Many Americans can trace some lines of their family tree back to the 1600s. However, African Americans descended from enslaved Africans, who began arriving in North America in 1619, lack ancestral
A new USC and Stanford study, recently published in *Genetics*, provides insight into who occupies these missing branches of family trees—and gives a glimpse of how many branches there are.

"Slavery was not that many generations ago, so my family still tells stories about our enslaved ancestors, like who they were and, in my case, how we ended up as light as we are," said first author Jazlyn Mooney, the Gabilan Assistant Professor of Quantitative and Computational Biology at the USC Dornsife College of Letters, Arts and Sciences. "But these are just stories and that is what most African Americans have left. We don't have any records or numbers. There's no tangible data."

For Mooney, the study sheds light on her personal ancestry. "It's fairly easy to trace my mother's side of the family all the way back to the early 1500s," Mooney said, noting that her mother's family traces to the medieval Jewish expulsion from Spain and is part of a community that came to New Mexico in the 1600s. "But my father is African American. And in that case, very quickly, we are no longer able to trace anything because of the lack of genealogical records."

That's because enslaved African Americans were rarely included in any official records. The 1870 federal census recorded formerly enslaved African Americans by name, and though it is a vital tool for genealogical research, many African Americans are still not able trace their family members to or beyond this document.

This study helps fill in those blank spaces along a typical African American's family tree. Using computational methods informed by genetic data, researchers estimate that a random African American born between 1960 and 1965 is descended from, on average, 314 African and 51 European ancestors reaching back to 1619. "The rough outline of
African-American family trees is well-known. There are many enslaved Africans, as well as some Europeans. But how many? The study asks a new question and gives some estimates," Mooney said.

Although the research doesn't reveal precisely who the African and European individuals were, the historical record can provide a general storyline. For example, many of the European ancestors appear in the family tree during the time of slavery, a period marked by prevalent sexual violence and exploitation of enslaved women. What's more, many of the African ancestors—untraceable through written records—are people who survived the deadly Middle Passage of the Transatlantic Slave Trade, imprisoned and packed into slave ships for trips lasting as long as 80 days.

To conduct the study, researchers created a 14-generation model divided into three time periods:

- The first period, 1619-1808, includes the founding of the African American population, with the population formed by Africans and Europeans.
- The second period, 1808-1865, is marked by the end of legal importation of enslaved African captives into the United States. The number of new African ancestors declines sharply, and the African American population continues to grow with contributions from Europeans and European Americans continuing.
- The third period, 1865-1965, begins with the end of legal enslavement and continues to many African Americans living today. With the end of legal slavery comes reduced contributions from the European and European-American sources; contributions from African sources remain low due to low immigration.
"It's a powerful method," said co-author Noah Rosenberg of Stanford. "Genetic ancestry studies usually focus on clustering the genomes of living people. The approach here is different. The ancestry is modeled with an explicit sense of genealogical descent over time."

The study also notes that some of the famous African Americans whose genealogies have been publicly reported, such as Michelle Obama, were born during the 1960-1965 period.

"It was helpful to think about these well-known people," Mooney said.

Mooney said that she and her colleagues are working on a computational model that will break the numbers down into their male and female components, which could add more context to African American population history.

"We could also explore adding in different ancestry components," Mooney said. "For example, some African American individuals have Native American ancestry. This could be studied as well."

In addition to Jazlyn Mooney and Noah Rosenberg, other authors of the study are Lily Agranat-Tamir and Jonathan Pritchard, both of Stanford.


Provided by University of Southern California

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