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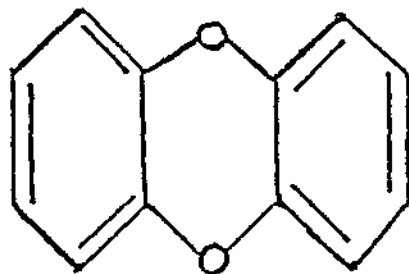
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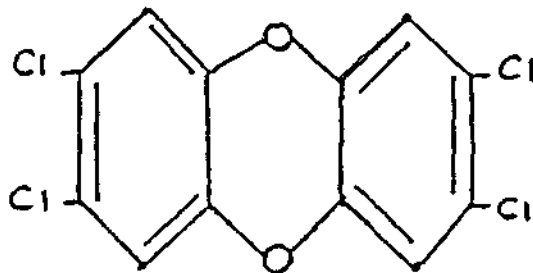
**USE OF HERBICIDES IN VIETNAM  
1961-1971**

A dioxin is any of a family of compounds known chemically as dibenzo-para-dioxins.



There are 75 different chlorinated dioxins.  
There are 22 different tetra isomers

Dioxin of Concern = 2,3,7,8-TCDD



## TOXICITY OF 2,3,7,8-TCDD

<u>Acute Toxicity:</u>	<u>Single Dose LD<sub>50</sub> (µg/kg)</u>
Guinea Pig	0.6
Rat	40
Rabbit	115
Monkey	70
Dog	150
Mouse	200
Hamster	3500
Bullfrog	Over 1000
Man	No deaths reported in literature
Teratogenic (Birth Defects)	
Mouse	Cleft palate, kidney abnormality
Other species	Embryo-and Fetotoxic
Mutagenic (Mutation)	Probably not a mutagen in higher animals
Carcinogenic (Cancer)	Liver, lung and oropharynx cancer noted in rats
Significance:	Bioavailability on Environmental matrices

EXPOSURE TO AGENT ORANGE CAN

NEVER BE QUANTIFIED!

HOWEVER

AN INDEX FOR LIKELIHOOD OF EXPOSURE

HAS BEEN DEVELOPED

EPIDEMIOLOGY IS THE STUDY OF THE FREQUENCY  
AND CAUSE OF DISEASE IN HUMAN POPULATIONS.

- CASE-CONTROL STUDY - SUBJECTS (CASES) ARE SELECTED FOR HAVING A PARTICULAR DISEASE AND CONTROL SUBJECTS ARE SELECTED ON BASIS OR ABSENSE OF DISEASE. THE EXPERIENCES OF THE TWO GROUPS ARE COMPARED.
- COHORT STUDY - STUDY POPULATION IS SELECTED ON THE BASIS OF KNOWN EXPOSURE AND KNOWN NON-EXPOSURE AND IS EXAMINED FOR THE PRESENCE OF DISEASE.

HOW DO WE REACH A SCIENTIFIC CONSENSUS?

CONSENSUS WILL BE ACHIEVED WHEN:

- EPIDEMIOLOGICAL DATA ARE STATISTICALLY SIGNIFICANT
- RESEARCH FINDINGS CAN WITHSTAND THE SCRUTINY OF PEER REVIEW
- AND RESEARCH RESULTS CAN BE DUPLICATED BY OTHER INVESTIGATORS.

ARE THERE ANY DISEASES ON WHICH THE  
MEDICAL COMMUNITY HAS REACHED CONSENSUS AS  
BEING ASSOCIATED WITH DIOXIN EXPOSURE?

YES1

- Chloracne
- Temporary Health Effects



CHLORACNE - SKIN CONDITION, RESEMBLING COMMON  
ACNE, WHICH APPEARS WITHIN A FEW WEEKS OF  
EXPOSURE TO DIOXIN AS WELL AS SOME OTHER  
CHLORINATED CHEMICAL COMPOUNDS.

OTHER CONDITIONS REPORTED IMMEDIATELY  
AFTER DIOXIN EXPOSURE AND THAT ARE TEMPORARY

ABNORMAL LIVER FUNCTIONS

HEADACHE

APATHY

FATIGUE

MUSCLE PAIN

JOINT PAIN

SEXUAL DYSFUNCTION

LOSS OF APPETITE

WEIGHT LOSS

SLEEP DISTURBANCES

DECREASED LEARNING  
ABILITY

DECREASED MEMORY

TINGLING IN EXTREMITIES

WHAT ARE THE LONG-TERM HEALTH ISSUES  
WHICH HAVE BEEN ATTRIBUTED TO THE USE  
OF AGENT ORANGE IN VIETNAM?

- Skin disorders including chloracne and PCT
- Birth Defects and Miscarriages
- Increased Death Rate
- Development of unusual or rare cancers
- Dioxin in human tissue as a cause of future disease

**HAS CHLORACNE BEEN DOCUMENTED  
IN VIETNAM VETERANS?**

**PRESENT STATUS: INITIAL REVIEW OF OVER 3,000  
VIETNAM VETERAN CLAIMS REVEALED  
NO DEFINITE CASES OF CHLORACNE.**

**ON-GOING STUDIES: AIR FORCE HEALTH STUDY-JAN 1984**

ARE VIETNAM VETERANS MORE  
LIKELY TO HAVE CHILDREN  
WITH BIRTH DEFECTS?

PRESENT STATUS: EPA ARKANSAS STUDY-1979  
NIOSH NEW YORK STATE STUDY  
1979  
NEW ZEALAND HERBICIDE  
APPLICATORS-1982  
AUSTRALIAN BIRTH DEFECTS  
STUDY-1983

PRESENT CONCLUSION: MEN AND WOMEN ARE AT  
NO INCREASED RISK

ON-GOING STUDIES: CDC/DOD/VA BIRTH DEFECTS  
STUDY-JAN 1984  
AIR FORCE HEALTH STUDY-JAN 1984

ARE VIETNAM VETERANS DYING IN  
INCREASED NUMBERS, AT EARLIER  
AGES OR FROM UNEXPECTED CAUSES?

STUDIES COMPLETED: FOUR INDUSTRIAL HEALTH  
STUDIES-1980-1983  
FINLAND MORTALITY STUDY OF  
HERBICIDE APPLICATORS-1982  
AIR FORCE HEALTH STUDY-  
BASELINE MORTALITY-1983

PRESENT CONCLUSION: NO EVIDENCE OF INCREASED  
DEATH RATE

ON-GOING STUDIES: NEW YORK STATE MORTALITY STUDY  
(JAN 1984)  
VA MORTALITY STUDY (DEC 1984)

ARE VIETNAM VETERANS MORE LIKELY TO DEVELOP  
CONNECTIVE TISSUE CANCER (SOFT TISSUE SARCOMA)?

COMPLETED STUDIES: SWEDISH SOFT TISSUE SARCOMA (STS)  
STUDIES-1978-1983

NEW ZEALAND STS STUDY-1982

FINLAND CANCER STUDY-1982

INDUSTRIAL STUDIES-1980-1983

PRESENT CONCLUSION: NO CONSENSUS

ON-GOING STUDIES: NCI STUDIES IN KANSAS,  
WASHINGTON, MINNESOTA-1984/85

VA/ARMED FORCES INSTITUTE OF  
PATHOLOGY (VIETNAM VETERAN  
STUDY)-1985

CENTERS FOR DISEASE CONTROL  
STUDY-1985

NIOSH INVESTIGATION-1985

NEW YORK STATE DEPARTMENT OF  
HEALTH-1984

ARE VIETNAM VETERANS MORE LIKELY  
TO DEVELOP OTHER FORMS OF CANCER?

COMPLETED STUDIES: FINLAND CANCER STUDY-1982  
SWEDISH RISK EVALUATION OF  
PESTICIDES-1982  
NCI FLORIDA PESTICIDE  
APPLICATOR STUDY-1983  
INDUSTRIAL STUDIES-1980-1983

PRESENT CONCLUSION: NO CONSENSUS

ON-GOING STUDIES: AIR FORCE HEALTH STUDY-1984  
NIOSH DIOXIN REGISTRY-1985  
CDC AGENT ORANGE EPIDEMIOLOGIC  
STUDY-1987



DO VIETNAM VETERANS WHO WERE EXPOSED  
TO AGENT ORANGE HAVE RESIDUAL LEVELS  
OF DIOXIN IN THEIR BODY TISSUE? IF SO,  
IS IT LIKELY TO CAUSE ANY HEALTH PROBLEMS?

STUDIES COMPLETED: VA FEASIBILITY STUDY

PRESENT CONCLUSIONS: SMALL AMOUNTS OF DIOXIN  
CAN BE DETECTED

NO CORRELATION BETWEEN  
DIOXIN LEVEL, EXPOSURE  
OR HEALTH

ON-GOING STUDIES: VA/EPA DIOXIN AND FURAN STUDIES  
OF HUMAN ADIPOSE TISSUE

ARE THERE OTHER HEALTH PROBLEMS  
PECULIAR TO VIETNAM VETERANS?

ON-GOING STUDIES: AIR FORCE HEALTH STUDY-1984  
CDC EPIDEMIOLOGIC STUDIES-1987  
VA VIETNAM EXPERIENCE TWIN STUDY  
1986

OTHER RELATED EFFORTS: VA AGENT ORANGE REGISTRY  
VA PATIENT TREATMENT FILE

**COMPONENTS OF THE FEDERAL STUDIES**

**ON-GOING HEALTH SURVEILLANCE**

**MORTALITY**

**MORBIDITY**

**SOFT TISSUE SARCOMAS/LYMPHOMAS**

**REPRODUCTIVE PROBLEMS**

**TCDD IN HUMAN ADIPOSE**

**INFORMATION DISSEMINATION**