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**Journal/Book Title**

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**Description Notes**



**AIR FORCE HEALTH STUDY  
(RANCH HAND II)**

**UPDATE BRIEFING**

**29 SEPTEMBER 1986**

**BRIEFER: COLONEL WILLIAM H. WOLFE**



## STUDY DEVELOPMENT



1978-1979

PROPOSAL DEVELOPED

1979

PEER REVIEW AND REFINEMENT

1979-1982

STUDY POPULATIONS IDENTIFIED  
QUESTIONNAIRES DEVELOPED

1982

PHYSICAL EXAMINATIONS ACCOMPLISHED

1983-PRESENT

MORTALITY REPORTS RELEASED

1984

BASELINE MORBIDITY REPORT RELEASED

1985

FIRST FOLLOWUP PHASE BEGUN



## STUDY DESIGN



IDENTIFY EXPOSED POPULATION

IDENTIFY AND SELECT COMPARISON POPULATION

DETERMINE BASELINE HEALTH STATUS

MORTALITY

MORBIDITY

COMPARE FINDINGS STATISTICALLY TO DELINEATE

POSSIBLE HERBICIDE EFFECTS

ACCOMPLISH FOLLOWUP STUDIES OF POPULATIONS



## MATCHING PROCESS



8 COMPARISONS SELECTED FOR EACH EXPOSED INDIVIDUAL  
MATCHED FOR SEX, AGE, DUTY CODE, RACE

RANDOM COMPARISONS FROM EACH MATCHED SET USED

5:1 IN FIRST FOUR MORTALITY REPORTS

ALL COMPARISONS AFTER 1986

1:1 IN BASELINE AND SUBSEQUENT MORBIDITY REPORTS

OTHERS AVAILABLE FOR REPLACEMENT



SUMMARY OF MORTALITY RESULTS  
(A/O 31 DEC 84)



EVALUATION OF 55 EXPOSED AND 285 COMPARISON DEATHS

RELATIVELY SMALL NUMBERS EMPHASIZE PRELIMINARY  
NATURE OF THESE RESULTS

MORTALITY EXPERIENCE NEARLY IDENTICAL IN BOTH GROUPS

CAUSE-SPECIFIC ANALYSES NOT STATISTICALLY DIFFERENT



## ADDITIONAL MORTALITY CONTRASTS



DOD RETIRED POPULATION

ALL RANK-EXPOSURE GROUPS DOING BETTER

EXPOSED-ENLISTED GROUP NOT STATISTICALLY BETTER

ACTIVE CIVIL SERVICE PERSONNEL

ALL SUBGROUPS EQUIVALENT TO CIVIL SERVICE

1978 U S WHITE MALES

ALL SUBGROUPS DOING SIGNIFICANTLY BETTER





### SUMMARY COUNTS OF DEATHS

RANK	RANCH HAND				COMPARISON		
	AT RISK	DEAD	PERCENT		AT RISK	DEAD	PERCENT
OFFICERS	466	16	3.4		2278	98	4.3
ENLISTED	791	39	4.9		3893	187	4.8
OCCUPATION							
FLYING	646	24	3.7		3163	161	5.1
GROUND	611	31	5.1		3008	124	4.1
TOTAL	1257	55	4.4		6171	285	4.6



## DEATHS BY CAUSE

	EXPOSED	COMPARISONS
ACCIDENTAL	19	96
SUICIDE/HOMICIDE	5	23
MALIGNANCY	6	51
CIRCULATORY	18	80
RESPIRATORY	0	7
DIGESTIVE	5	13
OTHER	2	15
TOTAL	55	285



## BASELINE MORBIDITY RESULTS



NO DEFINITIVE CLINICAL ENDPOINTS CONCLUSIVELY  
ATTRIBUTABLE TO HERBICIDE EXPOSURE

NO STS, PCT, OR CHLORACNE IN THE EXPOSED GROUP

SOME CLINICAL AND SUBCLINICAL DIFFERENCES OBSERVED  
RELEVANCE OF SOME DEPENDENT ON ADDITIONAL  
COVARIATE DATA

MOST VALUES WITHIN NORMAL RANGES

SCHEDULED FOLLOWUP EXAMINATIONS WILL PROVIDE DATA  
NECESSARY TO DEFINE RELEVANCE



## SIGNIFICANT GROUP DIFFERENCES



SELF-PERCEPTION OF HEALTH

SKIN CANCER

REPORTED BIRTH DEFECTS AND NEONATAL DEATHS

BABINSKI REFLEXES

SUBJECTIVE PSYCHOLOGICAL MEASURES

HEPATIC FUNCTION TESTS (GGTP, LDH, CHOLESTEROL)

PERIPHERAL PULSES

THYROID AND TESTOSTERONE



## PHASE II EXAMINATIONS



PILOT EXAMINATIONS IN APRIL 85

10 EXAMINEES

INITIAL EXAMINATIONS BEGAN MAY 85

2 GROUPS PER WEEK

9 GROUPS LOST DUE TO HOLIDAYS

2309 PARTICIPANTS

COMPLETED MARCH 86



## PROGRAM MODIFICATIONS FROM BASELINE



INTERVAL HISTORY (SUBJECT AND SPOUSE)

PHONE INTERVIEW WITH ENTIRE COMPARISON GROUP

BASELINE QUESTIONNAIRES TO NEW SUBJECTS AND SPOUSES

### DELETIONS:

PULMONARY FUNCTION STUDIES

NERVE CONDUCTION STUDIES

SEMEN STUDIES

IQ TESTING



## PROGRAM ENHANCEMENTS

SKIN CANCER EVALUATION

IMPROVED ALCOHOL AND SMOKING ASSESSMENT

COMBAT STRESS ASSESSMENT

BIRTH DEFECT SEVERITY ASSESSMENT

DOPPLER EXAMINATION OF PULSES

IMPROVED IMMUNOLOGIC ASSESSMENT

PORPHYRIN PROFILE BY HPLC



## EXAMINATION QUALITY CONTROL



OBSERVATION BY MONITOR WITH CHECKLIST

MARK-SENSE EXAMINATION FORMS

MANUAL AND ADP QC REVIEWS

STRICT LABORATORY QC

TIGHT CV%

FIRCUSUM

NO PRIOR STANDARDS FOR

IMMUNOLOGY QC

PATIENT CRITIQUE FORMS

BLINDNESS OF EXAMINERS





## DAILY SCHEDULE



0530	START 12-HOUR URINE COLLECTION
0630	DEPART FOR CLINIC
0700- 0800	INITIAL BLOOD DRAW
0800- 0900	SKIN TESTING
0800- 1500	EXAMINATION PSYCHOLOGICAL TESTING INTERVIEW
1730	TURN IN URINE COLLECTION



## RESTRICTIONS

3 DAY CARBOHYDRATE LOADING DIET

3 DAY ABSTINENCE FROM ALCOHOL

NO ALCOHOL FOR 2 DAYS ONSITE

FASTING AFTER MIDNIGHT

NO CAFFIENE OR NICOTINE AFTER MIDNIGHT

RESTRICTED UNTIL AFTER ECG AND DOPPLER



## PARTICIPATION



	RANCH HANDERS	ORIGINALS	REPLACEMENTS
PARTIAL	39	62	32
REFUSAL	6	9	9
NEW	-	3	39
GAINS	45	74	80
LOSSES	74	64	21
RETURNEES	971	872	267
PHASE II TOTAL	1016	946	347
BASELINE TOTAL	1045	936	288



## IMMUNOLOGY STUDIES



RANDOM SELECTION OF 1082 PARTICIPANTS (47%)

B AND T CELL STUDIES PERFORMED

SKIN TESTS TO 1768 (77%)

541 DELETED TO AVOID CONFOUNDING



## SPOUSE QUESTIONNAIRES

### INTERVAL HISTORY

1915 COMPLETED

979 ONSITE

936 MAIL/PHONE

BASELINE GIVEN TO 74

### FERTILITY REVIEW

CONTACTED 2108 SPOUSES

1613 RESPONDED (76.5%)



## TELEPHONE QUESTIONNAIRES



TOTAL SUBJECTS	7,963
INTERVIEWS COMPLETE	7,411 (93.1%)
REFUSALS	335 ( 4.2%)
UNLOCATABLES	190 ( 2.4%)
DECEASED	26 ( 0.3%)



THIRD PHYSICAL EXAMINATION

SCRIPPS CLINIC

LA JOLLA, CA

MAY 1987



## ANTICIPATED EXAMINATION ADDITIONS



### COMPLIANCE ENHANCEMENT

TONOMETRY

VISUAL ACUITY

AUDIOGRAMS

STOOL FOR OCCULT BLOOD

(PROCTOSCOPIC FOLLOWUP)

MEDICAL CONTACT CARDS





## ANTICIPATED EXAMINATION ADDITIONS



### SCIENTIFIC ISSUES

PULMONARY FUNCTION STUDIES

SCLR-90 PSYCHOLOGICAL BATTERY

MILLON CLINICAL SCALE

AUTOMATED BLOOD PRESSURE MONITOR

PROTEIN PROFILE

PHENOTYPE MARKER FOR ACTIVATED T CELLS

OPTIMIZE NATURAL KILLER CELL ASSAY

WITH INTERLUKIN-2



## ANTICIPATED EXAMINATION DELETIONS



MMP I

CORNELL INDEX

HALSTEAD-REITAN

TIMED URINE COLLECTION

PORPHYRIN PROFILES

CORTISOL DETERMINATIONS

POKEWEED ANTIGEN

FROZEN MLC POOL

PERIPHERAL DOPPLER



## ADDITIONAL CONSIDERATIONS



CARDIAC STRESS TESTING

PERSONALLY FUNDED IF DESIRED

D-GLUCARIC ACID ASSAY OF BANKED URINE SPECIMENS

SERUM DIOXIN ASSAY OF SUBSET OF EXPOSED GROUP



## MILESTONES

JUNE 1986

ANALYSIS BEGUN

FALL 1986

1986 MORTALITY UPDATE

MAY 1987

THIRD EXAMINATION TO BEGIN

FALL 1987

RELEASE OF SECOND MORBIDITY REPORT

FALL 1987

1987 MORTALITY REPORT

FALL 1989

RELEASE OF THIRD MORBIDITY REPORT