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**Report/Article Title** Typescript: Notes and diagrams regarding TCDD exposure

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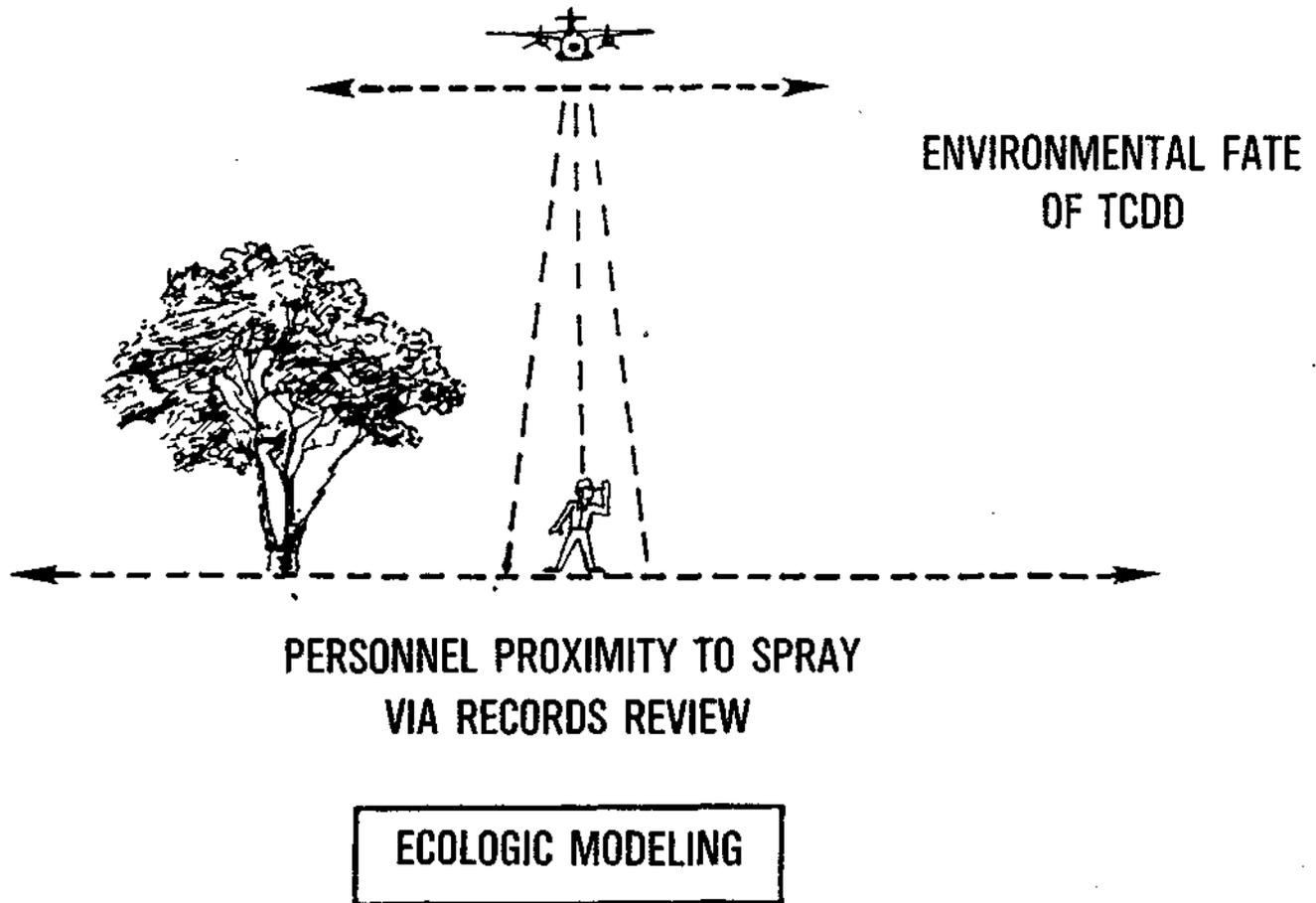
**Color**

**Number of Images** 11

**Description Notes** Typescript and diagrams regarding TCDD exposure, Australian Senate Committee on Science and the Environment, Ranch Hand versus Marine exposure

# PARAMETERS OF TCDD EXPOSURE

HERBS TAPE  
ACCURACY



ISSUE: CAN A VALID HERBICIDE ORANGE (TCDD) EXPOSURE ALLOCATION BE MADE FOR EACH INDIVIDUAL (GROUP) IN PREPARATION FOR A STUDY OF GROUND PERSONNEL?

EXPOSURE ALLOCATION OUTCOMES

- VALID
- MISCLASSIFIED
- BIASED

STUDY OUTCOMES

TRUTH  
INDETERMINANT  
POSITIVE OR NEGATIVE  
NOT TRUTH

## EXPOSURE ALLOCATION METHODS

### SUBJECTIVE MEANS:

- QUESTIONNAIRE TECHNIQUES

OPINION: INTENTIONAL MALATHION EXPOSURE BY SIMILAR AIRCRAFT IN RVN HAS CREATED A POSITIVE IRREVOCABLE BIAS

- SOLICITATION FOR "EXPOSED" VOLUNTEERS

OPINION: UNCORRECTABLE SELECTION BIAS

## **EXPOSURE ALLOCATION METHODS**

### **OBJECTIVE MEANS:**

- RECORD REVIEWS IN SELECTED OCCUPATIONAL GROUPS

OPINION: BIAS, MISCLASSIFICATION POSSIBLE, SMALL SAMPLE SIZE ASSURED

- PROBABILISTIC DETERMINATION VIA HERBS TAPES AND RECORD REVIEW FOR TIME/DISTANCE ESTIMATES

OPINION: MISCLASSIFICATION ASSURED; SELECTION BIAS PROBABLE, TRUE ERROR RATES IMPOSSIBLE TO MEASURE; VALIDITY COMPROMISED

## PROCESS OF EXPOSURE ALLOCATION INFLUENCES:

- COHORTS (STUDY AND COMPARISON) TO BE SELECTED
- METHOD(S) OF COHORT SELECTION
- SAMPLE SIZE OF COHORTS
- STATISTICAL POWER
- OPERATION OF CONFOUNDERS (MALATHION, COMBAT STRESS, ETC.)
- ● SCIENTIFIC/LAY ACCEPTANCE OF STUDY

## SOME STUDY OPTIONS BASED ON EXPOSURE DILEMMA

- PERFORM A "RVN EXPERIENCE STUDY"
- DECLARE AGENT ORANGE STUDY NOT DOABLE
- BOTH OPTIONS ABOVE
- DETERMINE FEASIBILITY OF USING OCCUPATIONAL GROUPS
- CONDUCT AGENT ORANGE STUDY BASED UPON PROBABILISTIC EXPOSURE
- ABOVE OPTION, ADD COHORT(S) FOR "RVN EXPERIENCE STUDY"

## OPINION

### BASED UPON

- WORLD LITERATURE: ZERO TO LOW INCIDENCE OF HEALTH CONSEQUENCES, RARE OR DIFFICULT TO MEASURE CLINICAL ENDPOINTS
- FACT OF UNESTIMATABLE ERROR RATES FOR EXPOSURE ALLOCATION IN GROUND TROOPS BASED UPON HERBS TAPES
- YIELDS A STUDY OF UNKNOWN ABILITY (POWER) TO DETECT A EFFECT
- USE OF PROBABILISTIC MEANS TO DETERMINE EXPOSURE

IS

SCIENTIFIC HOKUM

# AUSTRALIAN SENATE COMMITTEE ON SCIENCE AND THE ENVIRONMENT

## CONCLUSIONS

- LITTLE LIKELIHOOD AUSTRALIAN TROOPS WERE DIRECTLY OR INDIRECTLY EXPOSED TO HERBICIDES
- DIRECT EXPOSURE TO MALATHION WAS HIGHLY PROBABLE IN THE MAJORITY OF CASES
- EXPOSURE TO ANTIMALARIAL DRUGS WAS ROUTINE
- ANY ADDED CARCINOGENIC/TERATOGENIC BURDEN ON AUSTRALIAN TROOPS WAS RELATIVELY SMALL
- BASED ON CURRENT DATA,  
"THERE IS NO CONVINCING EVIDENCE THAT BIRTH ABNORMALITIES, PSYCHIATRIC DISORDERS AND MORTALITY ARE EXCESSIVE AMONG VIETNAM VETERANS."
- ALL FUTURE AUSTRALIAN GOVERNMENT STUDIES WILL ADDRESS THE ISSUE OF VIETNAM SERVICE, NOT SPECIFIC CHEMICAL EXPOSURE

# KEY ITEMS OF CONSIDERATION

## MARINE STUDY RELATIVE TO RANCH HAND STUDY

- "EXPOSED " MARINES RECEIVED AN AVERAGE EXPOSURE 1/1000 THE AVERAGE DOSE RECEIVED BY RANCH HAND PERSONNEL
- MARINE EXPOSURE ALLOCATIONS BASED ON DISTANCE FROM SPRAY PATHS LEAD TO SERIOUS MISCLASSIFICATION OR BIAS
- MARINE EXPOSURE ALLOCATIONS BASED ON TIME IN A SPRAY AREA SUBSTANTIALLY ALTER THE SIZES OF THE STUDY AND CONTROL POPULATIONS AND LEAD TO SERIOUS MISCLASSIFICATION

# **CONCLUSIONS**

## **RANCH HAND VERSUS OR PLUS THE MARINE POPULATION**

- **OVERWHELMING ALLOCATION PROBLEMS FOR “EXPOSURE-NONEXPOSURE” IN MARINES**
  - **MISCLASSIFICATION BY GAO CRITERIA = DILUTIONAL EFFECT**
  - **ALLOCATION BY PERSONAL HISTORY = BIAS**
- **MARINE EXPOSURE 1/1000 OF RANCH HAND EXPOSURE**
- **MARINE - RANCH HAND POPULATIONS DIFFER BY HOST FACTORS; AGE, RACE, EDUCATIONAL LEVEL, ETC**
- **BY CONSIDERATION OF EXPOSURE DIFFERENTIAL AND MISCLASSIFICATION, RANCH HAND STUDY FAR MORE POWERFUL THAN INDEPENDENT MARINE STUDY OR ADDITIVE STUDY TO INCLUDE MARINES**
- **ADDITION OF MARINE POPULATION TO RANCH HAND POPULATION = UNACCEPTABLE SCIENCE**

# MORTALITY ANALYSIS

## POWER COMPARISON OF THE RANCH HAND STUDY TO THE MARINE POPULATION CONSIDERING MISCLASSIFICATION AND RELATIVE EXPOSURE \*

POWER TABLE

RANCH HAND POWER 1-B	% MISCLASSIFICATION	MARINE STUDY POWER			
		EXPOSURE LEVELS RELATIVE TO RANCH HAND			
		1/10	1/20	1/100	1/1000
.87	0	.38	.17	.07	.05
	10	.33	.15	.06	.05
	25	.26	.13	.06	.05

ASSUMPTIONS: RH STUDY POP. 1,200; 6,000 (1:5)  
 MARINE STUDY POP. 21,900; 196,100  
 NORMAL INCIDENCE OF DISEASE = 0.001  
 DISEASE INCIDENCE IN RH = 0.004  
 LINEAR DOSE - RESPONSE  
 MISCLASS OF MARINE CONTROLS EXCLUDED

\* INCORRECT POPULATION NUMERICS BASED ON ENVIRONMENTAL FATE OF TCDD