

# Kaplan-Meier Analysis of Cumulative Ongoing Pregnancy Rates with Vitrified Donor Oocytes to Estimate Cost Effectiveness of “Assured Refund” Plans

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## DISCLOSURES:

None

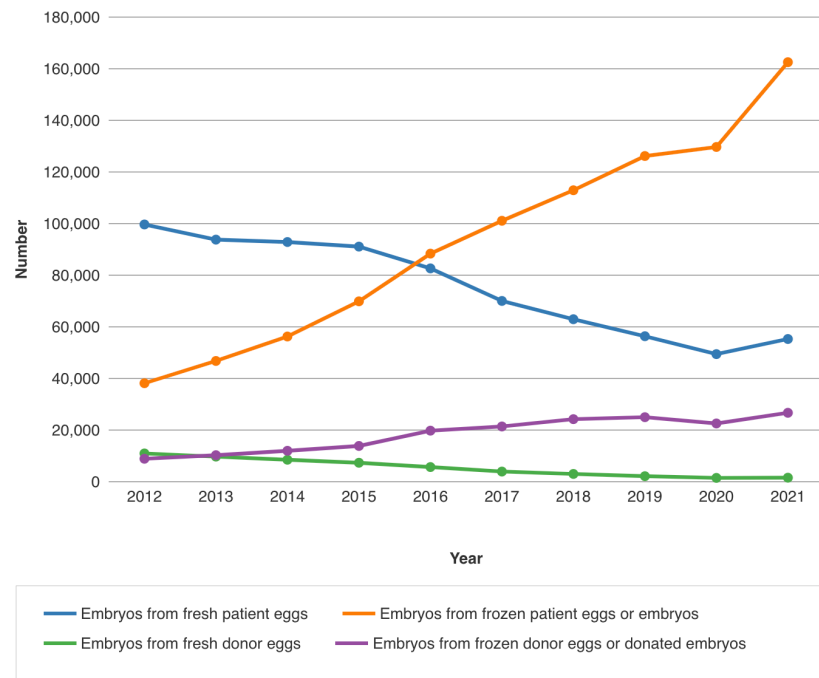




# BACKGROUND:

- Use of donor oocytes is increasing; ~40,000 babies are born annually in the US from donor gametes, with approximately 25% being from donor oocytes <sup>1</sup>

Number of ART Cycles, by Egg or Embryo Source, United States, 2012–2021



Year	Embryos from fresh donor eggs	Embryos from frozen donor eggs...
2012	10,954	8,893
2013	9,718	10,270
2014	8,507	11,974
2015	7,336	13,846
2016	5,677	19,779
2017	3,926	21,395
2018	3,005	24,235
2019	2,138	24,993
2020	1,477	22,563
2021	1,552	26,700

Reference: 2021 National ART Summary.



## Options for obtaining donor oocytes:

### 1) Single Egg Lots

- Typically includes ~6 oocytes
- At least 1 embryo guaranteed per lot

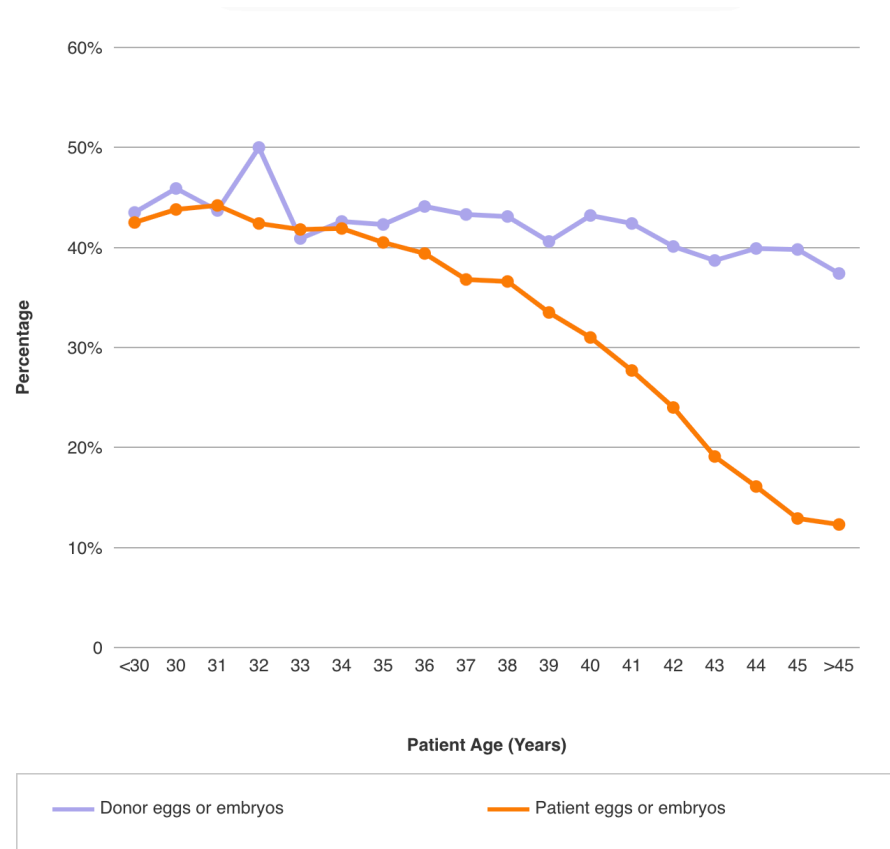
### 2) Assured Refund Programs

- Up to 6 lots of oocytes
- Full refund if no live birth achieved after use of all 6 lots





- Excellent success rates using donor eggs; largely attributed to the young age of oocyte donors
- SART data showed that 37-50% of embryo transfers using donor oocytes / embryos resulted in a live birth in 2021



Patient Age (Years)	Donor eggs or embryos
<30	43.5%
30	45.9%
31	43.7%
32	50.0%
33	40.9%
34	42.6%
35	42.3%
36	44.1%
37	43.3%
38	43.1%
39	40.6%
40	43.2%
41	42.4%
42	40.1%
43	38.7%
44	39.9%
45	39.8%
>45	37.4%



# OBJECTIVE:

To determine the sustained implantation rate (SIR) after transfer of donor oocyte derived embryos to elucidate efficiency and help to estimate the cost effectiveness of donor vitrified oocytes

SIR: beyond 20 weeks gestational age





# MATERIALS & METHODS:

- Assessment of outcomes from patients who purchased donor oocytes and underwent a frozen single embryo transfer (SET) between December 13, 2015 to September 30, 2022
- Included patients who obtained donor oocytes from 3 different egg banks  
→ 1832 transfers in 714 patients included
- Median number of blastocysts per egg lot: 2 (IQR: 2-3)
- Kaplan-Meier analysis to determine the cumulative SIR

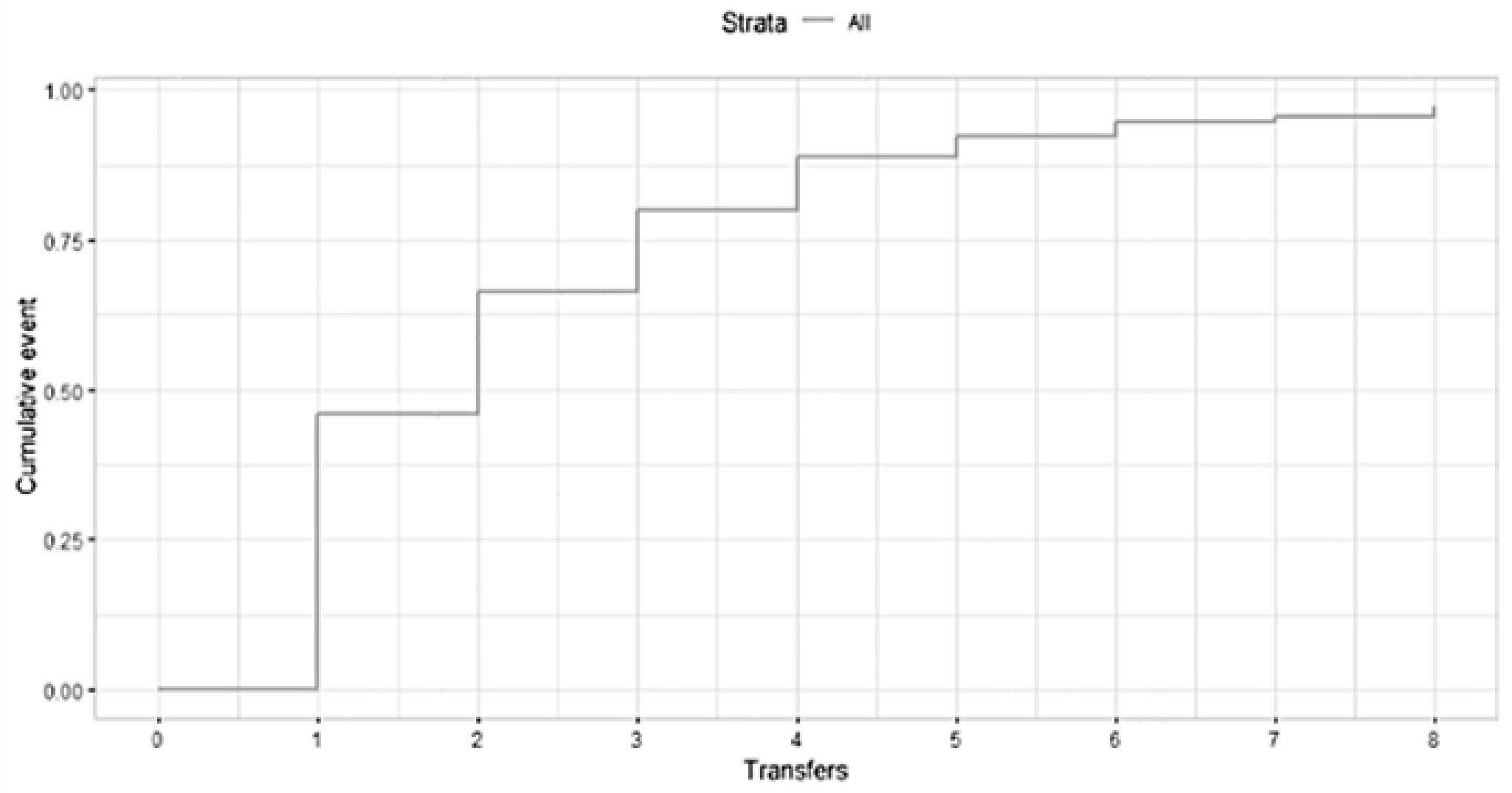
# Results





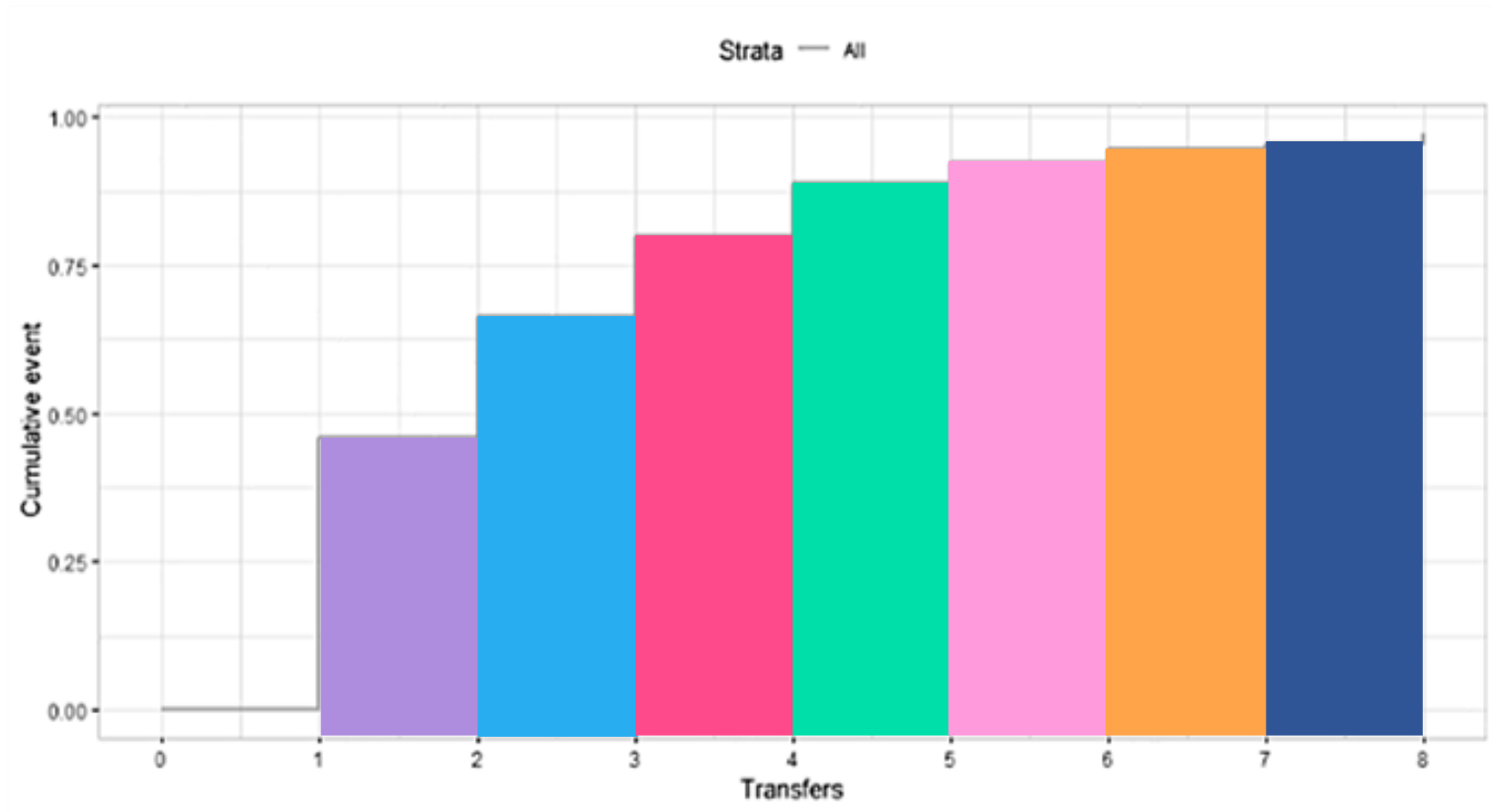


# Kaplan-Meier Analysis:





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Cumulative incidence reflecting SIR from successive transfers:

- 1: 0.458
- 2: 0.663
- 3: 0.80
- 4: 0.887
- 5: 0.923
- 6: 0.945
- 7: 0.955
- 8: 0.973

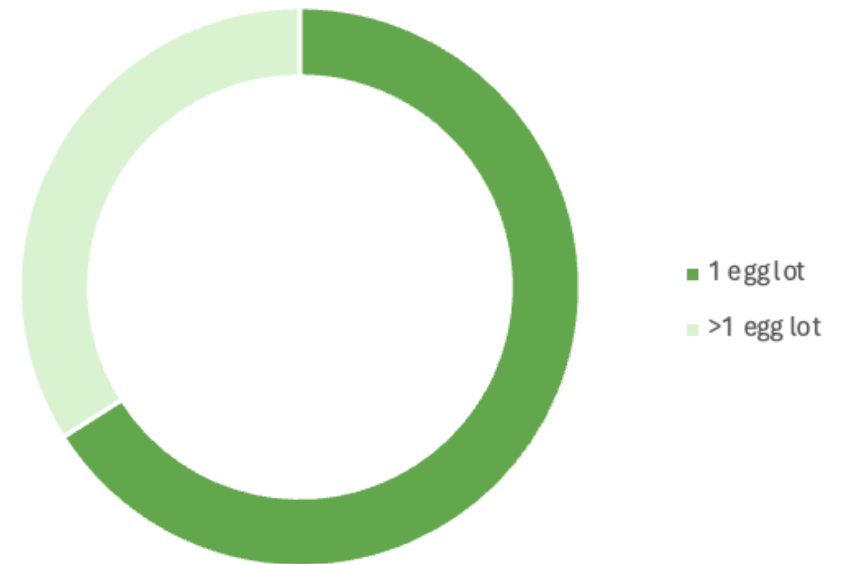


# RESULTS:

- 81.8% of egg lots resulted in >1 embryo available

Based on this analysis:

- 66% of patients had SIR after 1 egg lot
- 34% required > 1 oocyte lot





## Cost for Transfers with Single Lot Purchases:

$$\text{Total} = (L \times n) + (M \times N) + (T \times (N-n))$$

L: Cost of a single lot

n: Number of oocyte lots

M: Medication costs

N: Number of transfers

T: Cost of each transfer



## Cost for Transfers with Assured Refund Program:

$$\text{Total} = A + (M \times N)$$

A: Assured refund program (cost of oocytes and all transfers)

M: Medication costs

N: Number of transfers

# Cost Effectiveness Estimate:

$$\frac{[A + (M \times N)]}{[(L \times n) + (M \times N) + (T \times (N-n))]}$$

A: Assured refund program cost

L: Cost of a single lot

n: Number of oocyte lots

M: Medication costs

N: Number of transfers

T: Cost of each transfer

If <1; Indicative of relative value of the AR program

If >1; Indicative that individual lot purchase is of better value



# Example 1:

## 2 lots; 3 transfers

$$\frac{[42,000 + (1000 \times 1)]}{[(14,000 \times 1) + (1000 \times 1) + (4,000 \times (1-1))]}$$

A: Assured refund program cost

L: Cost of a single lot

n: Number of oocyte lots

M: Medication costs

N: Number of transfers

T: Cost of each transfer

= 2.86



# Example 2:

## 2 lots; 3 transfers

$$\frac{[42,000 + (1000 \times 3)]}{[(14,000 \times 2) + (1000 \times 3) + (4,000 \times (3-2])}$$

A: Assured refund program cost

L: Cost of a single lot

n: Number of oocyte lots

M: Medication costs

N: Number of transfers

T: Cost of each transfer

= 1.29





## Example 3:

2 lots; 5 transfers

$$\frac{[42,000 + (1000 \times 5)]}{[(14,000 \times 2) + (1000 \times 5) + (4,000 \times (5-2])}$$

A: Assured refund program cost

L: Cost of a single lot

n: Number of oocyte lots

M: Medication costs

N: Number of transfers

T: Cost of each transfer

= 1.04

## Example 4:

3 lots; 5 transfers

$$\frac{[42,000 + (1000 \times 5)]}{[(14,000 \times 3) + (1000 \times 5) + (4,000 \times (5-3))]}$$

A: Assured refund program cost

L: Cost of a single lot

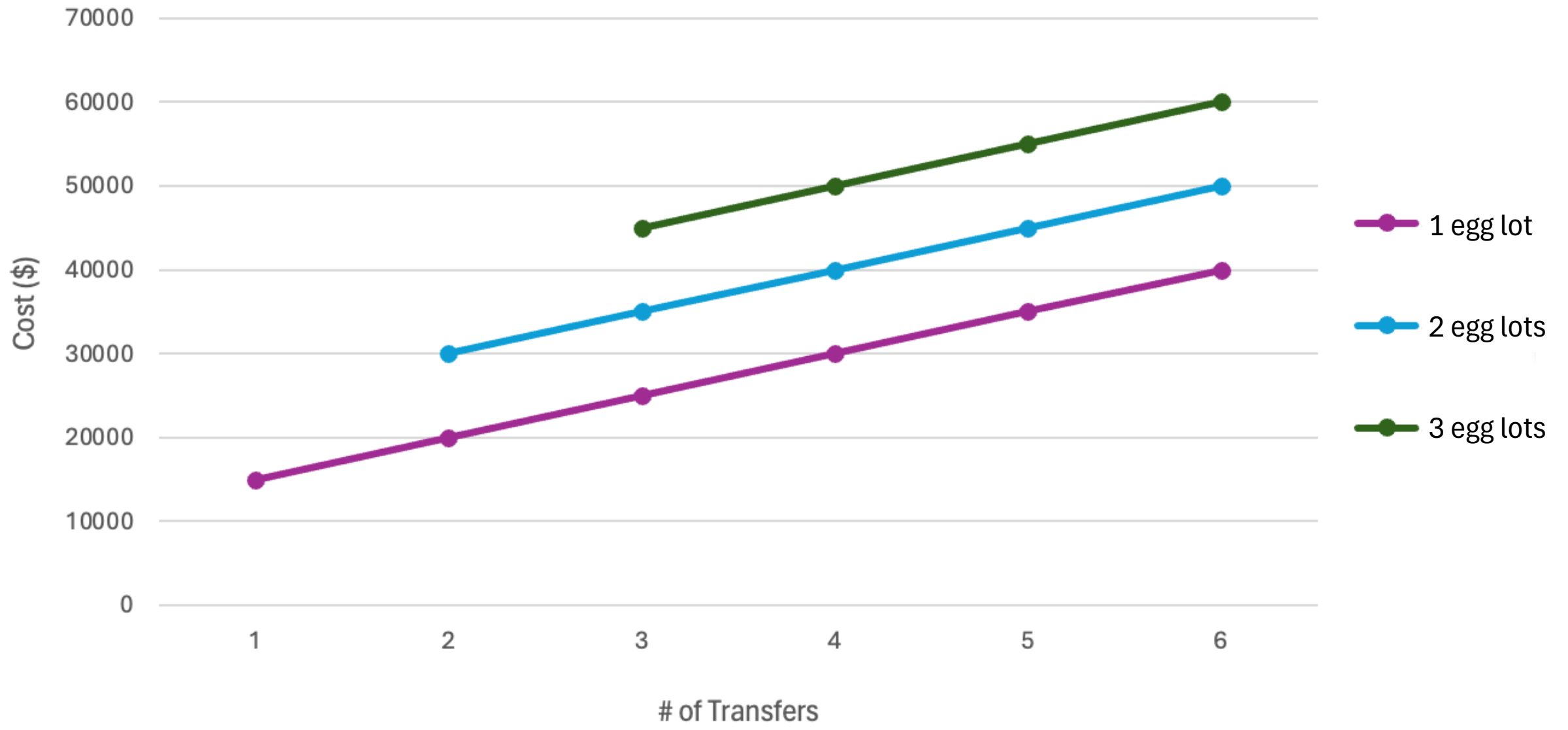
n: Number of oocyte lots

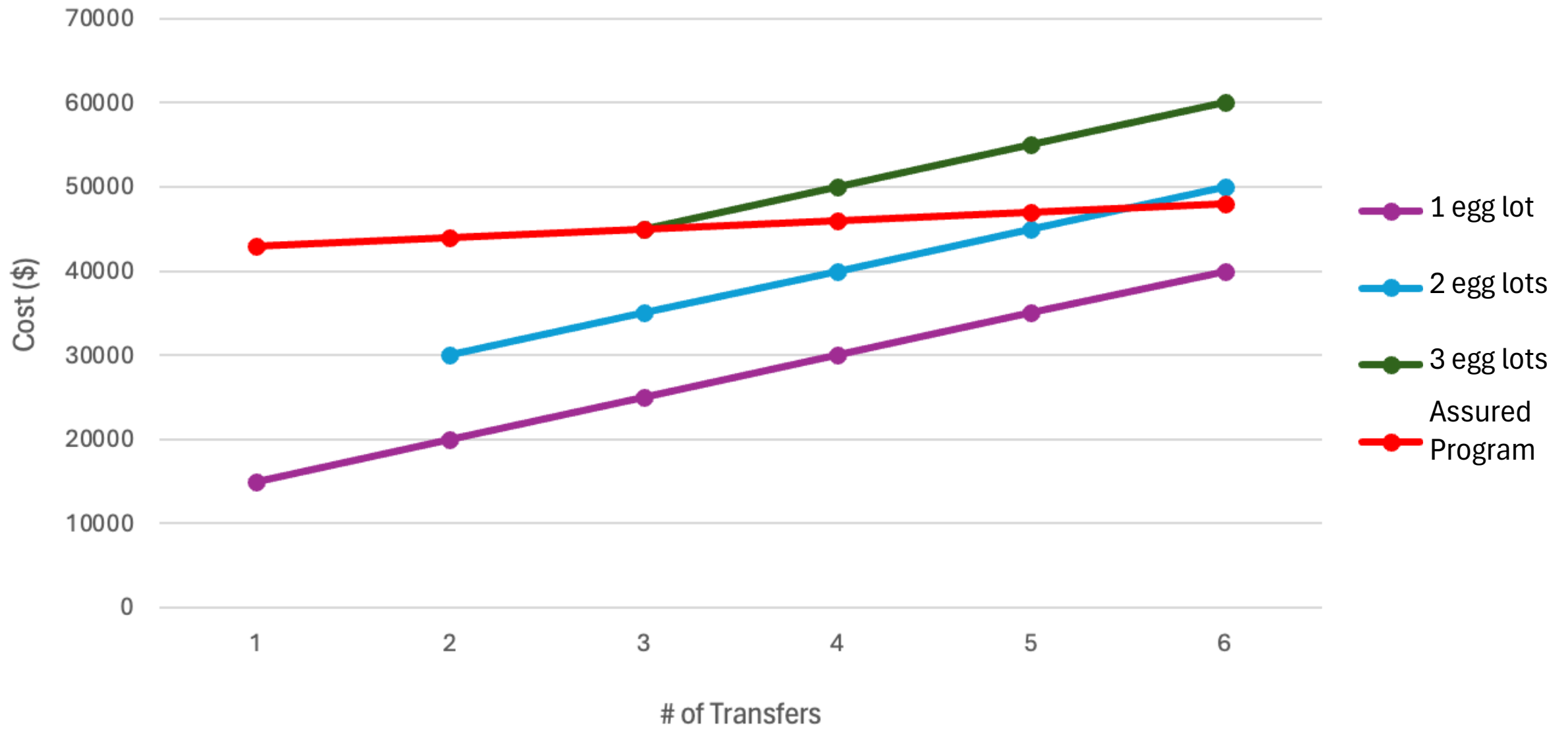
M: Medication costs

N: Number of transfers

T: Cost of each transfer

= 0.85







## CONCLUSIONS:

- Sustained implantation rates from vitrified donor oocytes are favourable with 66.3% of patients achieving success with a single egg lot and 95% of patients achieving sustained implantation within 6 embryo transfers
- The cost effectiveness appears to favour the assured programs if SIR is not achieved after 2 egg lots and additional lots are required
  - With 4 transfers, 89% of individuals achieved SIR



## CONCLUSIONS:

- Nevertheless, the decision on whether to use individual lots or assured refund programs is a complex decision for patients, as we cannot predict who will achieve SIR from a single lot or whether multiple transfers / lots will be required



*Thank you!*



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*fertility centre*



## References:

1. Peyser A, Brownridge S, Rausch M, Noyes N. The evolving landscape of donor egg treatment: success, women's choice, and anonymity. *Journal of assisted reproduction and genetics*. 2021;38(9):2327-2332.
2. Melnick AP, Rosenwaks Z. Oocyte donation: insights gleaned and future challenges. *Fertility and sterility*. 2018;110(6):988-993.
3. Centers for Disease Control and Prevention. National Center for Chronic Disease Prevention and Health Promotion. Division of Reproductive Health. 2021 National ART Summary.



## Indications for use of donor oocytes include <sup>1,2</sup>:

- Delayed childbearing (advanced age)
- Diminished ovarian reserve
- Premature ovarian failure
- Prior oophorectomy
- Prior gonadotoxic treatment
- Same sex male couples
- Maternal single-gene defects

