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CR-171 874
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TECHNICAL INFORMATION RELEASE

management and technical services company

TIR 2114-MED-5007

FROM	TO
Joel I. Leonard, Ph.D.	N. Cintron, Ph.D./SD4

DATE	CONTRACT NO:	T.O. OR A.D. REF:	MIS OR OTHER NASA REF:
4/8/85	NAS9-17151		

SUBJECT Alterations/Corrections to the BRASS Program

(NASA-CR-171874) ALTERATIONS/CORRECTIONS TO THE BRASS PROGRAM (Management and Technical Services Co.) 2 p HC A02/MF A01 CSCL 06S

N85-26121

Unclas

G3/52 21221

This report briefly summarizes corrections applied to statistical programs contained in two subroutines of the Bed Rest Analysis Software System.

Susan N. Brand

Attachment
/db

Unit Manager **Approving Manager** F. A. Kutyna, Ph.D. **NASA Concurrence**

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Alterations/Corrections to the BRASS Program

The Bed Rest Analysis Software System (BRASS) contains a data base of experimental results from a number of bed rest studies conducted over a 10-year period at the U.S. Public Health Hospital in San Francisco. It also includes subsystem programs which facilitate data analyses and displays. While conducting bed-rest data analyses with the BRASS program during the last contract period (1980-82), which led to the publication of the "Report of the Bed-Rest Data Analysis. Treatment: Bed Rest Only" (TIR 2114-MED-2021), an inconsistency in the calculation of significance (t-statistic) values was revealed.

Two subroutines, the LOOK and STAT subroutines, independently calculate significance values within the BRASS program. The significance values calculated by the STAT subroutine were tested extensively and found to be correct (with one exception discussed later), however, many of the values calculated by the LOOK subroutine were erroneously small (i.e., erroneously significant). The t-statistic computations in the LOOK and STAT subroutines were identical, however, the LOOK subroutine received erroneous input data for one of its variables. In STAT, the variables S1 and S2 were the sums of the squares of their values from their respective means for populations 1 and 2. In LOOK, these same variables (S1 and S2) were the standard deviations of the populations; that is, the sum of squares divided by their degrees of freedom. To correct this problem an array, designed for storage and retrieval of the sum of squares data, was incorporated into the BRASS program and applied to the t-statistic variables in the LOOK subroutine.

The above modification to the BRASS program corrected most of the erroneous significance values calculated by the LOOK subroutine; however, incorrect values were also encountered in both the STAT and LOOK subroutine for tests in which the standard deviations of both sample populations were equal to zero. These errors were the source of round-off errors and were corrected by checking for standard deviations less than 1×10^{-7}. Previously the standard deviation was checked for values equal to zero.