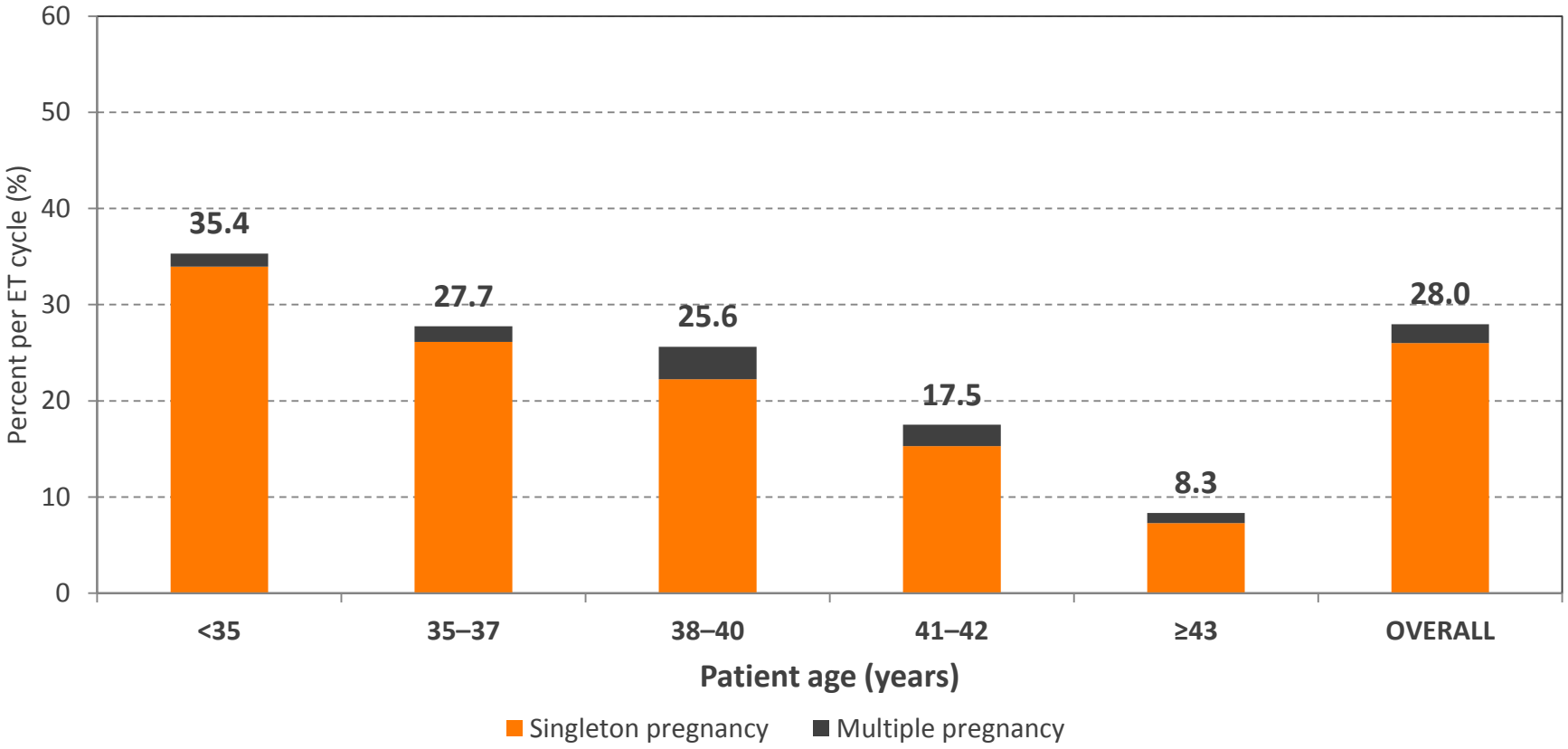


** Clinical pregnancy: clinical intrauterine, heterotopic, or ectopic pregnancy*

† Implantation rate: number of gestational sacs observed on ultrasound, divided by the total number of embryos transferred

Proportion of cycles resulting in an ongoing clinical pregnancy

ART cycles using IVF – own oocytes, 2020



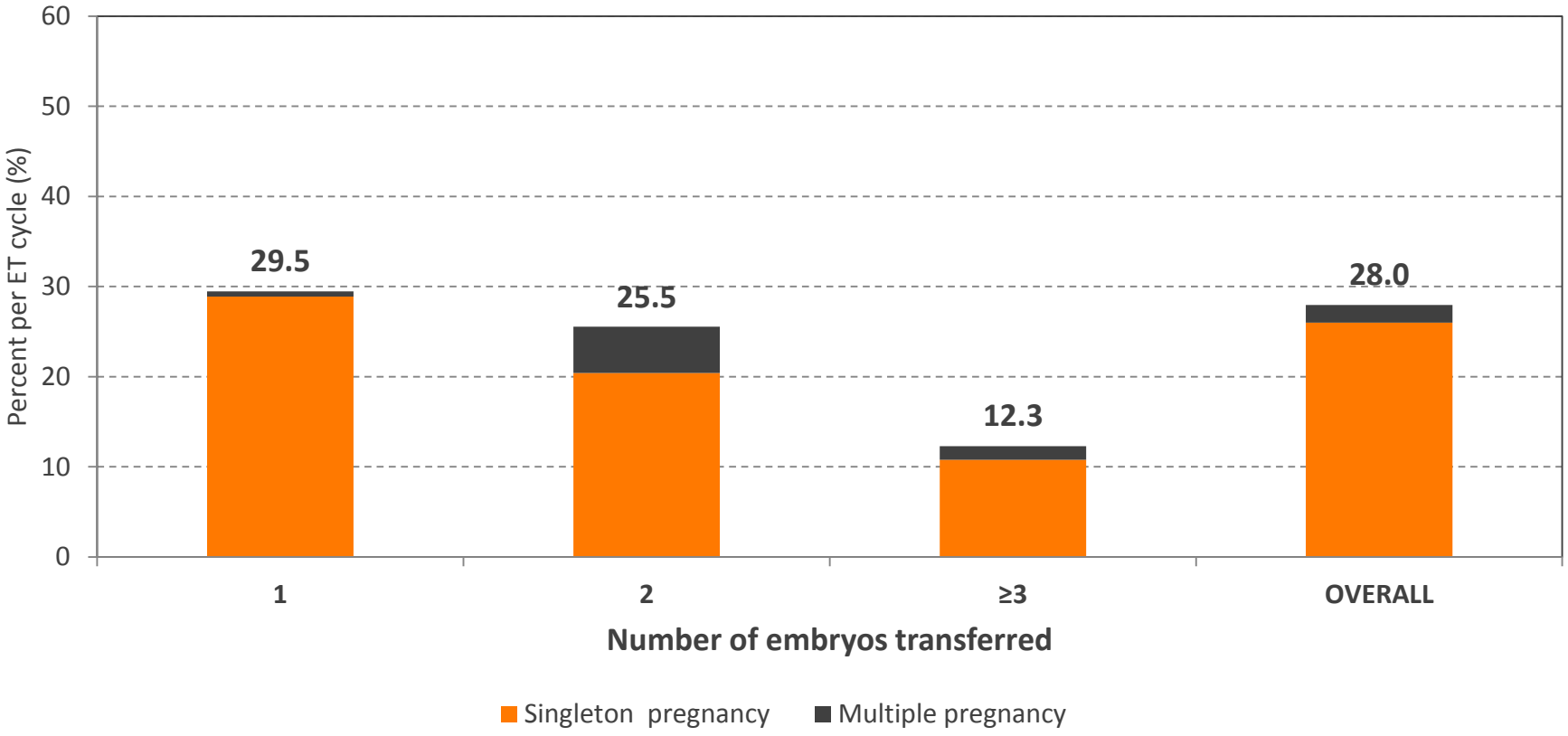
Singleton	**496**	**259**	**197**	**68**	**14**	**1,034**
Multiple	**20**	**16**	**30**	**10**	2	**78**

** Ongoing clinical pregnancy: clinical pregnancy with ≥1 fetal heart beat on ultrasound*

† Singleton pregnancy: ongoing clinical pregnancy with only one fetal heart beat on ultrasound; multiple pregnancy: ongoing clinical pregnancy with >1 fetal heart beat

Proportion of cycles resulting in an ongoing clinical pregnancy

ART cycles using IVF – own oocytes, 2020



Singleton	**778**	**248**	**7**	**1,034‡**
Multiple	**15**	**62**	**1**	**78**

NOTE: In rare cases, a single embryo may divide and produce twins or triplets. For this reason, a small percentage of multiple pregnancies can result from a single embryo transfer

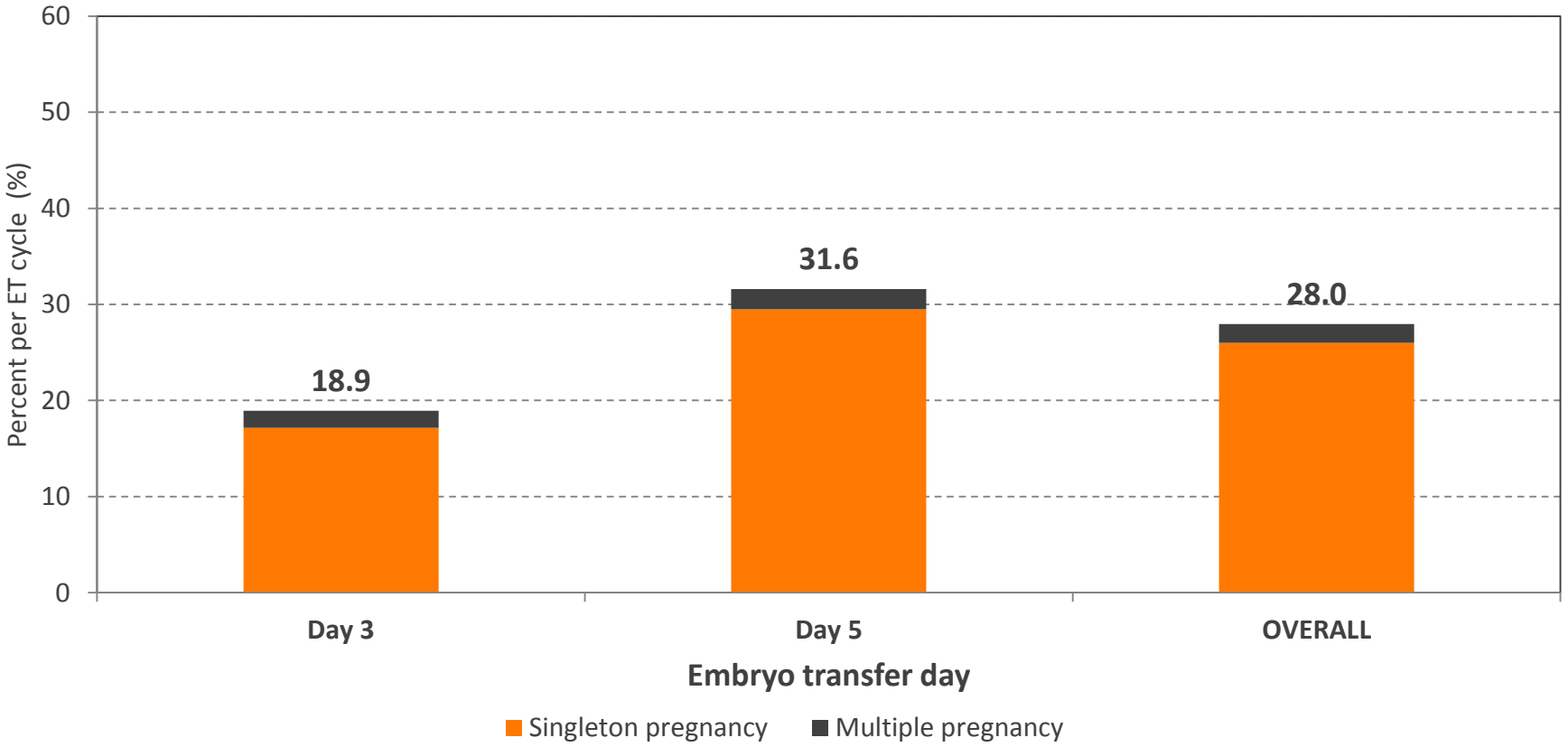
** Ongoing clinical pregnancy: clinical pregnancy with ≥1 fetal heart beat on ultrasound*

† Singleton pregnancy: ongoing clinical pregnancy with only one fetal heart beat on ultrasound; multiple pregnancy: ongoing clinical pregnancy with >1 fetal heart beat

‡ There was 1 cycle with an unknown number of embryos transferred

Proportion of cycles resulting in an ongoing clinical pregnancy

ART cycles using IVF – own oocytes, 2020



Singleton	**154**	**844**	**1,034**
Multiple	**16**	**60**	**78**

** Ongoing clinical pregnancy: clinical pregnancy with ≥1 fetal heart beat on ultrasound*

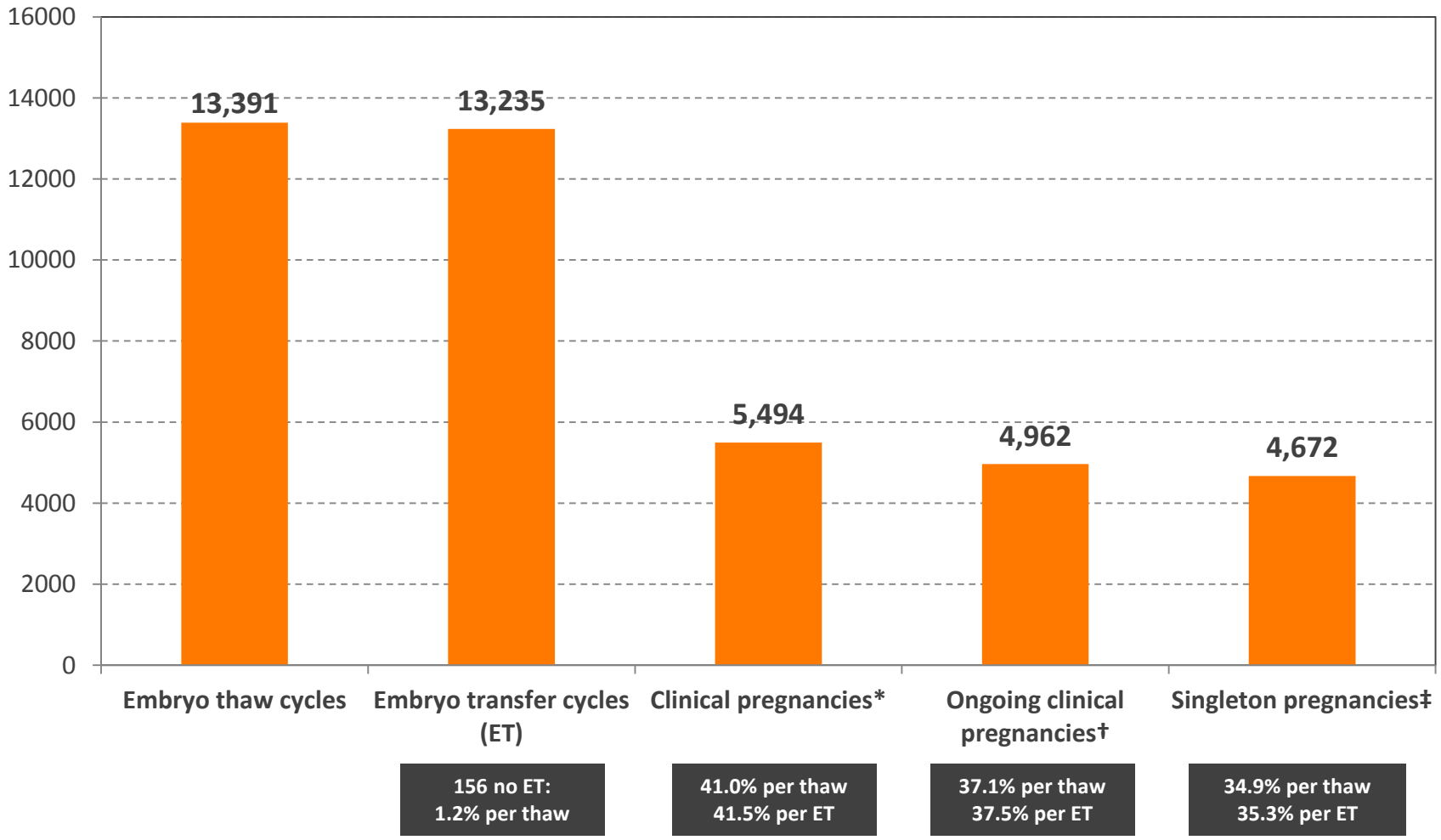
† Singleton pregnancy: ongoing clinical pregnancy with only one fetal heart beat on ultrasound; multiple pregnancy: ongoing clinical pregnancy with >1 fetal heart beat

TREATMENT CYCLES FOR 2020

ART cycles using FET – own oocytes

Stage of treatment and treatment outcomes

ART cycles using FET – own oocytes, 2020



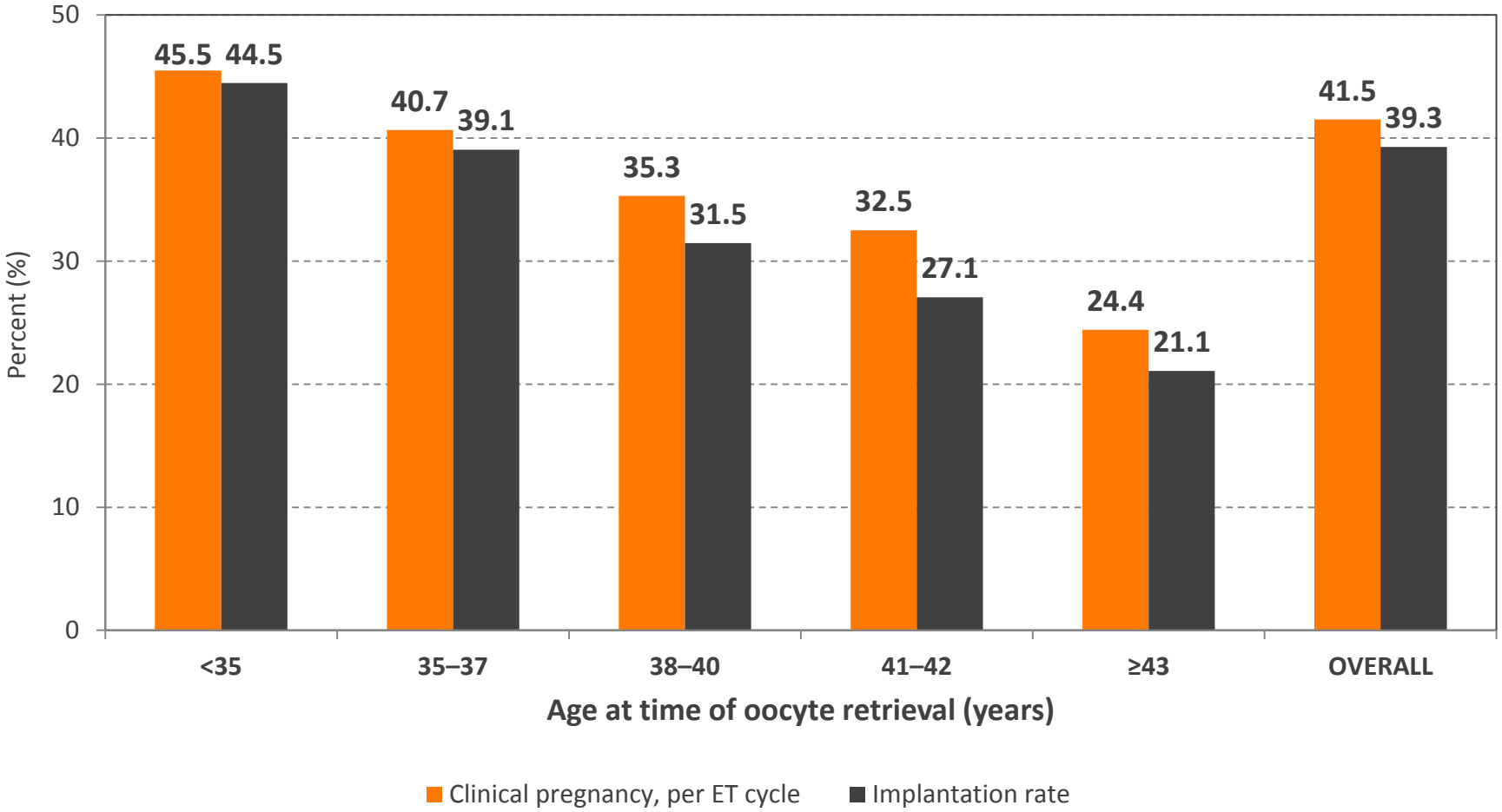
** Clinical pregnancy: clinical intrauterine, heterotopic, or ectopic pregnancy*

† Ongoing clinical pregnancy: clinical pregnancy with ≥1 fetal heart beat on ultrasound

‡ Singleton pregnancy: ongoing clinical pregnancy with only one fetal heart beat on ultrasound

Clinical pregnancy and implantation rate

ART cycles using FET – own oocytes, 2020

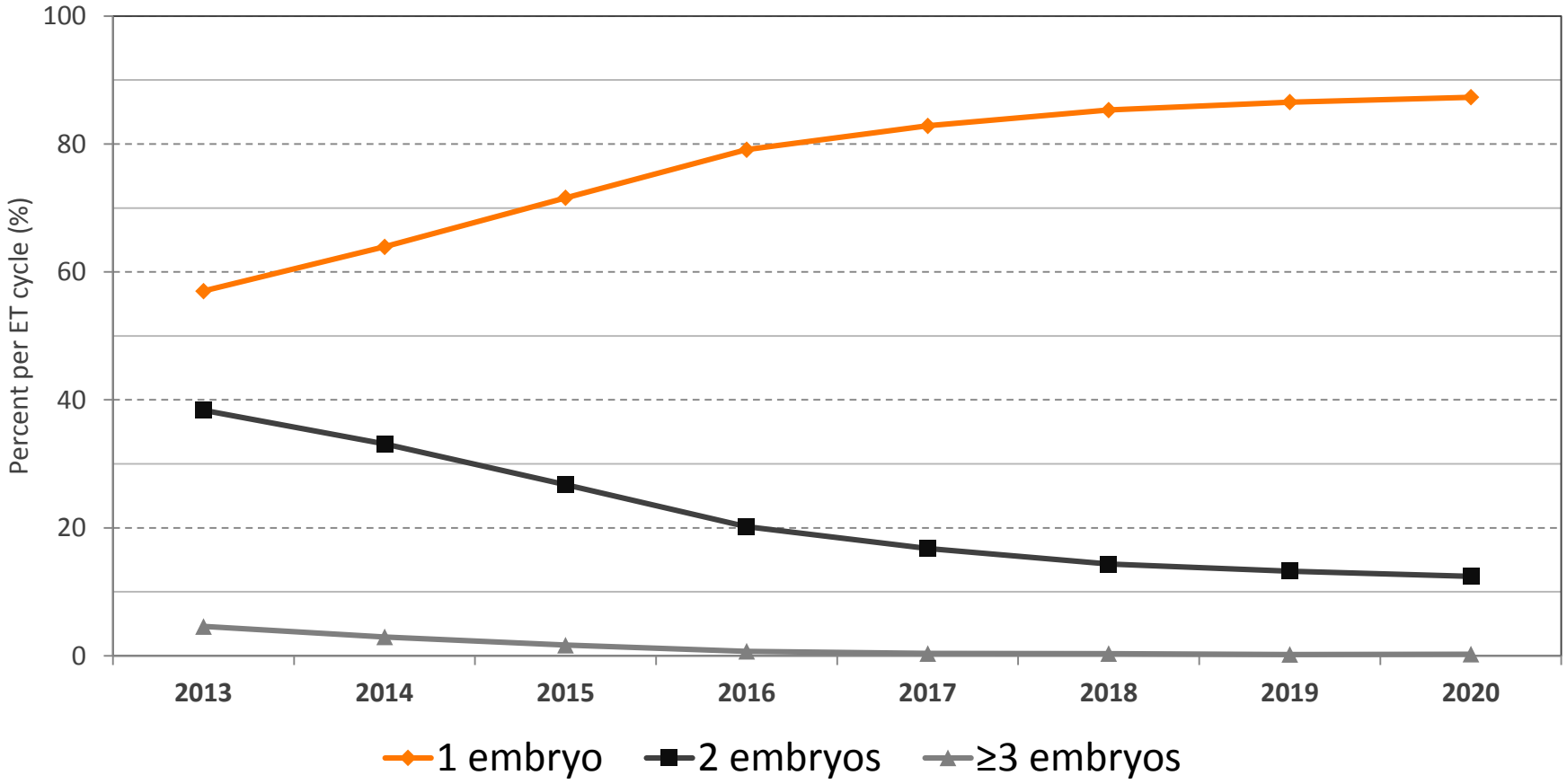


** Clinical pregnancy: clinical intrauterine, heterotopic, or ectopic pregnancy*

† Implantation rate: number of gestational sacs observed on ultrasound, divided by the total number of embryos transferred

Number of embryos transferred, by year

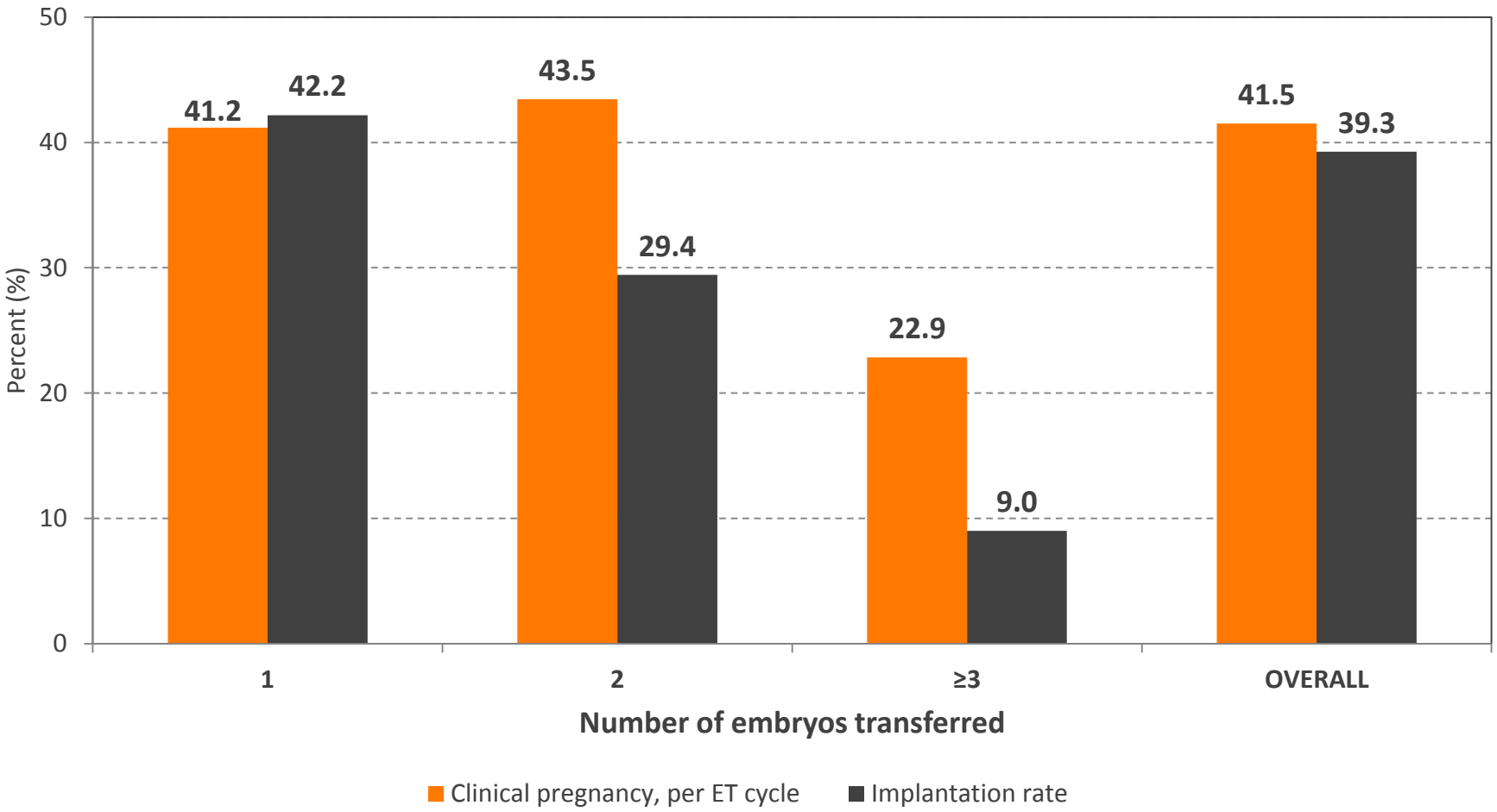
ART cycles using FET – own oocytes, 2020



** Excludes records with missing number of embryos transferred*

Clinical pregnancy and implantation rate

ART cycles using FET – own oocytes, 2020

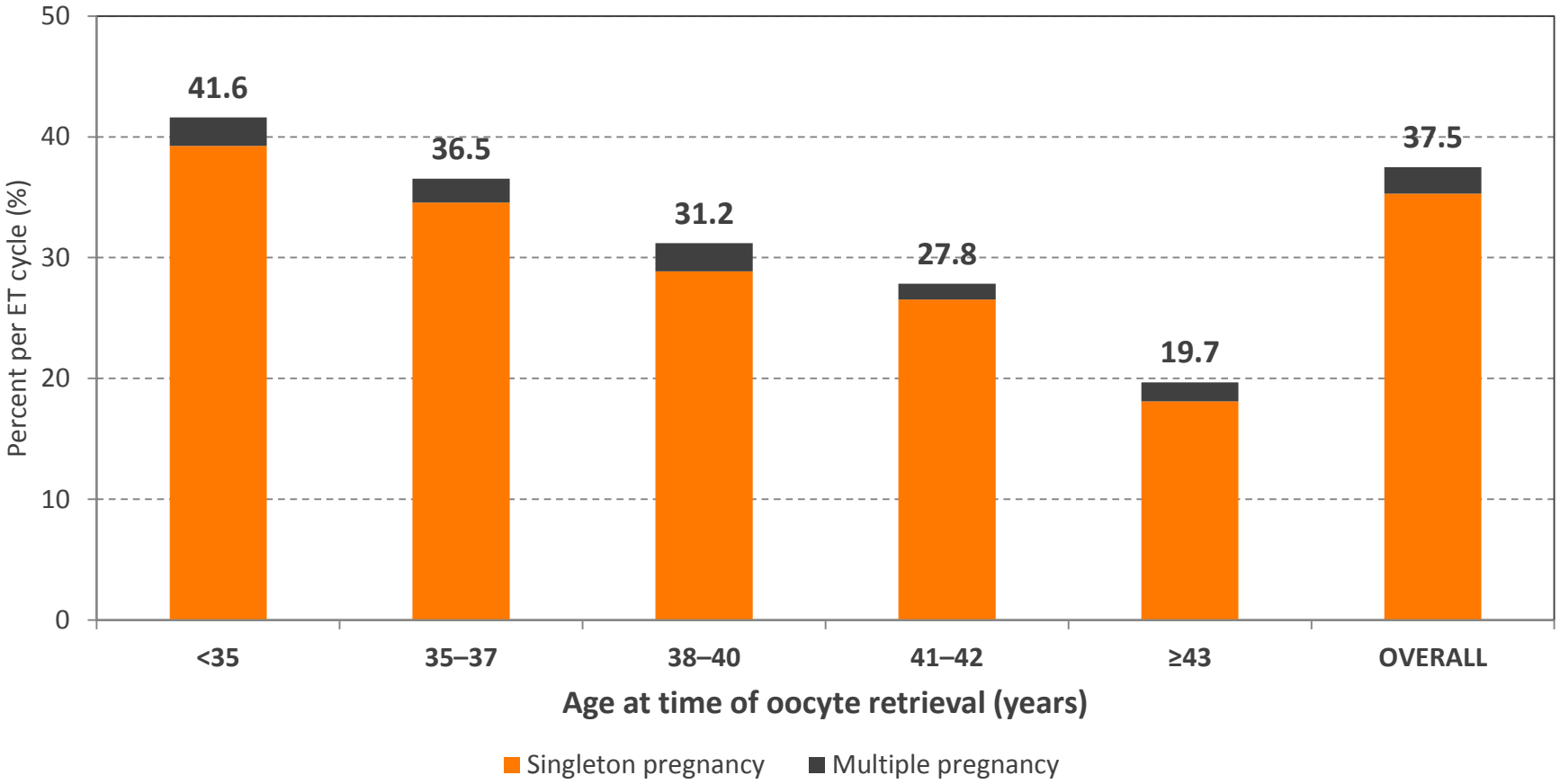


** Clinical pregnancy: clinical intrauterine, heterotopic, or ectopic pregnancy*

† Implantation rate: number of gestational sacs observed on ultrasound, divided by the total number of embryos transferred

Proportion of cycles resulting in an ongoing clinical pregnancy

ART cycles using FET – own oocytes, 2020



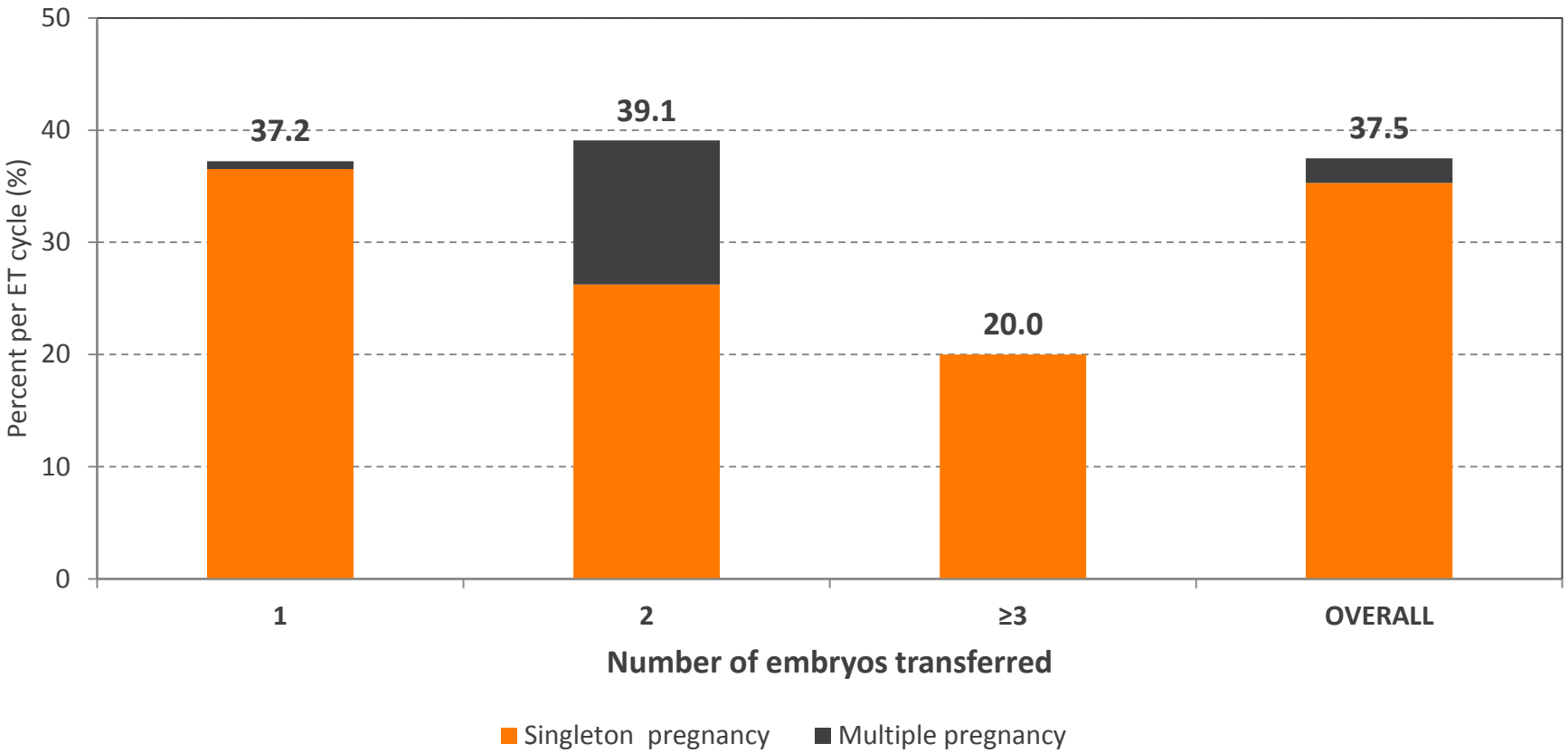
Singleton	2,674	1,135	635	182	46	4,672
Multiple	161	65	51	9	4	290

** Ongoing clinical pregnancy: clinical pregnancy with ≥1 fetal heart beat on ultrasound*

† Singleton pregnancy: ongoing clinical pregnancy with only one fetal heart beat on ultrasound; multiple pregnancy: ongoing clinical pregnancy with >1 fetal heart beat

Proportion of cycles resulting in an ongoing clinical pregnancy

ART cycles using FET – own oocytes, 2020



Singleton	**4,215**	**431**	**7**	**4,672‡**
Multiple	**79**	**211**	**0**	**290**

NOTE: In rare cases, a single embryo may divide and produce twins or triplets. For this reason, a small percentage of multiple pregnancies can result from a single embryo transfer

** Ongoing clinical pregnancy: clinical pregnancy with ≥1 fetal heart beat on ultrasound*

† Singleton pregnancy: ongoing clinical pregnancy with only one fetal heart beat on ultrasound; multiple pregnancy: ongoing clinical pregnancy with >1 fetal heart beat

‡ There were 19 cycles with an unknown number of embryos transferred

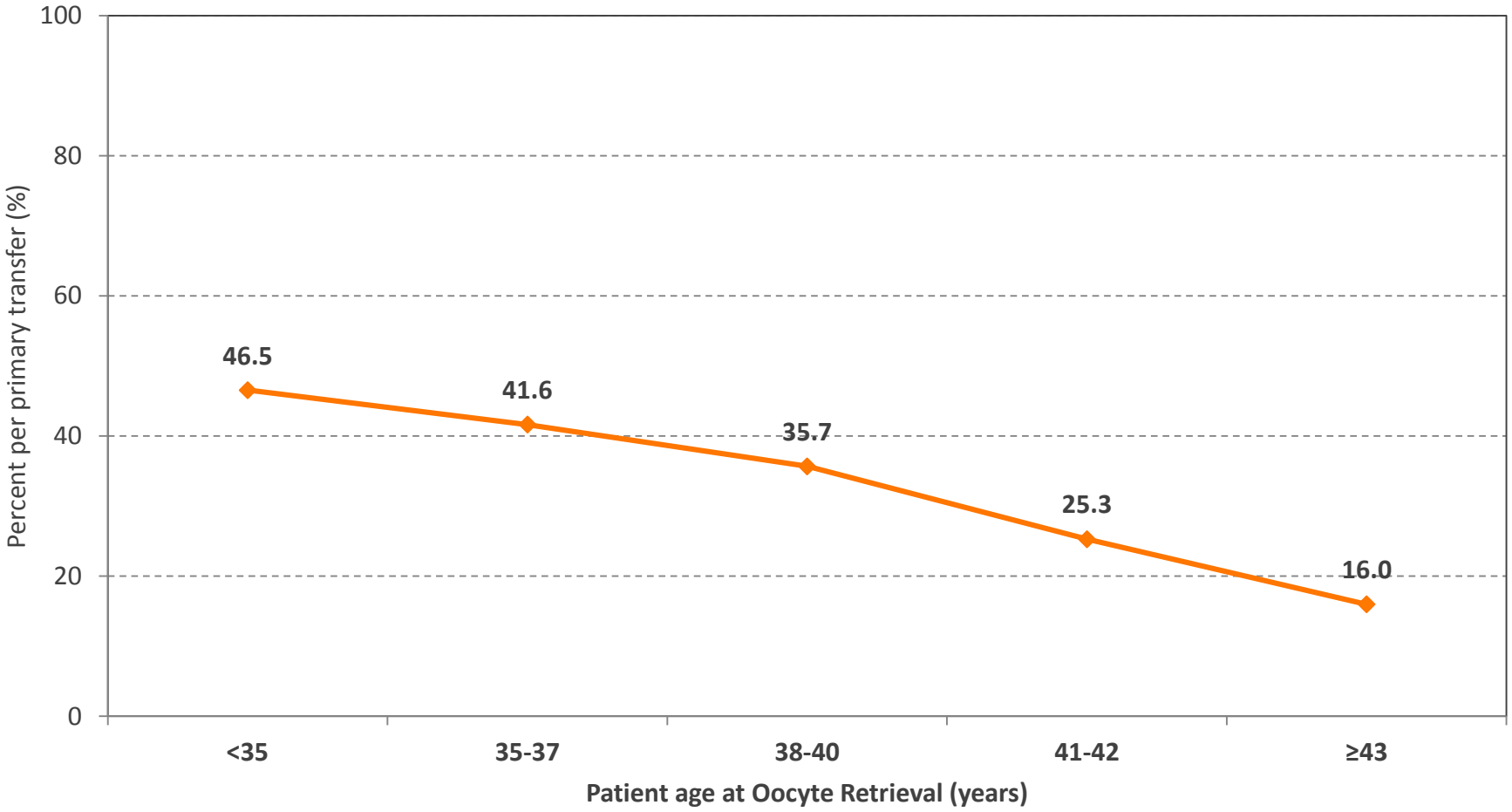
PRIMARY TRANSFER PREGNANCY RATE

Primary transfer rate

- **Cohort:**
  - Patients with first IVF cycle in CARTR Plus and no documented prior treatment cycle using own oocytes
  - The first treatment cycle with an embryo transfer
    - IVF with own oocytes
    - FET with own oocytes
  - **Rate per patient:** treatment cycle outcomes can be linked for a patient throughout the database

Primary transfer clinical pregnancy rate per patient

IVF and FET – own oocytes, 2013 – 2020

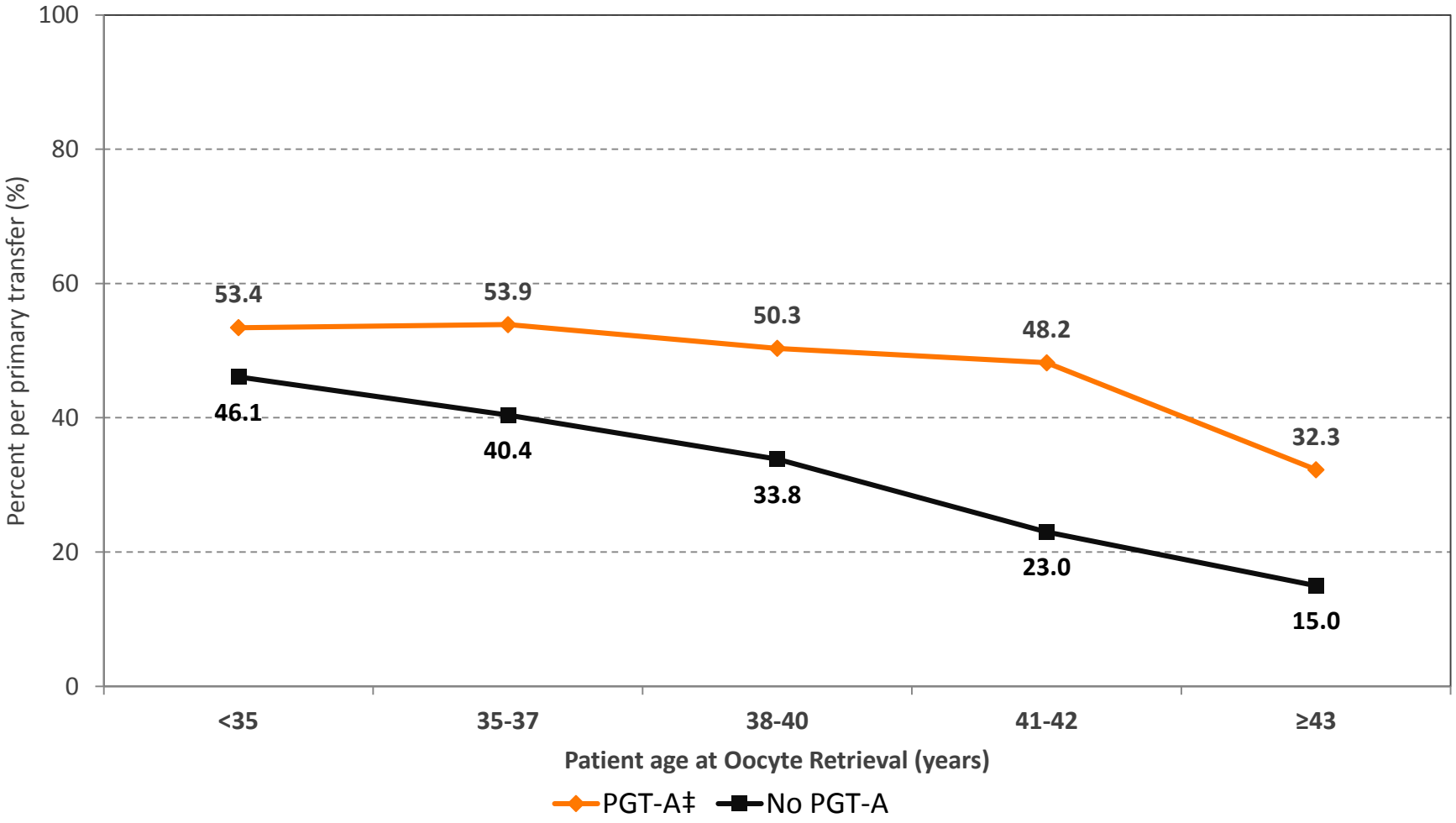


** Own oocytes exclusively*

† Clinical pregnancy: clinical intrauterine, heterotopic, or ectopic pregnancy

Primary transfer clinical pregnancy rate per patient

IVF and FET – own oocytes, 2013 – 2020



** Own oocytes exclusively*

† Clinical pregnancy: clinical intrauterine, heterotopic, or ectopic pregnancy

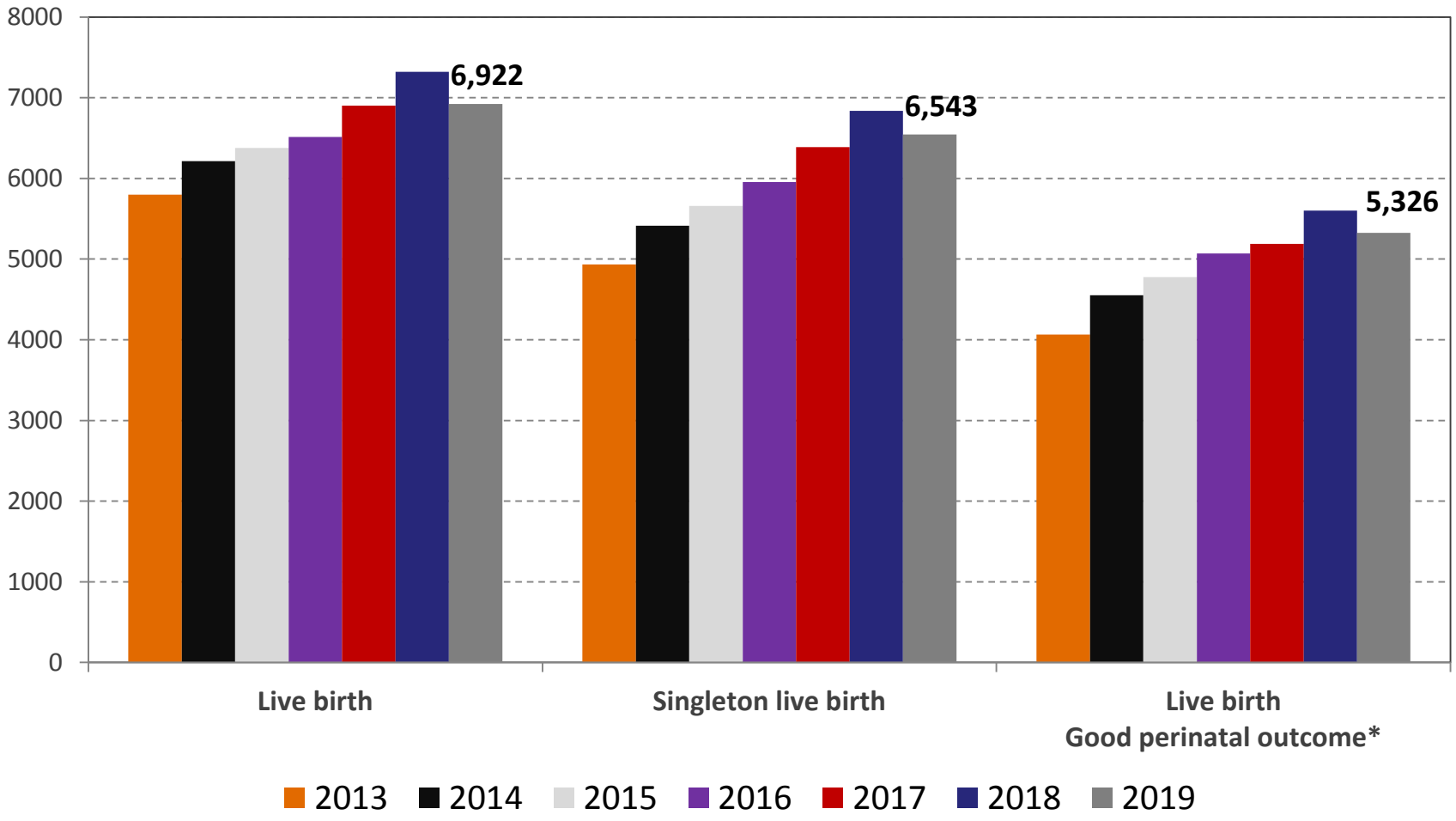
‡ PGT-A is defined as the intent to use PGT-A, as indicated in the Reasons for Treatment data element

BIRTH OUTCOMES FOR 2019

All ART treatment cycles (fresh and frozen)

Birth outcomes

All ART treatment cycles (fresh and frozen), 2013-2019

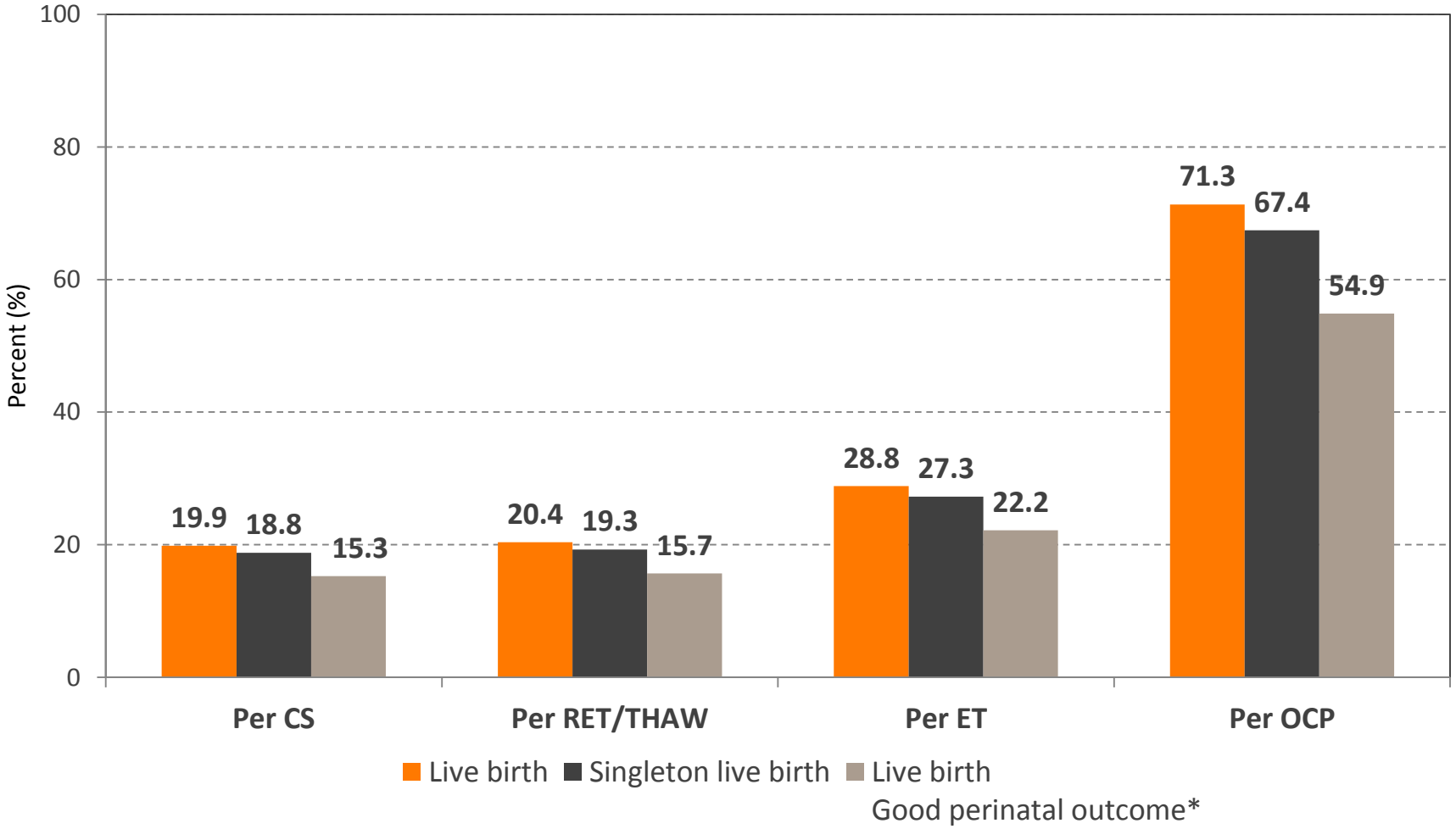


** Good perinatal outcome: singleton live birth at ≥37 weeks' gestation and a birth weight ≥2,500 grams*

† Cycle starts, oocyte retrievals/thaws and embryo transfers with an unknown birth outcome were removed from the denominator (n=3,609)

Birth outcome rates

All ART treatment cycles (fresh and frozen), 2019



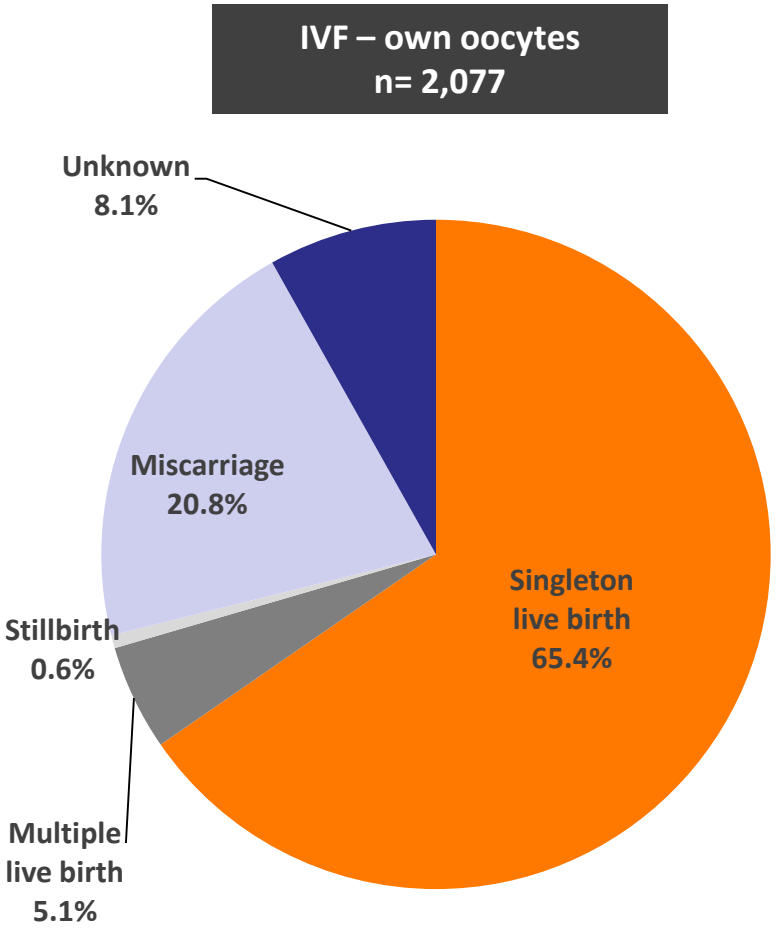
** Good perinatal outcome: singleton live birth at ≥37 weeks' gestation and a birth weight ≥2,500 grams*

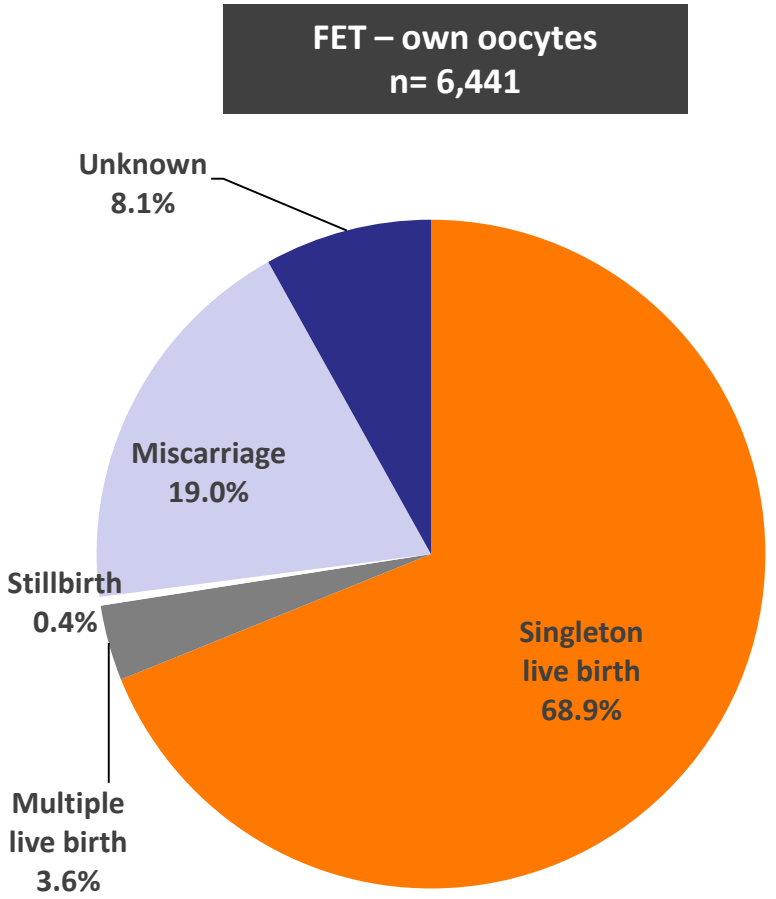
† OCP - Ongoing clinical pregnancy: a clinical pregnancy with documentation of at least one fetal heart beat on ultrasound

‡ Cycle starts, oocyte retrievals/thaws and embryo transfers with an unknown birth outcome were removed from the denominator (n=845)

Distribution of birth outcomes among ongoing clinical pregnancies

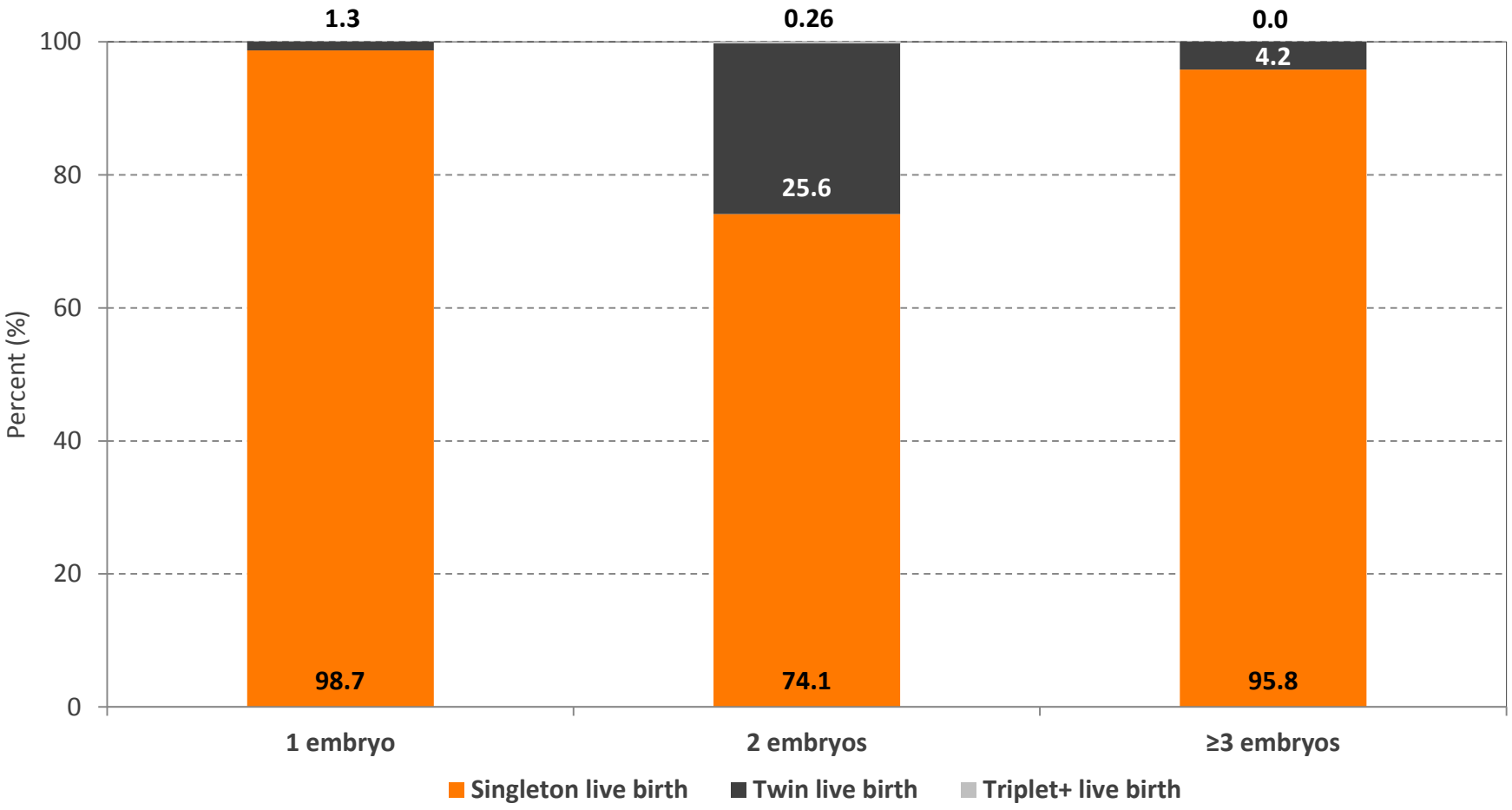
ART cycles using IVF and FET – own oocytes, 2019





Proportion of singleton and multiple live births

All ART treatment cycles (fresh and frozen), 2019



Live births	5,722	1,175	24

** Singleton live birth: one live birth*

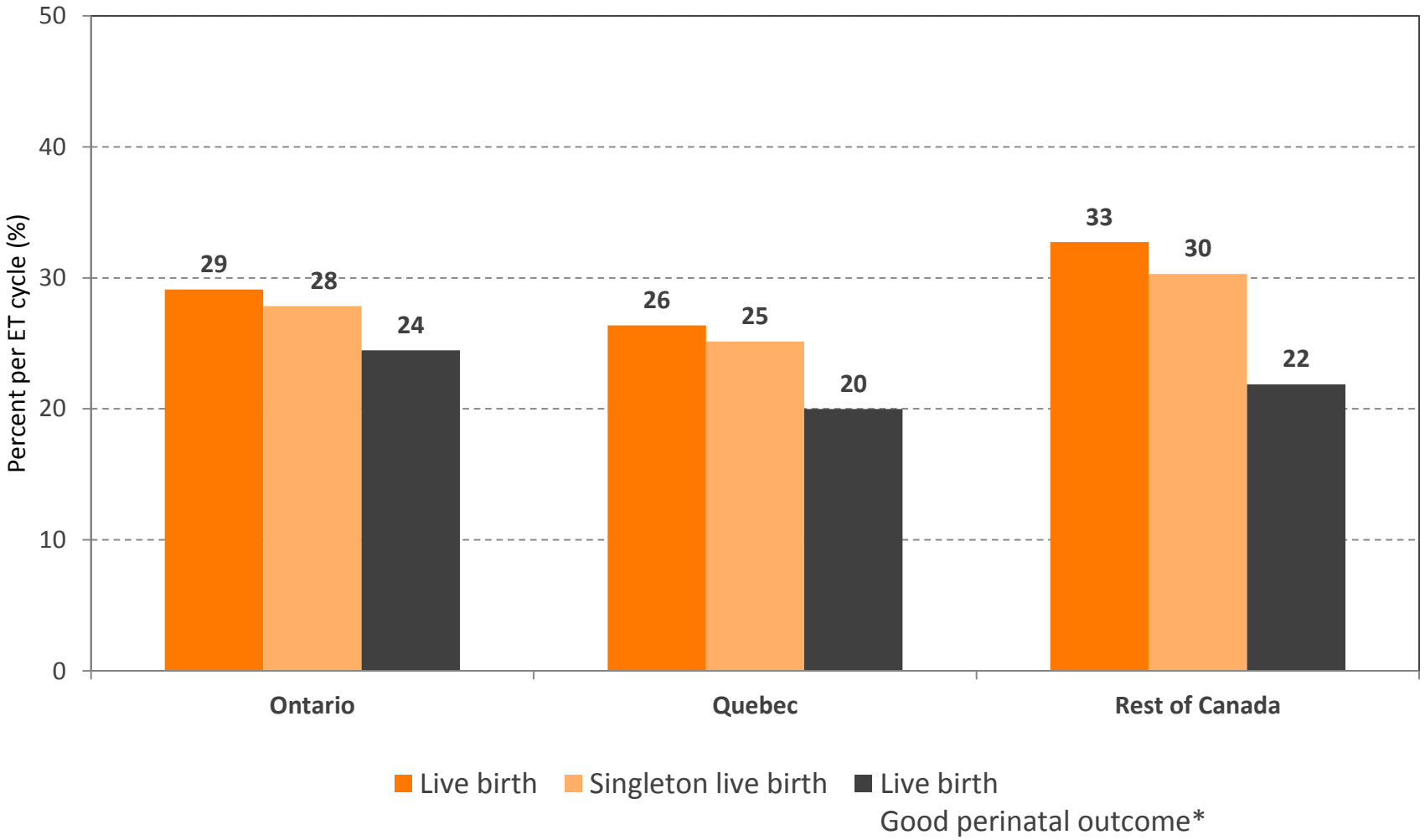
† Twin live birth: two births and at least one live birth

‡ Triplet+ live birth: three or more births and at least one live birth

§ There was 1 cycle with an unknown number of embryos transferred

Birth outcomes by province

All ART treatment cycles (fresh and frozen), 2019

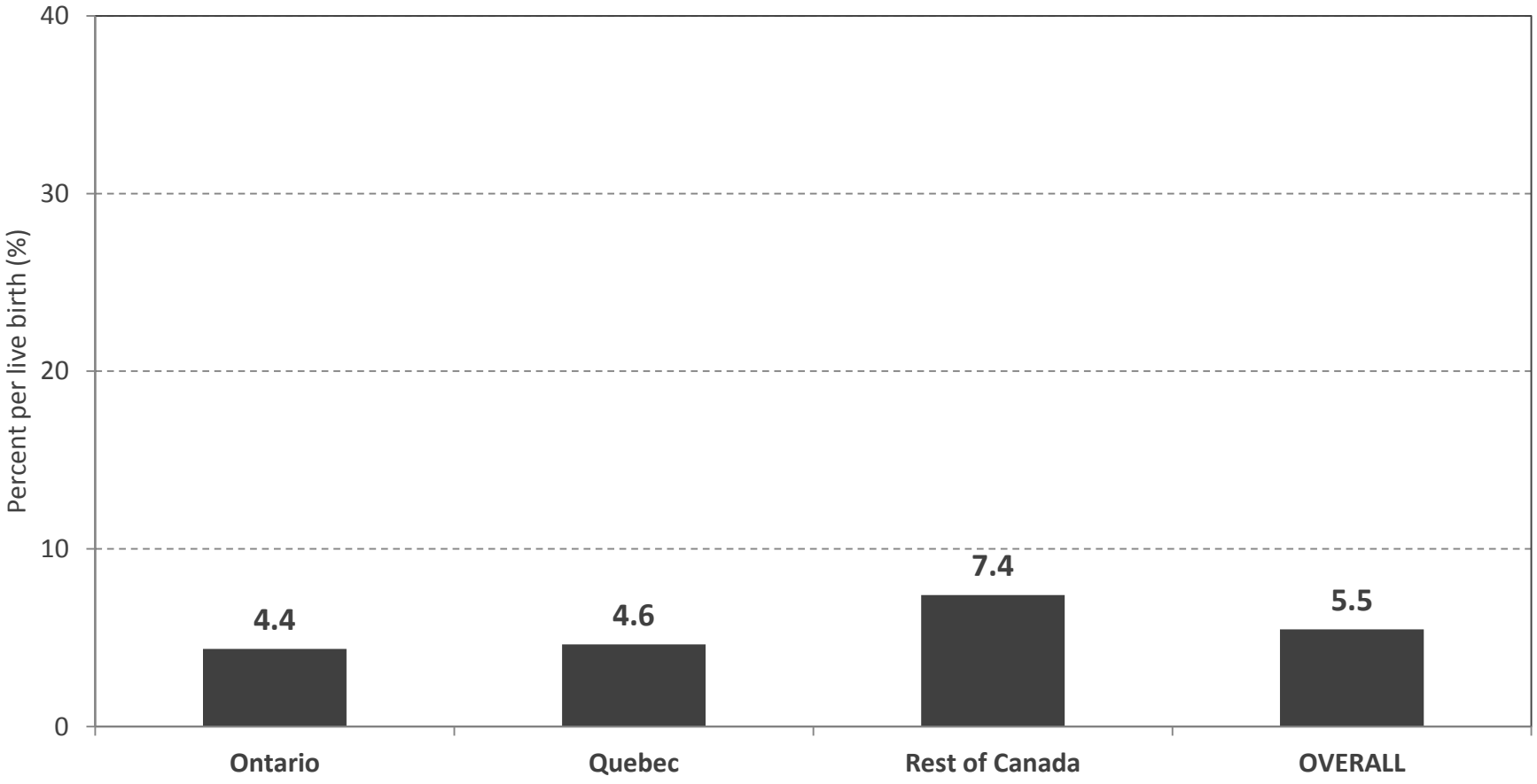


** Good perinatal outcome: singleton live birth at ≥37 weeks' gestation and a birth weight ≥2,500 grams*

† Cycle starts, and embryo transfers with an unknown birth outcome were removed from the denominator (n=845)

Multiple live rate per live birth, by province

All ART treatment cycles (fresh and frozen), 2019

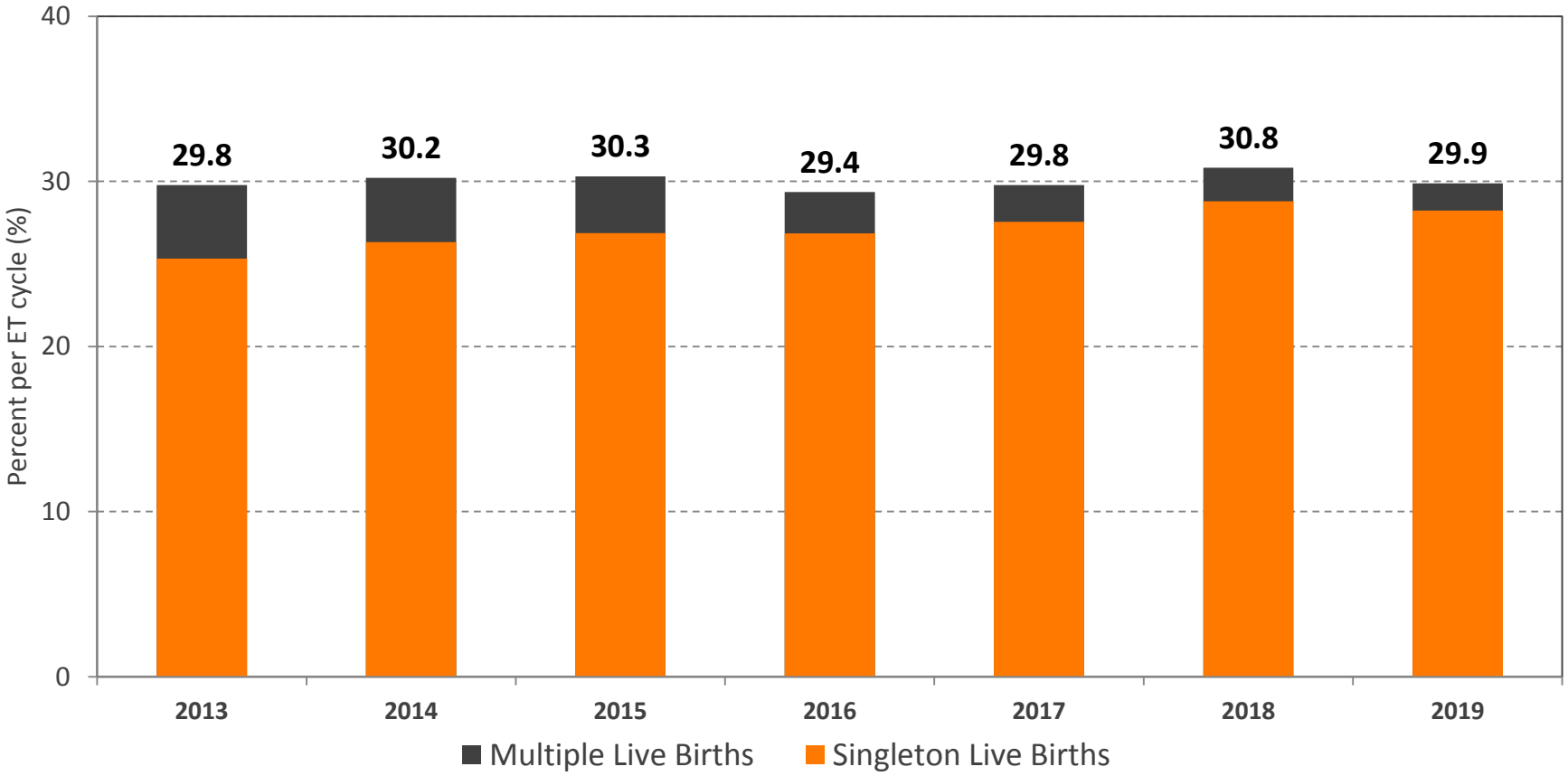


	Ontario	Quebec	Rest of Canada	OVERALL
Multiple births	158	41	180	379

** Multiple birth: At least one live birth from a multiple pregnancy*

Proportion of singleton and multiple live births

All ART treatment cycles, 2013 – 2019

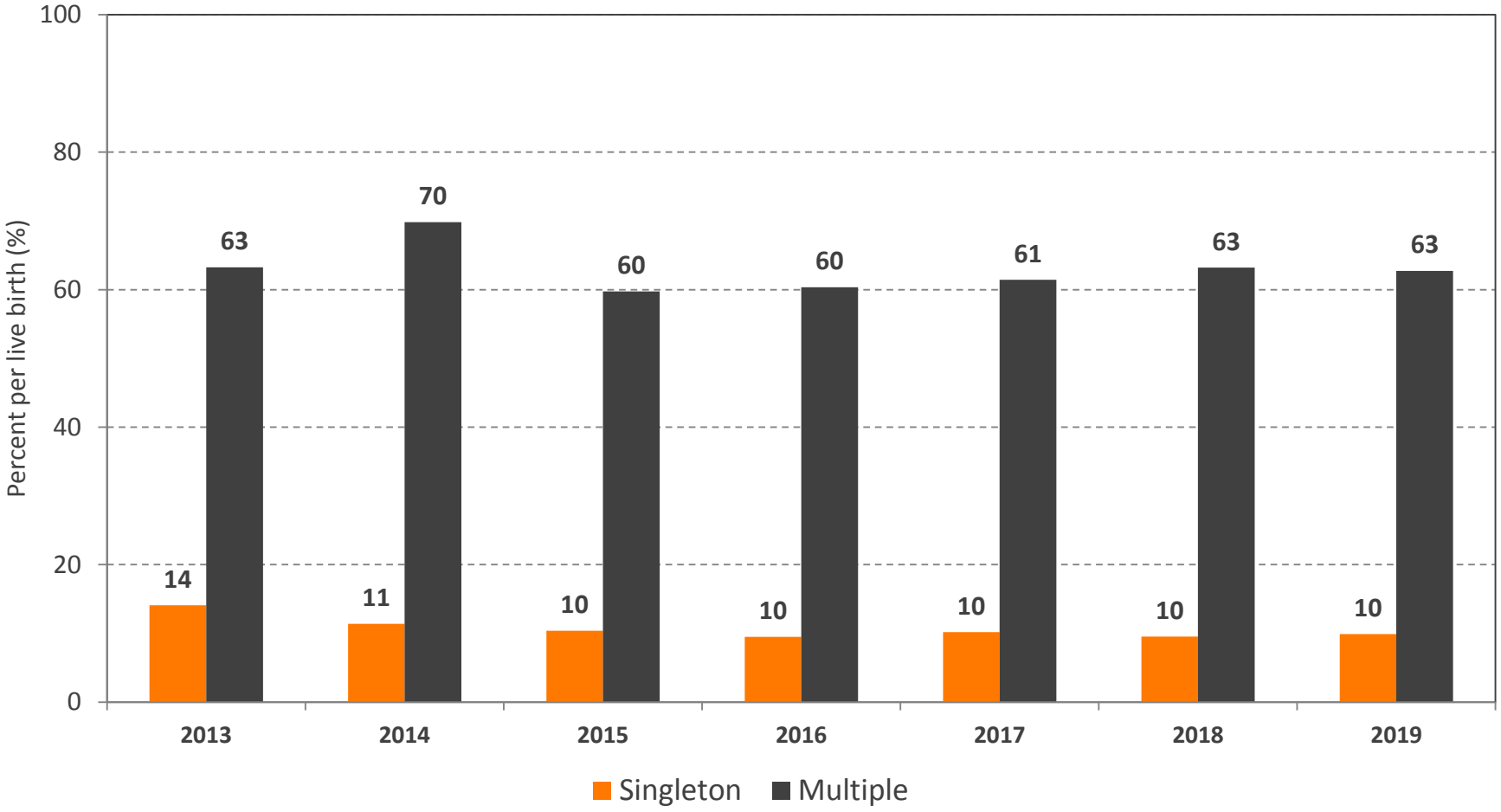


	2013	2014	2015	2016	2017	2018	2019
Live Births	5,800	6,215	6,379	6,514	6,903	7,320	6,922
Singletons	4,932	5,413	5,658	5,957	6,389	6,836	6,543
Multiples	868	802	721	557	514	484	379

** Cycle starts, oocyte retrievals/thaws and embryo transfers with an unknown birth outcome were removed from the denominator (n=3,609)*

Proportion of preterm births, by plurality

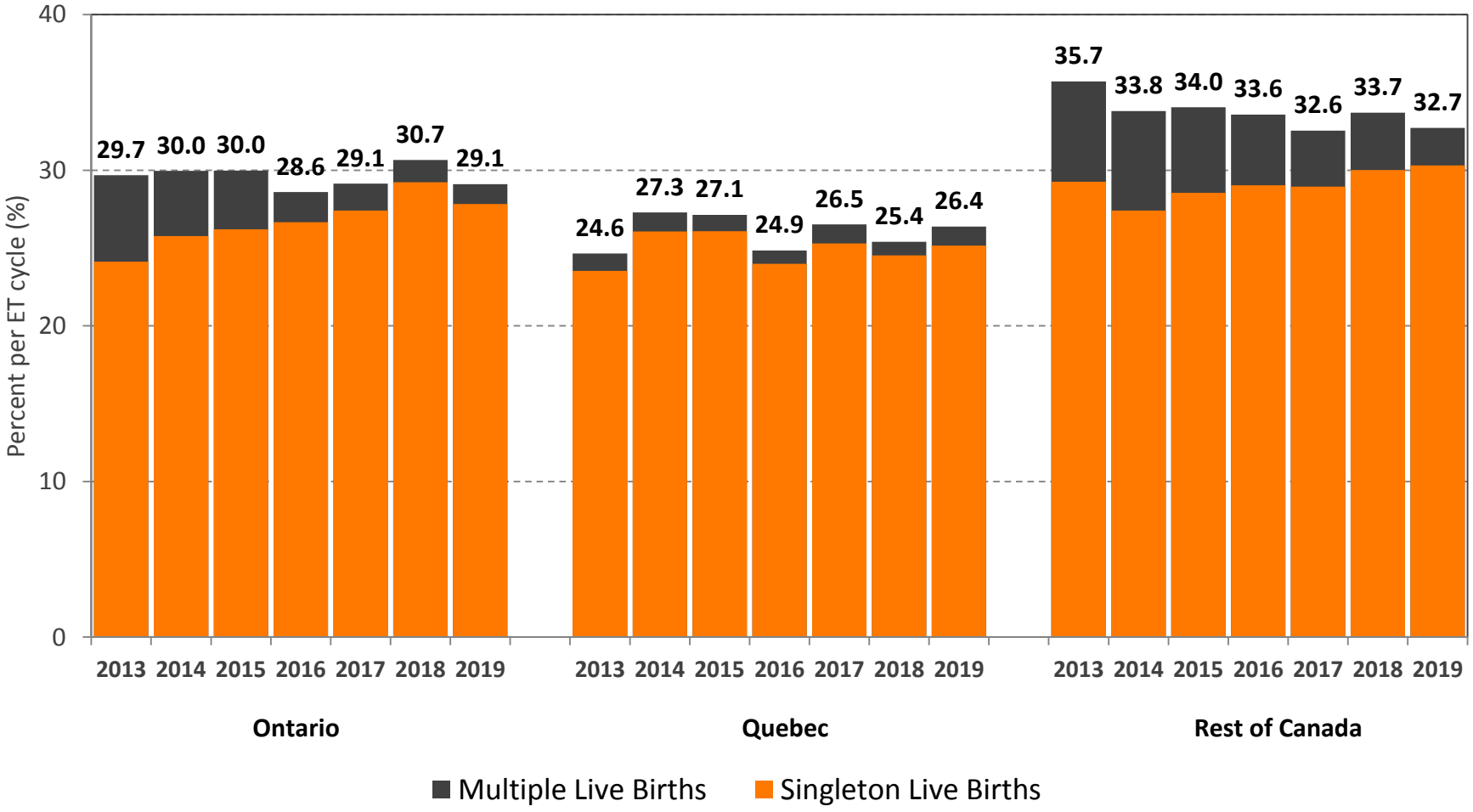
All ART treatment cycles (fresh and frozen), 2013-2019



Preterm birth <37 weeks' gestation.

Proportion of singleton and multiple live births by province

All ART treatment cycles, 2013 – 2019



† *Cycle starts, oocyte retrievals/thaws and embryo transfers with an unknown birth outcome were removed from the denominator (n=3,609)*

PREIMPLANTATION GENETIC TESTING

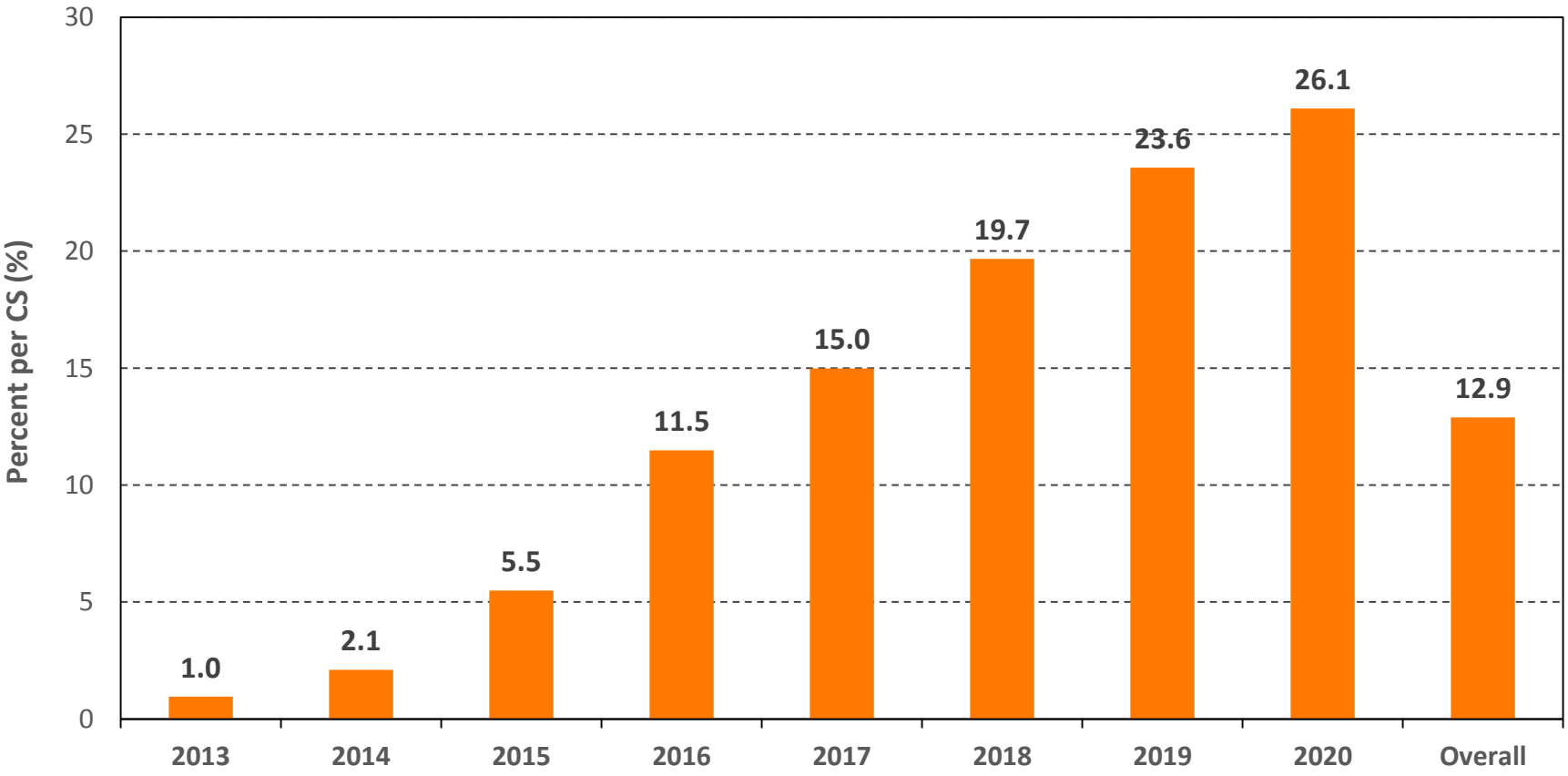
Intent to perform PGT-A or PGT-M

ART cycles using IVF, 2013 – 2020

Year	PGT-A			PGT-M		
	# Cycles	% CS	% RET	# Cycles	% CS	% RET
2013	160	0.95	1.02	177	1.05	1.13
2014	377	2.10	2.28	207	1.15	1.25
2015	980	5.49	5.90	562	3.15	3.38
2016	1,941	11.48	12.04	709	4.19	4.40
2017	2,641	14.99	15.79	630	3.57	3.77
2018	3,552	19.66	20.79	322	1.78	1.88
2019	4,184	23.57	24.90	351	1.98	2.09
2020	3,974	26.10	27.61	310	2.04	2.15
Overall	17,809	12.89	13.71	3,268	2.36	2.52

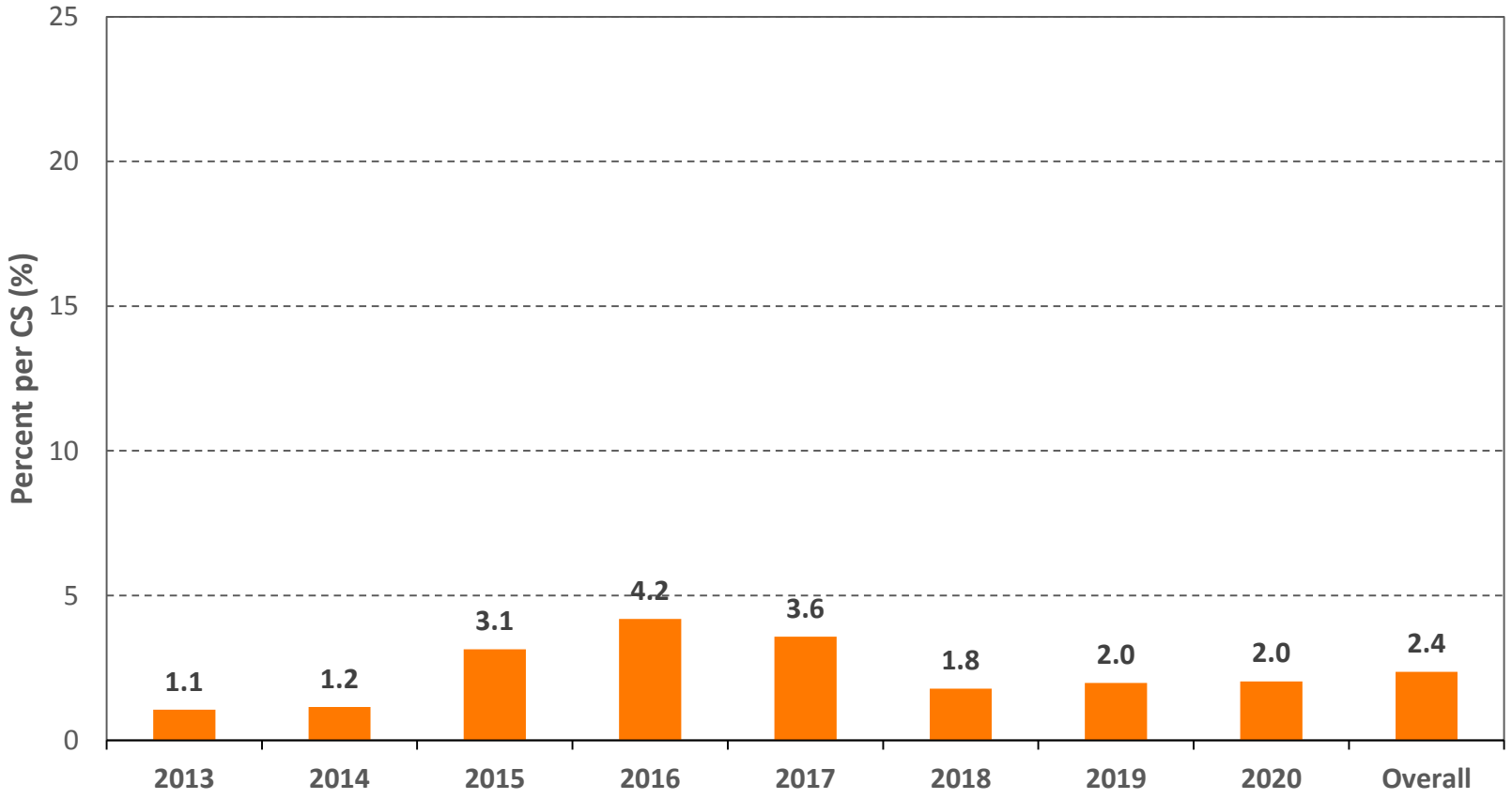
Intent to perform PGT-A

ART cycles using IVF, 2013 – 2020



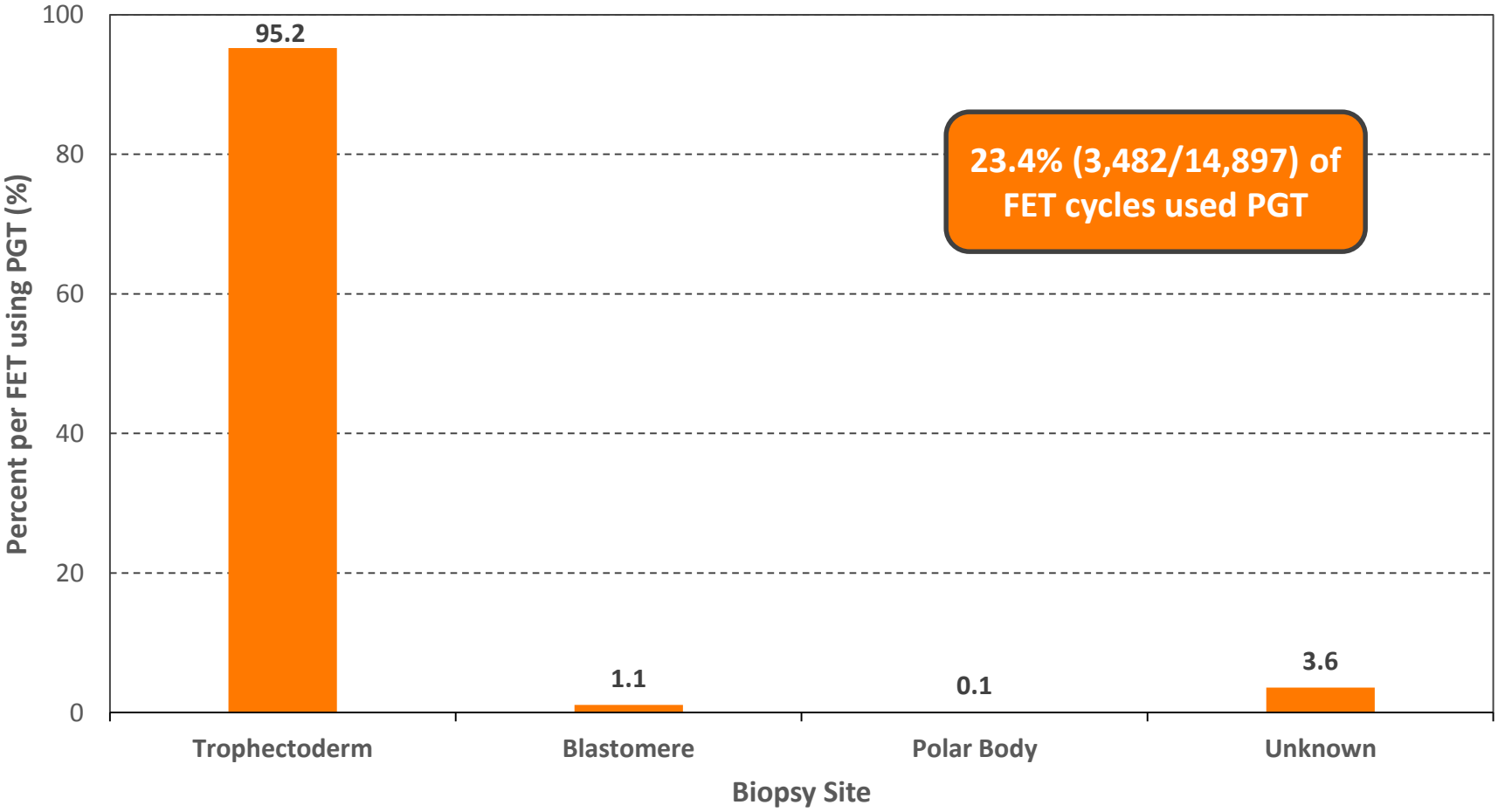
Intent to perform PGT-M

ART cycles using IVF, 2013 – 2020



Biopsy site of the transferred embryo

ART cycles using FET – own and donor oocytes, 2020



PGT-A results for the transferred embryo

ART cycles using FET – own and donor oocytes, 2020

Characteristic of transferred embryo	# FET cycles	Percent*
Euploid after PGT-A testing	3,095	96.5
Mosaic after PGT-A testing	106	3.3
Aneuploid after PGT-A testing	6	0.2
TOTAL after PGT-A testing	**3,207**	**100.0**

** A total of 3,482 FET cycles were tested for PGT-A or PGT-M/SR. Of these cycles, 204 (5.9%) had an unknown result.*

PGT-M/SR results for the transferred embryo

ART cycles using FET – own and donor oocytes, 2020

Characteristic of transferred embryo	# FET cycles	Percent
Free of genetic disease after PGT-M/SR testing	64	90.1
Carrier after PGT-M/SR testing	7	9.9
TOTAL after PGT-M/SR testing	**71**	**100.0**

** A total of 3,482 FET cycles were tested for PGT-A or PGT-M/SR. Of these cycles, 204 (5.9%) had an unknown result.*

Clinical pregnancy rates by the characteristics of the transferred embryo

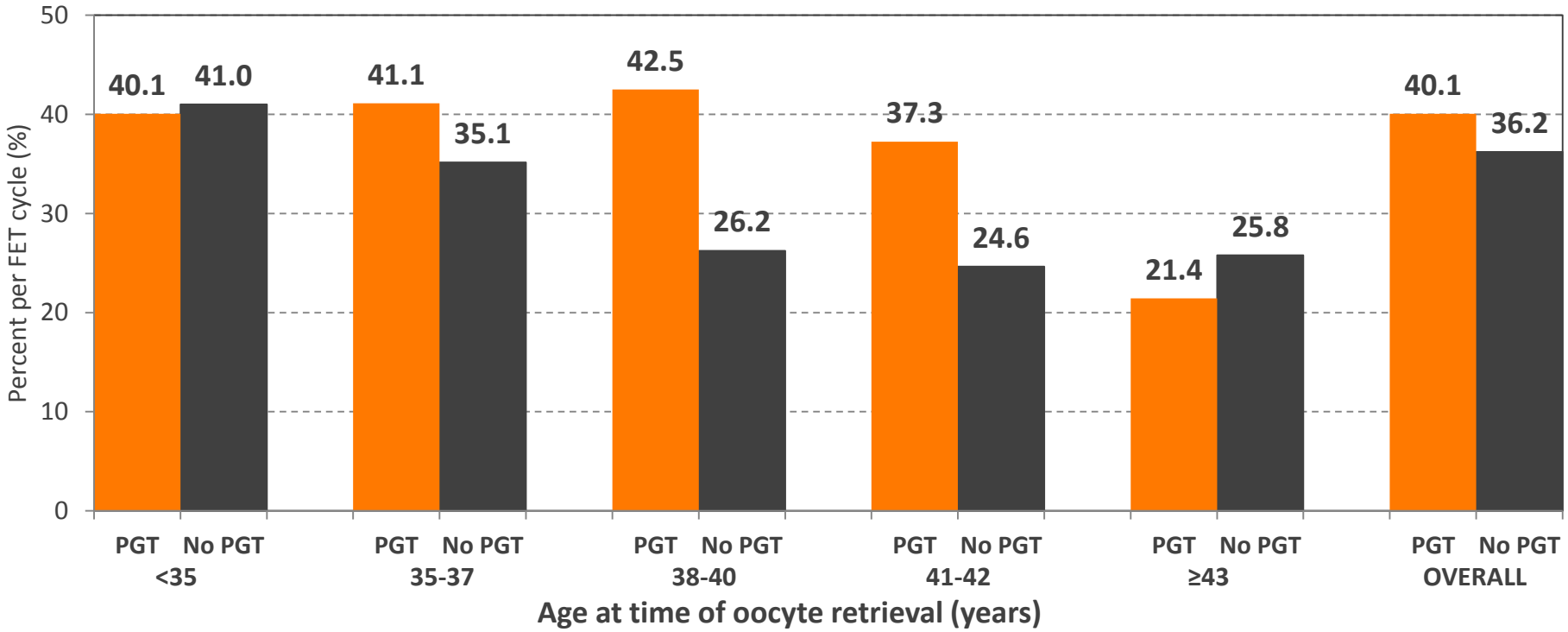
ART cycles using FET – own and donor oocytes, 2020

Characteristic of transferred embryo	Clinical Pregnancy		Ongoing Clinical Pregnancy	
	# FET cycles	*% FET*	*# FET cycles*	*% FET*
Euploid after PGT-A testing	1,365	44.1	1,264	40.8
Mosaic after PGT-A testing	34	32.1	31	29.2
Aneuploid after PGT-A testing	s*	s*	s*	s*
Free of genetic disease after PGT-M testing	26	40.6	26	40.6
Carrier after PGT-M testing	s*	s*	s*	s*
Unknown	77	37.7	69	33.8
TOTAL	**1,507**	**43.3**	**1,395**	**40.1**

** Suppressed due to count <6*

Ongoing clinical pregnancy rates by age among FET cycles with *vs* without PGT

ART cycles using FET – own and donor oocytes, 2020

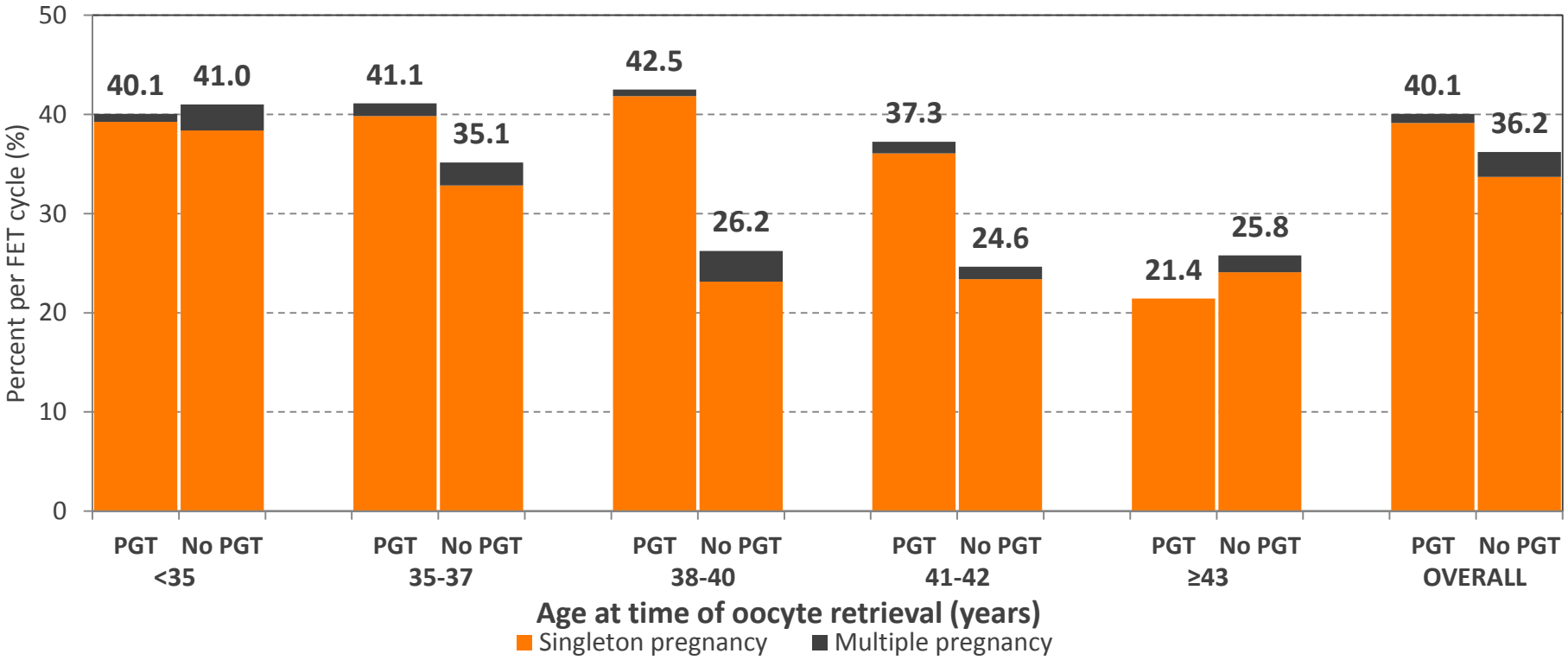


	PGT	No PGT	PGT	No PGT	PGT	No PGT	PGT	No PGT	PGT	No PGT	PGT	No PGT
OCP	581	2,562	380	889	315	423	95	137	24	121	1,395	4,132
FET	1,450	6,248	924	2,530	741	1,612	255	556	112	469	3,482	11,415

** Ongoing clinical pregnancy (OCP): clinical pregnancy with ≥1 fetal heart beat on ultrasound*

Ongoing clinical pregnancy rates by age and plurality among FET cycles with *vs* without PGT

ART cycles using FET – own and donor oocytes, 2020



	PGT	No PGT	PGT	No PGT	PGT	No PGT	PGT	No PGT	PGT	No PGT	PGT	No PGT
Singleton	569	2,399	368	831	310	373	92	130	24	113	1,363	3,846
Multiple	12	163	12	58	5	50	3	7	0	8	32	286
FET	1,450	6,248	924	2,530	741	1,612	255	556	112	469	3,482	11,415

** Ongoing clinical pregnancy (OCP): clinical pregnancy with ≥1 fetal heart beat on ultrasound*

† Singleton pregnancy: ongoing clinical pregnancy with only one fetal heart beat on ultrasound; multiple pregnancy: ongoing clinical pregnancy with >1 fetal heart beat

EMBRYO TRANSFER-SPECIFIC RATES

All ART treatment cycles (fresh and frozen) – own oocytes

n^{th} ET-specific rate

- **Cohort:**
  - Include all oocyte retrieval cycles from 2013 to 2020
    - Exclude any oocyte retrieval cycles that did not have any embryo transfer cycles documented within one year of oocyte retrieval date
  - Include any FET cycle(s) with an embryo transfer date within one year of their respective oocyte retrieval date

n^{th} ET-specific rate

- **Definition:**
  - n^{th} ET cycle
    - Defined as the embryos created from a unique retrieval cycle, where each succeeding ET cycle within a single retrieval are counted according to their transfer cycle start date. Only ET cycles within 1 year of their respective retrieval cycle are included
  - n^{th} ET-specific clinical pregnancy rate
    - The number of clinical pregnancies resulting from the n^{th} embryo transfer cycle within one year of retrieval. Expressed as a percentage of the total number of n^{th} ET cycles within one year of retrieval.
  - n^{th} ET-specific live birth rate
    - The number of live births resulting from the n^{th} embryo transfer cycle within one year of retrieval. Expressed as a percentage of the total number of n^{th} ET cycles within one year of retrieval.

Reasons for no ET among retrievals with no ET within 1 year of retrieval

IVF and FET cycles – own oocytes exclusively, 2013 – 2020

Reason for No ET	*N*	% RET with No ET	% All RET
All RET	117,320	-------	100%
Total No ET	29,313	100%	25.0%
No utilizable embryos	7,164	24.4%	6.1%
No normal fertilization	3,984	13.6%	3.4%
No oocytes	1,777	6.1%	1.5%
No utilizable oocytes	904	3.1%	0.8%
No sperm	192	0.7%	0.2%
Unknown*	15,292	52.2%	13.0%

**Unknown Reason: includes unknown reason, Freeze all, Inadequate uterine lining, and Patient choice*

ET-specific clinical pregnancy rates per retrieval, within 1 year of retrieval

IVF and FET cycles – own oocytes exclusively, 2013 – 2020

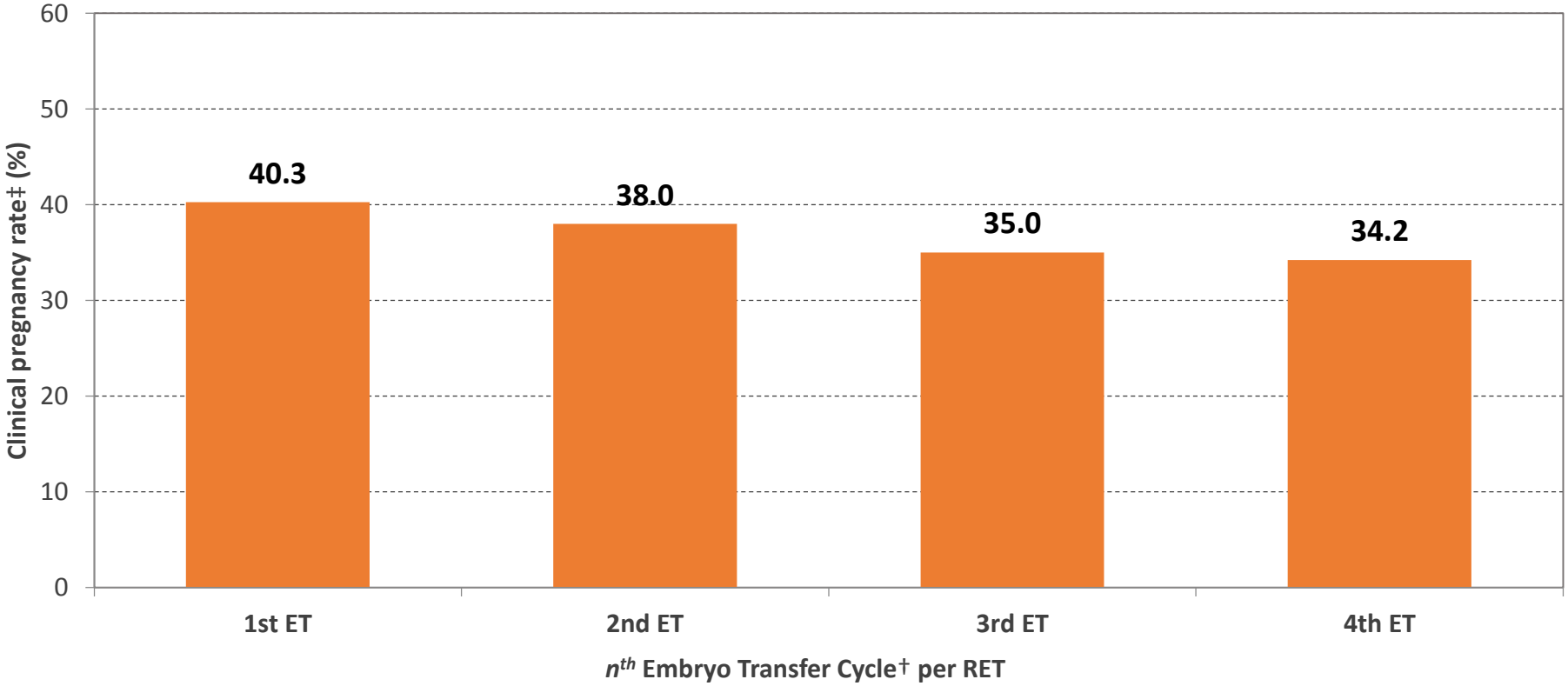
** Clinical pregnancy: clinical intrauterine, heterotopic, or ectopic pregnancy*

† nth ET cycle: Embryos created from a unique retrieval cycle, where each succeeding ET cycle within a single retrieval are counted according to their transfer cycle start date; only ET cycles within 1 year of their respective retrieval cycle are included

‡ Clinical pregnancy rate at each nth ET: the # of clinical pregnancies resulting from the nth ET cycle per retrieval divided by the number of nth ET cycles

ET-specific clinical pregnancy rates per retrieval, within 1 year of retrieval

IVF and FET cycles – own oocytes exclusively, 2013 – 2020



# CP @ *nth* ET	37,514	8,495	1,912	343
# of *nth* ETs	93,126	22,351	5,461	1,002

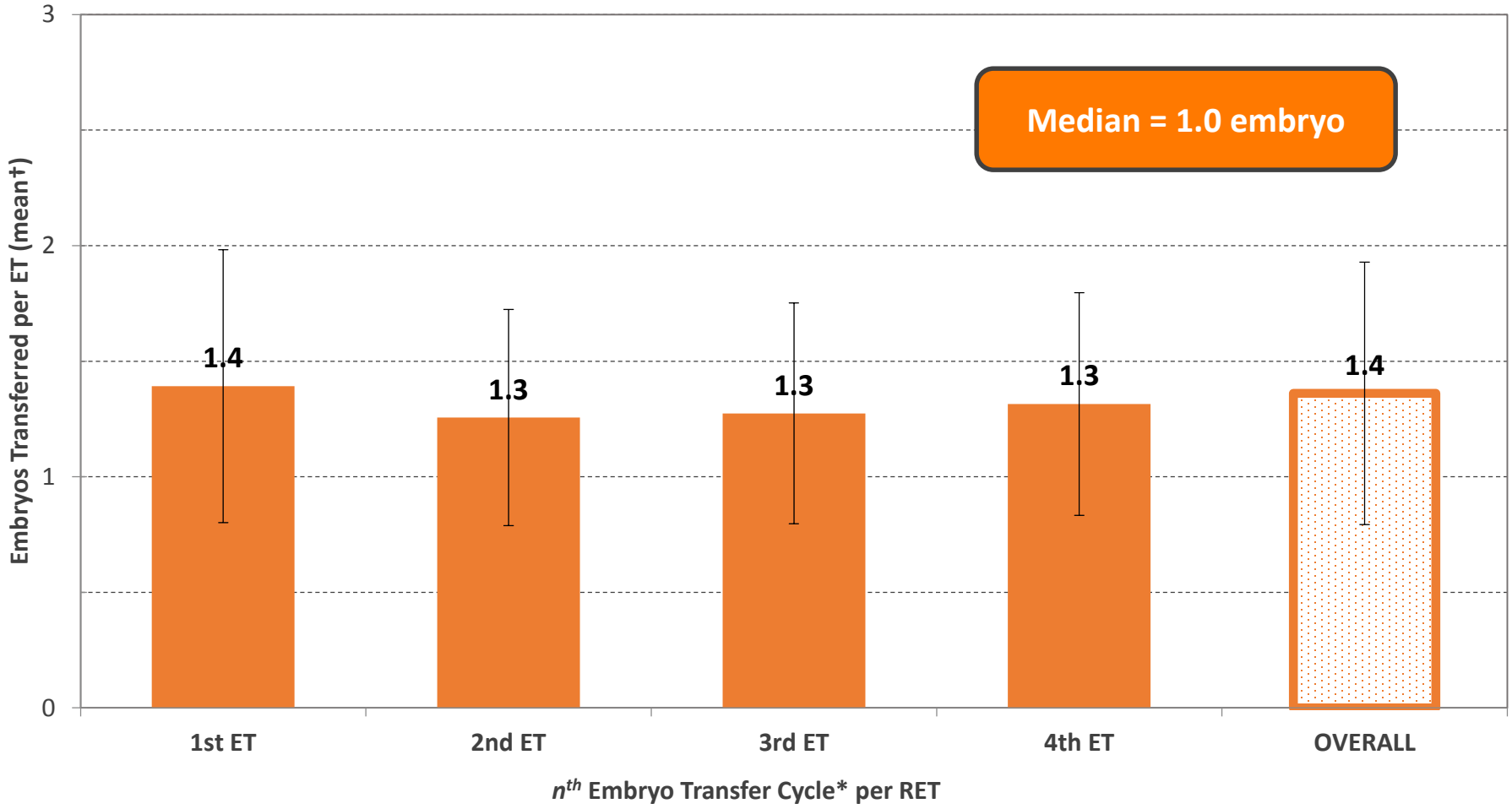
** Clinical pregnancy: clinical intrauterine, heterotopic, or ectopic pregnancy*

† nth ET cycle: Embryos created from a unique retrieval cycle, where each succeeding ET cycle within a single retrieval are counted according to their transfer cycle start date; only ET cycles within 1 year of their respective retrieval cycle are included

‡ Clinical pregnancy rate at each nth ET: the # of clinical pregnancies resulting from the nth ET cycle per retrieval divided by the number of nth ET cycles

Average number of embryos transferred per ET, among retrievals with at least 1 ET within 1 year of retrieval

IVF and FET cycles – own oocytes exclusively, 2013 – 2020

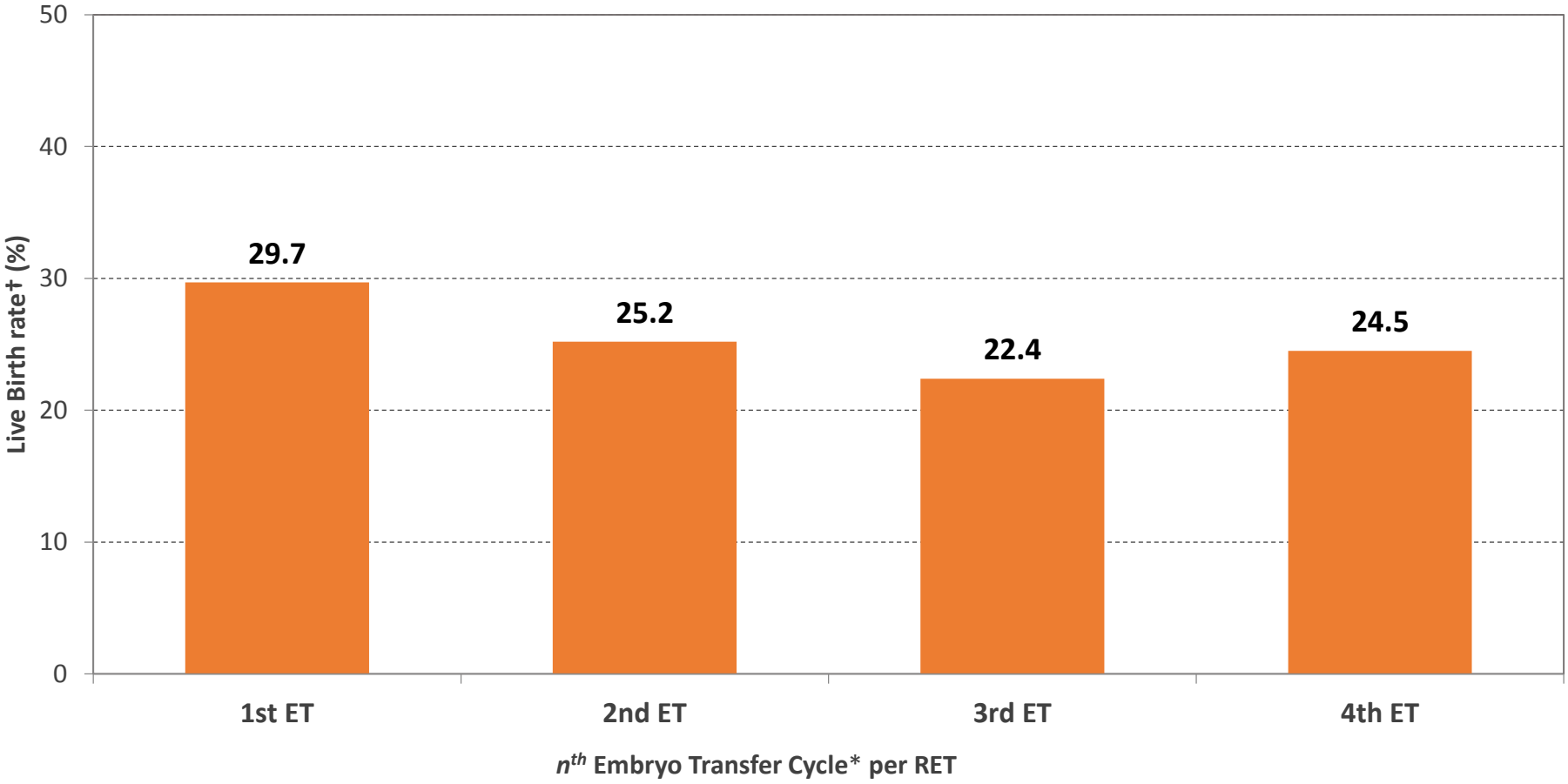


** nth ET cycle: Embryos created from a unique retrieval cycle, where each succeeding ET cycle within a single retrieval are counted according to their transfer cycle start date; only ET cycles within 1 year of their respective retrieval cycle are included*

† Error bars represent 1 standard deviation around the mean

ET-specific live birth rates per retrieval, within 1 year of retrieval

IVF and FET cycles – own oocytes exclusively, 2013 – 2019

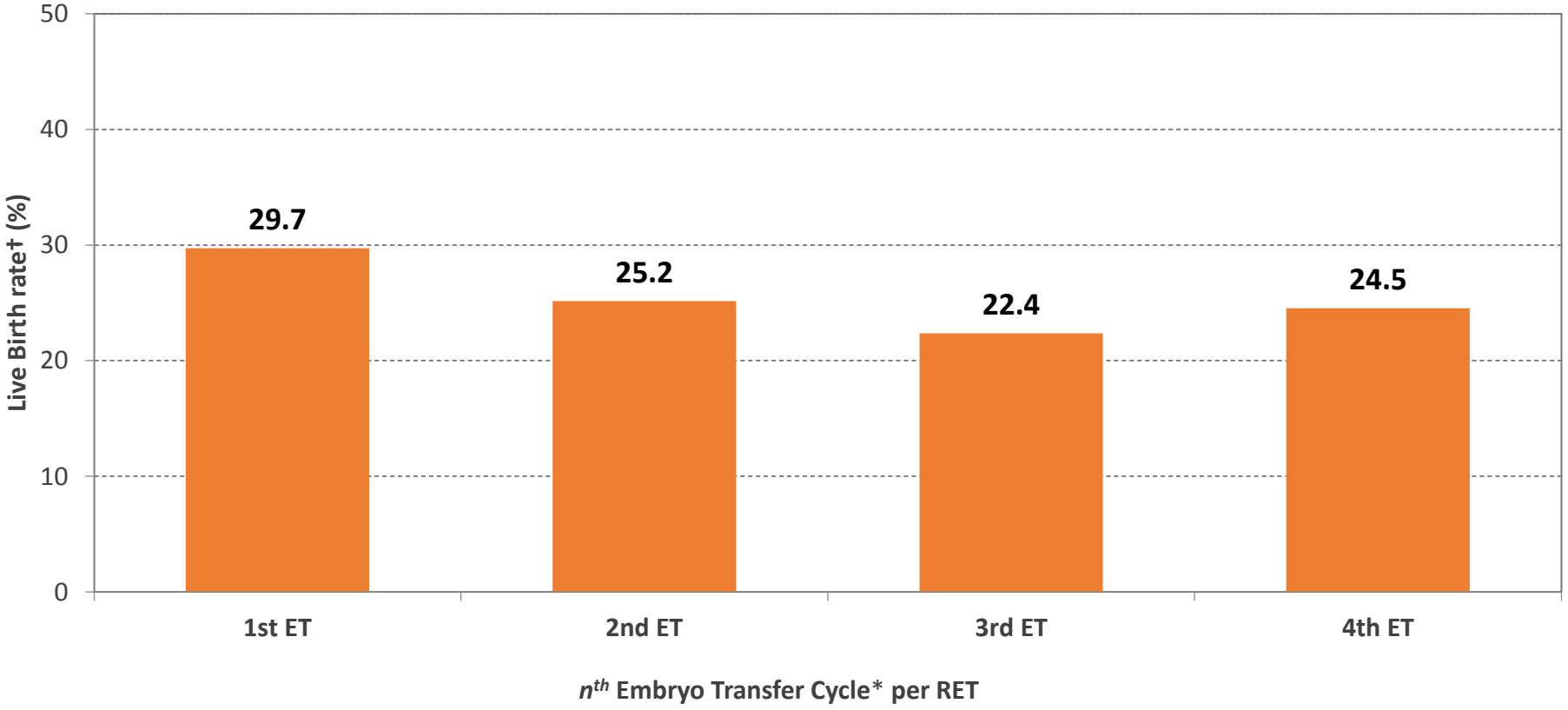


** nth ET cycle: Embryos created from a unique retrieval cycle, where each succeeding ET cycle within a single retrieval are counted according to their transfer cycle start date; only ET cycles within 1 year of their respective retrieval cycle are included*

† Live Birth rate at each nth ET: the # of live births resulting from the nth ET cycle per retrieval divided by the number of nth ET cycles

ET-specific live birth rates per retrieval, within 1 year of retrieval

IVF and FET cycles – own oocytes exclusively, 2013 – 2019



# LB @ *nth* ET	25,379	5,270	1,176	241
# of *nth* ETs	85,357	20,956	5,255	982

** nth ET cycle: Embryos created from a unique retrieval cycle, where each succeeding ET cycle within a single retrieval are counted according to their transfer cycle start date; only ET cycles within 1 year of their respective retrieval cycle are included*

† Live Birth rate at each nth ET: the # of live births resulting from the nth ET cycle per retrieval divided by the number of nth ET cycles

CUMULATIVE PREGNANCY AND LIVE BIRTH RATES

All ART treatment cycles (fresh and frozen) – own oocytes

Cumulative rate

- **Cohort:**
  - Include all oocyte retrieval cycles from 2013 to 2020
    - Exclude any oocyte retrieval cycles that did not have any embryo transfer cycles documented within one year of oocyte retrieval date
  - Include any FET cycle(s) with an embryo transfer date within one year of their respective oocyte retrieval date

Cumulative rate

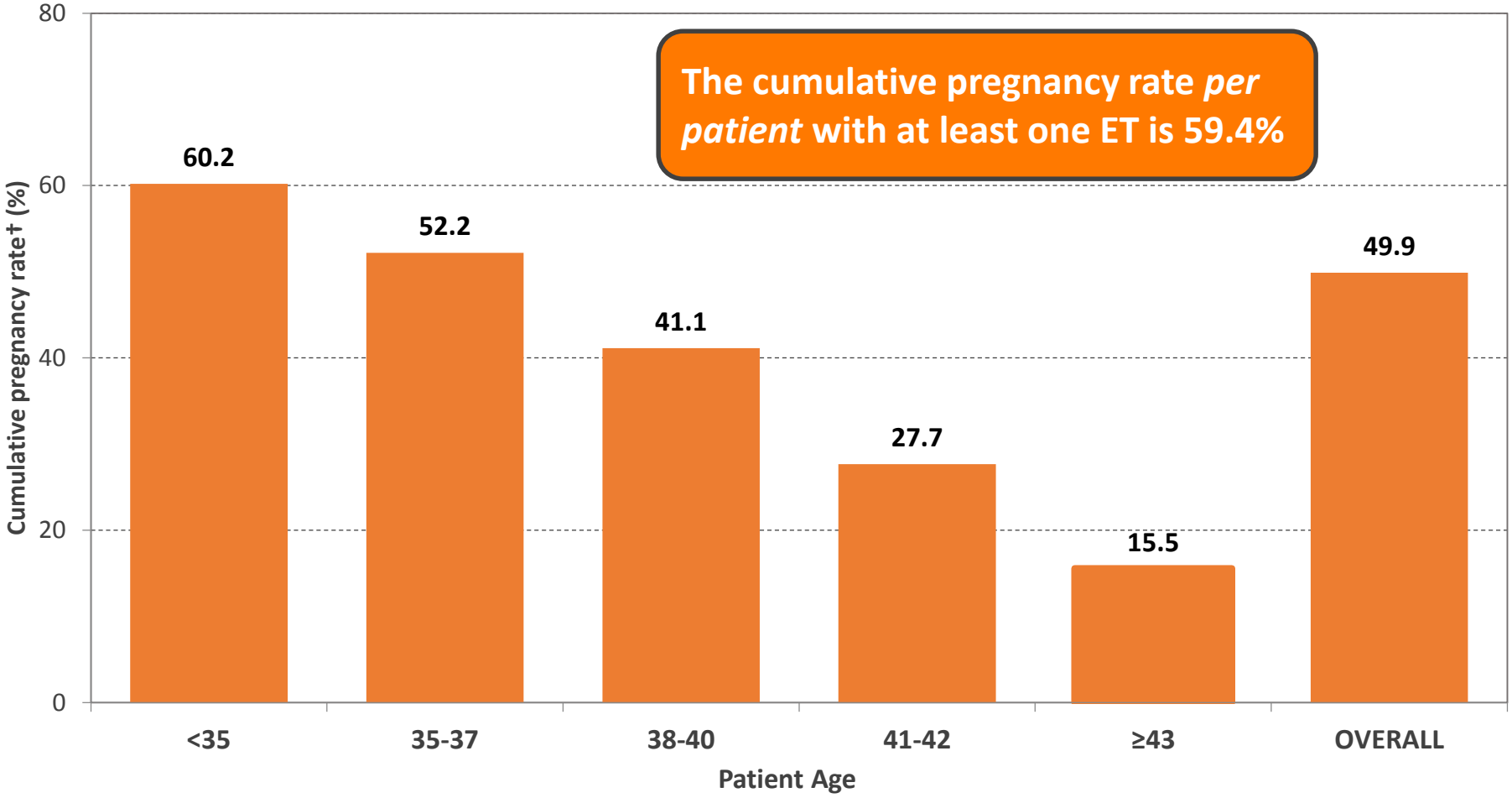
- **Definition:**
  - Cumulative clinical pregnancy rate
    - The number of oocyte retrievals resulting in at least one clinical pregnancy within one year of the retrieval. Expressed as a percentage of all oocyte retrieval cycles that had at least one fresh or frozen/thawed embryo transfer cycle within one year of the retrieval date.
  - Cumulative live birth rate
    - The number of oocyte retrievals resulting in at least one live birth within one year of the retrieval. Expressed as a percentage of all oocyte retrieval cycles that had at least one fresh or frozen/thawed embryo transfer cycle within one year of the retrieval date.

Cumulative rates

- **Options for calculation:**
  - **per patient:** treatment cycle outcomes can be linked for a patient throughout the database
  - **per oocyte retrieval (RET):** treatment cycles that used frozen oocytes or embryos can be linked to the IVF cycle where the oocytes were collected

Cumulative clinical pregnancy rate per retrievals with an ET, within 1 year of retrieval, by patient age

IVF and FET cycles – own oocytes exclusively, 2013 – 2020



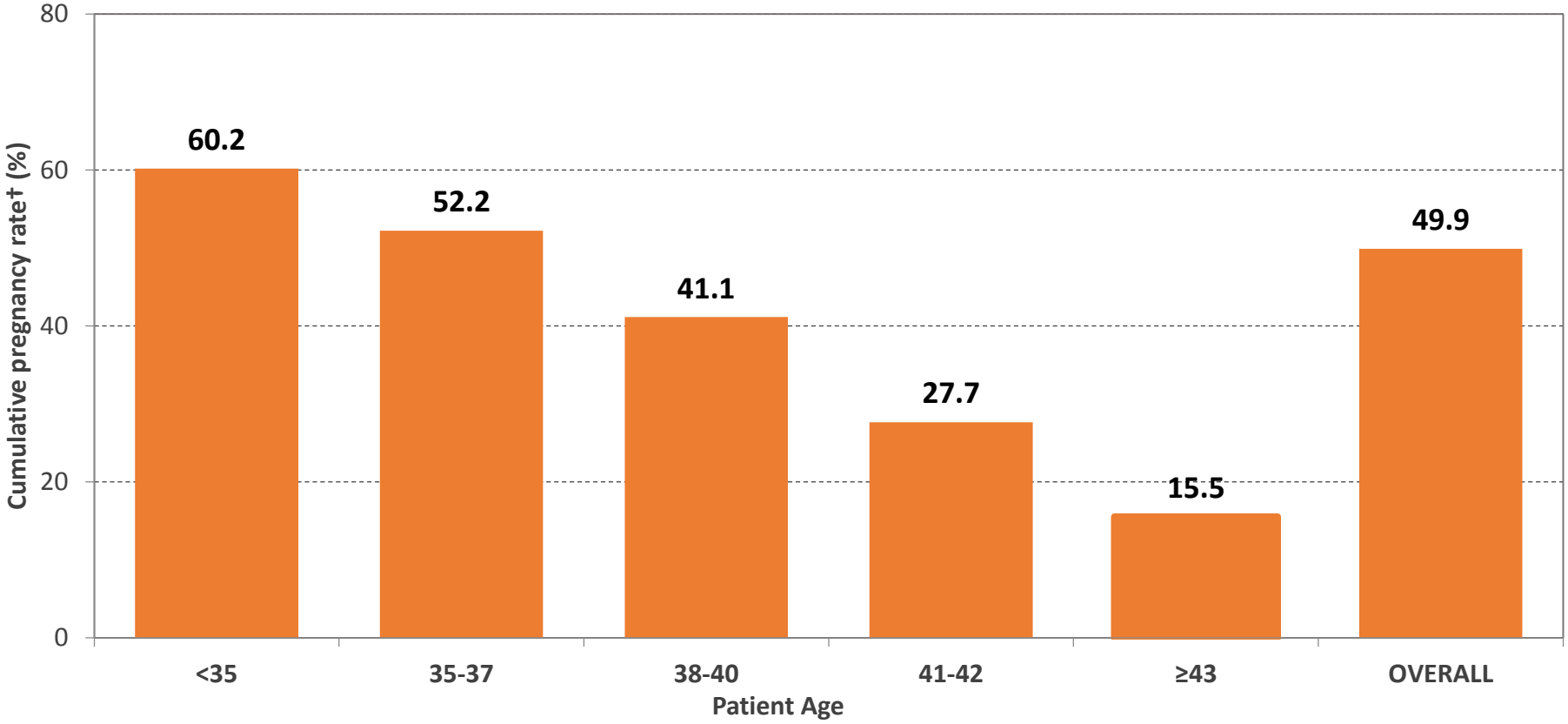
** Clinical pregnancy: clinical intrauterine, heterotopic, or ectopic pregnancy*

† Cumulative pregnancy rate: the number of retrievals resulting in at least 1 clinical pregnancies within 1 year of the retrieval divided by the total number of retrieval cycles that had at least 1 fresh or frozen embryo transfer.

‡ Patient Age: Age of patient at time oocyte retrieval

Cumulative clinical pregnancy rate per retrievals with an ET, within 1 year of retrieval, by patient age

IVF and FET cycles – own oocytes exclusively, 2013 – 2020



CP*	23,946	11,720	7,910	2,430	444	46,450
RET cycles	39,794	22,455	19,232	8,788	2,857	93,126

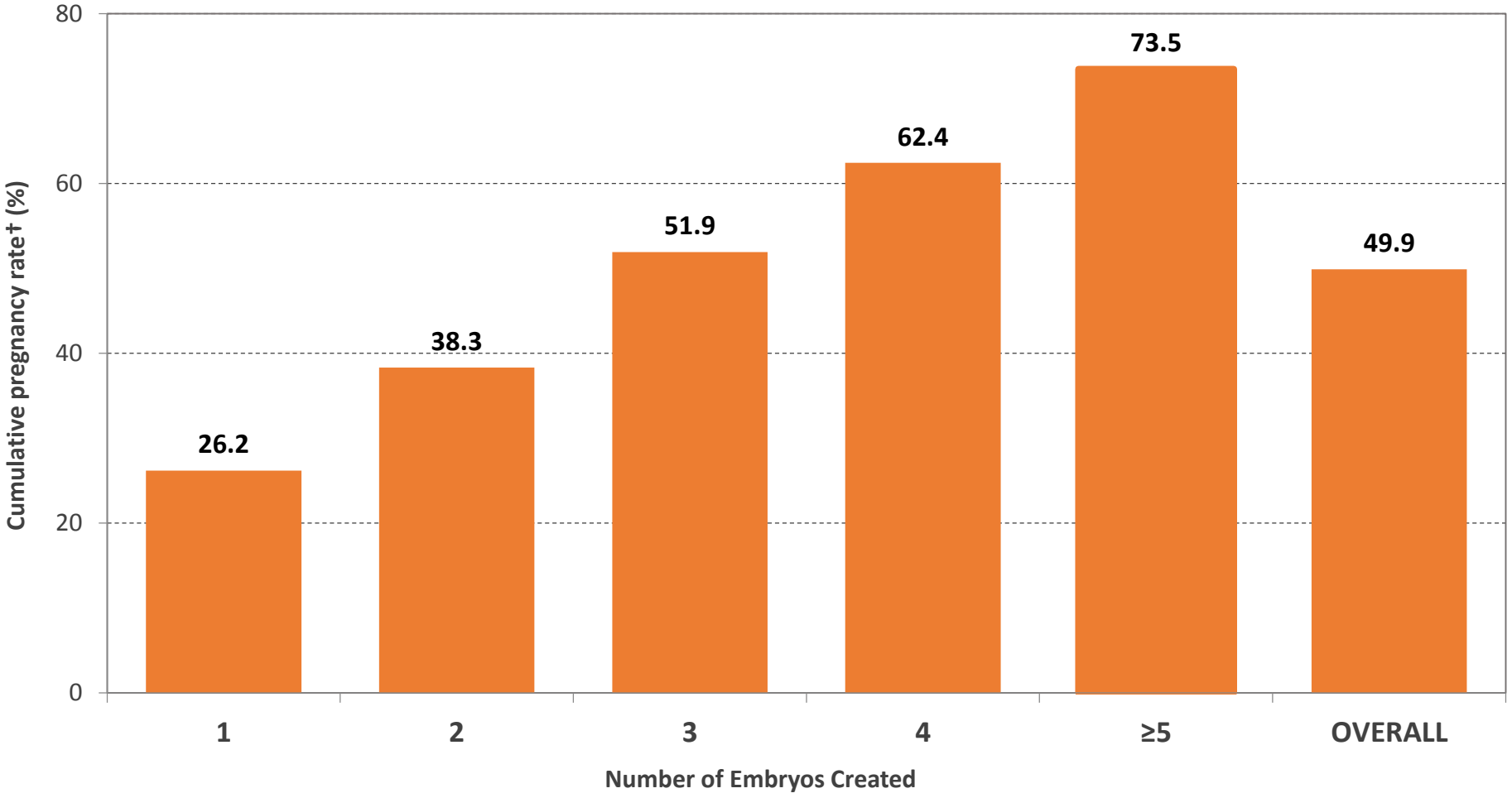
** Clinical pregnancy: clinical intrauterine, heterotopic, or ectopic pregnancy*

† Cumulative pregnancy rate: the number of retrievals resulting in at least 1 clinical pregnancies within 1 year of the retrieval divided by the total number of retrieval cycles that had at least 1 fresh or frozen embryo transfer

‡ Patient Age: Age of patient at time oocyte retrieval

Cumulative clinical pregnancy rate per retrievals with an ET, within 1 year of retrieval, by number of embryos created

IVF and FET cycles – own oocytes exclusively, 2013 – 2020

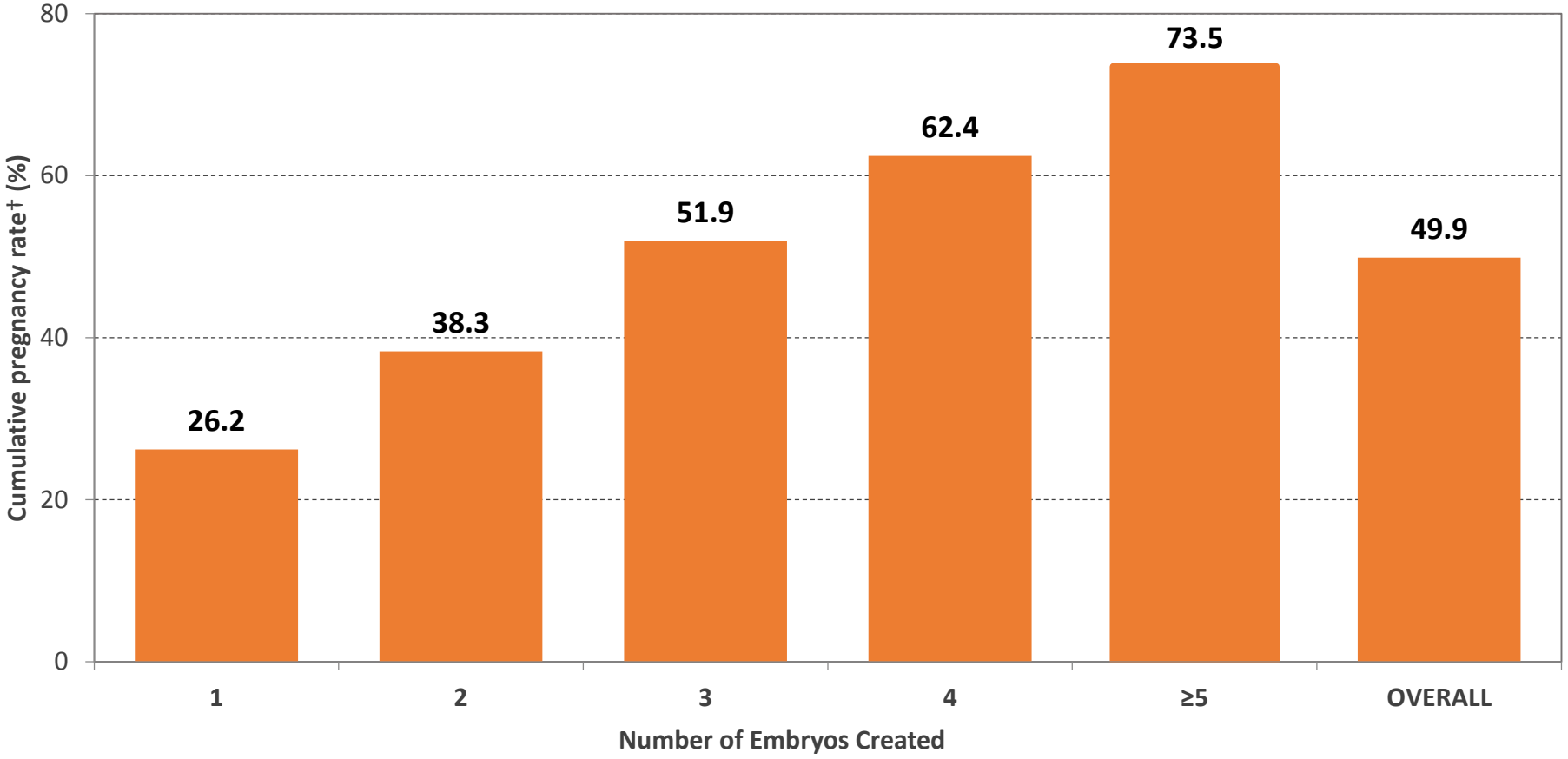


** Clinical pregnancy: clinical intrauterine, heterotopic, or ectopic pregnancy*

† Cumulative pregnancy rate: the number of retrievals resulting in at least 1 clinical pregnancies within 1 year of the retrieval divided by the total number of retrieval cycles that had at least 1 fresh or frozen embryo transfer.

Cumulative clinical pregnancy rate per retrievals with an ET, within 1 year of retrieval, by number of embryos created

IVF and FET cycles – own oocytes exclusively, 2013 – 2020



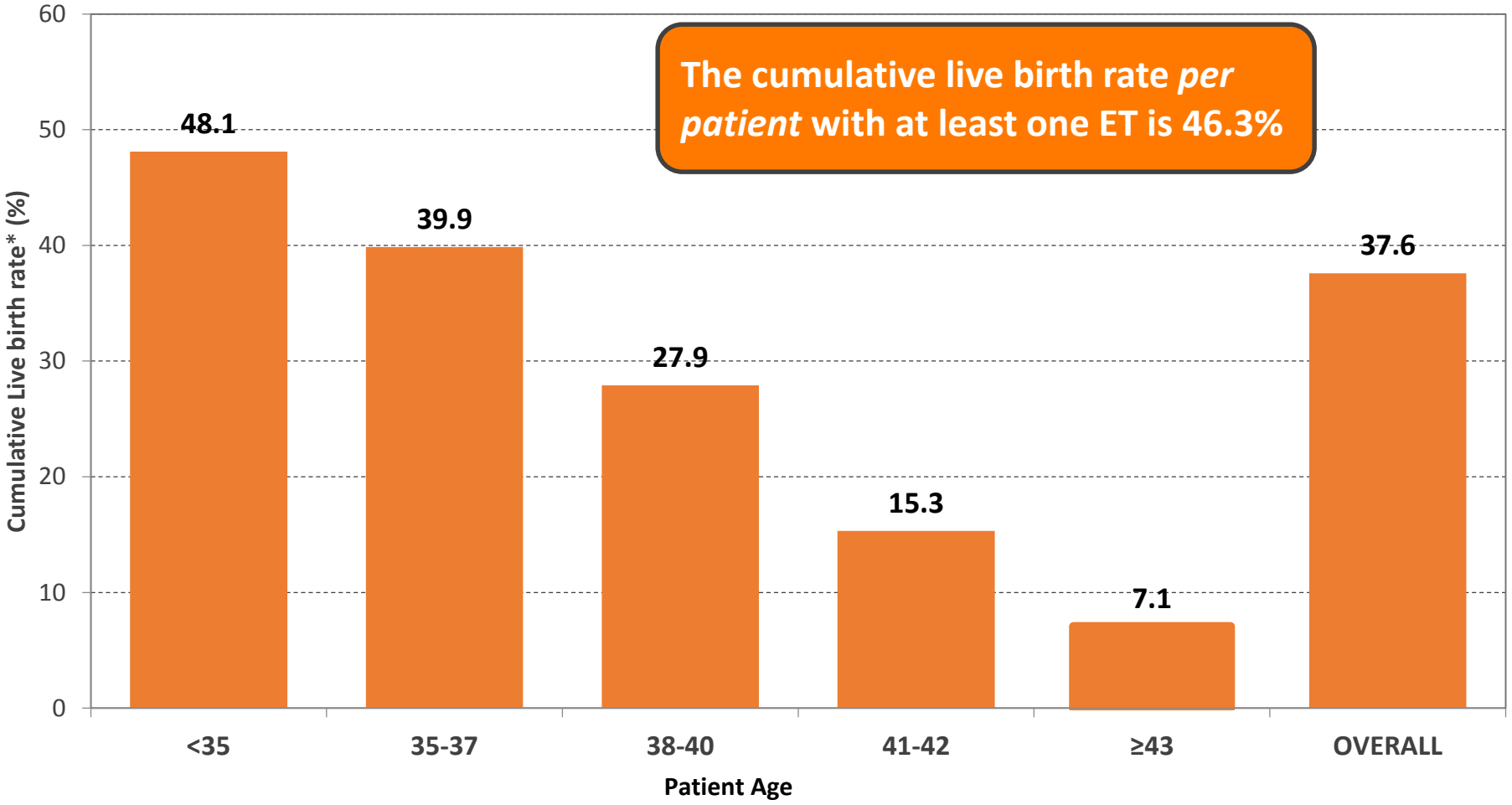
CP*	4,867	9,453	7,875	6,436	17,509	46,450
RET Cycles	18,587	24,677	15,174	10,314	23,834	93,126

** Clinical pregnancy: clinical intrauterine, heterotopic, or ectopic pregnancy*

† Cumulative pregnancy rate: the number of retrievals resulting in at least 1 clinical pregnancies within 1 year of the retrieval divided by the total number of retrieval cycles that had at least 1 fresh or frozen embryo transfer.

Cumulative live birth rates per retrieval with an ET, within 1 year of retrieval, by patient age

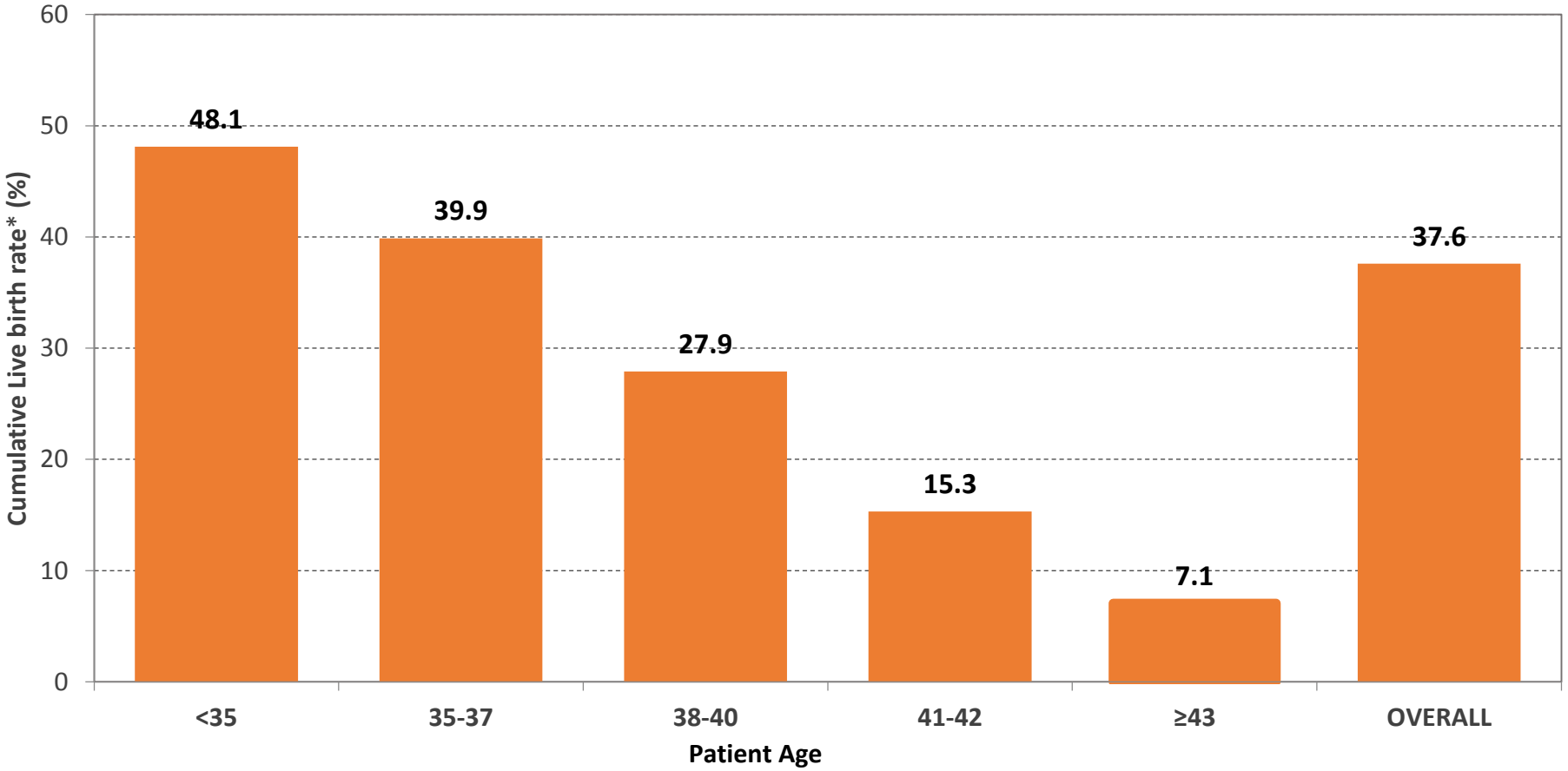
IVF and FET cycles – own oocytes exclusively, 2013 – 2019



** Cumulative Live Birth rate: the number of retrievals resulting in at least 1 live birth within 1 year of the retrieval divided by the total number of retrieval cycles that had at least 1 fresh or frozen embryo transfer.*

Cumulative live birth rates per retrieval with an ET, within 1 year of retrieval, by patient age

IVF and FET cycles – own oocytes exclusively, 2013 – 2019

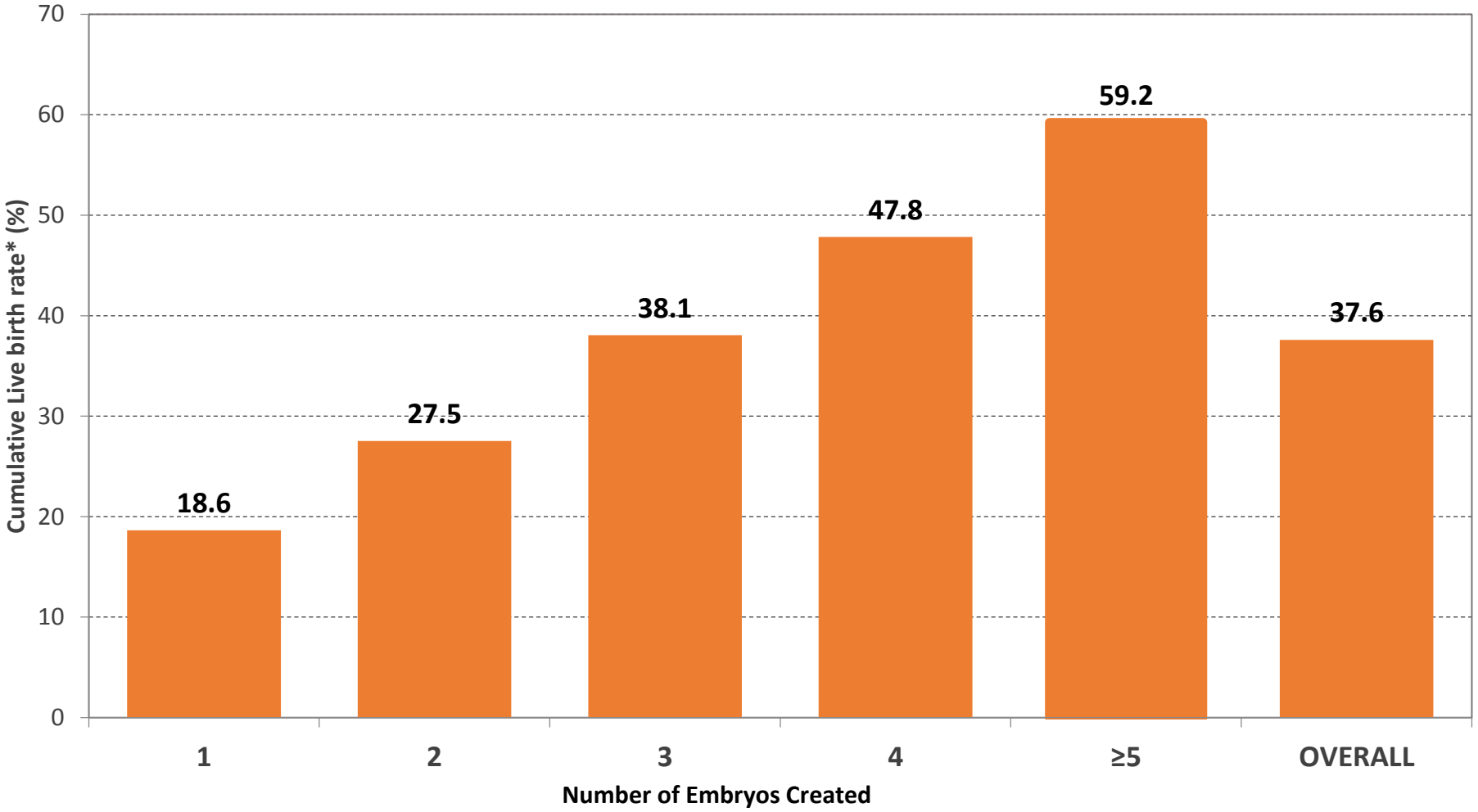


LB	17,575	8,172	4,920	1,238	184	32,089
RET Cycles	36,535	20,504	17,627	8,082	2,609	85,357

* *Cumulative Live Birth rate: the number of retrievals resulting in at least 1 live birth within 1 year of the retrieval divided by the total number of retrieval cycles that had at least 1 fresh or frozen embryo transfer.*

Cumulative live birth rates per retrieval with an ET, within 1 year of retrieval by number of embryos created

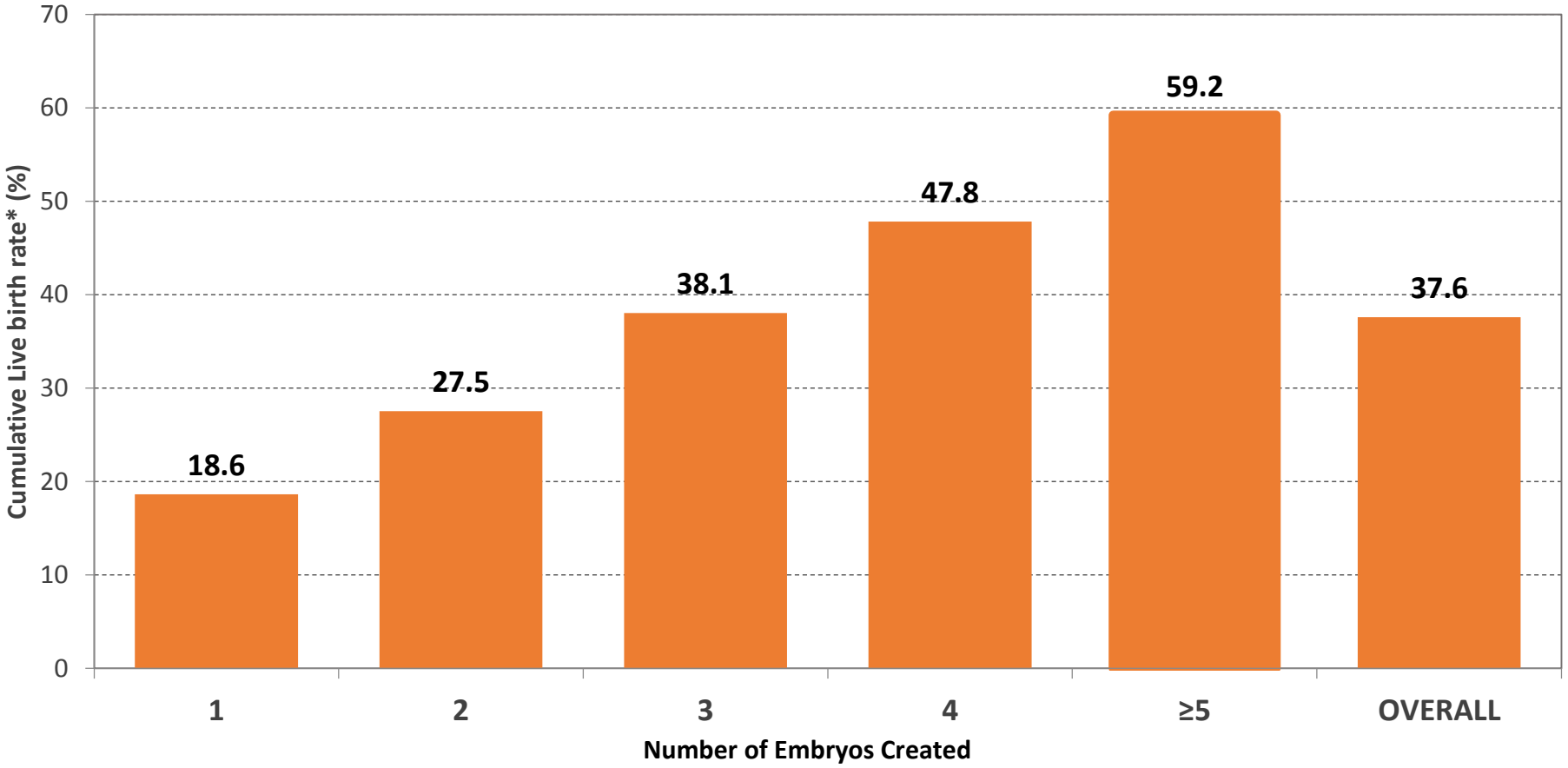
IVF and FET cycles – own oocytes exclusively, 2013 – 2019



** Cumulative Live Birth rate: the number of retrievals resulting in at least 1 live birth within 1 year of the retrieval divided by the total number of retrieval cycles that had at least 1 fresh or frozen embryo transfer.*

Cumulative live birth rates per retrieval with an ET, within 1 year of retrieval by number of embryos created

IVF and FET cycles – own oocytes exclusively, 2013 – 2019



LB	3,232	6,300	5,320	4,502	12,557	32,089
RET Cycles	17,350	22,886	13,981	9,414	21,200	85,357

** Cumulative Live Birth rate: the number of retrievals resulting in at least 1 live birth within 1 year of the retrieval divided by the total number of retrieval cycles that had at least 1 fresh or frozen embryo transfer.*

ONTARIO FERTILITY PROGRAM

Ontario Fertility Program *vs* Private pay in Ontario

2016-2019

Treatment cycles		2018		2019		2016-2019	
		OFP funded	*Private pay*	*OFP funded*	*Private pay*	*OFP funded*	*Private pay*
Unique patients	*N patients*	6,174	4,506	4,885	4,819	22,101	16,402
Gestational Carriers	*n CS*	72	232	54	88	390	1,698
IVF cycle starts	*n CS*	6,325	5,131	5,100	5,408	23,413	21,251
Cancellation rate	*% CS*	3.2%	4.6%	4.1%	4.7%	2.4%	5.7%

Ontario Fertility Program *vs* Private pay in Ontario

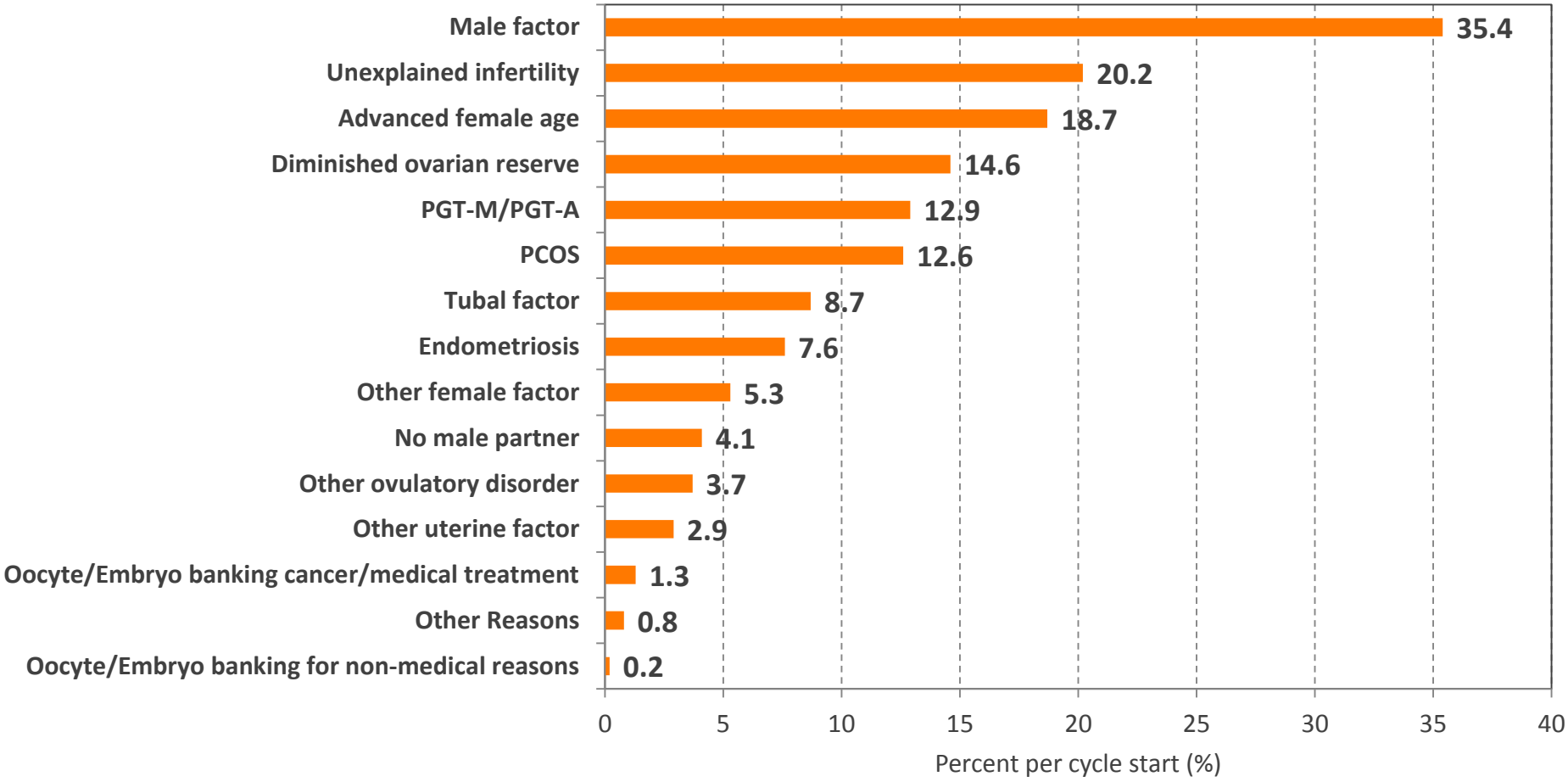
2016-2019

Treatment cycles		2018		2019		2016-2019	
		OFP funded	*Private pay*	*OFP funded*	*Private pay*	*OFP funded*	*Private pay*
IVF cycle starts	*n CS*	6,325	5,131	5,100	5,408	23,413	21,251
Embryo transfer cycles	*n ET*	5,289	3,078	4,274	3,243	26,555	17,588
Clinical pregnancies	*n CP*	2,030	1,290	1,554	1,247	9,936	7,154
	% ET	38.4%	41.9%	36.4%	38.5%	37.4%	40.7%
Ongoing clinical pregnancies	*n OCP*	2,024	1,283	1,551	1,242	9,909	7,125
	% ET	38.3%	41.7%	36.3%	38.3%	37.3%	40.6%
Multiple ongoing clinical pregnancies	*n OCP*	69	119	50	81	394	555
	% OCP	3.4%	9.3%	3.2%	6.5%	4.0%	7.8%

** Clinical pregnancy: clinical intrauterine, heterotopic, or ectopic pregnancy*
† Ongoing clinical pregnancy: clinical pregnancy with ≥1 fetal heart beat on ultrasound
‡ Multiple ongoing clinical pregnancy: ongoing clinical pregnancy with more than one fetal heart beat on ultrasound

Reasons for treatment among OFP-funded cycles

IVF cycles, 2016-19



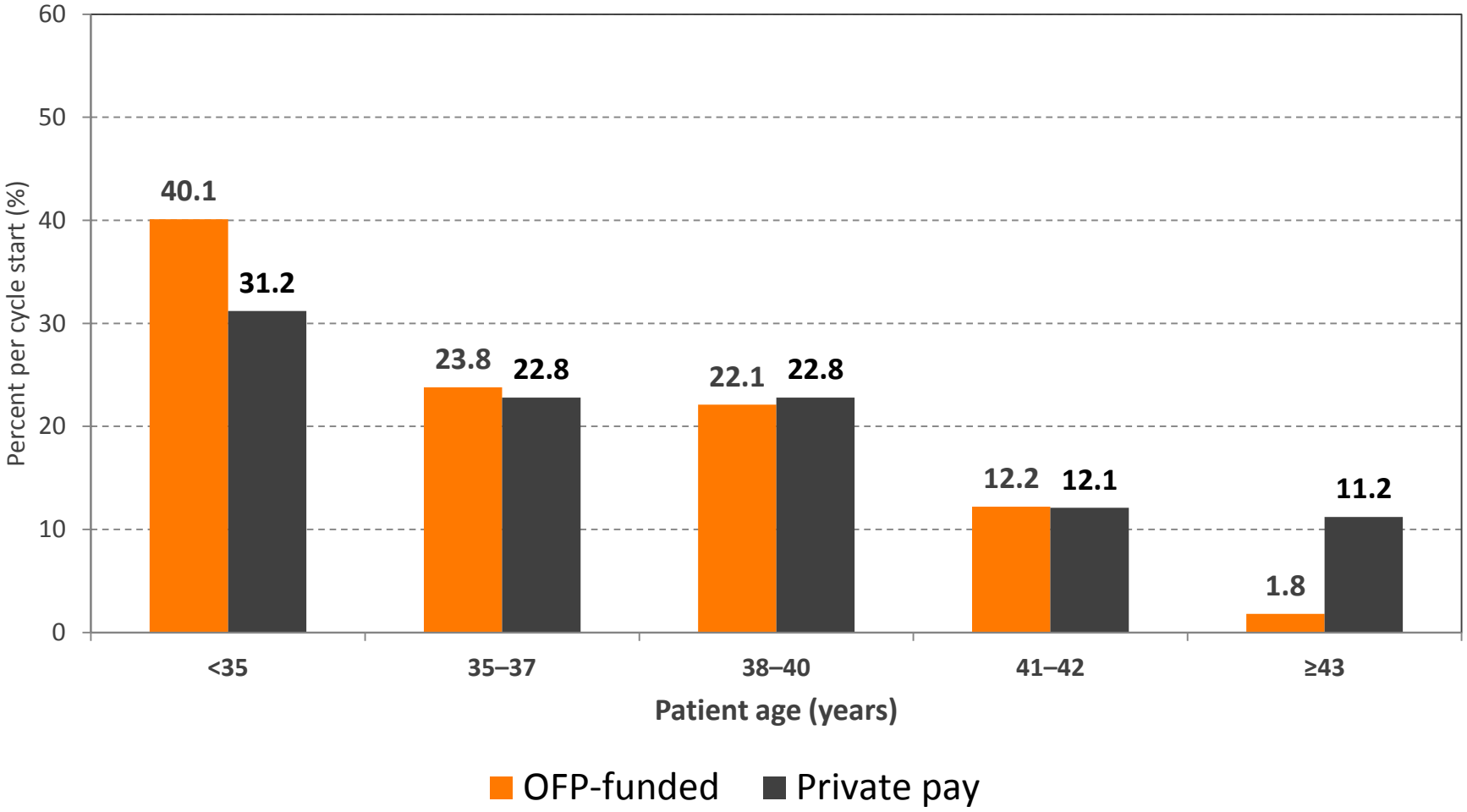
** Excludes fertility preservation cycles*

† Categories are not mutually exclusive

‡ Other reasons include: gonadotoxic therapy, no female partner and peritoneal factor or severe adhesions

Patient age by OFP vs Private pay in Ontario

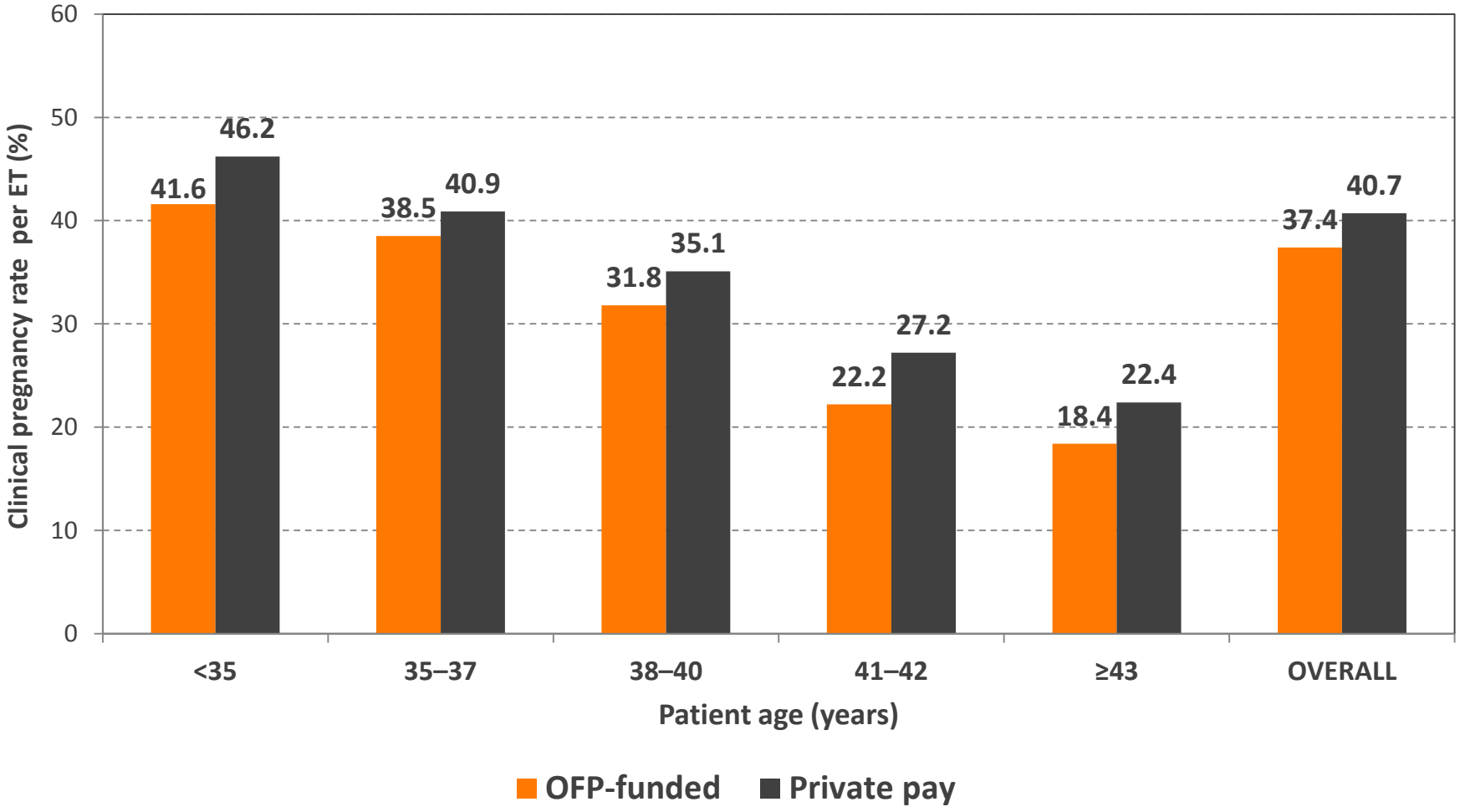
IVF cycles, 2016-19



*Excludes fertility preservation cycles

Clinical pregnancy rate per ET, by patient age and OFP vs Private pay in Ontario

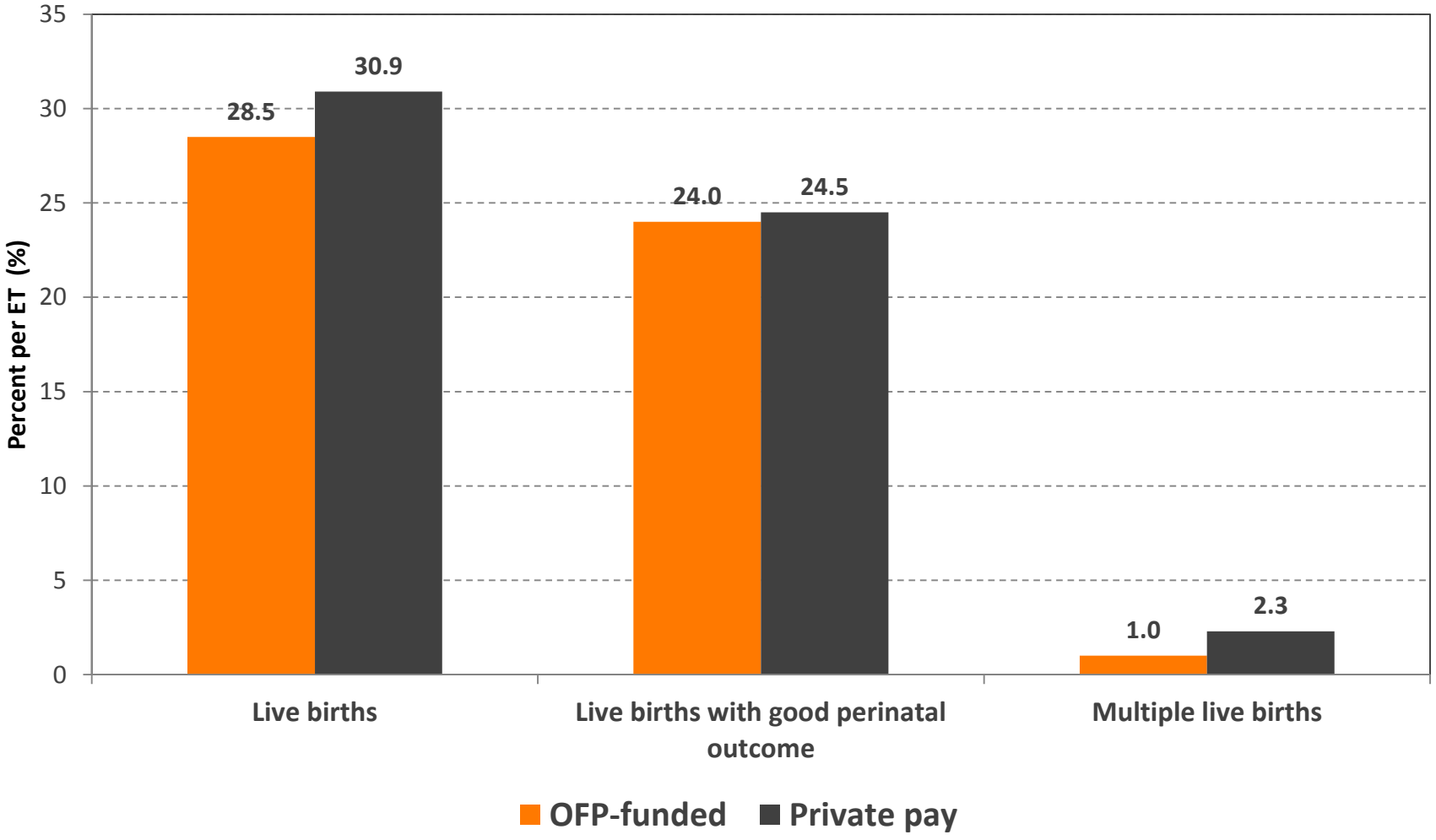
All ART treatment cycles (fresh and frozen), 2016-19



** Clinical pregnancy: clinical intrauterine, heterotopic, or ectopic pregnancy*

Birth outcome rates per ET by OFP vs Private pay in Ontario

All ART treatment cycles (fresh and frozen), 2016-19



** Good perinatal outcome: singleton live birth at ≥37 weeks' gestation and a birth weight ≥2,500 grams*

GESTATIONAL AGE AT TIME OF DELIVERY

Ontario births: IVF conceptions compared to spontaneous conceptions

Preterm birth

ART vs. Non-ART Ontario – 2013 – 2019

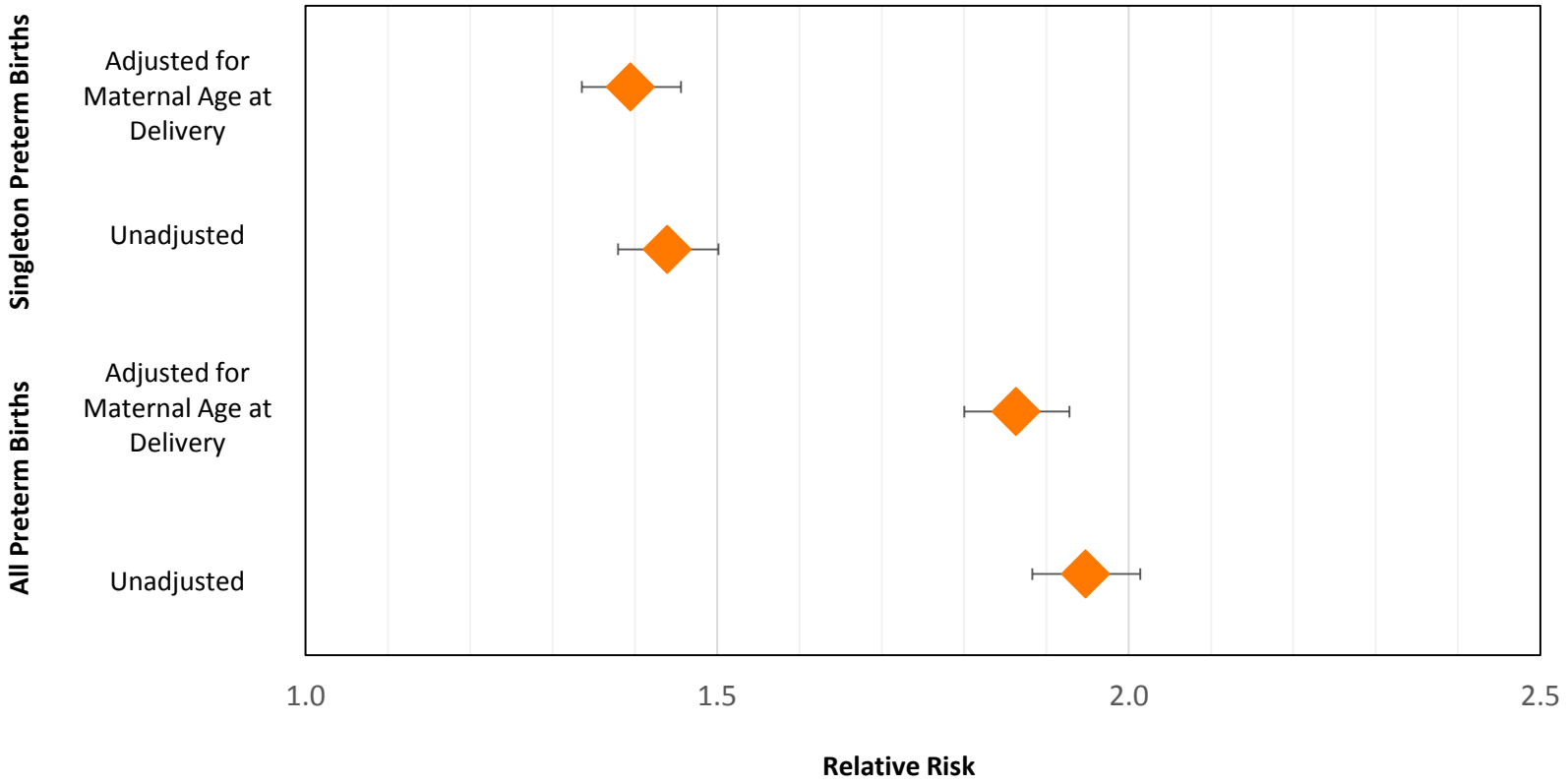
- **Preterm birth:**
  - **<37 weeks' gestation**
  - **RR = 1.95 95% CI: 1.88–2.01**
  - **adjusted RR = 1.86 95% CI: 1.80–1.93**

- **Singleton preterm births:**
  - **<37 weeks' gestation**
  - **RR = 1.44 95% CI: 1.38–1.50**
  - **adjusted RR = 1.39 95% CI: 1.34–1.46**

** Adjusted for maternal age at delivery.*

Preterm birth in Ontario

ART vs. Non-ART Ontario – 2013 – 2019



**Preterm birth is defined as live birth or stillbirth at ≤37 weeks gestation.*
**Error bars represent 95% Confidence Intervals*

Gestational age at time of delivery

ART vs. Non-ART Ontario – 2013 – 2019

CARTR Plus

Gestational age at delivery	Total births	ART		Non-ART		RR (95% CI)	Adj. RR (95%CI)
		n	%	n	%		
<32 weeks	15,818	658	3.13	15,160	1.44	2.17 (2.01, 2.34)	2.03 (1.87, 2.19)
32 weeks	3,328	139	0.66	3,189	0.30	2.18 (1.84, 2.58)	2.07 (1.74, 2.46)
33 weeks	5,034	247	1.28	4,787	0.46	2.58 (2.27, 2.93)	2.45 (2.15, 2.79)
34 weeks	8,860	366	1.74	8,494	0.81	2.15 (1.94, 2.39)	2.08 (1.87, 2.31)
35 weeks	15,585	576	2.74	15,009	1.43	1.92 (1.77, 2.08)	1.86 (1.71, 2.02)
36 weeks	32,244	1,047	4.99	31,197	2.97	1.68 (1.58, 1.78)	1.62 (1.52, 1.72)
≥37 weeks	989,741	17,970	85.56	971,771	92.58	0.92 (0.92, 0.93)	0.93 (0.92, 0.93)

** Adjusted for maternal age at delivery.*

Gestational age at time of delivery for singleton pregnancies

ART vs. Non-ART Ontario – 2013 – 2019

Gestational age at delivery	Total births	ART		Non-ART		RR (95% CI)	Adj. RR (95%CI)
		n	%	n	%		
<32 weeks	14,083	469	2.44	13,614	1.32	1.85 (1.69, 2.03)	1.72 (1.57, 1.89)
32 weeks	2,781	80	0.42	2,701	0.26	1.59 (1.28, 1.99)	1.51 (1.21, 1.89)
33 weeks	4,172	145	0.75	4,027	0.39	1.94 (1.64, 2.28)	1.84 (1.56, 2.18)
34 weeks	7,574	205	1.07	7,369	0.71	1.50 (1.30, 1.72)	1.46 (1.27, 1.68)
35 weeks	13,602	378	1.97	13,224	1.28	1.54 (1.39, 1.70)	1.51 (1.36, 1.67)
36 weeks	28,695	708	3.68	27,987	2.71	1.36 (1.26, 1.46)	1.33 (1.24, 1.43)
≥37 weeks	982,069	17,246	89.6	964,823	93.3	0.96 (0.96, 0.97)	0.96 (0.96, 0.97)

** Adjusted for maternal age at delivery.*

THANK YOU!

Lynn Meng, Epidemiologist
lmeng@bornontario.ca

Dr. Andrea Lanes, Clinical Content Specialist
alanes@bornontario.ca

Kasim Abdulaziz, Epidemiologist
kabdulaziz@bornontario.ca

Moya Johnson, Coordinator – CARTR Plus
mojohnson@bornontario.ca

Shelley Dougan, Manager
sdougan@bornontario.ca