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RESEARCH ARTICLE

REVISED Analysis of online information about success rates in fertility clinics in Spain. An urgent call for action

[version 2; peer review: 1 approved, 2 approved with reservations]

Anna De Bayas Sanchez[1,2], Virginie Rozée[3], Manon Vialle[3], Kristien Hens[4], Joke Stryuf[4], Willem Ombelet[5,6], María Rosa Tapia Sánchez[7], Marta María Albert Márquez[7], Juana Farfán Montero[7], José Miguel Carrasco[8], Michaela Fuller[2], Vera Dimitrievska[9,10], Jana Melosca[10], Nathaniel Barrett[11], Francisco Güell Pelayo[11,12]

[1]Institute for Medical Humanities, First Medical Faculty, Charles University, Prague, Czech Republic
[2]Medistella, Mediversvm s.r.o., Czech Republic
[3]INED, Research Unit “Sexual and reproductive Health and Rights", Aubervilliers, France
[4]Department of Philosophy, University of Antwerpen, Antwerpen, Belgium
[5]The Walking Egg Non-Profit Organization, Genk, Belgium
[6]Faculty of Medicine and Life Sciences, University of Hasselt, LCRC, Diepenbeek, Belgium
[7]University Rey Juan Carlos, Madrid, Spain
[8]APLICA Investigación y Traslación Cooperative, Madrid, Spain
[9]University of American College, Skopje, North Macedonia
[10]Healthgrouper, North Macedonia, North Macedonia
[11]Institute for Culture and Society, University of Navarra, Navarra, Spain
[12]Facultad de Bioética, Universidad Anáhuac México, Ciudad de México, Mexico

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Abstract

Background

The medically assisted reproduction (MAR) industry is a booming sector of the economy, and Spain is proving to be a notable example of this industry's rise. Marketing strategies in the healthcare sector are shaped by the constant tension between providing clear, complete and appropriate information about treatments and providing information to attract and retain customers.

Methods

We conducted a systematic analysis of success rate information published on the websites of Spain’s five with the strongest online presence MAR clinics as of November 2023. The analysis examined

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1. **Karin Hammarberg**, Monash University, Clayton, Australia
2. **Athanasios Papathanasiou**, Bourn Hall Clinic, Cambridgeshire, UK
3. **Petronela Naghi**, Calla—Infertility Diagnostic and Treatment Center, Oradea, Romania

terminology, certifications and audits by external bodies, references to data sources, age-specific success rates, and generalised claims about treatment effectiveness.

Results

We identified significant deficiencies and ambiguities in how clinics present success rate data. Common issues included vague definitions, lack of certification details, absence of reliable data sources, and failure to differentiate outcomes by age or treatment type. Several clinics used overly optimistic or potentially misleading statistics, making it difficult for patients to assess their realistic chances of success. We provide recommendations aimed at improving consumer protection and regulating advertising practices. We also emphasise that presenting clear and truthful success rate information is not only a legal requirement but also an ethical duty in reproductive healthcare.

Conclusions

Stronger regulation of success rate reporting in Spain's fertility sector is urgently needed. We recommend that external authorities oversee and standardise data reporting to ensure transparency and prevent misleading practices. A centralised public body should be responsible for monitoring, collecting, and managing this data to protect patient rights and improve trust in fertility care.

Keywords
ethics, bioethics, IVF advertising, assisted reproduction, success rates, fertility clinics, patient information

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Any reports and responses or comments on the article can be found at the end of the article.

Corresponding author: Francisco Güell Pelayo (fguell@unav.es)

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REVISED **Amendments from Version 1**

This updated version strengthens and clarifies our study following valuable reviewer feedback. We focus on how fertility clinics in Spain present information about their success rates online and what this means for patients seeking treatment. The title and abstract have been simplified, and we now explain that the clinics were chosen because they are the most visible to patients searching for IVF information on the internet. We also added background on how assisted-reproduction clinics are regulated in Spain and how they must report their results to the Spanish Fertility Society.

The methods section now describes how the patient organisation *Fertility* Europe contributed to developing our checklist for website analysis. The results are reorganised for clarity, with clearer definitions of success-rate terms, age groups, and treatment types. We also include national data showing the widespread use of ICSI in Spain.

In the discussion, we highlight that confusing or misleading messages often result not from bad intentions but from a lack of common standards and independent checks. The conclusion stresses that patients, clinics, and regulators all share responsibility for ensuring that fertility information is accurate, transparent, and easy to understand.

Any further responses from the reviewers can be found at the end of the article

Introduction

The medically assisted reproduction (MAR) industry is a rapidly expanding sector of the economy, driven by rising global infertility rates, which affect approximately 48 million couples and 186 million individuals worldwide. More than 10 million children have been born using MAR techniques (WHO, 2021), and the demand for these services continues to increase, now accounting for up to 7.9% of all births in Europe (Wyns *et al.*, 2022). On a global scale, Spain is one of the leading countries in terms of the number of clinics and total MAR cycles performed and is one of the main European destinations for reproductive tourism (Lafuente-Funes *et al.*, 2023). According to the Spanish Fertility Society (SEF) registry, 165,453 IVF cycles and 33,818 artificial inseminations were performed in 2021, representing an 11.7% increase compared to 2019 (SEF, 2021). The MAR industry has experienced significant growth, with the global in vitro fertilisation market reaching a valuation of USD 25 billion in 2022. Forecasts suggest that the market will exceed USD 59.45 billion by 2032. In Europe, the MAR market reached USD 7.75 billion in 2022 and is predicted to be worth over USD 13.05 billion by 2032, as a result of increasing medical tourism and legal reforms related to MAR techniques (Precedence Research, 2023). The internet has transformed how patients access MAR information. While patients once relied on doctors, they now have the ability to conduct online research on clinics in advance (Zhu *et al.*, 2024). However, this shift has not eliminated the information gap between patients and providers, often leading to marketing strategies that prioritise client acquisition over transparent communication of clinical outcomes. Major (2019) emphasises that patients typically possess less information than providers, including knowledge about alternative treatments and their effectiveness.

Many fertility clinics present success rates using a wide range of inconsistent measures, making it difficult for patients to make informed choices (Wilkinson *et al.*, 2017). The efficiency of the treatment in achieving its intended outcome is a central consideration. In the case of fertility treatment, the objective is the birth of a healthy child. Success in MAR should be understood as a multidimensional concept that includes not only live birth rates but also patient satisfaction, cost-effectiveness, and time to pregnancy (Rienzi *et al.*, 2021). A woman's age is the most important prognostic factor in fertility treatment. While the chances of becoming pregnant remain relatively stable up to the age of 30, they begin to decline significantly from age 37 onwards. For this reason, it is critical that information about success rates be contextualised by age. Treatment uptake data confirm this trend: according to the Spanish Fertility Society (SEF), around 50% of women attending clinics are over 40 years old, and approximately 75% of all cycles and transfers involving egg donation are performed for women over 40. One of the most critical factors for informed decision-making in fertility treatment is the success rate associated with each technique. This information should be presented with maximum clarity and accuracy to allow patients to make well-informed choices.

These issues should be read in the light of Spain's regulatory context: MAR clinics must be authorised by the regional health authorities and report activity and outcomes to the Spanish Fertility Society (SEF). However, there is no centralised system for external auditing or mandatory certification of the data published on clinic websites.

In this paper, we present a systematic analysis of the information about success rates available on the websites of five of the most representative fertility clinics in Spain. To our knowledge, this is the first systematic content analysis of Spanish fertility clinic websites focused specifically on how success rate data is communicated to potential patients.

Methods

Patient and Public Involvement: Although "Fertility Europe", the largest fertility patient association in Europe, was not a member of the scientific team of the project in which this research is framed, the association took part in the B2-InF consortium meetings where the checklist for the analysis of clinic websites was discussed and refined with their input.

To identify MAR clinics with the strongest online presence in Spain, we conducted internet searches using the five most common Google search keywords related to fertility treatment: 'fertilisation','insemination', 'infertility', 'pregnancy IVF' (in vitro fertilisation), and 'ICSI' (intracytoplasmic sperm injection). This method was intended to capture the clinics most likely to be encountered by patients online, based on visibility and accessibility of information. Search results for each

keyword were selected in order of appearance, excluding magazine articles, blogs, and clinics without their own laboratory. The selected clinics were Ginefiv, Instituto Bernabeu, Institut Marqués, FIV Valencia, and IVI-RMA. The selection process took place between July and August 2021. All chosen clinics operate in the private sector, which provides the majority of fertility treatments in Spain. These clinics play a significant role in shaping public perceptions of MAR, particularly regarding effectiveness, accessibility, and treatment outcomes.

Our focus was on the patient perspective: patients typically rely on online searches rather than scientific registries when seeking fertility care. Therefore, clinics most visible on Google are the most influential in shaping patient decisions. While this approach does not capture the full universe of Spanish clinics, it provides relevant insights into the information that patients are most likely to encounter.

Once selected, the websites of these five clinics were thoroughly examined to determine the information available in the local language. Data collection followed a systematic approach using specially designed templates categorised by theme, incorporating both textual and graphical content. Success rates were among the key themes analysed. The collected information was analysed in July and August 2023, and the clinic websites were reviewed again in March 2025 to verify any changes. The analysis focused on the terminology used to define treatment success rates (live birth, clinical pregnancy, or biochemical pregnancy), differentiation of success rates by age and technique (artificial insemination, IVF/ICSI, with or without gamete donation), and generalised quantitative descriptions of treatment effectiveness, and certification, and auditing by external bodies, reference to data sources.

This research has been conducted under the European Project "B2-InF: Be Better Informed About Fertility". The B2-InF Project was approved by the Research Ethics Committee of the University of Navarra (Project No. 2021.004, approved 29/01/2021). Data and materials related to this research are publicly available in the B2-InF project repository on Zenodo (Carrasco *et al.*, 2023).

Results

Criteria, clarification and definition of success rate

All clinics included in our analysis report success rates as cumulative per cycle, including outcomes from both fresh and frozen embryo transfers within the same treatment cycle.

Table 1 shows the criteria used to define success rates on the websites of the clinics surveyed. In particular, we analysed whether the success rate is defined as live birth, clinical pregnancy, or biochemical pregnancy, and whether these criteria are explicitly stated and explained.

- Of the five clinics surveyed, all provided information about success rates in terms of biochemical pregnancy. For three clinics, this is the only success rate information provided, while the other two also report clinical pregnancy rates.
- Only one clinic provides data on live birth rates. Additionally, only two of the clinics explicitly refer to 'biochemical pregnancy' and 'clinical pregnancy' using those terms. None of the clinics clearly explains the meaning of the terms 'biochemical pregnancy' or 'clinical pregnancy'.

Online information on success rate and age

In the clinics surveyed (see Table 2), we analysed the information provided about success rates in relation to age. We found that all of the clinics surveyed presented success rates by age group, although these groupings vary from clinic to clinic.

- Four clinics do not provide age-related success rates for donor oocytes, and only one of these also does provide age-related success rates for artificial insemination.
- Only one clinic provides information for an age range over 45.

Table 1. Criteria on which the success rate is based.

	Live birth	Clinical pregnancy[a]	Biochemical[b]	Explanation*	Definition**
Ginefiv[1]	No	No	Yes	No	No
Instituto Bernabeu[2]	No	Yes	Yes	No	No
Institut Marquès[3]	Yes	Yes	Yes	Clinical pregnancy/ "Born"	No
FIV Valencia[4]	No	No	Yes	No	No
IVI-RMA[5]	No	No	Yes	biochemical pregnancy tests	Yes

[a] *Clinical pregnancy refers to the confirmation of the presence of a heartbeat and gestational sac by ultrasound at 6–7 weeks of pregnancy.*

[b] *Biochemical pregnancy refers to the confirmation of the human chorionic gonadotropin (hCG) hormone in the urine, a test that indicates embryo implantation has occurred.*

* *Whether "biochemical pregnancy" or "clinical pregnancy" is specified.*

[1] https://www.ginefiv.com/en/discover-ginefiv/ginefiv-success-rates/ (Consulted on March 31, 2025)

[2] https://www.institutobernabeu.com/es/estadisticas/ (Consulted on March 31, 2025)

[3] https://institutomarques.com/resultados/ (Consulted on March 31, 2025)

[4] https://www.fivvalencia.com/es/fertilizacion-ovulos/icsi/ (Consulted on March 31, 2025)

[5] https://ivi.es/preguntas-frecuentes/tasas-de-exito/ (Consulted on March 31, 2025)

Table 2. Success rates according to age range.

	AI	IVF/ICSI	Egg donation
Ginefiv[6]	No range	<30, 30–34, 35–39, 40–45, >45	35–39, 40–45, >45
Instituto Bernabeu[7]	No range	<35, 35–39, >40	No range
Institut Marques[8]	<35, 35–39, >40	<35, 35–39, >40	No range
FIV Valencia[9]	No range	<35, 35–39, >40	No range
IVI-RMA[10]	No range	<29, 30–34, 35–39, 40–44	No range

AI: Artificial Insemination

IVF/ICSI: In Vitro Fertilisation and Intracytoplasmic Injection.

[6] https://www.ginefiv.com/en/discover-ginefiv/ginefiv-success-rates/ (Consulted on March 31, 2025)

[7] https://www.institutobernabeu.com/es/estadisticas/ (Consulted on March 31, 2025)

[8] https://institutomarques.com/resultados/ (Consulted on March 31, 2025)

[9] https://www.fivvalencia.com/es/fertilizacion-ovulos/icsi/ (Consulted on March 31, 2025)

[10] https://ivi.es/preguntas-frecuentes/tasas-de-exito/ (Consulted on March 31, 2025)

Success rates and MAR techniques

We also analysed the information on success rates according to the different techniques and procedures offered (see Table 3).

- All of the websites consulted differentiate between success rates for patients with and without egg donation.
- Only one of the five clinics makes a distinction between the success rates for those who undergo IVF and those who undergo ICSI.

Also, because success rates vary according to the techniques used, this information needs to be clearly differentiated. We find, however, that the four clinics consulted give a combined success rate for IVF and ICSI, and it is not clear whether this is an average of the two. With regard to gamete donation, all clinics differentiate success rates based on whether donor gametes are used. However, a notable pattern is that four of the clinics reviewed present a single success rate for egg donation, regardless of the recipient's age.

Table 3. Distinction of success rates by MAR techniques.

	IVF/ICSI	Egg donation
Ginefiv[11]	No	Yes
Instituto Bernabeu[12]	No	Yes
Institut Marqués[13]	No	Yes
FIV Valencia[14]	Yes	Yes
IVI-RMA[15]	No	Yes

[11] https://www.ginefiv.com/en/discover-ginefiv/ginefiv-success-rates/ (Consulted on March 31, 2025)

[12] https://www.institutobernabeu.com/es/estadisticas/ (Consulted on March 31, 2025)

[13] https://institutomarques.com/resultados/ (Consulted on March 31, 2025)

[14] https://www.fivvalencia.com/es/fertilizacion-ovulos/icsi/ (Consulted on March 31, 2025)

[15] https://ivi.es/preguntas-frecuentes/tasas-de-exito/ (Consulted on March 31, 2025)

Generalised quantitative descriptions of effectiveness

For each clinic website, in addition to examining systematic presentations of success rates, we looked for other quantitative descriptions of overall success rates or expected results—for example, those found in the general narrative of the clinic (see Table 4). In four of the five clinics, we found at least one general quantitative description of success rates, i.e., quantitative information that does not specify any relation to age, technique, or the use of gamete donation.

Concerning "non-specific quantitative information," in all of the clinics consulted, we found claims regarding the high effectiveness of MAR, but without specifying techniques, procedures, or age. On three clinics' websites, the same message is repeated: 9 out of 10 achieve pregnancy. Two clinic websites present this information in connection with "achieving the expected results" and "the goal of becoming parents," which strongly implies that 90% of patients achieve a live birth.

Limited certification and transparency of success rate data

Only two clinics state that the data from which they derive success rates have been certified. One clinic states that its data

Table 4. Non-specific quantitative information.

Ginefiv[16]	*"The pregnancy rate per cycle is 75%, and the cumulative pregnancy rate after three cycles exceeds 90%."*
Instituto Bernabeu[17]	*"Our statistics are certified and audited: after three treatments 96% of our patients achieve pregnancy".*
Institut Marquès[18]	*"Thus, our success rates, audited by the government of Catalonia, are among the highest in Europe. 9 out of 10 patients who come to us achieve pregnancy in one or more attempts".*
FIV Valencia[19]	*"FIV Valencia has impressive success rates in egg donation treatments, with a cumulative pregnancy rate of 95%, making it one of the leading clinics in Europe."*
IVI-RMA[20]	*" IVI has the best pregnancy rates, 9 out of 10 couples who trust us achieve their goal of becoming parents".*

[16] https://www.ginefiv.com/reproduccion-asistida/ovodonacion/#:~:text=Este%20es%20un%20programa%20con,3%20ciclos%20supera%20el%2090%25 (Consulted on March 31, 2025)

[17] https://www.institutobernabeu.com/es/estadisticas/ (Consulted on March 31, 2025)

[18] https://institutomarques.com/reproduccion-asistida/tecnologia-avanzada/embryoscope/ (Consulted on March 31, 2025)

[19] https://www.fivvalencia.com/es/Donacion-de-ovulos/ (Consulted on March 31, 2025)

[20] https://ivi.es/preguntas-frecuentes/ivi-en-el-mundo/ (Consulted on March 31, 2025)

have been certified by a relevant authority. Although access to a copy of the certificate is provided, this signed document is not sufficient for substantiation. It does not provide access to evidence-based data to corroborate the figures provided. On the other hand, it should be noted that the certificate does provide a detailed description of the process by which the certifying agency verified the data. Another clinic only claims that its data on success rates have been certified by a public body, but without providing access to this certificate or any further description of the certification process.

Discussion

We found few studies focusing on how success rates are advertised in assisted human reproduction clinics. One such study was conducted by the Human Fertilisation and Embryology Authority (HFEA) in the United Kingdom (Committee of Advertising Practice, 2021). After analysing the information promoted within the sector, the HFEA warned of a lack of transparency in the presentation of success rate statistics. Specifically, they expressed concern that results are often reported only for patients under 35 years of age and that the terminology used is unclear. The HFEA also recommended that percentages be presented as "live birth rate per embryo transfer." Another study (Sauerbrun-Cutler *et al.*, 2021) examined information provided by over 90% of U.S. clinics through their websites. According to the Society for Assisted Reproductive Technology (SART) guidelines on advertising, live birth rates per cycle start (intended retrieval) must be prominently displayed first, followed by rates per egg retrieval and per embryo transfer, with success rates reported for each SART-defined age category. Omitting live birth data per cycle start is not permitted. SART categorises maternal age as follows: <35, 35–37, 38–40, 41–42, and >42 years. The study analysed information from 361 U.S. clinics and found that only 10.5% reported success rates in terms of live births per transfer, retrieval, and cycle.

In the Spanish context, ART clinics must be authorised by the competent regional health authorities and are required to report their activity and outcome data to the Spanish Fertility Society (SEF). The SEF compiles and publishes annual reports with aggregated national data, covering a wide range of MAR techniques. However, the publication of clinic-specific success rates remains voluntary, and there is no centralised mechanism for external auditing or certification of the data published on individual clinic websites. This absence of independent oversight contributes to the lack of transparency and consistency we observed in the success rate data presented online.

Moreover, none of the clinic websites analysed disaggregated success rate data by fertilisation technique (i.e., IVF versus ICSI), making it impossible for patients to know whether reported outcomes are associated with one method or the other. This lack of transparency is particularly relevant given that, according to the 2022 SEF Registry, ICSI accounts for approximately 88.2% of initiated cycles in Spain (Sociedad Española de Fertilidad (SEF), 2022). Patients are therefore unable to assess whether the widespread use of ICSI—often even in the absence of male factor infertility—is supported by outcomes reported at the clinic level. In fact, based on data provided by the French government, the success rate of ICSI is only slightly higher than that of IVF, and not always. Studies indicate that when the cause of infertility is not of paternal origin, the success rates of IVF are better than those of ICSI, although it is debatable which technique is more beneficial in other cases (de Bantel-Finet *et al.*, 2022).

Given ICSI's widespread use in Spain, greater transparency would allow patients to understand when IVF and ICSI are clinically indicated. In light of this evidence, and given the different costs associated with using one or the other, information about success rates should enable patients to take these factors into consideration.

Given the widespread expectation that fertility treatment will result in the birth of a healthy child, clinics cannot comply with consumer law unless they provide success rate information explicitly defined in terms of live births. Although some fertility clinics in Spain may have a high proportion of international patients, they represent only about 10% of all treatment cycles nationwide, according to the latest reports from the Spanish Fertility Society (SEF). The number of domestic patients alone is higher than that reported by most other countries, providing a sufficiently large and robust dataset to estimate live-birth success rates with confidence.

Faced with this ambiguity and lack of clarity, some governments (e.g., France) have set up a public website where citizens can find success rates presented exclusively in terms of birth (Agence de la biomédecine, 2025), and have prohibited clinics from providing their own criteria and results. Similarly, Australia and New Zealand Assisted Reproduction Database (FSANZ), Society for Assisted Reproductive Technology (SART), and the Centers for Disease Control and Prevention (CDC), have created websites that must be accessible from the websites of all clinics. On these platforms, patients can enter personal data to receive an estimate of their chance of live birth, based on national data and clinical parameters.

In relation to this issue, it is worthwhile to point out a deficiency in the way information about success rates is managed by the Spanish Fertility Society (SEF). The SEF publishes a yearly report ("Registro Nacional de Actividad – Registro SEF") that presents official national statistics based on data collected from all clinics, covering all the MAR techniques performed in Spain in a given year. In this document, information is presented as an average over just three age groups: <35, 35–39, and ≥40.

Although donor age is the principal determinant of success in donor-egg IVF, recent evidence shows that recipient age also significantly influences outcomes, with implantation failure and pregnancy loss risks increasing progressively after the age of 40 (Sebastian-Leon *et al.*, 2025). This indicates that both own-egg and donor-egg cycles benefit from more precise age stratification than is currently provided in Spain.

Another dimension not addressed on clinic websites is whether success rates are reported per initiated cycle, per egg retrieval, or per embryo transfer. These yield different figures, and without clarification patients may misinterpret the likelihood of success. Providing both perspectives with clear explanations would enhance transparency.

We consider this information to be insufficient for making an informed decision about fertility treatment and indicative of a lack of involvement and oversight on the part of the Ministry of Health, which is responsible for establishing standards for data transparency in the fertility industry.

In the preceding analysis of information provided by Spanish clinics, our focus has been on the clarity and accuracy of information related to success rates. We believe that this analysis shows that the information provided does not meet national and European legal standards for advertising and publicity (Art. 3 of the Law 34/1988; ICC Code, 2018). Potential patients should not be misled into believing that the success rate of a procedure is significantly higher than it actually is. Such statements violate Spanish and European consumer protection laws on truthful advertising, which prohibit any advertising that, through false or misleading information—or the omission of essential details—leads consumers to make misinformed decisions. Even if clinics change their information policies so that success rates are clearly and accurately presented, however, another issue needs to be confronted. According to Spanish legal regulations on MAR in the public sector (Art. 3.1, Law 14/2006): "Assisted reproduction techniques shall be performed only where there are reasonable chances of success, they do not pose a serious risk to the health, physical or mental health of the woman or the possible offspring, and after free and conscious acceptance of the application by the woman, who must have been earlier and duly informed of her chances of success, as well as of her risks and the conditions of that application." The phrase "reasonable chances of success" serves as a legal threshold that limits access to fertility treatment in the public sector to women up to the age of 40. It is worth noting the disparity between the public and private sectors with respect to this issue.

Conclusion

Success rates should be defined clearly and exclusively in terms of live birth. To ensure the validity of these rates, clinics should provide access to evidence-based data that allow independent verification. Yet none of the clinics consulted offers sources that substantiate the origin or accuracy of their data. Substantiation is not merely good practice; it is a legal requirement. The 2018 Code of Advertising and Marketing Communication of the International Chamber of Commerce (ICC) states: "Descriptions, claims or illustrations relating to verifiable facts in marketing communications should be capable of substantiation. Claims that state or imply that a particular level or type of substantiation exists must have at least the level of substantiation advertised. Substantiation should be available so that evidence can be produced without delay and upon request to the self-regulatory organisations responsible for the implementation of the Code" (Article 6).

Moreover, information on success rates should be based on the best available evidence, and clinics should offer access to underlying data for verification. These rates must also be disaggregated by age group, as generalised figures are misleading and should be avoided. Clinic websites are also commercial spaces, and claims fall under consumer protection law. In Spain, these recommendations align not only with existing laws on consumer protection and advertising (e.g., Article 7.1 of Law 3/1991; Art. 3 of Law 34/1988; ICC Code, 2018; Directive 2006/114/EC), but also with universal standards of medical ethics and informed consent. Yet none of the clinics surveyed adhere to these principles. Our findings reflect not only individual clinic practices but also the

absence of standardised definitions, independent verification, and consumer-law oversight. This lack of clarity makes it difficult for patients to understand their real chances of success.

Success rate data should be monitored by external, independent authorities to prevent the publication of unverified or misleading statistics. To avoid conflicts of interest, we see no alternative but to establish a centralised public authority responsible for collecting, verifying, and managing clinic data to safeguard citizens' rights and interests. We advocate for the standardisation of success rate reporting to emphasise that these figures should not served as a basis for competition among clinics. Success rates are not universal indicators of quality, as outcomes depend heavily on each patient's individual health condition. Patients should be informed that success rates serve as contextual information rather than a definitive measure of a clinic's competence. In our view, more robust regulation of the information provided by the fertility industry in Spain is urgently needed.

In our view, more robust regulation of the information provided by the fertility industry in Spain is urgently needed. We believe that patients will be best served when regulators, clinics, and consumer-law authorities jointly address success-rate reporting, with genuine independence and without conflicts of interest.

Ethics approval

This project (No. 2021.004) received ethical approval on 29/01/2021 by the Research Ethics Committee of the University of Navarra.

Data availability statement

Underlying data

The data underlying the results cannot be shared for confidentiality reasons. The data have been restricted due to the sensitive nature of the information provided. There is a concern that the fertility industry might exploit this information for commercial purposes. Therefore, in the Grant Agreement No. 872706 — B2-InF, signed by the Research Executive Agency of European Commission and all B2InF project partners, was established that the dissemination level of the interviews, as well as the dissemination level of the reports and thematic analyses of the interviews, is "confidential", explicitly defined as "only for members of the consortium (including the Commission Services)". (see Annex 1, p. 6/27 of the Grant Agreement nr. 872706).

To request access, please email the corresponding author. Access will be granted once is confirmed that the data will be used solely for scientific research purposes and that all researchers involved in the study have no conflicts of interest. For the evaluation of the request, the Principal Investigator (PI) should submit:

1. A draft that includes, at a minimum, the hypothesis, the objectives of the research project, and the methodological framework.

2. A CV of the last 15 years for each researcher who will participate in the research and/or will have access to the data.

3. A personal statement from each researcher addressing the following points separately:

- In the last 15 years, neither my institution nor I, personally, have received salary, funding, grants, or personal fees from entities funded by the fertility industry (including clinics, laboratories or biopharma companies).
- In the last 15 years, neither my institution nor I, personally, have currently or previously collaborated with advocacy groups or civil associations related directly or indirectly to fertility issues.
- I have never held a position on boards of scientific, social or commercial entities funded by the fertility industry (including clinics, laboratories, or biopharma companies).

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Version 2

Reviewer Report 22 November 2025

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✓ **Petronela Naghi**
Calla—Infertility Diagnostic and Treatment Center, Oradea, Romania

The material presented raises a delicate issue within ART medical services, many clinics present various statistics on social media, which may not correspond to reality, and this is not only in Spain. However, no solution is in sight, since voluntary reporting is practiced, and coercive methods are not a solution

Is the work clearly and accurately presented and does it cite the current literature?
Yes

Is the study design appropriate and does the work have academic merit?
Yes

Are sufficient details of methods and analysis provided to allow replication by others?
Yes

If applicable, is the statistical analysis and its interpretation appropriate?
Yes

Are all the source data underlying the results available to ensure full reproducibility?
Yes

Are the conclusions drawn adequately supported by the results?
Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: I know the situation of fertility clinics because I work in the field, I am an embryologist, lab manager

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Version 1

Reviewer Report 19 August 2025

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Athanasios Papathanasiou
[1] Bourn Hall Clinic, Cambridgeshire, UK
[2] Bourn Hall Clinic, Cambridgeshire, UK

This paper addresses an important and sensitive subject. Patients seeking fertility care are in a vulnerable position and deserve accurate, comprehensible, and verifiable information on success rates. Fertility treatment is not only expensive but also emotionally charged, and there is a clear moral and legal duty to avoid misleading claims. The UK's HFEA provides one possible model: it verifies clinic submissions and publishes outcomes at both national and clinic level. This dual role—standard setting and independent verification—has strengthened comparability and public trust.

The stated aim of the paper is valuable, yet not fully clear. The inclusion of only five clinics is insufficiently justified, leaving questions about selection bias and representativeness. Greater transparency around why these clinics were chosen, would strengthen the work.

The Spanish context also complicates outcome reporting. A high proportion of patients are aged over 40 or undergo donor-egg treatment, and many are international patients who return home immediately after embryo transfer. As a result, pregnancy testing and ultrasound follow-up are often performed abroad, leaving Spanish clinics with incomplete outcome data. By contrast, clinics serving local populations (as in the UK) usually capture these outcomes themselves. This attrition limits the reliability of live-birth reporting in Spain. Since live birth rates are highly predictable once a clinical pregnancy is achieved, it may be more realistic for Spain to focus on clinical pregnancy rates as a provisional gold standard until live-birth follow-up can be made systematic.

Definitions are central. The distinction between biochemical pregnancy, clinical pregnancy, and live birth is obvious to clinicians but not to patients, who need clear and accessible explanations. The authors are right that imprecision here undermines comparability, but it is important not to assume intentional manipulation. Often the issue is that those writing website content "think like doctors," using technical categories without recognising how patients may misinterpret them.

Stratification by patient age also deserves careful consideration. For own-egg cycles, age is the strongest predictor of success. Granular age bands such as <35, 35–37, and 38–40 improve precision, but when denominators are small, rates can become unstable. The HFEA approach—reporting more detailed bands at the national level but broader ones ($\leq$37 vs $\geq$38) at clinic level—balances clarity with statistical reliability. Donor-egg cycles are different: outcomes are

largely determined by donor age, usually ≤35. Apart from a modest fall above 45, recipient age has little predictive value. Stratifying donor-egg outcomes by recipient age therefore adds confusion rather than clarity.

Another key issue is the denominator. Reporting per embryo transfer rather than per cycle can inflate apparent success rates, but both perspectives are valuable. Patients should understand the difference, and a simple glossary or side-by-side example would help avoid misinterpretation.

Consumer law adds another layer. Clinic websites are commercial spaces, and claims must be truthful and not misleading. The UK experience shows that even with a regulator in place, misleading advertising persisted. Even with the Competition and Markets Authority involvement, the optimal reporting standards are still under debate. Without explicit consumer-law alignment, a new regulator in Spain might still fail to address how outcomes are marketed online.

The tone of the article risks appearing combative towards clinics, especially larger groups. This could distract from the more important point that the problem is systemic: lack of shared definitions, lack of verification, and weak consumer-law oversight. Patients are best served when regulators, clinics, and consumer-law authorities act together. Framing the issue in this way would make the recommendations more constructive and less polarised.

Some further points merit reflection. Publishing separate IVF and ICSI success rates can create a marketing pressure for patients to choose the technique with the higher number, even though this is a clinical decision based on indication and local practice. Suggesting that ICSI is used primarily for financial gain is not warranted. It is also important to note that ICSI carries recognised risks, meaning patient choice should not be swayed by website presentation. Similarly, claims such as “around 90% after three cycles” fall into a grey zone: they should certainly be framed carefully, but for younger patients or donor-egg cycles, cumulative outcomes can plausibly approach this magnitude. These statements are not necessarily deceptive, but they can be misinterpreted without context.

The legal and ethical context is also important. In public systems, thresholds such as a “reasonable chance of success” are funding criteria, not prohibitions on private treatment. Patients retain autonomy, and clinics have a duty to support informed choice, not to restrict access based only on statistical probability.

Overall, the article highlights real concerns but could be strengthened by greater methodological clarity, fuller contextualisation of Spanish practice, and more balanced framing. A stronger case would come from a larger and more representative sample, clearer justification for methodological choices, and explicit engagement with both consumer law and the realities of international medical tourism.

Despite its limitations, the paper raises critical issues and should be viewed as a stepping stone towards a more transparent, patient-protective framework in Spain. The best way forward will likely involve a national authority that combines standard-setting, independent verification, and alignment with consumer-law enforcement. This would improve clarity and comparability for patients while supporting clinics in providing trustworthy information.

Is the work clearly and accurately presented and does it cite the current literature?

Partly

Is the study design appropriate and does the work have academic merit?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Partly

If applicable, is the statistical analysis and its interpretation appropriate?
Not applicable

Are all the source data underlying the results available to ensure full reproducibility?
Partly

Are the conclusions drawn adequately supported by the results?
Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: I have been running a group of UK fertility clinics and have been working closely with UK regulators and consumer law authorities. My areas of research include: Poor Ovarian Response (POR) during IVF, Emotional Aspects of IVF, Improving access to IVF treatment.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 05 Oct 2025

Anna De Bayas Sanchez

We would like to thank you sincerely for your careful reading of our manuscript and for your thoughtful and constructive comments. Your observations have been extremely valuable in helping us to improve the clarity, quality, and overall rigour of our work. Below, we provide a point-by-point response to each of your numbered comments. For each one, we explain the changes made to the manuscript and where they can be found in the revised version. ---

This paper addresses an important and sensitive subject. Patients seeking fertility care are in a vulnerable position and deserve accurate, comprehensible, and verifiable information on success rates. Fertility treatment is not only expensive but also emotionally charged, and there is a clear moral and legal duty to avoid misleading claims. The UK's HFEA provides one possible model: it verifies clinic submissions and publishes outcomes at both national and clinic level. This dual role—standard setting and independent verification—has strengthened comparability and public trust.
Thank you for your comment. We are familiar with the UK's HFEA model and recognise its value. However, the aim of this article is not to propose a specific regulatory model, but rather to analyse the information as it is presented from the patient's perspective. In other words, our objective is to examine the clarity and accuracy of the information provided by private companies in Spain. Our findings lead us to emphasise that presenting clear and truthful success-rate information is not only a legal obligation but also an ethical duty in reproductive healthcare. Moreover, given that current legislation on information is not being effectively enforced, we consider that urgent action by regulatory authorities is

required. The form that such action should take, however, lies beyond the scope of this article.

The stated aim of the paper is valuable, yet not fully clear. The inclusion of only five clinics is insufficiently justified, leaving questions about selection bias and representativeness. Greater transparency around why these clinics were chosen, would strengthen the work. Thank you for your helpful suggestion. We have revised the text to clarify why we focused on five clinics and to acknowledge the limitations of this approach. We added the following paragraph: "We conducted a systematic analysis of success-rate information published on the websites of Spain's five MAR clinics with the strongest online presence as of November 2023." "Our focus was on the patient perspective: patients typically rely on online searches rather than scientific registries when seeking fertility care. Therefore, clinics most visible on Google are the most influential in shaping patient decisions. While this approach does not capture the full universe of Spanish clinics, it provides relevant insights into the information that patients are most likely to encounter."

The Spanish context also complicates outcome reporting. A high proportion of patients are aged over 40 or undergo donor-egg treatment, and many are international patients who return home immediately after embryo transfer. As a result, pregnancy testing and ultrasound follow-up are often performed abroad, leaving Spanish clinics with incomplete outcome data. By contrast, clinics serving local populations (as in the UK) usually capture these outcomes themselves. This attrition limits the reliability of live-birth reporting in Spain. Since live birth rates are highly predictable once a clinical pregnancy is achieved, it may be more realistic for Spain to focus on clinical pregnancy rates as a provisional gold standard until live-birth follow-up can be made systematic. Thank you very much for this valuable comment. While some Spanish clinics have a high proportion of international patients, these represent only about 10–15% nationwide (11% according to the latest SEF report). The number of domestic patients alone is larger than in most European countries, providing a robust dataset for estimating live-birth success rates. From a patients' rights perspective, the challenge of follow-up cannot exempt clinics from reporting the live-birth outcome, which is both a legal requirement and the central figure patients need for informed decision-making. In any case, we are grateful for your valuable suggestion, and we have incorporated into the article, following your orientation, the following paragraph:
"Although some fertility clinics in Spain may have a high proportion of international patients, they represent only about 10% of all treatment cycles nationwide, according to the latest reports from the Spanish Fertility Society (SEF). The number of domestic patients alone is higher than that reported by most other countries, providing a sufficiently large and robust dataset to estimate live-birth success rates with confidence."

Definitions are central. The distinction between biochemical pregnancy, clinical pregnancy, and live birth is obvious to clinicians but not to patients, who need clear and accessible explanations. The authors are right that imprecision here undermines comparability, but it is important not to assume intentional manipulation. Often the issue is that those writing website content "think like doctors," using technical categories without recognising how patients may misinterpret them.

Thank you very much for this helpful comment. We fully agree that it is important not to assume intentional manipulation. We have carefully reviewed the manuscript with this in mind, and we believe that in its current form there are no statements that imply intentionality. To clarify this further, we have added the following paragraph: Our findings reflect not only individual clinic practices but also the absence of standardised definitions, independent verification, and consumer-law oversight. This lack of clarity makes it difficult for patients to understand their real chances of success.

Stratification by patient age also deserves careful consideration. For own-egg cycles, age is the strongest predictor of success. Granular age bands such as <35, 35–37, and 38–40 improve precision, but when denominators are small, rates can become unstable. The HFEA approach—reporting more detailed bands at the national level but broader ones (≤37 vs ≥38) at clinic level—balances clarity with statistical reliability. Donor-egg cycles are different: outcomes are largely determined by donor age, usually ≤35. Apart from a modest fall above 45, recipient age has little predictive value. Stratifying donor-egg outcomes by recipient age therefore adds confusion rather than clarity. Thank you very much for this valuable comment. We have added a paragraph on this important issue to bring further clarity: Although donor age is the principal determinant of success in donor-egg IVF, recent evidence shows that recipient age also significantly influences outcomes, with implantation failure and pregnancy loss risks increasing progressively after the age of 40 (Sebastian-Leon et al., 2025). This indicates that both own-egg and donor-egg cycles benefit from more precise age stratification than is currently provided in Spain.

Another key issue is the denominator. Reporting per embryo transfer rather than per cycle can inflate apparent success rates, but both perspectives are valuable. Patients should understand the difference, and a simple glossary or side-by-side example would help avoid misinterpretation. Thank you very much for this helpful comment. We have addressed this point by adding the following clarification: “Another dimension not addressed on clinic websites is whether success rates are reported per initiated cycle, per egg retrieval, or per embryo transfer. These yield different figures, and without clarification patients may misinterpret the likelihood of success. Providing both perspectives with clear explanations would enhance transparency”.

Consumer law adds another layer. Clinic websites are commercial spaces, and claims must be truthful and not misleading. The UK experience shows that even with a regulator in place, misleading advertising persisted. Even with the Competition and Markets Authority involvement, the optimal reporting standards are still under debate. Without explicit consumer-law alignment, a new regulator in Spain might still fail to address how outcomes are marketed online. Thank you very much for this very interesting reflection. We fully recognise the value of the UK experience, as well as those of Australia or the United States. However, as stated before, our goal in this article is not to undertake cross-country comparisons, but rather to analyse the information available to patients in Spain. We hope that future research will explore these international perspectives more fully.

The tone of the article risks appearing combative towards clinics, especially larger

groups. This could distract from the more important point that the problem is systemic: lack of shared definitions, lack of verification, and weak consumer-law oversight. Patients are best served when regulators, clinics, and consumer-law authorities act together. Framing the issue in this way would make the recommendations more constructive and less polarised. We sincerely appreciate your observation regarding the tone of the article. We acknowledge that, at first reading, it may appear somewhat combative towards clinics. However, our intention was not to single out specific institutions, but rather to report factual issues and patterns that are observable in the field. We also agree that framing the matter as a systemic problem is essential. One of our main concerns is precisely the risk of polarization between clinics and a general public that often lacks reliable information. We therefore agree that collaboration between regulators, clinics, and consumer-law authorities is necessary. At the same time, we would underline that patients will be best served when such cooperation takes place under conditions of genuine independence and free from conflicts of interest. To address your suggestion, we have incorporated clarifying sentences such as: "Our findings reflect not only individual clinic practices but also the absence of standardised definitions, independent verification, and consumer-law oversight." Finally, we conclude with: "We believe that patients will be best served when regulators, clinics, and consumer-law authorities jointly address success-rate reporting, with genuine independence and without conflicts of interest."

Some further points merit reflection. Publishing separate IVF and ICSI success rates can create a marketing pressure for patients to choose the technique with the higher number, even though this is a clinical decision based on indication and local practice. Suggesting that ICSI is used primarily for financial gain is not warranted. It is also important to note that ICSI carries recognised risks, meaning patient choice should not be swayed by website presentation. Similarly, claims such as "around 90% after three cycles" fall into a grey zone: they should certainly be framed carefully, but for younger patients or donor-egg cycles, cumulative outcomes can plausibly approach this magnitude. These statements are not necessarily deceptive, but they can be misinterpreted without context. Thank you very much for this thoughtful comment. We agree that it is important to present success rates in a way that avoids creating marketing pressure or misinterpretation. To address this, we have added the following clarification: "Given ICSI's widespread use in Spain, greater transparency would allow patients to understand when IVF and ICSI are clinically indicated."

The legal and ethical context is also important. In public systems, thresholds such as a "reasonable chance of success" are funding criteria, not prohibitions on private treatment. Patients retain autonomy, and clinics have a duty to support informed choice, not to restrict access based only on statistical probability. We appreciate your point regarding the legal and ethical context. To clarify, our article does question the effective autonomy of patients, but not in the sense of restricting their choices. Rather, we argue that genuine autonomy is not possible when patients lack accurate, transparent, and comprehensible information about success rates. We are not attempting to define what percentage of success should be considered "reasonable," nor are we suggesting that access should be limited on this basis. Our focus is solely on the absence of transparency and clarity in reporting, which undermines the conditions under which informed and

autonomous decision-making can truly take place. --------- We are very grateful for your contribution to strengthening our submission. Yours sincerely,
Anna de Bayas Sanchez

Competing Interests: No competing interests were disclosed.

Reviewer Report 14 July 2025

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Karin Hammarberg
[1] Monash University, Clayton, Victoria, Australia
[2] Monash University, Clayton, Victoria, Australia

Thank you for asking me to review this paper which reports findings from an analysis of content relating to success rates on fertility clinic websites in Spain. This is a very important topic as there is increasing understanding that the commercial interests in the fertility industry may impact negatively the quality of information for patients about what is possible with IVF. I have the following questions and comments.

1. Title: I suggest removing 'public health' and just having 'action' as in my view this has nothing to do with public health.
2. Abstract: What is meant by 'five most representative MAR clinics"? Representative in what way? Should that be largest?
3. Abstract: Similarly, it's unclear what you mean by 'legal recommendations', might be better to just have 'recommendations'.
4. Last paragraph before methods: Here you give away the answer to the question you are posing. I would take out reference to how clinics present success rates as that is your research question. Also, the last sentence states that this is the first study on this topic. This is incorrect, there are others. It might be the first analysis of content on Spanish fertility clinic websites.
5. Methods: Was there a reason for not involving patients or the public in the study design?? As this mainly concerns patients, their input would have been valuable.
6. Methods: You say the same thing twice here: 'To identify **the most frequently consulted MAR clinics in Spain**, we conducted internet searches using the five most common Google search keywords related to fertility treatment: 'fertilisation', 'insemination', 'infertility', 'pregnancy IVF' (in vitro fertilisation), and 'ICSI' (intracytoplasmic sperm injection). We chose this selection method **to identify the most frequently visited and consulted clinics in Spain**, ensuring that their online information is the most visible to the general public.' Please rephrase.
7. You mention that one of the things you looked for was 'certification and auditing by external bodies'. You should add some information in the introduction about how ART is

regulated in Spain. Are clinics obliged to be certified to operate and if so, who does this? Also, are clinics mandated to report their outcomes (number of cycles, pregnancy and live birth etc) to any central data collector and are such data published??

8. In the results section I suggest you organise the data you report under subheadings that match the data you say you collected in the methods section. This would make it easier for readers to follow.
9. Results: You say 'In particular, we analysed whether the success rate is defined as live birth, clinical pregnancy, or chemical pregnancy, and whether these criteria are explicitly stated and explained.' I think you should also mention what denominator clinics use for their success rate reporting. Often clinics report outcome data per embryo transfer which does not account for the people who don't reach the embryo transfer stage.
10. The first paragraph under the heading 'Online information on success rate and age' is not part of your results, would be better placed in the introduction.
11. The last sentence in the first column on page 5 says that clinics did not report IVF and ICSI outcomes separately. In some clinics ICSI is used in a high proportion of patients, including in cases where there is no male factor (against the existing evidence that this does not improve their chance of a baby). It would be helpful to know what proportion of ICSI cycles in the clinics you included.
12. This would be better placed in the discussion as it is not part of your results: 'In fact, based on the data provided by the French government, the success rate of ICSI is only slightly higher than that of IVF, and not always. Studies indicate that when the cause of infertility is not of paternal origin, the success rates of IVF are better than those of ICSI, although it is debatable which technique is more beneficial in other cases (Bantel-Finet et al., 2022). In light of this evidence, and given the different costs associated with using one or the other, information about success rates should enable patients to take these factors into consideration.'
13. In that same paragraph you say that clinics were 'interviewed', wasn't this a content review??
14. On page 6 this would be better placed in the discussion in my view: 'Such statements violate Spanish and European consumer protection laws on truthful advertising, which prohibit any advertising that, through false or misleading information—or the omission of essential details—leads consumers to make misinformed decisions.'
15. This is self-evident and does not in my view need stating: 'The primary expectation of people seeking fertility treatment is to become the parent of a healthy child—the main reason they seek the services of a clinic.' The sentence that follows mentions 'requirement' but it is not clear what the requirement is.
16. The first part on page 7 repeats the results, this should be avoided.
17. The sentence that follows starts with 'Given this expectation…' What expectation?
18. The last sentence in that paragraph states that patients receive a 'success rate defined exclusively in terms of live birth'. It may be better to say that they receive an estimate of their chance of a live birth based on the data they enter.
19. The conclusion is very long and the first sentence can be omitted as it is self-evident.

Is the work clearly and accurately presented and does it cite the current literature?
Partly

Is the study design appropriate and does the work have academic merit?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?
Partly

If applicable, is the statistical analysis and its interpretation appropriate?
Not applicable

Are all the source data underlying the results available to ensure full reproducibility?
Partly

Are the conclusions drawn adequately supported by the results?
Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: PhD and co-ordinator of IVF programs for 20 year.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 05 Oct 2025

Anna De Bayas Sanchez

We would like to thank you sincerely for your careful reading of our manuscript and for your thoughtful and constructive comments. Your observations have been extremely valuable in helping us to improve the clarity, quality, and overall rigour of our work. Below, we provide a point-by-point response to each of your numbered comments. For each one, we explain the changes made to the manuscript and where they can be found in the revised version. ---

1. Title: I suggest removing 'public health' and just having 'action' as in my view this has nothing to do with public health.
Response: Thank you for your suggestion. We have removed the reference to "public health" from the title, as recommended, and now refer simply to "action." We agree that this change makes the title more accurate and focused.

2. Abstract: What is meant by 'five most representative MAR clinics"? Representative in what way? Should that be largest?
Response: We agree that "representative" may imply broader coverage than intended. We have revised the text to clarify that our selection was based on online visibility and patient-facing influence, rather than clinic size or national representativeness.

3. Abstract: Similarly, it's unclear what you mean by 'legal recommendations', might be better to just have 'recommendations.
Response: Thank you for this helpful suggestion. We agree that the term "legal

recommendations" could be misleading or overly narrow. Our intention was to propose recommendations aimed at improving transparency, consumer protection, and advertising standards in the context of fertility treatment communication. To avoid confusion, we have revised the wording to "recommendations aimed at improving consumer protection and regulating advertising practices" in the Results section.

4. Last paragraph before methods: Here you give away the answer to the question you are posing. I would take out reference to how clinics present success rates as that is your research question. Also, the last sentence states that this is the first study on this topic. This is incorrect, there are others. It might be the first analysis of content on Spanish fertility clinic websites.
Response: Thank you very much for this helpful observation. We have revised the final paragraph of the Introduction to avoid anticipating the findings of the study and have removed the reference to how clinics present success rates. We have also rephrased the final sentence to clarify that, to our knowledge, this is the first systematic content analysis of Spanish fertility clinic websites focused specifically on success rate information.

5. Methods: Was there a reason for not involving patients or the public in the study design? As this mainly concerns patients, their input would have been valuable.
Response: In fact, we did involve the largest patient association, "Fertility Europe", which is part of the B2-InF consortium (although not of the scientific team), in a meeting where we discussed the checklist of data to be collected from clinic websites (of which success rates were only one of the aspects analysed). Thank you for your comment and for helping us to recognize the added value of that preliminary consultation. We have added this information to the Methods

6. Methods: You say the same thing twice here: 'To identify the most frequently consulted MAR clinics in Spain, we conducted internet searches using the five most common Google search keywords related to fertility treatment: 'fertilisation', 'insemination', 'infertility', 'pregnancy IVF' (in vitro fertilisation), and 'ICSI' (intracytoplasmic sperm injection). We chose this selection method to identify the most frequently visited and consulted clinics in Spain, ensuring that their online information is the most visible to the general public.'
Response: Thank you for pointing this out. We have revised the paragraph to eliminate redundancy and improve clarity. The revised text now avoids repetition while clearly explaining the rationale and method for selecting the clinics based on their online visibility.

7. You mention that one of the things you looked for was 'certification and auditing by external bodies'. You should add some information in the introduction about how ART is regulated in Spain. Are clinics obliged to be certified to operate and if so, who does this? Also, are clinics mandated to report their outcomes (number of cycles, pregnancy and live birth etc) to any central data collector and are such data published?
Response: Thank you for this helpful observation. We have now added a paragraph to the introduction explaining the regulatory framework for ART clinics in Spain. Specifically, we clarify that clinics must be authorised by the regional health authorities, in accordance with national law, and that they are required to report their treatment activity and outcomes to the Spanish Fertility Society (SEF). The SEF publishes aggregated national data annually, although clinic-level data publication remains voluntary. The revised introduction provides

this context, which helps to better frame our analysis of the lack of transparency and certification in the reporting of success rates.

8. In the results section I suggest you organise the data you report under subheadings that match the data you say you collected in the methods section. This would make it easier for readers to follow.
Response: Thank you very much for this helpful observation. We have revised the order of the analysis as described in the Methods section so that it now matches the structure and subheadings used in the Results section. We agree that this improves the clarity and readability of the article.

9. Results: You say 'In particular, we analysed whether the success rate is defined as live birth, clinical pregnancy, or chemical pregnancy, and whether these criteria are explicitly stated and explained.' I think you should also mention what denominator clinics use for their success rate reporting. Often clinics report outcome data per embryo transfer which does not account for the people who don't reach the embryo transfer stage.
Response: Thank you for your thoughtful comment. Indeed, we agree that the choice of denominator is crucial for interpreting success rates. In the case of the clinics analysed, all of them report success rates in terms of cumulative cycle outcomes. We have clarified this point in the Results section to make it explicit.

10. The first paragraph under the heading 'Online information on success rate and age' is not part of your results, would be better placed in the introduction.
Response: Thank you very much for your comment. We agree that the paragraph in question did not report results and therefore was not appropriate in the Results section. We have now removed it from that section and integrated it into the Introduction, where it fits more naturally and contributes to the contextual justification of our analysis. We believe this change improves the structure and clarity of the manuscript.

11. The last sentence in the first column on page 5 says that clinics did not report IVF and ICSI outcomes separately. In some clinics ICSI is used in a high proportion of patients, including in cases where there is no male factor (against the existing evidence that this does not improve their chance of a baby). It would be helpful to know what proportion of ICSI cycles in the clinics you included.
Response: Thank you for your thoughtful comment. We contacted the Spanish Fertility Society (SEF) to request access to clinic-specific data regarding the proportion of ICSI cycles. However, we were informed that "access to specific data from the Activity Registry – SEF Registry is not contemplated." Therefore, we have no means of accessing this information at the individual clinic level. Nonetheless, national-level data are available. According to the 2022 SEF Registry, ICSI accounted for approximately 88.2% of initiated cycles in Spain. We have now included this national statistic in the manuscript, as you suggested, to provide contextual information about the widespread use of ICSI in Spain.

12. This would be better placed in the discussion as it is not part of your results: 'In fact, based on the data provided by the French government, the success rate of ICSI is only slightly higher than that of IVF, and not always. Studies indicate that when the cause of infertility is not of paternal origin, the success rates of IVF are better than those of ICSI,

although it is debatable which technique is more beneficial in other cases (Bantel-Finet et al., 2022). In light of this evidence and given the different costs associated with using one or the other, information about success rates should enable patients to take these factors into consideration.'
Response: Thank you for your comment. We agree that the paragraph you mentioned does not correspond to the results of our empirical analysis. We have therefore removed it from the Results section and integrated it into the Discussion, where it contributes more appropriately to the interpretation of the findings and their implications for patient decision-making.

13. In that same paragraph you say that clinics were 'interviewed', wasn't this a content review?
Response: Thank you for catching this miswording. You are absolutely right - the clinics were not interviewed. The data were obtained through a systematic content review of their websites. We have corrected the sentence to reflect this accurately.

14. On page 6 this would be better placed in the discussion in my view: 'Such statements violate Spanish and European consumer protection laws on truthful advertising, which prohibit any advertising that, through false or misleading information—or the omission of essential details—leads consumers to make misinformed decisions."
Response: Thank you for this suggestion. We have removed the sentence from the Results section and placed it in the Discussion, where it is more appropriately situated within the analysis of legal compliance and consumer protection.

15. This is self-evident and does not in my view need stating: 'The primary expectation of people seeking fertility treatment is to become the parent of a healthy child—the main reason they seek the services of a clinic.' The sentence that follows mentions 'requirement' but it is not clear what the requirement is.
Response: Thank you for your helpful comment. You are right that the original formulation was unclear and could be seen as self-evident. We have revised the paragraph, accordingly, removing the sentence about patients' expectations and clarifying the reference to live birth as the most relevant outcome. We believe this improves both the clarity and precision of the argument.

16. The first part on page 7 repeats the results, this should be avoided.
Response: Thank you for pointing this out. We have revised the first part of page 7 to avoid repeating the results already presented. Instead of reiterating the data, we now provide a critical interpretation and highlight the ethical and legal implications of the lack of transparency in reporting success rates. This change strengthens the discussion by focusing on analysis rather than description.

17. The sentence that follows starts with 'Given this expectation…' What expectation?
Response: Thank you for your comment. We agree that the paragraph in question repeated information already presented in the Results section. We have removed it and revised the Discussion section, accordingly, focusing on the ethical, legal, and policy implications of our findings rather than restating the data.

18. The last sentence in that paragraph states that patients receive a ‘success rate defined exclusively in terms of live birth’. It may be better to say that they receive an estimate of their chance of a live birth based on the data they enter.
Response: Thank you for this helpful clarification. We agree that the original wording overstated the level of precision and determinism. We have revised the sentence to reflect that patients receive an estimate of their chance of live birth, based on the clinical data they provide and national datasets.

19. The conclusion is very long, and the first sentence can be omitted as it is self-evident.
Response: Thank you for your helpful suggestion. We have removed the first sentence of the conclusion and slightly reduced the overall length of the paragraph to improve clarity and conciseness, while retaining all key ideas. We appreciate your feedback. -------- We are very grateful for your contribution to strengthening our submission. Yours sincerely,
Anna de Bayas Sanchez

Competing Interests: No competing interests were disclosed.