

Proposal of a model to calculate the trend in the cumulative live birth rate in IVF cycles using Spanish National Register data from 2009 to 2021.



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STUDY QUESTION

Is it possible to estimate the trend in the cumulative rate of live births in IVF over 12 years, using data from the Spanish Registry?

WHAT IS KNOWN ALREADY

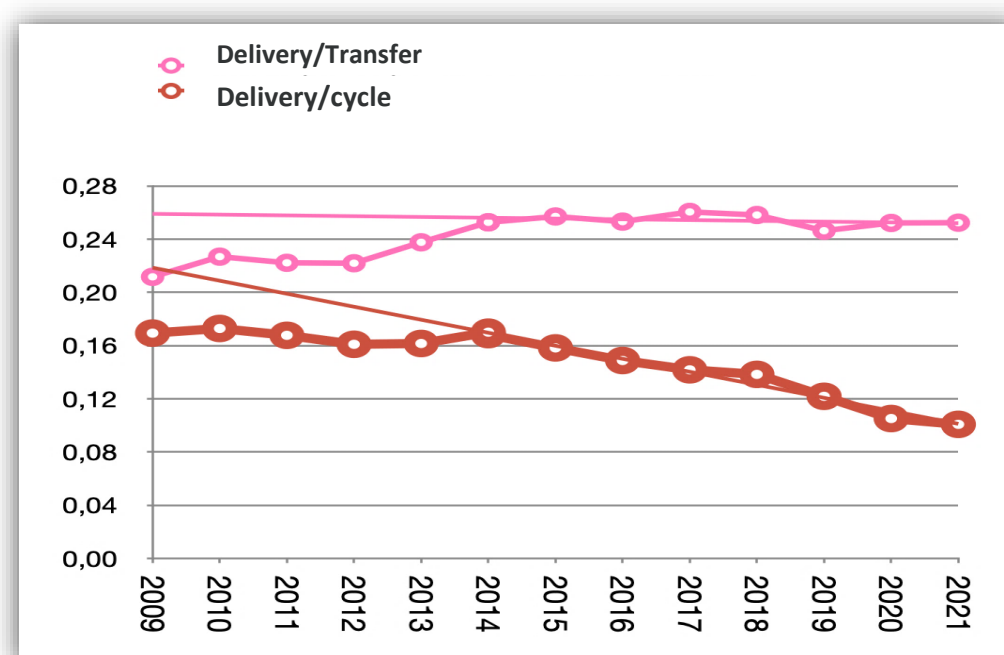
The progressive increase in elective freeze-all cycles no longer allows the use of live birth data by fresh transfer, especially in time series. Cumulative live birth rate (CLBR) has been proposed as an appropriate way of reporting success of an IVF program, incorporating both, fresh and frozen embryos. Nevertheless, views on the most appropriate parameters required to calculate such an outcome have been inconsistent and difficult for national aggregate registries. Furthermore, there is not unanimous definition for its calculation and although IVF Register is mandatory in Spain, an analysis of the CLBR has not been carried out.

METHODS

Data from the Spanish National Register of Assisted Reproduction including 456302 women undergoing IVF/ICSI (563000 ovarian stimulation cycles started, 359587 fresh transfers, and 36400 cryotransfer) using autologous gametes performed in Spain from 2009 to 2021 were analyzed. Oocyte donation and PGT-a cycles were excluded.

The main outcomes of present study were live birth rate per cycle (LBR) and cumulative live birth rate (CLBR).

RESULTS

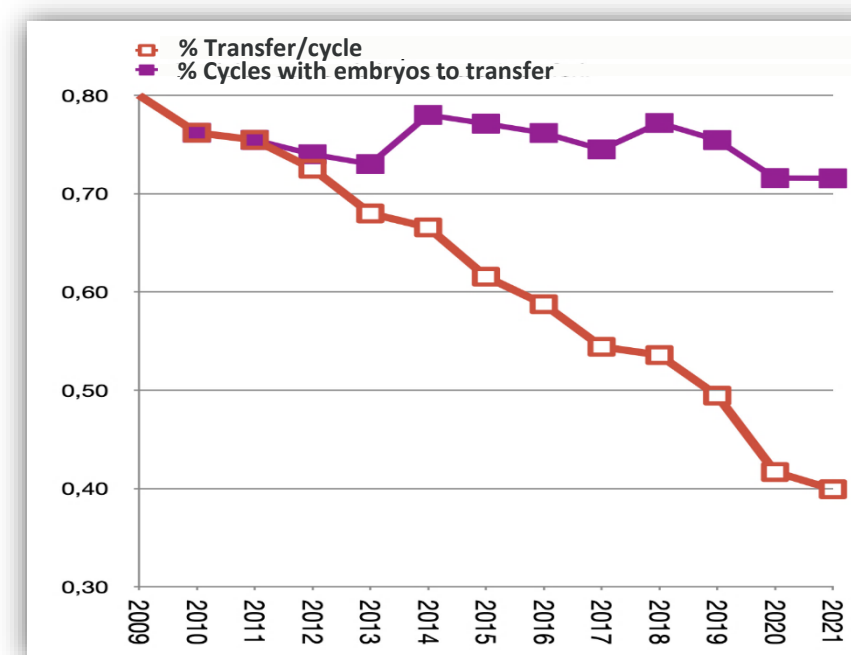


Since 2014, there has been a decrease in the delivery rate per cycle started

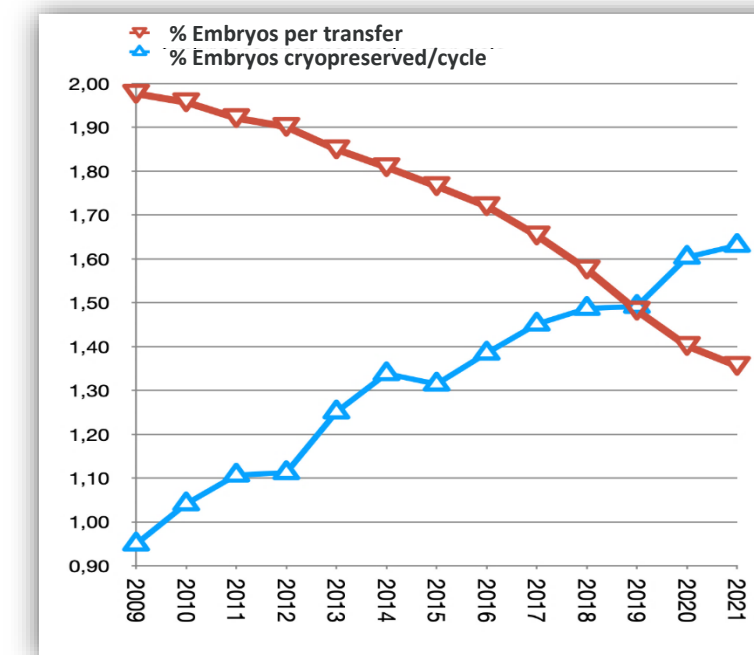
We propose a model that includes the **POTENTIAL PREGNANCY RATE**, which includes all pregnancies that can be achieved with the use of all the embryos obtained after each cycle started, until a live child is born.

$$TBFT + BRCT * (CP - TBFTCE) * (1 + PCT - PCT * BRCT)$$

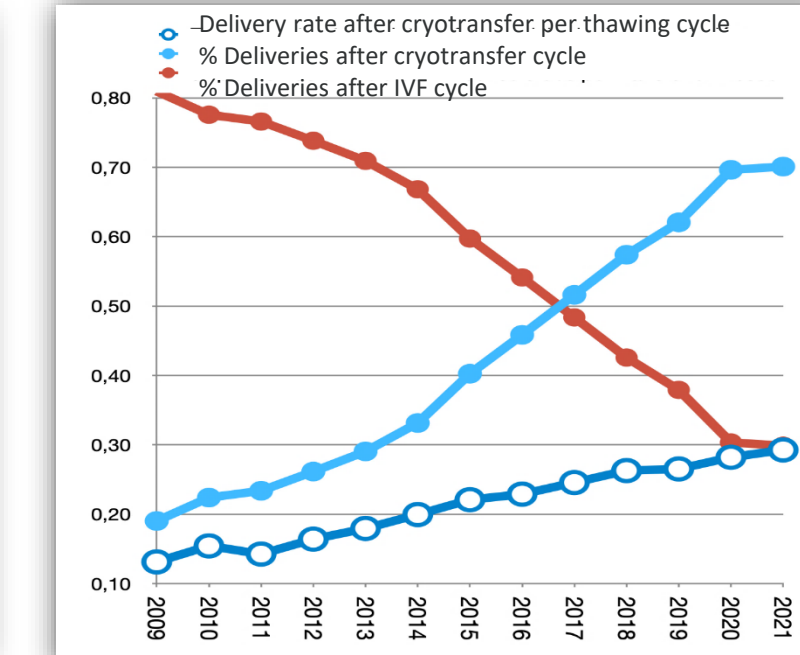
TBFT :Total births after fresh embryo transfer
 BRCT :Birth rate after cryo transfer
 CP :Cycles with embryo preservation
 TBFTCE :Total births after fresh transfer in cycles with cryopreserved embryos
 PCT :Possible cryo transfer cycles per IVF cycle with available embryos after the failure of the first cryo transfer



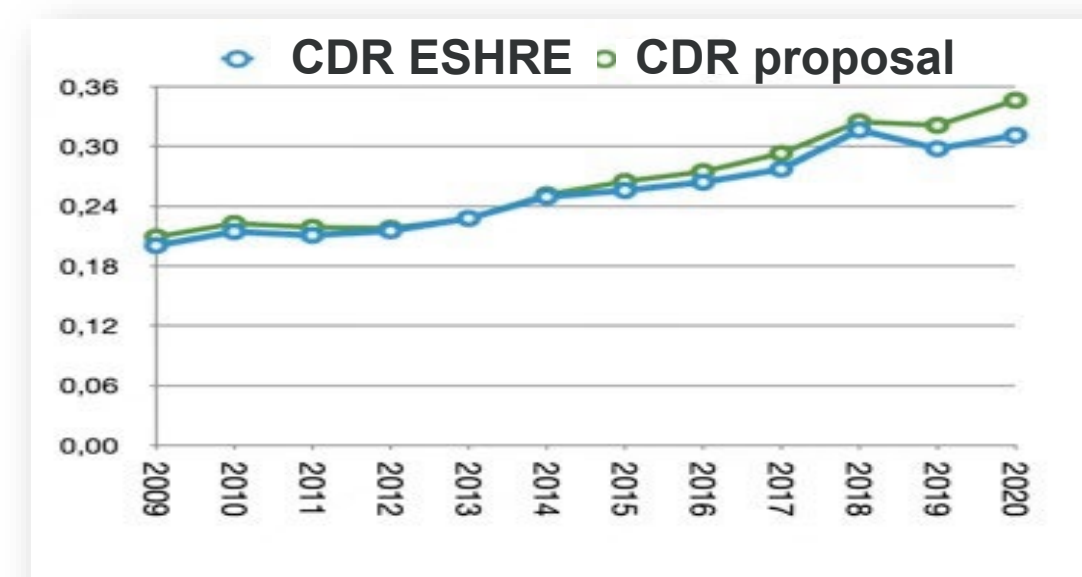
In the same period, the total number of fresh transfers has decreased even though the number of cycles with embryos to transfer is maintained.



This, together with a progressive decrease in the number of embryos used in each fresh transfer, means that the number of cryopreserved embryos per cycle increases year after year (**from 0.9 to 1.6 embryos per cycle started**).



It was also found a progressive increase in delivery rates after cryotransfer per thawing cycle, and a steady increase of the percentage of births after a cryotransfer cycle (**from 19 to 70%**), surpassing since 2017 those obtained after fresh transfer.



A constant increase in the cumulative delivery rate of 1.7% annually since 2012, rising from 22 % to 35% of births per cycle started.

CONCLUSION

The effectiveness of cryotransfer cycles has led to a rise in the delivery cumulative rate since 2012. Reporting CDR rather than success rates based on fresh embryo transfer will be more appropriate to understand the treatment efficacy