

## Taking ancestry into account with personalized medicine

The same technology that can trace your ancestry could also help doctors customize your medical care to take into account your unique genetic history. In an increasingly globalized world, with human populations mixing as never before, this precision will prove essential to update the broad racial categories previously used to inform care.

A [study in Science](#), led by Sanford's [Andrés Moreno-Estrada](#), studied Mexican's genetic diversity and compared it to their lung function to determine both the level of genetic diversity in Mexico's population and whether or not this had clinical relevance.

[Ozy.com's Melissa Pandika](#) captures the multiracial landscape and the almost laughably imprecise method of racial assessment currently use in clinical practice in an interview with study co-author Esteban González Burchard:

"How would you classify Obama?" asks [Burchard]. The president has a Kenyan father and white mother — so which race's clinical guidelines would doctors use? Typically, a receptionist guesses patients' race when they arrive for an appointment and relays that information to a technician, who then notifies the physician, Burchard said.

"We're moving beyond blanket definitions like Mexican or Latino," [said \[Moreno-Estrada\]](#).  
"Now we're putting finer details on that map."

The overall level of diversity in Mexico was staggering, with, as the study authors write: "We found striking genetic stratification among indigenous populations within Mexico at varying degrees of geographic isolation. Some groups were as differentiated as Europeans are from East Asians."

And these striking genetic differences translate to clinical relevance. Specifically, they examined lung function, as Pandika explains:

The researchers then examined whether the results of a lung function test (used to diagnose asthma and other respiratory problems) from kids in Mexico City and the San Francisco Bay Area reflected Mexico's genetic diversity. (Burchard is a pulmonologist at UCSF.) Sure enough, the lungs of a mestizo with western indigenous ancestry could appear a decade younger than an equally healthy person of the same age from Yucatán, who likely has Eastern indigenous blood. That means doctors should be using different criteria to diagnose lung disease for each population.

It may seem shocking, given the cultural arguments surrounding the biological relevance of race, that racial criteria and genetic differences are being used in medicine. (For a thorough overview of these issues as they connect to this research, [check out this earlier feature from the GLP's Tabitha M. Powledge](#).) Indeed, racial and population differences are not the only factors in, for instance, lung function.

Socioeconomic factors also influence lung function and shouldn't be neglected, as Pandika notes. But this study highlights the important synergy between evolutionary biology clinical guidelines:

Most population geneticists investigate patterns of human migration and variation — projects that typically receive scant funding compared to those with direct medical applications. But clinically relevant findings “are often rooted in studies that were simply curious about evolution,” said Noah Rosenberg, an evolutionary biologist at Stanford.

In the end, both medicine and evolutionary biology have unearthed the same complex genetic diversity from thousands of years of human wandering, settling, mixing. “This is driving the ball down the field toward precision medicine,” [Burchard said](#) — beyond black-and-white diagnoses.

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#### **Additional Resources:**

- [Troublesome genetics and race](#), Genetic Literacy Project
- [Does race exist? Do hills exist?](#), The Unz review
- [Cure for some could cost us all: Tailored medications risk unintended financial consequences](#), Boston Globe