

## **ABSTRACT**

### **SAMPLING BIASES AND NEW WAYS OF ADDRESSING THE SIGNIFICANCE OF TRAUMA IN NEANDERTALS**

**by**

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There is a popular perception that trauma was quite frequent in Neandertals because of harsh environmental conditions and their strenuous lifestyle. Many well-known individual Neandertals exhibit injuries, but they are mostly well-preserved, male and old. In previous examinations of patterns of trauma in Neandertals, frequencies of trauma by element were not addressed and the samples of Neandertals used represented neither a specific Neandertal population nor a demographically representative sample. The hypothesis that trauma in Neandertals occurs more frequently than in other groups has never been systematically tested. This thesis reports the development and results of new methods designed to address this question in a statistically valid manner.

The small number of mostly poorly preserved Neandertal remains is vulnerable to sampling biases. How such biases prevent trauma frequency data from representing the sampled population, and provoke misinterpretation in subsequent comparisons to other populations, is addressed. Ways to limit the influence of some of these biases in testing hypotheses about the significance of trauma are described.

The distribution and frequency of trauma among Neandertals is approached by asking three questions: 1) How is trauma distributed among individual Neandertals? 2) What is the frequency of trauma by skeletal element and are frequencies significantly different from those observed in modern populations? 3) Do trauma frequencies for two collections from single sites where the data were collected by identical methods significantly differ, and if so, in what ways? The significance of differences within these aspects of Neandertal trauma is determined by analyzing two-way contingency tables using simulations (ACTUS2).

Hypotheses are tested in three distinct contexts: 1) distribution of trauma among individual Neandertals with trauma; 2) distribution of trauma within a large sample of European Neandertals and in comparison to hunter-gatherer, forager and nomadic samples; and 3) comparisons between trauma in a single Neandertal sample and in a medieval sample where both samples are extremely fragmentary. Hypotheses of the independence of the presence of trauma and demographic variables, preservation status, injury severity, and area of the body injured are tested. In general, Neandertals do not show frequencies of trauma significantly greater than those in other groups.