

## Ethnic ancestry among Latinos influences asthma risk

By Ernie Hood

Researchers at the University of California, San Francisco (UCSF) and collaborators have shown that, among U.S. Latino children, the risks of developing asthma and lower lung function vary with genetic ancestry, even after adjusting for well-known social and environmental risk factors.

### The study

(<http://www.ncbi.nlm.nih.gov/pubmed/25301036>)

assessed asthma prevalence and lung function in 5,493 Latino children who were identified as being of Mexican, Puerto Rican, or other Latino ethnicity. “This is the largest, most comprehensive study of its kind in minority children,” said lead study scientist Esteban Burchard, M.D., a professor of bioengineering and therapeutic sciences at UCSF. Largely funded by NIEHS, the study was published online Oct. 6 in the *Journal of Allergy and Clinical Immunology*.

### Genetic ancestry matters

Among U.S. Latino children, asthma prevalence is highest in Puerto Ricans and lowest in Mexican-Americans. In general, Mexicans have more Native American ancestry, while Puerto Ricans have more African ancestry, with European ancestry common to both groups.

For each of the participants, the scientists used genome-wide data to estimate the proportion of African, European, and Native American ancestries. The analysis showed that for the Puerto Rican children, every 20 percent increase in African ancestry correlated with a 40 percent increase in asthma risk. Among Mexicans and other Latinos, every 20 percent increase in Native American ancestry resulted in a 43 percent decrease in the odds of developing asthma.

Even without asthma, lung function was lower among children with more African ancestry.

### Care with confounders

The scientists analyzed data from three previous independent studies. Using genotyping and sophisticated statistical methods, they were able to distinguish genetic influences on disease risk from environmental factors. The researchers found that the study results did not change when environmental or socioeconomic factors were considered, suggesting that genetic differences were the primary cause of the disparities.

“We took into account a wide variety of possible confounders that have never been considered in any other previous study of ancestry and asthma,” said Maria Pino-Yanes, Ph.D., a postdoctoral fellow in Burchard’s lab and lead author of the study.

“We included exposure to air pollution in the first year of life, indicators of socioeconomic status, mother’s highest education level, child’s health insurance status, discrimination, acculturation, and variables related to secondhand smoking.”

### Clinical implications

The findings may have an immediate impact on clinical practice. Doctors currently compare lung function test results to a standard reference to determine if the patient has lung disease, such as asthma, and the severity. Results showing differences in normal lung function among Latino children of diverse genetic ancestries suggest that the diagnosis of asthma and other lung disease in these groups should be more refined than it is at present.

“We need to develop new pulmonary reference standards to predict normal lung function in Puerto Ricans, who have the highest asthma prevalence and death rates,” Burchard said. “The current method for predicting lung function in Puerto Ricans relies on reference equations derived from Mexicans or whites.”

**Citation:** Pino-Yanes M, Thakur N, Gignoux CR, Galanter JM, Roth LA, Eng C, Nishimura KK, Oh SS, Vora H, Huntsman S, Nguyen EA, Hu D, Drake KA, Conti DV, Moreno-Estrada A, Sandoval K, Winkler CA, Borrell LN, Lurmann F, Islam TS, Davis A,



*Pino-Yanes and colleagues demonstrated that disparities in asthma prevalence and lung function among Latinos can be partially explained by differences in genetic ancestry. (Photo courtesy of Sam Oh, UCSF)*



*Burchard’s research has shown that, in comparison to white children, a higher percentage of minority children are not helped by inhaled asthma rescue medications. (Photo courtesy of Sam Oh, UCSF)*

Farber HJ, Meade K, Avila PC, Serebrisky D, Bibbins-Domingo K, Lenoir MA, Ford JG, Brigino-Buenaventura E, Rodriguez-Cintron W, Thyne SM, Sen S, Rodriguez-Santana JR, Bustamante CD, Williams LK, Gilliland FD, Gauderman WJ, Kumar R, Torgerson DG, Burchard EG

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. 2014. Genetic ancestry influences asthma susceptibility and lung function among Latinos. *J Allergy Clin Immunol*; doi:10.1016/j.jaci.2014.07.053 [Online 6 October 2014].

(Ernie Hood is a contract writer with the NIEHS Office of Communications and Public Liaison.)

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