

A STUDY OF SELENIUM IN NEW MEXICO

Presented by: Jim Standefer, Ph.D.
Toxicologist
Office of the Medical Investigator
Albuquerque, NM 87131

Through the Office of the Medical Investigator we obtained blood and urine specimens from 100 persons who were autopsied following traumatic injury death. These persons were apparently healthy at the time of death and resided in various counties in New Mexico (see Figure 1). The blood and urine samples were analyzed for Selenium by Atomic Absorption Spectrophotometry by a method which has a precision of $\pm 10\%$ and a recovery of $100 \pm 10\%$. All samples were assayed in duplicate.

The results of this study were tabulated and are displayed as follows. First, the average Selenium concentrations in blood and urine are shown for each county in Figures 2 and 3, respectively. For those counties in which less than four samples were assayed, the average value is shown but no standard deviation of the values is given. The differences observed between counties may or may not be real, and we must accumulate more data in each county before small differences could be validated.

The average values for all males and females in the study are shown in Table 1. The lower values in females compares with a recent report Tsongas and Fergeson (1), although we observed smaller differences in the Selenium values of males and females. The average value of 150 ug/liter in blood for males compares well with average values observed by other investigators in this country. Shamberger, et al (2) reported an average value of 229 ± 35 ug/liter, while Dickson and Tomilson (3) reported an average of 182 ± 36 ug/liter for populations in the United States. Wikstrom, et al (4) reported lower values in Scandanavian men (69 ± 11) while Griffiths and Thompson (5) reported an average of 68 ± 13 ug/liter for normal New Zealand people. It is interesting to note that in our study the concentration of Selenium in urine is consistently lower than in blood. This is not too surprising since most trace elements are found in lower concentrations in urine compared to blood.

In conclusion, the Selenium concentrations found in this study compare well with studies of larger populations in the United States. However, we have studied relatively small numbers of samples in some areas of the state and Selenium concentrations in select populations may be abnormal. This can be determined with further study.

Table 1. Average Selenium Concentrations in Blood and Urine

		<u>Number of Samples</u>	<u>ug/liter Averages</u>	<u>Standard Deviation</u>
Men	Blood	62	150	±61
	Urine	62	118	±53
Women	Blood	38	103	±35
	Urine	38	76	±53

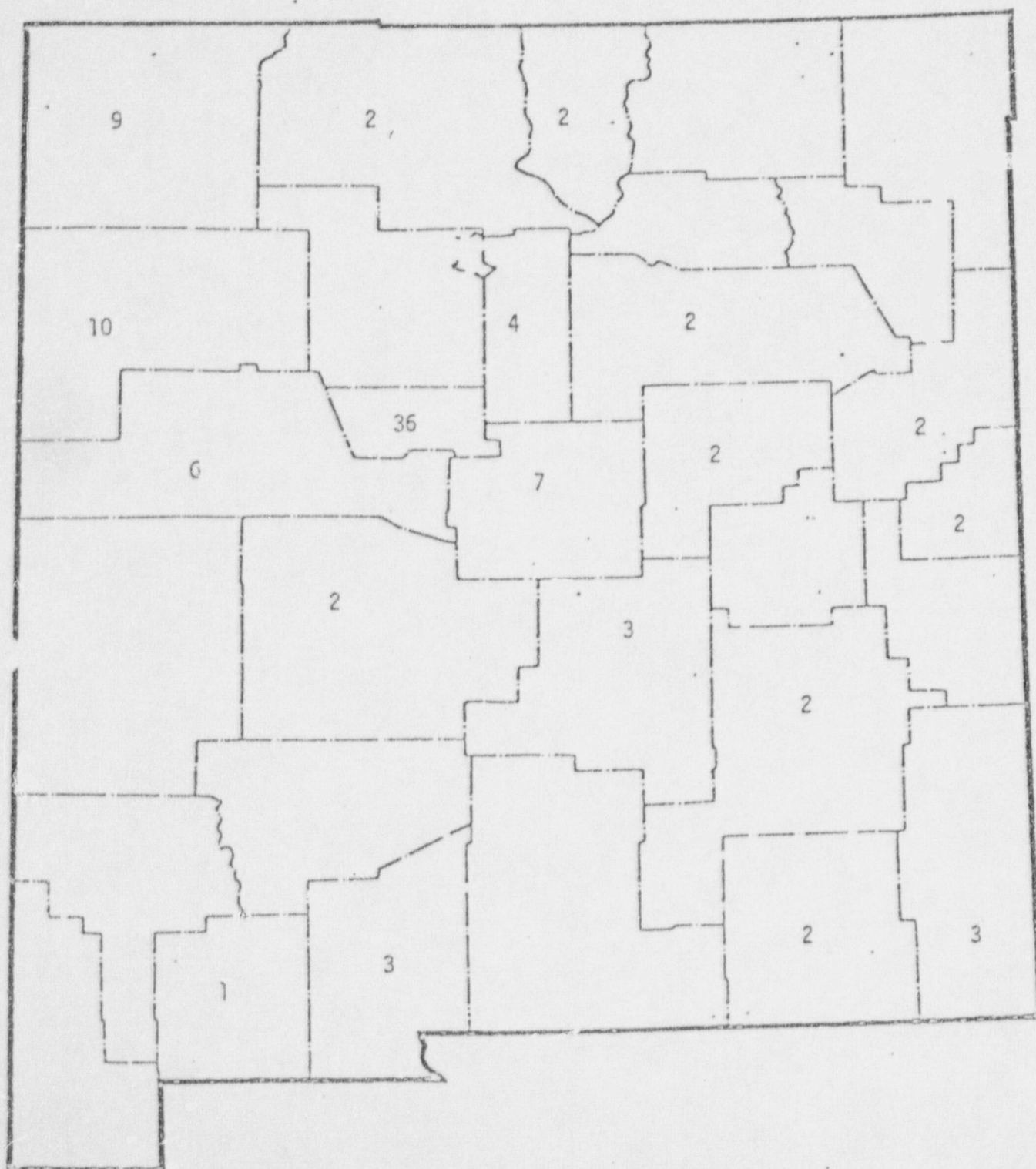


FIGURE 1. Distribution of subjects in New Mexico who were included in this study. The numbers in each county indicate the total number of subjects (male and female) from that county.

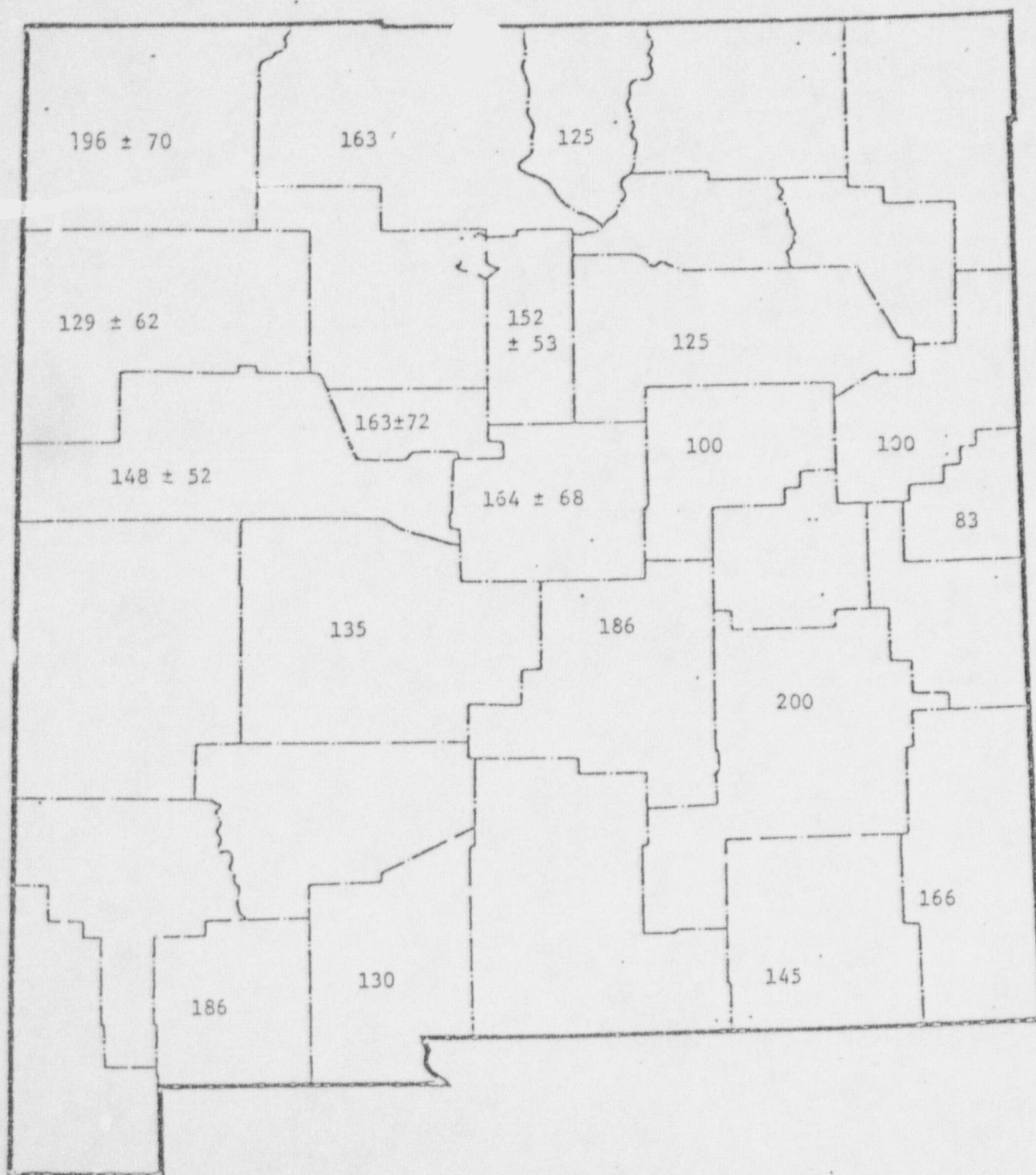


FIGURE 2. Average values for Selenium in blood samples as determined for each county in the study. The numbers indicate the average \pm one standard deviation. Counties with less than 4 individuals in the study show only the average value with no standard deviation.

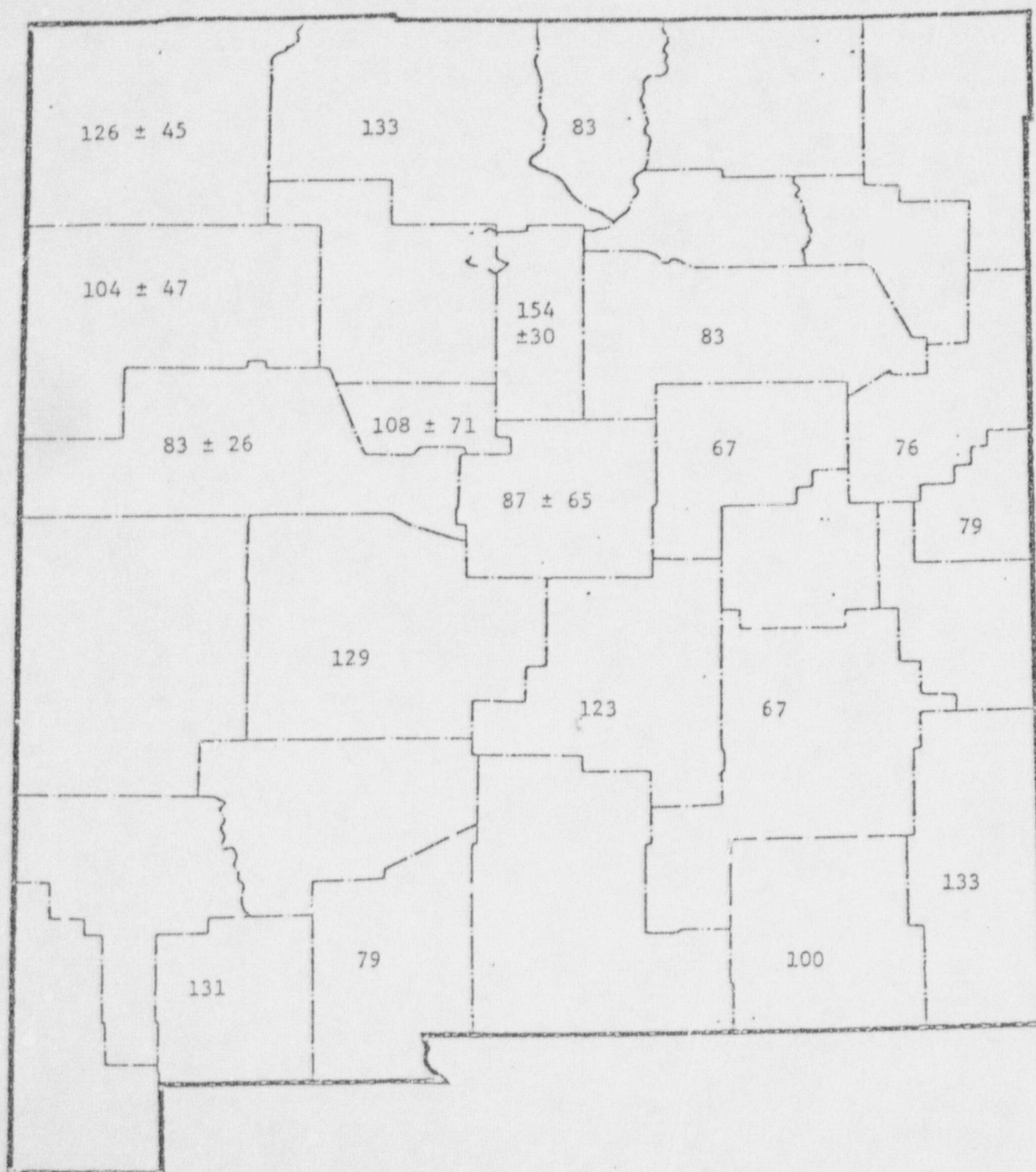


FIGURE 3. Average values for Selenium in urine samples as determined for each county in the study. The numbers indicate the average \pm one standard deviation. Counties with less than 4 individuals in the study show only the average value with no standard deviation.

REFERENCES:

1. Tsongas, T. and Fergeson, S., Tema Abstracts, 1977.
2. Shamberger, R., et.al., J. Nat. Cancer Inst., 50, 863 (1973).
3. Dickson, R. and Tomlison, R., Clin. Chim. Acta, 16, 311 (1967).
4. Wikstrom, J., et.al., Acta Neurol. Scand., 54, 287 (1976).
5. Griffiths, N.M. and Thompson, C.D., N.Z. Med. J., 80, 199 (1974).