



### A112 Antemortem vs. Postmortem Measured Statures of Korean War Casualties

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After attending this presentation, attendees will better understand the relationship between antemortem and postmortem measurements of stature and how this impacts the reference samples used in the anthropological calculation of stature.

This presentation will impact the forensic science community by further illuminating the relationship between antemortem and postmortem stature measurements.

Forensic anthropologists estimate the stature of skeletal remains using regression models based upon various data sets. Some data sets include measured antemortem statures for individuals, while others include postmortem cadaver lengths; rarely are both available. Two of the largest data sets available are those collected by Mildred Trotter from United States casualties from World War II and the Korean War, for whom living, measured statures were recorded. Other data sets, such as many anatomical collections, lack antemortem measurements and substitute postmortem stature, or cadaver length. These two measurements are not the same. The stature of any living individual is not a constant: recorded statures can vary based upon when they were taken, the methods used, and how they were transcribed. Postmortem measurements exhibit similar methodological and transcription variation, but are generally longer than antemortem measurements, presumably because curvature of the spine relaxes to some degree.

The Individual Deceased Personnel Files of historically identified Korean War casualties provide a data set of postmortem lengths that can be compared with antemortem measured statures. Stature was an essential component of the wartime identification process and was recorded at different stages. Form 1042 (Report of Interment) was completed when remains were initially processed and interred in a temporary cemetery. Early in the war, the height field was generally only completed for unknown remains; later on, its completion came to be more standardized. These measurements were taken by Army Graves Registration personnel at the cemetery. Form 1044 (Identification Data) was completed when the remains were later exhumed for identification processing by a team that generally included an anthropologist. Per the Central Identification Unit Standard Operating Procedures (SOP), these teams recorded “table measurements” of all flesh-covered remains, and long bone measurements from all skeletal and semi-skeletal remains. While bone lengths were recorded in centimeters (cm), all heights were measured in inches.

What is the relationship between these two postmortem measured statures and the casualties’ antemortem statures? Multiple studies indicate that postmortem measurements should be approximately 1” higher than antemortem. Furthermore, the table measurements recorded on Form 1044 should be more accurate than the cadaver lengths recorded on Form 1042, given the conditions under which each was taken. In fact, the cadaver lengths were subject to more rounding error than the 1042 or 1044 measures: of 239 cadaver lengths in the dataset, 7 (2.9%) ended in fractions, while 205/481 antemortem statures (42.6%) and 137/290 table measurements (47.2%) ended in fractions.

Comparing 235 cadaver lengths to antemortem statures, 10.6% were identical, 58.7% larger, and 30.6% smaller, and the mean difference was 0.73”; 49.4% of the cadaver lengths were less than 1” different from the antemortem heights, placing them within rounding error. Another 16.2% were at least 1” but less than 2” greater, placing them within the expected range for postmortem measures; 34.5% were from 2” or 8” larger. Some of these may well be



## Anthropology - 2017

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the result of growth after enlistment, given that many of the men enlisted at 18 or even 17 years of age, but much is presumably the result of measurement or recording error in either the antemortem or postmortem measures.

Comparing 289 table measurements to antemortem heights, 17.3% were identical, 55.0% larger, and 27.7% smaller, and the mean difference was 0.45"; 57.1% were less than 1" different from the antemortem heights, 10.4% were 1" or more shorter than antemortem heights (with a maximum discrepancy of 4"), while 29.4% were between 1" and 2.75" taller, and 3.1% were between 3" and 5.5" taller.

Only 48 cases had both cadaver lengths and table measurements recorded. The mean difference between them was -0.37", with half of the cadaver lengths larger and 37.5% smaller; 55.3% of the table measurements were closer to the antemortem height than the cadaver length was. Several cases demonstrate clear error in the recorded cadaver length, such as an antemortem height of 74" with a table measurement of 73.5" and a cadaver length of 67".

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### **Stature, Postmortem Measurement, Military**