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Age-based restrictions on reproductive care: discerning the arbitrary from the necessary

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Abstract

Policies that determine whether someone is allowed access to reproductive healthcare or not vary widely among countries, especially in their age requirements. This raises the suspicion of arbitrariness, especially because often no underlying justification is provided. In this article, we pose the question—under which circumstances is it morally acceptable to use age for policy and legislation in the first place? We start from the notion that everyone has a *conditional positive* right to fertility treatment. Subsequently, we set off to formulate a framework that helps to determine who should be excluded from treatment nonetheless. The framework's three core elements are: choosing and ethically justifying exclusion criteria (target), determining the actual limit between in- and exclusion (cut-off), and selecting variables that help to predict the exclusion criteria via correlation (as they are not directly measurable) (proxy). This framework allows us to show that referring to age in policy and legislation is only ethically justifiable if there is a sufficiently strong correlation with a non-directly measurable exclusion criterion. Moreover, since age is only one of many predicting variables, it should therefore not be ascribed any special status. Finally, our framework may be used as an argumentative scheme to critically assess the ethical legitimacy of policies that regulate access to (fertility) treatments in general.

Keywords Age limits · Infertility treatment · Fairness · Policy · Assisted reproduction · Parenthood

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Introduction

Policies that regulate access to Assisted Reproductive Technologies (ART) vary greatly among countries regarding their use of age as a reason to allow or deny treatment and reimbursement.[1] In Denmark, a woman is allowed ART up to the age of 45, whereas in Greece, this is allowed up to the age of 50 (as long as she uses her own eggs). While a woman in Belgium gets 6 full IVF cycles reimbursed before her 43rd birthday, a woman in Israel receives full and unlimited reimbursement of IVF-costs until the birth of two children and until she has reached the age of 45 if she uses her own eggs [1, 2]. Büchler and Parizer argue that this wide variety in age-limits across countries is (partially) the result of differing socio-cultural norms and expectations around "motherhood" [2].

But what legitimizes such restrictions to access fertility treatment and what makes age (besides sexual orientation of the aspiring parents) such a prevailing criterion in the first place? This leads us to the following normative question: *Under which circumstances is it morally acceptable to use age as a criterion to deny access to treatment in the context of ART?*

Cavaliere and Fletcher criticize the use of age as a criterion to grant or deny access to fertility treatments [3]. They argue that policies guiding IVF provision on the basis of age give rise to "ageist assumptions" (i.e., prejudices against certain people on the basis of their age). Cavaliere and Fletcher point at the discrepancy between—on the one hand—an individual with her unique set of circumstances, and—on the other hand—quantitative *population* data about age and fertility. The statistical subject ("epidemiological subject" as they call it) that emerges from such population-level studies merely consists of *average characteristics* (e.g., the average characteristics of people who share the same trait X). Studies have shown that women younger than 30 years have a significantly higher chance of conceiving via IVF than women aged 39–49 years. However, such chances merely relate to a statistical subject and could never properly represent a 29-year-old with a *lower than average* chance of success or a 39-year-old individual with a *higher than average* chance of success. Considering the potentially negative effects for the 39-year-old—as she might be denied treatment for having a too low statistically estimated chance of successful treatment—the authors argue that working with statistical subjects typically leads to some persons being unnecessarily constrained in their reproductive possibilities and is therefore unjust [3]. Yet, Cavaliere and Fletcher do not categorically reject age-based discrimination. When considering lifestyle-based access criteria, they remark that those criteria could actually exacerbate broader social inequalities if a relatively young and fertile—yet socially disadvantaged—woman has adopted an unhealthy lifestyle due to her circumstances and is subsequentially denied treatment because of that very lifestyle. It is along these lines that Cavaliere and Fletcher regard 'chronological age a remarkably egalitarian biosocial variable'

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[1] It is not our intention to only look at age-limits for women. Yet, because ART age-restrictions revolve almost exclusively around the age of women, our examples mainly concern female age-limits.

that may benefit disadvantaged groups 'because neither privilege nor disadvantage can alter your date of birth' [3, p. 15].

Overall, we share the view that allocating access to fertility treatment based on statistics—which typically disregard the uniqueness of individuals—is far from perfect. However, contrary to Cavaliere and Fletcher, we hold that it is *not necessarily* unjust to refer to generalizations when denying access to fertility treatments such as IVF. After all, denying someone access to treatment must occur based on *some* measurable characteristic (in order to avoid mere arbitrary exclusion). Therefore, referring to a statistical subject may in fact be justified. With regards to our own normative position, this implies that we do not *a priori* reject using age (or any other trait). In the next section, we briefly discuss the most prevalent variables for which age is being used as an (allegedly) predicting trait.

Using age to make claims about other variables

In the context of assisted reproduction, age (of women, but also of men to a lesser extent) is predominantly used to make claims about variables such as: life expectancy (of the aspiring parent(s)); the chance of a successful pregnancy/live birth after treatment; the estimated risk of birth defects, harm to the patient, and aneuploidies and miscarriages; and parenting competence.

Age is used as an indicator of healthy life expectancy because it can help to predict how many years in good health someone has left [4]. This estimation may then help to determine whether aspiring parents will live long enough—in good health—to actually care for their desired child and secure its welfare (at least until the child has reached maturity).

Age is used to estimate the chance of a successful pregnancy or live birth after fertility treatment since, for women beyond their mid-thirties, the chance to successfully reproduce (with or without assistance) decreases significantly due to a decrease in both quality and quantity of their eggs [5]. With the use of donated or preserved eggs however, even women in their fifties can have pregnancy rates similar to those of younger women. Yet, obstetric risks still unavoidably increase with the recipient's age, so that it remains a relevant variable despite the age of the eggs used [6, 7]. Ultimately, one may decide to deny access to fertility treatment altogether due to such concerns.

Finally, age is sometimes used to make claims about a decline in parenting competence of those who have children at a later stage in their lives (see the "Examples of an unclear target" subsection below). If such claims about age negatively correlating with parenting competence are correct, it could be argued that after a certain age the right to parenthood (see the next section on fertility treatment) should no longer be granted. It is theoretically plausible that from a certain point onwards, age may start to coincide with a decline in one's parenting capacities, presumably because people who are themselves in need of aid are less able to care for another person. However, there is no empirical evidence for a correlation between parenting competence and age *before* the stage of being high care dependent.

Being of “advanced parental age” seems to be often deployed as an alleged self-evident objection against allowing people access to fertility treatment, reimbursement, or to parenthood in general. However, it often remains unclear whether—and if so, how—such a decision is ethically justified. After all, the extent to which age can actually reveal something about another variable such as life expectancy, treatment success, or parenting competence is not self-evident. In addition, one should provide a clear argument for why the variables (such as the aforementioned) are of moral relevance in a specific context.

In this article, we will sketch a framework to help formulate and structure the ethical arguments to determine under which circumstances it is morally acceptable to use age as a criterion to deny access to ART. However, before we do that, in the next section we will argue that everyone has a *conditional positive* right to receive such treatment and that the burden of proof is on those who want to restrict this right.

Fertility treatment as a (conditional) positive right

People are broadly considered to have the liberty to decide whether or not to have children and, if so, how many and at what moment in their life. The “right to found a family” has even been considered a basic human right [8]. As such, the right to found a family is a negative right, meaning that no one should interfere with a person’s decisions regarding reproduction. However, when people need medical assistance to reproduce, the question arises as to if, and if so, to what extent, they ought to be assisted by others (e.g., fertility doctors) and/or the state to exercise their right to found a family. We follow Boivin and Pennings by holding that realising parenthood in someone’s life plan is of such importance that physicians and the state have a *prima facie* obligation to help realise that goal.

Besides that, there are various other rationales to argue that fertility treatment should be a positive right. For instance, one may argue that ART is a medical need, or (granted that infertility is considered a disease) a human right because it can be argued that people have a “right to health” [9]. However, the idea of a positive right to ART remains controversial since the moral weight of someone’s desire to have genetically related children is disputed. Therefore, we hold that a positive right to fertility treatment and reimbursement thereof should be *conditional,* meaning that couples should only be actively assisted in their reproductive desire insofar as this is reasonably attainable in the societal context. In other words, as long as it is feasible to grant this right without compromising the support for other medical treatments that are arguably of greater importance (e.g., matters of life and death), this right to fertility treatment ought to be recognised and actively supported by a state. The actual determination of the cut-offs on reimbursement remains a matter for national politics.

There are many circumstances and scenarios imaginable where it is morally justifiable, even recommendable, to *restrict* the positive right to ART (which is what makes it conditional). As Segers and colleagues put it: ‘When, for instance, there is a low chance for success or a high risk of harmful consequences, the decision not to invest in the satisfaction of the initial reproductive desire does not reflect an attitude of disrespect towards that desire, given that it is evaluated on the grounds of good normative reasons' [10, p. 492]. Such "grounds of good normative reasons", supported by sound data, are crucial because the burden of proof lies on those who make the decisions and policies that restrict the right to fertility treatment and reimbursement [11]. The moral framework that is supposed to help with this—and which we are about to present—consists of three interconnected key concepts: "target" (a variable on which in- or exclusion is based but which is itself not directly measurable); "proxy" (a variable that correlates with a target and thus helps to predict it); and "cut-off" (the level below which access should be restricted). In the next section, we will define these three components and their roles in detail.

Preliminary conceptual clarification: target, proxy, and cut-off

A "target" is a trait that cannot be measured directly but must instead be estimated by looking at another trait. An example of a target is the life-expectancy of a specific individual, which can be predicted based on his or her current age, state of health, and a series of other factors. In the context of ART, another relevant target is the probability of an IVF treatment resulting in a live birth (i.e., the "success rate"). Importantly, we make a distinction between sub-targets and main-targets. The trait on which inclusion or exclusion hinges, we call the main-target; the trait that approximates that main-target may itself *also* have to be estimated, which makes it a sub-target (see Fig. 1).

Traits that are used to estimate either a sub-target or main-target are called "proxies". Essential to a proxy is that it correlates with a target to the extent that it sufficiently helps to predict that target [12]. The degree, or "strength", of a given correlation is expressed in a number between − 1 and + 1 [13]. Because there is not always a direct path from a proxy to a main-target, we also distinguish two kinds of proxies: initial-proxy and sub-proxy. An initial-proxy is a trait that is directly measurable and is thus the trait to start with when trying to find a way towards the main-target. For example (also see Fig. 1): A woman's personal AMH (Anti-Müllerian Hormone) level (i.e., initial-proxy) can be measured to provide insight regarding her ovarian reserve. Subsequently, knowing about a woman's ovarian reserve helps to estimate her chance of having a live birth through fertility treatment (which is the main-target) [14]. Being located in-between AMH and success-rate, ovarian reserve acts as a sub-target, which subsequently fulfils the role of sub-proxy to help estimate our main-target (i.e., her chance of a live birth). Indeed, the basic relationship between a proxy and its target implies some kind of "chain": a proxy leads to a target, which may in turn become a proxy, and so forth until the main-target is identified. This chain should ideally be as short as possible, but looking out for such in-between correlations may nonetheless be important as it helps to control for confounding variables [15].

A final remark about proxies is that any connotation(s) a proxy may have (e.g., prejudice, stereotype, social expectations, etc.) should play no role. In principle, a proxy's only relevance is its correlation with a target. Assuming one does indeed purely look at this correlation, even proxies that are generally perceived as

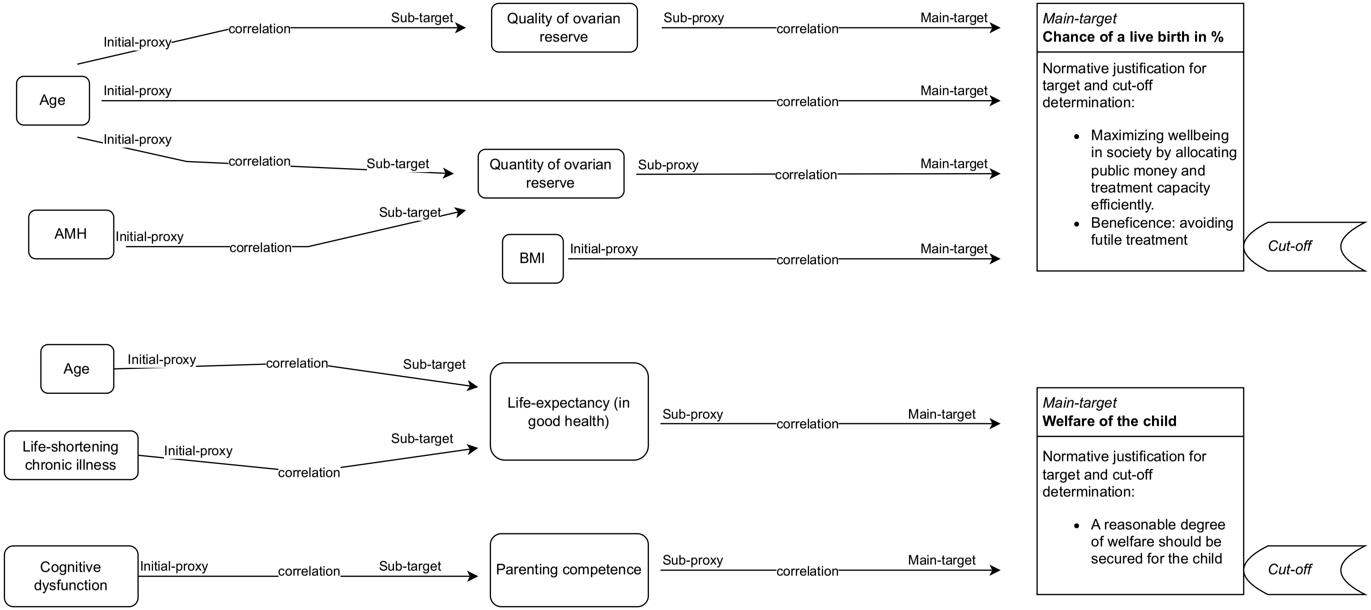

Fig. 1 A (non-exhaustive) flow chart to illustrate the interrelation between initial-proxy, sub-proxy, sub-target, main-target, and cut-off

controversial—such as ethnicity—might be added. For instance, Black and South Asian women were found to have lower live birth rates after IVF compared to White women [16, 17]. However, '[i]t could be argued that the difference in IVF success rates may be influenced primarily by socioeconomic factors, such as lack of access to medical treatment leading to higher age at first encounter' [16, p. 363]. Therefore, one may object that the strength of a given correlation does not necessarily make it morally acceptable to use that proxy, and that policies should not compound a prior injustice [18, 19].

Notwithstanding the relevance of these concerns in certain cases, it still would not make sense to ignore "ethnicity" only because the origins of its correlation lie in an injustice, while it may turn out to be a reliable proxy for the chance of a live birth. Hence, if it would be demonstrated that the lower success rate of certain groups is caused by unjust circumstances, one should take measures to amend those circumstances. Improving those circumstances would—eventually—also improve the desired outcome. It does not help them to ignore the proxy (with its correlation stemming from injustice) and start treating those patients despite the expected outcome being below the cut-off.

Once it is decided which main-targets are morally relevant and which proxies should be observed, it is necessary to determine a "cut-off" for the main-target. The cut-off is the point below which access to treatment and/or reimbursement is denied. The cut-off can be a straightforward numeric value, such as when it is decided that (for example) 5% is the limit below which a woman's approximated chance of a live birth is considered too low for it to be worthwhile to reimburse her fertility treatment(s).[2] If a main-target is not expressed as a numeric value (such as 'welfare of the future child'), then the cut-off will be less precisely pre-determinable. As a result, this will require a more ad-hoc interpretation and judgement of the party enforcing the policy in a concrete situation. In the next section, we will discuss the role of a main-target in more detail.

Main target: transparency and justification of its moral relevance

When introducing a policy or making a decision that restricts a conditional positive right (e.g., to fertility treatment, to reimbursement thereof, or to family building in general), it is crucial to do so on the basis of a sound ethical justification. At the same time, it is equally important to make these justifications transparent to allow for debate. According to our framework, the main-target is supposed to meet these demands.

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[2] Here, "worthwhile" refers to an ethically justifiable allocation of public funds.

Examples of an unclear target and questionable correlation with age

It is very difficult, if not impossible, to find clear ethical justifications in the legislation of countries that impose an age limit on access to fertility treatment. This illustrates the current lack of transparency which prevents critical analysis of the rationale behind these policies. The two examples of court rulings that we are about to present will help to illustrate our point because they concern cases in which age is also used as a limiting factor while it remains ambiguous as to what makes age relevant.

In 2010, the parental rights of an Italian couple over their one-year-old child (conceived via ART) were terminated by the court after an incident where the child was found abandoned and crying in the parents' car for about 45 min [20]. Although the Court of Cassation later emphasised 'that the decision was not grounded in any consideration of the couple's age' [20, p. 11], Margaria and Sheldon argued to the contrary. In their analysis of the case, they wrote that 'understandings of appropriate parental age continue to play a significant role in its subtext' [20, p. 12] because the arguments supporting the verdict of the court appeared to have been significantly *invigorated* by the father and mother's unconventionally high parental age (70 and 57 respectively). Indeed, the fact that the father is likely to die before the child has reached maturity at least raises questions about his age in regard to the welfare of the child. Yet, the court stressed that parental age did not play a role at all. Which criteria *did* the court take into consideration then? The court's omittance of clarity about its line of reasoning only increases suspicions of ambiguity and prejudice. Translating this to our framework, it seems that welfare of the child, ideas about parental obligations, or both, fulfilled the role of main-target in the decision. Yet, no concrete specification of a target has been given, nor any justification for the reference to age in the form of proof of a correlation between the two.

In another example, age was explicitly referred to but without any explanation for its relevance to the given context. In 2006, a 49 year-old Swiss woman was deemed "too old" by the national court to adopt a second child. Later, in 2010, the European Court of Human Rights (ECHR) ruled on an appeal that there had been no discrimination in the Swiss court's previous ruling four years earlier. Considering the interests of the already adopted child and those of a child to-be-adopted, the ECHR stated that the age difference between the woman and a desired second child of 46 to 48 years, would have been 'too big' because 'there should be an *appropriate age difference*' [21, par. 91, emphasis added]. Yet, an explanation of why age difference was a relevant criterion was not given, nor was it stated what age difference between the mother and the child would have been appropriate (and why). In other words, age was arbitrarily referred to as a criterion to base their decision on. However, as already stated at the beginning of this section, it should not be concluded that the reference to age was wrong per se. The actual flaw rather lies in the lack of proof for a correlation between age (proxy) and a clearly defined target with a cut-off, coupled with an explanation of the main target's ethical relevance. In the next section, this will be further clarified.

Selecting and ethically justifying a main-target

In the previous section, we argued that clarity about the selected main-target(s) is crucial. However, it is at least as important to show the *ethical relevance* of each main-target.

Since the right to fertility treatment and (partial) reimbursement is a *conditional* positive right, there are circumstances under which reimbursement or treatment altogether should *not* be provided. For instance, in some cases, the costs of reimbursing fertility treatment with public funds are not proportional to the estimated chance of a successful treatment in light of other kinds of medical treatment that also demand public funding. In a similar vein, engaging in fertility treatment while the estimated chance of success is futile should also be avoided, since treatment would put an unnecessarily high physical and emotional burden on the patient and be a waste of resources and treatment capacity. Both these reasons to limit access to fertility treatment are driven by the intention to allocate public money and treatment capacity efficiently to maximize wellbeing in society. Thus, the bioethical principle of justice is of issue here.

The fact that "live birth rate" (i.e., the chance of success) is a variable that expresses the efficacy of ARTs makes it an appropriate main-target. Where, exactly, the cut-offs on reimbursement and treatment should be placed, however, is another matter. In practice, a cut-off on reimbursement is eventually determined in a political context based on how much a society is willing to pay for a live birth. As to the cut-off on treatment altogether, one may decide to follow the American Society for Reproductive Medicine's definition of futile treatment as a 1% or less chance of success [22]. Yet, which chance of success amounts to futility is also totally context dependent. Think, for example, about someone's aesthetic nose surgery having an expected chance of success of 10%. This may arguably be too low for treatment to be worthwhile. On the other hand, in life-or-death cases of with an even lower chance of success, most people *would* consider treatment worthwhile. Hence, just like the cut-off on reimbursement, what chance of a live birth should be considered sufficient would depend on a cost–benefit analysis. More specifically, treatment is no longer worthwhile ethically when the burden for the patient, together with used treatment capacity and resources, outweigh the desired outcome (giving birth to a healthy baby, in our case) by taking into account the estimated chance of success. Only then would it be legitimate to refer to the estimated chance of success when denying someone access to fertility treatment.

In addition to "live birth rate", the "welfare of the child" —driven by the principle of procreative beneficence—should be included as a main-target when regulating access to ARTs. Now, we hold that there must be an acceptable chance that a *reasonable* degree of welfare of the future child will be attained. Located between, on the one hand, a principle that accepts a minimal degree of welfare for the child and, on the other hand, one that demands the highest degree, the "reasonable welfare principle" tries to find a balance between these two extremes [23]. Although it is very difficult to define what constitutes a "reasonable" level of welfare, it may be suggested 'that an individual has a decent welfare level when he has the abilities and opportunities to realize those dimensions and goals that in general make human lives valuable' [23, p. 1148]. If, for whatever reason, (an) aspiring parent(s) is estimated to be unable to secure such a reasonable degree of welfare for the child in the future, access to fertility treatment should be denied. This reasoning is based on a *non-comparative* and *impersonal* approach to harm [24] in combination with our threshold principle of reasonable welfare (thus avoiding the non-identity issue). The impersonal approach to harm revolves around preventing avoidable suffering in the world. This allows us to abstain from comparing possible scenarios and instead look at what degree of harm would actually be evoked in a specific case. The principle of parental responsibility maintains that future parents should only have a child when that child will have a decent chance of a happy life, which means that the minimal threshold is higher than a life worth living [25].

In order to predict whether a specific set of aspiring parents will indeed be able to secure a reasonable level of their desired child's welfare, or to estimate one's chance of a live birth, we need to look at other traits that *are* measurable and correlate with these targets. In the next section, we will elaborate on how to go about the process of selecting a proxy.

A proxy must correlate strongly with its target

For the moral justification of its use, it is crucial that a proxy shows a strong correlation with its target. What can be regarded as "strong" or "strong enough" depends on the context. A judgement about whether or not a proxy provides enough certainty about a target is related to the desired outcome. Simply put: there should be a very strong correlation if one is about to deny a highly desired outcome, while a relatively weak correlation might suffice if one intends to avoid a serious harm. For example, the demands that should be placed on the correlation strength between age (initial-proxy) and live birth rate (main-target) are high because the desired outcome (in this case, a child) is highly valued. As already mentioned in the first section above, female age happens to be a good predictor for IVF success rate [5]. Yet, it is important to keep in mind that a correlation is never perfect and that there is always a margin of error. This implies that when a proxy is used in policy to exclude certain people from receiving fertility treatment, there will always be a group of people that will be excluded while they are above the cut-off. As shown above, Cavaliere and Fletcher [3] deem this possibility—on the basis of statistic generalizations—unjust, yet there is simply no alternative. Accepting a certain degree of inaccuracy is unavoidable due to the finally generalizing and uncertain nature of probability and statistics.

In the previous paragraph, we saw how the value-level of desired outcome (e.g., a child) can raise the demand on the ethically required correlation strength. However, this can also work in the opposite direction if one wants to avoid harm. Thus, if the desired outcome amounts to avoiding significantly compromising the welfare of the future child, for instance, this should actually lower the demands on the predictive accuracy of a proxy about that outcome. For example, parents with a mild to severe cognitive dysfunction are much less likely to provide adequate care for their children and thus secure a reasonable degree of welfare. Research of Willems and colleagues

[26] has shown that of the 1549 families they investigated that were led by parents with a mild to severe cognitive dysfunction, more than half of them "failed at parenting", which should be understood as amounting to severe neglect and child abuse.[3]

Translating this to our main-target "welfare of the child", with which the initial proxy "cognitive dysfunction of the parent"[4] correlates via the sub-proxy "parenting competence", we would end up with a correlation of about 0.5, which is indeed rather weak. However, this might nonetheless be considered strong enough to deny fertility treatment to couples who have a moderate to severe cognitive dysfunction in light of the desired outcome of avoiding serious harm to the future child. This implies that there will also be a number of parents who are denied access to treatment while their parenting competence would be *above* the cut-off of their future child's welfare, but one may argue that their exclusion is justified by the desired outcome of avoiding harm. Subsequently, consistency demands that if a reliable body of research would show that 50% of the aspiring parents over 55 years will at some point be unable to provide adequate care for their child up until it has reached maturity, the same conclusion must be drawn.

As Cavaliere and Fletcher rightly state, 'age is only a *partial* predictor of women's fertility and of IVF success rates' [3, p. 2, emphasis added]. Measuring a woman's AMH value, for instance, can help to gain more accuracy in predicting her chance of a live birth after IVF [14].

Another example is the fact that having a very low or very high Body Mass Index (BMI) correlates with reduced live birth rates [27, 28]. Taking one or more additional proxies into consideration may add a degree of certainty about the target. However, although parameters such as BMI and AMH potentially help to gain precision and detect those individuals with a higher or lower than average chance of success, adding a proxy should add a *substantial* amount of precision to avoid unnecessary complexity and safeguard applicability of the framework. In other words, if including a particular proxy will help to detect only a few "outliers", it is probably not worth the effort, cost, and complexity to include it.

Yet, with regards to the target "welfare of the child", it is particularly important to look at multiple proxies at the same time because there are many different variables that influence the welfare of the child, each in its own way. A parent's life expectancy in good health,[5] for instance, correlates with a child's welfare because it helps to predict how long that parent will be able to take care of the child. Considering someone's *health adjusted* life expectancy in good health would be more accurate, but is also more difficult to measure. Having to cope with an ageing parent in need of care or being confronted with a parent's death early in a child's life amounts to a potentially serious source of harm to a child [29]. However, of all European

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[3] Although the authors define these concepts in detail in their article, research like this on which a correlation could be based may also include implicit normative assumptions. Concepts like "failed at parenting", "severe neglect", and perhaps even "child abuse" are not value-neutral.

[4] That is, an IQ below a certain threshold.

[5] The sub-proxy "life expectancy in good health" correlates with age. In 2020, EU citizens of 50 years of age had an average of 19.9 and 18.9 remaining life years in good health for women and men respectively [4].

countries only Portugal and France enforce a legal maximum age limit (at 60) for men who want to access ART [1, 30]. Besides Finland, Sweden, and Switzerland maintaining a recommended male-age-limit at 60, 56, and 56[6] years respectively, and Germany and Austria's refusal to reimburse couples of which the man is 50 years or older, no other country refers to the age of the aspiring father in their policies [1]. Besides someone's current age, facts like life-shortening chronic illnesses (such as cancer or cystic fibrosis) and, as we saw in the above, having a cognitive dysfunction, are examples of proxies that should also be considered when estimating the main-target "welfare of the child".

Discussion

We started this article from the observation that age is a central criterion on which decisions about access to reproductive care and its reimbursement are based, and that how those age limits are subsequently defined varies widely among countries. This led us to ask how to determine under which circumstances it is morally acceptable to use age as a criterion to deny access to treatment in the context of ART. On the basis of the framework we subsequently sketched, we are now in the position to answer this question. If age is useful to (help) predict a target variable that is morally relevant *and* if the correlation between the two is strong enough considering the desired outcome, it is acceptable, even recommended, to use age. Conversely, it is ethically unjustifiable to use an age cut-off in the context of fertility treatment—or parenthood in general—as long as one does not cite a strong enough correlation between age and a morally relevant target.

By observing age's strong correlation with live birth rate after IVF with one's own eggs, we can conclude that in those cases it is acceptable to use age to control access to treatment. As for parenting competence, there may only be a negative correlation with age at a certain point in life because of (high care dependent) health issues. Therefore, the assertion that just any above-average parental age has a bad influence on parenting competence *before that point*, or making ambiguous insinuations in that regard, is ethically unjustifiable. It can be important to use more than just one proxy, especially in the case of predicting whether a reasonable degree of the future child's welfare can be secured. Although age *can* be a relevant proxy in such cases, it should not be the only one as it is one of multiple factors correlated with the welfare of the future child.

If a woman uses donor- or previously stored eggs instead of her own at advanced age, her current age will correlate significantly less with the chance of success because—aside from an increase in obstetric risks—it is the age of the (donor) egg that determines most of the outcome. Therefore, in such cases age is predominantly relevant as a proxy for life expectancy in good health in order to secure the welfare of the future child. Because of this, the age cut-off on IVF with donated or preserved

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[6] This is roughly based on the life expectancy, because in Switzerland the potential father should be able to live until the child is 18 years old.

eggs should be higher than on treatment with “advanced age”-eggs. Yet in practice, many countries enforce the same cut-off for both kinds of treatment.

Since our framework demands that the link of a proxy to its target is made explicit, it helps to detect policies that use age (or any other proxy) arbitrarily, or as a means to implicitly reaffirm certain prejudices and stereotypes when denying access to treatment. In many countries for instance, fertility treatment is only accessible to heterosexual couples [1]. Yet, the trait “homosexuality” does not correlate with any target that is ethically relevant in the context of assisted reproduction and childcare, which renders the exclusion of same-sex couples unethical, if not outright discriminatory. At the same time, the framework makes visible how it is ethically questionable that apart from those few aforementioned exceptions (Portugal, Finland, Sweden and Switzerland), no recommendations nor legally binding cut-offs on the age of the aspiring father are mentioned in European countries’ legislations around fertility treatment [1]. Yet, a cut-off on paternal age is not a straightforward matter because it may be argued that a cut-off on the age of the aspiring father would not respect the reproductive autonomy of his partner. If a male–female couple of 65 and 40 years respectively requests fertility treatment, denying them access because the aspiring father will in all likelihood not remain in good enough health for at least 18 years, may be considered too strict. After all, the aspiring mother may declare that she is fully aware of the fact that at some point in the future, she will likely have to care not only for their child, but also for her husband (if he will not have passed away already), and that she is willing to accept that scenario. A way to accommodate this could might require arranging a network of peers who are willing to assist in care tasks and running the household. Still, the question remains how feasible this is and how such situations will actually turn out. More research and discussion on paternal age-limits is required, as this is not simply a matter of mere gender (in) equality.

Our framework is intended to help make policies more transparent, consistent, and ethical. Although this demands that each cut-off is duly argued for—together with the selection of a main-target—we do not suggest that there exists a single and ideal policy that should be enforced everywhere. There are simply too many contingencies at play in each (societal) context.

This brings us to its limitations. First of all, there is the difficulty of having to determine a cut-off, which entails enforcing a sharp break on a variable that is itself on a continuum (e.g., success rate, welfare). This is a problem that our framework brings to the surface but for which it does not offer a concrete solution. Secondly, the difficulty remains of having to determine an ethically required minimum in correlation strength together with an appropriate cut-off. We suggest looking at the moral weight of the case by considering how much a desired outcome is valued, but do not provide further guidance of such discussions. Think for instance about the aspiring parents with a cognitive dysfunction as discussed above. Although we hold that a correlation of 0.5 is strong enough considering the desired goal of securing the future child’s welfare, someone may argue the opposite by saying that the correlation is not strong enough to trump the principle of reproductive autonomy, despite this risk of a seriously compromised welfare of their future child. The problem of assessing the epistemic base underlying a given correlation is closely related to this.

The number of studies from which a correlation is derived, how the separate variables were exactly defined within each study, and the characteristics of the studied population are just some examples of factors that influence the quality of the empirical back-up that a proxy requires. Serious flaws or lacunas herein would significantly diminish the ethical validity of a decision or legislation based on that correlation. In the third section, we mentioned that there are indications that ethnicity correlates with IVF outcome, but much more research would be required to build a solid enough epistemic base for ethnicity as a proxy for chance of a live birth. Finally, because a main-target and its cut-off(s) require empirical support expressed in (anticipated) utility, our framework is inherently consequentialist. Hence, it does not allow for the inclusion of deontological arguments, such as the notion that a child has a right to both a father and a mother when it grows up (instead of a single parent or two parents of the same sex). Yet, most deontological arguments that express a duty have a consequentialist counterpart. For instance, the deontological position that the decision to reproduce implies making a commitment to parental obligations and responsibilities (i.e., a duty to care) until the child has at least reached maturity is compatible with the demand that the parent(s) must be able to care for the child—to secure a reasonable degree of welfare—until it has reached maturity, which is essentially consequentialist.

Conclusion

We started from the notion that people have a conditional positive right to fertility treatment, implying that although there are circumstances under which this right ought to be restricted, this should happen based on transparent and clear ethical arguments. Across all policies that regulate access to fertility treatments, age is one of the central variables on the basis of which access is denied to certain people. Yet, the argumentation underlying such age limits often remains opaque, which may arouse the suspicion of prejudice about parenthood after a certain age or even mere arbitrariness. The intent of this article has been to offer a rationale in the form of a framework that helps to judge the ethical validity of decisions about access to fertility treatment for policymaking. This is still a raw sketch, but we believe that it provides the basis of a useful argumentative scheme to scrutinize policies that regulate access to fertility treatments (and potentially beyond) and assess them in terms of the quality of their underlying justification and therewith moral/ethical legitimacy.

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Declarations

Conflict of interest The authors declare that there is no conflict of interest.

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