**What did we do?**

We studied the DNA and health of several hundred Tsimane. We wanted to know how Tsimane DNA has changed over time, especially in ways that may be important for health.

**What is DNA?**

DNA carries all the information about how a living thing will look and function. For instance, DNA in humans determines things like what color your eyes are and how your heart works. Each piece of information is carried on a different section of the DNA and these sections are called “genes”. Each person’s DNA is unique, which is why each person is unique in terms of their traits like height, body shape, hair color and texture, etc. DNA is passed down from parents to children, which is why your children’s traits are more similar to your own than they are to someone who is not in your family.

**What did you study using DNA?**

Because DNA is passed down from parents to children, it can give us a lot of information about the relationships between individuals and populations. You got your DNA from your parents, but they got it from their parents, and so on, such that there is information about your distant ancestors in your DNA. We can use this information to understand the history of the Tsimane going back in time. In this study, we used DNA to understand how similar the Tsimane are to other populations as well as how much “admixture” or mating there has been between Tsimane and other groups going back far in time. Of the other populations around the world who also have DNA data available, we found that the Tsimane are most similar to other South American groups; this is expected since the Tsimane share history with other South American groups if we go very far back in time.

We also found that there has been almost no admixture between Tsimane and Europeans. Unlike many other South American groups (Peruvians for example) who have admixed with missionaries or other European individuals in the last few hundred years, this does not seem to be something that happened in the Tsimane.

Sometimes when DNA is passed down, it changes or “mutates”. Sometimes DNA mutates in a way that is beneficial to health and survival; when this happens it spreads in the population because people who carry the mutation are able to live longer. We were interested in identifying these beneficial mutations in DNA and understanding how they affect health in the Tsimane. This was the main goal of the study.

**What did you find out about health?**

We found evidence for beneficial mutations at genes involved in how the Tsimane fight infections and use energy (i.e., how your body processes food and uses the nutrients from food to fuel all the things it needs to do). This makes a lot of sense because the Tsimane live in an environment where there are many parasites to deal with, so mutations that help people stay healthy during an infection will be useful. These mutations probably arose long ago and have spread in the population over thousands of years, such that most people carry them today.

We are also interested in whether the genes we identified that are related to energy usage have something to do with the Tsimane’s exceptionally healthy hearts. However, we need to do more research to say anything for sure about this.

**Why will these results be interesting to other scientists?**

Many researchers are interested in understanding how populations around the world are related to each other, as well as their history of migration and admixture that have made their DNA look how it does today. The Tsimane are a part of that much larger global picture and many people would be interested in learning more about the Tsimane’s history.

From a clinical point of view, scientists are interested in understanding which DNA mutations affect health, so that we can identify people that may be at risk of a particular disease. This would allow us to know, for example, who is at risk of becoming ill in old age by taking a DNA sample earlier in life. It can also help us develop medicine. More work is needed to get to this point, but this study tells us that there are mutations in the Tsimane that are important for your health.

Also, almost all of the studies that have been done so far that have linked DNA mutations to health have focused on Europeans. Since each person’s DNA is unique and each population’s DNA is different, it is likely that there are mutations in the Tsimane that do not exist in other populations (as well as mutations among Europeans that don’t exist among Tsimane). It would be very interesting to the scientific community to study these “novel” or “Tsimane-specific” mutations. We need to generate other types of data to specifically study these novel or Tsimane-specific mutations, but that is something we are hoping to do.