Understanding Science and Scientific Methods:

An Overview for Lawyers

SUMMARY – 3 October 2005

Class on 26 September 2005 Covered Topics 2.c.ii. (part) and 2.c.iii. on the Syllabus

I. Cohort Studies – Figure 2-3 -- Look Forward in Time

A. Data are gathered in standardized fashion and you start with a population that is not diseased.

B. Problems: a) Sample selection; b) Loss to follow-up; c) change in habits; d) Surveillance bias.

C. The 1999 Journal of the National Cancer Institute article on TCDD exposure and disease at American Chemical plants.


2. Control – General Population.

3. The rate of All Cancers and Lung Cancer increase with exposure.

4. Bottom Line – Pretty good evidence that TCDD causes cancer in humans.

D. The 2003 article Cancer Risk for Chemical Workers Exposed to 2,3,7,8-tetrachlorodibenzo-p-dioxin by the Dow Chemical Scientists.
1. Sample – 2,187 Dow Chemical Workers who were likely exposed to high levels of Dioxin on or before 1983. (Note that these 2,187 were part of the previous study.)

2. Control groups – U.S. White Male Population and Local Dow Workers not exposed to Dioxin.

3. Conclusion – Pretty Strong and Favorable to Dow.

E. The “Ranch Hand” Study (Cohort Study)

1. Cases -- The 1,000 Ranch Hands

2. Controls – AF Personnel flying C-130s (non-herbicide duty)

3. Results:
   
   a. The mortality rate of the group is the same as the matched comparison group;

   b. Mortality is significantly lower than the rate for the male population of the United States;

   c. The number of birth defects among children of Ranch Hand veterans is the same as the children of the comparison group;

   d. Some evidence in the Ranch Hand population that dioxin exposure is related to cancer but the results are weak.
Examples of Past Topics

The Status of DNA testing under *Daubert*

The Admissibility of Hair Comparison Evidence

The Status of Polygraph Testing under *Daubert*

The Reliability of Handwriting Analysis

The Scientific Status of Hypnotically Refreshed Memory

The Admissibility of Standard Field Sobriety Tests