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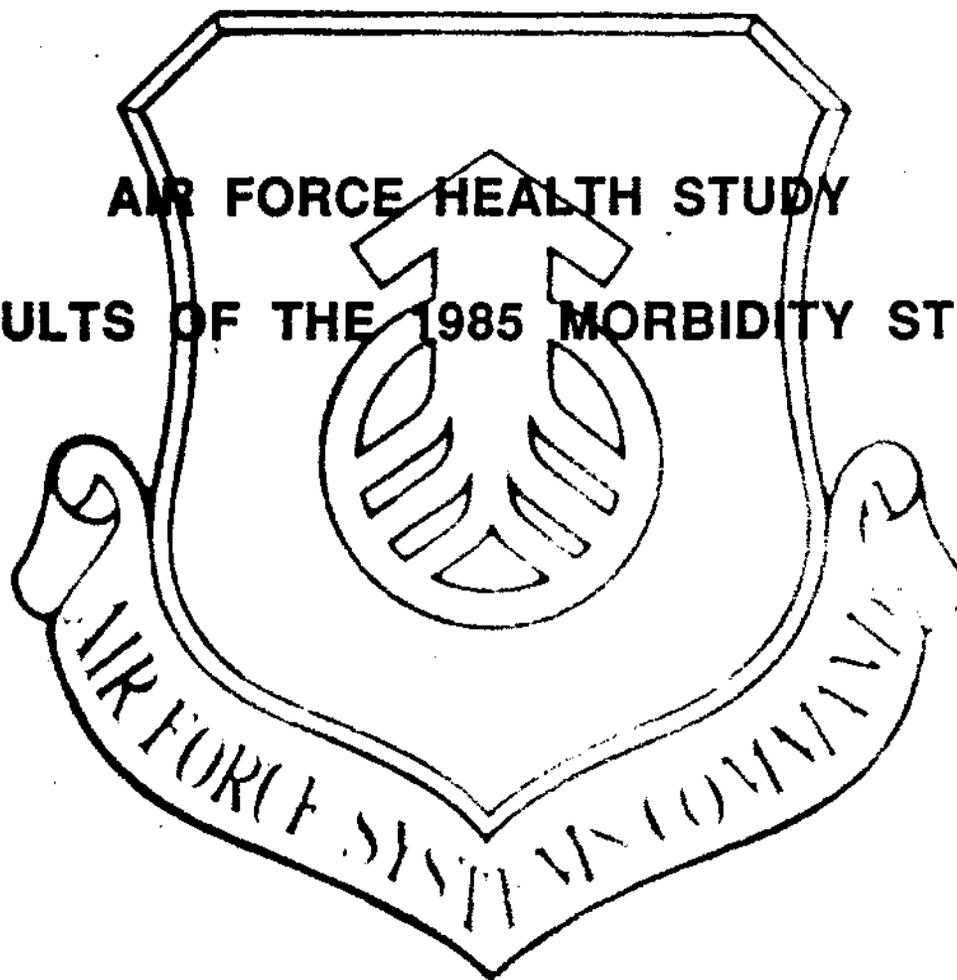
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AIR FORCE HEALTH STUDY
RESULTS OF THE 1985 MORBIDITY STUDY



BRIEFER: COLONEL WILLIAM H. WOLFE



AIR FORCE HEALTH STUDY PHASE III RESULTS MAY 1985 - MARCH 1986

- EXAMINATION OF 2309 PARTICIPANTS
 - 93% OF ALL PHASE I PARTICIPANTS
 - 1016 RANCH HANDS
 - 1293 COMPARISONS

- CONTRACTORS:
 - SAIC, McLEAN, VA
 - SCRIPPS CLINIC, LA JOLLA, CA
 - NORC, CHICAGO, IL



CHARACTERISTICS OF THE PARTICIPANTS

	RANCH HANDS	COMPARISONS
MEAN AGE	46.9 YRS	46.8 YRS
CURRENT SMOKERS*	40.1%	35.0%
ALCOHOL USE SINCE 1982	88.7%	88.7%
COLLEGE EDUCATED	48.6%	49.3%
RETIRED MILITARY	54.4%	52.8%

* STATISTICALLY SIGNIFICANT



PHYSICAL EXAMINATION FORMAT

- GENERAL EXAMINATION
- NEUROLOGICAL EXAMINATION
- DERMATOLOGICAL EXAMINATION
- DOPPLER EVALUATION OF PULSES
- CHEST X-RAY
- PSYCHOLOGICAL STUDIES
- 33 CLINICAL LABORATORY TESTS
- IMMUNOLOGICAL STUDIES



QUALITY ASSURANCE PROGRAM

- PREDETERMINED STATISTICAL PLAN
- STRICT LABORATORY QUALITY CONTROL
- MARK-SENSE FORMS USED FOR DATA COLLECTION
- EXAMINERS UNAWARE OF PARTICIPANT STATUS
- ON-SITE MONITOR PRESENT THROUGHOUT EXAMINATION PERIOD



GENERAL HEALTH

- OVERALL GROUP SIMILARITY
- NO DIFFERENCES IN APPEARANCE OF ILLNESS OR AGE
- MORE RANCH HANDS PERCEIVED HEALTH AS FAIR OR POOR (9.1% VERSUS 7.3%)
 - PRIMARILY SEEN IN ENLISTED PARTICIPANTS
 - IMPROVED PERCEPTION OF HEALTH FROM THAT IN 1982
- RANCH HANDS HAD LOWER MEAN % BODY FAT
- SEDIMENTATION RATE RESULTS MIXED
 - MEANS EQUAL (5.05 MM/HR VERSUS 4.93 MM/HR)
 - MORE "ABNORMALS" IN RANCH HANDS (5.8% VERSUS 3.6%)



MALIGNANCY

- NO GROUP DIFFERENCES OVER INTERVAL PERIOD FOR SKIN OR SYSTEMIC MALIGNANCY
- LIFETIME HISTORY OF BASAL CELL SKIN CANCER
 - CONTINUES TO BE ELEVATED IN RANCH HANDS
 - RELATIVE RISK = 1.56
- SYSTEMIC CANCER EQUIVALENT IN BOTH GROUPS
 - 1 SOFT TISSUE SARCOMA IN EACH GROUP
 - 1 LYMPHOMA IN EACH GROUP
- FINDINGS NOT DISTURBING BUT ARE CAUSE FOR CONTINUED SURVEILLANCE



NEUROLOGY

- FEWER NUMBER OF ABNORMALITIES THAN AT BASELINE
- AGE, ALCOHOL, DIABETES HAD SIGNIFICANT IMPACT
- TESTS OF CRANIAL, PERIPHERAL AND CENTRAL NERVOUS SYSTEMS ARE EQUIVALENT
- BABINSKI REFLEX DIFFERENCES AT BASELINE NO LONGER SEEN



PSYCHOLOGY

- HISTORY OF PSYCHOLOGICAL ILLNESS EQUIVALENT
- MMPI RESULTS:
 - INCREASED DENIAL AND MASCULINITY/FEMININITY SCALE ABNORMALITIES IN COMPARISONS
 - MARGINAL INCREASES IN HYSTERIA AND INTROVERSION SCALE ABNORMALITIES IN RANCH HANDS
- MORE CORNELL MEDICAL INDEX ABNORMALITIES IN RANCH HANDS (COMPLAINTS OF MEDICAL PROBLEMS)
- EQUIVALENT RESULTS ON HALSTEAD-REITAN PERFORMANCE TESTS
- SIGNIFICANT EFFECTS OF EDUCATION, AGE AND ALCOHOL



GASTROINTESTINAL/HEPATIC

- EQUIVALENT HISTORY OF LIVER DISEASE AND ULCERS
- 11 LABORATORY ASSAYS OF HEPATIC FUNCTION
 - INCREASED SGPT AND UROPORPHYRINS IN COMPARISONS
 - INCREASED ALKALINE PHOSPHATASE IN RANCH HANDS
 - BORDERLINE ELEVATION OF COPROPORPHYRIN IN RANCH HANDS
 - NO EVIDENCE OF PORPHYRIA CUTANEA TARDA
 - ABNORMALITIES EQUALLY DIVIDED IN THE TWO GROUPS



DERMATOLOGY

- NO CHLORACNE DIAGNOSED
- EQUIVALENT HISTORY OF SKIN DISEASE
- NO GROUP DIFFERENCES IN DIAGNOSED SKIN DISORDERS

HEMATOLOGY

- EQUIVALENCE IN 8 LABORATORY TESTS
- AGE, RACE, OCCUPATION SMOKING HAD SIGNIFICANT EFFECT



CARDIOVASCULAR

- NO DIFFERENCES IN ECG OR BLOOD PRESSURE
- PULSE DIFFERENCES SEEN AT BASELINE NO LONGER SEEN
- INCREASED HISTORY OF HEART DISEASE IN RANCH HANDS
(24% VS 20%) NOT ACCOMPANIED BY OTHER ABNORMALITY
- CHOLESTEROL AND TRIGLYCERIDE LEVELS EQUIVALENT



RENAL

- NO DIFFERENCES IN HISTORY OF RENAL DISEASE
CHANGE NOTED FROM BASELINE
- EQUIVALENCE IN 5 LABORATORY TESTS

PULMONARY

- NO DIFFERENCES SEEN EXCEPT IN INCREASED RATES IN
RANCH HANDS
- NO PATTERN SUGGESTING DISEASE DIFFERENTIAL



ENDOCRINOLOGY

- NO DIFFERENCE IN HISTORY OF DISEASE
- TSH AND TESTOSTERONE INCREASED IN RANCH HANDS
(0.7% VS 0.5% AND 1.3% VS 1.1%)
- INCREASE IN IMPAIRED GLUCOSE TOLERANCE
IN COMPARISONS (10.9% VS 14.3%)



IMMUNOLOGY

- 6 CELL MARKER AND 3 FUNCTIONAL TESTS PERFORMED ON 47% OF PARTICIPANTS
- GROUP EQUIVALENCE ON ALL TESTS
- SKIN TEST DATA NOT ANALYZED DUE TO EXCESSIVE INTER-READER VARIATION
- QUALITY CONTROL ENHANCED FOR PHASE III



LONGITUDINAL ANALYSES

- 19 VARIABLES STUDIED
 - EACH PARTICIPANT ACTED AS HIS OWN "CONTROL"
GROUP CHANGES OVER TIME ASSESSED
 - 5 SIGNIFICANT CHANGES
 - SEDIMENTATION RATE (METHOD CHANGE)
 - BABINSKI REFLEX
 - DEPRESSION (MMPI)
 - PLATELET COUNT
 - PULSES
- GROUP EQUIVALENCE
AT FOLLOWUP
- NO DETRIMENTS TO RANCH HANDS



EXPOSURE INDEX ANALYSES

- SPORADIC DIFFERENCES SEEN BUT NO CONSISTENT PATTERN EMERGES IN ANY CLINICAL AREA



CURRENT EXPOSURE INDEX

- ESTIMATE BASED ON:
 - GALLONS OF HERBICIDE SPRAYED PER MONTH (1962-1971)
 - LEVELS OF DIOXIN CONTAMINATION
 - NUMBER OF MEN ASSIGNED EACH MONTH

- A DIFFERENT INDEX WAS MADE FOR EACH OCCUPATION GROUP NO METHOD TO RELATE ONE TO THE OTHER

- BETTER ESTIMATE OF EXPOSURE NEEDED



USAF/CDC COOPERATIVE EFFORTS

- PILOT STUDY OF 200 GROUNDCREW PERSONNEL
- DIOXIN HALF-LIFE STUDY OF 100 PAIRS OF SERA (1982/1987)
- LARGE SCALE TESTING OF AFHS PARTICIPANTS



AFHS/CDC SERUM DIOXIN ASSAY STUDIES

- FIRST 76 ASSAY RESULTS
 - 23 COMPARISONS
 - MEAN: 5.3 PPT
 - RANGE: 3 - 9 PPT
 - 53 RANCH HANDS
 - MEAN: 55.3 PPT
 - RANGE: 3 - 314 PPT



AFHS SERUM DIOXIN TESTING

- DRAWING 450cc OF BLOOD AT SCRIPPS CLINIC FROM ALL PARTICIPANTS
- PERFORM DIOXIN ASSAYS AT CDC



CONCLUSIONS

- SUBTLE BUT CONSISTENT NARROWING OF DIFFERENCES SEEN AT BASELINE
- REASSURING EVIDENCE THAT CURRENT HEALTH OF RANCH HANDS IS NOT DIFFERENT THAN COMPARISONS
- NO EVIDENCE TO IMPLICATE LINK BETWEEN HERBICIDE AND ADVERSE HEALTH
- CONTINUED SURVEILLANCE STILL REQUIRED