Human Germ-line Editing - China's Condemnation

What is the issue?

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- China has recently condemned its 'baby gene editing' scientist He Jiankui of violating both ethics and laws in his research.
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- The issue has forced researchers everywhere to take a hard look at the ethics of gene-editing.
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What was He Jiankui's claim?

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- Human germline modification means deliberately changing the genes passed on to children and future generations.
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- He Jiankui claims to have created the world's first genetically edited babies last year. Click here to know more.
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- He claims to have altered twin girls' genes so they could not get HIV.
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- He faced severe condemnation as any application of gene editing on human embryos for reproductive purposes was unethical.
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- He had also allegedly used technology of an uncertain safety level.
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Why is He's exercise so significant?

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- The promises of gene-editing using the Crispr-Cas9 editing system are boundless.

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- Editing DNA to correct disease mutations has been possible for a while now, which means others can also do what Mr. He did.
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- Over a dozen clinical trials are currently on to treat diseases like HIV, multiple myeloma and other forms of cancer.
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- But, notably, none of them involve editing the so-called 'human germ-line'.
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- Instead, they have restricted themselves to fixing genetic flaws in sick adults.
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- But Mr. He deactivated a gene in two human embryos, which means that the changes he made could be inherited by the next generation.
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- In doing so, he violated the widely held ethical consensus that it is too early for germ-line editing, as less is known on the risks associated.
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What is the need for caution?

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- Editing the ‘human germline’ is an exercise fraught with unknown risks and embryo gene-editing is not as precise as is needed today.
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- The technology can result in unintended mutations, which in turn can cause cancers.
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- There is also the danger of mosaicism, in which some cells inherit the target mutation, while others do not.
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- Even when gene-editing becomes fool-proof, the decision to edit embryos will have to be assessed on its other ethical aspects.
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- This is because, today, there is less understanding on how exactly individual genes influence phenotypes (the visible traits of people).
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- Every gene likely influences multiple traits, depending on the environment it interacts with.
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- This makes it hard to predict the ultimate outcome of an embryo-editing exercise without decades of follow-up.
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- E.g. in He’s experiment, he sought to immunise a pair of twins from HIV by tinkering with a gene called CCR5
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- But while protecting against HIV, a deactivated CCR5 gene can also make people more susceptible to West-Nile Fever.
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- So in all, there is now a global need for clear guidelines on genetic intervention which can be made defensible only in very rare situations where no alternative exists.
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Source: The Hindu

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