

# Two Native American geneticists interpret Elizabeth Warren's DNA test

October 23 2018, by Krystal Tsosie And Matthew Anderson

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Some American Indian tribes, including the Navajo Nation, have moratoriums on genetic testing. Credit: [Phil Noble/Reuters](#)

Dr. Carlos Bustamante, a prominent population geneticist, [recently concluded](#) that Senator Elizabeth Warren had "a Native American

ancestor." While geneticists agree on the [validity](#) of the test, which is based on established statistical models of DNA inheritance, we as two Native American geneticists find the interpretation to be [problematic](#).

The reasons have to do with what we see as Warren's motives, the genetic variants informing the comparison and overall concerns Native Americans have with genetic testing.

Because Bustamante used Indigenous individuals from Central and South America as a reference group to compare Warren's DNA, we believe he should have stated only that Warren potentially had an "Indigenous" ancestor 6-10 generations ago, not conclusively a "Native American" one. The distinction might seem hypercritical to most, but to the sovereign tribal nations of the United States it's an important one.

## Genetic controversies

Our concern stems from the historical power imbalances around how genetic material has been collected.

Bustamante's analysis utilized genetic data collected from Indigenous individuals as part of the [1000 Genomes Project](#). The project's broad goal was to catalog genetic data from worldwide populations to advance knowledge of human diversity.

For Indigenous groups in the U.S. and globally, this approach has always been a concern. There is a [cultural disconnect](#) between Indigenous origin stories and the practice of tracing human origins through DNA.

Adding to this, earlier ventures of cataloging Indigenous genetic variants, such as the [Human Genome Diversity Project](#) and [Genographic Project](#), were denounced by the United Nations and Indigenous nations worldwide for a lack of engagement and transparency. The control and

collection of genomic information from marginalized Indigenous groups led to concerns that such information could be used [for commercial gain](#) and opened the projects to accusations of exploitation. A [declaration](#) in 2007 was passed calling for the cessation of genomic studies collecting Indigenous biomarkers.

While the 1000 Genomes Project learned from its predecessors and adopted more extensive [consent](#) procedures, it and other large-scale ancestry projects publicly disclose the genomic information they collect, which is meant to advance research. But Indigenous groups' concerns about having commercial companies profit from their genetic material without their inclusion has endured. Data from the 1000 Genomes Project and Human Genome Diversity Project, for instance, are used to inform percent Native American ancestry estimates as advertised by direct-to-consumer tests [23andMe](#) and AncestryDNA, the latter of which posted a billion dollars in [revenue](#) in 2017.

Because of this and other [recent genetic controversies](#) impacting Indigenous communities, Native Americans in the U.S. have been wary of participating in genomics research. Some tribes, like the [Navajo Nation](#), have long-standing moratoriums on genetics research. As such, Native American individuals constitute the [lowest](#) ethnic or minority group recruited into genomic studies. (We point to an ethical [framework](#) for engaging Indigenous communities that can address these concerns, developed by [Indigenous geneticists](#).)

## Genetic testing principles

For these reasons, Bustamante could not use U.S. tribal groups in his analyses of Warren's DNA. But how does this affect the interpretation?

These studies compare the genetic variants that an individual possesses to a reference group. In Bustamante's analysis, he used 37 Indigenous

individuals from Mexico, Peru and Colombia. Indigenous communities and nations across both continents exchanged goods, migrated and intermarried, and can be [culturally linked](#). But considering that Indigenous peoples of Central and South American have [important different population and genetic histories](#) from tribes of the U.S., one can see that he utilized a proxy.

Importantly, most genetic tests sample only a subset of a person's DNA at certain locations, or loci, on a person's chromosomes. Often, a set of markers across a genomic region are passed onto progeny with other regions due to physical proximity on the DNA, although this is not the case for all parts of the genome. Statistics are then used to determine which loci are more likely to be co-inherited with others.

Although these tests utilize our best understandings of genetics and statistics, they are still predictions. And statements of statistical inferences should be in respect to the reference group sampled. So the conclusion, at its most conservative, is that Warren has a high statistical probability that her DNA points to an Indigenous ancestor.

## Demonstrating ancestry

Warren claimed that her DNA test result corroborates [family lore](#) of a certain Cherokee ancestor but genealogical records show "[no proof](#)" that her great-great-grandmother was part Cherokee. Thus, Warren has not demonstrated a direct lineal descent from an enrolled tribal member, a requirement for citizenship by all three of the federally recognized Cherokee tribes. Even further, the Cherokee Nation of Oklahoma denounced DNA tests as insufficient for determining lineage and "[inappropriate](#)."

There are hundreds of thousands of Americans who [self-identify as Cherokee](#) or claim to have a Cherokee ancestor, and finding evidence

can be difficult.

Determining which tribal census record – for instance, the [Dawes Roll](#) or [1924 Baker Roll](#) used by the Cherokee Nation of Oklahoma and Eastern Band of Cherokee Indians, respectively, for enrollment – requires specific knowledge of the ancestor in question. Even though the Dawes Roll has an extensive record of past enrollees, as Cherokee Nation of Oklahoma tribal member McKalee Steen told one of us (Tsosie), "there were a lot of people [who] were too afraid to sign it and now their descendants have no way of knowing or showing that they are a descendant of a tribal member." These concerns lasted well into the mid-20th century in Oklahoma, where Sen. Warren was raised.

Throughout this, Warren has stated that she understands the "distinction between citizenship and ancestry" and she does not seek tribal enrollment in the Cherokee Nation of Oklahoma. But even with the backlash by Native Americans, she still [defends](#) her decision to release her DNA test results. Her response, "I have an election," and her immediate call to a [bet](#) with President Trump illuminates her political motives in trying to [demonstrate a Native American ancestry](#).

## **Our concerns about DNA ancestry**

From our perspective, Warren has taken a complex and [harmful history](#) of "Indian" blood quantification – a system we see as meant to [dilute](#) our existence – and reduced it to a political ploy. As such, we ultimately see the test is about her own political gain.

In fact, we wish to be excluded from any conversation that conflates DNA ancestry with Indigenous or Native American identity. And the distinction is an important one – "Native American" is not just an ethnic term but it is a cultural and political designation. Tribal sovereignty, the ability to self-govern, is constructed on a special nation-to-nation

relationship with the federal government and requires the ability to determine citizenship. To have this biologically reified and reduced to biomarkers from a broad definition of Indigenous peoples that each have their own histories is to threaten the very sovereign status that enables Native American cultural and traditional ways of living.

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