Clarifying Misconceptions and Recentring the Debate on Heritable Human Genome Editing in South Africa: A Response to De Vries

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Abstract

This article responds to recent criticisms by Professor Jantina de Vries regarding my research group's position on the legal status of heritable human genome editing (HHGE) in South Africa. De Vries challenges our interpretation of section 57 of the *National Health Act* (NHA), questions the methodology of our deliberative public engagement study, and speculates about the broader intentions behind our work. In this response, I clarify our interpretation of section 57 using established principles of statutory interpretation and show that the provision prohibits reproductive cloning but does not ban HHGE outright. I address misconceptions surrounding the scope and structure of the provision, and demonstrate why an interpretation that bans HHGE would result in internal inconsistency. I also defend the methodological soundness and peer-reviewed credibility of our public engagement research, and respond to concerns about our broader strategic intent. Finally, I propose a constructive path forward: a context-sensitive regulatory framework for HHGE grounded in constitutional values, public health priorities and rigorous ethical oversight. The article aims to re-centre the debate on substantive legal and governance issues and invites evidence-based academic engagement on the future of HHGE in South Africa. In doing so it contributes to a more principled and legally coherent foundation for regulating advanced biotechnologies in constitutional democracies.

Keywords

Health law; genome editing; *National Health Act*; public engagement; statutory interpretation.

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1 Introduction

Heritable human genome editing (HHGE) represents one of the most debated frontiers of modern biotechnology, raising profound ethical, legal and societal questions. In South Africa, where public health challenges and constitutional values uniquely shape the discourse, the debate surrounding HHGE is both urgent and nuanced. In a recent blog post on the official website of the University of Cape Town, Professor Jantina de Vries[1] raised concerns about the legal position adopted by my research group in relation to HHGE in South Africa. She questions the claim – advanced in our publications – that HHGE is not banned outright under South African law. In her view this claim relies on a "highly technical" reading of section 57 of the *National Health Act* (NHA),[2] which "most legal and scientific experts in South Africa" find unconvincing. She also raises methodological concerns about our public deliberation study, suggesting that its findings overstate public support for HHGE. In addition she expresses concern about the broader trajectory of our work, suggesting that it may be aimed at preparing the ground for strategic litigation.

The core concern raised by De Vries – namely, that the uncritical adoption of HHGE could exacerbate existing inequalities in a society marked by a history of injustice – is a legitimate and important one. In any consideration of genome editing, especially in South Africa, questions of fairness, access and social justice must remain central. Where I differ from De Vries is not in recognising these risks, but in how best to address them. Rather than pre-emptively prohibiting HHGE through restrictive legal interpretation, I argue that these concerns are better managed through a clear and enabling regulatory framework grounded in constitutional values and subject to robust ethical oversight.

In our digital age, blog posts are potentially powerful media for robust academic debate. Moreover, if such posts are published on official university websites, they are reasonably perceived as carrying a good measure of academic authority. As such, it would then also be reasonable to expect such purportedly academic blog posts to remain grounded in accuracy, and exhibit sound reasoning and careful engagement with primary sources – in other words, to adhere to the basic tenets of academic rigour. However, I suggest that De Vries' blog post is wanting in this regard.

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AI Declaration**:** The author acknowledges the use of ChatGPT to enhance the quality of language and readability of this article.

1 De Vries 2024 https://health.uct.ac.za/ethics-lab/articles/2024-11-15-legal-and-ethical-debate-human-heritable-genome-editing-hhge-south-africa.

2 *National Health Act* 61 of 2003 (NHA).

Given the legal nature of the assertions made by De Vries, I decided to defend my research group's work in South Africa's highest impact law journal, and subject my response to rigorous peer review by legal experts.

In this response I aim to address De Vries' critiques directly, and re-centre the debate on meaningful legal and governance solutions for HHGE in South Africa. To achieve this, the response is structured as follows. First I examine De Vries' critique of our interpretation of section 57 of the NHA. I demonstrate through rigorous statutory interpretation that section 57 prohibits reproductive cloning but does not ban HHGE. This part clarifies how the provision must be read within its textual, contextual and historical framework, and challenges the assumption that HHGE falls under this prohibition. Second I turn to the methodological critique of our deliberative public engagement study on HHGE. I explain why deliberative engagement was the most appropriate methodology, address misconceptions about participant selection, and highlight the peer-reviewed validation of our approach. Third, I engage with De Vries' broader speculation about the motives behind our research, clarifying the distinction between advancing scholarly discourse and shaping regulatory policy. Finally I propose a shift in focus towards constructive governance solutions, outlining how South Africa can regulate HHGE in a manner consistent with constitutional rights, public health priorities and ethical safeguards.

The legal and ethical discourse surrounding HHGE in South Africa deserves a constructive approach. Rather than becoming side-tracked by misinterpretations, the conversation should prioritise the concrete legal and policy questions that will shape the future of genetic medicine in the country. In this spirit I invite De Vries and other scholars to engage not in vague criticism but in specific, evidence-based dialogue about the legal, ethical and methodological dimensions of HHGE regulation.

2 The critique of our legal interpretation

Section 57 of the NHA reads as follows:

> **Prohibition of reproductive cloning of human beings**
>
> 57 (1) A person may not—
>
> (a) manipulate any genetic material, including genetic material of human gametes, zygotes or embryos; or
>
> (b) engage in any activity, including nuclear transfer or embryo splitting,
>
> for the purpose of the reproductive cloning of a human being.
>
> (2) The Minister may, under such conditions as may be prescribed, permit therapeutic cloning utilising adult or umbilical cord stem cells.

> (3) No person may import or export human zygotes or embryos without the prior written approval of the Minister.
>
> (4) The Minister may permit research on stem cells and zygotes which are not more than 14 days old on a written application and if—
>
> (a) the applicant undertakes to document the research for record purposes; and
>
> (b) prior consent is obtained from the donor of such stem cells or zygotes.
>
> (5) Any person who contravenes a provision of this section or who fails to comply therewith is guilty of an offence and is liable on conviction to a fine or to imprisonment for a period not exceeding five years or to both a fine and such imprisonment.
>
> (6) For the purpose of this section—
>
> (a) "reproductive cloning of a human being" means the manipulation of genetic material in order to achieve the reproduction of a human being and includes nuclear transfer or embryo splitting for such purpose; and
>
> (b) "therapeutic cloning" means the manipulation of genetic material from either adult, zygotic or embryonic cells in order to alter, for therapeutic purposes, the function of cells or tissues.

My research group's legal interpretation, developed and refined over time, is that section 57 of the NHA is specifically designed to prohibit reproductive cloning, not HHGE.[3] Accordingly, HHGE is not categorically banned under South African law. This, of course, does not imply that HHGE research can proceed unconditionally. As with any research – particularly in the health research context – numerous legal and ethical requirements must be adhered to. Most notably, all health research requires approval from a health research ethics committee registered with the National Health Research Ethics Council (NHREC),[4] and embryo research additionally requires ministerial approval.[5]

A noteworthy development is that the NHREC's 2024 ethics guidelines includes a section that purports to regulate HHGE,[6] which implies that HHGE is in principle lawful – aligning with our position. This implication has drawn criticism from bio-conservative commentators, some of whom have responded with alarmist narratives. In contrast, my research group has consistently reiterated our well-established position. We welcome the NHREC's guidelines as a constructive step towards regulating HHGE

3 Thaldar *et al* 2020 *S Afr J Sci* 1-8; Townsend and Shozi 2021 *PELJ* 1-28; Thaldar and Shozi 2022 *TSAR* 1-24; Thaldar *et al* 2025 *SAMJ*.

4 Section 73 of the NHA.

5 Section 57(4) of the NHA.

6 NHREC *South African Ethics in Health Research Guidelines* 74-75.

responsibly and ensuring that it aligns with both ethical oversight and public health priorities.[7]

Against this backdrop De Vries presents her critique of my research group's legal interpretation, beginning with a candid acknowledgment that she is not a lawyer. While this admission is honest, it inevitably sets a modest benchmark for the critique, as legal interpretation demands precision and analytical depth that can be challenging without formal training. Nevertheless, by engaging in the specialised domain of statutory interpretation her critique must still be evaluated on its accuracy and rigour.

Unfortunately De Vries presents an oversimplified version of our argument, reducing it to a contrived and scarcely recognisable interpretation. This requires a clear and thorough clarification of our position to avoid misrepresentation. Furthermore, rather than engaging substantively with the merits of our interpretation, De Vries asserts that "most legal and scientific experts in South Africa" find it unconvincing. This claim is unsupported by evidence and raises questions about its empirical basis. Has a systematic survey of South African legal and scientific professionals been conducted? Without such substantiation, generalised statements of this nature detract from the credibility of her critique and risk undermining meaningful academic dialogue.

While a recent editorial by De Vries and colleagues focusses explicitly on subsection 57(1),[8] in her solo blog post Dr Vries casts a broader net by also referring to "genetic manipulation for research purposes" and the meaning of "reproductive", thus implicating not only subsection 57(1) but also subsections 57(4) and 57(6). However, her remarks do not amount to a discernible argument in the analytical sense, as they consist of general assertions about the perceived views of "[m]ost legal and scientific experts in South Africa" rather than a structured interpretation of the statutory text. Needless to say, the views of most legal and scientific experts – even if there were evidence of such a consensus, which there is not – are not part of the canon of statutory interpretation. If one is serious about understanding the meaning and import of section 57, De Vries' remarks are therefore unhelpful. Nevertheless, to clarify my research group's position and avoid misrepresentations, I provide an analysis of section 57 considered in its entirety. This analysis synthesises my research group's thinking and internal discussions over the past few years, while incorporating new insights where appropriate.

7 Thaldar *et al* 2025 *SAMJ* 6-7.
8 Ramsay *et al* 2025 *SAMJ* 4-5.

2.1 Section 57 and human reproductive cloning

Section 57 of the NHA addresses various aspects of genetic research and manipulation, with specific provisions governing both research on embryos and the prohibition of reproductive cloning. Research on embryos within the first 14 days of development is permitted under section 57(4), provided three conditions are met: ministerial consent, donor consent, and the researcher's undertaking to maintain detailed records. This provision establishes a legal framework for embryonic research, distinguishing it from the broader prohibitions under the same section.

The prohibition of "reproductive cloning of a human being" is a central feature of section 57. This concept is defined in section 57(6)(a) as the manipulation of genetic material to achieve the "reproduction of a human being", including nuclear transfer or embryo splitting for such purposes. This statutory definition exemplifies problematic drafting,[9] highlighting the need for specialist health lawyers to revise this chapter of the NHA. The word *reproduction* can have two possible meanings:

- copying or replication (at a genetic level) of a human being—i.e., the common understanding of cloning; or
- procreation in the broader reproductive sense.[10]

For several reasons, the first meaning is the correct one.

2.1.1 Context

In South African law it is well-established that statutory interpretation requires consideration of the context in which a provision appears and the apparent purpose it seeks to achieve.[11] In the case of section 57 multiple indicators point to its specific objective of outlawing reproductive cloning.[12] These indicators include the section's heading, "Prohibition of reproductive cloning of human beings", as well as the repeated references to cloning throughout the provision.[13]

2.1.2 Background

The background to the drafting of section 57 – the circumstances attendant upon its creation – can provide valuable insight into its purpose.[14] The NHA, enacted in 2003, was drafted in the aftermath of the cloning of Dolly the

9 Townsend and Shozi 2021 *PELJ* 8.
10 Thaldar and Shozi 2022 *TSAR* 17.
11 *Natal Joint Municipal Pension Fund v Endumeni Municipality* 2012 4 SA 593 (SCA) para 18.
12 Thaldar and Shozi 2022 *TSAR* 17.
13 Thaldar *et al* 2020 *S Afr J Sci* 3.
14 *Natal Joint Municipal Pension Fund v Endumeni Municipality* 2012 4 SA 593 (SCA) para 18.

Sheep in 1996. While gene editing techniques such as zinc finger nucleases were already available by 2003, HHGE as it is now understood – particularly with the precision and accessibility brought by CRISPR-Cas9 – had not yet become a practical or especially prominent focus of scientific or legal concern. Thus it seems unlikely that HHGE could have been the mischief addressed in section 57. Moreover, the ethical concerns with human cloning primarily centre on human individuality and genetic uniqueness.[15] However, these concerns are not applicable to HHGE.[16] This suggests that the purpose of section 57 is to prohibit reproductive cloning rather than HHGE.

2.1.3 Linguistic coherence

A key principle of statutory interpretation is that the language of a provision must conform to the ordinary rules of grammar and syntax. The phrase "copying of a human being" is linguistically coherent because the verb *copying* does not, on its own, specify the object being copied – it could refer to anything, so the addition of "a human being" is necessary to convey meaning. In contrast, the phrase "procreation of a human being" is awkward because the noun *procreation* already implies the generation of a being of the same species. One does not typically speak of the "procreation of a cat" or the "procreation of a human being"; rather, the species is understood from the context. As a result, the phrase "of a human being" becomes redundant and unnatural in ordinary language, introducing unnecessary repetition that detracts from the grammatical and stylistic precision expected in statutory drafting.

2.1.4 Avoiding inconsistency

A fundamental principle of statutory interpretation, which offers a definitive conclusion in the present analysis, is that internal inconsistency within a statute must be avoided.[17] If the term "reproduction" were interpreted to mean "procreation," it would render unlawful all manipulation of genetic material aimed at achieving procreation. As I explain in section 2.2.2 below, such manipulation includes widely accepted practices such as *in vitro* fertilisation (IVF). However, section 68 of the NHA explicitly provides for the ministerial regulation of activities such as IVF, thereby affirming their lawfulness. Clearly, IVF cannot be unlawful and lawful at the same time. Consequently, interpreting "reproduction" as "procreation" would result in an internal inconsistency within the statute, making such an interpretation untenable.

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15 Thaldar and Shozi 2022 *TSAR* 17.
16 Thaldar and Shozi 2022 *TSAR* 17.
17 *Moyo v Minister of Justice and Constitutional Development* 2018 2 SACR 313 (SCA) para 90.

2.1.5 Conclusion on the meaning of "reproduction of a human being"

For these reasons, "reproduction of a human being" must be understood as the copying or replication (at a genetic level) of a human being. Hence, the statutory meaning of reproductive cloning aligns with the common understanding of the concept, which is different from and does not include HHGE.

2.2 The focus of debate: section 57(1)

I now turn to section 57(1), which has been the focus of recent debate[18] – probably because it contains the prohibition. For ease of reference I quote this subsection again:

> 57 (1) A person may not—
>
> (a) manipulate any genetic material, including genetic material of human gametes, zygotes or embryos; or
>
> (b) engage in any activity, including nuclear transfer or embryo splitting,
>
> for the purpose of the reproductive cloning of a human being.

That HHGE involves the manipulation of genetic material is self-evident. The critical question, therefore, is whether section 57(1) prohibits all forms of genetic manipulation, including HHGE, or only those undertaken for the purpose of reproductive cloning. Resolving this issue requires an analysis of the structure of the provision.

2.2.1 The structure of section 57(1)

The structural arrangement of section 57(1) is critical to its interpretation. The qualifying phrase at the end – "for the purpose of the reproductive cloning of a human being" – is distinctly separated from subsection (b) by a line break and is aligned with the main body of the provision, rather than being indented like subsections (a) and (b). This structural arrangement indicates that the qualifying phrase governs both subsections, making it clear that the prohibition on manipulating genetic material in subsection (a) applies only when such manipulation is undertaken for the purpose of reproductive cloning.[19] Consequently, genetic manipulation for other purposes is not prohibited.[20]

As previously established, reproductive cloning does not encompass HHGE. It follows, therefore, that the manipulation of genetic material for HHGE falls outside the scope of section 57(1) and is not prohibited. Any interpretation that disregards the qualifying phrase – "for the purpose of the

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18 Ramsay *et al* 2025 *SAMJ*; Thaldar *et al* 2025 *SAMJ*.
19 Thaldar *et al* 2025 *SAMJ* 6.
20 Thaldar *et al* 2025 *SAMJ* 6.

reproductive cloning of a human being" – would constitute a misreading of the provision.[21]

Although this argument based on the structural arrangement of section 57(1) is conclusive, it is further reinforced by an examination of the meaning of "manipulate" in both ordinary language and scientific discourse.

2.2.2 The meaning of "manipulate"; ordinary meaning

The term "manipulate" is not defined in the NHA and must therefore be interpreted according to its ordinary meaning, which includes:

- "to manage or utilize skilfully",[22] or
- "to use something, often with a lot of skill".[23]

Applying this ordinary meaning, "manipulate any genetic material" would logically refer to the skilful handling, control, or utilisation of genetic material.[24] Many widely accepted and essential scientific and medical practices involve such skilful handling of genetic material, including:

- *DNA isolation*. The process of extracting genetic material (DNA) from biological samples for analysis. While this involves physical and chemical handling of the genetic material, it does not entail any modification or artificial control of the DNA sequence.
- *Genetic sequencing*. A technique used to read and interpret the genetic material by determining the exact sequence of nucleotides in DNA. This process does not modify the DNA but provides information essential for genetic research and diagnostics.
- *In vitro fertilisation (IVF)*. A reproductive technique in which genetic material from egg and sperm cells is combined outside the body to facilitate conception. While IVF involves the handling and selection of this genetic material, it does not involve any modification or reprogramming of the DNA itself.
- *Preimplantation genetic testing (PGT).* A method of screening embryos by analysing their genetic material for specific conditions before implantation. Like genetic sequencing, PGT involves assessing embryos based on their genetic composition but does not involve any alteration of the genetic material itself.

21 Townsend and Shozi 2021 *PELJ* 7.

22 Merriam-Webster Dictionary date unknown https://www.merriam-webster.com/dictionary/manipulate.

23 Cambridge Dictionary date unknown https://dictionary.cambridge.org/dictionary/english/manipulate.

24 Thaldar *et al* 2025 *SAMJ* 6.

If section 57(1) were interpreted as prohibiting any manipulation of genetic material – i.e., if the qualifying phrase were deemed to be applicable only to (b) and not to (a) – it would unintentionally criminalise all of these practices – an absurd and catastrophic result that would undermine both public health and scientific research.

2.2.3 The meaning of "manipulate" a scientific meaning?

A counterargument might be that "manipulate any genetic material" should not be interpreted according to ordinary language but rather in accordance with a narrower scientific definition. For instance, *A Dictionary of Genetics* defines gene manipulation as:[25]

> [t]he formation of new combinations of genes in vitro by joining DNA fragments of interest to vectors so as to allow their incorporation into a host organism where they can be propagated.

This definition highlights two essential components of the scientific understanding of genetic manipulation:

- *Modification*. The direct alteration of genetic material, meaning that the DNA sequence itself is physically modified by inserting, deleting or rearranging genetic fragments.
- *Artificial control*. The deliberate, human-driven intervention in genetic material, making it a form of artificial genetic control.

HHGE would clearly fall within this scientific definition because it entails both the modification and the artificial control of DNA. It directly alters the genetic sequence of embryos and intentionally directs genetic expression in ways that could be passed on to future generations.

However, this scientific definition would exclude several key processes that should logically fall under section 57(1)'s prohibition on reproductive cloning, including:

- *Embryo splitting*. A technique where an early-stage embryo is artificially divided to produce identical twins. This method does not modify DNA but results in genetically identical individuals. If genetic manipulation were defined as only the modification of DNA, then embryo splitting would not qualify as genetic manipulation.
- *Nuclear transfer*. The process of creating a genetic copy of an organism by transferring the nucleus of a somatic cell into an enucleated egg. While this involves transferring genetic material, it does not involve direct genetic modification under the scientific definition.

25 King, Stansfield and Mulligan *Dictionary of Genetics* 174.

- *Other forms of reproductive cloning*. Methods such as cytoplasmic transfer or parthenogenesis could theoretically produce genetically identical offspring without altering DNA sequences, meaning they would not qualify as "genetic manipulation" under the scientific definition.

This contradicts section 57(6), which explicitly employs the phrase "manipulation of genetic material" in its definition of reproductive cloning. It is therefore evident that "manipulation of genetic material" cannot be confined to the narrow scientific definition. Consequently, the counterargument that "manipulate" should be interpreted scientifically rather than in its ordinary sense is untenable.

This reinforces my earlier conclusion: interpreting section 57(1) as a blanket prohibition on all forms of genetic manipulation would inadvertently criminalise essential medical and scientific practices – an illogical and counterproductive outcome that would not only stifle scientific progress but also undermine public health efforts. This conclusion further substantiates my position that section 57(1) cannot be interpreted as imposing a blanket prohibition on all forms of genetic manipulation.

2.3 Conclusion: Distilling the argument

My research group's interpretation of section 57 draws a clear distinction between (a) reproductive cloning, which is prohibited, and (b) other forms of genetic manipulation, such as HHGE, which are not. The statutory language confines the prohibition to genetic manipulation undertaken "for the purpose of reproductive cloning". It does not extend to all forms of genetic manipulation.

This conclusion is firmly rooted in established principles of statutory interpretation. For comparison, consider a legal provision stating: "Using a cell phone for the purpose of setting off a bomb is prohibited." This would not mean that all cell phone use is banned, but rather that only cell phone use for a particular prohibited purpose falls within its scope. The same reasoning applies to section 57, which prohibits genetic manipulation only where it serves the specific purpose of reproductive cloning.

Rather than engaging substantively with the complexities of this interpretation, De Vries' critique relies on reductive reasoning and unsupported assertions that fail to meet the standard of academic rigour expected in scholarly discourse. This approach misrepresents our position and undermines constructive academic engagement on an issue where clarity, precision and intellectual honesty are paramount.

3 Speculation about our broader strategy

Under the heading "A Broader Strategy at Play?" De Vries speculates that by publishing papers on Ubuntu philosophy, ethical principles and public attitudes toward HHGE my research group may be "constructing a narrative and evidence base that could support future legal challenges". Let me address this directly.

As socially conscious academics we pursue our research not merely for intellectual satisfaction (though it is very satisfying!) but also to create meaningful social impact. This includes contributing to policy reform through legislative processes and, where necessary, advancing the interpretation and application of the law through litigation. Our ability to engage in academic, policy and judicial arenas is a strength we value and exercise responsibly in alignment with the values of the Constitution.[26]

However, speculating that my research group has a "Broader Strategy" insinuates that we have some kind of ideological agenda with HHGE, and detracts from meaningful dialogue on the substance of our work. My research group has produced a substantial body of literature on HHGE[27] and we would welcome engagement with its substance. I hold no ideological commitment either for or against HHGE. My commitment is to the values of the Constitution. HHGE is in my view a tool – one with significant potential to advance those values, but also one that, if misused, could undermine them. On this foundational principle I suspect De Vries and I are in agreement.

I also remain open to being persuaded on how these constitutional values should be applied to emerging technologies like HHGE. If better insights are presented, I am prepared to be convinced. My positions on a number of issues have evolved over my career, often in response to thoughtful challenges from colleagues and students. I take pride in remaining open to new ideas and perspectives.

All socially conscious academics aim to have an impact beyond the ivory tower. My research group is no different, and we are proud to contribute to

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26 For example, human dignity, equality and freedom, as per s 36 of the *Constitution of the Republic of South Africa*, 1996.

27 Thaldar *et al* 2020 *S Afr J Sci* 1-8; Townsend and Shozi 2021 *PELJ* 1-28; Thaldar and Shozi 2022 *TSAR* 1-24; Thaldar *et al* 2025 *SAMJ*; Thaldar *et al* 2021 *PLoS One*; Thaldar *et al* 2022 *PLoS One*; Shozi *Afrocentric Approach to CRISPR-Cas9*; Shozi 2021 *JLB*; Shozi *et al* 2021 *J Med Ethics*; Shozi and Thaldar 2023 *Am J Bioeth*; Thaldar and Steytler 2021 *SALJ* 260-288; Thaldar and Shozi 2023 *Bioethics*; Kamwendo *Access to Healthcare in the Age of CRISPR*; Shozi 2020 *SAJHR* 1-24; Thaldar and Shozi 2020 *CRISPR J* 32-36; Thaldar 2023 *Health and Human Rights J* 43-52; Townsend 2020 *BMC Medical Ethics*; Kamwendo and Shozi 2021 *S Afr J Bioeth Law* 97-100; Thaldar, Shozi and Kamwendo 2021 *BioLaw Journal* 409-416; Thaldar 2023 *S Afr J Bioeth Law* 91-94.

the ongoing conversations about the responsible governance of HHGE in South Africa.

4 Methodological concerns about our public deliberation study

De Vries has expressed scepticism regarding the methodology of our deliberative public engagement study on HHGE. However, our methodology has been published in a peer-reviewed journal as a standalone article,[28] followed by publication of the study results in another peer-reviewed article.[29] This ensures that the process has been transparent and subject to rigorous academic scrutiny. Given this, vague attacks that do not engage with the actual details of our methodology are unhelpful and risk undermining the credibility of the broader academic debate.

To clarify, our study employed a deliberative public engagement methodology, chosen precisely because traditional public opinion polling does not allow for reflection or informed engagement. Public attitudes towards HHGE are often shaped by misconceptions or knee-jerk reactions, and our objective was to capture well-reasoned perspectives rather than superficial opinions. The study was designed to ensure inclusivity across demographic categories such as race, gender, education, age and religion, with the participants selected using a stratified randomisation process to maximise the diversity of their perspectives. The study did not seek to be statistically representative but rather aimed to provide an inclusive forum where a broad range of viewpoints could be rigorously debated.

All participants were required to pass an entrance exam that ensured they had a foundational understanding of genome editing before engaging in the deliberations. This was modelled on the Harvard Personal Genome Project's approach and ensured that responses were not based on misinformation or superficial understanding. The deliberations took place over three consecutive evenings via Zoom, with structured discussions facilitated by trained moderators. The study process included small-group discussions, plenary sessions and a structured voting system that measured changes in participant perspectives over time. The presence of a genetics expert allowed for the clarification of technical questions but did not influence the deliberative process, ensuring that the participants formulated their own views independently.

The study's results demonstrated a strong preference for HHGE when used to prevent serious heritable conditions, while there was significant opposition to HHGE for enhancement purposes. A key theme in the

28 Thaldar *et al* 2021 *PLoS One*.
29 Thaldar *et al* 2022 *PLoS One*.

deliberations was the principle of medical necessity, with the participants making clear distinctions between therapeutic applications and enhancements. There was also broad agreement that, should HHGE be permitted, access should not be limited to the wealthy but should be equitably available. These findings align with international public engagement exercises, reinforcing that deliberation provides more nuanced and considered perspectives than traditional polling.

If De Vries has specific methodological critiques or contradictory data, we would welcome them as part of a constructive academic dialogue. However, vague or unfounded claims contribute nothing to scholarly discourse and fail to engage with the substantive details of our study. If there are legitimate methodological concerns, they should be articulated clearly so that they can be addressed in a manner that advances rather than undermines meaningful discussion.

5 The need for substantive academic dialogue

While blog posts typically have a more informal tone than peer-reviewed academic articles, this does not mean that the language used in blog posts is immune to analysis – especially not if the blog post in question purports to engage in academic debate on a university's official website. In this section I reflect on the language used in De Vries' blog post and suggest that it is calculated to distract from substantive academic dialogue and marginalise my research group.

De Vries calls for the HHGE debate to be inclusive and evidence-based. This is commendable and aligns with the principles of meaningful academic discourse. However, the tone of her blog post, particularly the use of language such as "controversial" and "outrage" in relation to my research group's work, stands in contrast with this call. Instead of engaging with the substance of our work, she gives it negative emotive labels. This rhetorical tactic diverts attention from the actual legal and ethical arguments we have developed and undermines the potential for constructive academic dialogue.

The suggestion implied by De Vries' tone and choice of words – that our work lacks regard for ethical or public concerns – is both baseless and counterproductive. Our research is deeply grounded in South African constitutional values. For instance, past and present members of my research group have engaged rigorously with the values and rights enumerated in the Constitution, such as dignity,[30] equality,[31] freedom of

30 Thaldar *et al* 2020 *S Afr J Sci* 1-8; Shozi *Afrocentric Approach to CRISPR-Cas9*; Shozi 2021 *JLB*; Shozi *et al* 2021 *J Med Ethics*.

31 Thaldar *et al* 2020 *S Afr J Sci* 1-8; Shozi and Thaldar 2023 *Am J Bioeth*.

scientific research,[32] and access to healthcare services,[33] examining how these intersect with HHGE. We have also analysed how recent constitutional case-law in the field of reproductive law may in future impact on the balancing of parental reproductive autonomy and the best interest of the child in the context of HHGE,[34] and considered how HHGE should be governed at an international level.[35] These contributions reflect intellectual depth and demand equally thoughtful engagement – not dismissal through emotionally charged rhetoric.

The body of work produced by my research group – which includes legal analyses, constitutional interpretations, ethical reflections grounded in African philosophy, empirical studies on public attitudes, and detailed proposals for legislative reform – constitutes almost the entirety of the South African literature on the legal and ethical dimensions of HHGE to date. References to our own publications throughout this article are not incidental; they serve to illustrate the extent and depth of our engagement with the topic in the local context, and to foreground the existence of a substantial body of South African scholarship. Any serious academic dialogue on HHGE in South Africa must take this literature into account. Moreover, our publications draw extensively on international sources, ensuring that our work is not only rooted in local realities but also responsive to global developments. A truly inclusive and evidence-based debate must begin with an honest engagement with the existing scholarship – especially when that scholarship has emerged from the very context under discussion.

Characterising my research group's work as "controversial" or linked to "outrage" is a transparent attempt to marginalise us and our work. This framing distracts from substantive debate and paints our contributions as inherently contentious rather than as vital insights rooted in South Africa's constitutional and public health realities. Academic dialogue on HHGE must centre on rigorous, evidence-based arguments while respecting the complexities of local contexts.[36] Only by doing so can it remain relevant and responsive to the unique challenges and opportunities facing South Africa.

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32 Thaldar *et al* 2020 *S Afr J Sci* 1-8; Thaldar and Steytler 2021 *SALJ* 260-288; Thaldar and Shozi 2023 *Bioethics*.

33 Thaldar *et al* 2020 *S Afr J Sci* 1-8; Kamwendo *Access to Healthcare in the Age of CRISPR*.

34 Shozi 2020 *SAJHR* 1-24; Thaldar and Shozi 2020 *CRISPR J* 32-36; Thaldar 2023 *Health and Human Rights* 43-52.

35 Shozi *et al* 2021 *J Med Ethics*; Thaldar and Shozi 2023 *Bioethics*; Townsend 2020 *BMC Medical Ethics*; Kamwendo and Shozi 2021 *S Afr J Bioeth Law* 97-100; Thaldar, Shozi and Kamwendo 2021 *BioLaw Journal* 409-416.

36 Thaldar, Shozi and Kamwendo 2021 *BioLaw Journal* 409-416.

6 Recentring the dialogue

South Africa stands at a pivotal moment in its legislative journey concerning HHGE. In my recent proposal for legislative reform[37] I argue that South Africa has a unique opportunity to pioneer the responsible governance of HHGE, underpinned by its constitutional values and informed by informed public opinion. My proposal, designed as a set of sub-regulations for inclusion in the country's revised artificial reproductive technology (ART) regulations, offers a balanced framework that enables scientific progress while safeguarding ethical principles.

At its core the proposed framework is guided by five principles. First, HHGE should be regulated, not banned. Public opinion in South Africa strongly supports using HHGE to prevent serious diseases and enhance immunity against infectious diseases like HIV and tuberculosis, reflecting pressing public health needs. Second, the regulations adopt the well-established standard of safety and efficacy, requiring rigorous preclinical studies and clinical trials before any clinical applications of HHGE are approved. Third, the framework respects the principle of the quality of life over preserving a so-called "normal" genome, aligning with South Africa's constitutional values of human dignity and equality. Fourth, it prioritises parental reproductive autonomy, allowing parents rather than the state to decide on using HHGE for their prospective children, subject to established safeguards. Finally, the framework seeks to promote equality of access, ensuring that HHGE technologies benefit all South Africans and not just a privileged few.

A key feature of the proposal is the inclusion of a temporary moratorium on clinical applications of HHGE, coupled with explicit provisions to enable HHGE research and clinical trials. This approach facilitates the development of safe and effective technologies while preventing premature or unsafe applications. Moreover, the framework incorporates mechanisms to balance parental decision-making with the rights of prospective individuals not to be harmed.

This legislative model represents a pragmatic, context-sensitive approach to regulating HHGE, addressing South Africa's unique public health challenges while ensuring alignment with constitutional rights. By placing public health, human dignity and equality at the forefront, it offers a pathway to responsibly harnessing the transformative potential of genome editing technologies. I invite critics such as De Vries to engage constructively with this proposal, as it aims to shift the focus of the HHGE debate from polarised rhetoric to meaningful solutions tailored to South Africa's needs.

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37 Thaldar 2023 *S Afr J Bioeth Law* 91-94.

7 Conclusion

De Vries rightly highlights the importance of justice in HHGE, particularly in a country with a history of inequality. Advancements in genetic technologies must be pursued responsibly, with a commitment to avoiding the exacerbation of existing disparities. This aligns with my research group's focus on rigorous ethical oversight, the promotion of fair access, and robust public engagement. My recently proposed legislative framework seeks to translate these commitments into actionable governance mechanisms, addressing South Africa's unique public health challenges while upholding constitutional values.

At the same time, meaningful academic dialogue on HHGE requires accurate representations of opposing views and substantive engagement with legal and ethical arguments. Speculating about motives or framing legitimate scholarship as "controversial" or linked to "outrage" detracts from constructive debate. By advancing a pragmatic and principled framework for regulating HHGE, my proposal aims to shift the conversation toward meaningful solutions, fostering an approach that is both innovative and inclusive. The focus must remain on the merits of the arguments and the pressing need to balance scientific progress with justice, and with South Africa's constitutional vision. Only by grounding this debate in substantive proposals and informed critique can we ensure that HHGE serves as a tool for societal advancement rather than division.

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List of Abbreviations

Am J Bioeth	American Journal of Bioethics
CRISPR J	The CRISPR Journal
HHGE	heritable human genome editing
IVF	in vitro fertilisation
J Med Ethics	Journal of Medical Ethics
JLB	Journal of Law and the Biosciences
NHA	National Health Act 61 of 2003
NHREC	National Health Research Ethics Council
PELJ	Potchefstroom Electronic Law Journal
PGT	preimplantation genetic testing
S Afr J Bioeth Law	South African Journal of Bioethics and Law
S Afr J Sci	South African Journal of Science
SAJHR	South African Journal of Human Rights
SALJ	South African Law Journal
SAMJ	South African Medical Journal
TSAR	Tydskrif vir die Suid-Afrikaanse Reg