

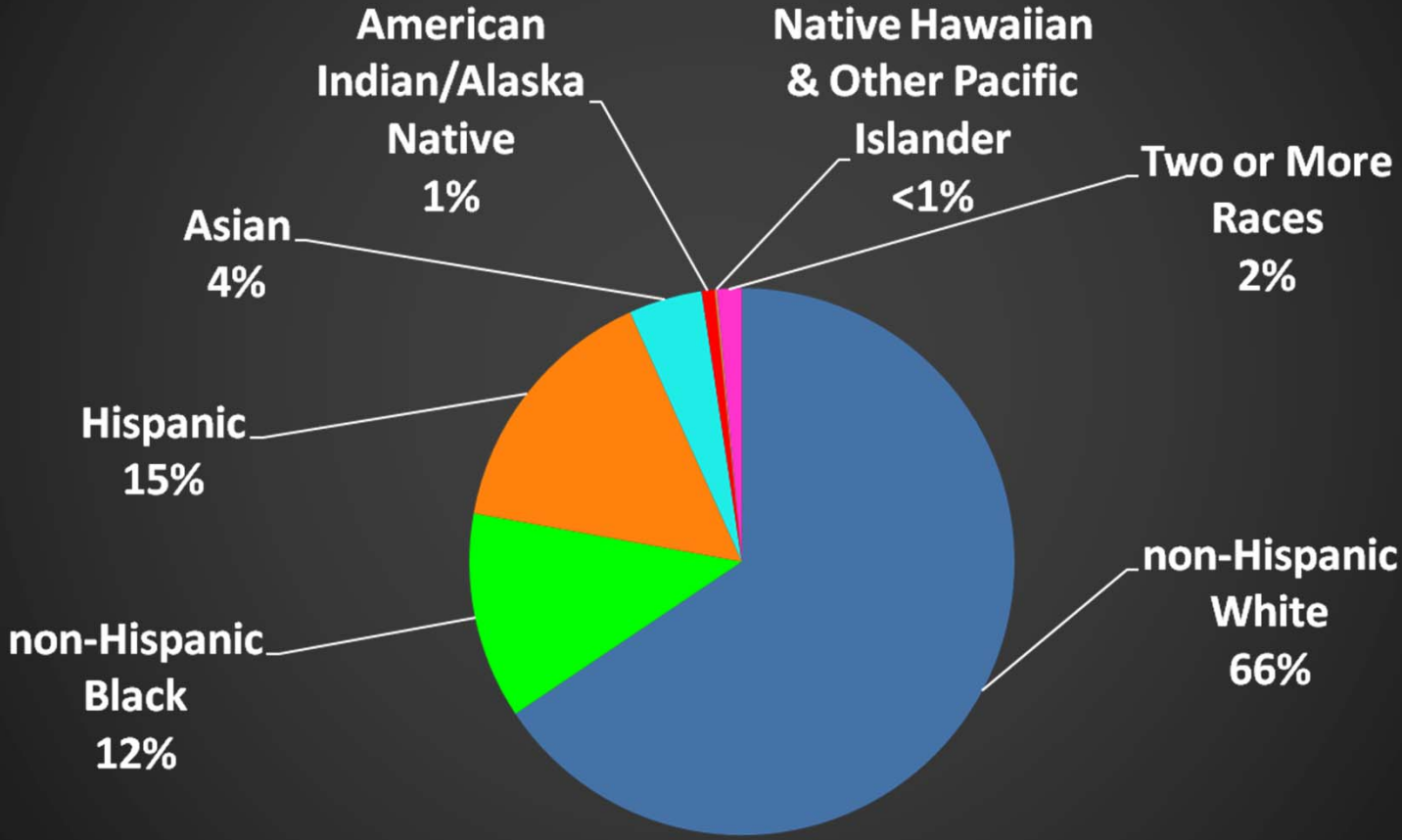
Making Precision Medicine

Socially Precise

Esteban González Burchard, M.D., M.P.H.

UCSF

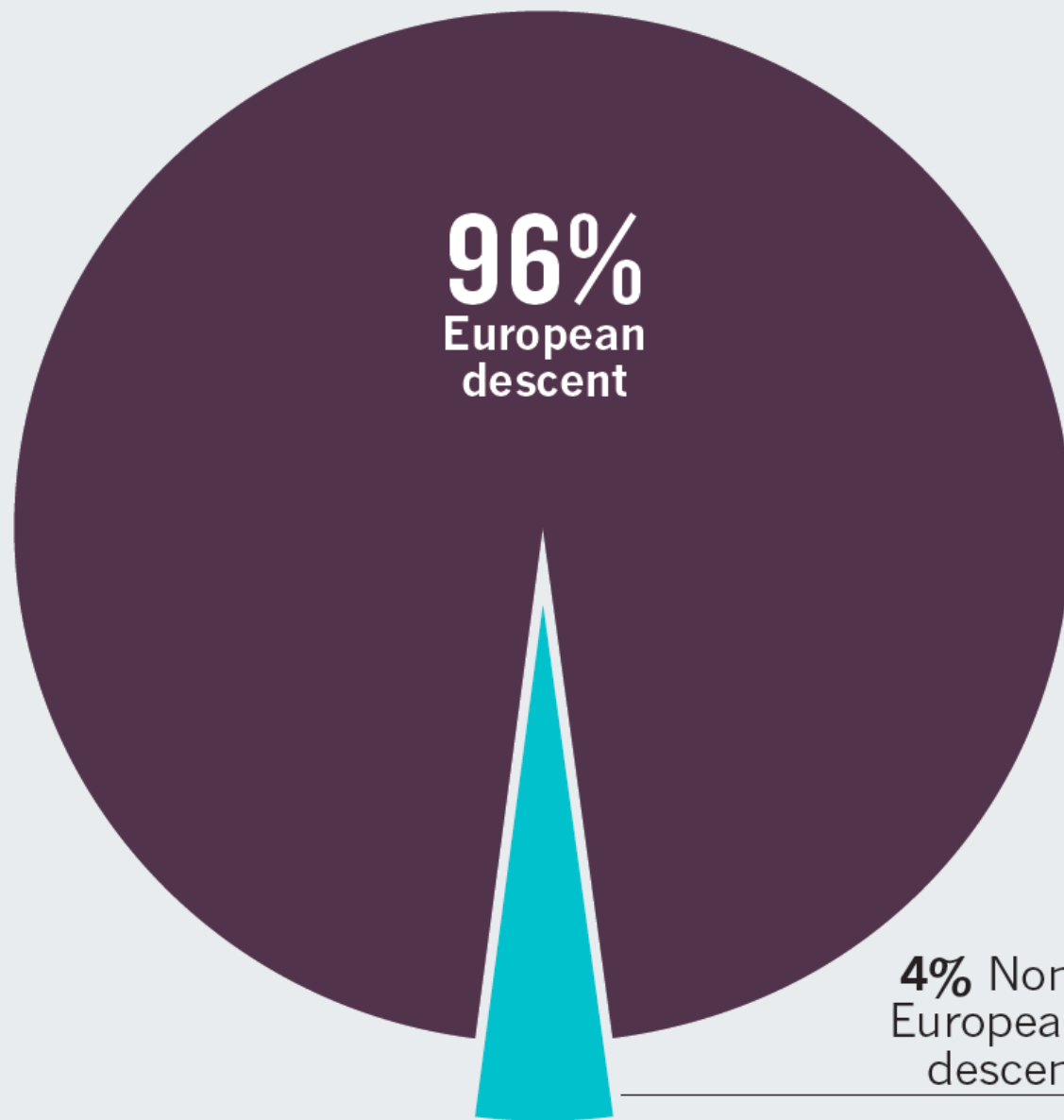
U.S. Population





SAMPLING BIAS

Most genome-wide association studies have been of people of European descent.



Nature 2011

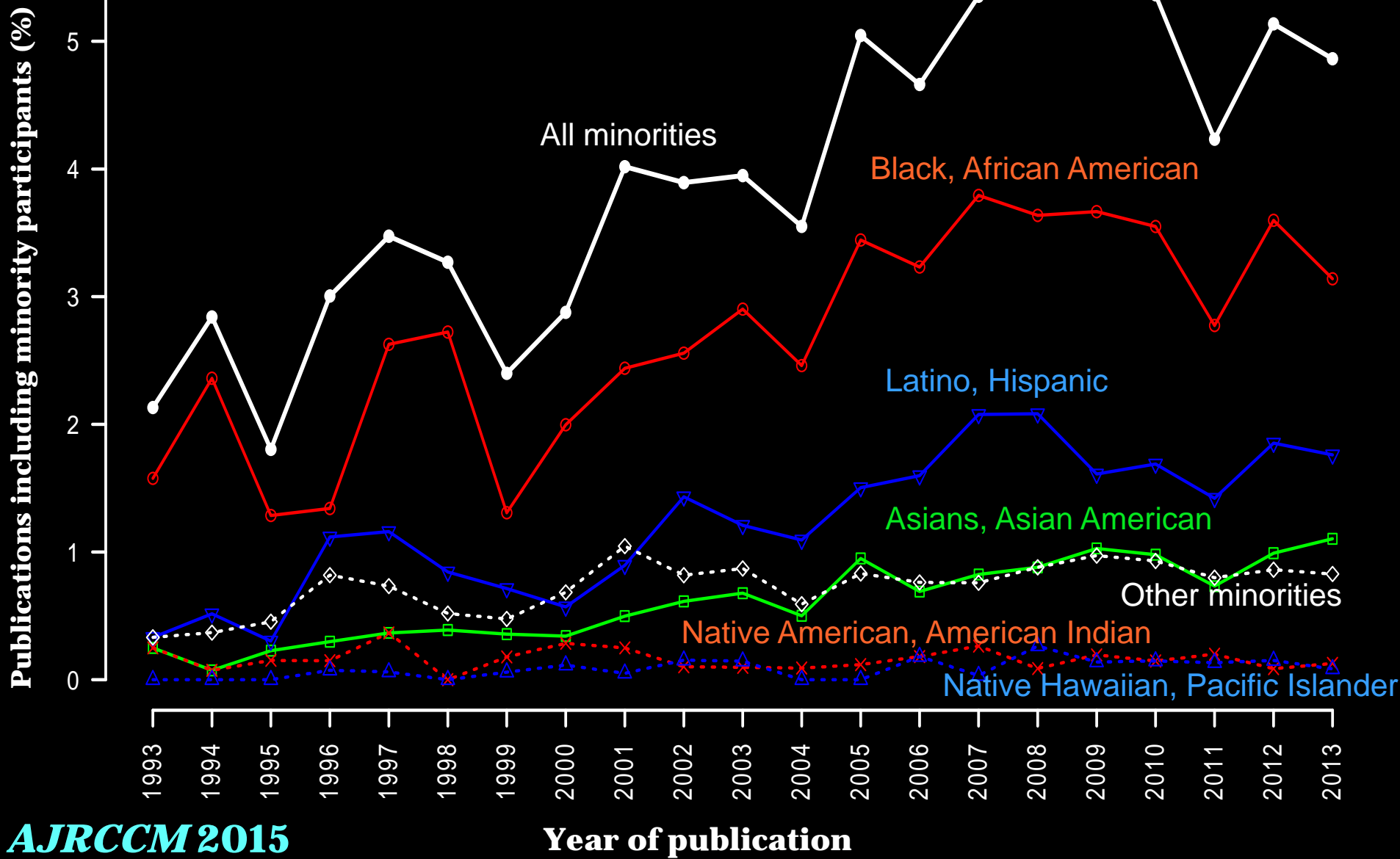
UCSF



NIH-Funded Pulmonary Publications



95% European Origin



AJRCCM 2015

[News Biology](#)

Lung research survey highlights lack of minority subjects in many biomedical studies



Science 2015

QUINN DOMBROWSKI/Flickr (CC BY-SA 2.0)

GALA & SAGE STUDIES

Local, national, international



1998 - present

UCSF

Deep Phenotyping

> 8,500 Latino & African American children & adolescents (8-21yrs)

Domain

Information Gathered

Asthma

Spirometry

Drug response

Medical history
&
Blood work

Genotyping

Cotinine

IgE

Exposures

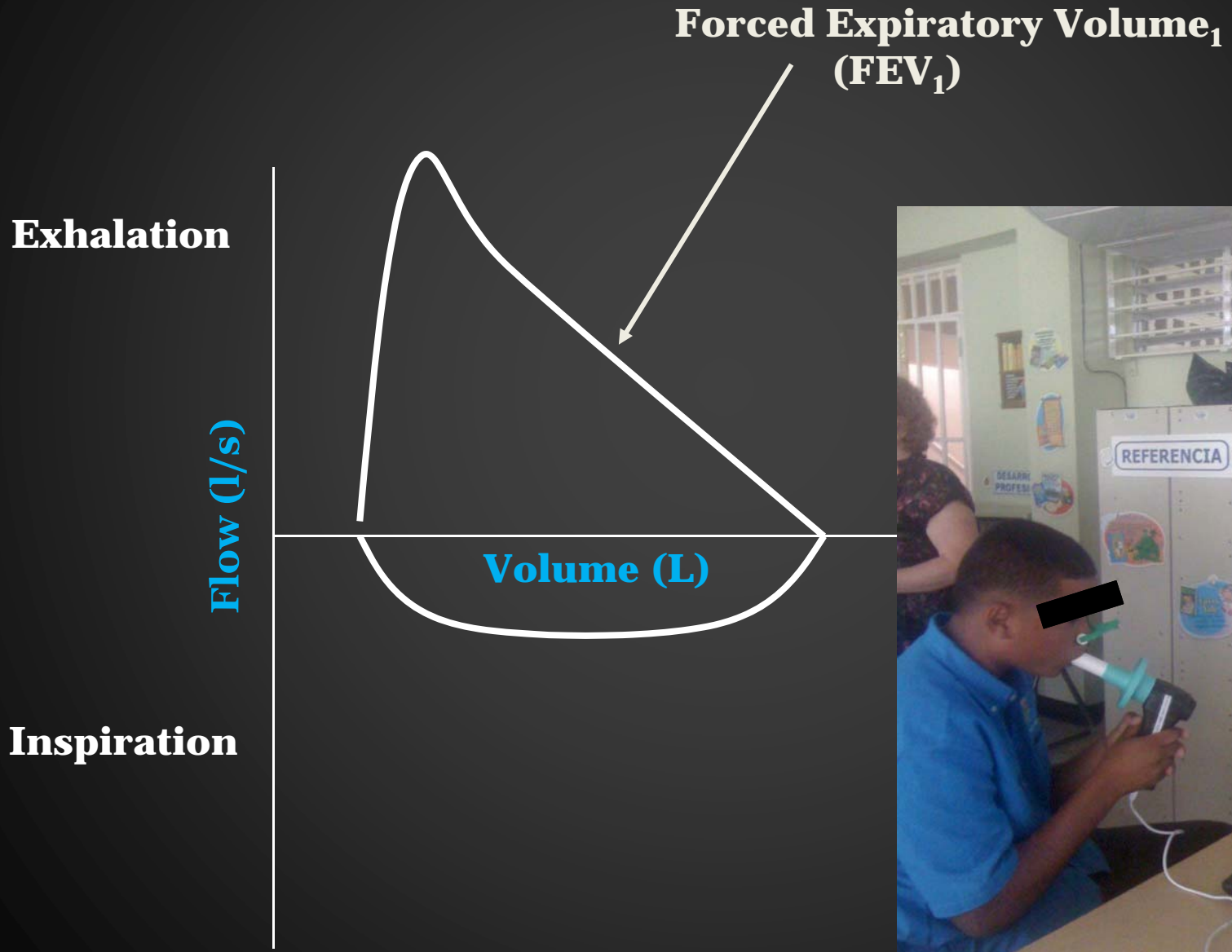
Environmental

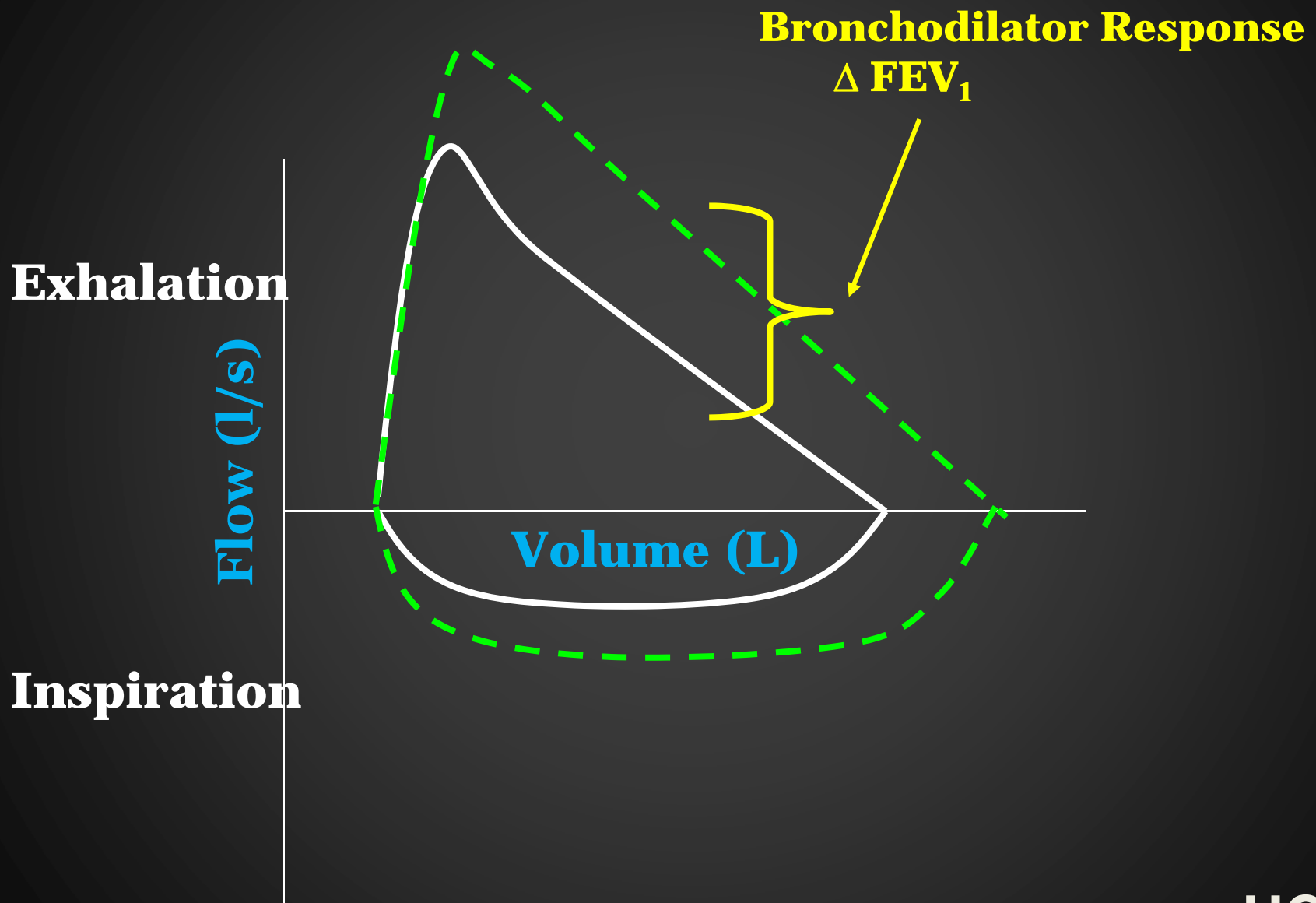
Nutritional

Social

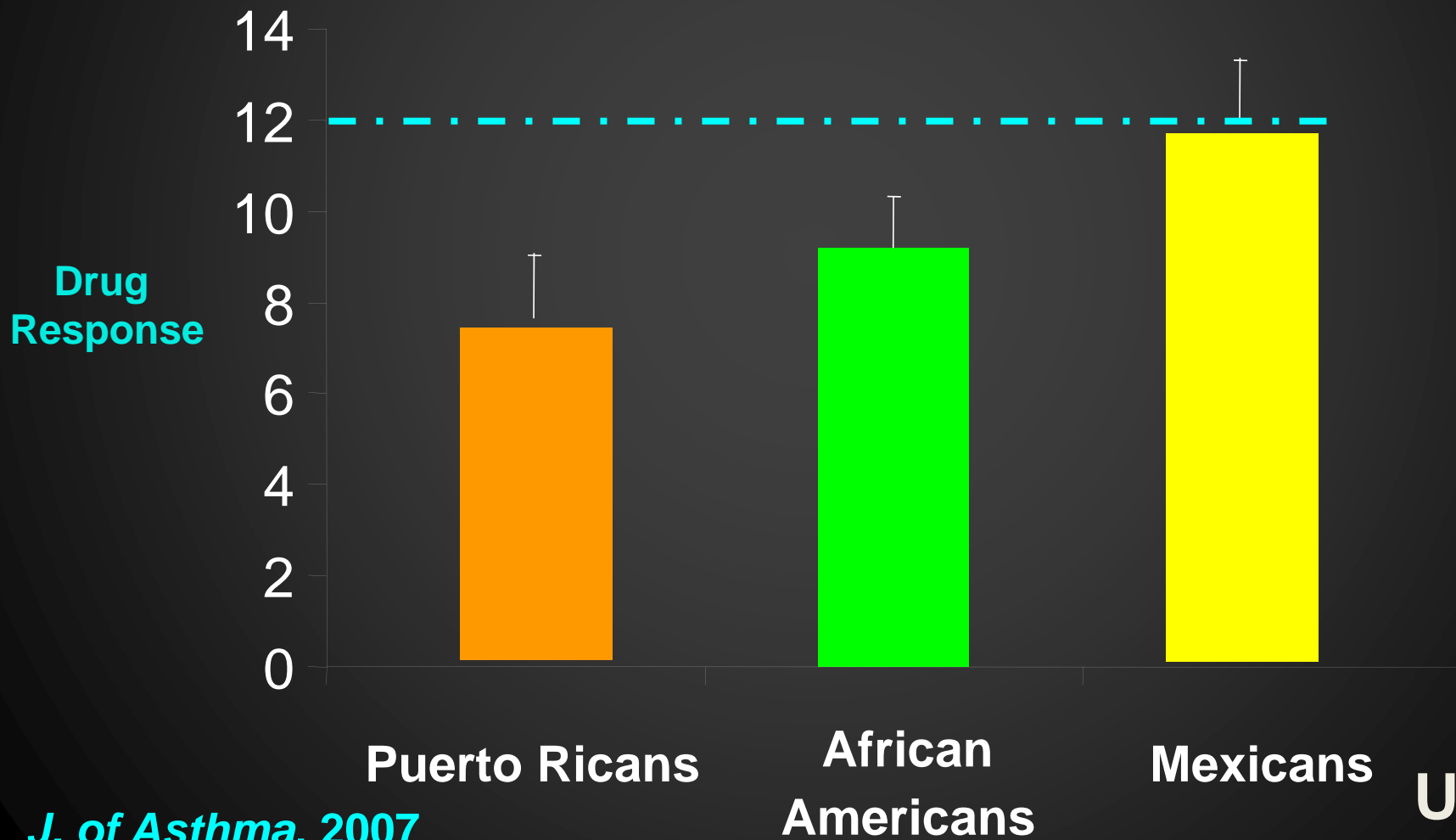
UCSF

Lung Function Testing





Children - Moderate-to-Severe Asthma

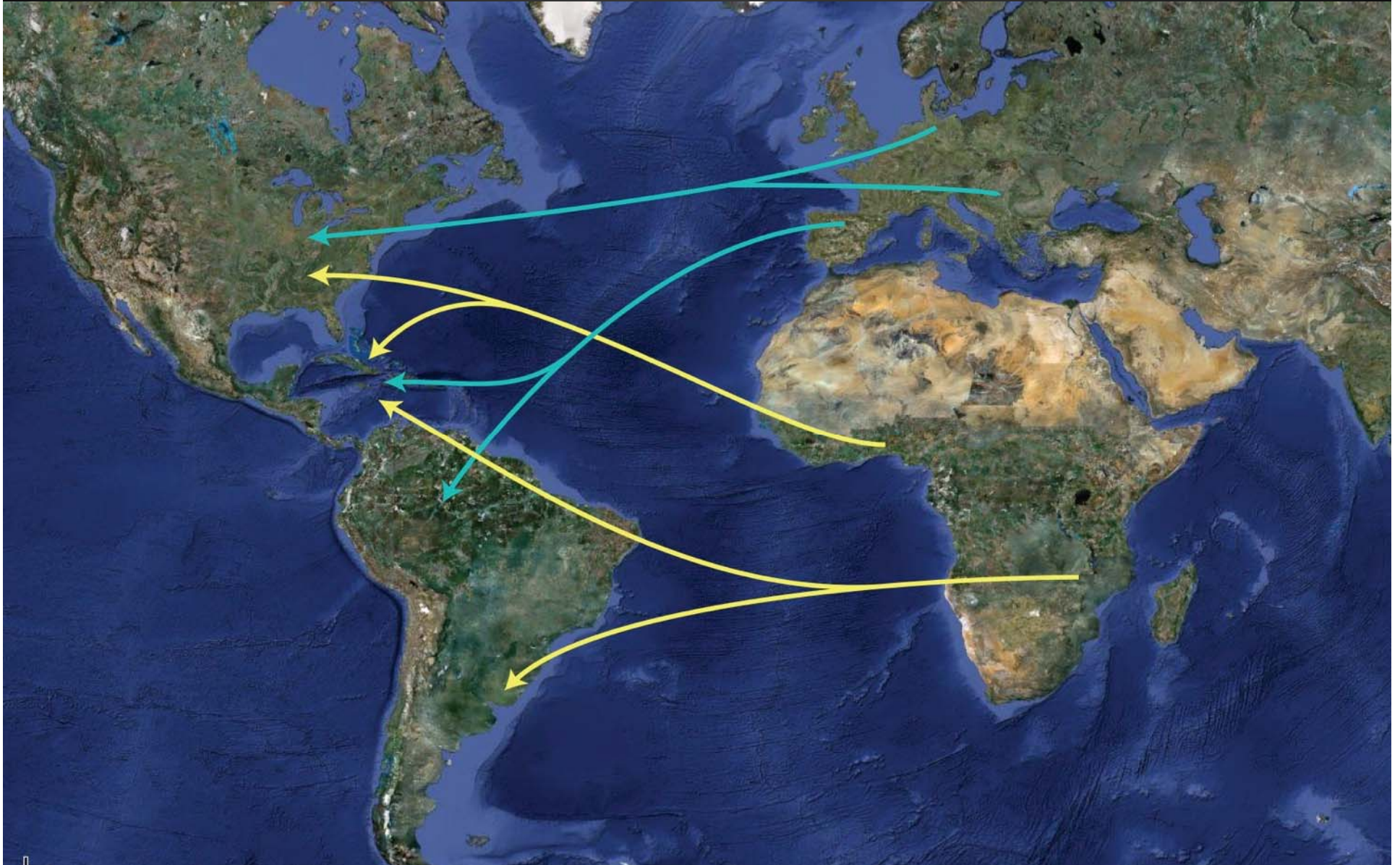


J. of Asthma, 2007

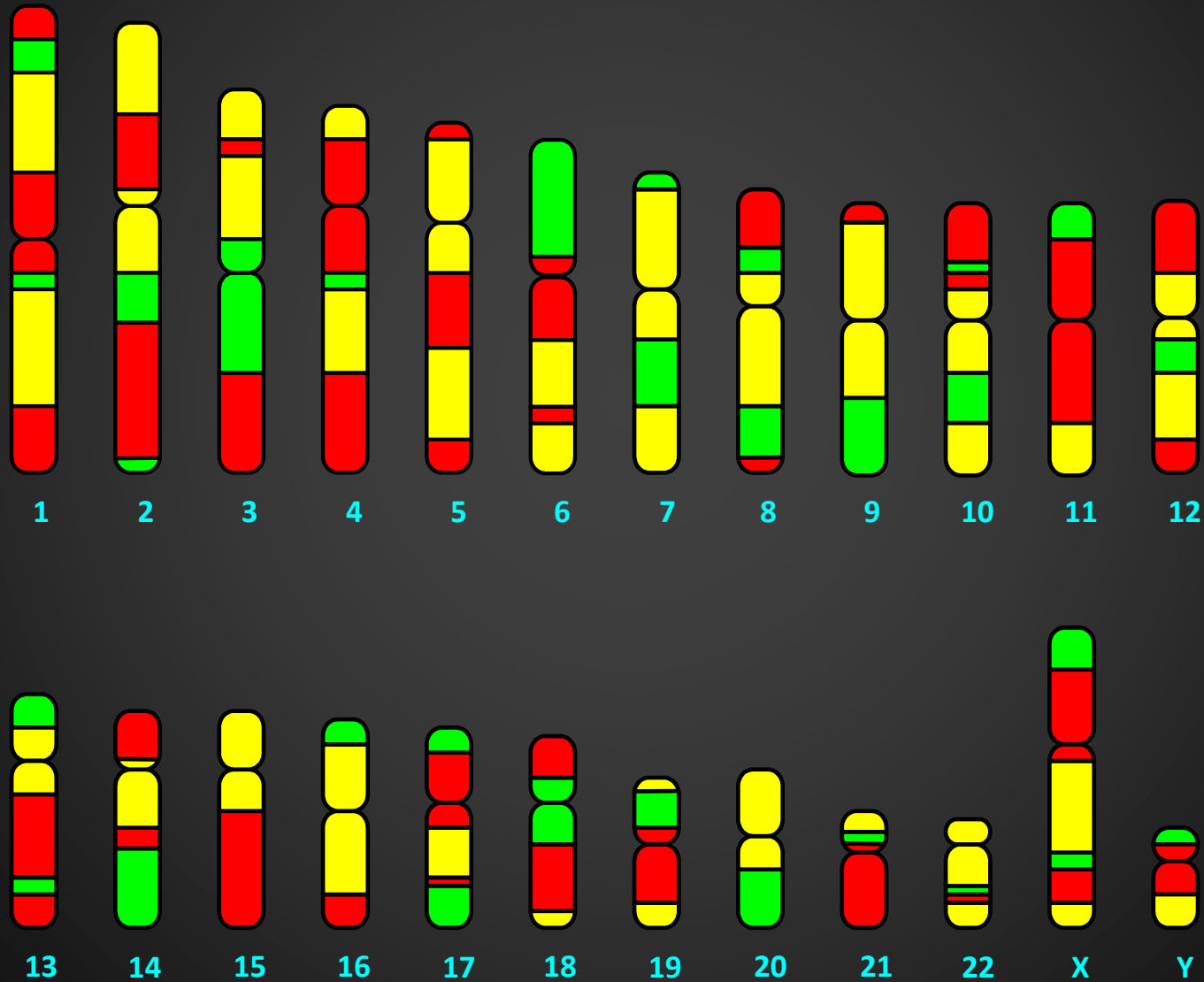
UCSF

Racially Mixed Populations

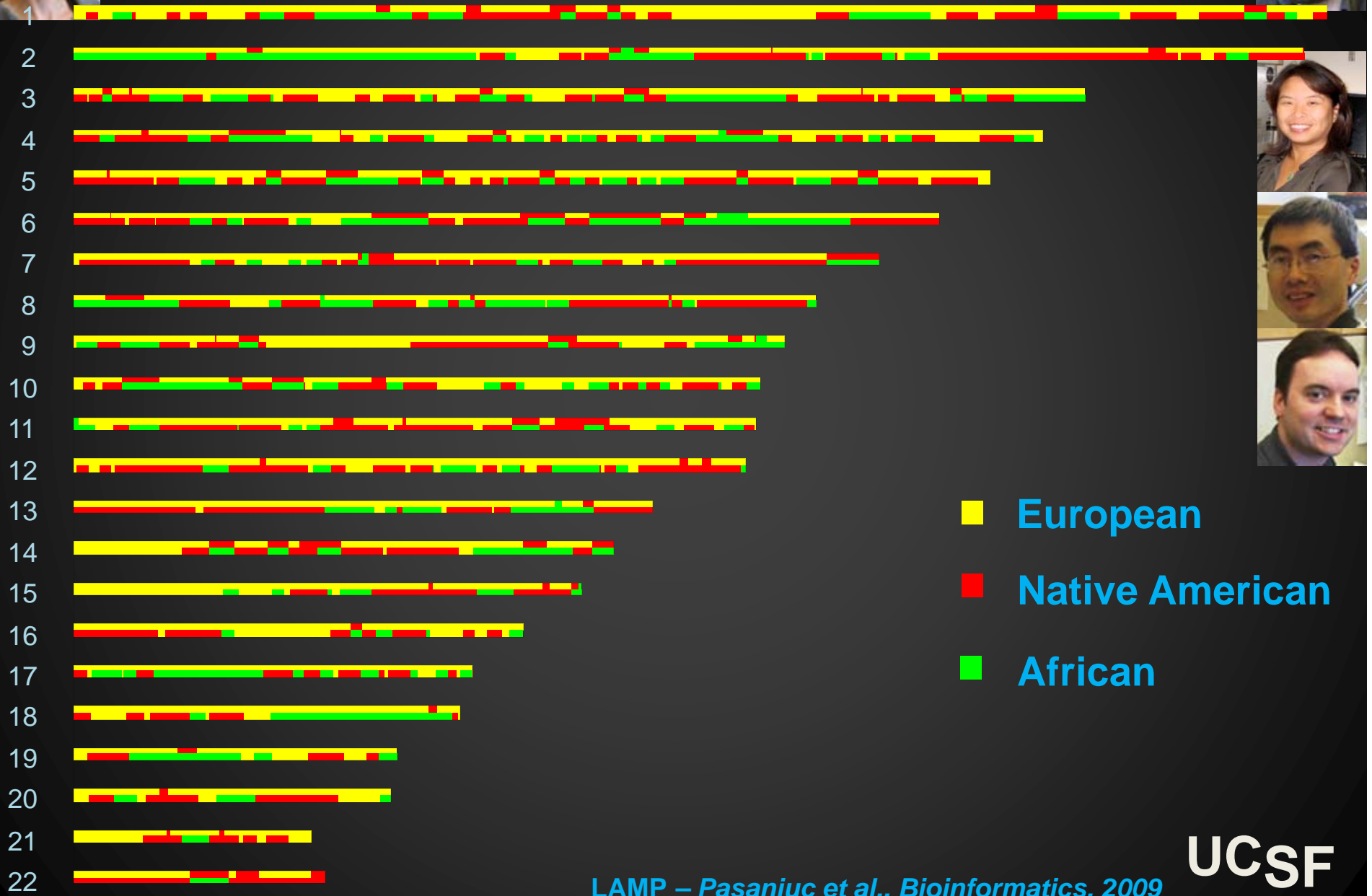
Rich resource for study of complex diseases



Locus Specific Ancestry



Locus Specific *Ancestry*



Can We *Leverage* **Ancestry**

to

Scientific Advantage?

Can We *Leverage* *Ancestry*

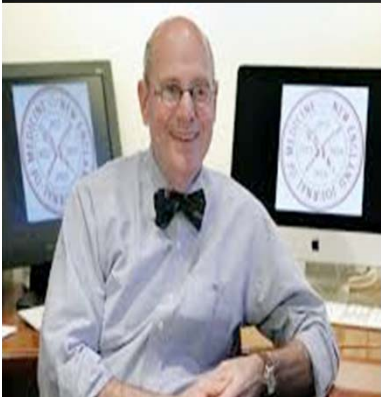
to

Scientific Advantage?



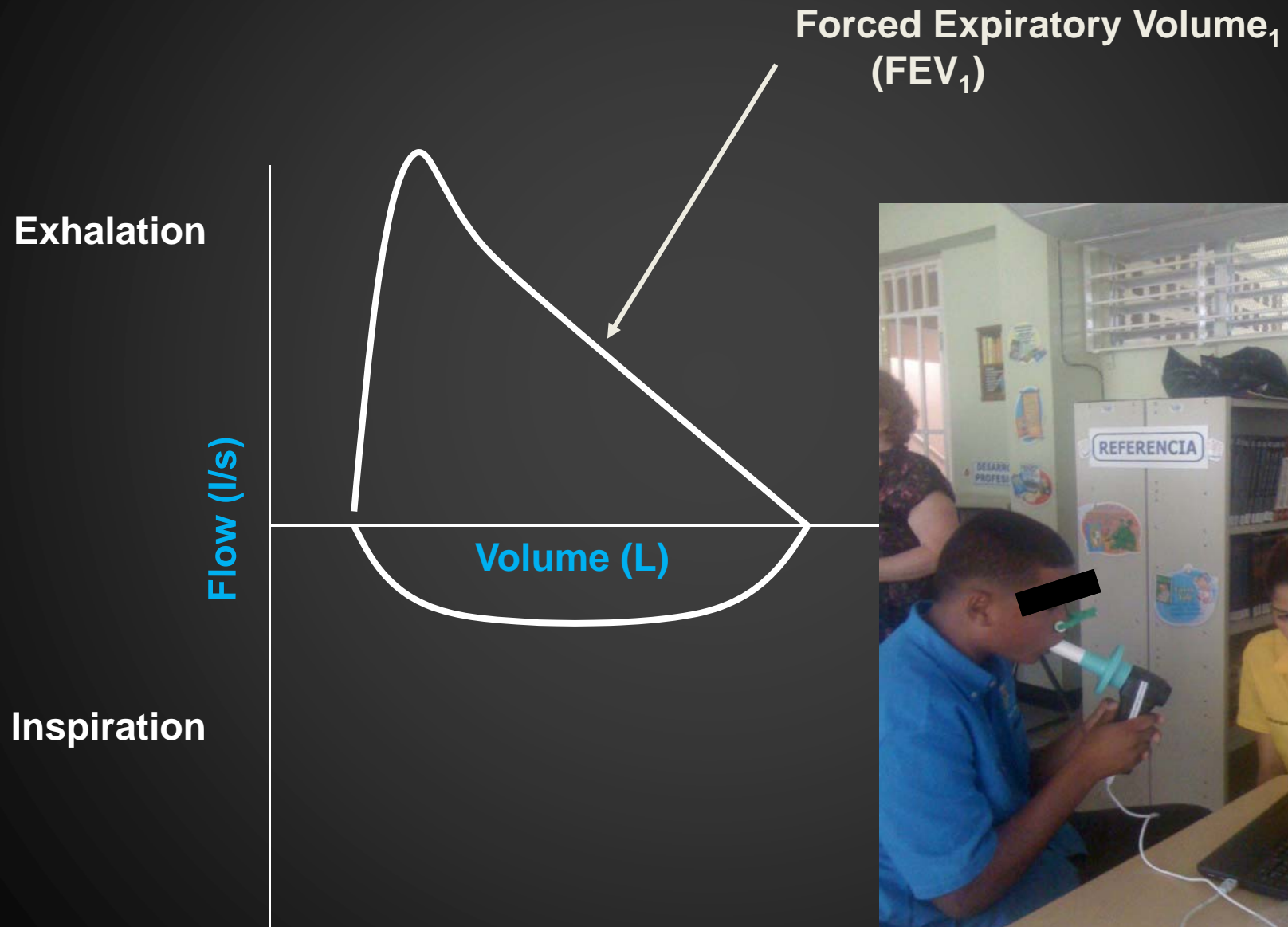
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Clinical Relevance?



UCSF

Lung Function Testing



Self-identified Race & Lung Function

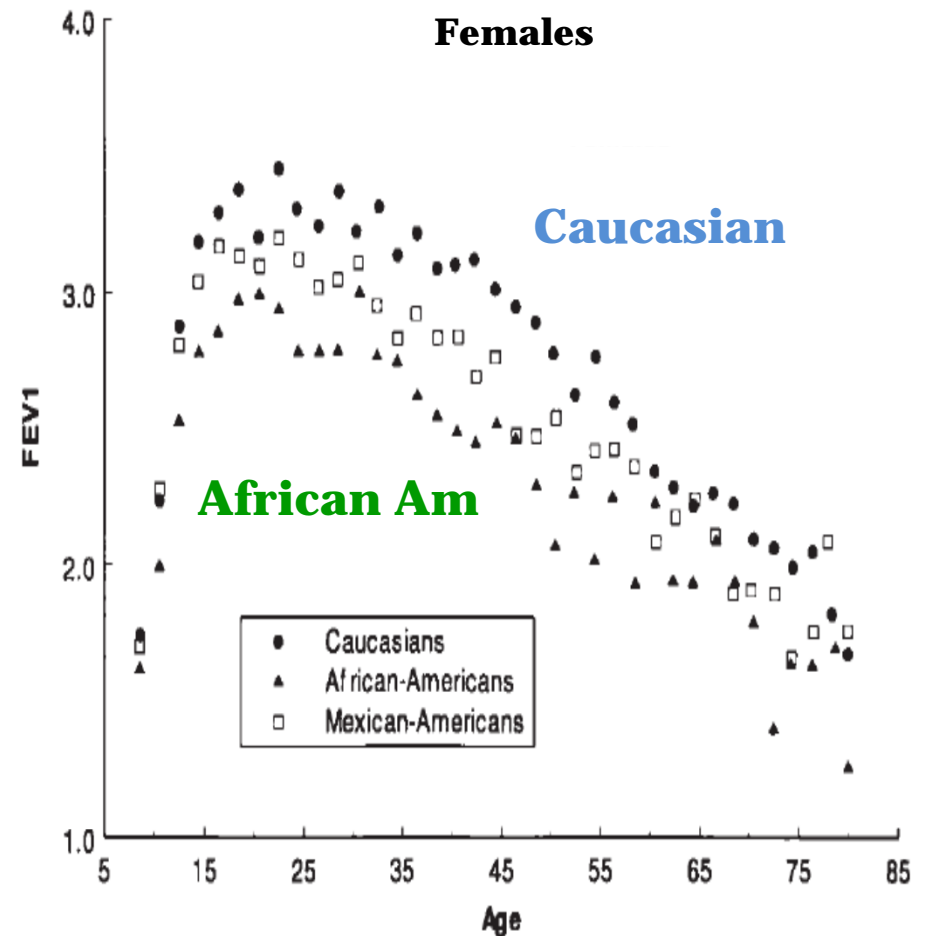
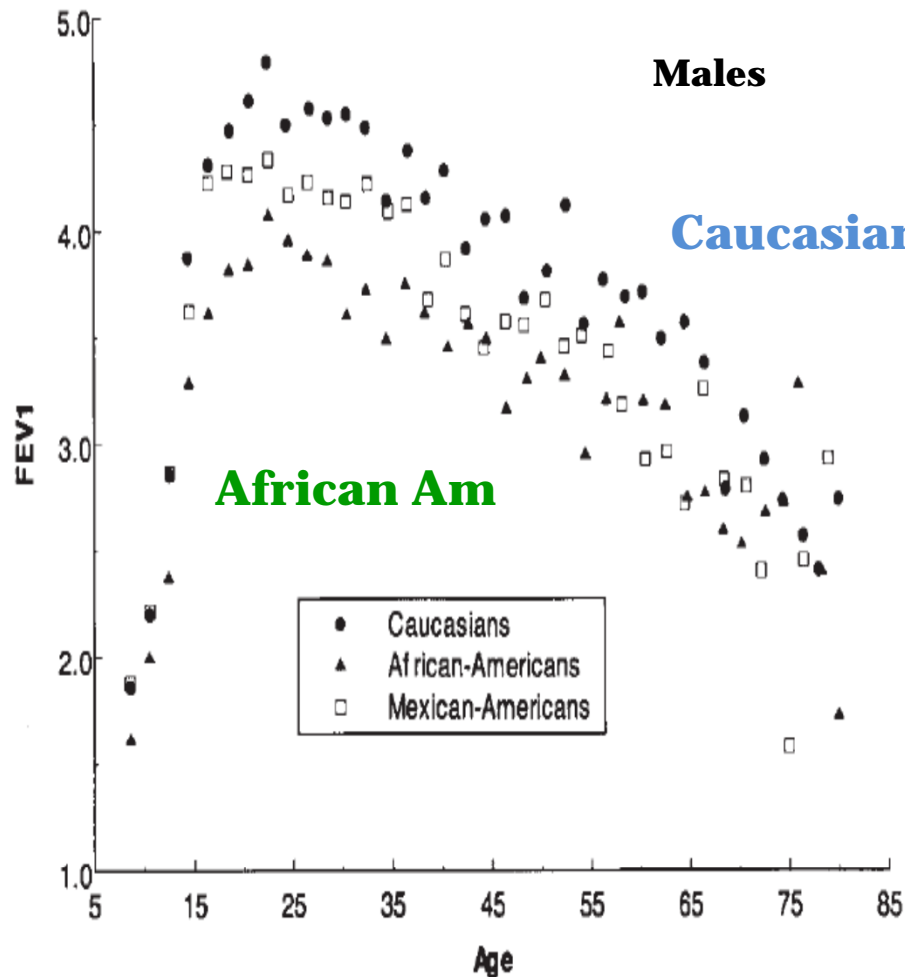


Figure 1. Mean FEV₁ versus age (2-yr increments) for male subjects.

Figure 2. Mean FEV₁ versus age (2-yr increments) for female subjects.

Adapted from NHANES data - Hankinson JL et al. AJRCCM 1999

Self-identified Race & Lung Function

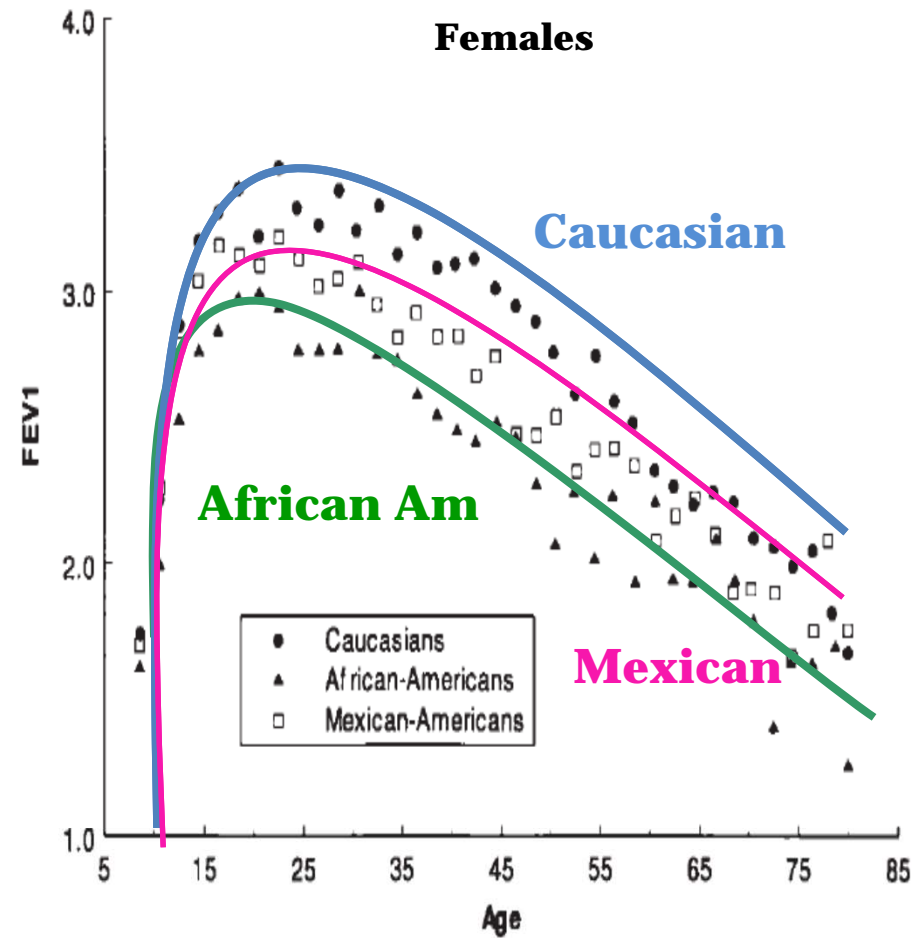
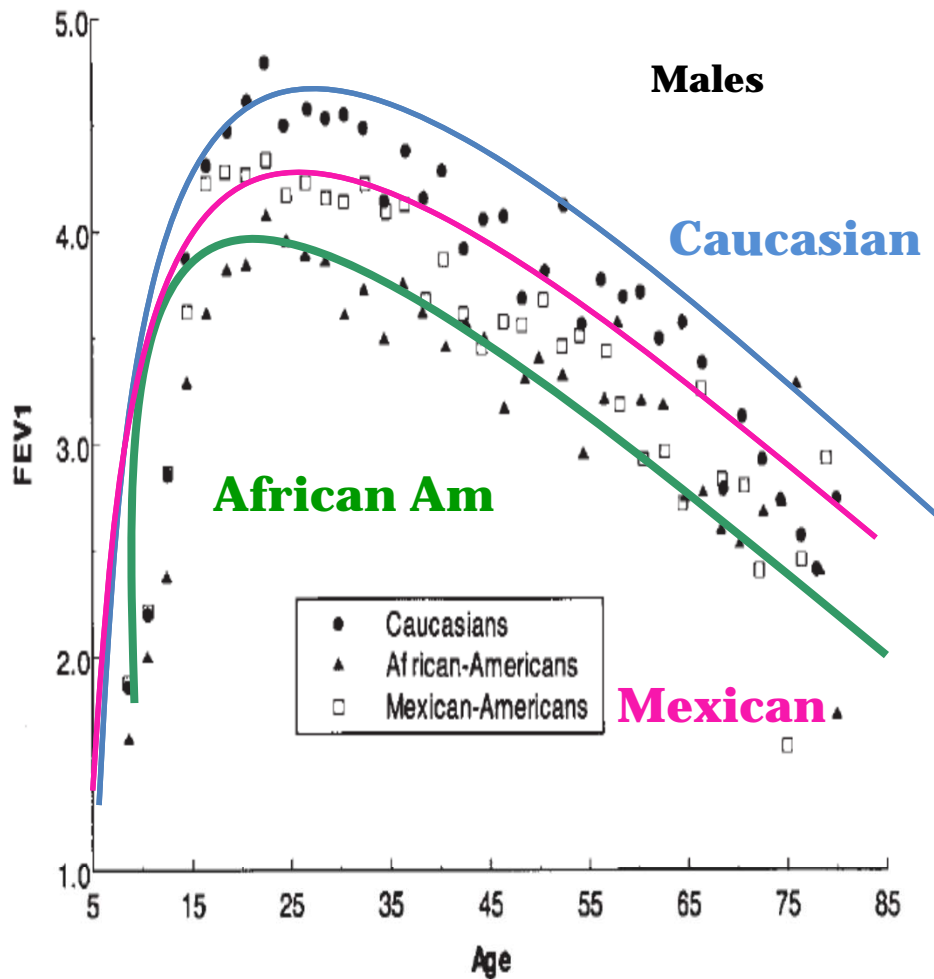


Figure 1. Mean FEV₁ versus age (2-yr increments) for male subjects.

Figure 2. Mean FEV₁ versus age (2-yr increments) for female subjects.

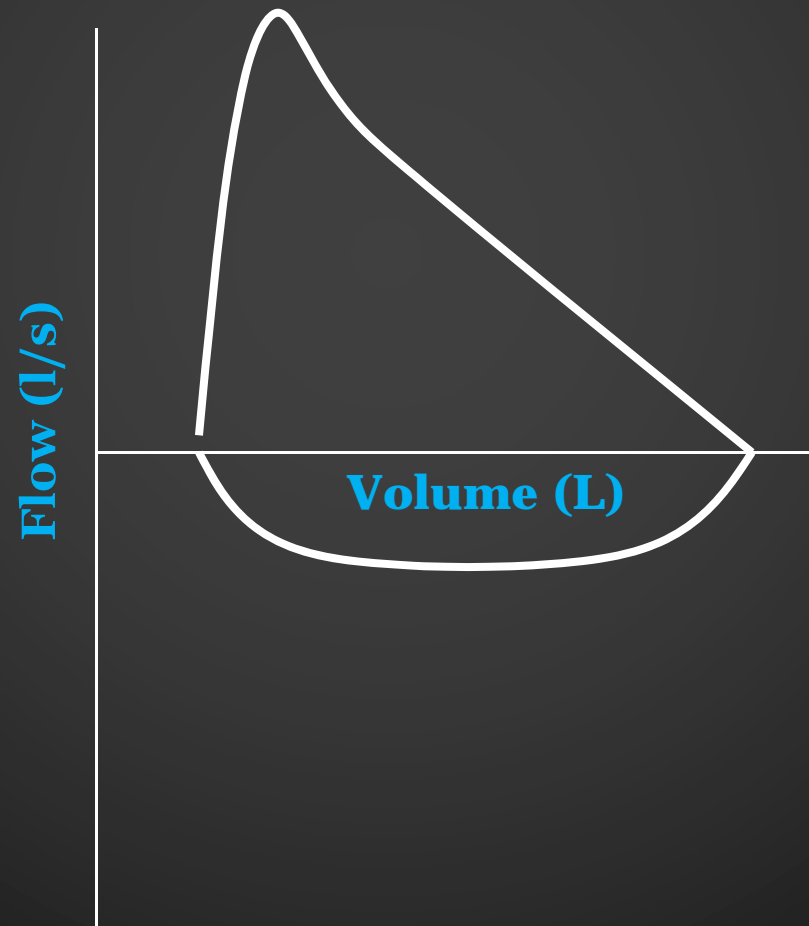
Adapted from NHANES data - Hankinson JL et al. AJRCCM 1999



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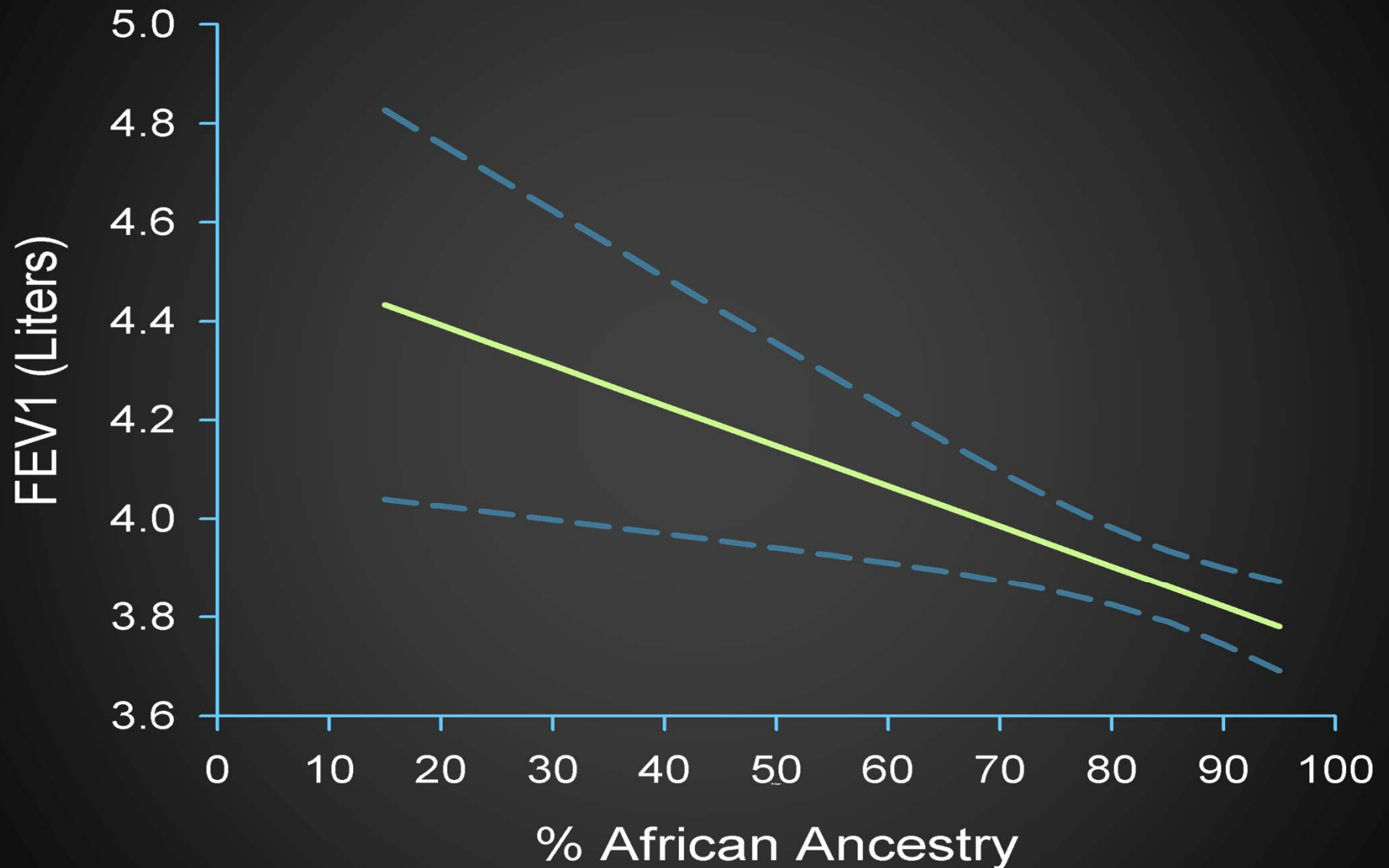


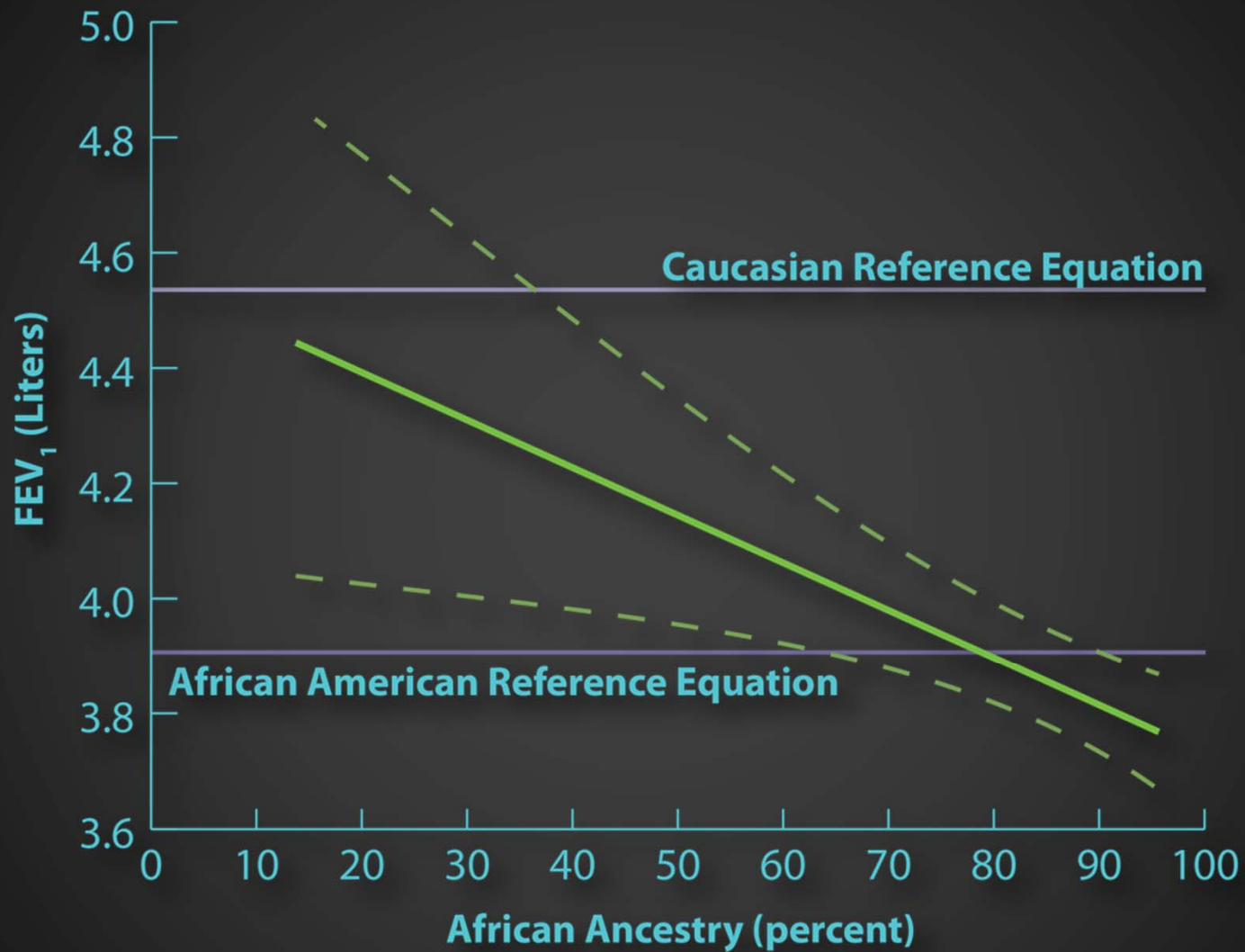
Self-identified Race vs. *Genetic Ancestry*?

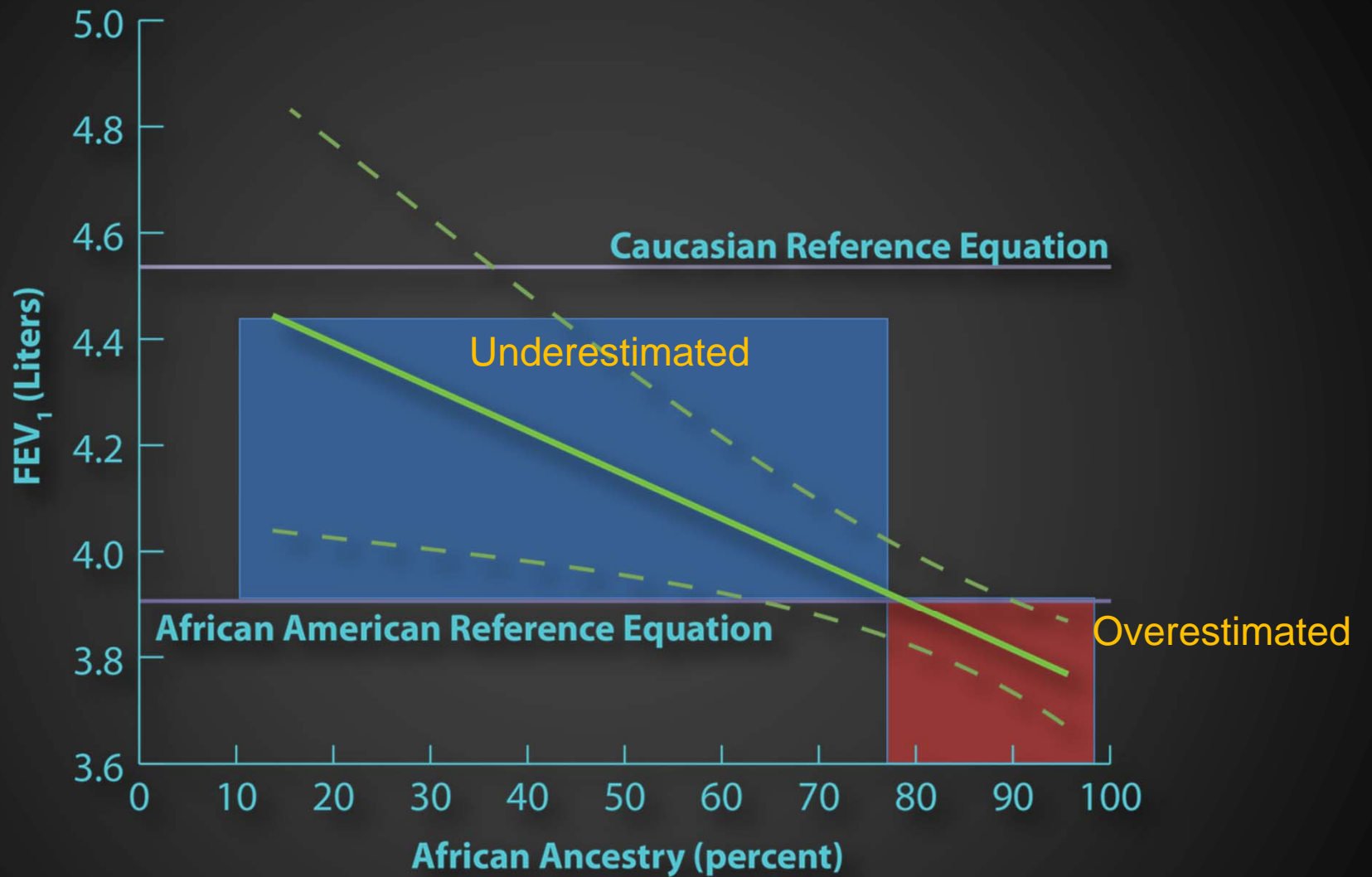


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Ancestry & Lung Function (FEV₁)

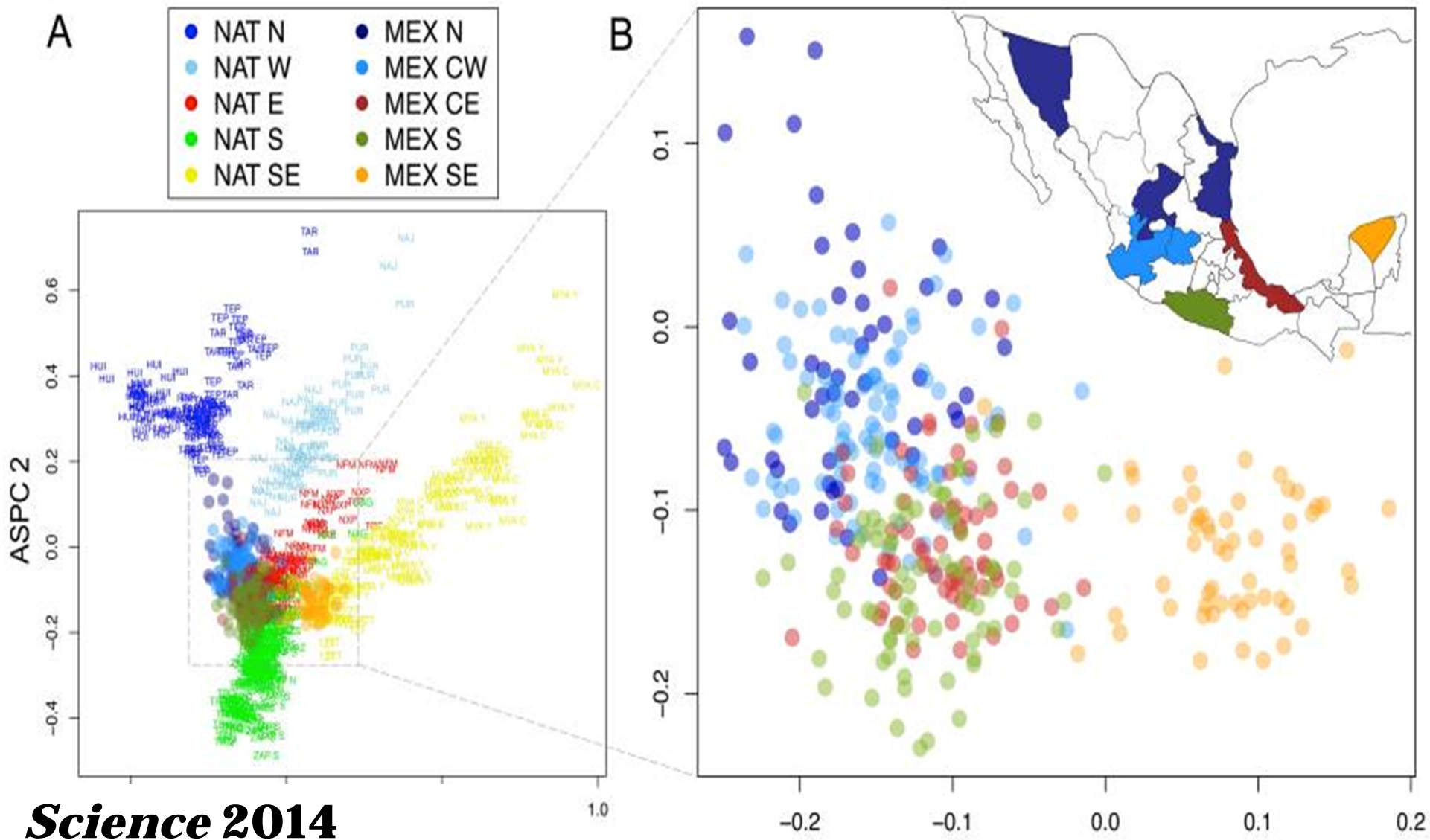




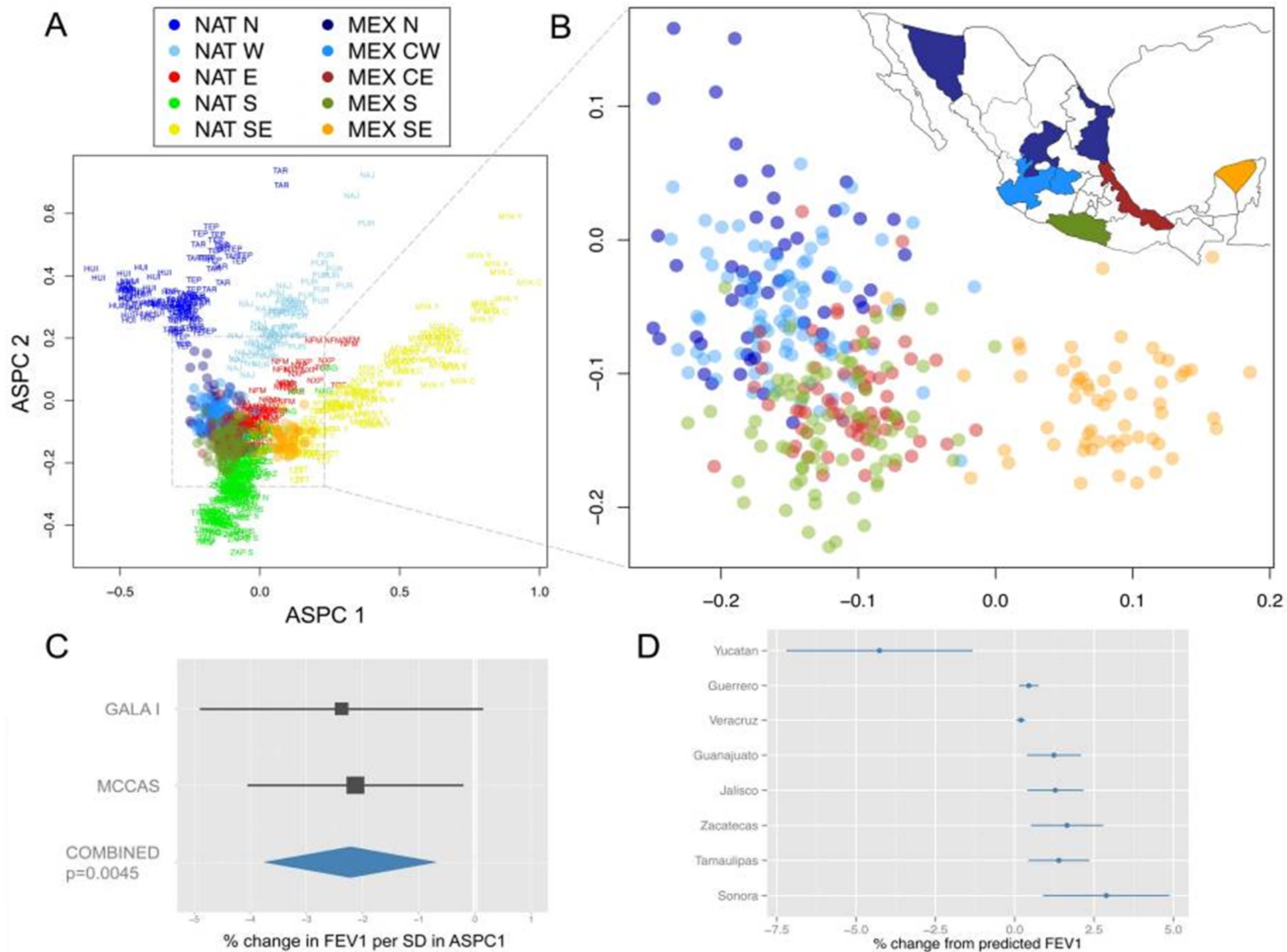




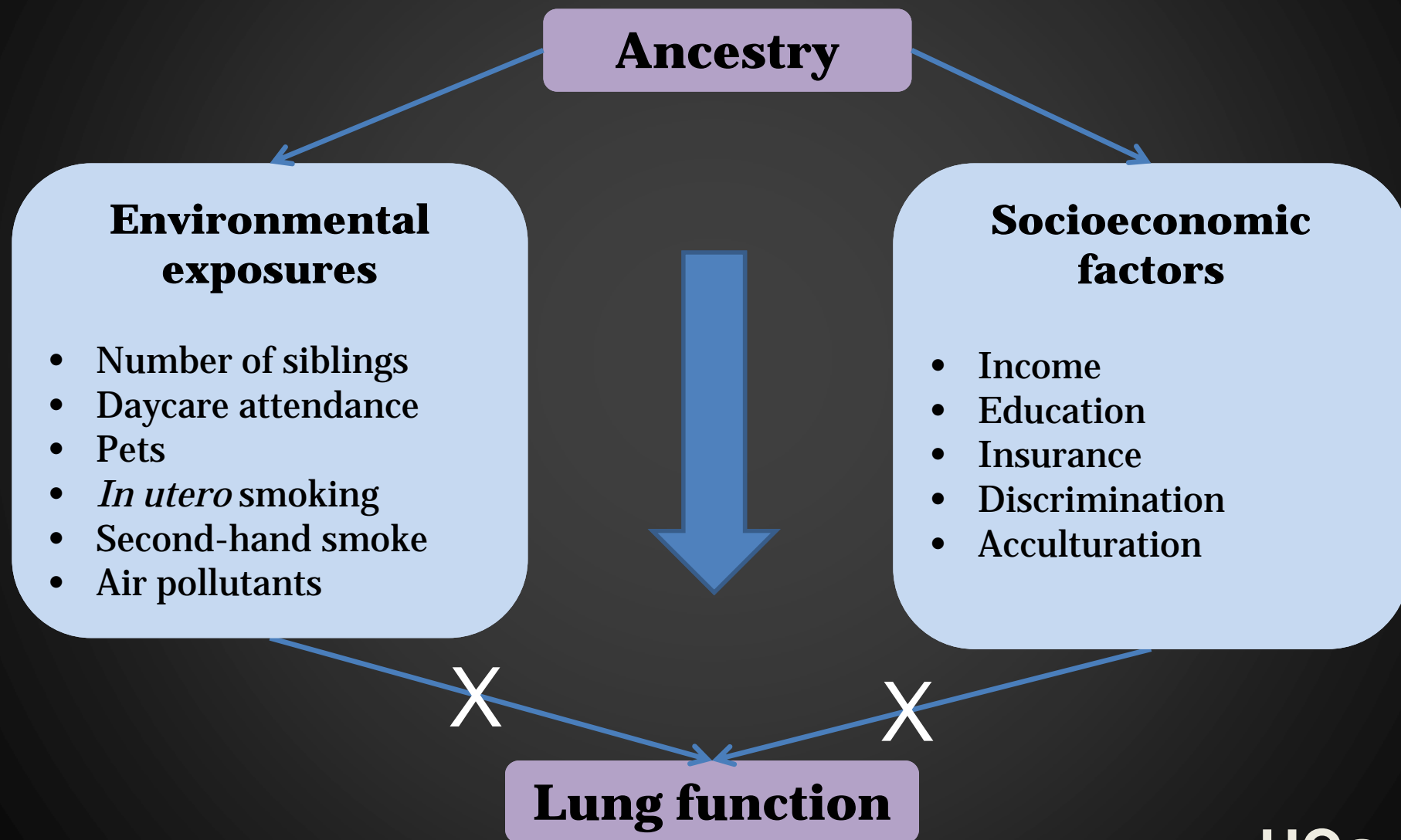
Ancestry & FEV₁



Science 2014

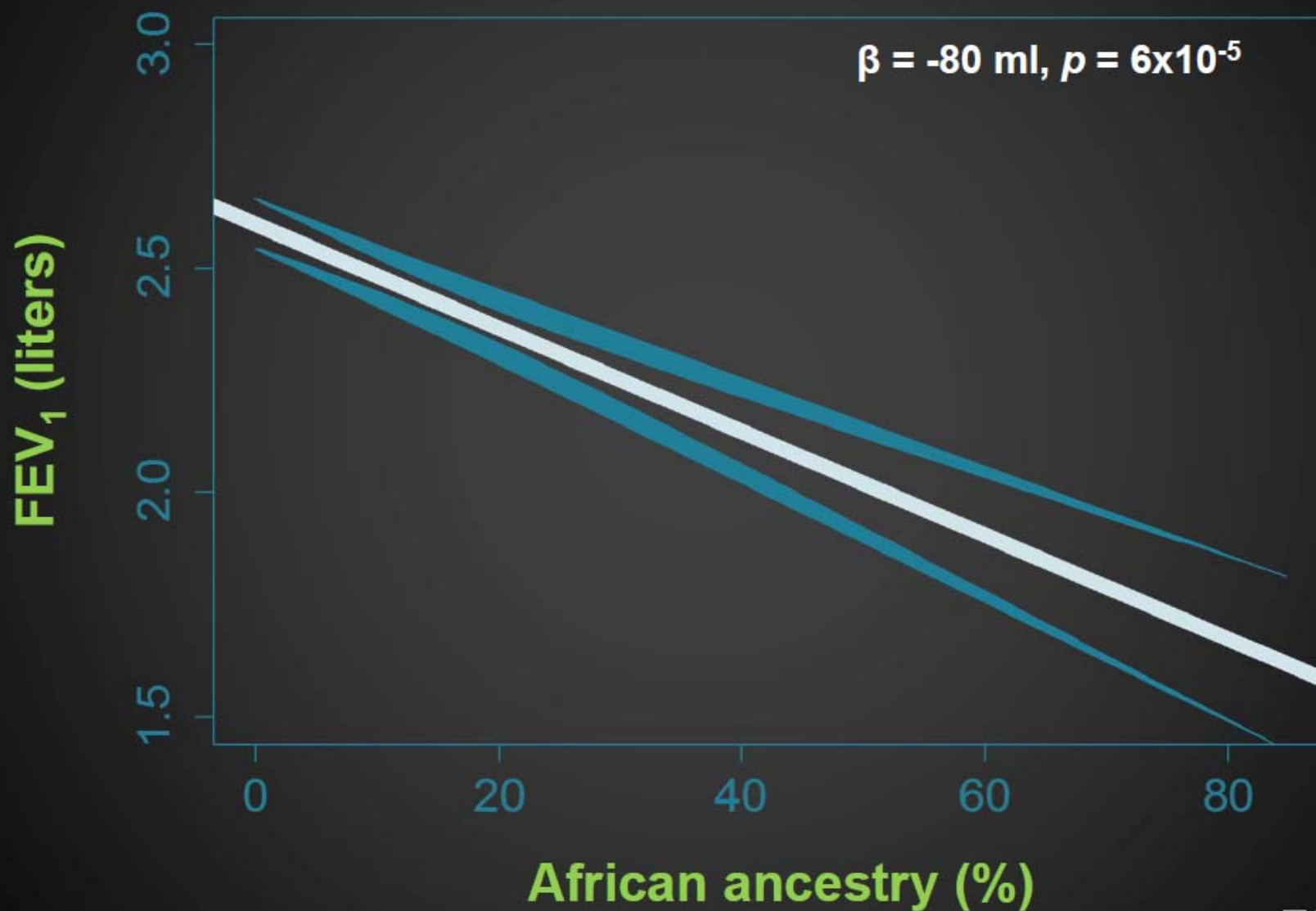


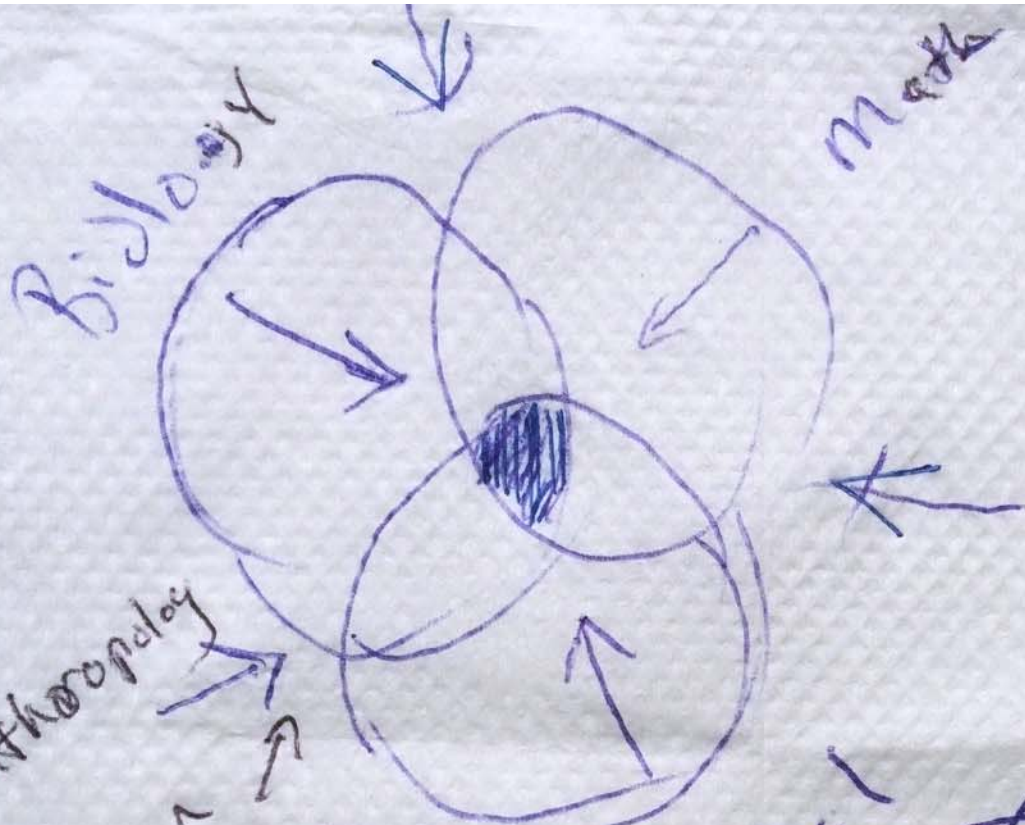
Ancestry & Lung Function





Ancestry & Lung Function in Latinos





Sept 30, 2015

Anthropology
Population History

Clinical

Esteban
Borchard

K. THANGARAJ

Kenji

30/9/15

