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Press Release

Humans have always come in different shapes and sizes

Tübingen researchers show that even our earliest ancestors varied in build

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A joint study by researchers from the Universities of Tübingen and Cambridge demonstrates that the earliest members of our genus *Homo* varied widely in body size. Until now, we knew little about the height and weight of our ancestors who lived between 2.5 and 1.5 million years ago. Co-author of the study, Manuel Will, says even then, human populations varied in size. Will is a doctoral candidate at Tübingen's institute of Early Prehistory and Quaternary Ecology. "These findings have important implications for the evolution of our genus," he says. The study was published online yesterday in the *Journal of Human Evolution.*

Will worked with Cambridge anthropologist Jay Stock to compare the physiology of individuals from early human populations, using fossils from the famous Olduvai Gorge in Tanzania and from Koobi Fora in Kenya, as well as individuals from the "Cradle of Humankind" in South Africa. Their sample also included the oldest human fossils from outside Africa, from Dmanisi in Georgia. They found significant differences in body sizes which strongly indicate that there were at least two differently sized species of *Homo* living between 2.5 and 1.5 million years ago. Individuals from Koobi Fora (1.7-1.5 million years ago) stood up to around 165 cm and weighed 70kg on average, whereas their contemporaries from Olduvai appear to have been on average 20cm smaller and 20kg lighter.

The comparison between the African and Eurasian fossils showed that early humans grew bigger only after the first migrations out of Africa and more specifically around 1.7-1.5 million years ago within Africa in the Koobi Fora region. Furthermore, the Georgian fossils still possessed smaller bodies. Taken together, this belies the theory that bigger size was the necessary physical condition for the first humans to migrate to Eurasia according to study authors Will and Stock.

The researchers used mathematical formulas to determine the size of the bodies in life, extrapolating from the fossil remains. Such fragments often reveal the genus but do not provide enough information for researchers to determine the species with certainty.

For this reason, the Tübingen-Cambridge study did not classify the fossils according to species, instead using time and geography to determine the body-size difference in these early human populations. These two variables were easier to control, and at the same time, increased the sample size of early *Homo* individuals - because all the bone fragments from the right era and location could be included. “This innovative approach has allowed the researchers to shed new light on the evolution of body size within our genus,” says Professor Katerina Harvati-Papatheodorou, head of the Palaeoanthropology working group at Tübingen’s Institute of Prehistory and Medieval Archaeology.

The study is the most comprehensive of its kind to date and the first statistical investigation of body-size differences between early *Homo* species.

Publication:

Will, M., Stock, J.T., Spatial and temporal variation of body size among early Homo, Journal of Human Evolution (2015), http://dx.doi.org/10.1016/j.jhevol.2015.02.009
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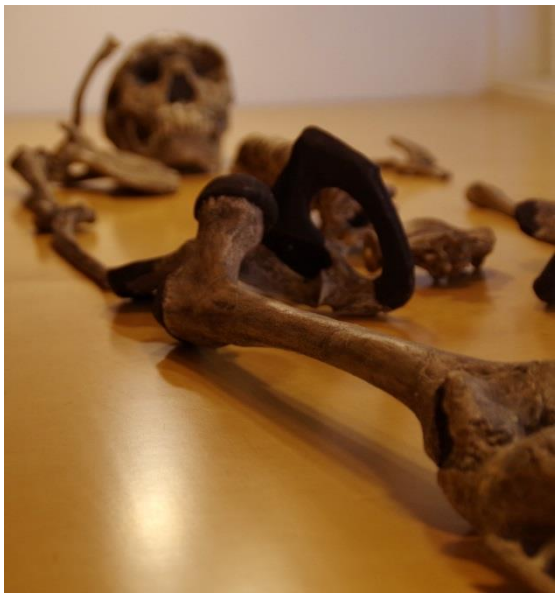

The Turkana boy (*Homo erectus*), 1.5 million years old. The femur is often used for mathematical calculations of body size because it is the largest bone and carries much of the body’s weight.

Photo: Jay Stock

Koobi Fora, a key source of early human fossil remains.

Photo: Manuel Will