

Center for Health Equity Research

**Southwest Health Equity Research Collaborative
PILOT PROJECT PROGRAM**

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Project Title: Testing the utility of biocrust restoration to stabilize soils and reduce *Coccidioides* abundance

Proposal Abstract:

Valley Fever is a prevalent cause of community acquired pneumonia in the Southwestern United States. Infection is caused by inhalation of airborne *Coccidioides* spp. fungal conidia. For most people, the disease is mild or asymptomatic, but in others, it can cause severe respiratory illness and even death. Native American and Hispanic people are more likely to have severe manifestations or die from the disease than Caucasians. Although the cause of this disparity is unknown, it is likely a result of several factors, including work in agriculture, residence in areas experiencing land degradation and dust emissions, and inequity in healthcare. Soil becomes airborne in areas where the land surface has been disturbed, commonly as a result of agriculture, livestock grazing, recreation or land development. In the Southwest, a community of microorganisms called biocrusts are critical to maintaining soil health and integrity, but these organisms are also lost with soil disturbance. Biocrusts bind the soil surface, protecting it from wind and water erosion, thus reducing soil disturbance and dust. We propose to test the potential of biocrust restoration to reduce exposure to *Coccidioides*. Specifically, we will test several methods of restoring biocrusts from field collected or field collected and cultivated biocrusts in a Valley Fever hotspot near Scottsdale, AZ to determine which methods best mitigate dust from soil and reduce the abundance of *Coccidioides* either directly or through competition with the soil microbial community. This translational research will demonstrate the potential of a novel environmental intervention to reduce incidence of Valley Fever.