Germline Gene Editing Applications and the Afro-communitarian Ubuntu Philosophy

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Abstract
Germline gene editing has many applications or uses. This article focuses on specific applications. Specifically, the article draws on a moral norm arising from the thinking about the value of communal relationships in the Afro-communitarian *ubuntu* philosophy to interrogate key issues that specific applications of germline gene editing – for xeno-transplantation, agriculture and wildlife – raise. The article contends that the application of germline gene editing in these areas is justified to the extent that they foster the capacity to relate with others and to be communed with by others. The article grants that our today's decisions about germline gene editing will likely affect future humans, but will attempt to justify how this may be ethically permissible.
Keywords: Germline gene editing; Afro-communitarianism; Ubuntu philosophy; Morality

Introduction
Germline gene editing raises several ethical questions. For example, there is a risk of harm. Will germline gene editing harm individuals and their future generations? In what ways? Does the potential for harm render it always immoral? If we decide to edit a trait; for example, if we edit a child's IQ, give the child green eyes and dark skin colour because these things tend to be preferred today, are we not imposing present-day values on future generations? And would this be ethical?[1] There are other ethical issues. However, in this article, I draw on a moral norm that is grounded in the Afro-communitarian *ubuntu* philosophy to reflect on the issues that some applications of germline gene editing raise. The Nuffield Council on Bioethics describes gene editing

> as the practice of making targeted interventions at the molecular level of DNA or RNA function, deliberately to alter the structural or functional characteristics of biological entities. These entities include complex

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[1] Chris Wareham - at the Steve Biko Centre for Bioethics, University of Witwatersrand, Johannesburg - has given a lecture on different ethical issues that different uses of germline gene editing (in the military or agriculture) raise. I draw on that lecture, as well as go beyond the same to consider the implications of an African moral theory for different uses of germline gene editing.

living organisms, such as humans and animals, tissues and cells in culture, and plants, bacteria and viruses. (BIOETHICS 2016, 7)

In other words, gene editing is a form of engineering that allows professionals to insert, change, modify or customize a DNA anywhere. Professionals can replace a bad DNA or modify a defective one with gene editing. They could also enhance an existing gene that is not necessarily defective. There are important questions the preceding raises. For example, should gene editing be used only for therapeutic purposes like curing a condition, or should professionals use the same *only to* alter traits such as increasing intelligence? The reader should notice the crucial difference between germline gene editing and somatic gene editing. Somatic gene editing is the editing of cells in a human in a way that is not passed on to future generations or impacts the individual's reproductive cells. In contrast, the edited traits are passed on to the future progeny in germline gene editing. Precisely, the latter entails a change in the human species.

Germline gene editing has many controversial applications in different fields like agriculture, wildlife/ecosystem, health, and the military, to name a few. For example, one controversy germline gene editing raises in the military is the ethical permissibility of creating super soldiers. Is this justified? Gene Ethics is the field of enquiry that studies ethical issues related to these applications. This article is situated within this field of enquiry since it describes how a moral norm arising from the thinking about dominant values, particularly communal relationships, in the Afro-communitarian philosophy of *ubuntu* can enhance our thinking regarding applications of germline gene editing. The question this article asks is, "how can the moral norm arising from the thinking about communal relationships in the Afro-communitarian *ubuntu* philosophy inform our view about specific applications of germline gene editing?" This work is essential since it contributes toward adequately echoing an African voice on the ethical discourse on germline gene editing. The work is also vital for epistemic justice by responding to the call to inform the development and deployment of emerging technologies with dominant values in Africa.

Herein, it is important to acknowledge that several scholars have explored key questions concerning germline gene editing by drawing on African philosophies and values. For example, Bonginkosi Shozi, Donrich Thaldar, Marietjie Botes, Beverley Townsend, and Julian Kinderlerer have all reflected on different ethical and legal issues (like when is germline gene editing permissible for humans? Should the public be allowed to access gene editing? What gene editing technologies should be researched or used?) that genome editing technologies like the Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR) and germline gene editing raise, *mostly when they are used for therapeutic purposes in human beings* (SHOZI 2020; THALDAR n.d.n 2020; SHOZI 2021). However, the specific ethical questions this article interrogates are unique and have not been explored *by drawing on values from the Global South*: "should an animal be enhanced for the purpose of organ transplantation in humans? Is controlled extinction of certain species permissible? Is it permissible to use germline gene editing for agricultural purposes?" This article does not claim that these questions have not been explored at all since there are, in fact, some

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scholars who have explored these questions (TRIPATHI n.d.n 2022; OGAUGWU n.d.n 2019; CHIMAKONAM & AKPAN 2012; CHIMAKONAM 2013). However, the author is unaware of any study that has explored these *ethical questions* by drawing on *the dominant value of communal relationships in Africa* or at least interrogates these questions in this way to a significant degree.

Equally, the reader should notice that the use of the expression *dominant value in* Africa does not intend to essentialize Africa. It is difficult, if not nearly impossible, to find a value all Africans share in common, given the heterogeneity of the continent. However, some values are more common and frequently drawn on to think morally (EWUOSO & HALL 2019). This is how the article uses the expression, dominant values in Africa. Equally, it is important I clarify that I use Afro-communitarianism and African ethics interchangeably to refer to the moral philosophy informed by key values salient in Africa. Broadly, these values include fellowship, communal relationship, harmony, solidarity and interdependence. As previously stated, the reader should notice that I have not claimed that these values *can only* be found on the continent or that *all Africans* believe this to be true. Instead, the moral judgments and practices around these values and their intuitions have not come to Africa from other continents. In this regard, something can be called African even when it is not unique to the continent. Thaddeus Metz expresses this point well in the following way,

> Despite the lack of something utterly geographically distinctive, it is apt to call the moral theory I develop 'African' because the ideas that it expresses and that inform it are much more salient there than in not only the West, but also the major Islamic and Hindu traditions. (METZ 2010, 50)

Additionally, the reader should notice that *ubuntu* is only one African ethic and thus cannot be said to represent *all* African ethics. To this end, the thinking – grounded in *ubuntu* philosophy – about specific applications of germline gene editing ought not to be taken as representing the views of *all* Africans.

To realize the objective of this article, I will proceed in the first section to outline the *ubuntu*-inspired moral norm I consider relevant to the aim of this article. In the second section, I demonstrate the implications of the moral norms for specific applications of germline gene editing. In the third section, I address potential objections that might contend that my exploration of germline gene editing applications is shallow and has not addressed more significant issues around the rights of the future generation.

Defining *Ubuntu*

Many scholars have clearly articulated the moral duties entailed in the Afro-communitarian *Ubuntu* philosophy. For example, in one systematic review, Cornelius Ewuoso and Susan Hall describe common aspects that are found in many, and sometimes competing, formulations of the same(EWUOSO & HALL 2019). This article advances these descriptive studies by providing *evaluative* arguments that defend the usefulness of the core aspects of the *ubuntu* philosophy.

Ubuntu (generally translated as humanness) has something to do with what it means to be human, its very essence. The opposite of humanness is *into,*

meaning a thing. In the scholarship and published works on *ubuntu* philosophy*,* scholars generally identify acting in ways that prize interdependence and other-regarding behaviours as the core aspects of humanness or developing personhood. This view is best expressed by the Late Archbishop Desmond Tutu in the following way:

> When we want to give high praise to someone we say, '*Yu, u nobuntu*'; he or she has *ubuntu*. This means that they are generous, hospitable, friendly, caring and compassionate. They share what they have. It also means that my humanity is caught up, is inextricably bound up, in theirs. We belong in a bundle of life … I am human because I belong, I participate, I share. A person with *ubuntu* is open and available to others, affirming of others, does not feel threatened that others are able and good, for he or she has a proper self-assurance that comes with knowing that he or she belongs in a greater whole and is diminished when others are humiliated or diminished, when others are tortured or oppressed, or treated as if they were less than who they are. (TUTU 1999, 34f)

In the scholarship of many scholars of the *ubuntu* philosophy, a common view is that communal relationships and other-regarding behaviours are at the centre of being a human or person. A common maxim that expresses this idea is the claim, 'a person is a person through other persons.' The maxim has both descriptive and prescriptive implications. Descriptively, it implies that one is metaphysically dependent on the community for one's identity. Prescriptively, the maxim expresses the moral principle that one ought to prize other-regarding behaviours since this is how one becomes human and/or a person (EWUOSO & HALL 2019). One ought to affirm others, seek goals that do not undermine their well-being, share a way of life with them, and act in ways that will more likely promote their good.

The *others* whose good one ought to seek are not limited to living humans but include non-human species like animals and plants in the broader environment on the horizontal line and spirits and ancestors on the vertical line. In other words, the community with whom one must relate comprises other humans, animals, and the wider environment. These are the entities on the horizontal line. The vertical line consists of spiritual entities like ancestors and spirits. Humanness and personhood tend to be in a symbiotic relationship with the physical and spiritual worlds in the African philosophy of *ubuntu.* In light of the preceding, Cornelius Ewuoso and Susan Hall (2019, 93) describe *ubuntu* philosophy as:

> an essentially *relational* ethics, which prizes [communal] relationships of interdependence, fellowship, reconciliation, relationality, community friendliness, harmonious relationships and other-regarding actions such as compassion and actions that are likely to be good for others, in which actions are morally right to the extent that they honour the capacity to relate communally, reduce discord or promote friendly relationships with others, and in which the physical world and the spiritual world are fundamentally united.

The view that ubuntu is an essentially relational ethics is also supported by Muxe Nkondo (2007, 91), who contends,

> If you [ask] ubuntu advocates and philosophers: what principles inform and organize your life? What do you live for…the answers would express commitment to the good of the community in which their identities were formed, and a need to experience their lives as bound up in that of their community.

Equally consider the following remark by Jonathan Chimakonam and Uchenna Ogbonnaya(2022, 7) concerning humans from this Afro-communitarian perspective, "humans do not exist in isolation; they exist in a community." These and other remarks about *ubuntu* prove that *ubuntu* philosophy is an essentially relational philosophy. It grounds morality in relationships. As Jonathan Chimakonam and Uchenna Ogbonnaya (2022, 8) remark," [in *ubuntu* philosophy], one can only become moral within [communal relationships]." The normative implication of the scholarship on *ubuntu* philosophy (or the moral norm that arises from this description) is that actions are right "to the extent that they promote social integration and interconnectedness, honour communal relationships or the capacity for the same and reduce discord or promote friendly relationships with others" (EWUOSO & HALL 2019, 100).

Notice that the preceding moral norm does not imply that individuals who *fail to* showcase *ubuntu* in the relevant sense are *literally* no longer humans. Instead, it means they have been unable to showcase what is valuable about human nature. In subsequent sections, I will demonstrate the implications of this norm for specific applications of germline gene editing in subsequent sections.

Specific Applications of Germline Gene Editing and Ubuntu Philosophy

In this section, I explore the implications of the moral norm for the specific applications of germline gene editing in medicine, agriculture and wildlife. It is not always possible to explore the implications of the moral norm I described in the previous section for all the possible applications of germline gene editing. However, given the limited space, this article will restrict its discussion to these three common areas of human endeavours.

Xeno-transplantation

There are several gene-editing technologies in existence. Some include recombinant DNA technology and CRISPR, which allows segments of genes to be removed and added. In fact, CRISPR is an exciting new technology, allowing scientists to undertake necessary research (at reduced cost), most of which may have taken years and cost millions of dollars.

These technologies may be used to realize various objectives. For example, they could be used to study specific conditions and diseases. In the past, they have been used to modify animal organs so that they (animals) become more suitable for transplantations in humans (xeno-transplantation). Specifically, Jonathan Chimakonam and Chris Akpan (2012, 3) describe xeno-transplantation as "organ transplantation between members of different species." There are utilitarian arguments justifying xeno-transplantation. There is a massive shortage

of organs like the liver and kidney, and many people will die on the waiting list. Xeno-transplantation promises to be a game-changer by cultivating scarce organs in animals (KRISHNA & LEPPING 2011). In fact, there has been real progress in this regard. Transplant surgeons have been harvesting and transplanting pig heart valves and kidney transplants into humans for years. Geneticists have found a way to alter the DNA of pigs. Specifically, they have found a way to make a hole in pigs, implant human stell cells into the pig's embryo, use the human stem cells to grow new organs in pigs, and finally, transplant the new organs into a human body. However, is this morally justified? Could humans use animals as means of realizing their health needs? The reader would observe that these questions has also been raised by Jonathan Chimakonam and Chris Akpan (2012). Unlike these scholars who draw on the thinking about individual's right to self-determination to interrogate these questions, I draw on a moral theory from the Global South. Notably, from the point of view of *ubuntu* philosophy that morally requires individuals to prize other-regarding behaviours, this is justified since it can advance human relationships. Illness undermines fellowship with other humans since it reduces one's opportunity to enjoy a deep communal relationship with them. Contrarily, freedom from disease can increase one's opportunity to enjoy a deep communal relationship with others (EWUOSO 2021).

However, the reader should notice how the moral norm I draw on differs from the utilitarian philosophy that has been used to justify xeno-transplantation. Since *ubuntu* emphasizes right relationship with both humans and animals (horizontal line), how one treats the animals also matters. Unlike the utilitarian philosophy that merely emphasizes overall happiness, in the ubuntu philosophy, the animal's good must also be considered since this is essential for acting morally and becoming a person from this positionality. Equally, the reader should notice that in the *ubuntu*-inspired justification, xeno-transplantation is moral because it enhances communal relationships, and is different from the utilitarian-inspired justification that emphasizes maximizing happiness. In utilitarianism, it does not matter whether an action produces happiness at the expense of some individuals or entities. In contrast, in the deontological interpretation of the ubuntu that this article draws on, one ought *not* to realize a good end however one can. Mary Carman (2023, 3) articulates this point aptly in the following way, "[in *ubuntu* philosophy], we have a duty to promote and respect [relationships], not to maximize them" since maximizing them can conflict with some intuitions we hold about relationships. Certain ways of relating with others are immoral in themselves, even if they produce overall happiness. For example, forcing an individual to have a sexual relationship with oneself. Part of respecting animals as objects of relationships requires that they should not be subjected to unnecessary pain and hardship to foster human good, or they should not be used merely for this purpose.

In light of the above, xeno-transplantation raises one ethical question worth considering, even if briefly. Does having a part of an animal in oneself make one less of a person/human? Does it undermine or decrease one's identity? While Jonathan Chimakonam and Chris Akpan (2012) feel it does – and they call this the "YU[C]K FACTOR". As they remarked, "Having an animal's organ in one's body has the potential to decrease one's self image despite intense counseling on the neutrality of this occurrence. We feel that this possibility, referred to as the

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"YUK FACTOR" [sic]…is a strong ethical opposition to the domain of xeno-transplantation on the level of the individual involved" (CHIMAKONAM & AKPAN 2012, 6). However, the reader should observe that in the modal account of the Ubuntu philosophy that I draw on, the capacity for communal relationships is what matters for being a person and not *merely or solely* some biological factors. Suppose that capacity is not significantly undermined, that is, suppose xeno-transplantation does not make one more of an animal than a human in ways that imply that the individual is no longer able to commune or be communed with in the appropriate ways. Suppose the individual could still relate with others and be related with, in relevant ways. In that case, they remain a person/human. Given the importance that is placed on communal relationships, in the rare event that xeno-transplantation undermines one's capacity to relate; in such event, it would be immoral.

Agriculture

Germline gene editing could also be used in agriculture to increase animal and plant efficiency, safety, and productivity. For example, germline gene editing could make animals and crops more resistant to diseases. To reduce environmental waste, enviro-pigs have been developed by modifying the pig's gene structure. Equally, scientists have succeeded in increasing yield so that there are more corns. In the same vein, scientists have also improved the environmental adaptation of certain plants like grapes to survive more scorching weather or season (KARAVOLIAS n.d.n 2021; MALLAPATY 2022).

Yet, the application of germline gene editing to realize various ends in agriculture raises critical ethical questions worth addressing from the Afro-communitarian *ubuntu* philosophy perspective. There are questions about food safety. Is genetically modified food safe for humans? For example, Jonathan Chimakonam (2013) has argued that genetically modified food could have unforeseen health implications. A more recent systematic review has also confirmed some adverse effects associated with consuming genetically modified food. They include low fertility, cancer and mortality, to name a few (SHEN n.d.n 2022). However, as the authors observe, these adverse effects are common in genetically modified foods that were not safely developed. Will these modified genes be passed on to the human germline and affect humans in ways we cannot imagine now? These are scientific questions, which nonetheless have moral implications.

For this reason, ethics must be integrated into science. The reader should notice that many scholars have attempted to defend how ethics can be integrated into the use of germline gene editing in agriculture. For example, Nicholas Karavolias and colleagues (2021) have explored the various ethical issues gene editing for agriculture raises and in the process, explain how these ethical issues may be addressed. Similarly, Fatma Ayanoglu and colleagues (2020), as well as Mara Almeida and Robert Ranisch (2022) have also explored questions concerning how ethics can be integrated into germline gene editing for various agricultural purposes.

However, I am not aware of a study which has explored how the ethical questions that germline gene editing *for various* agricultural purposes may be addressed from the Afro-communitarian *ubuntu* philosophy perspective. I

acknowledge that there is always the probability of scientists going too far, implying that their reason for using germline gene editing may not be to enhance human good but increase profit or realize ideologies. The Nazi eugenic view is an example. The philosophy that morally requires one to act in ways that promote one another's quality of life demands that the goal of editing within the field of agriculture should not merely be to grow profit by *safely* increasing yields. Science ought to be *primarily* concerned about plant and environmental safety. In other words, scientists ought not to be merely concerned about making profits or increasing agricultural yields only for human consumption. Germline gene editing within the field of agriculture is morally permissible from the *ubuntu* perspective, if it is safe and does not harm the environment.

Wildlife

Germline gene editing could also alter insect species or eradicate pests like locusts that cause colossal damage to humans and plants. For example, scientists have been able to control the extinction of anopheles mosquitoes that cause malaria in some regions of the world (WISE & BORRY 2022). Some *controlled* eradication of plants and insect species raises specific ethical questions from the perspective of the Afro-communitarian ubuntu philosophy. First, what would be the impact on the ecosystem of causing the extinction of insects like mosquitoes? This question is important from the point of view of the predator-prey relationship of the ecosystem. Are there predators of anopheles mosquitoes that will die out if there are no more anopheles mosquitoes? Are there preys of these mosquitoes that would likely overpopulate the ecosystem because anopheles mosquitoes have been completely eradicated? Are there other humans who consider these mosquitoes objects of communal relationships and whose relational capacities would be undermined if these mosquitoes are eradicated? Second, the *intrinsic value of biodiversity* queries the permissibility of causing the extinction of particular species. Suppose we believe – as I have defended in this article – that biodiversity is intrinsically valuable and species in the wider environment are part of communal relationships. In that case, it would be immoral to directly cause the extinction of particular species since this will violate the intrinsic value of biodiversity itself.

To reiterate, the Afro-communitarian *ubuntu* philosophy mandates other-regarding behaviours, where the *other* in the other-regarding behaviours include all entities in the physical and spiritual world. Although entities in communal relationships have intrinsic values, most scholars of this philosophy accept that we do not have *equal* moral duties to all entities. Our moral duties to others depend on their moral status, whether full or partial. African conceptions of moral status have been discussed to a significant degree by Thaddeus Metz (2012). Nonetheless, note that to have a moral status is to be an *object* of *direct duties*. Entities that have full moral status are those that can be subject and object of relationships. Entities that have partial moral status are those that can only be the objects of relationships. One is a subject if one can *in principle* "share a way of life" with others, and an object if others can share a way of life with oneself. Humans are generally in a position to share a way of life with other humans. In this regard, they have full moral status. Animals have partial moral status since they cannot be subjects of relationships. However, other humans can have a relationship with them – as

objects of that relationship. This is also true of plants and insects. Entities with no moral status can neither be subjects nor objects of relationships, such as a pen or a stone.

The theory of moral status grounded in ubuntu philosophy suggests that there is a greater moral obligation to seek the well-being of entities with higher moral status. In this case, there is a higher moral duty to seek the well-being of humans through the controlled extinction of insects that undermine humans' well-being. Here, the ethical basis for the controlled extinction of anopheles mosquitoes is that they undermine the well-being of agents with a higher moral status. Accordingly, it would be immoral to cause the extinction of entities with partial moral status when they pose no significant threat to entities with higher moral status.

Objecting to the Ubuntu-Inspired Germline Gene Editing Applications

One objection to the *ubuntu*-inspired thinking about germline gene editing application that I described in the previous section is that it is shallow and has not considered to any significant degree more important ethical concerns raised against germline gene editing. One crucial ethical concern is the risk of harm to future generations or the risk of off-targets. It is currently difficult to understand or comprehend the potential harm associated with germline gene editing and how far-reaching the harm will be to undertake a proper risk-benefit calculus of the same. What also makes germline gene editing problematic is that it cannot be reversed if there are harmful modifications. Any germline gene enhancement is permanent. These technologies are imperfect, and there are likely to be off-target alterations. As a result, modifications, including enhancements later found to be harmful or dangerous, cannot be reversed. How does the Afro-communitarian *ubuntu* philosophy respond to this issue?

Additionally, we intuitively believe that parents have a right to make decisions on behalf of their children. But germline gene editing raises fundamental questions regarding informed consent and whether it is justified to make life-changing decisions about how the life of our children will go. These questions are important because there will likely be cultural changes in the future. In the same way our preferences today are significantly different from what used to be the case. What today's people prefer might be different tomorrow. So, is it ethically permissible to make this type of change on behalf of non-consenting offspring, given that the changes we consent to now will endure throughout their lifetime?

The critic is correct to observe that I have focused primarily on the beneficial and therapeutic applications of germline gene editing for transplantation, agriculture and wildlife. However, should germline gene editing be permitted since it is nearly impossible to outline all the harm that can result? From the *ubuntu* perspective, it does not seem necessary to know all the harm that can result from germline gene editing, including the future ones. It is sufficient that germline gene editing does not harm one's capacity to share a way of life in the present. In the ethics of relationships grounded in *ubuntu,* our present and longstanding relationships have moral priority over future and potential ones (METZ 2007; METZ & GAIE 2010). In other words, we are more obligated to foster present and actual relationships than future ones. Whilst this philosophy acknowledges the moral right of future

generations; nonetheless, it considers the right of the present and actual humans as more important. This thinking does not jeopardize future lives. Specifically, lives matter regardless of *where* they live or *when* they are lived. Though our present relationships are more morally important, *ubuntu* requires individuals to consider the long-term impact of current actions *when they* are known. In other words, though *ubuntu* privileges current lives, it does not thereby systematically neglect future lives. There is a general duty to use current information to ensure that life goes *as well as possible* for all humans, including future humans, over the long term. Future generations may be far away in time, the risk of harm to them equally ought to be accounted for in our decisions in the present. This, in fact, is the basis of various agitations for political governments to make firm decisions against climate change. Many climate change activists intuitively believe that we have a moral duty to ensure that no civilization ends up in a worst state owing to our current actions. This is equally the conviction of the Afro-communitarian *ubuntu* philosophy.

In addition to the preceding, I also acknowledge that other non-therapeutic applications would raise important questions, like using germline gene editing to give more cognitive capacity to the recipient or characteristics like the capacity to run faster. These are less urgent applications of germline gene editing(METZ 2022). The preceding contrasts more urgent purposes for using germline gene editing. These more urgent purposes include using germline gene editing to prevent illnesses or treat adverse conditions that an individual and/or their future generation may suffer. Germline gene editing for more urgent purposes is always moral since illness undermines one's capacity to be the subject and object of communal relationships (EWUOSO 2020). From the point of view of the Afro-communitarian *ubuntu* philosophy, less urgent applications of germline gene editing would be moral or immoral to the extent that they advance sharing a way of life. For example, suppose that by granting greater cognitive capacity, an individual is better able to relate and be related with – or seek to increase the quality of others – this would be justified from the perspective of the Afro-communitarian *ubuntu* philosophy. Contrarily, germline gene editing *for less urgent purposes* like making a beautiful girl downright gorgeous will be immoral from the point of view of the Afro-communitarian *ubuntu* philosophy, suppose these less urgent purposes undermine relationships. To understand how, the reader should notice that the basis of morality is relationship. Moral actions are those that foster relationships or at least, do not undermine the same, whilst actions are immoral, suppose they undermine communal relationships.

Furthermore, the reader should also notice that the objection I address, raises key questions not only about the importance of undertaking *full* risk-benefit calculus but also about whether it is ethical to make life-altering decisions on behalf of future generations. In other words, is it ethical to behave paternalistically towards the future generation? Paternalism is not always immoral and may be justified if it advances relationships (from the perspective of the Afro-communitarian *ubuntu* philosophy). Particularly, such paternalistic acts are justified if the anticipated benefits – including benefits to future generations – outweigh any harm that may likely result. Moreover, part of our responsibility to future generations includes ensuring that there is a *future.* This may entail passing on healthy genes and ensuring a reasonably good habitat or environment for future

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lives. For this reason, though values and preferences of individuals may change in the future, whereas germline gene editing is irreversible, germline gene editing undertaken for more urgent purposes (like eliminating bad genes or developing environmentally friendly animals) could be long-term actions we can take in the present to protect future generations or ensure that there is indeed a future. In other words, suppose we believe that our present actions could indirectly improve the lives of future humans or enhance their capacity to share a way with others. In that case, this ought to be done.

Bonginkosi Shozi and Donrich Thaldar (2023) provide a different justification for why we have an obligation to foster future generations' health, which is worth highlighting here. Conceptualizing community as a metaphysical entity encompassing the past, present and future humans, they contended that taking the interest of all humans seriously will include acting in ways that [honour past memories and] foster future humans' well-being. The preceding thinking about community echoes the description of ubuntu by Cornelius Ewuoso and Susan Hall (2019) – which I described in a previous section as encompassing all lives in the physical and spiritual worlds. Reasonably, this could imply – as Bonginkosi Shozi and Donrich Thaldar (2023) rightly remarked – requiring present humans to undergo human heritable genome editing that results in the birth of children with modified (good) genome. Although not a uniquely African maxim, one saying that adequately captures the preceding is "we do not inherit the Earth from our ancestors; we borrow it from our children" (MAWLONG 2020).

Conclusion
In this article, I have outlined the implications of the Afro-communitarian *ubuntu* philosophy for specific applications of germline gene editing. Specifically, the philosophy that grounds moral status and morality in communal relationships would permit germline gene editing on the condition that it fosters one's capacity to share a way of life with others. Furthermore, germline gene editing will be impermissible if it causes division among individuals. Nonetheless, many choices we make in the present are based on current values and preferences, which may indeed change in the future. Importantly, we would not likely know our future generations' preferences. Future humans are better positioned to describe their own interests and preferences. Although I have justified the permissibility of paternalistic decisions on behalf of future humans, nonetheless, I believe that studies are still required to interrogate how we can ensure that our present decisions concerning germline gene editing do not significantly limit future generations' capacity to make choices by locking them firmly into our present values and preferences.

This issue is dedicated to our Assoc. Editor and a second-generation member of the Calabar (Conversational) School of Philosophy (CSP): **Prince. Prof Mesembe Ita Edet (1965-2023)**

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