From Covid 19 Pandemic to Germline Genome Editing. Rethinking Values: From Liberal Society to Control Society?

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ABSTRACT

This text explores the intricate relationship between personal autonomy and public health objectives, particularly accentuated during the recent pandemic. Emphasising the challenge of balancing individual autonomy with broader public health imperatives, the discussion delves into state interventions that may restrict individual freedom and the potential moral justifications behind such actions. Public health interventions, encompassing various policies from data collection to preventive legislation, are examined in light of their impact on individual freedom. Drawing on Holland's analysis, the text illustrates how these policies may limit individual autonomy while serving the interests and welfare of society. It argues that, in a liberal society, restrictions on citizen choices are justified not only for individual health but also to safeguard collective interests. The recent COVID-19 response, including measures like lockdowns and vaccine passports, exemplifies this evolving balance. The text contends that, as the state places more emphasis on public health over personal autonomy, interventions like genome editing might cease to be considered mere options, potentially leading to mandatory genetic modifications for those desiring children. This shift raises ethical questions about protecting individual autonomy in a diverse society. The text highlights the absence of compelling justifications against restricting individuals from making autonomous decisions about their children's genetic makeup or imposing legal obligations for genome editing.

1. Introduction

There is palpable tension in public health policy and action between the value placed on personal autonomy and the overarching goals of health and well-being. This tension has resonated widely in recent discourse on public health policy and has become particularly salient in managing the pandemic (Holland

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2021; 2015; 2014). The debate has highlighted the challenge of balancing respecting individual autonomy, addressing public health′s broad imperatives, and determining if and when state intervention that restricts individual autonomy can be morally justified. Public health interventions refer to government-supported initiatives aiming to achieve primary public health objectives, which include monitoring, protecting, and improving the well-being of populations. These actions cover many policies, from collecting health data to monitor population health, providing health education to promote healthy habits, and adopting preventive legislation and programs in response to public health crises and significant social issues. Mainly following Stephen Holland's analysis, we will illustrate how these public health policies may imply a restriction of individual freedom and how this restriction may be justified by the need to promote the interests and welfare of individuals. We will see, however, that in a liberal society, public health policies that restrict citizens' choices can be justified not only to promote individual health but also to safeguard collective interests and the general welfare. People with unhealthy lifestyles or habits are more susceptible to disease, can infect or make other people sick, and potentially strain already limited health resources that could otherwise be used to provide treatment and, where possible, benefit others. In the recent pandemic, we had an example of the kind of intervention the state can take to prevent harm to its citizens. Significant restrictions on people′s movement were implemented to protect the population. For example, tight, prolonged closures were imposed during periods of widespread infection. Schools and universities were closed, and classes were held at a distance. Many workers were forced to work from home, and international travel was banned or restricted to specific categories.

Authorised persons had to observe a quarantine period when travelling. After explaining that recent public health policies against COVID-19 (in particular the vaccine passport) introduce a new balance between the value of autonomy and public health, we will argue that the state might be tempted not only to 'encourage' healthy lifestyles – because they reduce both the risk of disease and the burden on society – but also to actively promote the use of (bio)technologies for enhancement purposes, and possibly to impose sanctions or penalties on citizens who choose to behave irresponsibly. If this happens, people who wish to have a child could be obliged to control and possibly modify (correct and/or enhance) the genetic makeup of the unborn child. Until now, decisions concerning the unborn child's DNA have been considered as a matter solely for the parents. We say that if the value of protecting public health were to become more and more critical and, in line with our hypothesis, to prevail more and more over the value of personal autonomy, genome editing interventions could no longer be considered a matter of 'choice' (i.e., an option). Suppose we regard the protection of individual autonomy within a context of reasonable pluralism as essential for a well-ordered society. In that case, we face a remarkable dilemma that demands our attention. However, we have found no convincing justification for why it would be morally wrong to prevent individuals from exercising their (reproductive) freedom. Additionally, we have found no compelling reasons to reject the idea of imposing a legal obligation on individuals to modify their genomes.

In section 2, we begin with the idea that in liberal societies, there is a moral duty to protect and improve the health and well-being of the population. We will then explain how this ethical responsibility can justify restrictions on the autonomy of individual citizens. In section 3, we will explain how the public health measures adopted in our societies during the pandemic emergency (in particular, the vaccine passport) contribute to reshaping the hierarchy of values by reducing the importance of personal autonomy to increase the importance of health. In our opinion, it cannot be ruled out that the new balance of values established during the pandemic will continue after it has ended, leading to a further reduction in personal autonomy in favour of public policies aiming to safeguard or promote the common good. In our opinion, this could have unprecedented consequences, especially in the area of reproduction, as people could have a duty to control the genetic makeup of the children they bring into the world and, where possible, correct their genomes. Finally, in section 4, we will address the possible objections that could be raised against the introduction of an obligation (for parents) to correct the genetic heritage of their children. It could be argued that such an obligation might not be easily enforceable or that it would, in particular, burden women who would have to resort to assisted reproduction.

Furthermore, it could be argued that it would not be easy to agree on which genetic modification interventions are most desirable (and should be practised on the children we bring into the world) or that interventions of this kind would not be necessary for those coming into the world in any case. However, we have failed to identify compelling reasons to explain why it would be wrong to deprive people of the (reproductive) freedom to choose their children's genetic makeup entirely and why we should oppose imposing a legal obligation on them to modify their genomes. We hope that someone else will be more successful and provide more compelling reasons to challenge the idea of mandatory genome editing.

2. Exploring boundaries: challenges in public health intervention

In recent decades, particularly in medicine and bioethics, there has been increasing recognition of the importance of, and moral justification for, protecting personal health decisions from undue interference by the state or third parties.[1] However, it has been argued that rigid adherence to autonomy in the context of public health interventions within a liberal state may be misguided (Holland 2021; Nuffield Council on Bioethics 2007). Even in societies founded on liberal principles, there is a moral obligation to promote general health and well-being (Kramer 2017, pp. 47-48). This highlights that, while autonomy is a fundamental value, it must be balanced against the imperative of public health, recognising that there are conditions that justify restrictions on personal freedom (Holland 2015).

According to the Nuffield Council on Bioethics (2007), whose report on moral issues in public health is a landmark in the field, health surveillance programmes are seen as easier to justify not because they go unnoticed but because of the impracticality of involving citizens and obtaining their consent. The Nuffield Council on Bioethics suggests that asking people to consent to such public health programmes, which do not risk their health or safety, would often be complex and unreasonable in practice. Furthermore, this position extends to 'health promotion' interventions in the workplace or reducing alcohol or tobacco consumption in the population, where democratic procedures and transparent decision-making may suffice, following consultation with relevant stakeholders.

Moreover, within the context of liberal thinking, there is a broad consensus that information programmes or campaigns to raise citizens' awareness – of, for example, the consequences of certain lifestyles or diets – can be justified. The rationale behind this approach is that sharing or transmitting information enhances individual autonomy by enabling people to make more in-

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[1] Examples include the principle of informed consent, which ensures patients make healthcare decisions based on their own values, the recognition of reproductive rights that allow individuals control over their reproductive choices, and the right to make end-of-life decisions that respect personal autonomy (Veatch, Guidry-Grimes 2019).

formed choices. This is consistent with the perspective of John Stuart Mill (1975), who argued against coercion but emphasised the importance of dialogue and persuasion in influencing individual decision-making (Griffith and West 2015, 1095). In essence, liberal principles recognise the importance of protecting individual autonomy and acknowledge the role of informed decision-making.

While it is clear that providing information is very different from attempting to covertly influence an individual's decisions through specific interventions aiming to promote their well-being and/or health, Holland (2014) notes that in the realm of public health policy, it is not inherently unethical to use citizens' cognitive biases to guide them towards confident choices (Holland 2021). Holland argues that this intervention can be justified from a political perspective that defends individual autonomy (Holland 2015; 2021), especially when individuals can make free choices and resist nudges to impose low costs on citizens. According to Thaler and Sunstein (2008), such policies fall under 'libertarian paternalism'. These policies promote citizens' well-being, health and interests without eliminating options, respecting their autonomy. These interventions refrain from forcing individuals to take specific actions or, as Thaler and Sunstein add, make their lives more difficult if they choose not to do so. In essence, 'libertarian paternalism' seeks to nudge individuals towards better choices while preserving their freedom of choice: "To count as a mere nudge, the intervention must be easy and cheap to avoid. Nudges are not mandates. Putting the fruit at eye level counts as a nudge. Banning junk food does not" (Thaler and Sunstein 2008, p. 6).

However, when such measures are perceived as still infringing on personal autonomy, proponents of libertarian paternalism respond as follows. First, they argue that individuals' choices are always influenced (i.e. personal decisions are never entirely independent of external factors). Therefore, allowing this conditioning to occur arbitrarily would be impractical, as this would increase the likelihood of citizens making sub-optimal choices for themselves. Furthermore, Thaler and Sunstein (2008) say it would be wrong to think that we can always look after our interests or do so better than other people because we often have to make decisions in situations of uncertainty or do not have time to think. As a result, Thaler and Sunstein argue, we often adopt practical rules that only sometimes work (or produce the best outcome) or are appropriate to the situation.

Nudging has been criticised and examined in detail in the extensive existing literature (Holland 2014, pp. 331-353; Galletti 2020). Critics argue, for example, that libertarian paternalism falls short as an optimal approach to promoting public health because it does not address or eliminate the social and economic inequalities that prevent specific individuals or groups from accessing health care. Furthermore, nudging could have dangerous long-term consequences by potentially encouraging planners to implement increasingly paternalistic, coercive interventions. While libertarian paternalists argue that nudges should not aim to impose a particular conception of the good but rather to help citizens promote and realise their conception, determining people's true desires is not always straightforward (Nuffield Council on Bioethics 2007).

Moreover, it would be pointless to try to reason about what rational people would prefer since – as Holland (2014) explains – a person′s rational preferences may vary and, in any case, depend on how a person has chosen to live his or her life: "What is in one's interest will depend on one's conception of how one should live one's life" (Holland 2014, p. 344). However, for Holland (2014), this criticism does not apply to health. Indeed, in these cases, it would be possible to appeal to a widely shared view, and nudging would be the easiest way to promote general interest. Nudging would only be unsuitable where there is clinical uncertainty or where people have forms of addiction (or mental health problems) that do not allow them to be autonomous. Its benefits should always be taken into consideration in all other cases. Then, we should not misinterpret this nudging as paternalistic interference because promoting people′s health is consistent with promoting their autonomy. Indeed, being autonomous does not mean acting on one′s most immediate desires or impulses but enjoying the ability to follow one′s deepest core values: that is to say, those which one has thoughtfully endorsed, or at least would do if one were able to do so. Moreover, health is the precondition for enjoying the possibility of freely choosing one′s own life since illness always narrows down the field of possibilities (Nys 2008, p. 68):

> A simple illustration of the general approach is the smoker whose first-order desire is for a cigarette, but whose second-order desire is not to be a smoker. Suppose a public health policy limits the smoker's freedom to smoke: is this objectionably illiberal? This depends on whether it contravenes their will and, focusing on their first-order desire, it might seem to do so, but the policy aligns with their second-order desires or accords with their 'deep' autonomy (or whatever version of the idea is in play) so, in that sense, it does not

> contravene their will and is therefore unobjectionable (Holland 2021, pp. 35-36).

However, according to the Nuffield Council on Bioethics (2007), criticism of the use of nudging in health policy does not necessarily arise from the presence of a paternalistic approach but rather from the idea that in the field of public health, it may be beneficial to limit options. In other words, the critique suggests that "...paternalism goes too far, but libertarian paternalism does not go far enough" (p. 25). For example, requiring people to contribute to the health service is the best way to ensure an adequate health service because the national health service can only function if all citizens contribute. There is, therefore, no point in allowing people to choose whether or not to contribute since the withdrawal of a small group (or even just one person) would be enough to bring a public programme into crisis (p. 25). Savulescu and Giubilini (2019, p. 243) propose an even broader perspective. According to them, public health policies that restrict citizens′ choices are justified to promote individual health and safeguard collective interests and general well-being. People with unhealthy lifestyles or habits are more susceptible to disease, potentially putting a strain on already limited health resources that could otherwise be used to provide care and, where possible, benefit others.

This means that lifestyles are not just choices that affect individuals. We are talking about behaviours (such as not wearing a seatbelt, eating junk food, smoking cigarettes or drinking alcohol) that affect the lives of others and impose additional costs on the healthcare system (Savulescu and Giubilini 2019). This justifies the right of the state to intervene in the autonomy or freedom of individuals. If we accept that the state can be justified in interfering with citizens′ freedom primarily to prevent harm to others, then specific public health measures can also be considered legitimate. In other words, from a liberal perspective, specific public health measures can be supported based on the Millian principle, which states that exercising power over an individual against his or her will in a civilised society is justified only if it is aimed towards preventing harm to others. The individual′s physical or moral well-being is not a sufficient basis for such intervention (Mill 1975, pp. 14-15), but the community′s interest would be at stake. If state interference seems unacceptable to us, the only conceivable alternative is to leave citizens free to choose anything without any restrictions (from the state) but then hold them accountable for what they do (or do not do) to stay healthy and possibly make them pay for the costs of health care (Wikler 2002; 1987).

The ban on smoking in public places is the classic example of a public health measure taken by the state to prevent harmful behaviour towards others: "The ban is partly to avoid the third party harm to bar staff and others of passive smoking, and partly to motivate smoking cessation by, for example, making smoking less convenient. But the ban is justified by the former consideration, i.e., to avoid third party harm, because this brings it under the harm principle" (Holland 2021, p. 37). Other examples include mandatory childhood vaccinations and HIV testing of immigrants without their explicit consent (Holland 2015, p. 98). In the recent pandemic, numerous public health measures were taken to contain the spread of the virus, in line with the Millian principle of preventing harm (Holland 2021; Rainey and Giubilini 2021; Wilkinson and Savulescu 2023). Significant restrictions on the movement of people have been implemented to protect the population. For example, tight, prolonged lockdowns were imposed during widespread infection. Schools and universities were closed, and classes were held remotely. Many workers were required to work from home, and international travel was prohibited or restricted to specific categories. Authorised persons were required to observe a quarantine period when travelling. In addition, citizens were required to maintain social distancing, wear masks (especially in enclosed spaces), and sanitise their hands to limit contact and gatherings (Holland 2021, p. 41). Some countries used technological means to monitor and track people′s movements, to identify those most at risk of infection, or to monitor infected people under quarantine (Ziliotti 2021). Finally, vaccination requirements were introduced for specific categories of workers (e.g., health care professionals and those caring for the elderly or vulnerable), along with vaccination passports that dictated access to activities such as travel, eating out, going to bars, going to the gym, and attending public events (Savulescu 2023; Cameron et al. 2021).

3. Towards a new balance of values?

Every public health measure taken during the pandemic has triggered a widespread public debate showing no sign of abating. Some have questioned the need to impose measures that significantly curtail personal freedom. In contrast, others have expressed concern about the potential long-term impact on the well-being and health of younger generations due to prolonged school and university closures. In addition, tracking technologies have raised fears about the prospect of creating a surveillance society (Zuboff 2019). Our focus is on explaining how the public health measures adopted in our societies during the pandemic emergency contribute to reshaping the hierarchy of values by reducing the importance of personal autonomy in order to increase the importance of health. Individual rights, in particular personal autonomy, remain fundamental reference points. However, the management of the pandemic crisis reveals a concerted effort to justify substantial public health measures that curtail personal autonomy based on the link that unites individual interests and freedom with the common good (Abdalla et al. 2020; Morabia 2020; Feachem Medlin 2002). The link between individual interests and freedom and communitarian thinking is passed through a new, now institutionalised, conception of health (Brown et al. 2021b, p. 457). Indeed, health is no longer seen as a private condition but as a public or common good (Mori 2021). The regulatory consequences of this critical 'semantic shift' are apparent: health is no longer just a fundamental right for the individual but also a moral responsibility or duty towards the societies or communities of which each of us is a member since our behaviour can put the lives of our fellow citizens at risk.

The vaccination card is the measure that has most institutionalised this new concept of health through an unprecedented extension of the individual's responsibility towards the whole. All the measures adopted during the pandemic emergency aimed to protect public health by preventing harm (and the spread of infection). However, the vaccination passport also asserts the duty to care for one′s health by intervening in one's body, which can provide a kind of reinforcement (Mori 2021). In other words, it is no longer a question of refraining from behaviour that could harm others, which is the aim of the first public health measures adopted in response to the emergency: the vaccination passport obliges the individual to contribute 'responsibly' to the health of his or her community by undergoing a medical treatment that has no dangerous consequences for health, except for temporary, easily bearable effects (Gibelli et al. 2022; Lederman, Corcos 2024). As Brown et al. say, it would be unacceptable to restrict the autonomy of citizens for no reason, but this restriction becomes legitimate if we can pose a risk to others: "It is unethical – Brown et al. (2021a, p. e61) state – to restrict freedom unless there is a real risk to other people. If we have the technology to decide who is not a risk, we should use it".

The fact that the vaccination passport was not 'compulsory' in liberal democratic societies – that is, there was no law giving health professionals the power to administer vaccinations without or against people′s consent (as in compulsory medical treatment) – is (morally) irrelevant. However, where the passport has been introduced, essential rights and freedoms have been curtailed without vaccination, a prerequisite for obtaining the passport. For example, where the passport was required for 'essential' and 'non-essential' situations, it was not just that you could not go to bars or restaurants, attend a concert, go to university or attend public events (a stadium, a museum or a conference): you could not even use public transport, travel or work. In practice, it was impossible to work and maintain a social life, with easily imaginable consequences for one′s well-being and health. In our opinion, this is more than enough to claim that the vaccination passport is a coercive measure or, to be more precise, that it effectively makes vaccination compulsory.

Moreover, as Julian Savulescu (2021) points out, we can speak of coercion (or obligation) when we find ourselves in a situation where we have to choose what to do (and we are free to do anything), but we are deprived (by someone) of an important option or good. For example, a thief who enters our house with a gun to rob us of our property forces us to choose between life (the risk of being killed, injured, etc.) and our property. We could also be killed, but we have no other choice if we want to live. We have little choice because we are obliged (or forced) to deliver our goods. With the introduction of the vaccine passport, the same can be said of vaccination against COVID-19: no one forced us, but there was a price to pay if we chose not to be vaccinated.

The argument that if you did not want to be vaccinated, you could still get the passport by presenting a negative test is not strong. Many countries did not cover the cost of swabs, and some, such as Germany, which initially offered free swabs, no longer do so to encourage vaccination (Fiske, McLennan, Buyx 2021). Moreover, in some cases - regardless of the swab - measures were introduced to restrict the movement of unvaccinated people (as in the case of Austria) or - as in the case of Singapore - to exclude from public health assistance anyone who had not been vaccinated or who had COVID-19 (Bardosh et al. 2022; Ignovska 2023). Furthermore, we could not agree with those who argued that, even if vaccination were a coercive measure, it would still be an intervention in continuity with other measures necessary for the functioning of society and would, therefore, justify the reduction of personal autonomy. Consider seat belts, driving licences, traffic regulations, or laws requiring citizens to contribute economically through taxes. Vaccination is a significant innovation in how liberal democratic societies manage public health precisely because it is a compulsory or coercive measure. These societies value the principle that any medical (or health) intervention always requires the individual′s consent and cannot be imposed against their will. Savulescu and Giubilini (2019) argue that the moral relevance of vaccination, which involves an intervention in the body, is not so significant. This is because even the principle of respecting the body′s integrity, like any other principle, is not absolute and can be sacrificed for more important ends. As Savulescu and Giubilini write (2019, p. 246), it can be abandoned "for the sake of public interest". We are not suggesting that this cannot be true or morally acceptable; the vaccination passport may be an appropriate, proportionate measure to deal with a pandemic emergency, the continuation of which could have had catastrophic health and economic consequences. We note that bodily integrity has hitherto been considered a fundamental legal principle in societies with a liberal democratic constitution. Justifying the introduction of coercive interventions on the body for the sake of general well-being (Holland 2021, pp. 47-49) means establishing a new balance between the value of autonomy and public health.

4. Genome editing: can public interest override reproductive autonomy?

Given the significant shifts in the value landscape of our society, it is legitimate to ask about the possible practical consequences of reassessing the value of personal autonomy compared to the common good. It is possible – as has been argued (Dennis et al. 2022) – that there is no need to worry about what will come after the pandemic since the measures adopted (especially those significantly restricting personal autonomy) were necessary for an emergency situation and should therefore be considered temporary, or at least limited to the Covid-19 emergency. However, it cannot be ruled out that the new balance of values established during the pandemic will continue after it, leading to further reduction in the area of personal self-determination or autonomy in favour of public intervention or policies aiming to safeguard or promote the common good (Sorsa and Kivikoski 2023). In this scenario, especially in the context of ongoing scientific and technological advances (consider, for example, the new possibilities offered by the development of increasingly intelligent machines capable of monitoring and collecting data on our health), the consequences for public health could be unprecedented. The state could find moral justification in not only 'encouraging' healthy lifestyles – because they reduce both the risk of disease and the burden on society – but also actively promoting the use of enhancing biotechnologies and possibly imposing sanctions or penalties on citizens choosing to behave ‘irresponsibly’. There is no need to consider all possible scenarios here; it is sufficient to consider what this might mean at the time of genome editing. Until now, decisions concerning the DNA of the unborn child (e.g. whether to correct or enhance it) have been seen as a matter for the parents alone (Robertson 1999; Agar 2004; Hughes 1996, p. 99). It is generally argued that, just as the state has no right to interfere with personal decisions about whether and when to have a child, how many children to have, and how far apart and when to have them, nor does it have the right to condition decisions about the genes to transmit. However, should the value of safeguarding public health become increasingly important and, in line with our hypothesis, prevail more and more over the value of personal autonomy, genome editing interventions could no longer be considered a matter of ‘choice’ (i.e. an option), rather an obligation that every responsible parent has – even before the children they choose to bring into the world – towards the community to which they belong (Balistreri 2016; 2020). Suppose we believe that it is crucial for a well-ordered society to protect and promote the autonomy of the individual within a reasonable moral pluralism. This raises a significant problem we are called upon to address (Balistreri 2020).

In our view, the problem arises both when we consider genome editing interventions on the embryo (germline) as interventions affecting the person, and when we consider them as interventions changing a person’s identity. In the former case, it may seem more than legitimate to ask parents to correct or edit the genome of the unborn child since genetically enhanced children, who will later be born, will enjoy a better life (Battisti 2021; Harris 2007; Sparrow 2007, 2011, 2022). If we assume that germline genome editing interventions are person-affecting, it is reasonable to conclude that parents must resort to them (de Araujo 2017; Gyngell, Bowman-Smart and Savulescu 2019). In other words, it cannot be a matter of preference, because they have a ‘duty’ to do the best thing for the children who will later be born: “Once it becomes possible to enhance the expected welfare of a child through genome editing, the principle of procreative beneficence will imply an obligation to perform genome editing whenever we bring human beings into existence” (Sparrow 2022, p. 11). For the unborn, the benefits would not be minor, but significant: instead of being condemned to a life of suffering (and considerable disability), they would look forward to an open future. Of course, we should also consider the consequences of the intervention on the lives of those wanting to reproduce. For example, we might imagine that parents hold (not necessarily religious) ideological positions or world views opposing intervention in the genetic heritage of the unborn. They may believe that it is always wrong to control birth processes, or that this indicates a morally undesirable attitude towards not only the child to be born but also life itself. Or they may simply believe that every life is worth living, or that they have no obligation to explain their reproductive choices. These are, for example, the reactions of the main character in "Intrusion", Ken MacLeod's novel, to a society that has implemented a series of measures to increasingly ensure the safety and health of its citizens, including surveillance technology making it possible to eliminate genetic diseases before birth. Macleod describes how Hope refuses to take "the fix", a pill that could cure genetic diseases and correct any genetic errors in a fetus's genome. Despite having already turned down the treatment once, the pressure on her to accept it is growing, and it′s unlikely she′ll be able to avoid it again. While she could easily request an exemption based on religious beliefs, she chooses not to and offers no explanation for her decision, stating that it is simply her choice (Macleod 2013, pp. 34-35). However, in the era of genome editing, it may seem reasonable for our societies to ask parents to set aside their beliefs, and we may not perceive this as an imposition of unbearable sacrifice.

After all, it is difficult to see why our duty to look after the welfare of our children and to ensure, at least prima facie, that they have access to interventions that can improve their health (and well-being) should not also apply to the pre-natal period, at least in those cases where treatment is available and it is possible to intervene 'safely'. One can also argue about the specific circumstances (and modalities) in which this duty should apply and the moral and legal implications of a form of parental responsibility manifesting itself after the conception of the embryo but 'before its birth'. However, it would be unreasonable to say that the same kind of medical intervention is obligatory after birth but only optional and left to the parents' discretion before it. Moreover, any intervention on the embryo, including genome editing, could have significant implications, as it may not be feasible or yield the same outcomes if performed after the child′s birth. Even if post-natal genome editing were possible, germline genome editing could be a less invasive and less stressful option. This is because germline editing can be done immediately after fertilization when the embryo is just a few cells and lacks any sensitivity. If we assume that the genetic makeup of a child can be fully modified even after birth, this does not lessen the significance of prenatal intervention. Certain genetic disorders, if not addressed promptly, could lead to irreversible effects on the child once born. In other words, post-natal genome editing could correct his genetic anomalies but not the physical and/or cognitive problems caused by these same anomalies in the meantime.

Furthermore, if parents are legally obliged to ensure that their children attend school, this begs the question why comparable obligation should not exist regarding the correction of their genetic makeup, particularly where this can be done safely and without risk to the unborn child. Whether pertaining to genetic intervention or education, one could affirm that preempting parental conduct that might compromise their offspring's health or welfare falls within the remit of the state (Fowler 2014). As articulated by Joe Feinberg (1980, p. 140), these imperatives underscore entitlement to an unencumbered future, circumscribing parental prerogatives in child-rearing and mandating state intervention in cases of parental neglect or abuse:

> However, most people would accept that there should be significant constraints on how parents raise their children. For example, compulsory elementary education is widely accepted, so is the idea that the state may intervene with parental freedom in cases of child neglect or where parents are, for example, encouraging seriously anti-social behaviour in their children. Insofar as widely held views on parenting support a right to determine the characteristics of one's children, and thus to determine the genetic characteristics of one's future children, they support only a rather constrained right. It is therefore difficult to see how an appeal to such views could support an unconstrained right of the sort that would be necessary to support an unregulated genetic supermarket approach to RGTs[2] (Gyngell, Douglas 2015, p. 247).

Consider widely accepted enhancements of natural primary goods such as schooling, vaccination, and statutes prohibiting marriage between relatives to prevent the incidence of resulting children born with birth defects. Mandatory education, inoculation, and incest laws are likewise coercive, collective, and statesponsored, but liberals do not complain that these practices unjustifiably violate parental liberty, undermine family privacy, or impose on some the values of others. Just as state action can undermine the autonomy of citizens, so too can parental action undermine the autonomy of children. If the liberal commitment to offspring autonomy is important enough for the state to man-

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[2] Reproductive genetic technologies.

date traditional environmental enhancements for natural primary goods, then that very same interest is important enough for the state to mandate genetic enhancements for analogous autonomy-enlarging goods (Fox 2007, p. 23).

Moreover, problems remain even when genome editing is considered (not affecting the person but) ′affecting identity′. Discussions on reproductive choices generally distinguish between ′person-influencing′ and ′identity-influencing′ interventions, on the assumption that selection (of embryos) is one type of treatment that changes identity (of the child who later will be born), whereas interventions that produce genetic changes are person-affecting actions (Balistreri 2024).

However, not everyone agrees with this approach. For example, Tom Douglas and Katrien Devolder (2022) argue that germline genome editing can be considered person-affecting only if the parents would be willing to have a child even without any genetic modification. In other cases (i.e. when the parents would not continue with the development of the embryo if they could not edit it), genetic interventions cannot have an effect or improve the condition of the child who is then born (and, therefore, being 'person affecting'), since the unborn child would be no worse off if the parents had not been able to resort to genome editing. It is reasonable to assume that it would not be born and, presumably, another person would be born instead (Douglas, Devolder 2022). In this case, therefore, genome editing would indeed be 'identity altering' in every sense of the word, as it would determine the birth of a person who would otherwise never have come into existence.

Like Douglas and Devolder, Robert Sparrow (2021) argues that it is conceivable that germline genetic modification interventions, particularly in the early stages of development and clinical application, will never be 'person affecting' (but will always have an impact on identity), since they will always involve selection among different 'modified embryos'. Embryo genome editing could only be considered person-affecting if just a single embryo were present in the procedure. However, he claims that genome editing interventions will always involve multiple embryos because it is more logical to modify a certain number of embryos in the first place and then select those in which the modification has been more successful. Therefore, genome editing cannot be person-affecting because it not only genetically alters the inheritance of the individual who will come into the world, but also affects the identity of the future child through embryo selection: "while the literature has tended to treat modification as an alternative to selection, in reality – Sparrow writes – the process of modification will usually involve selection. (...) If, instead, we focus on the history of the events that led to the birth of a genome-edited individual, then (...) genome editing looks identity affecting. Because the process of genome editing includes selection, if it were not for the editing, another person would have come into existence" (Sparrow 2022, pp. 9-10).

Furthermore, genome editing intervention on the embryo can be considered 'person-affecting' if we start from the idea that we are first and foremost our bodies and therefore began to exist at the moment of fertilization (animalism).[3] However, if we adopt a different perspective and hypothesise that we are primarily our mental or psychological content (our thoughts, emotions, beliefs, desires, and perceptions), then it seems plausible to argue that genome editing could alter the identity of the future individual. Perhaps genome editing intervention that simply modifies a trivial aspect (but what is a trivial aspect?) of the person to be born might not have this effect, but it is not difficult to imagine that modifications correcting significant genetic anomalies or enhancing their abilities and dispositions might also change their character. In any case, there would still be no person at the moment of genome editing, since our identity would not consist of the identity of substance but of consciousness (Locke, 1975, pp. 302-307). Whereas animalism holds that we are essentially human animal[4], and therefore begin to exist the moment our bodies begin to exist, the Lockian (or psychological) view holds that 'we' are persons who cannot be reduced to the human animal, and it can therefore be argued that we begin to exist when we begin to have consciousness. In a recent article, I argued that contemporary reflection on moral issues relating to germline genome editing is predominantly anchored in a 'biological' (or genetic) view of identity. In this sense, I suggested that the introduction of a psychological perspective can significantly enrich the philosophical and moral debate by provid-

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[3] Animalism states that we are primarily our body, i.e., our organism (Olson, 1997, 2007), and, therefore, our survival is linked to that of our body. As long as our body (as an organism) is functioning, we continue to live.

[4] The psychological view asserts that we are a thinking entity and that, consequently, what ensures our survival is not our body but (our) psychological continuity. That is, a person persists as long as psychological continuity persists and disappears when this continuity is lost, regardless of what happens to their body. In other words, as Stephan Blatti states, "(...) psychological criteria of personal identity assert that a psychological relation of some sort is necessary and/or sufficient for each of us to persist through time" (Blatti, 2020).

ing an alternative perspective (Balistreri 2024). This is not the place to delve into this issue. We are primarily interested in discussing what changes from a moral perspective when genome editing of embryos affects the identity of the individuals who are born.

According to Sparrow, realizing that genome editing interventions are not 'person-affecting' offers a strong argument against the coercive implementation of such procedures. From his perspective, the lack of direct impact on the individual's genome and well-being strengthens the case for individual parental choice in genome editing interventions and procedures. However, even in this scenario (even if these interventions were not 'person-affecting' but identity-affecting), there may still be grounds for considering them legally 'mandatory'. In our view, the rationale is simple: we can also assume that the parent's decision not to resort to these interventions cannot worsen the life or condition of the child that will be born (because if the parents decide not to undergo genome editing treatment, they would be giving birth to another embryo). However, this is still a decision that will have a significantly negative impact on other people's lives.

If, for example, we adopt a stance similar to that taken during the pandemic, when compulsory vaccination was introduced to restrict citizens' choices, not only to promote individual health but also to protect collective interests and general well-being, then we may have a strong case for compulsory genome editing. Suppose individuals do not control the genetic inheritance of the unborn child and refuse to correct significant abnormalities or, at least where possible, to enhance it. In that case, society will be forced to invest substantial resources in the care and treatment of these individuals, diverting economic resources that could otherwise be used to improve the overall quality of life or to care for other citizens. Ultimately, the lives of existing individuals or those who would be born in any case (even if their parents have chosen genome editing) would be worse than they would otherwise have been. Moreover, this issue remains even if the individuals born do not require medical intervention (for example, if their condition or disability does not require operations or hospitalisation) or if we assume that disability is not a disease but a mere difference, as for example Garland-Thomson (2012) says, for society would still face significant economic costs to facilitate their complete (or at least improved) integration and development. Finally, the problem is not only the costs that society will be forced to bear for people needing major treatment. Failing to fix an anomaly when it is possible through genome editing means allowing this trait to survive and be passed on to other people, with the consequences that may result (Agar 2023; Veit, Anomaly, Agar, Singer, Fleischman, Minerva 2021).

5. Arguments against mandatory genome editing

In the previous sections, we have seen that the state regularly adopts public policy measures restricting (or tending to restrict) spaces of personal autonomy in the name of collective welfare. It could be argued, however, that in the case of genome editing, it would be more complex to adopt (and implement) public measures restricting individual freedom. First, how do we proceed should some women decide not to resort to genome editing? Alternatively, how do we, in any case, drive the most recalcitrant people to accept this intervention or sanction them (should our attempts to convince them be unsuccessful)? If we rule out coercion (acting against their will) – and, anyhow, how could we implement this plan, seeking out pregnant women and segregating the more recalcitrant ones until the intervention? – only then does the option of sanction remain: economic or legal penalties such as imprisonment or performance of public utility work or loss of privileges. However, such solutions would penalise not only the parents but also the people being born. Moreover, even the mere risk of penalty or stigma could have dramatic consequences for the individuals who would later be born. Pregnant women not wishing to subject the embryo to genome editing might, out of fear of being discovered or reported to the authorities by healthcare providers, skip medical checkups or forego healthcare altogether. Yet obligation without penalty would not be practical because the lack of consequences or punishment for failing to comply with the obligation would reduce the incentive for people to follow it. Any penalty for non-compliance that does not support obligation might ultimately be ineffective because people may feel less inclined to abide by it.

To ensure effectiveness, though, some might suggest particularly extreme measures. For example, a parent who does not agree to edit genetic anomalies of the embryo (or to enhance it) may lose parental authority over his or her children. At the moment, such a measure may seem unduly harsh on parents, but, at the time of genome editing, a parent who renounces correcting (or enhancing) the genetic makeup of the child who will later be born could appear irresponsible and incapable of taking proper care of his or her health and well-being. In such cases, then, removing parental authority may seem an appropriate, morally justified measure. Besides, one could argue that the right to raise children cannot be unconditional and that people can lose this if they fail to live up to it (Lafollette 1980, p. 187): "A person has a right to rear children if he meets certain minimal standards of child rearing. Parents must not abuse or neglect their children and must also provide for the basic needs of the children". From this perspective, a person who does not bother to have the embryo genetically screened and, if necessary, undergo modification or enhancement intervention may not be an abusive parent, but is still neglecting the welfare of the child who will later be born.

Furthermore, it is true that, if mothers and fathers lose parental authority, their children will also suffer the consequences. Nonetheless, living with their biological or intended parents is not always in the children's best interests. That is to say, if parents prove to be abusive or no longer capable of ensuring their offspring's welfare, it may be preferable for their children to reside with another family. Yet, the more invasive the genome editing intervention correcting (or enhancing) the embryo's genetic makeup is, the greater the risk to the health and well-being of the woman carrying the pregnancy becomes – for instance, there may be permanent or significant consequences to her body – and the less acceptable an obligation to subject the embryo to genome editing intervention appears. Indeed, we should consider the interests of not only the embryo (or the person who will later be born) but also the woman going through pregnancy (Overall 2012; Simonstein 2019). However, if the genome editing is straightforward and does not cause significant discomfort, societal expectations might be exceptionally high and in this case women would have far more responsibility.

If embryo conception takes place in vitro, things would be much simpler in the sense that it would be easier to enforce the legal compulsoriness of genome editing interventions. Indeed, there would in that case be no need to intervene on the woman against her will: the embryo would be produced in vitro, and intervention would not affect her. In addition, it would be easier to monitor people desiring a child (and there would be no need to punish those declining to accept genome editing), since people or couples refusing genome editing could not have access to in-vitro fertilization. Moreover, one can also imagine that people resorting to assisted reproductive intervention, placing their final hopes of ever having a child in new technologies, would find it easier to accept genome editing intervention. Finally, even if we assume that genome editing could easily be made compulsory purely for those using assisted reproduction, this does not mean that the consequences would only affect a very small part of the population. It is true that, at present, only a very small percentage of children are born through assisted reproduction. Yet in the future, human reproduction may become increasingly dependent on technology as related techniques become more reliable, offering people wanting a child far-reaching control over the genetic traits of the unborn offspring.

It could, though, be argued that making genome editing mandatory would be wrong because it would mean forcing women desiring a child to resort to assisted reproduction. After all, genome editing interventions could be 'far more easily' feasible on newly fertilised egg cells or embryos at the earliest stage of development (and become much less effective or otherwise safe the more advanced the embryo's development becomes). In this scenario, conceiving an embryo in a test tube rather than through sexual reproduction might seem to be the most reasonable – or indeed, the only possible – choice if one needs to correct significant abnormalities in the genetic makeup or even improve its characteristics. Moreover, assisted reproduction would have a further advantage over sexual one in that it would allow people to produce several embryos and then select the best genetic characteristics of those that would later be edited. However, it is arguable that the possibility to use genome editing would change the reproductive scenario. Even if genome editing were not mandatory, women wanting a child might still feel compelled to resort to artificial reproduction (Sparrow 2011). Today, women who choose to give birth at home are considered bad mothers because they risk not only their own health, but also that of their children (Balistreri, Pacini 2015). Tomorrow, women conceiving through sex may be seen as irresponsible, not only because they are not bringing the embryo with the best genetic code into the world (and/or not selecting it) but also because they are rendering the genome of the unborn child much more difficult to edit or enhance (Simonstein 2019). Finally, we must also consider that, in the near future, genome editing may become more and more accessible, and perhaps we could even practice it on human embryos conceived (not in vitro but) sexually and at an advanced stage of development, that is, when they are already composed of a large number of cells. In this case, women desiring a child (and agreeing to genome editing) would no longer necessarily have to resort to assisted reproductive interventions.

So even if we were unable to develop genome editing techniques that are advanced enough to allow correction or genetic modification interventions on aged embryos, in the future there might still be assisted reproductive techniques that can be practised easily (or involve far less inconvenience and fewer complications for women than they do now). Alternatively, we may, in the meantime, have developed technologies allowing women to have a child without carrying out the gestation of embryos (i.e., delegating the conception and gestation of the embryo to machines). With an artificial uterus, women desiring a child would still need to undergo the health treatments necessary for the production and collection of the oocytes, but not those preparing the body to receive the embryo (Smajdor 2007; 2012; Tripodi 2022). If it were also possible to obtain egg cells (in vitro-derived gametes) from somatic ones, they too would no longer need to undergo treatment for ovarian stimulation (Horer, Feichtinger, Rosner, Hengstschläger 2023; Notini et al. 2020; Smajdor and Cutas 2015; 2014). Finally, the introduction of legal obligation to change the genetic makeup of the embryo would in any case not worsen the condition of women choosing voluntarily to resort to assisted reproductive interventions because, for example, they cannot have a child sexually or because they might transmit genetic abnormalities to their children.

One could, then, object that, in a liberal society such as ours, it would be difficult, if not impossible, to reach a consensus on the genome editing interventions to be practised on the unborn child. Any legislative proposal to introduce mandatory genome editing would face the complexity of identifying the necessary intervention type. Defining a standard set of mandatory genome editing practices could be highly problematic in the presence of a significant diversity of opinions, values and ethical beliefs. The various moral and cultural perspectives could lead to significant, insuperable divergences on what ‘ought to’ means regarding genetic modification. Moreover, one might add that the highly personalised nature of decisions relating to genome editing, involving aspects such as the health and physical characteristics of the child, might make it difficult to establish a broad, shared consensus. The issue becomes even more complex when one considers variations in opinion among individuals and communities. However, in the case of therapies, the existing broad consensus in medicine on what constitutes treatment may be more than sufficient to determine what to do.

Furthermore, (even if there were no obligations) the problem would still remain, as we can imagine that one would still feel the need to distinguish genome editing interventions for therapeutic purposes from those lacking such purposes. After all, many people believe that the only morally acceptable gene editing interventions are those that prevent significant abnormalities (or diseases) or that, in any case, genome editing interventions with a therapeutic purpose are morally more acceptable than those that modify or enhance characteristics of the human species. One can, though, concur that it might be more challenging to agree on which enhancing interventions are desirable and recommendable. Again, however, it can reasonably be presumed that a broad consensus may also be reached in this case. I am thinking, for example, of interventions making people far more resistant to disease (not only cancer but also the risk of being infected with dangerous or lethal viruses) or slow cellular ageing (Davis 2022), or improving their 'cognitive' abilities (Savulescu, Bostrom 2011). Even if these interventions are not therapeutic, they would still have an important effect on people's quality of life. At any rate, legal obligation to control and possibly modify the genetic makeup of the unborn child would be the best antidote to the risk that genome editing would widen the gap between the more and less fortunate. In fact, in this case – and it makes no difference whether the genome editing intervention is "therapeutic" or "ameliorative" – the state would even guarantee access to such procedures to those segments of the population with limited financial resources.

Finally, it could be argued that any requirement to change the genetic makeup of the unborn child would be meaningless because one can still enjoy a good life with genetic defects (or abnormalities). For example, those who argue that disability represents diversity rather than pathology might posit that the problem it constitutes is circumscribed, not general. Such a view suggests that the lack of a specific ability may be compensated for by developing other abilities or dispositions that an individual would not otherwise cultivate or evolve. The central idea is that, although disability may negatively affect a specific domain of experience, a general negative impact on overall quality of life cannot be automatically inferred. As pointed out by Barnes (2009, p. 342), a feature that has a negative effect in one specific area can have a positive one in others, thus contributing to an individual′s general well-being and happiness. This perspective argues that the loss of one good may be offset by access to others. For example, Barnes (2014, p. 90) illustrates that listening is an intrinsic good; but (it is not the only 'good', because) there are equally 'essential' alternatives, enabling a person born deaf to learn sign language or to perceive music through vibration (Garland Thompson 2012). In our view, however, a convincing argument can be made against the claim that disabilities would never be defects or disadvantages but 'mere differences' such as sexuality, gender and race (McMahan 2005; Harris 2001; Balistreri 2022). First of all, it is an oversimplification to claim that disability sometimes makes life more difficult only because of the social exclusion and isolation affecting those with particular characteristics, as there are conditions that would cause suffering and limit the opportunities of individuals even in the fairest, most welcoming society imaginable (Shakespeare T. 2014). Moreover, even if disability were the mere difference, society might – as we explained earlier – have an interest (in engaging) in preventing the birth of people with certain features. This interest could stem from various considerations, such as a desire to improve the overall quality of people's lives by providing them access to a broader range of opportunities and goods and reducing any financial and social burdens associated with disabling conditions. So even if particular conditions had no negative consequences on people's quality of life (and disability was, therefore, mere difference), they could still entail a significant cost to society in terms of health care and treatment. Therefore, even from a perspective that views disability as but a difference, it opens up room for ethical discussion about decisions regarding the prevention and management of genetic characteristics (Savulescu and Kahane 2011).

6. Conclusions

The idea that tomorrow, people desiring a child may be forced to control the genetic makeup of the embryo they produce and, if necessary, modify it seems abhorrent to us, whilst we regard it as fitting that the state should not restrict people′s freedom in their reproductive sphere on the basis of considerations of economic interests and the welfare of society. However, when we consider the reproductive scenario that opens up with the development of genome editing techniques, we cannot ignore the moral reasons that might justify state intervention. It is generally argued that, just as the state has no right to interfere with personal decisions about whether and when to have a child, how many children to have, and how far apart and when to have them, so it has no right to condition decisions about the type of genetic code to be transmitted to them. However, if, as was recently the case with the pandemic, the value of safeguarding public health were to become increasingly important and, in line with our hypothesis, prevail more and more over the value of personal autonomy, genome editing interventions could no longer be considered a matter of "choice" (i.e. an option), but an obligation that every responsible parent has towards their own children and community. Suppose we believe that a well-ordered society must protect the individual′s autonomy within a reasonable pluralism.

This case would raise a significant problem that we are called upon to address. However, we have failed to identify compelling reasons to explain why it would be wrong to deprive people of the (reproductive) freedom to choose their children′s genetic makeup entirely and, finally, why we should oppose imposing legal obligation on them to modify their genomes.

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