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Review

Artificial Womb Technology and Abortion: An Argument-Based Systematic Review

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Abstract: This paper reviewed the ethical arguments on Artificial Womb Technology (AWT) in relation to abortion, offering a better understanding of the current debate. We conducted a systematic review of the ethical literature. Forty-eight articles met the predefined inclusion criteria out of 2133 screened. We identified four questions in the literature. First, how could AWT affect viability thresholds, currently used to regulate abortion access in some jurisdictions? Second, should AWT substitute abortion? Some support a substitution because it will allow to terminate the pregnancy and preserve the fetus. Others believe that abortion should be available regardless of AWT. The rights to autonomy, not to be a biological parent, to genetic privacy and to property were used in this discussion. Third, who is entitled to decide whether and how to terminate a pregnancy when AWT is available? The pregnant person alone or both parents should consent? Fourth, what are the practical implications of substituting abortion e.g. for the care management of 'AWT infants' in the adoption system? We concluded that the debate should focus more on the real implications of substituting abortion with the AWT currently in development. Authors supporting an abortion substitution should be more realistic when describing the consequences of their arguments.

Keywords: Abortion; artificial wombs; ectogenesis; artificial placenta; termination of pregnancy; foetal transfer; ethics.

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1. Introduction

The term Artificial Womb Technology (AWT) describes technologies that can be used to maintain gestation partially or fully in an artificial uterine environment, outside the human body. Within this general label we can identify different processes or technologies. In particular, Artificial Placenta

(AP), partial ectogenesis or partial ectogestation refer to technologies able to support a preterm infant for a few weeks in an artificial environment until lung development allows transfer to regular neonatal intensive care (Cavolo et al., 2024). Artificial Womb (AW), full ectogenesis or full ectogestation refer to future technologies that would be able to maintain an entire gestation from conception to delivery in an artificial environment (Cavolo et al., 2024).

Recent scientific developments have brought us a step closer to using AP to improve the survival and quality of life of extremely premature babies (Bryner et al., 2015; Partridge, Davey, Hornick, & Flake, 2017). In 2017, a team of researchers at the Children's Hospital of Philadelphia announced they successfully used their EXTEND artificial placenta to sustain extremely premature lambs, "developmentally equivalent to the extreme premature [22-24 week] human infant" (Partridge, Davey, Hornick, McGovern, et al., 2017, p.1), for four weeks, allowing them to grow substantially (Partridge, Davey, Hornick, McGovern, et al., 2017). The EXTEND is a fluidic incubator that uses artificial amniotic fluid and mimics all aspects of normal fetal life (The Children's Hospital of Philadelphia, n.d.). The system relies on the fetal heartbeat to circulate blood, which is then oxygenated through an external oxygenator (Partridge, Davey, Hornick, McGovern, et al., 2017; The Children's Hospital of Philadelphia, n.d.). For human fetal transfer to this artificial uterine environment a Caesarian section will be required (Kozlov, 2023).

Since 2017, different AP prototypes similar to the EXTEND have also been in development (Kozlov, 2023). These prototypes are all slightly different from a technical point of view, but they all aim at treating preterm infants by mimicking the human placenta and keeping the lungs in fetal state (Kozlov, 2023). These systems would only make it possible to gestate extreme premature babies for a few weeks outside of the human womb and are not capable of carrying a pregnancy from conception to delivery in the foreseeable future, making them different from a hypothetical artificial womb (The Children's Hospital of Philadelphia, n.d.).

Scientists involved in the development of APs have clarified that their technology cannot maintain full ectogenesis and that their purpose is to treat extremely premature infants (Kozlov, 2023; The Children's Hospital of Philadelphia, n.d.). However, the potential of AWT to sustain a pregnancy partially or even fully in the future, has sparked discussions about its impact for reproductive choices and specifically for abortion rights and access (Browne et al., 2023; Cavaliere, 2020; Cohen, 2017b; Horn, 2020b; Kaczor, 2005; Stratman, 2020).

For example, some have argued that the arrival of this technology and its successful implementation will signal the end of the 'abortion debate', as it will help to separate termination of pregnancy from the death of the fetus, and there will no longer be a need to resort to lethal abortions (Blackshaw & Rodger, 2019; Kaczor, 2018; Simkulet, 2020). Instead, 'aborted' fetuses will be transferred to AWT to continue gestation and go through the adoption

process. Others insist on framing abortion as an "essential healthcare resource" (Romanis & Horn, 2020, p.180) instead of a moral problem and advocate for access to abortion independent of other reproductive options or technologies, including AWT (Horn, 2020a, 2021; Romanis & Horn, 2020; Stratman, 2023).

Different arguments have been raised in the literature regarding the possibility of using AWT instead of abortion and all of them have been challenged in some way, without reaching a consensus. Thus, the purpose of this paper is to systematically review the ethical arguments on AWT in relation to abortion, offering a better understanding of the ongoing debate and underlining potentially overlooked issues in existing literature. This will help to understand how to safeguard access to abortion –which we believe is a fundamental medical right necessary to protect pregnant people's (bodily) rights and autonomy– against the advent of AWT, in the current legislative regime.

2. Materials and Methods

We conducted an argument-based systematic review of the ethical literature (McCullough et al., 2007; Mertz, 2019) on Artificial Womb Technology (AWT) related to abortion. A systematic search of Pubmed, Embase, Web of Science and the Philosopher's Index electronic databases was conducted on 15 November 2023 and updated on 12 September 2024. Two groups of words were used to construct a search string: one on AWT, containing words such as artificial placenta, artificial womb, partial ectogenesis, full ectogenesis, ectogenesis, biobag, and one on ethics, containing words such as ethics, morals, philosophy, bioethics (Cavolo et al., 2024). (Table 1)

Table 1. Databases, search string[1], search results.

Database[2]	**Group 1 Artificial Womb Technology**	**Group 2 Ethics**	**Results (15 November 2023)**	**Complementary search results[3] (12 September 2024)**
Pubmed	(artificial placenta OR artificial womb OR	("Ethics"[Mesh] OR "Philosophy"[Mesh] OR	966	67

[1] Previously used in: Cavolo, A., Boer, A. de, Proost, L. D., Verweij, E. J., & Gastmans, C. (2024). Navigating the Ethical Landscape of the Artificial Placenta: A Systematic Review. Prenatal Diagnosis, 45(2), 236–246. https://doi.org/10.1002/pd.6711

[2] Search was limited to English.

[3] Search was limited by date: 16 November 2023 – 12 September 2024

	partial ectogenesis OR full ectogenesis OR ectogenesis OR ectogestation OR artificial womb technology OR artificial womb technologies OR artificial utero OR full ectogestation OR partial ectogestation OR biobag OR ex vivo uterine therapy OR extracorporeal life support OR extracorporeal membrane)	ethic* OR philosophy OR bioethic*[tiab] OR philosophical[tiab] OR moral[tiab] OR morals[tiab])		
Web of Science *(All fields)*	(artificial placenta OR artificial womb OR partial ectogenesis OR full ectogenesis OR ectogenesis OR ectogestation OR artificial womb technology OR artificial womb technologies OR artificial utero OR full ectogestation OR partial ectogestation OR biobag OR ex vivo uterine therapy OR extracorporeal life support OR extracorporeal membrane)	(ethics OR ethical OR philosophy OR philosophical OR bioethics OR bioethical OR moral OR morals)	471	56
Embase	('artificial placenta':ti,ab,kw OR 'artificial womb':ti,ab,kw OR 'partial	(ethics:ti,ab,kw OR ethical:ti,ab,kw OR philosophy:ti,ab,kw OR philosophical:ti,ab,kw OR bioethics:ti,ab,kw OR	457	61

	ectogenesis':ti,ab,kw OR 'full ectogenesis':ti,ab,kw OR ectogenesis:ti,ab,kw OR ectogestation:ti,ab,kw OR 'artificial womb technology':ti,ab,kw OR 'artificial womb technologies':ti,ab,kw OR 'artificial utero':ti,ab,kw OR 'full ectogestation':ti,ab,kw OR 'partial ectogestation':ti,ab,kw OR biobag:ti,ab,kw OR 'ex vivo uterine therapy':ti,ab,kw OR 'extracorporeal life support':ti,ab,kw OR 'extracorporeal membrane':ti,ab,kw)	bioethical:ti,ab,kw OR moral:ti,ab,kw OR morals:ti,ab,kw)		
The Philosopher's Index *(Search fields: Heading word, Title, Abstract)*	(artificial AND placenta OR artificial AND womb OR partial AND ectogenesis OR full AND ectogenesis OR ectogenesis OR biobag)	(ethics OR ethical OR moral OR morals OR philosophy OR philosophical OR bioethics OR bioethical)	54	1

The search string was created in collaboration with a librarian and was already used in another peer-reviewed publication from the last author that explored the ethical debate surrounding AP (Cavolo et al., 2024).[4] This search string included terms capturing all AWTs and was, therefore, suitable for this review as well. After discussion with a university librarian

[4] Differently from this review, that publication did not include articles investigating future artificial wombs or AWT in general, and it did not focus specifically on the abortion debate.

and other experts in systematic reviews, we chose to not add a third group of words related to abortion because it returned an immense amount of results. Considering that we only wanted articles discussing abortion in relation to AWT, we convened that the best strategy was to do a broad search on AWT to retrieve all articles on that and within these articles only include those that discuss abortion. Search was not limited by publication date.

The results from the four electronic databases were merged before proceeding with deduplication, and independent title, abstract, and full-text screening by both authors using Rayyan. Disagreements were resolved by discussion until consensus was reached. The "snowball method" and citation tracking were also applied to identify five additional relevant publications (Greenhalgh & Peacock, 2005). Predefined inclusion/exclusion criteria guided the selection of the eligible articles.

Inclusion and exclusion criteria are divided into three categories: 1) Types of publication, 2) Topic, 3) Language.

1) Types of publication that were included in the paper are published articles, case studies[5], editorials[6] and letters to the editors[7], presenting fully elaborated original ethical argumentations. Types of publication that were excluded are dissertations, books, book chapters, guidelines, conference proceedings, ethics policies and codes because they cannot be systematically searched. Reviews, empirical studies, clinical trials, and legal articles were also excluded because they are descriptive articles, that do not contain original ethical and normative argumentation, that is articles describing current practices without any original contribution.
2) Articles on the topic of artificial womb technologies (i.e., articles on technologies mimicking the human womb to maintain fully or partially a gestation in an artificial environment) related to abortion were included.[8] Articles on other reproductive technologies, e.g. utero transplantation, IVF, were excluded. Articles that discussed multiple reproductive technologies were included but only data related to AWT were extracted.
3) Only publications in English were included.

The literature search was conducted and summarized following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram (Liberati et al., 2009). (Figure 1)

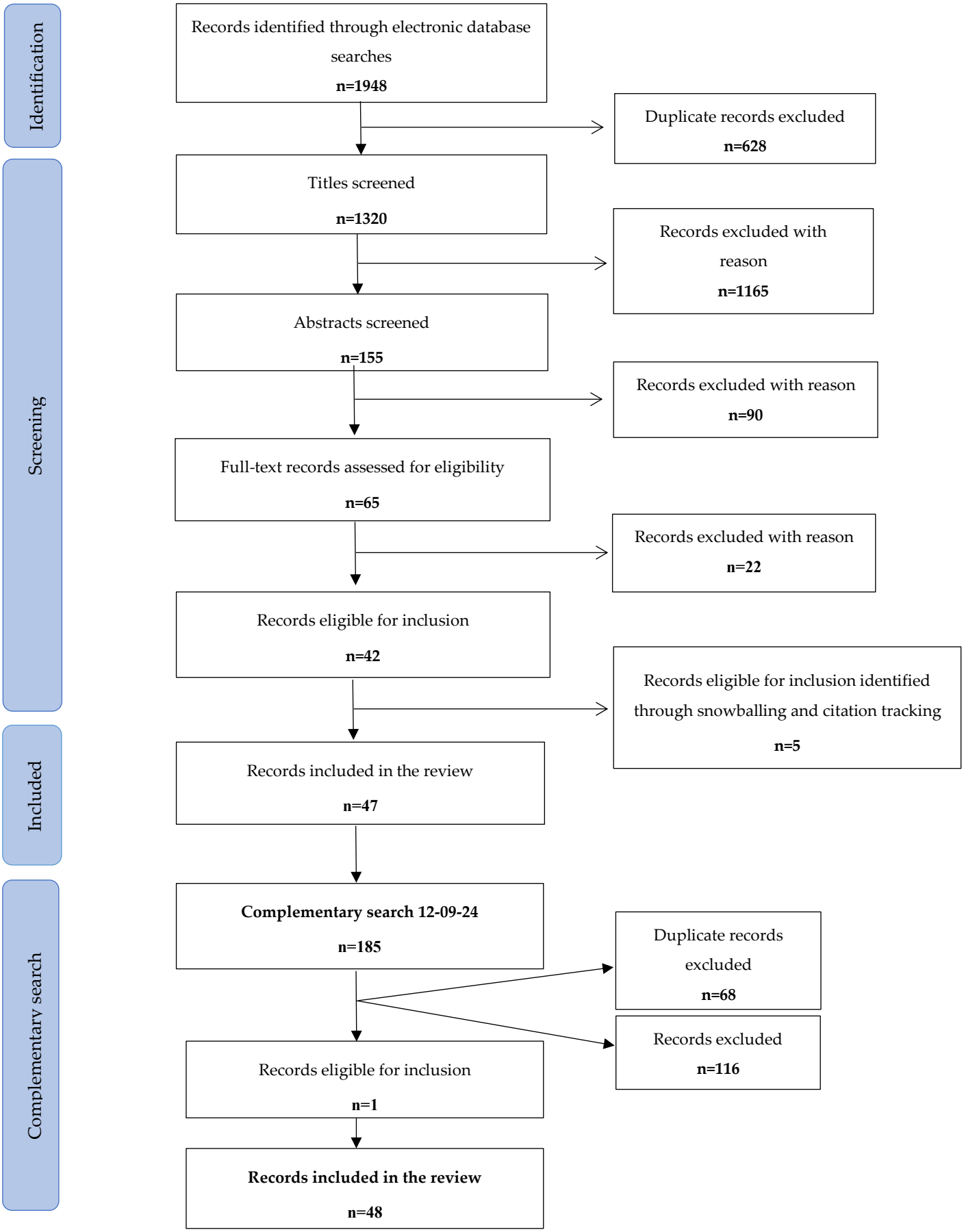
[5] Sometimes ethical arguments related to AWT and abortion are discussed in these publications.

[6] Ibid

[7] Ibid

[8] In this paper, we only focused on arguments specifically discussing abortion permissibility in relation to AWT, and not on the overall view of authors on abortion in general.

Figure 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram.


Identification
Screening
Included
Complementary search
Records identified through electronic database searches
n=1948
Duplicate records excluded
n=628
Titles screened
n=1320
Records excluded with reason
n=1165
Abstracts screened
n=155
Records excluded with reason
n=90
Full-text records assessed for eligibility
n=65
Records excluded with reason
n=22
Records eligible for inclusion
n=42
Records eligible for inclusion identified through snowballing and citation tracking
n=5
Records included in the review
n=47
Complementary search 12-09-24
n=185
Duplicate records excluded
n=68
Records excluded
n=116
Records eligible for inclusion
n=1
Records included in the review
n=48

In the absence of a standard for quality appraisal of argument-based literature, the 'appraisal using procedural quality assurance criteria' strategy was followed (Mertz, 2019). The quality of the included literature was assumed based on the peer review process and the academic reputation of the journals. This is adequate as the aim of the review is descriptive and not normative (Mertz, 2019).

Data analysis and synthesis was inspired by the 5 preparatory steps of the coding process described in the Qualitative Analysis Guide of Leuven (QUAGOL) (Dierckx de Casterlé et al., 2012, 2021). The material was read thoroughly and repeatedly. Relevant parts of each publication were summarized. Based on these extensive summaries, individual conceptual schemes, and then a general conceptual scheme to map and organize the relevant concepts, arguments and nuances were developed. The general scheme was the basis to synthesize and report results. We were vigilant in ensuring that our results accurately represented the richness of the data by constantly moving between the different stages of the process.

Even though the QUAGOL approach was originally developed for analyzing qualitative interview data, it can be used to analyze qualitative material in general and it has been successfully used for argument-based reviews in the past (see for example Howes & Gastmans (2021) and Vandemeulebroucke et al. (2018)).

3. Results

We identified and analyzed 48 eligible publications. The publication dates range from 1977 to 2024, with 34 records published amid the introduction of the EXTEND AP technology in 2017, indicating a revival of the debate in recent years. Most publications (n=40) originated from Anglo-Saxon countries (i.e. US, UK, Australia, Canada)(Adkins, 2021; Alghrani, 2007; Anderson, 2023; Blackshaw & Rodger, 2019; Brown & Watson, 2023; Browne et al., 2023; Cohen, 2017a, 2020; Davin & Kaczor, 2005; Goldstein, 1978; Hendricks, 2018; Hine, 2024; Hopkins, 2008; Horn, 2020a, 2021; Humber, 1977; Jackson, 2008; James, 1987; Kaczor, 2005, 2018; Kendal, 2020, 2022; Kennedy & Nelson, 2023; Langford, 2008; Mathison & Davis, 2017; Murphy, 1989; Overall, 2015; Pruski & Playford, 2022; Rodger, 2021; Roesner, 2023; Romanis, 2019, 2021; Romanis & Horn, 2020; Simkulet, 2020, 2023; Singh, 2022; Stratman, 2020, 2021b, 2023; Wells, 1987). Of the remaining publications, three originated from Europe (Accoe & Pennings, 2024; Räsänen, 2017, 2023), two from Malaysia (Muhsin et al., 2023; Yaakob, 2022), one from Israel (Simonstein, 2006) and one from South Africa (Lupton, 1997). The country of origin of one publication was not found (Räsänen, 2021). More information on the characteristics of included publications can be found in Table 2.

Table 2. Characteristics of included publications (N=48).

CHARACTERISTICS	NUMBER OF PUBLICATIONS
Article type	
Full article	33
Commentary	15
Year of publication	
2017-2024	34
2000-2016	8
1977-1999	6
First author's number of included publications	
Romanis E.C.	3
Räsänen J.	3
Stratman C.	3
Kaczor C.	2
Horn C.	2
Cohen I.G.	2
Simkulet	2
Kendal E.	2
Accoe D., Adkins V., Alghrani A., Anderson M.L., Blackshaw B.P., Brown B.P., Browne T.K., Davin J., Goldstein M.A., Hendricks P., Hine K., Hopkins P., Humber J.M., James D.N., Kennnedy S., Lupton M.L., Mathison E., Murphy J.S., Roesner N., Simonstein F., Singh P., Wells D., Pruski M., Rodger D., Langford S., Yaakob H., Jackson E., Overall C., Muhsin S.M.	1 (each)
Country of first author's affiliation	
USA	19
UK	12
Australia	5
Canada	4
Malaysia	2
Belgium, Denmark, Finland, Israel, South Africa	1 (each country)
Not found	1

We identified five main themes in the discussion around AWT and abortion: 1) viability thresholds, 2) whether AWT should substitute abortion, 3) arguments to determine whether AWT should substitute abortion, 4) who is entitled to decide whether and how to terminate a pregnancy when AWT is available, and 5) practical implications.

3.1 Viability thresholds

A first issue is how AWT will affect abortion thresholds that are used to regulate access to abortion services. In some jurisdictions (e.g. the Netherlands or UK) abortion permissibility is closely linked to fetal viability, i.e. the point at which a fetus has a chance to survive outside the pregnant woman's womb if treated (Horn, 2021). Different factors affect the viability threshold, such as gestational age, sex, weight, resources available, and prevalent medical and sociocultural attitudes toward premature infants (Horn, 2021). Fetal viability sets a gestational limit after which abortion access may be restricted or prohibited (Horn, 2021). In this context, the advent of AWT has raised concerns about how viability and consequently abortion rights might be affected. The following scenarios were presented in the literature.

3.1.1 AWT will not affect viability thresholds

Three publications examined the possibility that viability will stay the same (Cohen, 2017a; Hine, 2024; Räsänen, 2023). According to Hine (2024) fetuses extracted from a human womb only to be transferred into AWT are not viable (although justification is not provided). Therefore, the viability threshold –and consequently viability-based access to abortion– should not be affected by AWT. Cohen (2017a) and Räsänen (2023) also considered that the viability threshold could stay the same. However, they speculated that a transfer to AWT, instead of an abortion, could be required even for a pre-viable fetus. Therefore, abortion would be allowed only until the earliest point at which AWT can be used.

Cohen (2017a) and Räsänen (2023) also considered a possibility of increasing access to pregnancy termination after viability –through fetal transfer to AWT– which would normally be prohibited. However, this possibility was criticized by two publications (Brown & Watson, 2023; Romanis & Horn, 2020) pointing out that as viability thresholds do not allow for women to end their pregnancies once viability is reached, there is no reason to imagine states offering this more expensive and riskier option to end unwanted viable pregnancies (Brown & Watson, 2023; Romanis & Horn, 2020).

3.1.2 AWT will affect viability thresholds

Various scholars recognized the potential of AWT to lower viability thresholds, challenging abortion regulation, especially in jurisdictions

where the law uses a gestational limit to determine the (im)permissibility of abortions. In this context, we identified different positions.

Some publications maintained that if AWT lowers the viability threshold, abortion permissibility would be affected as well, with abortion being prohibited the moment fetal transfer to AWT becomes possible (Alghrani, 2007; Browne et al., 2023; Cohen, 2017a, 2020; Goldstein, 1978; Hopkins, 2008; Horn, 2020a; Jackson, 2008; Murphy, 1989; Räsänen, 2023; Romanis, 2019; Romanis & Horn, 2020; Simonstein, 2006; Stratman, 2023). From the moment this lowered viability threshold is reached, states could either allow or prohibit that AWT is used as an alternative to natural gestation (Cohen, 2017a; Räsänen, 2023). In this scenario, if full ectogenesis becomes possible, the viability threshold will move all the way to conception (Alghrani, 2007; Browne et al., 2023; Cohen, 2020; Hopkins, 2008; Murphy, 1989; Simonstein, 2006). Some of these publications clearly identified this possibility as a threat to reproductive rights (Browne et al., 2023), highlighting the need (in their opinion) for a different (legislative) approach to abortion in view of AWT (Cohen, 2020; Horn, 2020a; Jackson, 2008; Murphy, 1989; Romanis, 2019; Romanis & Horn, 2020).

Another publication dating to 1977 –before successful AP prototypes were developed– considered that just the existence of AWT could move viability to conception, irrespective of the earliest point at which AWT could be used (Humber, 1977). As this technological development would render all fetuses "potentially able to live outside the mother's womb, albeit with artificial aid" (p. 141) abortion would be prohibited at any gestational age (Humber, 1977).

3.2 Should AWT substitute abortion?

Another issue raised by the literature is whether fetal transfer to AWT should substitute abortion. Forty-one publications developed different arguments to either support substituting abortion with AWT transfer or to oppose it.

3.2.1 AWT should substitute abortion

Twelve publications supported that fetal transfer to AWT should substitute abortion because it allows to terminate the pregnancy while 'saving' the 'baby' (Blackshaw & Rodger, 2019; Davin & Kaczor, 2005; Goldstein, 1978; Hendricks, 2018; Hopkins, 2008; Humber, 1977; Kaczor, 2005, 2018; Pruski & Playford, 2022; Räsänen, 2023; Simkulet, 2020; Stratman, 2020)[9]. The unwanted fetus, instead of being aborted, would be adopted by individuals willing to care for it (Simkulet, 2020; Stratman, 2020).

[9] However, Räsänen specifies that in the compromise he proposes abortion would be allowed until the moment fetal transfer to AWT becomes possible, at which point it would be substituted by fetal transfer to AWT.

Some of these publications established the following requirements that must be met to support AWT as a compulsory alternative to abortion. AWT needs to be a safe alternative (Blackshaw & Rodger, 2019; Humber, 1977; Kaczor, 2005; Pruski & Playford, 2022; Simkulet, 2020; Stratman, 2020) with comparable risks to current abortion methods (Kaczor, 2005; Simkulet, 2020), affordable or state funded (Blackshaw & Rodger, 2019; Goldstein, 1978; Humber, 1977; Kaczor, 2005; Simkulet, 2020) and widely available for pregnant people to use (Goldstein, 1978; Kaczor, 2005; Pruski & Playford, 2022; Simkulet, 2020; Stratman, 2020).

3.2.2 AWT should not substitute abortion

On the other hand, 28 publications maintained that fetal transfer to AWT should not substitute abortion, using two different lines of argumentation.

One group, consisting of three publications, opposed the use of AWT as an alternative to abortion altogether, based on practical and moral grounds (Anderson, 2023; Davin & Kaczor, 2005; Muhsin et al., 2023). Anderson (2023) and Muhsin et al. (2023) supported that as termination of pregnancy is considered wrong, AWT transfer should only be utilized when there is a medical indication to do so. More specifically, Muhsin et al. (2023), explaining the Islamic perspective, supported that AWT should not be used to avoid the moral guilt of terminating a pregnancy. AWT should only be used for extremely premature infants and potentially for pregnancies with increased risks (Muhsin et al., 2023). Anderson (2023), explaining the antiabortionist perspective, supported that any use of AWT should be limited to saving embryos that would otherwise not survive, and should not expand to intentionally disconnecting the embryo from the mother. Davin (Davin & Kaczor, 2005) opposed the use of AWT for abortion purposes –even suggesting making AWT illegal– arguing that it would encourage (sexual) irresponsibility and create an "overwhelming financial burden on society" (p. 657).

The second group, consisting of 25 publications, was against fetal transfer to AWT substituting abortion, because, in their opinion, by making AWT transfer compulsory the states would violate pregnant people's (reproductive) rights (Alghrani, 2007; Brown & Watson, 2023; Browne et al., 2023; Cohen, 2020; Hine, 2024; Horn, 2020a, 2021; Jackson, 2008; James, 1987; Kendal, 2020, 2022; Kennedy & Nelson, 2023; Langford, 2008; Murphy, 1989; Overall, 2015; Räsänen, 2017, 2021; Roesner, 2023; Romanis, 2019, 2021; Romanis & Horn, 2020; Simkulet, 2023; Singh, 2022; Stratman, 2023, 2021). These authors explained that AWT and abortion should coexist and pregnant people should be able to choose the best medical care for them. However, one publication recognized the risk that the (co-)existence of AWT could lead to a moral expectation, and consequent undue pressure, for the pregnant people to choose AWT transfer, irrespective of a legal or moral obligation being imposed (Langford, 2008).

3.3 Arguments to determine whether AWT should substitute abortion

We identified four main arguments that are used to debate whether AWT should substitute abortion.

3.3.1 Autonomy and bodily autonomy

Overall, 13 publications supported that replacing abortion with AWT violates autonomy as a right to pursue one's goals, as it does not achieve the goal of abortion (Adkins, 2021; Alghrani, 2007; Brown & Watson, 2023; Horn, 2020a, 2021; Jackson, 2008; Langford, 2008; Overall, 2015; Räsänen, 2021; Rodger, 2021; Roesner, 2023; Romanis & Horn, 2020; C. Stratman, 2023). More specifically, several records explained that the purpose of AWT does not coincide with the purpose of an abortion –which is primarily to avoid the birth of a child for various reasons– and thus AWT transfer cannot satisfy individuals seeking abortions (Brown & Watson, 2023; Jackson, 2008; Langford, 2008; Overall, 2015; Räsänen, 2021; Rodger, 2021; Romanis & Horn, 2020). Various authors further explained that abortion is a complex decision that expresses, more than a desire to stop gestating, a desire to control one's own life, whereas enforcing AWT as an alternative to abortion removes control from pregnant persons by reducing their choices (Alghrani, 2007; Brown & Watson, 2023; Horn, 2020a, 2021; Langford, 2008; C. Stratman, 2023). Some publications underlined that abortion should be seen as an "essential healthcare resource" (Romanis and Horn, 2020, p.180), instead of a moral problem that might eventually be solved by advancements in reproductive technology, like AWT (Horn, 2020a, 2021; Romanis & Horn, 2020; C. Stratman, 2023). In this sense, abortion access should be guaranteed regardless of the existence of AWT. One publication even highlighted that any legal restrictions on abortion access due to AWT availability would express systemic misogyny and should not be implemented (Stratman, 2023).

Nineteen publications focused specifically on bodily autonomy. Some argued that, irrespective of whether AWT transfer is invasive or not, any restriction on the right to choose when and how to terminate one's pregnancy leads to the violation of their bodily integrity and autonomy (Hine, 2024; Langford, 2008; Overall, 2015; Romanis, 2019; Romanis & Horn, 2020). Others supported that the invasiveness of AWT transfer will ground their claim to not be forced to undergo the procedure (Cohen, 2017a; Stratman, 2020; Wells, 1987). Various publications agreed that making a (more burdensome) intervention a compulsory alternative to abortion should not be allowed as it violates the right to bodily autonomy (Alghrani, 2007; Kendal, 2020; Mathison & Davis, 2017) and the right to choose one's own medical treatment (Jackson, 2008; James, 1987; Langford, 2008).

Furthermore, several authors agreed that AWT transfer abdominal surgery at approximately the 22nd week of pregnancy cannot be accepted as an ethical substitute for the majority of medical abortions that are

performed with minimal risk during the first weeks of gestation (Alghrani, 2007; Brown & Watson, 2023; Browne et al., 2023; Horn, 2020a; Rodger, 2021; Romanis & Horn, 2020; Simkulet, 2023). Hine (2024) highlighted the severe lasting effects and future consequences of AWT transfer on the body, especially with repeated transfers, which should not be overlooked. Finally, two publications underlined that, in any case, even if there is a fetal right to life, this is not a right to use another person's body for AWT transfer (Simkulet, 2023; Singh, 2022).

On the other side of the spectrum, 12 publications supported that abortion is a right to stop gestating that is not connected with a right to secure the death of the fetus (Blackshaw & Rodger, 2019; Cohen, 2017a, 2020; Goldstein, 1978; Hopkins, 2008; Humber, 1977; Kaczor, 2005; Lupton, 1997; Pruski & Playford, 2022; Räsänen, 2023; Simkulet, 2020; Singh, 2022). In their opinion, AWT would replace abortion without infringing on women's (bodily) autonomy. More specifically, several records supported that when substituting abortion with AWT transfer the right to control one's body is still respected as gestation is ended even if the fetus survives (Cohen, 2017a, 2020; Goldstein, 1978; Hopkins, 2008; Humber, 1977; Kaczor, 2005; Lupton, 1997). One record specified that when fetal transfer to AWT is covered by the same informed consent as abortion, autonomy is not violated (Räsänen, 2023).

Nonetheless, two publications maintained that even if AWT transfer entails additional medical risks or limitations, if the risks are comparable or not too high, the right to stop gestating is still respected (Pruski & Playford, 2022; Simkulet, 2020). One record argued that even if AWT is significantly more invasive and burdensome than abortion, when the fetus has full moral status, only AWT should be used to end the pregnancy (Blackshaw & Rodger, 2019). Another publication underlined that a fetus' positive right to life surpasses a right to bodily autonomy (Singh, 2022).

3.3.2 Right not to become a biological parent

Six publications argued for a right not to become a biological parent (Brown & Watson, 2023; Jackson, 2008; Langford, 2008; Overall, 2015; Räsänen, 2017; Romanis & Horn, 2020). In their view, people seeking pregnancy termination are exercising a right not to reproduce, rejecting both biological and social parenthood and corresponding harmful parental obligations. This right cannot be achieved through AWT transfer as they will still be biological parents against their will.

We also found nine publications opposing such a claim (Blackshaw & Rodger, 2019; Goldstein, 1978; Hendricks, 2018; Hopkins, 2008; Kaczor, 2018; Kendal, 2020; Mathison & Davis, 2017; Simkulet, 2020; Stratman, 2020). Five records argued that there is no right to avoid biological parenthood in the first place (Blackshaw & Rodger, 2019; Goldstein, 1978; Hendricks, 2018; Mathison & Davis, 2017; Stratman, 2020). Moreover, according to two publications, even abortion does not prevent someone

from becoming a biological parent, only from continuing to be one (Blackshaw & Rodger, 2019; Kaczor, 2018). Nevertheless, even if such a right not to become a biological parent was violated and this resulted in harm, according to three publications, this harm does not seem to be sufficiently significant to justify "killing" the fetus (Blackshaw and Rodger, 2019, p.79; Hopkins, 2008, p.313; Simkulet, 2020, p.96).

On the other hand, one author took a different approach supporting that this argument does not apply as "[p]arenthood is dependent on the existence of a relationship that never comes into being in the context of a terminated pregnancy" (Kendal, 2020, p.200).

3.3.3 Right to genetic privacy

One publication supported a right to genetic privacy that justifies permitting abortions after the advent of AWT (Räsänen, 2017). According to this author, allowing genetic children to come into this world without consent from the parents, violates their genetic privacy, so they should be able to secure the "death of the fetus" (Räsänen, 2017, p.697).

Five publications replied to this claim. According to three publications, there is no right to genetic privacy but a right not to have our genetic information misused or used against consent which still cannot justify the "death of the fetus" (Blackshaw & Rodger, 2019, p.76; Mathison & Davis, 2017, p. 313; Stratman, 2020, p.683). Maybe there is a right to not have one's entire genome released without consent, but this is not violated as a child only has 50% of one's genome (Mathison & Davis, 2017). Two publications argued that, even assuming that a right to genetic privacy exists, this right could have considerable limits, so it does not seem to justify the death of the fetus (Kaczor, 2018; Mathison & Davis, 2017). One author supported that the right to genetic privacy is a right not to have one's genetic information spread, but in the case of AWT transfer this right has already been violated in advance, as the fetus already exists (Hendricks, 2018).

3.3.4 Right to property

Two publications argued that a property right grounds a right to abortion over AWT transfer (Overall, 2015; Räsänen, 2017). Räsänen (2017) explained that since genetic parents own the fetus, their rights to property would be violated if the fetus was gestated in AWT against their consent and thus they have a collective right to secure the death of the fetus. Overall (2015) argued that since the pregnant person owns the fetus in their body, no one can remove it alive against this person's will and best interests, with the goal of keeping it alive.

On the other hand, four publications responded that there is no property right over fetuses (Blackshaw & Rodger, 2019; Kaczor, 2018; Mathison & Davis, 2017; Stratman, 2020), with two publications specifying that even if a property right exists, assuming that the fetus has some moral status, this property right is limited and does not justify securing its death

(Blackshaw & Rodger, 2019; Mathison & Davis, 2017). Mathison & Davis (2017) illustrated this point by making an analogy with buying a historic building. Despite the buyer owning the building they cannot destroy it at will. Their property right has significant limitations due to the building's instrumental value. Similarly, even if parents own their fetus, their property right does not justify a right to destroy it. Another publication argued that a genetic or property-based defense of abortion in this context fails to "reflect the diversity and complexity of contemporary family-making" (Horn, 2021, p.95), especially in situations in which the biological, gestational and/or intended parents are not the same (Horn, 2021). For example, in case of surrogacy, gestational parents that are not the biological parents could be forced to continue or stop gestation against their will, based on the biological parents' property right (Horn, 2021).

3.4 Who is entitled to decide whether and how to terminate a pregnancy?

Another issue that surfaces in this context is who is responsible for deciding whether and how to terminate a pregnancy when AWT is available.

Seven publications supported that the pregnant person is the only one entitled to decide when and how they will terminate their pregnancy –even when AWT is available–, as their body and autonomy are always impacted (Accoe & Pennings, 2024; Horn, 2021; Murphy, 1989; Overall, 2015; Romanis, 2021; Romanis & Horn, 2020; Stratman, 2023). Their right to decide exists independent of their partner's opinion. A collective right of both parents based on genetic relatedness would lead to possible coercion to either terminate or continue a pregnancy against the pregnant person's will (Horn, 2021; Murphy, 1989). Two publications argued that a potential right to the "death of the fetus", like a right to terminate one's pregnancy, would be an individual right exercised by the pregnant person, based on their right to autonomy, regardless of their partner's opinion (Stratman, 2023; Stratman, 2020).

On the other hand, three publications argued for a collective right (Cohen, 2017a, 2020; Räsänen, 2017). According to Räsänen (2017), as intercourse is a collective act that leads to a fetus that bears the DNA of both of the individuals involved, the right to decide whether to terminate a pregnancy is a collective right. Moreover, as biological 'fathers' positions could have strong or equal weight in termination decisions (Cohen, 2020), there is a possibility to prohibit abortion when couples disagree and only allow AWT transfer (Cohen, 2017a; Räsänen, 2017). However, this possibility was rejected by another publication, arguing that a biological 'father's' right to become a (biological and social) parent is a negative right and, thus, cannot constitute a duty of assistance for pregnant people to opt for fetal transfer to AWT instead of abortion (Accoe & Pennings, 2024).

3.5 Practical implications

A last issue that we identified is related to the practical implications of imposing an AWT transfer as a compulsory alternative to abortion. We found 18 publications recognizing that proscribing abortions and transferring all unwanted fetuses to AWT will have serious implications for the pregnant person, the child born, and the society (Alghrani, 2007; Brown & Watson, 2023; Davin & Kaczor, 2005; Horn, 2020a, 2021; Jackson, 2008; James, 1987; Kendal, 2022; Kennedy & Nelson, 2023; Langford, 2008; Lupton, 1997; Overall, 2015; Pruski & Playford, 2022; Rodger, 2021; Romanis, 2019; Romanis & Horn, 2020; Stratman, 2021; Yaakob, 2022).

Six publications argued that with all unwanted pregnancies carried to term there will be a severe lack of willing individuals to adopt 'aborted' fetuses (Alghrani, 2007; Davin & Kaczor, 2005; Horn, 2020a; James, 1987; Lupton, 1997; Pruski & Playford, 2022), especially since AWT would "encourage people to become irresponsible in their sexual behavior" (Davin & Kaczor, 2005, p.657). Two publications highlighted that these fetuses will be premature, medically vulnerable and highly dependent in need of close care (Horn, 2020a; Overall, 2015). Five publications explained that caring and providing for all these 'aborted' fetuses will create overwhelmingly high costs and burdens for society, increasing the need for more orphanages and related services (Alghrani, 2007; Davin & Kaczor, 2005; James, 1987; Lupton, 1997; Yaakob, 2022). Alternatively, in the case that parental obligations could not be waived, pregnant people undergoing a compulsory AWT transfer to terminate an unwanted pregnancy could be faced with alimony requests from the parent willing to raise the resulting child (Pruski & Playford, 2022).

Moreover, 12 publications warned about the immediate danger to pregnant people. Proscribing abortions could result in illegal and unsafe abortions (Alghrani, 2007; Horn, 2021; Jackson, 2008) and increased maternal deaths (Alghrani, 2007; Horn, 2021). Despite abortion being prohibited, people would still seek abortion services but would be faced with increased criminalization and denial of resources or even coercion and violence (Horn, 2020a, 2021). They could be punished for endangering their fetuses and coerced into medical treatments against their consent or subjected to state control (Kennedy & Nelson, 2023). This approach would foster distrust towards women's bodies (Overall, 2015) and maintain systemic misogynistic behaviors and expectations (Stratman, 2021). At the same time, the increased fetal visibility that AWT would provide could potentially ground a greater legitimization to antiabortionist claims (Kendal, 2022; Langford, 2008; Rodger, 2021; Romanis, 2019). Pregnant people would be faced with an emotional burden when forced to use AWT, as their child would still be alive somewhere (Yaakob, 2022), and with increased stigma when not opting for AWT transfer (Rodger, 2021).

Furthermore, two publications addressed issues of discrimination and equal access (Brown & Watson, 2023; Horn, 2020a). When AWT is the only option to terminate a pregnancy, and since equal access is not established,

those who cannot afford to use AWT or cannot get access to one in time would be forced to carry their pregnancies to term. This would lead to discrimination (Horn, 2020a), especially at the expense of historically excluded groups (e.g. black or trans people, or undocumented immigrants) (Brown & Watson, 2023). To avoid this, Goldstein (1978) linked viability and abortion prohibition to AWT being "meaningfully available" (p.916) and affordable or covered by state funds.

Lastly, two authors addressed the technological gap between the technology imagined in arguments supporting a compulsory AWT transfer and the technological capabilities of APs currently in development (Romanis & Horn, 2020). These arguments often overlook that the body of the person who gestates will always be involved and the fact that AP only allows for fetal transfer at 22 weeks of gestation, requiring a more harmful procedure (i.e. a C-section) than earlier (medical) abortions (Horn, 2020a).

On the other side of the spectrum, Simkulet (2020) supported that these concerns can be answered through governmental intervention or individual charity. For example, antiabortionists could voluntarily adopt the unwanted fetuses of biological parents or cover the costs of AWT for parents who wish to raise the child but would otherwise not afford it etc. Kaczor (Davin & Kaczor, 2005) argued that a situation with children without a home is still preferable to children that are "no longer alive" (p.658) and saw AWT as an opportunity to encourage responsible sexual behavior.

4. Discussion

Our results are based on 48 mostly recent publications (34 publications from 2017 to 2024). Our analysis was conducted following the QUAGOL guide which ensured the rigor of our work (Dierckx de Casterlé et al., 2012). Moreover, as authors we have complementary expertise in biolaw and abortion (DC) and ethics and AWT (AC), which allowed us to conduct a comprehensive and nuanced analysis of the relevant ethical argumentation.

However, as only English language publications were included, the majority of which originate from western high-income countries, the generalizability of our results might be limited. This limitation might have introduced cultural bias, understating ethical concerns that are more relevant to low- and middle-income countries. Moreover, as the technologies discussed are either still in development or not invented yet, our results reflect the speculative nature of the normative literature examined. Through our analysis we noticed that the positions of some authors shifted from supporting a substitution of abortion by AWT to opposing it or conversely (i.e. Räsänen (2017, 2021, 2023), Simkulet (2020, 2023) and Stratman (2023, 2021a, 2021b)). This could further indicate the speculative nature of the ethical argumentation that requires revisiting

previous positions and perhaps adapting the arguments to new information.

Furthermore, we noticed that some of the publications examined were in direct dialogue with each other (e.g. Kaczor, 2018 and Blackshaw & Rodger, 2019 replying to Räsänen, 2017 or Rodger, 2020 replying to Stratman, 2020, and Stratman, 2021 replying with another publication), which, at times, made synthesizing complex arguments, while capturing all the different nuances, challenging. To reinforce the accuracy of our analysis we incorporated external feedback from scholars with expertise in bioethics and reproductive ethics, focused on following a rigorous methodology and provided transparency about the sources used and the manner they were used in.

4.1 Viability

Our results indicated that a substantial part of the literature focuses on whether and how AWT will lower viability thresholds, and potentially restrict abortion access. As discussed, viability thresholds represent the point at which a fetus is considered to have a chance to survive outside the womb if treated (Horn, 2021). However, as De Proost et al. (2023) highlight, viability is just a "statistical property" (p.387), not an absolute limit that guarantees survival, as demonstrated by the fact that fetuses at 22 and 23 weeks are considered viable and yet mortality remains high (Myrhaug et al., 2019). Further, it has an indeterminate nature, due to its dependence from contextual variables, like available resources, treatment guidelines and socio-cultural values (e.g. religious beliefs) (De Proost et al., 2023). Globally, these variables differ substantially, which means that viability thresholds also differ between jurisdictions. For instance, issues of availability of resources result in viability thresholds in high-income countries being typically lower than in low-income countries (De Proost et al., 2023; Wilkinson et al., 2019).

In this context, viability is considered by many a rebuttable presumption, surrounded by ambiguity and a general lack of consensus, which overall demonstrates its weakness to regulate the permissibility of abortion (De Proost et al., 2023; Kendal, 2020; Romanis, 2020; Romanis & Horn, 2020; C. Stratman, 2023). Hence, it seems that the indeterminate nature of viability demonstrates that viability cannot inform a morally relevant abortion threshold (De Proost et al., 2023). After all, abortion permissibility should not be based on a medical assessment of fetal development (Horn, 2021) or on possible access to neonatal care (De Proost et al., 2023) but on the health, needs, and wishes of pregnant people (Horn, 2021).

The overall inadequacy of the viability criterion becomes more evident when, for example, considering the speculated scenario where fetal transfer to AWT could eventually be possible as early as the beginning of a pregnancy, moving viability all the way to conception (see Alghrani,

2007; Browne et al., 2023; Cohen, 2020; Hopkins, 2008; Murphy, 1989; Simonstein, 2006). In that case, even embryos that are only a few days old would be 'viable' and states could decide to prohibit abortions at any point of the pregnancy. However, following this logic and keeping the focus on viability as AWT –or any other technological/medical advancement– progresses and becomes able to support more premature fetuses would eventually –as Mary Ann Warren wrote– "force[ ] us to make a hazardous leap from the technologically possible to the morally obligatory" (Warren, 1989, p.50), disregarding the needs and desires of pregnant people (Horn, 2021). It would also consequently exacerbate issues of (equal) access to pregnancy termination and reproductive justice, as only those who could ensure (physical, financial and legal) access to the necessary technology would be able to terminate their pregnancy (Brown & Watson, 2023; Horn, 2020a).

Overall, as viability seems to be an inadequate criterion to regulate abortion access, whether AWT will lower viability should be irrelevant for abortion. In this context, to keep the focus on viability after the advent of AWT would only serve to further limit reproductive autonomy in termination decisions, possibly allowing doctors to provide more cautious medical care, or refuse to perform abortions when a pregnancy can be terminated by using AWT (Adkins, 2021; Romanis, 2019). An approach focused on fetal viability further decentralizes pregnant people (Horn, 2021; Romanis, 2020). It also contextualizes abortion as a moral problem in need of a technological solution, and as a means to alleviate a crisis, instead of a free reproductive choice (Halliday et al., 2023; Horn, 2021). On the contrary, a position like Horn's seems more appropriate: abortion is a vital healthcare resource, and consequently it's a procedure that does not require ethical justification or technological solutions through AWT (Horn, 2020a, 2021; Romanis & Horn, 2020).

4.2 Artificial Womb Technology and artificial placentas

Our analysis also indicated that there is a vagueness related to the technological aspects of the AWT described in arguments related to abortion (im)permissibility. This vagueness becomes evident through the confusion between different AWT terms used in the literature. For example, Mathison & Davis (2017) state that "researchers now predict that within only a few decades it will be possible for doctors to transfer an otherwise pre-viable fetus from the mothers body into an artificial womb and carry it to term – a process known as ectogenesis" (p.313). From this description it is difficult to understand whether they refer to AP prototypes under development, which could in fact be available in the coming years, or a more advanced AW technology that could gestate a fetus or embryo at any point of gestation and that has not been invented yet.

This distinction has severe implications for the validity of the arguments constructed and their impact on abortion regulation. The APs

we will have in the foreseeable future will require pregnant people to continue their pregnancy against their will until the 22nd week of gestation and then undergo a C-section to transfer the fetus to the AP (Horn, 2020a; Romanis & Horn, 2020; The Children's Hospital of Philadelphia, n.d.). Moreover, they will require a specialized team of technicians and healthcare professionals and substantial funds to operate (Alghrani, 2007; Horn, 2020a; The Children's Hospital of Philadelphia, n.d.). As it is difficult to imagine every hospital, abortion clinic and healthcare facility providing this option, especially in an affordable setting, issues of availability and equal access arise. People undergoing unwanted pregnancies could be left vulnerable to discrimination, denial of care and forced gestation, or even (increased) domestic violence due to inability to access the necessary means to terminate their pregnancies (Horn, 2021; Roberts et al., 2014). At the same time, issues of availability could also affect the chances of premature babies in need of this technology to survive, if necessary limited resources are directed towards unwanted pregnancies (Cavolo, 2025). An AW, on the other hand, if invented, could have fundamentally different features and implications for pregnant people. However, AWs will not be a reality for the foreseeable future (as already explained by developers of AP technology) (The Children's Hospital of Philadelphia, n.d.).

In order to explore the actual socio-legal implications of substituting abortion, the discussion needs to be focused on the actual features and limitations of the technology we have. As Romanis & Horn (2020) underlined, constructing speculative arguments and overstating the capacities of AWT reinforces the antiabortionist notion that abortion is a problem that requires a (technological) solution. To move away from speculative scenarios, there is a need for a concrete legal discussion that will ground speculative arguments, investigating the real implications of substituting abortion with APs. This analysis seems necessary to understand how the legislators would react. For example, in jurisdictions where viability is used to regulate abortion access, availability of APs could affect the point at which a new viability threshold is set.

4.3 The adoption 'solution' and the neglected practical implications

Lastly, our results showed that there are several authors arguing for substituting abortion with fetal transfer to AWT and adoption of the unwanted fetuses by willing individuals (Blackshaw & Rodger, 2019; Davin & Kaczor, 2005; Goldstein, 1978; Hendricks, 2018; Hopkins, 2008; Humber, 1977; Kaczor, 2005, 2018; Pruski & Playford, 2022; Räsänen, 2023; Simkulet, 2020; Stratman, 2020). However, it seems that these authors fail to adequately address the practical implications of an abortion prohibition for the pregnant person, the child born, and society. Issues of surplus fetuses and overwhelming costs to be borne by society, coercion and physical or emotional trauma, discrimination and equal access are rarely

considered, as they are overshadowed by the 'exciting' prospect of AWT to 'end' the abortion debate.

For example, our results showed that the solution of adoption is often offered as a panacea, without further consideration of the immense number of vulnerable fetuses that would suddenly require intensive care (Blackshaw & Rodger, 2019; Hendricks, 2018; Hopkins, 2008; Humber, 1977; Kaczor, 2005, 2018; Räsänen, 2023), or the costs required of pregnant people to get access to the technology in the first place (Hendricks, 2018; Hopkins, 2008; Kaczor, 2018; Räsänen, 2023). While one might be willing to excuse authors that developed their arguments in a more speculative frame, before the announcement of the EXTEND prototypes in 2017, it is worrisome that practical concerns are not adequately addressed even in publications after 2017.

Furthermore, this presumably simple and new 'solution' seems to just disguise an old 'dilemma' –abortion or adoption?– overlooking the multitude of (combinations of) reasons why pregnant people seek abortions (e.g. financial concerns, timing, age, partner suitability, desire not to have –more– children, avoiding giving the baby for adoption etc.) that cannot be simply reduced to a mere desire to stop being physically pregnant (Biggs et al., 2013; Chae et al., 2017; Kirkman et al., 2009). As several authors highlighted, the main goal of abortion is to prevent the birth of a child (Brown & Watson, 2023; Jackson, 2008; Langford, 2008; Overall, 2015; Räsänen, 2021; Rodger, 2021; Romanis & Horn, 2020), which is also underlined by the fact that, despite the antiabortion discourse promoting adoption over abortion for many decades (Idzik, 2022), pregnant people continue to seek abortion services. For them, adoption is not an acceptable alternative to abortion because it results in the birth of a child, leading to an undesirable parental bond (Fuentes et al., 2023) or to a sense of (ir)responsibility towards the child born (Fuentes et al., 2023; Haslanger, 2022). Therefore, the 'solution' of fetal transfer and adoption seems to ignore the needs and concerns of pregnant people, promoting an old, 'rejected' idea as something new and revolutionary. Thus, it is a 'solution' that seems unlikely to satisfy those seeking to terminate their pregnancy.

In this regard and to re-center pregnant people in the discussion surrounding a potential abortion prohibition, there is a need to inform theoretical arguments around AWT and abortion with the views of those that might need to use abortion services. More research is needed to gain insights on potential child bearers' perspectives on the use of AP and consequent adoption process as an alternative to abortion, as they will be the ones most affected by a possible abortion prohibition. Currently, speculation around the attitudes of women towards this new technology (and its unacceptability as an abortion substitute) seems to have been mostly based on the insights offered by Cannold in 1995 (Cannold, 1995). However, Cannold's research was conducted before the development of

AP prototypes and refers to an AW that is not really comparable with the actual AP technology under development. More empirical research is needed to understand the voices of potential AP users, in light of the actual AP technological capabilities, to offer a deeper understanding of the overall feasibility of replacing abortion by AP transfer and adoption.

At the same time for arguments supporting an abortion substitution to be transparent, they need to reflect on their implications in a pragmatic manner. Authors should recognize and address both the consequences of substituting abortion with the specific AWT that will soon be available – namely APs– and the related practical implications of banning abortions and mandating that all fetuses be carried to term (artificially or naturally). How will society cope with the immense number of extremely vulnerable fetuses looking for a new caretaker? How will the state ensure equal access to AWT for all pregnant individuals? How will the safety, wellbeing and autonomy of pregnant people be protected? Especially when discussing trade-offs or moral compromises, these issues should be realistically approached and adequately addressed, to provide the public and the decision-makers with a holistic picture. This will allow for a more honest reflection of the necessary concessions to support an abortion substitution.

5. Conclusions

Our review shows that there is an ongoing open debate on whether and how AWT should affect abortion access. There is disagreement between authors on 1) how AWT could affect viability thresholds, 2) whether AWT should substitute abortion, 3) the arguments that should be used to determine whether AWT should substitute abortion, 4) who is entitled to decide whether and how to terminate a pregnancy when AWT is available, and 5) practical implications. However, our analysis indicates that, to dismantle the notion that abortion is a problem to be solved through technology, there is a need to shift the focus away from viability concerns. Moreover, there is a need for a concrete legal discussion that will investigate the real implications of substituting abortion with the AP technology currently in development, shifting the focus away from speculative arguments of (uninvented) AWs. Lastly, to be transparent regarding the practical implications of substituting abortion, authors supporting an abortion substitution by AWT ought to be more realistic when describing the impact and consequences of their arguments.

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