

Estimation of Femoral Length through Fragmentary Bone Dimensions

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ABSTRACT Bone fragments have often been neglected by most researchers assuming no relevant information can be obtained from such remains. The present study aims at formulating means of reconstruction of femoral length from fragmentary measurements pertaining to multiple dimensions of the femur like earlier studies where a single (linear or transverse) dimension is used. A total of 288 femora, belonging to 82 male and 63 female documented skeletons have been measured for fifteen linear, transverse, sagittal and circumferential measurements along with maximum length. All the skeletons belonged to the residents of Madhya Pradesh, India. Analysis of data reveals non-significant bilateral differences in all the fragmentary dimensions of the femur, but the sex differences are highly significant at the $P < .01$ level. Thus, the sexes have been dealt with separately for computation of linear and multilinear regression formulae. Shaft length shows the highest correlation with femoral length and proves to be the best single predictor of bone length for either sex. This is followed by the upper epiphyseal breadth for males and bicondylar breadth for females. Ten out of fifteen fragmentary measurements contribute to formulate four multiple regression equations for both sexes. The equation based on two linear, one transverse and a circumferential measurement proves to be the best indicator of femoral length.