

# REFERENCES

## Technical Info

Clauser, Charles E.; Gordon, Claire C.; McConville, John T; Tebbetts, Ilse (1986). "Selection of Dimensions for an Anthropometric Database Volume:1 Rationale, Summary, and Conclusion". Natick, MA; U.S. Army Natick Research, Development, and Engineering Center. NATICK/TR-86/053

This report is available at <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA179566&Location=U2&doc=GetTRDoc.pdf>

Abstract: A large number of body size variables were examined and rated for their usefulness in an anthropometric data base designed to serve present and future needs of the U.S. Army. These dimensions are assembled in groups representing various uses to which the Army might put these data, ranging from the design of clothing, personal protective equipment, and workspaces, to the development of link systems and human analogues. A total of 362 dimensions analyzed in this study were rated as marginal, useful or essential to one or more of these applications. Some 194 dimensions are suggested as candidates for measurement in a proposed new large-scale multipurpose survey of Army personnel. Sources for the study included 34 anthropometric surveys of U.S. and foreign military and civilian subjects, as well as questionnaire surveys and interviews with clothiers, modelers, design engineers, physical anthropologists, and others experienced in the application of anthropometric data to military design problems. Dimension lists from fourteen large-scale surveys were selected for detailed review. Descriptions and analyses of all the dimensions measured in those surveys appear in Volume II of this report.

Clauser, Charles E.; McConville, John T; Gordon, Claire C.(1986). "Selection of Dimensions for an Anthropometric Database Volume II: Dimension Evaluation Sheets" Natick, MA; U.S. Army Research, Development and Engineering Center. NATICK/TR-86/054

This report is available at <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA179472&Location=U2&doc=GetTRDoc.pdf>

Abstract: Anthropometric dimensions measured in 14 major foreign and domestic military and civilian surveys were reviewed in detail for possible inclusion in an anthropometric survey of U.S. Army men and women. Detailed review of each dimension included the following information: a description of the dimension, subject position, and landmarks required; type of instrument used; significant technique differences among different surveys; alternative dimensions that could serve the same function in a data base; summary statistics from surveys that included the dimensions; notation of significant gender or racial differences for the dimension; ease of reproducibility, and factors contributing to reproducibility problems (if any); and a rating (with rationale) of the dimension's

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relative utility for a U.S. Army data base. Review sheets summarizing this information comprise Volume II of this report.

Gordon, Claire C.; Bradtmiller, Bruce (1992). Interobserver Error in a Large Scale Anthropometric Survey. *American Journal of Human Biology*, 4(2), 253-263.

This report is available at <http://nsrdec.natick.army.mil/LIBRARY/90-99/R92-09.pdf>

Abstract: The adverse effects of interobserver error on morphometric population comparisons are well documented in the literature. While interobserver error can rarely be avoided, it can be minimized by having a single individual locate and mark relevant landmarks, by limiting the number of observers for each variable, and by reviewing repeated measures data daily to catch and correct measurer drift during data collection. In this study, two pairs of experts participated in interobserver error trials designed to pre-set observer error limits for use in the quality control of a large scale anthropometric survey. Repeatability data were also collected twice daily in the field and reviewed with the measurers. Interobserver errors obtained in the field were lower than those achieved by the experts for 27 of 30 dimensions. These results suggest that establishment of permissible interobserver error in advance of data collection and frequent review of repeated measurements during data collection can reduce the magnitude of interobserver error below that obtained by experts measuring in a laboratory setting. However, even differences of small magnitude can be serious when they are directional, and 17 of 30 dimensions exhibited statistically significant bias between measurers despite all quality control efforts. The magnitudes of interobserver error observed in this study have proven particularly useful in evaluating the biological relevance of statistically significant differences which are of relatively small magnitude.

Gordon, Claire; Bradtmiller, Bruce; Paquette, Stephen (2008) Presentation to the Human Biology Association; *Anthropometric Changes in the US Army: 1987-2007*; 9-10 Apr 2008; Columbus, OH