

# Air Force Health Study

*An Epidemiologic Investigation of  
Health Effects in Air Force Personnel  
Following Exposure to Herbicides*

*SAIC Team*

Russell H. Roegner, Ph.D.  
William D. Grubbs, Ph.D.  
Michael B. Lustik, M.S.  
Amy S. Brockman, M.S.  
Scott C. Henderson, M.S.  
David E. Williams, M.D., SCRF

*Air Force Team*

Col William H. Wolfe, M.D., M.P.H.  
Joel E. Michalek, Ph.D.  
Col Judson C. Miner, D.V.M., M.P.H.

Project Manager: R.H. Roegner  
Statistical Task Manager: W.D. Grubbs  
SAIC Quality Review Chair: W.F. Thomas  
SAIC Editors: Cynthia A. Marut  
Elisabeth M. Smeda

Program Manager: R.W. Ogershok

SCIENCE APPLICATIONS  
INTERNATIONAL CORPORATION  
8400 Westpark Drive  
McLean, VA 22102

EPIDEMIOLOGY RESEARCH DIVISION  
ARMSTRONG LABORATORY  
HUMAN SYSTEMS DIVISION (AFSC)  
Brooks Air Force Base, TX 78235

*In conjunction with*

SCRIPPS CLINIC & RESEARCH FOUNDATION,  
LA JOLLA, CA

NATIONAL OPINION RESEARCH CENTER,  
CHICAGO, IL

March 1991

Volume IX

## SERUM DIOXIN ANALYSIS OF 1987 EXAMINATION RESULTS

Contract Number: F41689-85-D-0010

SAIC Project Number: I-813-X4-195/254/437/011/942/943

(Distribution Unlimited)

**AIR FORCE HEALTH STUDY**

**An Epidemiologic Investigation of  
Health Effects in Air Force Personnel  
Following Exposure to Herbicides**

**March 1991**

**VOLUME IX**

**SERUM DIOXIN ANALYSIS OF  
1987 EXAMINATION RESULTS**

**EPIDEMIOLOGY RESEARCH DIVISION  
ARMSTRONG LABORATORY  
HUMAN SYSTEMS DIVISION (AFSC)  
Brooks Air Force Base, Texas 78235**

## LIST OF APPENDICES

<u>Appendix</u>		<u>Page</u>
A	Study Selection and Participation .....	A-1
B-1	Dioxin Assay .....	B-1-2
B-2	Exposure Index Information.....	B-2-1
C	Statistical Methods.....	C-1
D	Data Displays for the Covariate Associations.....	D-1
E	General Health Assessment.....	E-1
E-1	Data Displays for the General Health Assessment.....	E-1-1
E-2	Interaction Displays for the General Health Assessment.....	E-2-1
F	Malignancy Assessment.....	F-1
F-1	Data Displays for the Malignancy Assessment.....	F-1-1
F-2	Interaction Displays for the Malignancy Assessment.....	F-2-1
G	Neurological Assessment.....	G-1
G-1	Data Displays for the Neurological Assessment.....	G-1-1
G-2	Interaction Displays for the Neurological Assessment.....	G-2-1
H	Psychological Assessment.....	H-1
H-1	Data Displays for the Psychological Assessment .....	H-1-1
H-2	Interaction Displays for the Psychological Assessment.....	H-2-1
I	Gastrointestinal Assessment.....	I-1
I-1	Data Displays for the Gastrointestinal Assessment.....	I-1-1
I-2	Interaction Displays for the Gastrointestinal Assessment.....	I-2-1
J	Dermatologic Assessment.....	J-1
J-1	Data Displays for the Dermatologic Assessment.....	J-1-1
J-2	Interaction Displays for the Dermatologic Assessment.....	J-2-1
K	Cardiovascular Assessment.....	K-1
K-1	Data Displays for the Cardiovascular Assessment.....	K-1-1
K-2	Interaction Displays for the Cardiovascular Assessment .....	K-2-1
L	Hematologic Assessment.....	L-1
L-1	Data Displays for the Hematologic Assessment.....	L-1-1
L-2	Interaction Displays for the Hematologic Assessment .....	L-2-1
M	Renal Assessment .....	M-1
M-1	Data Displays for the Renal Assessment .....	M-1-1
M-2	Interaction Displays for the Renal Assessment.....	M-2-1
N	Endocrine Assessment.....	N-1
N-1	Data Displays for the Endocrine Assessment .....	N-1-1
N-2	Interaction Displays for the Endocrine Assessment.....	N-2-1
O	Immunologic Assessment.....	O-1
O-1	Data Displays for the Immunologic Assessment.....	O-1-1

## **LIST OF APPENDICES (Continued)**

<b><u>Appendix</u></b>		<b><u>Page</u></b>
O-2	Interaction Displays for the Immunologic Assessment.....	O-2-1
P	Pulmonary Assessment.....	P-1
P-1	Data Displays for the Pulmonary Assessment .....	P-1-1
P-2	Interaction Displays for the Pulmonary Assessment.....	P-2-1
Q	Conclusions--Summary of Analysis Results .....	Q-1
R	Glossary of Abbreviations .....	R-1

## **TABLE OF CONTENTS - REPORT**

### **VOLUME I**

- EXECUTIVE SUMMARY**
- ACKNOWLEDGMENTS**
- CHAPTER 1 - Introduction**
- CHAPTER 2 - Dioxin Assay**
- CHAPTER 3 - The Relationship Between the Exposure Index and Dioxin Body Burdens in Ranch Hands**
- CHAPTER 4 - Statistical Methods Models and Assumptions**
- CHAPTER 5 - Covariate Associations**
- CHAPTER 6 - General Health Assessment**

### **VOLUME II**

- CHAPTER 7 - Malignancy Assessment**

### **VOLUME III**

- CHAPTER 8 - Neurological Assessment**
- CHAPTER 9 - Psychological Assessment**

### **VOLUME IV**

- CHAPTER 10 - Gastrointestinal Assessment**
- CHAPTER 11 - Dermatologic Assessment**

### **VOLUME V**

- CHAPTER 12 - Cardiovascular Assessment**
- CHAPTER 13 - Hematologic Assessment**

### **VOLUME VI**

- CHAPTER 14 - Renal Assessment**
- CHAPTER 15 - Endocrine Assessment**
- CHAPTER 16 - Immunologic Assessment**

### **VOLUME VII**

- CHAPTER 17 - Pulmonary Assessment**
- CHAPTER 18 - Conclusions**
- CHAPTER 19 - Future Directions**

### **VOLUME VIII**

- APPENDIX A through J**

### **VOLUME IX**

- APPENDIX K through R**