Reviewer's report

Title: Joint modeling of success and treatment discontinuation in in vitro fertilization programs: a retrospective cohort study

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Reviewer: Hind Beydoun

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Manuscript Title: Joint modeling of success and treatment discontinuation in in vitro fertilization programs: a retrospective cohort study

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The purpose of this retrospective cohort study is to evaluate the link between two processes, namely IVF treatment success and discontinuation. The authors use a random effects model to assess risk factors for both outcomes simultaneously.

Despite the relatively large sample size (n=3002), this retrospective study is limited in scope as it focuses on two IVF centers from different geographical areas in France. Nevertheless, it can be viewed as a pilot study which can be replicated later on using a larger number of centers.

1. Major Compulsory Revisions:

1.1. The term “discontinuation” used in this manuscript needs to be clarified from the outset, given that it may be mistaken for “cancellation”. Specifically, the authors need to indicate whether or not it has been defined by others, and include a citation in the Introduction. Then, in the Methods section, they need to provide a set of criteria for defining a “discontinuation” in their study, especially that women may discontinue an IVF treatment for various reasons, e.g. maternal age, financial resources, migration, seeking IVF treatment elsewhere etc. Also, what is the specific lag time from stopping IVF treatment until a woman is considered as a having had a “discontinuation”?

1.2. The terms “shared random effect model” and “joint modeling” are statistical tools that a general medical audience may not be familiar with. These need to be better defined in a statistical analysis section, and not just in an Appendix section of the manuscript. The rationale for using these methods as opposed to using Cox proportional hazards model or multinomial logistic regression model should be clarified.

1.3. The Discussion section lacks a paragraph presenting study limitations and another paragraph presenting study implications.

2. Minor Essential Revisions:
2.1. The title can be revised as follows: “Joint modeling of success and treatment discontinuation in in the context of vitro fertilization programs: a retrospective cohort study”

2.2. The question posted by the authors should be better defined. The hypothesis needs to be stated clearly in the introduction as it would justify using these advanced statistical methods.

2.3. Methods (P. 5): “Live birth rate after …” The authors need to state that this particular outcome is a reflection of IVF success.

2.4. Results (P. 7): “with 1,556 women … medium-sized city center” Please, reiterate what was the timeframe for the study population, i.e. start and end dates.

2.5. Figure Legends, P. 18: “95% credible interval” should be restated as “95% confidence interval”.

3. Discretionary Revisions:

None.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Needs some language corrections before being published

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests:

'I declare that I have no competing interests'