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## Tracing very long-term kinship networks using SOCSIM

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### Abstract

While each individual has 10 billion ancestors a thousand years ago, these are not distinct and in practice, the number of distinct ancestors is much smaller. A female ('mitochondrial Eve') and a male ancestor ('Y-chromosome Adam') of all humans certainly existed, possibly about 100,000 years ago, and a most recent common ancestor (MRCA) of all humans existed much more recently. I use the SOCSIM micro simulation program to estimate the patterns of descent over periods of several centuries, using as indicators, the proportion of people without any living descendants; the mean number of distinct descendants; and the genetic contribution to later populations. About three quarters of those born in the past have no descendant, mainly because they did not reach the age of reproduction. After about 500 years, the number of descendants with the populations sizes used here, about 4,000, the number of descendants becomes very similar and close to the size of the number of descendants, confirming that even in these timescale, in the past, a person is either the ancestor of everyone, or of no-one. However, the genetic contribution does not exhibit a similar tendency to uniformity. Issues such as the relevant measures of generational replacement to cases with multiple lines of descent are also considered.

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### Keywords

[genetics](#), [kinship](#), [microsimulation](#)

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