

# THIS WEEK

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## Anatomy does not define gender

*Proposals in the United States to classify people on the basis of anatomy or genetics have no scientific basis and should be scrapped.*

According to a draft memo leaked to *The New York Times*, the US Department of Health and Human Services (HHS) proposes to establish a legal definition of whether someone is male or female based solely and immutably on the genitals they are born with. Genetic testing, it says, could be used to resolve any ambiguity about external appearance. The move would make it easier for institutions receiving federal funds, such as universities and health programmes, to discriminate against people on the basis of their gender identity.

The memo claims that processes for deciding the sex on a birth certificate will be “clear, grounded in science, objective and administrable”.

The proposal — on which HHS officials have refused to comment — is a terrible idea that should be killed off. It has no foundation in science and would undo decades of progress on understanding sex — a classification based on internal and external bodily characteristics — and gender, a social construct related to biological differences but also rooted in culture, societal norms and individual behaviour. Worse, it would undermine efforts to reduce discrimination against transgender people and those who do not fall into the binary categories of male or female.

Furthermore, biology is not as straightforward as the proposal suggests. By some estimates, as many as one in 100 people have differences or disorders of sex development, such as hormonal conditions, genetic changes or anatomical ambiguities, some of which mean that their genitalia cannot clearly be classified as male or female. For most of the twentieth century, doctors would often surgically alter an infant’s ambiguous genitalia to match whichever sex was easier, and expect the child to adapt. Frequently, they were wrong. A 2004 study tracked 14 genetically male children given female genitalia; 8 ended up identifying as male, and the surgical intervention caused them great distress (W. G. Reiner and J. P. Gearhart *N. Engl. J. Med.* **350**, 333–341; 2004).

Even more scientifically complex is a mismatch between gender and the sex on a person’s birth certificate. Some evidence suggests that transgender identity has genetic or hormonal roots, but its exact biological correlates are unclear. Whatever the cause, organizations such as the American Academy of Pediatrics advise physicians to treat people according to their preferred gender, regardless of appearance or genetics.

The research and medical community now sees sex as more complex than male and female, and gender as a spectrum that includes transgender people and those who identify as neither male nor female. The US administration’s proposal would ignore that expert consensus.

The idea that science can make definitive conclusions about a person’s sex or gender is fundamentally flawed. Just ask sports organizations such as the International Olympic Committee (IOC), which have struggled with this for decades. In the 1960s, concerned that men would compete in women’s events, officials tried classifying athletes through genital exams — an intrusive and humiliating process. DNA tests that check for the presence of a Y chromosome did not prove reliable, either: people with XY chromosomes can have female characteristics owing to conditions including an inability to respond to testosterone.

Nowadays, the IOC classifies athletes by measuring their

testosterone levels, but this, too, is flawed. Certain medical conditions can raise women’s testosterone levels to the typical male range, and the tests leave them unable to compete among women.

If the Trump administration does attempt to impose genetic testing, it will have many surprises. For instance, genetic recombination can transfer Y chromosome genes to X chromosomes, resulting in people with XX chromosomes who have male characteristics.

**“Attempts to pigeonhole people have nothing to do with science and everything to do with stripping away rights.”**

Political attempts to pigeonhole people have nothing to do with science and everything to do with stripping away rights and recognition from those whose identity does not correspond with outdated ideas of sex and gender. It is an easy way for the Trump administration to rally its supporters, many of whom oppose equality for people from sexual and gender minorities. It is unsurprising that it appeared just weeks before the midterm elections.

This is not the first time that the administration has attacked legal protections for transgender and non-binary people. Last year, Trump declared that transgender people would no longer be allowed to serve in the US military, and rescinded guidelines suggesting that schools should let pupils use the lavatory of their choice. An October 2017 memo from the US Department of Justice stated that laws prohibiting employment discrimination should not apply to gender identity.

Instituting a policy with a narrow definition of sex or gender and no basis in science would be a major step backwards for the United States in gender-identity issues. Sadly, the move is only the latest in a series of proposals that misuse and ignore science and harm marginalized groups as part of a quest to score cheap political points. ■

## False promises

*Brazil’s new president is a threat to global science.*

A decade ago, under the leadership of Luiz Inácio ‘Lula’ da Silva, Brazil seemed like a tropical juggernaut that could play a leading part in the fight against climate change. The economy was booming, helping Lula’s government to lift millions out of poverty. Beer and soya-bean production was steadily increasing, even as deforestation — one of Brazil’s largest sources of carbon emissions — in the Amazon plummeted. Today, Lula is in jail on corruption charges, the economy is a shambles, violence is on the increase and deforestation is back on the rise. And now Brazil has elected as president Jair Bolsonaro, a right-wing demagogue with an anti-environmental agenda.