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Air Force Health Study

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

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APPENDIX A

**Advisory Committee on Special Studies
Relating to the Possible Long-Term Health
Effects of Phenoxy Herbicides and Contaminants**

**Advisory Committee on Special Studies
Relating to the Possible Long-Term Health Effects
of Phenoxy Herbicides and Contaminants**

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APPENDIX B

Questionnaire Methodology

TABLE B-1.

Elements of the Interval Questionnaires

Type	Method	Elements
Participant Interval Questionnaire	In Person	Demographic, educational, occupational, toxic exposures, reproductive experience, medical
Spouse* Interval Questionnaire	By Mail	Comprehensive reproductive history
Baseline Participant Questionnaire	In Person	Demographic, educational, occupational, medical, compliance, toxic exposures, and reproductive experience
Baseline Spouse* Questionnaire	In Person	Comprehensive reproductive history
Telephone Survey	By Telephone	Self-perception of health: current medications, severity of recent illness, absenteeism, income level

*Present, former, or partner.

Participant Interval Questionnaire

4428Sec-1

-1-

TIME AM 10-13/
BEGAN PM

BEGIN DECK 01

-2-

DECKS 01-02

SECTION 1: INTRODUCTION

This part of the study asks about the health of current and former Air Force Members and their families.

At various points in the questionnaire, we will be using the term "biological" to describe family relationships. For example, we might ask about your "biological" children. When we use this term, we do not mean your step-children or step-parents or people related to you through adoption. We mean people related to you by blood.

You may refuse to answer any question you choose. However, we and the Air Force ask that you answer as many of the questions as you can, so the results will accurately and fully tell your story. I'd also like to emphasize that we need as accurate a picture as you can remember. So when we ask you about the dates of events in your life, please think carefully.

First I have a few background questions to ask you.

1. My records indicate that your date of birth is (DATE OF BIRTH, FROM INFORMATION SHEET, ITEM 1). Is that correct?

Yes1 14/

No (CORRECT INFORMATION SHEET, AND GO TO Q.2)...2

2. Do you remember the month and year you were interviewed the last time for this study? We are talking about the interview in your home before you went for your physical exam.

A. Was it in 1981 or 1982? (RECORD ON INFORMATION SHEET)

B. What month did the interview take place? (RECORD ON INFORMATION SHEET. IF R CAN'T REMEMBER EXACT MONTH ASK C)

C. Was it in the Spring, Summer, Fall or Winter?

(INTERVIEW: IF SPRING, RECORD ON INFO SHEET AS MARCH
IF SUMMER, RECORD ON INFO SHEET AS JUNE
IF FALL, RECORD ON INFO SHEET AS SEPTEMBER
IF WINTER, RECORD ON INFO SHEET AS DECEMBER)

INTERVIEWER: CONTINUE TO FIND OUT FROM THE RESPONDENT ANY OTHER BLANK OR MISSING INFORMATION FROM THE INFORMATION SHEET. RECORD ON THE INFORMATION SHEET.

3. INTERVIEWER: ASK A FOR RESPONDENT, THEN ASK B AND C FOR PARENTS

A. RESPONDENT	B. MOTHER	C. FATHER
To which of the following racial or ethnic groups do you belong? (CODE ALL THAT APPLY) (PROBE: What others?)	To which of the following racial or ethnic groups does your biological mother belong? (CODE ALL THAT APPLY) (PROBE: What others?)	To which of the following racial or ethnic groups does your biological father belong? (CODE ALL THAT APPLY) (PROBE: What others?)
English/Welsh....01 15-16/	English/Welsh....01 51-52/	English/Welsh....01 16-17/
Scottish.....02 17-18/	Scottish.....02 53-54/	Scottish.....02 18-19/
German.....03 19-20/	German.....03 55-56/	German.....03 20-21/
Irish.....04 21-22/	Irish.....04 57-58/	Irish.....04 22-23/
Scandinavian....05 23-24/	Scandinavian....05 59-60/	Scandinavian....05 24-25/
Polish.....06 25-26/	Polish.....06 61-62/	Polish.....06 26-27/
Russian.....07 27-28/	Russian.....07 63-64/	Russian.....07 28-29/
Other Slavic....08 29-30/	Other Slavic....08 65-66/	Other Slavic....08 30-31/
Jewish.....09 31-32/	Jewish.....09 67-68/	Jewish.....09 32-33/
French.....10 33-34/	French.....10 69-70/	French.....10 34-35/
Italian.....11 35-36/	Italian.....11 71-72/	Italian.....11 36-37/
Spanish.....12 37-38/	Spanish.....12 73-74/	Spanish.....12 38-39/
Mexican.....13 39-40/	Mexican.....13 75-76/	Mexican.....13 40-41/
Greek.....14 41-42/	Greek.....14 77-78/	Greek.....14 42-43/
American Indian..15 43-44/	American Indian..15 79-80/	American Indian..15 44-45/
Asian.....16 45-46/	Asian.....16 10-11/	Asian.....16 46-47/
African.....17 47-48/	African.....17 12-13/	African.....17 48-49/
Other (SPECIFY)	Other (SPECIFY)	Other (SPECIFY)
.....18 49-50/	.....18 14-15/	.....18 50-51/

BAND
CARD
A

B-3

SECTION 2: EDUCATION

1. My records show that when you were last interviewed you had received a (DEGREE LAST OBTAINED FROM ITEM 2, INFORMATION SHEET). Have you received any additional regular school certificates, diplomas or degrees since that time, that is, since (DATE OF LAST INTERVIEW)?

Yes.....(ASK A AND B).....1
No.....(SKIP TO Q.2).....2

INTERVIEWER: FOR EACH DEGREE CODED IN A, ASK B.

Table with columns A (What certificates, diplomas, and/or degrees did you get?) and B (In what year did you receive (DEGREE IN A.)? RECORD YEAR). Rows include High school diploma, High school equivalency diploma, Associate of Arts (A.A.), Bachelor of Arts (B.A.) or Bachelor of Science (B.S.), Masters (M.A. or M.S.), Doctorate (Ph.D., M.D., Ed.D., Sc.D.), Others (SPECIFY), and No certificate, diploma, or degree (volunteered).

HAND CARD B

B-4

2. Since (DATE OF LAST INTERVIEW) have you participated in any civilian job training programs (other than the formal schooling that we discussed), that prepared you for a major change in your occupation?

Yes.....(ASK A).....1
No.....(SKIP TO Q.3).....2

12/

Form with three columns: 1ST PROGRAM, 2ND PROGRAM, 3RD PROGRAM. Each column contains questions A, E, I (1st column); B, F, J (2nd column); C, G, K (3rd column); D, H, L (4th column) regarding training programs and completion dates.

3. Have you served in the military (at all) since (DATE OF LAST INTERVIEW)

Yes.....1 49/
 No.....(SKIP TO SECTION 3).....2

4. Are you currently serving in the military?

Yes.....1 50/
 No.....2

5. Now, let's talk about any military and specialized training programs that prepared you for a major change in your occupation. Since (DATE OF LAST INTERVIEW), (and besides the formal schooling and job training programs you've told me about), have you participated in any military technical or specialized training programs that prepared you for a major change in your career?

Yes....(ASK A-E).....1 51/
 No.(SKIP TO SECTION 3)..2

B-5

5. (Continued)

BEGIN DECK 04

1ST PROGRAM	2ND PROGRAM	3RD PROGRAM
A. For what kind of work was your first military training program preparing you?	F. For what kind of work was your second military training program preparing you?	K. For what kind of work was your third military training program preparing you?
B. What is the AFSC for that job?	G. What is the AFSC for that job?	L. What is the AFSC for that job?
| | | | | 52-56/	| | | | | 66-70/	| | | | | 10-14/
C. In what month and year did you start this training?	H. In what month and year did you start this training?	M. In what month and year did you start this training?
| | | | Month Year 57-60/	| | | | Month Year 71-74/	| | | | Month Year 15-18/
D. In what month and year did you complete this training?	I. In what month and year did you complete this training?	N. In what month and year did you complete this training?
| | | | Month Year 61-64/	| | | | Month Year 75-78/	| | | | Month Year 19-22/
CURRENTLY IN TRAINING..1	CURRENTLY IN TRAINING..1	CURRENTLY IN TRAINING..1
E. Have you participated in any other military job training program that prepared you for a major change in your occupation?	J. Have you participated in any other military job training program that prepared you for a major change in your occupation?	O. Have you participated in any other military job training program that prepared you for a major change in your occupation?
Yes..(ASK F)..1 65/ No.....2	Yes..(ASK R)..1 79/ No.....2	Yes(NEM QUER)..1 23/ No.....2 24-27/R

SECTION 3: EMPLOYMENT

Now I have some questions about working. Please tell me about any jobs you've had that lasted for 3 months or longer since (DATE OF LAST INTERVIEW). If you had more than one job at the same time, please tell me about each job separately. Count changes of jobs for the same employer as separate jobs. Do not include jobs in the military. Let's start with the most recent regular job you've had and work back in time to (DATE OF LAST INTERVIEW).

1. In what month and year did you start your most recent job that lasted 3 months or longer?

_____/_____/_____/_____
 Month Year

28-31/

NO CIVILIAN JOBS (SKIP TO SECTION 4).....1 32/

- A. What (is/was) the name of your employer?

33-57/

- B. (Is/Was) this a full-time or part-time job?

Full-time.....1

58/

Part-time.....2

- C. What kind of business (is/was) that--what (do/did) they make or do there?

59-61/

- D. What (do/did) you actually do on the job--what (are/were) some of your main duties?

62-64/

1. (Continued)

- E. Please look at this card and tell me which number best describes the kind of industry you (work/worked) in? (WRITE IN NUMBER)

HAND
CARD
C

ENTER NUMBER: [] [] []

65-66/

- F. In what month and year did this job end or is this your current job?

_____/_____/_____/_____
 Month Year

67-70/

CURRENT JOB.....(SKIP TO Q.2).....1 71/

- G. What was the main reason you stopped working on your job?

72-73/

2. While working at (EMPLOYER) (do/did) you come in contact with any of the substances on this card? By contact I mean that you inhaled, tasted, had skin contact with these fibers and chemicals or were exposed to ionizing or nuclear radiation.
 CODE ALL THAT APPLY

FOR EACH SUBSTANCE
 CODED IN Q.2, ASK A.

- A. In general, how many days a month did you come in contact with (SUBSTANCE)?

Less than
 once a month

Asbestos.....01	74-75/	[] [] days	.....95	76-77/
BEGIN DECK 05				
Ionizing or nuclear radiation.....02	10-11/	[] [] days	.....95	12-13/
Industrial chemicals.....03	14-15/	[] [] days	.....95	16-17/
Insecticides or pesticides.....04	18-19/	[] [] days	.....95	20-21/
Degreasing chemicals.....05	22-23/	[] [] days	.....95	24-25/
Defoliants or herbicides.....06	26-27/	[] [] days	.....95	28-29/
None of the above (SKIP TO Q.5)....07	30-31/			

HAND
CARD
D

3. While you were on that job, how often (do/did) you wash to remove the (SUBSTANCES) or use protective gear -- would you say all of the time, some of the time, or never?

- All of the time.....1 32/
- Some of the time.....2
- Never.....(SKIP TO Q.5).....3

4. Which of the following (do/did) you use on that job? (CODE ALL THAT APPLY)

- Air filter.....01 33-34/
- Goggles.....02 35-36/
- Face shield.....03 37-38/
- Special clothing.....04 39-40/
- Washing facilities.....05 41-42/
- Self-contained or supplied air breathing apparatus.....06 43-44/
- None.....07 45-46/

5. Did you have another job before the job with (NAME IN Q.1A) but, since (DATE OF LAST INTERVIEW) that lasted 3 months or longer?

- Yes.....1 47/
- No.....(SKIP TO Q.21).....2

6. In what month and year did you start that job?

Month Year 48-51/

A. What was the name of your employer?

52-76/

B. Was this a full-time or part-time job?

- Full-time.....1 77/
- Part-time.....2

6. (Continued)

6. (Continued)

C. What kind of business was that--what did they make or do there?

18-12/

D. What did you actually do on the job--what were some of your main duties?

13-15/

E. Please look at this card and tell me which number best describes the kind of industry you worked in? (WRITE IN NUMBER)

HAND CARD C

ENTER NUMBER: [] []

16-17/

F. In what month and year did this job end?

Month Year

18-21/

CURRENT JOB.....(SKIP TO Q.7)....0001

G. What was the main reason you stopped working on your job?

22-23/

B-7

7. While working at (EMPLOYER) did you come in contact with any of the substances on this card? By contact I mean that you inhaled, tasted, had skin contact with these fibers and chemicals, or were exposed to ionizing or nuclear radiation.
(CODE ALL THAT APPLY)

FOR EACH SUBSTANCE CODED IN Q.7, ASK A.

A. In general how many days a month did you come in contact with (SUBSTANCE)?

Less than once a month

Asbestos.....01	24-25/	<input type="text"/>	days	.....95	26-27/
Ionizing or nuclear radiation....02	26-29/	<input type="text"/>	days	.....95	30-31/
Industrial chemicals.....03	32-33/	<input type="text"/>	days	.....95	34-35/
Insecticides or pesticides.....04	36-37/	<input type="text"/>	days	.....95	38-39/
Degreasing chemicals.....05	40-41/	<input type="text"/>	days	.....95	42-43/
Defoliants or herbicides.....06	44-45/	<input type="text"/>	days	.....95	46-47/
None of the above (SKIP TO Q.10).07	48-49/				

HAND CARD D

8. While you were on that job, how often did you wash to remove the (SUBSTANCES) or use protective gear -- would you say all of the time, some of the time, or never?

- All of the time.....1 50/
- Some of the time.....2
- Never.....(SKIP TO Q.10).....3

9. Which of the following did you use on that job? (CODE ALL THAT APPLY)

Air filter.....01	51-52/
Goggles.....02	53-54/
Face shield.....03	55-56/
Special clothing.....04	57-58/
Washing facilities.....05	59-60/
Self-contained or supplied air breathing apparatus.....06	61-62/
None.....07	63-64/

HAND CARD E

10. Did you have another job before the job with (NAME IN Q.6A) but, since (DATE OF LAST INTERVIEW)?

- Yes.....1 65/
- No(SKIP TO Q.21).....2

11. In what month and year did you start that job?

Month Year 66-69/

A. What was the name of your employer?

BEGIN DECK 07

10-34/

B. Was this a full-time or part-time job?

- Full-time.....1 35/
- Part-time.....2

C. What kind of business was that--what did they make or do there?

36-38/

D. What did you actually do on the job--what were some of your main duties?

39-41/

E. Please look at this card and tell me which number best describes the kind of industry you worked in?

HAND CARD C

ENTER NUMBER: 42-43/

11. (Continued)

11. (Continued)

F. In what month and year did this job end?

Month	Year		

44-47/

CURRENT JOB:....(SKIP TO Q.12)....0001

G. What was the main reason you stopped working on your job?

48-49/

12. While working at (EMPLOYER) did you come in contact with any of the substances on this card? By contact I mean that you inhaled, tasted, had skin contact with these fibers and chemicals, or were exposed to ionizing or nuclear radiation.
CODE ALL THAT APPLY

FOR EACH SUBSTANCE CODED IN Q.12, ASK A.

A. In general how many days a month did you come in contact with (SUBSTANCE)?
Less than once a month

- Asbestos.....01 50-51/ days95 52-53/
- Ionizing or nuclear radiation....02 54-55/ days95 56-57/
- Industrial chemicals.....03 58-59/ days95 60-61/
- Insecticides or pesticides.....04 62-63/ days95 64-65/
- Degreasing chemicals.....05 66-67/ days95 68-69/
- Defoliants or herbicides.....06 70-71/ days95 72-73/
- None of the above (SKIP TO Q.15).07 74-75/

13. While you were on that job, how often did you wash to remove the (SUBSTANCES) or use protective gear -- would you say all of the time, some of the time, or never?

- All of the time.....1 76/
- Some of the time.....2
- Never.....(SKIP TO Q.15).....3

14. Which of the following did you use on that job? (CODE ALL THAT APPLY)

- | | |
|---|--------|
| Air filter.....01 | 10-11/ |
| Goggles.....02 | 12-13/ |
| Face shield.....03 | 14-15/ |
| Special clothing.....04 | 16-17/ |
| Washing facilities.....05 | 18-19/ |
| Self-contained or supplied air breathing apparatus.....06 | 20-21/ |
| None.....07 | 22-23/ |

HAND CARD E

15. Did you have another job before job with (NAME IN Q.11A), but since (DATE OF LAST INTERVIEW)?

- Yes.....1 24/
- No(SKIP TO Q.21).....2

16. In what month and year did you start that job?

Month	Year		

25-28/

A. What was the name of your employer?

29-53/

B. Was this a full-time or part-time job?

- Full-time.....1 54/
- Part-time.....2

C. What kind of business was that--what did they make or do there?

55-57/

16. (Continued)

B-9

16. (Continued)

D. What did you actually do on the job--what were some of your main duties?

58-60/

E. Please look at this card and tell me which number best describes the kind of industry you worked in? (WRITE IN NUMBER)

HAND CARD C

ENTER NUMBER: [] [] 61-62/

F. In what month and year did this job end?

[] [] [] [] 63-66/
Month Year

CURRENT JOB:....(SKIP TO Q.12)....0001

G. What was the main reason you stopped working on your job?

67-68/

17. While working at (EMPLOYER) did you come in contact with any of the substances on this card? By contact I mean that you inhaled, tasted, had skin contact with these fibers and chemicals, or were exposed to ionizing or nuclear radiation. (CODE ALL THAT APPLY)

FOR EACH SUBSTANCE CODED IN Q.17, ASK A.

A. In general, how many days a month did you come in contact with (SUBSTANCE)? Less than once a month

Table with 4 columns: Substance, Code, Days, Range. Includes Asbestos, Ionizing or nuclear radiation, Industrial chemicals, Insecticides or pesticides, Degreasing chemicals, Defoliants or herbicides, and None of the above.

HAND CARD D

18. While you were that job, how often did you wash to remove the (SUBSTANCES) or use protective gear -- would you say all of the time, some of the time, or never?

All of the time.....1 24/
Some of the time.....2
Never.....(SKIP TO Q.20).....3

19. Which of the following did you use on that job? CODE ALL THAT APPLY

HAND CARD E

Air filter.....01 25-26/
Goggles.....02 27-28/
Face shield.....03 29-30/
Special clothing.....04 31-32/
Washing facilities.....05 33-34/
Self-contained or supplied air breathing apparatus.....06 35-36/
None.....07 37-38/

20. Did you have another job before the job (NAME IN Q.16A), but since (DATE OF LAST INTERVIEW)?

Yes.....(USE NEW QUEX).....1 39/
No.....2

21. During the past six months, did illness or injury keep you from work, not counting work around the house?

Yes.....1 40/
No.....(SKIP TO SECTION 4)...2
Retired.....(SKIP TO SECTION 4)...3
Unemployed..(SKIP TO SECTION 4)...4

22. Altogether, how many days did illness or injury keep you from work during the past six months? (REFERS TO "WORKING DAYS" ONLY)

ENTER NUMBER OF DAYS: [] [] [] 41-43/

23. What illnesses or injuries caused you to miss work?

44/

B-10

SECTION 4: MILITARY

1. Now I am going to ask you about some of your experiences in the military. First, which of the following statements best describes your assignment during the Vietnam War?

HAND CARD F

A crew member in Vietnam who was on a flying status.....1 45/
 Not a crew member, but flew one or more missions in Vietnam..2
 A crew member, but did not log flying time in Vietnam.....3
 Not a crew member.....4

2. INTERVIEWER: WAS R SERVED IN MILITARY SINCE LAST INTERVIEW? (IS Q.3 IN SECTION 2, CODED "YES"?)

YES.....(GO TO Q.3).....1 46/
 NO.....(SKIP TO SECTION 5).....2

3. Since (DATE OF LAST INTERVIEW) have you retired, been discharged or separated from the (BRANCH OF SERVICE FROM INFORMATION SHEET ITEM 3)?

Yes.....(ASK A THROUGH C).....1 47/
 No.....(SKIP TO Q.4).....2

- A. Were you retired, discharged or separated?

Retired.....1 48/
 Discharged/Separated.....2

- B. In what month and year were you (retired/discharged/separated) from the (BRANCH OF SERVICE FROM INFORMATION SHEET ITEM 3)?

 Month Year

49-52/

3. (Continued)

- C. Following your (retirement/separation/discharge) in (DATE IN B.), did you reenter the armed forces?

Yes.....1 53/
 No.....2

4. I would like to ask you the names of all the countries, including the United States, you have been stationed in since (DATE OF LAST INTERVIEW)

When last interviewed you were stationed in (COUNTRY FROM INFORMATION SHEET ITEM 3), and your assignment began in (DATE OF ASSIGNMENT FROM INFORMATION SHEET ITEM 3). Is that correct?

Yes....(ASK B THROUGH K).....1 54/
 No...(CORRECT INFORMATION SHEET, THEN ASK B THROUGH K).....2

4. (Continued)

BEGIN DECK 10

L. Since (DATE OF LAST INTERVIEW), in what country were you next stationed while on active duty? Include temporary duties of greater than 90 days.

M. Since (DATE OF LAST INTERVIEW), in what country were you next stationed while on active duty? Include temporary duties of greater than 90 days.

55-56/R

COUNTRY

10-11/

O. In what month and year did you begin and end active duty in (COUNTRY)?

N. In what month and year did you begin and end active duty in (COUNTRY)?

X. In what month and year did you begin and end active duty in (COUNTRY)?

BEGIN

BEGIN

BEGIN

Month Year

Month Year

Month Year

57-60/

12-15/

37-40/

END

END

END

Month Year

Month Year

Month Year

61-64/

16-19/

41-44/

Current.....1

Current.....1

Current.....1

C. What specific job assignments (do/did) you have in (COUNTRY)? Can you give me the Air Force Speciality Code? (PROBE: What others?)

N. What specific job assignments (do/did) you have in (COUNTRY)? Can you give me the Air Force Speciality Code? (PROBE: What others?)

X. What specific job assignments (do/did) you have in (COUNTRY)? Can you give me the Air Force Speciality Code? (PROBE: What others?)

1. Month Year 65-69/

1. Month Year 20-24/

1. Month Year 45-49/

2. Month Year 70-74/

2. Month Year 25-29/

2. Month Year 50-54/

3. Month Year 75-79/

3. Month Year 30-34/

3. Month Year 55-59/



4. (Continued)

BEGIN DECK 11

D. (Do/Did) your duties in (COUNTRY) include flying?

60/

Yes.....1

No...(SKIP TO G)....2

O. (Do/Did) your duties in (COUNTRY) include flying?

10/

Yes.....1

No...(SKIP TO R)....2

Z. (Do/Did) your duties in (COUNTRY) include flying?

30/

Yes.....1

No...(SKIP TO CC)....2

E. How many flight hours did you log while in (COUNTRY)?

61-64/

Hours

P. How many flight hours did you log while in (COUNTRY)?

11-14/

Hours

AA. How many flight hours did you log while in (COUNTRY)?

31-34/

Hours

F. What specific letter and numerical designation(s) did each aircraft have?

Q. What specific letter and numerical designation(s) did each aircraft have?

BB. What specific letter and numerical designation(s) did each aircraft have?

1. Month Year 65-69/

1. Month Year 15-19/

1. Month Year 35-39/

2. Month Year 70-74/

2. Month Year 20-24/

2. Month Year 40-44/

3. Month Year 75-79/

3. Month Year 25-29/

3. Month Year 45-49/

B-12

4. (Continued)

G. In your job assignments while stationed in (COUNTRY), (do/did) you come in contact with any of the substances on this card? By contact I mean that you inhaled, tasted, had skin contact with these fibers and chemicals, or were exposed to ionizing or nuclear radiation. CODE ALL THAT APPLY

HAND CARD D

- asbestos.....01 50-51/
ionizing or nuclear radiation....02 52-53/
industrial chemicals.03 54-55/
insecticides or pesticides.....04 56-57/
degreasing chemicals.05 58-59/
defoliants or herbicides.....06 60-61/
none of the above (SKIP TO K).....07 62-63/

R. In your job assignments while stationed in (COUNTRY), (do/did) you come in contact with any of the substances on this card? By contact I mean that you inhaled, tasted, had skin contact with these fibers and chemicals, or were exposed to ionizing or nuclear radiation. CODE ALL THAT APPLY

HAND CARD D

- asbestos.....01 64-65/
ionizing or nuclear radiation....02 66-67/
industrial chemicals.03 68-69/
insecticides or pesticides.....04 70-71/
degreasing chemicals.05 72-73/
defoliants or herbicides.....06 74-75/
none of the above (SKIP TO V).....07 76-77/

CC. In your job assignments while stationed in (COUNTRY), (do/did) you come in contact with any of the substances on this card? By contact I mean that you inhaled, tasted, had skin contact with these fibers and chemicals, or were exposed to ionizing or nuclear radiation. CODE ALL THAT APPLY

HAND CARD D

BEGIN DECK 12

- asbestos.....01 10-11/
ionizing or nuclear radiation....02 12-13/
industrial chemicals.03 14-15/
insecticides or pesticides.....04 16-17/
degreasing chemicals.05 18-19/
defoliants or herbicides.....06 20-21/
none of the above (SKIP TO GG).....07 22-23/

H. In general, how many days a month (do/did) you come in contact with (SUBSTANCE)?

- asbestos [] [] 24-25/
less than once a month.....95
ionizing or nuclear radiation [] [] 26-27/
less than once a month.....95
industrial chemicals [] [] 28-29/
less than once a month.....95
insecticides or pesticides [] [] 30-31/
less than once a month.....95
degreasing chemicals [] [] 32-33/
less than once a month.....95
defoliants or herbicides [] [] 34-35/
less than once a month.....95

I. Did you wash to remove the (SUBSTANCES) or did you use protective clothing or gear when stationed in (COUNTRY) all the time, some of the time, or never?

- All the time.....1 36/
Some of the time...2
Never.(SKIP TO K)..3

S. In general, how many days a month (do/did) you come in contact with (SUBSTANCE)?

- asbestos [] [] 37-38/
less than once a month.....95
ionizing or nuclear radiation [] [] 39-40/
less than once a month.....95
industrial chemicals [] [] 41-42/
less than once a month.....95
insecticides or pesticides [] [] 43-44/
less than once a month.....95
degreasing chemicals [] [] 45-46/
less than once a month.....95
defoliants or herbicides [] [] 47-48/
less than once a month.....95

T. Did you wash to remove the (SUBSTANCES) or did you use protective clothing or gear when stationed in (COUNTRY) all the time, some of the time, or never?

- All the time.....1 49/
Some of the time...2
Never.(SKIP TO V)..3

DD. In general, how many days a month (do/did) you come in contact with (SUBSTANCE)?

- asbestos [] [] 50-51/
less than once a month.....95
ionizing or nuclear radiation [] [] 52-53/
less than once a month.....95
industrial chemicals [] [] 54-55/
less than once a month.....95
insecticides or pesticides [] [] 56-57/
less than once a month.....95
degreasing chemicals [] [] 58-59/
less than once a month.....95
defoliants or herbicides [] [] 60-61/
less than once a month.....95

EE. Did you wash to remove the (SUBSTANCES) or did you use protective clothing or gear when stationed in (COUNTRY) all the time, some of the time, or never?

- All the time.....1 62/
Some of the time...2
Never.(SKIP TO GG)..3



BEGIN DECK 13

J. Which of the following did you use on that job?
CODE ALL THAT APPLY

- Air filter.....01 63-64/
- Goggles.....02 65-66/
- Face Shield....03 67-68/
- Special clothing.....04 69-70/
- Washing facilities.....05 71-72/
- Self contained or supplied air breathing apparatus.....06 73-74/
- None.....07 75-76/

K. Are there any other countries that you have been stationed in since (DATE OF LAST INTERVIEW)?

Yes.(GO TO L)...1 77/

NO.(SKIP TO SECTION 5)..2

U. Which of the following did you use on that job?
CODE ALL THAT APPLY

- Air filter.....01 10-11/
- Goggles.....02 12-13/
- Face Shield....03 14-15/
- Special clothing.....04 16-17/
- Washing facilities.....05 18-19/
- Self contained or supplied air breathing apparatus.....06 20-21/
- None.....07 22-23/

V. Are there any other countries that you have been stationed in since (DATE OF LAST INTERVIEW)?

Yes.(GO TO W)...1 24/

NO.(SKIP TO SECTION 5)..2

FF. Which of the following did you use on that job?
CODE ALL THAT APPLY

- Air filter.....01 25-26/
- Goggles.....02 27-28/
- Face Shield....03 29-30/
- Special clothing.....04 31-32/
- Washing facilities.....05 33-34/
- Self contained or supplied air breathing apparatus.....06 35-36/
- None.....07 37-38/

GG. Are there any other countries that you have been stationed in since (DATE OF LAST INTERVIEW)?

Yes...(USE MEN QUIZ)...1 39/

NO.(GO TO SECTION 5)..2

SECTION 5: MARITAL AND FERTILITY HISTORY

I. Now I would like to ask you about your personal relationships.

When we talked with you last, you said you were (READ MARITAL STATUS FROM INFORMATION SHEET ITEM 4). Is that correct?

Yes.....(ASK A).....1 40/

No.....(CORRECT INFO SHEET, THEN ASK A).....2

A. INTERVIEWER: WAS STATUS "MARRIED" AT LAST INTERVIEW?

YES.....(SKIP TO E).....1 41/

NO.....(ASK B).....2

B. INTERVIEWER: SEE INFORMATION SHEET ITEM 5. WAS RESPONDENT "LIVING WITH PARTNER" AT LAST INTERVIEW?

YES.....(ASK C).....1 42/

NO.....(SKIP TO Q.3).....2

C. What is the current full name of the person you were living with in (DATE OF LAST INTERVIEW)?

LAST NAME

FIRST NAME

MIDDLE NAME

INTERVIEWER: RECORD NAME ON INFORMATION SHEET, ITEM 05

D. In what month and year did you start living with (NAME)?

ENTER MONTH AND YEAR [] [] [] [] 43-46/
MO YR

(GO TO Q.2)

E. According to our records, you were married to (NAME AT INFORMATION SHEET ITEM 6). Is that correct?

Yes.....1 47/

No...(CORRECT INFO SHEET, THEN GO TO Q.2)....2

HAND CARD E

B-14

1. (Continued)

F. In what month and year did you get married to (NAME)?

ENTER MONTH AND YEAR [] [] [] [] 40-51/
NO YR

2. Have you stopped living with (NAME)?

Yes.....(ASK A).....1 52/
No.....(SKIP TO C).....2

A. How did this (marriage/relationship) end?

Separation.....1 53/
Divorce.....2
Death of spouse or partner.....(ASK B-E)
YOUNG ASK (2-3).....3

B. In what month and year did this occur?

ENTER MONTH AND YEAR: [] [] [] [] 54-57/
NO YR

C. During this (marriage/relationship), how many times were you living apart from (NAME) for 3 months or more since (DATE OF LAST INTERVIEW)?

ENTER NUMBER OF TIMES: [] [] 58-59/
OR
None.....(SKIP TO F).....00

D. For how many months did you live apart the (first/next) time?

First time: [] [] 60-61/
Second time: [] [] 62-63/
Third time: [] [] 64-65/
Fourth time: [] [] 66-67/

HAND
CARD
G

B-15

2. (Continued)

E. During this (marriage/relationship), (since the (DATE OF LAST INTERVIEW)), did you ever have a problem conceiving a child because of prolonged separation?

Yes.....1 68/
No.....2

F. And what is (NAME OF SPOUSE/PARTNER)'s present street address?

STREET ADDRESS _____ BEGIN DECK 14
10-34/

G. And what city, state and zip code does (SPOUSE/PARTNER) live in?

_____ [] [] [] [] [] [] [] [] [] []
CITY STATE ZIP CODE
35-54/ 55-56/ 57-61/

H. And what is (NAME OF SPOUSE/PARTNER)'s present telephone number?

[] [] [] [] - [] [] [] [] [] [] 62-71/
AREA CODE NUMBER
NO PHONE.....1

I. Thinking of all the people you know, who would be the one person who would be most likely to know where (NAME OF SPOUSE/PARTNER) is? ENTER FULL NAME OF PERSON BELOW AND ASK J-N.

_____ BEGIN DECK 15
(LAST) 10-29/
_____ 30-44/
(FIRST) (MIDDLE)

J. What is (PERSON'S) relationship to (NAME OF SPOUSE/PARTNER)?

_____ 45-46/

K. Where does (PERSON) live?

_____ 47-71/
STREET ADDRESS APTS

_____ BEGIN DECK 16
CITY STATE ZIP CODE
10-29/ 30-31/ 32-36/

2. (Continued)

L. What is (PERSON'S) telephone number?

AREA CODE PHONE NUMBER 37-46/

NO PHONE.....1

M. IF (PERSON) HAS PHONE: In whose name is the phone listed?

(PERSON'S) name.....(SKIP TO N).....1 47/

OTHER.....(SPECIFY BELOW).....2

DON'T KNOW.....3

(LAST), 48-72/

(FIRST) (MIDDLE)

N. INTERVIEWER: HAS R STOPPED LIVING WITH SPOUSE OR PARTNER? (IS "YES" CODED AT Q.2?)

Yes.....1 73/

No.....(SKIP TO Q.10).....2

3. Since (DATE OF LAST INTERVIEW), have you reconciled, married (again) or have you lived together as a partner for 3 months or more with someone to whom you weren't married?

Yes.....(ASK A).....1 74/

No.....(SKIP TO Q.10).....2

A. How many times did you get married or live as a partner with someone for 3 months or more since (DATE OF LAST INTERVIEW)?

RECORD NUMBER OF TIMES: 75/

4. Thinking of (that/the first) relationship since (DATE OF LAST INTERVIEW), did you marry this person?

Yes.....1 76/

No.....2

RECONCILED.....3

B-16

4. (Continued)

A. What is the current full name of (this person/your wife)?

ID #

(LAST) 77-78/

(FIRST) (MIDDLE)

INTERVIEWER: RECORD FULL NAME OF (SPOUSE/PARTNER) ON INFORMATION SHEET, ITEM 07 AND RECORD ID# ABOVE.

BEGIN DECK 17

What was her full maiden name?

10-29/

What was her birthdate? RECORD DATE: MO DA YR 30-35/

B. In what month and year did you (reconcile/get married to/start living with) (NAME)?

ENTER MONTH AND YEAR: MO YR 36-39/

C. Have you stopped living with (NAME)?

Yes.....(ASK D-F).....1 40/

No.....(SKIP TO Q.4F).....2

D. How did this (marriage/relationship) end?

Separation.....1 41/

DIVORCE.....2

Death of spouse or partner...(ASK E-B, THEN SKIP TO Q.5)....3

HAND CARD S

4. (Continued)

E. In what month and year did this occur?

ENTER MONTH AND YEAR: [][]/[][] 42-45/
MO YR

F. During this (marriage/relationship), how many times were you living apart from (NAME) for 3 months or more since (DATE OF LAST INTERVIEW)?

ENTER NUMBER OF TIMES: [][] 46-47/

OR

None.....(GO TO I).....00

G. For how many months did you live apart the (first/next) time?

First time: [][] 48-49/

Second time: [][] 50-51/

Third time: [][] 52-53/

Fourth time: [][] 54-55/

H. During this (marriage/relationship), (since the (DATE OF LAST INTERVIEW)), did you ever have a problem conceiving a child because of prolonged separation?

Yes.....1 56/

No.....2

I. And what is (NAME OF SPOUSE/PARTNER)'s present street address?

_____ 57-60/
STREET ADDRESS

BEGIN DECK 18

J. And what city, state and zip code does (SPOUSE/PARTNER) live in?

_____ 10-29/ 30-31/ 32-36/
CITY STATE ZIP CODE

K. And what is (NAME OF SPOUSE/PARTNER)'s present telephone number?

[][][] - [][][][][] 37-46/
AREA CODE NUMBER

NO PHONE.....1

B-17

4. (Continued)

L. Thinking of all the people you know, either around here or elsewhere, who would be the one person who would be most likely to know where (NAME OF SPOUSE/PARTNER) is? ENTER FULL NAME OF PERSON BELOW AND ASK M-P.

_____ 47-65/
(LAST),

_____ 66-60/
(FIRST) (MIDDLE)

BEGIN DECK 19

M. What is (PERSON'S) relationship to (NAME OF SPOUSE/PARTNER)?

_____ 10-11/

N. Where does (PERSON) live?

_____ 12-36/
STREET ADDRESS APT#

_____ 37-56/ 57-58/ 59-63/
CITY STATE ZIP CODE

O. What is (PERSON'S) telephone number?

[][][] - [][][][][] 64-73/
AREA CODE PHONE NUMBER

NO PHONE.....1

P. IF (PERSON) HAS PHONE: In whose name is the phone listed?

(PERSON'S) name.....(SKIP TO Q.5).....1 74/

OTHER.....(SPECIFY BELOW).....2

DON'T KNOW.....(SKIP TO Q.5).....8

BEGIN DECK 20

_____ 10-34/
(LAST),

_____ (FIRST) (MIDDLE)

5. INTERVIEWER: IS THERE A SECOND RELATIONSHIP SINCE THE DATE LAST INTERVIEW? (IS NUMBER OF TIMES RECORDED IN Q.3A EQUAL TO 2 OR MORE?)

YES.....(GO TO Q.6).....1 35/

NO.....(SKIP TO Q.10).....2

6. Thinking of the next relationship since (DATE OF LAST INTERVIEW), did you marry this person?

Yes.....1 36/
No.....2

A. What is the current full name of this person?

ID #

(LAST) 37-38/

(FIRST) (MIDDLE)

INTERVIEWER: RECORD FULL NAME OF (SPOUSE/PARTNER) ON INFORMATION SHEET, ITEM 07 AND 10# ABOVE.

What was her full maiden name?

_____ 39-58/

What was her birthdate? RECORD DATE: _____ 59-64/
MO DA YR

B. In what month and year did you (get married to/start living with) (NAME)?

ENTER MONTH AND YEAR: _____ 65-68/
MO YR

C. Have you stopped living with (NAME)?

Yes.....(ASK D-F).....1 69/
No.....(SKIP TO F).....2

D. How did this (marriage/relationship) end?

HARD CARD G
Separation.....1 70/
Divorce.....2
Death of spouse or partner (ASK B-G, THEN SKIP TO G.7).....3

6. (Continued)

E. In what month and year did this occur?

ENTER MONTH AND YEAR: _____ 71-74/
MO YR

F. During this relationship, how many times were you living apart from (NAME) for 3 months or more since (DATE OF LAST INTERVIEW)?

ENTER NUMBER OF TIMES: _____ 75-76/
OR
None.....(GO TO I).....00

G. For how many months did you live apart the (first/next) time?

First time:..... _____ 77-78/
Second time:..... _____ 79-80/
Third time:..... _____ BEGIN DECK 21 80-81/
Fourth time:..... _____ 82-83/

H. During this (marriage/relationship), (since the (DATE OF LAST INTERVIEW)), did you ever have a problem conceiving a child because of prolonged separation?

Yes.....1 84/
No.....2

I. And what is (NAME OF SPOUSE/PARTNER)'s present street address?

_____ 85-89/
STREET ADDRESS

J. And what city, state and zip code does (SPOUSE/PARTNER) live in?

CITY STATE ZIP CODE
40-59/ 60-61/ 62-66/

B-18

6. (Continued)

K. And what is (NAME OF SPOUSE/PARTNER)'s present telephone number?

AREA CODE NUMBER 67-76/

NO PHONE.....1

L. Thinking of all the people you know, either around here or elsewhere, who would be the one person who would be most likely to know where (NAME OF SPOUSE/PARTNER) is? ENTER FULL NAME OF PERSON BELOW AND ASK M-P.

BEGIN DECK 22 10-29/

(LAST), (FIRST) (MIDDLE) 30-44/

M. What is (PERSON'S) relationship to (NAME OF SPOUSE/PARTNER)?

45-46/

N. Where does (PERSON) live?

STREET ADDRESS APTS 47-71/ BEGIN DECK 23

CITY STATE ZIP CODE 10-29/ 30-31/ 32-36/

O. What is (PERSON'S) telephone number?

AREA CODE PHONE NUMBER 37-46/

NO PHONE.....1

P. IF (PERSON) HAS PHONE: In whose name is the phone listed?

(PERSON'S) name....(SKIP TO Q.7).....1 47/

OTHER.....(SPECIFY BELOW).....2

DON'T KNOW.....(SKIP TO Q.7).....3

(LAST), 48-72/

(FIRST) (MIDDLE)

7. INTERVIEWER: IS THERE A THIRD RELATIONSHIP SINCE THE DATE LAST INTERVIEW? (IS NUMBER OF TIMES RECORDED IN Q.3A EQUAL TO 3 OR MORE?)

YES.....(GO TO Q.8).....1 73/

NO.....(SKIP TO Q.10).....2

8. Thinking of the next relationship since (DATE OF LAST INTERVIEW), did you marry this person?

Yes.....1 74/

No.....2 ID #

A. What is the current full name of this person?

(LAST) 75-76/ (FIRST) (MIDDLE)

INTERVIEWER: RECORD FULL NAME OF (SPOUSE/PARTNER) ON INFORMATION SHEET, ITEM 07 AND ID # ABOVE.

What was her full maiden name? BEGIN DECK 24

10-29/

What was her birthdate? RECORD DATE: NO DA YR 30-35/

B. In what month and year did you (get married to/start living with) (NAME)?

ENTER MONTH AND YEAR: 36-39/ NO YR

C. Have you stopped living with (NAME)?

Yes.....(ASK D-P).....1 40/

No.....(SKIP TO F).....2

B-19

B. (Continued)

D. How did this (marriage/relationship) end?

HARD CARD C	Separation.....1	41/
	Divorce.....2	
	Death of spouse or partner (ASK B-H, THEN SKIP TO Q.9).....3	

E. In what month and year did this occur?

ENTER MONTH AND YEAR: 42-45/
MO YR

F. During this (marriage/relationship), how many times were you living apart from (NAME) for 3 months or more since (DATE OF LAST INTERVIEW)?

ENTER NUMBER OF TIMES: 46-47/
 OR
 None.....(GO TO Q.9).....00

G. For how many months did you live apart the (first/next) time?

First time..... 48-49/
 Second time..... 50-51/
 Third time..... 52-53/
 Fourth time..... 54-55/

H. During this (marriage/relationship), since the (DATE OF LAST INTERVIEW), did you ever have a problem conceiving a child because of prolonged separation?

Yes.....1 56/
 No.....2

I. And what is (NAME OF SPOUSE/PARTNER)'s present street address?

_____ 57-60/
STREET ADDRESS
 BEGIN DECK 25

J. And what city, state and zip code does (SPOUSE/PARTNER) live in?

_____ 32-36/
CITY STATE ZIP CODE
 10-29/ 30-31/

B. (Continued)

K. And what is (NAME OF SPOUSE/PARTNER)'s present telephone number?

- 37-46/
AREA CODE NUMBER
 NO PHONE1

L. Thinking of all the people you know, either around here or elsewhere, who would be the one person who would be most likely to know where (NAME OF SPOUSE/PARTNER) is? ENTER FULL NAME OF PERSON BELOW AND ASK M-P.

_____ 47-71/
(LAST),

(FIRST) (MIDDLE)

M. What is (PERSON'S) relationship to (NAME OF SPOUSE/PARTNER)?

72-73/
 BEGIN DECK 26

N. Where does (PERSON) live?

_____ 10-34/
STREET ADDRESS APTS

CITY STATE ZIP CODE
 35-54/ 55-56/ 57-61/

O. What is (PERSON'S) telephone number?

- 62-71/
AREA CODE PHONE NUMBER
 NO PHONE1

P. IF (PERSON) HAS PHONE: In whose name is the phone listed?

(PERSON'S) name....(SKIP TO Q.9).....1 72/
 OTHER.....(SPECIFY BELOW).....2
 DON'T KNOW.....(SKIP TO Q.9).....6

BEGIN DECK 27

_____ 10-34/
(LAST),

(FIRST) (MIDDLE)

B-20

9. INTERVIEWER: IS THERE A FOURTH RELATIONSHIP SINCE THE DATE LAST INTERVIEW? (IS NUMBER OF TIMES RECORDED IN Q. 3A EQUAL TO 4 OR MORE?)

YES....(GO TO NEW QUESTIONNAIRE).....1 35/
 NO.....2

VERIFICATION OF BIOLOGICAL CHILDREN USING CHILDREN'S RECORD FORM

10. INTERVIEWER: ARE CHILDREN LISTED ON CHILDREN'S RECORD FORM?

YES.....(ASK A).....1 36/
 NO.....(ASK B).....2

A. I'd like to read information about your (child/children) from our last interview to check our records. As of (DATE OF LAST INTERVIEW), our records show that you have had (NUMBER OF CHILDREN). . .(READ EACH CHILD'S FULL NAME, SEX, AND BIRTHDATE AND MOTHER'S NAME). Is that correct?

IF INFORMATION IS CORRECT (GO TO Q.11).....1 37/
 IF INFORMATION IS INCORRECT, MAKE CORRECTIONS ON CHILDREN'S RECORD FORM (THEN GO TO Q.11).....2

B. Our records show that you had not had any children of your own as of (DATE OF LAST INTERVIEW). Is that correct?

IF INFORMATION IS CORRECT (GO TO Q.12).....1 38/
 IF INFORMATION IS INCORRECT, ASK FOR (CHILD/CHILDREN)'S FULL NAME, SEX, BIRTHDATE AND MOTHER'S NAME. RECORD BEGINNING AT LINE 01 ON CHILDREN'S RECORD FORM....(THEN GO TO Q.11).....2

11. INTERVIEWER: ASK THIS QUESTION FOR EACH CHILD LISTED ON CHILDREN'S RECORD FORM FOR WHICH THERE IS NO DEATH DATE.

What is (NAME OF 1ST CHILD/NAME OF 2ND CHILD, ETC.)'s current age? RECORD ON CHILDREN'S RECORD FORM.

IF DECEASED SINCE LAST INTERVIEW, ASK A-C. OTHERS GO TO Q.12.

A. When did (CHILD) die? RECORD DAY, MONTH, AND YEAR ON CHILDREN'S RECORD FORM.

B. What was the cause of death? RECORD BELOW.

BEGIN DECK 28

C. Where is (CHILD)'s death registered? In what city and state?

CHILD ID: [] [] CHILD ID: [] [] CHILD ID: [] []
 39-40/ 60-61/ 10-11/

CAUSE: _____ 41/ _____ 62/ _____ 12/

REGISTRATION: _____
 (CITY) 42-57/ (CITY) 63-78/ (CITY) 13-28/

 (STATE) 58-59/ (STATE) 79-80/ (STATE) 29-30/

12. INTERVIEWER: HAS R BEEN MARRIED OR HAD A PARTNER FOR 3 MONTHS OR MORE SINCE (DATE OF LAST INTERVIEW)?

YES.....(ASK A).....1 31/
 NO.....(SKIP TO SECTION 6).....2

A. Was/Have (your wife/any of your partners) become pregnant by you since (DATE OF LAST INTERVIEW)?

Yes.....(ASK B).....1 32/
 No.....(SKIP TO Q.25).....2

B. How many pregnancies (has your wife/have your partners) had with you since (DATE OF LAST INTERVIEW)?

ENTER NUMBER OF PREGNANCIES: [] [] 33-34/
 (GO TO Q.13)

B-21

14. (Continued)

E. Was (CHILD) a twin?

Yes.....1 35/
No.....2

F. Was (CHILD) premature, full term, or overdue?

Premature.....1 36/
Full term.....2
Overdue.....3
Don't know.....6

G. How old was (NAME OF MOTHER) when (CHILD) was born?

RECORD AGE: [][] 37-30/
Don't know.....98

H. What is the name and address of the doctor or medical facility who has (CHILD)'s birth registration records? RECORD BELOW

DOCTOR'S NAME OR FACILITY NAME 39/
STREET ADDRESS

[][] (CITY) (STATE)

INTERVIEWER: RECORD NAME AND ADDRESS ON MEDICAL CONSENT FORM

I. What is the name and address of the doctor or medical facility who has (CHILD)'s current medical records? RECORD BELOW. 40/

DOCTOR'S NAME OR FACILITY NAME

STREET ADDRESS

[][] (CITY) (STATE)

INTERVIEWER: RECORD NAME AND ADDRESS ON MEDICAL CONSENT FORM

J. What is (CHILD)'s current age? RECORD IN CHILDREN'S RECORD FORM OR SUPPLEMENTARY CHILDREN'S RECORD FORM. IF DECEASED, ASK K-M. OTHERS GO TO Q.15.

B-23

14. (Continued)

K. When did (CHILD) die? RECORD DAY, MONTH, AND YEAR ON CHILDREN'S RECORD FORM OR SUPPLEMENTARY CHILDREN'S RECORD FORM.

L. What was the cause of death? RECORD BELOW. 41/

M. Where is (CHILD'S) death registered? In what city and state?

[][] (CITY) [][] (STATE)
42-57/ 58-59/

15. INTERVIEWER: IS THERE A SECOND PREGNANCY SINCE THE DATE OF LAST INTERVIEW (IS NUMBER OF PREGNANCIES IN Q.12B EQUAL TO 2 OR MORE?)

YES.....(SKIP TO Q.17).....1 60/
NO.....(SKIP TO Q.25).....2

16. When did that pregnancy end?

RECORD DATE: [][] [][] [][] [][] [][] [][] 61-66/
NO DA YR

A. How many weeks had (NAME) been pregnant when that happened?

ENTER NUMBER OF WEEKS: [][] 67-68/
Don't know.....98

IF MISCARRIAGE OR STILLBIRTH, ASK B-C; OTHERS GO TO D.

B. Did a doctor tell you why this (miscarriage/stillbirth) might have occurred?

Yes.....(ASK C).....1 69/
No.....(GO TO D).....2

C. What did the doctor say caused the (miscarriage/stillbirth)? RECORD VERBATIM.

70/

16. (Continued)

D. INTERVIEWER: IS THERE A SECOND PREGNANCY SINCE DATE OF LAST INTERVIEW? (IS NUMBER OF PREGNANCIES IN Q.12B EQUAL TO 2 OR MORE?)

YES.....(GO TO Q.17).....1 71/
 NO.....(SKIP TO Q.25).....2

17. When did the next pregnancy begin? What month and year?

ENTER MONTH AND YEAR: 72-75/
MO YR

A. INTERVIEWER: HAS R HAD MORE THAN ONE RELATIONSHIP SINCE DATE OF LAST INTERVIEW? (SEE INFO SHEET, ITEMS 05, 06 AND 07)

YES.....(ASK B).....1 76/
 NO.....(GO TO C).....2

BEGIN DECK 30

B. Which (spouse/partner) had this pregnancy?

RECORD NAME: _____ 10-34/
(LAST)

_____ (FIRST) _____ (MIDDLE)

INTERVIEWER: RECORD ID # FROM INFORMATION SHEET, ITEM 05, 06, OR 07 35-36/

C. How many months did it take (NAME OF SPOUSE/PARTNER) to become pregnant (this time)?

RECORD MONTHS AND/OR 37-38/
 AND/OR YEARS: MOs Yrs

Wasn't trying.....00 39-40/
 OR
 DON'T KNOW.....98

D. Were either you or (NAME OF SPOUSE/PARTNER) using birth control at the time she became pregnant?

Yes.....(ASK E).....1 41/
 No.....(SKIP TO Q.18).....2

B-24

17. (Continued)

E. Please look at this card and tell me all the letters of the type of birth control you or (NAME) were using when she became pregnant. CODE ALL THAT APPLY.

HAND
CARD
N

- 1. Pill.....01 42-43/
- 2. Douche.....02 44-45/
- 3. Foam.....03 46-47/
- 4. Jelly, cream, suppository.....04 48-49/
- 5. IUD.....05 50-51/
- 6. Condom, rubber.....06 52-53/
- 7. Diaphragm.....07 54-55/
- 8. Diaphragm and jelly.....08 56-57/
- 9. Rhythm - Calendar.....09 58-59/
- 10. Rhythm - Temperature.....10 60-61/
- 11. Withdrawal.....11 62-63/
- 12. Other (SPECIFY) _____ 12 64-65/
- DON'T KNOW.....98 66-67/

18. Did that pregnancy result in a live birth, or in a miscarriage, stillbirth, or abortion, (or is (NAME) still pregnant)?

- Live birth.....(ASK A-J).....1 68/
- Miscarriage.....(SKIP TO Q.20).....2
- Stillbirth.....(SKIP TO Q.20).....3
- Abortion.....(SKIP TO Q.20).....4
- Still pregnant.....(SKIP TO Q.25).....5

A. What is the first and last name of the child as it appears on the birth certificate? RECORD ON CHILDREN'S RECORD FORM OR SUPPLEMENTARY CHILDREN'S RECORD FORM.

INTERVIEWER: RECORD ID FROM CHILDREN'S RECORD FORM OR SUPPLEMENTARY CHILDREN'S RECORD FORM. 69-70/

B. When was (CHILD) born? ENTER BIRTHDATE ON CHILDREN'S RECORD FORM OR SUPPLEMENTARY CHILDREN'S RECORD FORM.

C. Was (CHILD) male or female? RECORD ON CHILDREN'S RECORD FORM OR SUPPLEMENTARY CHILDREN'S RECORD FORM.

D. How much did (CHILD) weigh at birth?

ENTER POUNDS: 71-72/
 AND
 OUNCES: 73-74/
 OR
 Don't know.....98

18. (Continued)

F. Was (CHILD) a twin?

Yes.....1 75/
No.....2

F. Was (CHILD) premature, full term, or overdue?

Premature.....1 76/
Full term.....2
Overdue.....3
Don't know.....8

G. How old was (NAME OF MOTHER) when (CHILD) was born?

RECORD AGE: [] [] 77-78/
Don't know.....98

H. What is the name and address of the doctor or medical facility who has (CHILD)'s birth registration records? RECORD BELOW

DOCTOR'S NAME OR FACILITY NAME 79/

STREET ADDRESS

[] []
(CITY) (STATE)

INTERVIEWER: RECORD NAME AND ADDRESS ON MEDICAL CONSENT FORM

I. What is the name and address of the doctor or medical facility who has (CHILD)'s current medical records? RECORD BELOW

DOCTOR'S NAME OR FACILITY NAME 80/

STREET ADDRESS

[] []
(CITY) (STATE)

INTERVIEWER: RECORD NAME AND ADDRESS ON MEDICAL CONSENT FORM

J. What is (CHILD)'s current age? RECORD IN CHILDREN'S RECORD FORM OR SUPPLEMENTARY CHILDREN'S RECORD FORM. IF DECEASED, ASK K-H. OTHERS GO TO Q.19.

B-25

18. (Continued)

K. When did (CHILD) die? RECORD DAY, MONTH, AND YEAR ON CHILDREN'S RECORD FORM OR SUPPLEMENTARY CHILDREN'S RECORD FORM.

L. What was the cause of death? RECORD BELOW.

_____ 10/

M. Where is (CHILD'S) death registered? In what city and state?

_____ [] []
(CITY) 11-26/ (STATE) 27-28/

19. INTERVIEWER: IS THERE A THIRD PREGNANCY SINCE THE DATE OF LAST INTERVIEW? (IS NUMBER OF PREGNANCIES IN Q.12B EQUAL TO 3 OR MORE?)

YES.....(SKIP TO Q.21).....1 29/
NO.....(SKIP TO Q.25).....2

20. When did that pregnancy end?

RECORD DATE: [] [] [] [] [] [] 30-35/
MO DA YR

A. How many weeks had (NAME) been pregnant when that happened?

ENTER NUMBER OF WEEKS: [] [] 36-37/
Don't know.....98

IF MISCARRIAGE OR STILLBIRTH, ASK B-C; OTHERS GO TO D.

B. Did a doctor tell why this (miscarriage/stillbirth) might have occurred?

Yes.....(ASK C).....1 38/
No.....(GO TO D).....2

C. What did the doctor say caused the (miscarriage/stillbirth)? RECORD VERBATIM.

_____ 39/

20. (Continued)

D. INTERVIEWER: IS THERE A THIRD PREGNANCY SINCE DATE OF LAST INTERVIEW? (IS NUMBER OF PREGNANCIES IN Q.12R EQUAL TO 3?)

YES.....(GO TO Q.21).....1 40/
 NO.....(SKIP TO Q.25).....2

21. When did the next pregnancy begin? What month and year?

ENTER MONTH AND YEAR: 41-44/
MO YR

A. INTERVIEWER: HAS R HAD MORE THAN ONE RELATIONSHIP SINCE DATE OF LAST INTERVIEW? (SEE INFO SHEET, ITEMS 05, 06 AND 07)

YES.....1 45/
 NO.....(ASK C).....2

B. Which (spouse/partner) had this pregnancy?

RECORD NAME: _____ 46-70/
(LAST)

_____ (FIRST) _____ (MIDDLE)

INTERVIEWER: RECORD ID # FROM INFORMATION SHEET, ITEM 05, 06, OR 07 71-72/

C. How many months did it take (NAME OF SPOUSE/PARTNER) to become pregnant (this time)?

RECORD MONTHS AND/OR 73-74/
 AND/OR YEARS: MO YR

Wasn't trying.....00
 OR 75-76/
 DON'T KNOW.....98

D. Were either you or (NAME OF SPOUSE/PARTNER) using birth control at the time she became pregnant?

Yes.....(ASK E).....? 77/
 No...(SKIP TO Q.22).....2

B-26

21. (Continued)

E. Please look at this card and tell me all the numbers of the types of birth control you or (NAME) were using when she became pregnant. CODE ALL THAT APPLY.

HAND	1. Pill.....01	10-11/
CARD	2. Douche.....02	12-13/
H	3. Foam.....03	14-15/
	4. Jelly, cream, suppository.....04	16-17/
	5. IUD.....05	18-19/
	6. Condom, rubber.....06	20-21/
	7. Diaphragm.....07	22-23/
	8. Diaphragm and jelly.....08	24-25/
	9. Rhythm - Calendar.....09	26-27/
	10. Rhythm - Temperature.....10	28-29/
	11. Withdrawal.....11	30-31/
	12. Other (SPECIFY) _____	12 32-33/
	DON'T KNOW.....98	34-35/

22. Did that pregnancy result in a live birth, or in a miscarriage, stillbirth, or abortion, (or is (NAME) still pregnant)?

Live birth.....(ASK A-J).....? 36/
 Miscarriage.....(SKIP TO Q.24).....2
 Stillbirth.....(SKIP TO Q.24).....3
 Abortion.....(SKIP TO Q.24).....4
 Still pregnant.....(SKIP TO Q.25).....5

A. What is the first and last name of the child as it appears on the birth certificate? RECORD ON CHILDREN'S RECORD FORM OR SUPPLEMENTARY CHILDREN'S RECORD FORM.

INTERVIEWER: RECORD ID FROM CHILDREN'S RECORD FORM OR SUPPLEMENTARY CHILDREN'S RECORD FORM. 37-38/

B. When was (CHILD) born? ENTER BIRTHDATE ON CHILDREN'S RECORD FORM OR SUPPLEMENTARY CHILDREN'S RECORD FORM.

C. Was (CHILD) male or female? RECORD ON CHILDREN'S RECORD FORM OR SUPPLEMENTARY CHILDREN'S RECORD FORM.

D. How much did (CHILD) weigh at birth?

ENTER POUNDS: 39-40/
 AND
 OUNCES: 41-42/
 OR
 Don't know.....98

22. (Continued)

E. Was (CHILD) a twin?

Yes.....1 43/
No.....2

F. Was (CHILD) premature, full term, or overdue?

Premature.....1 44/
Full term.....2
Overdue.....3
Don't know.....4

G. How old was (NAME OF MOTHER) when (CHILD) was born?

RECORD AGE: [][] 45-46/
Don't know.....96

H. What is the name and address of the doctor or medical facility who has (CHILD)'s birth registration records? RECORD BELOW

DOCTOR'S NAME OR FACILITY NAME 47/

STREET ADDRESS

(CITY) (STATE)

INTERVIEWER: RECORD NAME AND ADDRESS ON MEDICAL CONSENT FORM

I. What is the name and address of the doctor or medical facility who has (CHILD)'s current medical records? RECORD BELOW

DOCTOR'S NAME OR FACILITY NAME 48/

STREET ADDRESS

(CITY) (STATE)

INTERVIEWER: RECORD NAME AND ADDRESS ON MEDICAL CONSENT FORM

J. What is (CHILD)'s current age? RECORD IN CHILDREN'S RECORD FORM OR SUPPLEMENTARY CHILDREN'S RECORD FORM. IF DECEASED, ASK K-N. OTHERS GO TO Q.23.

K. When did (CHILD) die? RECORD DAY, MONTH, AND YEAR ON CHILDREN'S RECORD FORM.

22. (Continued)

L. What was the cause of death? RECORD BELOW. 49/

M. Where is (CHILD'S) death registered? In what city and state?

(CITY) (STATE) 50-65/ 66-67/
50-65/ 66-67/

23. INTERVIEWER: IS THERE A FOURTH PREGNANCY SINCE THE DATE OF LAST INTERVIEW? (IS NUMBER OF PREGNANCIES IN Q.12B EQUAL TO 4 OR MORE?)

YES.....(GO TO NEW QUESTIONNAIRE).....1 68/
NO.....(SKIP TO Q.25).....2

24. When did that pregnancy end?

RECORD DATE: [][][][][][] 69-74/
MO DA YR

A. How many weeks had (NAME) been pregnant when that happened?

ENTER NUMBER OF WEEKS: [][] 75-76/
Don't know.....98

IF MISCARRIAGE, ASK B-C; OTHERS GO TO D.

B. Did a doctor tell why this miscarriage might have occurred?

Yes.....(ASK C).....1 77/
No.....(GO TO D).....2

C. What did the doctor say caused the miscarriage? RECORD VERBATIM. 78/

D. INTERVIEWER: IS THERE A FOURTH PREGNANCY SINCE DATE OF LAST INTERVIEW? (IS NUMBER OF PREGNANCIES IN Q.12B EQUAL TO 4 OR MORE?)

YES.....(GO TO NEW QUESTIONNAIRE).....1 79/
NO.....2

B-27

25. Since (DATE OF LAST INTERVIEW) have you ever tried for a period of one year or more, to conceive a child and were not able to do so?

Yes.....1 10/
No.....(SKIP TO SECTION 6).....2

26. For how many periods of one year or more did this happen?

One.....1 11/
Two.....2
Three.....3

27. Since (DATE OF LAST INTERVIEW), in what month and year did the first period begin? And in what month and year did it end?

Begin 12-15/ End 16-19/
OR HAS NOT ENDED.....0000
NO YR NO YR

28. During (PERIOD) what was your wife or partner's first name? RECORD BELOW.

20-33/
34-35/
ID #

29. How old was (NAME) in (BEGINNING DATE OF PERIOD)?

RECORD AGE: 36-37/

30. During (PERIOD), did either of you see a doctor to discuss any difficulties in conceiving children?

Yes.....1 36/
No.....2

31. CODE "PERIOD 1" AND HAND SELF-ADMINISTERED FORM 1.

There are many reasons that some couples find it difficult or impossible to conceive a child. Please read this card and circle the number on Side A for each reason which applied to you for this period. Side B provides reasons appropriate for your spouse. Circle as many responses as appropriate.

Now please fill out this card and place it in the envelope when you are finished.

32. INTERVIEWER: IS THERE A SECOND PERIOD OF INFERTILITY SINCE DATE OF LAST INTERVIEW? (IS Q.26 CODED "TWO" OR MORE?)

YES.....(GO TO Q.33).....1 39/
NO.....(SKIP TO SECTION 6).....2

33. Since (DATE OF LAST INTERVIEW), in what month and year did the second period begin? And in what month and year did it end?

Begin 40-43/ End 44-47/
NO YR NO YR

34. During this second period what was your wife or partner's first name? RECORD BELOW.

48-61/
62-63/
ID #

35. How old was (NAME) in (BEGINNING DATE OF PERIOD)?

RECORD AGE: 64-65/

36. During this second period did either of you see a doctor to discuss any difficulties in conceiving children?

Yes.....1 66/
No.....2

37. CODE "PERIOD 2" AND HAND SELF-ADMINISTERED FORM 1.

There are many reasons that some couples find it difficult or impossible to conceive a child. Please read this card and circle the number on Side A for each reason which applied to you for this period. Side B provides reasons appropriate for your spouse. Circle as many responses as appropriate.

Now please fill out this card and place it in the envelope when you are finished.

38. INTERVIEWER: IS THERE A THIRD PERIOD OF INFERTILITY SINCE DATE OF LAST INTERVIEW? (IS Q.26 CODED "THREE"?)

YES.....(GO TO Q.39).....1 67/
NO.....(SKIP TO SECTION 6).....2

PLEASE GO ON TO NEXT PAGE ----->

	1ST CHILD	2ND CHILD																								
CHILD'S NAME:																										
CHILD'S DOB	37-33/	49-50/																								
MOTHER'S DOB	34-33/	51-52/																								
4. Did (CHILD) ever have a diagnosed... (READ EACH CATEGORY)...	<table border="0"> <tr> <td></td> <td>Yes</td> <td>No</td> </tr> <tr> <td>learning disability.....</td> <td>2</td> <td>36/</td> </tr> <tr> <td>physical or motor impairment..</td> <td>2</td> <td>31/</td> </tr> <tr> <td>mental impairment.....</td> <td>2</td> <td>30/</td> </tr> </table>		Yes	No	learning disability.....	2	36/	physical or motor impairment..	2	31/	mental impairment.....	2	30/	<table border="0"> <tr> <td></td> <td>Yes</td> <td>No</td> </tr> <tr> <td>.....</td> <td>2</td> <td>53/</td> </tr> <tr> <td>.....</td> <td>2</td> <td>54/</td> </tr> <tr> <td>.....</td> <td>2</td> <td>55/</td> </tr> </table>		Yes	No	2	53/	2	54/	2	55/
	Yes	No																								
learning disability.....	2	36/																								
physical or motor impairment..	2	31/																								
mental impairment.....	2	30/																								
	Yes	No																								
.....	2	53/																								
.....	2	54/																								
.....	2	55/																								
5. Has (CHILD) ever diagnosed as having cancer?	<table border="0"> <tr> <td>Yes..... (ASK A & B).....</td> <td>39/</td> </tr> <tr> <td>No..... (GO TO Q.6).....</td> <td>2</td> </tr> </table>	Yes..... (ASK A & B).....	39/	No..... (GO TO Q.6).....	2	<table border="0"> <tr> <td>..... (A & B).....</td> <td>56/</td> </tr> <tr> <td>..... (0,6).....</td> <td>2</td> </tr> </table> (A & B).....	56/ (0,6).....	2																
Yes..... (ASK A & B).....	39/																									
No..... (GO TO Q.6).....	2																									
..... (A & B).....	56/																									
..... (0,6).....	2																									
A. In what month and year was the diagnosis made?	<table border="0"> <tr> <td>NO</td> <td>MR</td> <td>40-43/</td> </tr> </table>	NO	MR	40-43/	<table border="0"> <tr> <td>NO</td> <td>MR</td> <td>57-60/</td> </tr> </table>	NO	MR	57-60/																		
NO	MR	40-43/																								
NO	MR	57-60/																								
B. What kind of cancer was diagnosed?	44/	61/																								
Don't know.....	8	Don't know.....																								
6. INTERVIEWER: HAS ANY DEFECT OR IMPAIRMENT BEEN IDENTIFIED IN (CHILD)? CHECK CHILDREN'S RECORD FROM MD QS. 1, 2, AND 4.	<table border="0"> <tr> <td>YES..... (GO TO Q.7).....</td> <td>45/</td> </tr> <tr> <td>NO..... (ASK A).....</td> <td>2</td> </tr> </table>	YES..... (GO TO Q.7).....	45/	NO..... (ASK A).....	2	<table border="0"> <tr> <td>..... (Q.7).....</td> <td>62/</td> </tr> <tr> <td>..... (A).....</td> <td>2</td> </tr> </table> (Q.7).....	62/ (A).....	2																
YES..... (GO TO Q.7).....	45/																									
NO..... (ASK A).....	2																									
..... (Q.7).....	62/																									
..... (A).....	2																									
A. INTERVIEWER: IS THERE ANOTHER CHILD?	<table border="0"> <tr> <td>YES..... (ASK Q.4 AND 5).....</td> <td>46/</td> </tr> <tr> <td>NO..... (SKIP TO Q.22).....</td> <td>2</td> </tr> </table>	YES..... (ASK Q.4 AND 5).....	46/	NO..... (SKIP TO Q.22).....	2	<table border="0"> <tr> <td>..... (Q.4 AND 5).....</td> <td>63/</td> </tr> <tr> <td>..... (Q.22).....</td> <td>2</td> </tr> </table> (Q.4 AND 5).....	63/ (Q.22).....	2																
YES..... (ASK Q.4 AND 5).....	46/																									
NO..... (SKIP TO Q.22).....	2																									
..... (Q.4 AND 5).....	63/																									
..... (Q.22).....	2																									
7. What kind of (birth defect(s)/impairment) does/did (CHILD) have? Any others?	47/	64/																								
8. Did you (or someone else) discuss (CHILD'S) (birth defect(s)/impairment) with a doctor?	<table border="0"> <tr> <td>Yes..... (GO TO Q.9).....</td> <td>48/</td> </tr> <tr> <td>No..... (SKIP TO Q.11).....</td> <td>2</td> </tr> </table>	Yes..... (GO TO Q.9).....	48/	No..... (SKIP TO Q.11).....	2	<table border="0"> <tr> <td>..... (Q.9).....</td> <td>65/</td> </tr> <tr> <td>..... (Q.11).....</td> <td>2</td> </tr> </table> (Q.9).....	65/ (Q.11).....	2																
Yes..... (GO TO Q.9).....	48/																									
No..... (SKIP TO Q.11).....	2																									
..... (Q.9).....	65/																									
..... (Q.11).....	2																									

3RD CHILD		4TH CHILD		5TH CHILD		6TH CHILD	
66-67/		14-15/		31-32/		48-49/	
68-69/		16-17/		33-34/		50-51/	
Yes	No	Yes	No	Yes	No	Yes	No
.....1	2 70/	.....1	2 10/	.....1	2 35/	.....1	2 52/
.....1	2 71/	.....1	2 19/	.....1	2 36/	.....1	2 53/
.....1	2 72/	.....1	2 20/	.....1	2 37/	.....1	2 54/
.....(A & B).....1 73/		.....(A & B).....1 21/		.....(A & B).....1 30/		.....(A & B).....1 55/	
.....(Q.6).....2		.....(Q.6).....2		.....(Q.6).....2		.....(Q.6).....2	
74-77/		22-25/		39-42/		56-59/	
[] [] [] []		[] [] [] []		[] [] [] []		[] [] [] []	
NO YR		NO YR		NO YR		NO YR	
78/		26/		43/		60/	
Don't know.....8		Don't know.....8		Don't know.....8		Don't know.....8	
BEGIN DECK 33							
.....(Q.7).....1 10/		.....(Q.7).....1 27/		.....(Q.7).....1 44/		.....(Q.7).....1 61/	
.....(ASK A).....2		.....(ASK A).....2		.....(ASK A).....2		.....(ASK A).....2	
.....(Q.4 AND 5).....1 11/		.....(Q.4 AND 5).....1 20/		.....(Q.4 AND 5).....1 45/		.....(Q.4 AND 5).....1 62/	
.....(Q.22).....2		.....(Q.22).....2		.....(Q.22).....2		.....(Q.22).....2	
12/		29/		46/		63/	
.....(Q.9).....1 13/		.....(Q.9).....1 30/		.....(Q.9).....1 47/		.....(Q.9).....1 64/	
.....(Q.11).....2		.....(Q.11).....2		.....(Q.11).....2		.....(Q.11).....2	

B-31

	1ST CHILD	2ND CHILD
CHILD'S NAME:		
CHILD'S ID #		
MOTHER'S ID #		
9. INTERVIEWER: IF DEFECT(S), DISABILITY, OR IMPAIRMENT FOUND SINCE 1962 ASK Q.9; OTHERS GO TO Q.10. What is the name and address of the doctor who diagnosed CHILD as having a birth defect/impairment?	DOCTOR'S NAME OR FACILITY NAME STREET ADDRESS CITY STATE	DOCTOR'S NAME OR FACILITY NAME STREET ADDRESS CITY STATE
10. Did the doctor say that (CHILD) needs/ed) any testing, medication, treatment, surgery, or special equipment because of a (birth defect/impairment)? (By special equipment I mean a wheelchair, walker, artificial limb, body brace(s), or crutches).	Yes.....1 66/ No.....2 Don't know.....8	.....1 72/ .....2.....8
11. Did (CHILD) ever receive any testing, medication, treatment, surgery or special equipment because of a (birth defect/impairment)?	Yes.....1 67/ No.....2 Don't know.....8	.....1 73/ .....2.....8
12. At any time, did (CHILD'S) (birth defect(s)/impairment) interfere in any way with (CHILD'S) physical or social development? For example, getting a job or making friends?	Yes.....(GO TO Q.13).....1 68/ No.....(ASK A).....2 Don't know.....8	.....(Q.13).....1 74/ .....(ASK A).....2.....8
A. INTERVIEWER: WAS THERE A YES CODED AT Q.10 or Q.11?	YES.....(GO TO Q.13).....1 69/ NO.....(ASK B).....2	.....(Q.13).....1 75/ .....(ASK B).....2
B. INTERVIEWER: IS THERE ANOTHER CHILD?	YES.....(GO BACK TO Q.4 FOR NEXT CHILD).....1 70/ NO.....(ASK P TO Q.22).....2	.....(Q.4).....1 76/ .....(Q.22).....2

3RD CHILD	4TH CHILD	5TH CHILD	6TH CHILD
DOCTOR'S NAME OR 77/	DOCTOR'S NAME OR 13/	DOCTOR'S NAME OR 19/	DOCTOR'S NAME OR 25/
FACILITY NAME	FACILITY NAME	FACILITY NAME	FACILITY NAME
STREET ADDRESS	STREET ADDRESS	STREET ADDRESS	STREET ADDRESS
CITY STATE	CITY STATE	CITY STATE	CITY STATE
.....1 76/	.....1 14/	.....1 20/	.....1 26/
.....2	.....2	.....2	.....2
.....8	.....8	.....8	.....8
.....1 79/	.....1 19/	.....1 21/	.....1 27/
.....2	.....2	.....2	.....2
.....8	.....8	.....8	.....8
BEGIN DECK 36			
.....(Q.13).....1 10/	.....(Q.13).....1 14/	.....(Q.13).....1 22/	.....(Q.13).....1 28/
.....(ASK A).....2	.....(ASK A).....2	.....(ASK A).....2	.....(ASK A).....2
.....8	.....8	.....8	.....8
.....(Q.13).....1 11/	.....(Q.13).....1 17/	.....(Q.13).....1 23/	.....(Q.13).....1 29/
.....(ASK B).....2	.....(ASK B).....2	.....(ASK B).....2	.....(ASK B).....2
.....(Q.4).....1 12/	.....(Q.4).....1 18/	.....(Q.4).....1 24/	.....(Q.4).....1 30/
.....(Q.22).....2	.....(Q.22).....2	.....(Q.22).....2	.....(Q.22).....2

B-32

	1ST CHILD	2ND CHILD
CHILD'S NAME:		
CHILD'S ID #	|||	|||
MOTHER'S ID #	|||	|||
13. Did (CHILD'S) doctor say that (any of) (CHILD'S) (birth defect(s)/impairment(s) was/were life-threatening if left untreated? (By untreated I mean if (CHILD) did not receive surgery, medication, a special diet, or some other medical intervention.)	31/ Yes.....(ASK A).....1 No.....(ASK A).....2 Don't know.....(ASK A).....8	37/ .....(ASK A).....1 .....(ASK A).....2 .....(ASK A).....8
A. INTERVIEWER: IS CHILD UNDER TWO YEARS OLD OR DID CHILD DIE BEFORE HE/SHE WAS TWO YEARS OLD?	32/ YES.....(SKIP TO Q.20).....1 NO.....2	38/ .....(Q.20).....1.....2
14. Did (CHILD) ever need help with eating, dressing, bathing, or using the toilet because of a (birth defect/impairment)? (Help includes someone actually helping rather than just standing by to assist if needed.)	33/ Yes.....1 No.....2	39/ .....1.....2
15. Because of a (birth defect/impairment), did (CHILD) ever use or need any mechanical or special aids such as a wheelchair, walker, body brace, artificial limbs, or crutches to carry out everyday activities?	34/ Yes.....1 No.....2	40/ .....1.....2
16. Has (CHILD) ever been unable to take part at all in ordinary play with other children because of a (birth defect/impairment)?	35/ Yes.....(GO TO Q.17).....1 No.....(ASK A).....2	41/ .....(Q.17).....1 .....(ASK A).....2
A. Has (CHILD) ever limited in the kind or amount of play he/she could do because of his/her (birth defect/impairment)?	36/ Yes.....1 No.....2	42/ .....1.....2

3RD CHILD	4TH CHILD	5TH CHILD	6TH CHILD
43/	49/	55/	61/
.....(ASK A).....1	.....(ASK A).....1	.....(ASK A).....1	.....(ASK A).....1
.....(ASK A).....2	.....(ASK A).....2	.....(ASK A).....2	.....(ASK A).....2
.....(ASK A).....8	.....(ASK A).....8	.....(ASK A).....8	.....(ASK A).....8
44/	50/	56/	62/
.....(0,20).....1	.....(0,20).....1	.....(0,20).....1	.....(0,20).....1
.....2	.....2	.....2	.....2
45/	51/	57/	63/
.....1	.....1	.....1	.....1
.....2	.....2	.....2	.....2
46/	52/	58/	64/
.....1	.....1	.....1	.....1
.....2	.....2	.....2	.....2
47/	53/	59/	65/
.....(0,17).....1	.....(0,17).....1	.....(0,17).....1	.....(0,17).....1
.....(ASK A).....2	.....(ASK A).....2	.....(ASK A).....2	.....(ASK A).....2
48/	54/	60/	66/
.....1	.....1	.....1	.....1
.....2	.....2	.....2	.....2

B-33

	1ST CHILD	2ND CHILD
CHILD'S NAME:		
CHILD'S ID #		
MOTHER'S ID #		
17. Did (CHILD'S) (birth defect(s)/impairment) ever keep (him/her) from going to school?	Yes.....(00 TO 0,10).....1 67/	.....(0,10).....1 75/
	No.....(ASK A).....2	.....(ASK A).....2
A. Did (CHILD) ever have to go to a certain type of school, or be in a special class because of (his/her)(birth defect(s)/impairment)?	Yes.....(00 TO 0,10).....1 68/	.....(0,10).....1 76/
	No.....(ASK B).....2	.....(ASK B).....2
B. Has (CHILD) ever limited in school attendance or in being able to learn because of (his/her)(birth defect(s)/impairment)?	Yes.....1 69/	.....1 77/
	No.....2	.....2
18. Because of (his/her) (birth defect(s)/impairment) did (CHILD) ever need a lot more help than other children (CHILD'S) age in going outside, getting to school, going to the store, and other everyday activities like that?	Yes.....1 70/	.....1 78/
	No.....2	.....2
19. Because of a (birth defect/impairment), did (CHILD) ever need the help of another person for everyday activities such as taking care of the house or yard, doing the laundry, or preparing meals?	Yes.....1 71/	.....1 79/
	No.....2	.....2
		BEGIN DECK 37
20. Will/Would (CHILD'S) birth defect(s) (keep/have kept) (him/her) from working on a job for pay?	Yes.....(00 TO 0,21).....1 72/	.....(0,21).....1 80/
	No.....(ASK A).....2	.....(ASK A).....2
A. Will/Would (CHILD) (be/have been) limited in the kind of work (he/she) could (do/have done) because of (his/her) birth defect(s)?	Yes.....(00 TO 0,21).....1 73/	.....(0,21).....1 81/
	No.....(ASK B).....2	.....(ASK B).....2
B. Will/Would (CHILD) (be/have been) limited in the amount of work (he/she) could (do/have done) because of (his/her) birth defect(s)?	Yes.....1 74/	.....1 82/
	No.....2	.....2

3RD CHILD	4TH CHILD	5TH CHILD	6TH CHILD
.....1 13/	.....1 21/	.....1 29/	.....1 37/
.....2	.....2	.....2	.....2
.....1 14/	.....1 22/	.....1 30/	.....1 38/
.....2	.....2	.....2	.....2
.....1 15/	.....1 23/	.....1 31/	.....1 39/
.....2	.....2	.....2	.....2
.....1 16/	.....1 24/	.....1 32/	.....1 40/
.....2	.....2	.....2	.....2
.....1 17/	.....1 25/	.....1 33/	.....1 41/
.....2	.....2	.....2	.....2
.....1 18/	.....1 26/	.....1 34/	.....1 42/
.....2	.....2	.....2	.....2
.....1 19/	.....1 27/	.....1 35/	.....1 43/
.....2	.....2	.....2	.....2
.....1 20/	.....1 28/	.....1 36/	.....1 44/
.....2	.....2	.....2	.....2

B-34

	1ST CHILD	2ND CHILD
CHILD'S NAME:		
CHILD'S ID #	.....1	.....1
MOTHER'S ID #	.....1	.....1
21. INTERVIEWER: DOES RESPONDENT HAVE ANOTHER CHILD?	YES.....(GO BACK TO Q.5).....1 45/	.....(Q.5).....1 46/
	NO.....(GO TO Q.22).....2	.....(Q.22).....2
22. Did you ever have a birth defect?		
	Yes.....(ASK A).....1	47/
	No.....2	
A. What kind of birth defect was it? Any others?		48/
	
	
	
23. Do you have any biological brothers or sisters? Include any brothers or sisters who may have died before the age of 1.		
	Yes.....(ASK Q.24).....1	49/
	No.....(SKIP TO Q.25).....2	
	Don't know..(SKIP TO Q.25).....0	

3RD CHILD	4TH CHILD	5TH CHILD	6TH CHILD
.....(0,3).....1 50/ .....(0,22).....2	.....(0,3).....1 51/ .....(0,22).....2	.....(0,31).....1 52/ .....(0,22).....2	.....(0,31).....1 53/ .....(0,22).....2

B-35

24. Did any of your biological brothers or sisters ever have a birth defect?

- Yes.....(ASK A).....1 54/
- No.....(SKIP TO Q.25).....2
- Don't know...(SKIP TO Q.25).....0

A. Who had a defect, brothers, sisters, or both?

- Brothers.....1 55/
- Sisters.....2
- Both.....3

FOR EACH SIBLING WITH A BIRTH DEFECT, ASK: What kind of birth defect did your (brother/sister) have? Was this sibling a half (brother/sister) or a full (brother/sister)? RECORD BELOW.

Sibling 1	Sibling 2
DEFECT: _____ 56/	DEFECT: _____ 58/
_____	_____
Half (brother/sister)...1 57/	Half (brother/sister)...1 59/
Full (brother/sister)...2	Full (brother/sister)...2
Sibling 3	Sibling 4
DEFECT: _____ 60/	DEFECT: _____ 62/
_____	_____
Half (brother/sister)...1 61/	Half (brother/sister)...1 63/
Full (brother/sister)...2	Full (brother/sister)...2

25. Now I would like to ask you some questions about your biological parents. Did either your biological mother or biological father ever have a birth defect?

- Yes.....(GO TO Q.26).....1 64/
- No.....(SKIP TO Q.26).....2
- Don't know...(SKIP TO Q.26).....0

26. Which parent had a birth defect?

- Mother only.....1 65/
- Father only.....2
- Both parents.....3

27. What kind of birth defect did your (PARENT) have?

Mother: _____ 66/ Father: _____ 67/

Now I have some different kind of questions.

28. Has anyone near to you died in the last 12 months?

Yes..(ASK A AND B).....1 60/

No.....2

INDEX CARD I

A. What was the person's relationship to you? Please choose as many as apply. CODE ALL THAT APPLY.

A. Child.....01 69-70/

B. Parent.....02 71-72/

C. Spouse/partner.....03 73-74/

D. Brother or sister.....04 75-76/

E. Other near relative of you or your spouse/partner.....05 77-78/

F. Friend.....06 79-80/

BEGIN DECK 38

G. Other (SPECIFY) _____

07 10-11/

B. What (was the date/were the dates) of the death(s)? What month and year?

ENTER MONTH AND YEAR: [][][][] 12-15/
MO YR

ENTER MONTH AND YEAR: [][][][] 16-19/
MO YR

ENTER MONTH AND YEAR: [][][][] 20-23/
MO YR

SECTION 7: HEALTH

1. Now let's talk about health. Compared to other people your age, would you say that your health is . . . (READ CHOICES)?

Excellent.....1 24/

Good.....2

Fair.....3

Poor.....4

2. Since (DATE OF LAST INTERVIEW) have you had acne on your face, chest or back?

Yes.....1 25/

No.....(SKIP TO Q.8).....2

3. During what year, between (DATE OF LAST INTERVIEW) and now, did you last have acne on your face, chest or back?

RECORD YEAR: [][] 26-27/

4. Think about the (first/next) time you had acne on your face, chest or back between (DATE OF LAST INTERVIEW) and now. When did it start and until when did it last? (PROBE FOR ALL PERIODS OF TIME).

First	Second	Third
[][][][] 28-31/	[][][][] 36-39/	[][][][] 44-47/
No Yr	No Yr	No Yr
to	to	to
[][][][] 32-35/	[][][][] 40-43/	[][][][] 48-51/
No Yr	No Yr	No Yr

B-36

HAND CARD J

Q. 4 INTERVIEWER: ASK A FOR EACH TIME IN Q.4

A. Please show me on this diagram where the acne (is/was) located (the [first/next] time). CIRCLE "YES" OR "NO"

	FIRST TIME		SECOND TIME		THIRD TIME				
	Yes	No	Yes	No	Yes	No			
Temples	1	2	52/	1	2	61/	1	2	70/
Eyes or eyelids	1	2	53/	1	2	62/	1	2	71/
Ears	1	2	54/	1	2	63/	1	2	72/
Cheeks	1	2	55/	1	2	64/	1	2	73/
Nose	1	2	56/	1	2	65/	1	2	74/
Forehead	1	2	57/	1	2	66/	1	2	75/
Jaw, Chin	1	2	58/	1	2	67/	1	2	76/
Other	1	2	59/	1	2	68/	1	2	77/
Chest	1	2	59/	1	2	68/	1	2	77/
Back	1	2	60/	1	2	69/	1	2	78/

IF ANY "YES" TO TEMPLES, EYES, EYELIDS OR EARS IN A ABOVE, ASK Q.5
ALL OTHERS SKIP TO Q.8

5. Between (DATE OF LAST INTERVIEW) and now, did you ever consult a doctor or medical facility about the acne on your [temples/eyes/eyelids/ears]?

Yes.....1 79/
No (SKIP TO Q.8).....2

6. What month and year did you last consult a doctor about the acne on your [temples/eyes/eyelids/ears]?

Mo Yr

BEGIN DECK 39

10-13/

B-37

7. What was the name of the doctor or medical facility you consulted at the time?

Last Name

First Name

OR

Facility Name

A. What is the address of that (doctor/medical facility)?

STREET ADDRESS

CITY

(STATE)

8. What is your blood type?

A.....1
B.....2
O.....3
AB.....4
Don't know.....6

A. Is that positive or negative?

Positive.....1
Negative.....2

9. During the last year, how often, on average, would you say you use aspirin?

More than 4 aspirin a day.....1
4 aspirin a day (2 doses a day).....2
2 aspirin a day (1 dose a day).....3
6-8 aspirin a week (1 dose, 3-4 days/week).....4
4 aspirin a week or less.....5
None.....6

HAND CARD K

HAND CARD L

ASK OF ALL RESPONDENTS

10. The next questions deal with your reaction to the sun without the use of suntan lotions. If your skin was exposed to the sunlight for the first time in the summer for a period of 30 minutes would you

HAND CARD N

- Always burn, never tan.....1 18/
- Usually burn, tan with difficulty.....2
- Sometimes burn mildly, tan above average....3
- Rarely burn, tan with ease.....4

11. In the summer, once you have already been in the sun several times, what reaction will your skin have the next time you go out in the sun for two or more hours on a bright day? Would you say you get

- A painful burn.....1 19/
- A burn.....2
- Some redness only.....3
- No reaction.....4

12. After repeated sun exposures, for example, a two week vacation outdoors, will your skin become . . .

HAND CARD N

- Only freckled or no suntan at all.....1 20/
- Only mildly tanned due to a tendency to peel.....2
- Moderately tanned.....3
- Very brown and deeply tanned.....4

13. HAND SELF-ADMINISTERED FORM 2. We would like you to tell us all the places you've lived since you were born. Please list all the places you've lived for more than 12 months starting with the first place since birth. Please take your time. It will probably take you 10 minutes or so to fill out this form. Please begin.

14. During any period in your life, did a doctor ever tell you that you had a peptic or stomach ulcer?

- Yes.....(GO TO Q.15).....1 22/
- No.....(SKIP TO Q.24).....2

15. During what month and year did a doctor first tell you that you had a peptic or stomach ulcer?

Mo	Yr
----	----

23-26/

16. What is the full name of the doctor who made the diagnosis or the medical facility where the diagnosis was made?

LAST

FIRST

MIDDLE

OR

FACILITY NAME

A. What is the address of that (doctor/medical facility)?

STREET ADDRESS

CITY

(STATE)

27/

17. Do you have a peptic or stomach ulcer now?

- Yes.....1 28/
- No.....2

18. What month and year did you last consult a doctor for your peptic or stomach ulcer?

Mo	Yr
----	----

29-32/

19. Have you ever during any period in your life had a bleeding ulcer?

- Yes.....1 33/
- No.....(SKIP TO Q.21).....2

20. During what month(s) and year(s) did you have a bleeding ulcer?

<u>FROM</u>		<u>FROM</u>		<u>FROM</u>
[][][][]	34-37/	[][][][]	42-45/	[][][][]
Mo Yr		Mo Yr		Mo Yr
TO		TO		TO
[][][][]	38-41/	[][][][]	46-49/	[][][][]
Mo Yr		Mo Yr		Mo Yr

21. Were you ever (during any period in your life) hospitalized for your peptic or stomach ulcer?

Yes.....1 58/
No.....2

22. Have you ever (during any period in your life) had surgery for your peptic or stomach ulcer?

Yes.....1 59/
No.....2

23. Are you currently taking any prescribed medicines for your peptic or stomach ulcer?

Yes.....1 60/
No.....(SKIP TO Q.24).....2

A. What are the names of the medicines you are taking?
(PROBE: WHAT OTHERS?)

1) _____ 61-63/
2) _____ 64-66/
3) _____ 67-69/

24. Please indicate which of the following members of your biological family have ever had a peptic or stomach ulcer?

HAND
CARD
0

1. Mother.....01 70-71/
2. Father.....02 72-73/
3. Full Brother.....03 74-75/
4. Half Brother.....04 76-77/
5. Full Sister.....05 78-79/
6. Half Sister.....06 10-11/
7. None.....07 12-13/
8. Don't Know.....08 14-15/

25. Do you have or have you recently had sharp upper stomach pain?

Yes.....1 16/
No.....(SKIP TO Q.26).....2

26. Was this pain relieved by food, milk, or antacids?

Yes.....1 17/
No.....2

27. Was this stomach pain awakened you from sleep?

Yes.....1 18/
No.....2

28. Have you vomited blood recently?

Yes.....1 19/
No.....2

29. Have you recently experienced dark tar colored stools or bowel movements?

Yes.....1 20/
No.....2

B-39

Do you have (CONDITION) now?		Are you currently taking any prescribed medicines for your (CONDITION)?		What are the names of medicines you are taking? Any others?	When did you last consult a doctor for (CONDITION) between (DATE OF LAST INTERVIEW) and now?	What is the full name and address of the doctor or medical facility you last consulted?
Yes	No	Yes	No			
1	2 34/ 1 SKIP TO F	2 35/ 1 SKIP TO F	11 _____ 34-36/	Mo Yr	_____	Last Name 49/
			2) _____ 35-37/	45-48/		First Name
			3) _____ 42-44/			OR
						Facility Name
						Street Address
						City State
1	2 50/ 1 SKIP TO F	2 51/ 1 SKIP TO F	11 _____ 52-54/	Mo Yr	_____	Last Name 65/
			2) _____ 55-57/	61-64/		First Name
			3) _____ 58-60/			OR
						Facility Name
						Street Address
						City State

B-41

Since (DATE OF LAST INTERVIEW) has a doctor told you that you had ...	A		B		What is the full name and address of the doctor who made the diagnosis or the medical facility where the diagnosis was made?
	Yes	No	Yes	No	
52. Anemia	1 2 46/ 1 SKIP TO Q.33	2 46/ 1 SKIP TO Q.33	11 _____ Mo Yr	_____	Last Name 71/
					First Name
					OR
					Facility Name
					Street Address
					City State
53. A heart condition (SPECIFY) _____	1 2 72/ 1 SKIP TO Q.54	2 72/ 1 SKIP TO Q.54	11 _____ Mo Yr	_____	Last Name 78/
					First Name
					OR
					Facility Name
					Street Address
					City State

BEGIN DECK 41

C		D		E		F		G	
Do you have (CONDITION) now?		Are you currently taking any prescribed medicines for your (CONDITION)?		What are the names of medicines you are taking? What others?		When did you last consult a doctor for (CONDITION) between (DATE OF LAST INTERVIEW) and now?		What is the full name and address of the doctor or medical facility you last consulted	
Yes	No	Yes	No			No	Yr	Last Name	25/
1	2 10/ 1 SKIP TO F	2 11/ 1 SKIP TO F		1) _____ 12-14/	_____ No	_____ Yr		_____ Last Name	25/
				2) _____ 15-17/		26-24/		_____ First Name	
				3) _____ 18-20/				_____ OR	
								_____ Facility Name	
								_____ Street Address	
								_____ City	_____ State
1	2 26/ 1 SKIP TO F	2 27/ 1 SKIP TO F		1) _____ 28-30/	_____ No	_____ Yr		_____ Last Name	41/
				2) _____ 31-33/		32-40/		_____ First Name	
				3) _____ 34-36/				_____ OR	
								_____ Facility Name	
								_____ Street Address	
								_____ City	_____ State

B-42

A		B	
Since (DATE OF LAST INTERVIEW) has a doctor told you that you had ...		Between (DATE OF LAST INTERVIEW) and now, in what month and year did a doctor first tell you that you had (CONDITION)?	
Yes	No	What is the full name and address of the doctor who made the diagnosis or the medical facility where the diagnosis was made?	
1	2 42/ 1 SKIP TO Q.35	_____ No	_____ Yr
		_____ Last Name	47/
		_____ First Name	
		_____ OR	
		_____ Facility Name	
		_____ Street Address	
		_____ City	_____ State
1	2 48/ 1 SKIP TO Q.36	_____ No	_____ Yr
		_____ Last Name	53/
		_____ First Name	
		_____ OR	
		_____ Facility Name	
		_____ Street Address	
		_____ City	_____ State

C		D		E		F		G	
Do you have (CONDITION) now?		Are you currently taking any prescribed medicines for your (CONDITION)?		What are the names of medicines you are taking? What others?		When did you last consult a doctor for (CONDITION) between (DATE OF LAST INTERVIEW) and now?		What is the full name and address of the doctor or medical facility you last consulted?	
Yes	No	Yes	No			No	Yr		
1	2 27/	1	2 20/	1) _____	_____	_____	_____	_____	_____
	SKIP		SKIP	2) _____	_____	No	Yr	Last Name	42/
	TO		TO	3) _____	_____			First Name	
	F		F					OR	
								Facility Name	
								Street Address	
								City	State
1	2 43/	1	2 44/	1) _____	_____	_____	_____	_____	_____
	SKIP		SKIP	2) _____	_____	No	Yr	Last Name	50/
	TO		TO	3) _____	_____			First Name	
	F		F					OR	
								Facility Name	
								Street Address	
								City	State

B-44

		A		B	
		Since (DATE OF LAST INTERVIEW) has a doctor told you that you had ...		Between (DATE OF LAST INTERVIEW) and now, in what month and year did a doctor first tell you that you had (CONDITION)?	
		Yes	No	What is the full name and address of the doctor who made the diagnosis or the medical facility where the diagnosis was made?	
50. Intestinal parasites?	1 2 50/	_____	_____	_____	_____
	SKIP	No	Yr	Last Name	64/
	TO			First Name	
	Q.59		60-63/	OR	
				Facility Name	
				Street Address	
				City	State
59. Gall bladder problems?	1 2 65/	_____	_____	_____	_____
	SKIP	No	Yr	Last Name	70/
	TO			First Name	
	Q.48		66-69/	OR	
				Facility Name	
				Street Address	
				City	State

C		D		E		F		G	
Do you have (CONDITION) now?		Are you currently taking any prescribed medicines for your (CONDITION)?		What are the names of medicines you are taking? What others?		When did you last consult a doctor for (CONDITION) between (DATE OF LAST INTERVIEW) and now?		What is the full name and address of the doctor or medical facility you last consulted?	
Yes	No	Yes	No			No	Yr		
1	2 71/ 1 SKIP TO F	2 72/ 1 SKIP TO F		1) _____ 73-75/		_____ No	_____ Yr	Last Name	17/
				2) _____ 76-78/ BEGIN DECK 45		_____ No	_____ Yr	First Name	
				3) _____ 78-79/				OR	
								Facility Name	
								Street Address	
								City	State
1	2 16/ 1 SKIP TO F	2 17/ 1 SKIP TO F		1) _____ 20-22/		_____ No	_____ Yr	Last Name	33/
				2) _____ 25-27/		_____ No	_____ Yr	First Name	
				3) _____ 28-30/				OR	
								Facility Name	
								Street Address	
								City	State

B-45

		A		B	
Since (DATE OF LAST INTERVIEW) has a doctor told you that you had ...		Between (DATE OF LAST INTERVIEW) and now, in what month and year did a doctor first tell you that you had (CONDITION)?		What is the full name and address of the doctor who made the diagnosis or the medical facility where the diagnosis was made?	
		Yes	No		
40. Any other liver condition? (SPECIFY)	1 2 34/	_____ SKIP TO Q.41	_____ No	_____ Yr	_____ 36-39/
					Last Name
					40/
					First Name
					OR
					Facility Name
					Street Address
					City
					State
41. Pneumonia?	1 2 41/	_____ SKIP TO Q.42	_____ No	_____ Yr	_____ 42-45/
					Last Name
					41/
					First Name
					OR
					Facility Name
					Street Address
					City
					State

C		D		E		F		G	
Do you have (CONDITION) now?		Are you currently taking any prescribed medicines for your (CONDITION)?		What are the names of medicines you are taking? What others?		When did you last consult a doctor for (CONDITION) between (DATE OF LAST INTERVIEW) and now?		What is the full name and address of the doctor or medical facility you last consulted?	
Yes	No	Yes	No			No	Yr	Last Name	62/
1	2 47/	1	2 48/	1) _____	_____	_____	_____	_____	62/
	SKIP		SKIP	2) _____	_____	_____	_____	_____	
	TO		TO	3) _____	_____	_____	_____	_____	
	F		F					First Name	
								OR	
								Facility Name	
								Street Address	
								City	State

		A		B	
Since (DATE OF LAST INTERVIEW) has a doctor told you that you had ...		Between (DATE OF LAST INTERVIEW) and now, in what month and year did a doctor first tell you that you had (CONDITION)?		What is the full name and address of the doctor who made the diagnosis or the medical facility where the diagnosis was made?	
		Yes	No		
42. A respiratory condition other than pneumonia?	1	2 10/	_____	_____	_____
(SPECIFY) _____	SKIP	TO	No	Yr	Last Name
	TO	Q.43	12-15/	_____	10/
				First Name	
				OR	
				Facility Name	
				Street Address	
				City	State
43. Any other major condition?	1	2 11/	_____	_____	_____
(SPECIFY) _____	SKIP	TO	No	Yr	Last Name
	TO	Q.44	19-22/	_____	25/
				First Name	
				OR	
				Facility Name	
				Street Address	
				City	State

B-46

C		D		E		F		G	
Do you have (CONDITION) now?		Are you currently taking any prescribed medicines for your (CONDITION)?		What are the names of medicines you are taking? What others?		When did you last consult a doctor for (CONDITION) between (DATE OF LAST INTERVIEW) and now?		What is the full name and address of the doctor or medical facility you last consulted?	
Yes	No	Yes	No			No	Yr	Last Name	55/
1	2 24/	1	2 25/	1) _____	_____	_____	_____	_____	_____
	SKIP		SKIP	2) _____	_____	No	Yr	Last Name	55/
	TO		TO	3) _____	_____			First Name	
	F		F					OR	
								Facility Name	
								Street Address	
								City	State
1	2 40/	1	2 41/	1) _____	_____	_____	_____	_____	_____
	SKIP		SKIP	2) _____	_____	No	Yr	Last Name	55/
	TO		TO	3) _____	_____			First Name	
	F		F					OR	
								Facility Name	
								Street Address	
								City	State

B-47

		A		B	
		Now, during what month and year did a doctor first tell you that you had (CONDITION)?		What is the full name and address of the doctor who made the diagnosis or the medical facility where the diagnosis was made?	
		Yes	No		
44.	Have you ever in your entire life been treated for a mental or emotional disorder?	1	2 56/	_____	_____
	(SPECIFY) _____ 57/	SKIP	TO	No	Yr
		U.45	58-61/	Last Name	62/
				First Name	
				OR	
				Facility Name	
				Street Address	
				City	State

Do you have (CONDITION) now?		Are you currently taking any prescribed medicines for your (CONDITION)?		What are the names of medicines you are taking? What others?	When did you last consult a doctor for (CONDITION) between (DATE OF LAST INTERVIEW) and now?	What is the full name and address of the doctor or medical facility you last consulted?
Yes	No	Yes	No			
1	2 63/ 1 SKIP	1	2 64/ 1 SKIP	1) _____ 65-67/	_____ No	_____ Yr
	TO	TO		2) _____ 68-70/		_____ 74-77/
	F	F		3) _____ 71-73/		_____ First Name
						OR
						_____ Facility Name
						_____ Street Address
						_____ City State

45. At any time since (DATE OF LAST INTERVIEW) has a doctor told you that you had cancer?
 Yes.....1 10/
 No...(SKIP TO Q.49).....2

46. Did the doctor tell you that this was a skin cancer or a systemic (body) cancer?
 Skin cancer only.....1 11/
 Systemic cancer only.....(SKIP TO Q.48).....2
 BOTH SKIN AND SYSTEMIC CANCER.....3

SKIN CANCER ONLY

47. Please look at this chart and tell me where each of your skin cancers (is/was) located.

INTERVIEWER: INDICATE THE ANATOMICAL CODE FOR EACH SITE BEING REPORTED.

SITE NUMBER	1	2	3
	_____ SITE CODE	_____ 12-13/	_____ 14-15/	_____ 16-17/

- CODES:
- | | |
|--|---|
| (01) Scalp or Forehead | (14) Arm or Hand, Not Otherwise Specified |
| (02) Eye Lid | (15) Genitals |
| (03) Ear | (16) Leg |
| (04) Nose | (17) Foot |
| (05) Head or Neck, Not Otherwise Specified | (18) Leg or foot, Not Otherwise Specified |
| (06) Cheek, chin or jaw | (19) Skin, Not Otherwise Specified |
| (07) Neck or Supraclavicular | (20) Upperlip, Not Otherwise Specified |
| (08) Vermilion | (21) Lowerlip, Not Otherwise Specified |
| (09) Trunk, Front | (22) Lip, Not Otherwise Specified |
| (10) Trunk, Back | |
| (11) Trunk, Not Otherwise Specified | |
| (12) Arm | |
| (13) Hand | |

INTERVIEWER: FOR EACH SITE REPORTED ASK A THROUGH E

SKIN CANCER ONLY

SITE 1

A. In what month and year was cancer of the (SITE) first diagnosed?

Mo. Yr. 18-21/

HAND CARD P

B. What kind of skin cancer was this?

- Basal cell carcinoma.....1 22/
Squamous cell carcinoma.....2
Melanoma.....3
Cancer metastatic to the skin.....4
DON'T KNOW.....8

C. What is the full name and address of the doctor or the medical facility where the diagnosis was made?

Last Name 23/
First Name
OR
Facility Name
Street Address
City
State



SITE 2

A. In what month and year was cancer of the (SITE) first diagnosed?

Mo. Yr. 24-27/

HAND CARD P

B. What kind of skin cancer was this?

- Basal cell carcinoma.....1 29/
Squamous cell carcinoma.....2
Melanoma.....3
Cancer metastatic to the skin.....4
DON'T KNOW.....8

C. What is the full name and address of the doctor or the medical facility where the diagnosis was made?

Last Name 29/
First Name
OR
Facility Name
Street Address
City
State



SITE 3

A. In what month and year was cancer of the (SITE) first diagnosed?

Mo. Yr. 30-33/

HAND CARD P

B. What kind of skin cancer was this?

- Basal cell carcinoma.....1 34/
Squamous cell carcinoma.....2
Melanoma.....3
Cancer metastatic to the skin.....4
DON'T KNOW.....8

C. What is the full name and address of the doctor or the medical facility where the diagnosis was made?

Last Name 35/
First Name
OR
Facility Name
Street Address
City
State



47.

SITE 1

D. What treatments or medicines (do/did) you take for cancer of the(SITE)?

CODE ALL THAT APPLY

- Radiation.....1 36/
Chemotherapy.....2 37/
Surgery.....3 38/
Other.(SPECIFY)..4 39/

HAND CARD P

E. During what month and year did you first receive (EACH TREATMENT CODED IN D) for cancer of the (SITE)?

RADIATION Mo. Yr. 40-43/
CHEMOTHERAPY Mo. Yr. 44-47/
SURGERY Mo. Yr. 48-51/
OTHER Mo. Yr. 52-55/

IF SECOND SITE CODED IN Q.47 GO TO SITE 2
IF Q.46 CODED "1", SKIP TO Q.49

SITE 2

D. What treatments or medicines (do/did) you take for cancer of the(SITE)?

CODE ALL THAT APPLY

- Radiation.....1 56/
Chemotherapy.....2 57/
Surgery.....3 58/
Other.(SPECIFY)..4 59/

NONE.....0

E. During what month and year did you first receive (EACH TREATMENT CODED IN D) for cancer of the (SITE)?

RADIATION Mo. Yr. 60-63/
CHEMOTHERAPY Mo. Yr. 64-67/
SURGERY Mo. Yr. 68-71/
OTHER Mo. Yr. 72-75/

IF THIRD SITE CODED IN Q.47 GO TO SITE 3
IF Q.46 CODED "1", SKIP TO Q.49

SITE 3

D. What treatments or medicines (do/did) you take for cancer of the(SITE)?

CODE ALL THAT APPLY

- Radiation.....1 76/
Chemotherapy.....2 77/
Surgery.....3 78/
Other.(SPECIFY)..4 79/

NONE.....0
BEGIN DECK 46

E. During what month and year did you first receive (EACH TREATMENT CODED IN D) for cancer of the (SITE)?

RADIATION Mo. Yr. 10-13/
CHEMOTHERAPY Mo. Yr. 14-17/
SURGERY Mo. Yr. 18-21/
OTHER Mo. Yr. 22-25/

IF Q.46 CODED "1", SKIP TO Q.49

B-49

SYSTEMIC (BODY) CANCER ONLY

48.

BODY PART 1	BODY PART 2	BEGIN DECK 47 BODY PART 3
A. In what part of your body (is/was) cancer located (RECORD VERBATIM) 26-45/	A. In what part of your body (is/was) cancer located? (RECORD VERBATIM) 51-70/	A. In what part of your body (is/was) cancer located? (RECORD VERBATIM) 10-29/
_____	_____	_____
_____	_____	_____
B. What kind of cancer was it? 46/	B. What kind of cancer was it? 71/	B. What kind of cancer was it? 30/
_____	_____	_____
_____	_____	_____
C. In what month and year was cancer of the (BODY PART) first diagnosed? [] [] 47-50/	C. In what month and year was cancer of the (BODY PART) first diagnosed? [] [] 72-75/	C. In what month and year was cancer of the (BODY PART) first diagnosed? [] [] 31-34/
Mo. Yr.	Mo. Yr.	Mo. Yr.

48. (Continued)

BODY PART 1	BODY PART 2	BODY PART 3
D. What is the full name and address of the doctor or the medical facility where the diagnosis was made?	D. What is the full name and address of the doctor or the medical facility where the diagnosis was made?	D. What is the full name and address of the doctor or the medical facility where the diagnosis was made?
Last Name 35/	Last Name 40/	Last Name 45/
First Name	First Name	First Name
OR	OR	OR
Facility Name	Facility Name	Facility Name
Street Address	Street Address	Street Address
City	City	City
State	State	State
E. What treatments or medicines (do/did) you take for cancer of the (BODY PART)? CODE ALL THAT APPLY	E. What treatments or medicines (do/did) you take for cancer of the (BODY PART)? CODE ALL THAT APPLY	E. What treatments or medicines (do/did) you take for cancer of the (BODY PART)? CODE ALL THAT APPLY
Radiation.....1 36/	Radiation.....1 41/	Radiation.....1 46/
Chemotherapy.....2 37/	Chemotherapy.....2 42/	Chemotherapy.....2 47/
Surgery.....3 38/	Surgery.....3 43/	Surgery.....3 48/
Other.(SPECIFY)..4 39/	Other.(SPECIFY)..4 44/	Other.(SPECIFY)..4 49/
_____	_____	_____
_____	_____	_____
NONE.....0	NONE.....0	NONE.....0

HAND CARD Q

B-50

49. (Continued)

E. What is the name and address of the doctor or medical facility you last consulted about your leukemia?

59/

Last Name

First Name

OR

Facility Name

Street Address

City

State

F. During what month and year did you last consult (NAME IN E)?

Mo.

Yr.

60-63/

INTERVIEWER: FOR EACH YES, ASK A THROUGH B:

A.

(PH)
CARD
J

ASK C-G FOR EACH
"YES" AT B.

50. Since DATE OF LAST INTERVIEW have you had . . .

On what part of your body did you have (CONDITION)? Any other part?

Did you discuss (CONDITION) with a doctor?

What was the diagnosis?

What is the doctor's name and address?

Yes No Yes No Yes No

1. Patches of your skin change color

1 2 64/

Site Code 65-66/

Site Code 67-68/

Site Code 69-70/

Last Name

First Name

Facility Address

City

State

BEGIN DECK 49

2. Eosin brushing of the skin thin usual?

1 2 74/

Site Code 75-76/

Site Code 77-78/

Site Code 79-80/

Last Name

First Name

Facility Address

City

State

CODES FOR Q.50

GO TO Q.50 CONTINUED

- 001) Scalp or forehead
- 002) Eye Lid
- 003) Ear
- 004) Nose
- 005) Head or Neck, Not Otherwise Specified
- 006) Cheek, chin or jaw
- 007) Neck or Suprastavicular
- 008) Vermilion
- 009) Trunk, Front
- 010) Trunk, Back
- 011) Trunk, Not Otherwise Specified
- 012) Arm
- 013) Hand
- 014) Arm or hand, Not Otherwise Specified
- 015) Genitals
- 016) Leg
- 017) Foot
- 018) Leg or Foot, Not Otherwise Specified
- 019) Skin, Not Otherwise Specified
- 020) Upper lip, Not Otherwise Specified
- 021) Lower lip, Not Otherwise Specified
- 022) Lip, Not Otherwise Specified

90. (Continued)

E.	F.	G.
During what month and year was that?	What is the name and address of the doctor or medical facility you last consulted about (CONDITION)?	During what month and year did you last consult SOME FROM (I)?
13-16/ No. Yr.	17/ Last Name First Name OR Facility Name Street Address City State	18-21/ No. Yr.

22-25/ No. Yr.	26/ Last Name First Name OR Facility Name Street Address City State	27-30/ No. Yr.
-------------------	---	-------------------

B-53

A. IWD CARD J	B.	C.	D.
50. Since WARE OF LAST (ALLITERIS) have you had . . .	On what part of your body did you have (CONDITIONS)? What other part?	Did you discuss (CONDITION) with a doctor?	What was the diagnosis? What is the doctor's name and address?
Yes No	Yes No	Yes No	Yes No
31/	32-33/ Site Code 34-35/ Site Code 36-37/ Site Code	38/	39/ Last Name 40/ First Name Facility Address City State

CODES FOR Q.30

GO TO Q.30 CONTINUED --

- | | |
|--|---|
| CODES: (01) Scalp or forehead | (14) Arm or Hand, Not Otherwise Specified |
| (02) Eye Lid | (15) Dentals |
| (03) Ear | (16) Leg |
| (04) Nose | (17) Foot |
| (05) Head or Neck, Not Otherwise Specified | (18) Leg or Foot, Not Otherwise Specified |
| (06) Cheek, chin or jaw | (19) Skin, Not Otherwise Specified |
| (07) Neck or Supraclavicular | (20) Upper lip, Not Otherwise Specified |
| (08) Throat | (21) Lower lip, Not Otherwise Specified |
| (09) Trunk, Front | (22) Lip, Not Otherwise Specified |
| (10) Trunk, Back | |
| (11) Trunk, Not Otherwise Specified | |
| (12) Arm | |
| (13) Hand | |

38. (Continued)

E.	F.	G.
During what month and year was last?	What is the name and address of the doctor or medical facility you last consulted about (CONDITION)?	During what month and year did you last consult? (NAME FROM I?)
<hr/>		
_____ Last Name _____ No. Yr. 41-44/	_____ First Name or _____ Facility Name _____ Street Address _____ City State	_____ No. Yr. 45-49/

B-54

ASK A THROUGH J FOR EACH YES

39. (Continued)

Aside from injury, since (DATE OF LAST INTERVIEW) have you had . . . Yes No	A.	B.	C.
	Thinking about the period between (DATE OF LAST INTERVIEW) and now, when did you first notice (CONDITION)?	Which limbs or muscles were affected?	Do you still have (CONDITION)?
			Yes No
<hr/>			
4. Persistent numbness of any of your limbs? 1 2 30/	_____ No. Yr. 31-34/	_____ 35-38/	1 2 37/
<hr/>			
5. Persistent tingling sensations in any of your limbs? 1 2 30/	_____ No. Yr. 39-42/	_____ 43-47/	1 2 45/

50. (Continued)

D From (DATE OF LAST INTERVIEW) and now, during what months and year(s) was the (CONDITION) most intense?	E Did you see a doctor for (CONDITION)?		F What was the diagnosis?	G What is the name and address of the doctor who made the diagnosis or the medical facility where the diagnosis was made?
	Yes	No		
[][] [][] 66-69/ No. Yr. TO [][] [][] 70-73/ No. Yr.	1	2 14/	_____	Last Name _____ 16/ First Name _____ OR Facility Name _____ Street Address _____ City [][] State [][]
TO BEGIN DECK 50 [][] [][] 10-13 No. Yr.	SKIP TO 0,51	_____ 15/	_____	Last Name _____ 16/ First Name _____ OR Facility Name _____ Street Address _____ City [][] State [][]



50. (Continued)

H. During what month and year was that?	I. What is the name and address of the doctor or medical facility you last consulted about (CONDITION)?	J. During what month and year did you last consult (NAME FROM I)?
[][] [][] 17-20 No. Yr.	Last Name _____ First Name _____ OR Facility Name _____ Street Address _____ City [][] State [][]	21/ [][] [][] 22-25/ No. Yr.
[][] [][] 26-29/ No. Yr.	Last Name _____ First Name _____ OR Facility Name _____ Street Address _____ City [][] State [][]	30/ [][] [][] 31-34/ No. Yr.

B-55

ASK A THROUGH J FOR EACH YES

	A.		B.		C.	
	Yes	No	Yes	No	Yes	No
51. Aside from injury, since (DATE OF LAST INTERVIEW) have you had . . .						
			Thinking about the period between (DATE OF LAST INTERVIEW) and now, when did you first notice (CONDITION)?		Do you still have (CONDITION)?	
			which flaps or muscles were affected?			

1. Persistent deep burning sensations in any of your flaps	1	2	35/	No.	Yr.	36-39/		1	2	42/
										40-41/

PLEASE GO ON TO NEXT PAGE →

2. Persistent echos and pains in any of your flaps	1	2	43/	No.	Yr.	44-47/		1	2	50/
										48-49/

B-56

51. (Continued)

D Between (DATE OF LAST INTERVIEW) and now, during what month and year(s) was the (CONDITION) most intense?

E Did you see a doctor for (CONDITION)?

F What was the diagnosis?

G What is the name and address of the doctor who made the diagnosis or the medical facility where the diagnosis was made?

Yes No

51-54/
 No. Yr.

55-58/
 No. Yr.

1 2 39/
 SKIP
 TO
 2

 Last Name 61/

 First Name ON

 Facility Name

 Street Address

 City State



62-65/
 No. Yr.

66-69/
 No. Yr.

1 2 70/
 SKIP
 TO
 9-52

 Last Name 72/

 First Name ON

 Facility Name

 Street Address

 City State



B-57

51. (Continued)

H. During what month and year was that?

I. What is the name and address of the doctor or medical facility you last consulted about (CONDITION)?

J. During what month and year did you last consult? NAME FROM I?

BEGIN DECK 51

73-76/
 No. Yr.

77-80/
 No. Yr.

 Last Name 77/

 First Name ON

 Facility Name

 Street Address

 City State

81-84/
 No. Yr.

85-88/
 No. Yr.

 Last Name 86/

 First Name ON

 Facility Name

 Street Address

 City State

ASK A THROUGH J FOR EACH YES

	A.	B.	C.
	Thinking about the period between (DATE OF LAST INTERVIEW) and now, when did you first notice (CONDITION)?	Which limbs or muscles were affected?	Do you still have (CONDITION)?
52. Aside from injury, since (DATE OF LAST INTERVIEW) have you had . . .	Yes No		Yes No

	20-21/		22-23/	
1. A reduction in grip strength	1	2 25/	1	2 30/
		No. Tr.		

PLEASE GO ON TO NEXT PAGE →

52. (Continued)

D	E	F	G
from (DATE OF LAST INTERVIEW) and now, during what month and year(s) was the (CONDITION) most intense?	Did you see a doctor for (CONDITION)? Yes No	What was the diagnosis?	What is the name and address of the doctor who made the diagnosis or the medical facility where the diagnosis was made?
[] [] 30-34/ No. Yr. 10 [] [] 35-39/ No. Yr.	1 2 39/ SKIP TO Q.33	_____ _____ _____ 40/	Last Name _____ 41/ First Name _____ OR _____ Facility Name _____ Street Address _____ City [] [] State [] []



52. (Continued)

H.	I.	J.
During what month and year was that?	What is the name and address of the doctor or medical facility you last consulted about (CONDITION)?	During what month and year did you last consult (NAME FROM I)?
[] [] 42-45/ No. Yr.	Last Name _____ First Name _____ OR _____ Facility Name _____ Street Address _____ City [] [] State [] []	46/ [] [] 47-50/ No. Yr.

B-59

53. (Besides the prescribed medicines you told me about) are you currently taking any (other) prescribed medicines?

Yes.....(ASK A).....1 53/

No....(SKIP TO SECTION 8)....2

A. For what conditions are the medicines? What other conditions?

1) _____ 53/

2) _____

3) _____

SECTION 8: HEALTH HABITS

The next set of questions refers to smoking habits.

1. Have you ever smoked at least as many as 5 packs of cigarettes, that is, 100 cigarettes, during your entire life?

Yes.....1 53/

No....(SKIP TO Q.22).....2

2. Do you now smoke cigarettes?

Yes.....1 54/

No....(SKIP TO Q.11).....2

CURRENT CIGARETTE SMOKER SECTION

3. On average, how many cigarettes do you smoke a day?

INTERVIEWER: IF A ANSWERS BY GIVING NUMBER OF PACKS OF CIGARETTES, RECORD VERBATIM. THEN MULTIPLY THE NUMBER OF PACKS BY 20 AND ENTER THE NUMBER OF CIGARETTES SMOKED.

ENTER NUMBER OF CIGARETTES PER DAY: [] [] 55-56/

(IF NOT EVERY DAY:) 0 [] [] PER MONTH 57-58/

OR

(IF NOT EVERY DAY:) 0 [] [] PER YEAR 59-60/

4. For how many years have you been smoking (NUMBER IN Q.3) (cigarettes per day/per month/per year)?

- Less than 2 years.....01 61-62/
- 2-5 years.....02
- 6-10 years.....02
- 11-15 years.....03
- 16-20 years.....04
- 21-25 years.....05
- 26-30 years.....06
- 31-35 years.....08
- 36-40 years.....09
- More than 40 years.....10

HAND CARD R

5. What brand of cigarettes do you usually smoke? (IF MORE THAN ONE BRAND OR NO REGULAR BRAND MENTIONED ASE, which one do you smoke the most?)

ENTER BRAND _____ OFFICE USE
 No regular brand.....996 [] [] 63-65/

6. For how long now have you been smoking this particular brand?

ENTER DAYS: [] [] 66-67/
 OR WEEKS: [] [] 68-69/
 OR MONTHS: [] [] 70-71/
 OR YEARS: [] [] 72-73/

B-61

7. What type of cigarettes are they? Are they . . . (READ EACH PAIR TOGETHER)

- CODE ONE
- A. Filter tip or.....1 74/
 - Non-filter tip?.....2
- CODE ONE
- B. Regular size.....1 75/
 - King size or.....2
 - 100 Millimeter?.....3

8. Now I am going to show you a diagram of different size cigarettes. Please look at the picture of the (KIND OF CIGARETTE IN Q.7A AND Q.7B). Now, considering your style of smoking--for example, how long you usually leave the cigarette in an ashtray or just hold it in your hand--tell me the number which indicates how much of the cigarette you actually smoke.

- Section 1.....1 76/
- Section 2.....2
- Section 3.....3
- Section 4.....4

HAND CARD S

9. During the period when you were smoking the most heavily on a regular basis, about how many cigarettes did you usually smoke in a day?

ENTER NUMBER: [] [] PER DAY 77-78/
 (IF NOT EVERY DAY:) 0 [] [] PER MONTH 79-80/
 OR BEGIN DECK 52
 (IF NOT EVERY DAY:) 0 [] [] PER YEAR 10-11/

A. When was that?

FROM
 [] [] [] [] 12-15/
 Mo Yr
 TO
 [] [] [] [] 16-19/
 Mo Yr

10. When you smoke cigarettes, how deeply do you usually inhale? Would you say:

- As deeply into the chest as possible.....1 20/
- Only partly into the chest.....2
- As far back as the throat.....3
- Well back into the mouth, or.....4
- Just puff and don't really draw it in at all.....5
- DON'T KNOW.....6

HAND
CARD
T

SKIP TO Q.22

FORMER CIGARETTE SMOKER SECTION

11. How long has it been since you smoked cigarettes fairly regularly (RECORD NUMBER)

- ENTER DAYS: 21-22/
- OR WEEKS: 23-24/
- OR MONTHS: 25-26/
- OR YEARS: 27-28/
- NEVER SMOKED REGULARLY.....(SKIP TO Q.22).....1 29/

12. On the average, about how many cigarettes a day were you smoking at that time?

INTERVIEWER: IF R ANSWERS BY GIVING NUMBER OF PACKS OF CIGARETTES, RECORD VERBATIM. THEN MULTIPLY THE NUMBER OF PACKS BY 20 AND ENTER THE NUMBER OF CIGARETTES SMOKED.

- ENTER NUMBER OF CIGARETTES PER DAY: 30-31/
- (IF NOT EVERY DAY:) PER MONTH 32-33/
- OR
- (IF NOT EVERY DAY:) PER YEAR 34-35/

13. How long had you been smoking (NUMBER IN Q.12) (cigarettes per day/per week/per month)?

- Less than 2 years.....01 36-37/
- 2-5 years.....02
- 6-10 years.....03
- 11-15 years.....04
- 16-20 years.....05
- 21-25 years.....06
- 26-30 years.....07
- 31-35 years.....08
- 36-40 years.....09
- More than 40 years.....10

HAND
CARD
R

14. You mentioned that you have not smoked regularly for (TIME IN Q.11). Did you ever stay off cigarettes for a longer period of time?

- Yes.....1 38/
- No.....(SKIP TO Q.16).....2

15. How long did you stay off cigarettes at that time?

- ENTER DAYS: 39-40/
- OR WEEKS: 41-42/
- OR MONTHS: 43-44/
- OR YEARS: 45-46/

16. What brand of cigarette did you usually smoke just before you stopped smoking cigarettes regularly? (IF MORE THAN ONE BRAND OR NO REGULAR BRAND MENTIONED, ASK: Which one did you smoke the most?)

- ENTER BRAND _____ OFFICE USE
- No regular brand.....996 47-49/

B-62

17. For how long did you smoke this particular brand?

ENTER DAYS:	<input type="text"/>	50-51/
OR WEEKS:	<input type="text"/>	52-53/
OR MONTHS:	<input type="text"/>	54-55/
OR YEARS:	<input type="text"/>	56-57/

18. What type of cigarettes were they?

		CODE ONE	
A. Filter tip or.....	1		58/
Non-filter tip?.....	2		
		CODE ONE	
B. Regular size.....	1		59/
King size or.....	2		
100 Millimeter?.....	3		

19. Now I am going to show you a diagram of different size cigarettes. Please look at the picture of the (KIND OF CIGARETTE IN Q.18A AND Q.18B). Now, considering your style of smoking--for example, how long you usually leave the cigarette in an ashtray or just hold it in your hand--tell me the number which indicates how much of the cigarette you actually smoked.

Section 1.....	1	60/
Section 2.....	2	
Section 3.....	3	
Section 4.....	4	

HAND CARD 5

B-63

20. During the period when you were smoking the most heavily on a regular basis, about how many cigarettes did you usually smoke in a day?

ENTER NUMBER:	<input type="text"/>	PER DAY	61-62/
(IF NOT EVERY DAY:)	\$ <input type="text"/>	PER MONTH	63-64/
OR			
(IF NOT EVERY DAY:)	\$ <input type="text"/>	PER YEAR	65-66/

A. When was that?

FROM		
<input type="text"/>	<input type="text"/>	67-70/
Mo	Yr	
TO		
<input type="text"/>	<input type="text"/>	71-74/
Mo	Yr	

21. When you smoked cigarettes, how deeply did you usually inhale? Would you say:

As deeply into the chest as possible.....	1	75/
Only partly into the chest.....	2	
As far back as the throat	3	
Well back into the mouth, or.....	4	
Just puff and don't really draw it in at all.....	5	
DON'T KNOW.....	6	

HAND CARD 7

CURRENT PIPE SMOKER SECTION

22. During your entire life, have you smoked at least as many as 50 pipefuls of tobacco?

Yes.....	1	76/
No.....(SKIP TO Q.35).....	2	

23. Do you now smoke a pipe?

Yes.....1 77/
No.....(SKIP TO Q.20).....2

24. About how many average sized pipefuls of tobacco do you usually smoke in a day?

ENTER NUMBER OF PIPEFULS OF TOBACCO PER DAY: [] [] 78-79/
BEGIN DECK 53
(IF NOT EVERY DAY:) # [] [] PER MONTH 10-11/
OR
(IF NOT EVERY DAY:) # [] [] PER YEAR 12-13/

25. For how many years have you been smoking (NUMBER IN Q.24) (pipefuls per day/per month/per year)?

Less than 2 years.....01 14-15/
2-5 years.....02
6-10 years.....02
11-15 years.....03
16-20 years.....04
21-25 years.....05
26-30 years.....06
31-35 years.....08
36-40 years.....09
More than 40 years.....10

HAND
CARD
R

26. During the period when you were smoking the most heavily, about how many pipefuls of tobacco did you usually smoke in a day?

ENTER NUMBER: [] [] PER DAY 16-17/
(IF NOT EVERY DAY:) # [] [] PER MONTH 18-19/
OR
(IF NOT EVERY DAY:) # [] [] PER YEAR 20-21/

26. (Continued)

A. When was that?

FROM [] [] [] [] 22-25/
Mo Yr
TO [] [] [] [] 26-29/
Mo Yr

27. When you smoke a pipe, how deeply do you usually inhale? Would you say:

As deeply into the chest as possible.....1 30/
Only partly into the chest.....2
As far back as the throat.....3
Well back into the mouth, or.....4
Just puff and don't really draw it in at all....5
DON'T KNOW.....8

HAND
CARD
T

(SKIP TO Q.35)

FORMER PIPE SMOKER SECTION

28. How long has it been since you smoked a pipe fairly regularly? (RECORD NUMBER)

ENTER DAYS: [] [] 31-32/
OR WEEKS: [] [] 33-34/
OR MONTHS: [] [] 35-36/
OR YEARS: [] [] 37-38/
NEVER SMOKED REGULARLY.....(SKIP TO Q.35).....1 39/

29. On the average, about how many pipefuls of tobacco a day were you smoking at that time?

ENTER NUMBER OF PIPEFULS OF TOBACCO PER DAY: [] [] 40-41/
(IF NOT EVERY DAY:) # [] [] PER MONTH 42-43/
OR
(IF NOT EVERY DAY:) # [] [] PER YEAR 44-45/

B-64

30. For how long did you smoke (NUMBER IN Q.29) (pipefuls of tobacco per day/per week/per month)?

- Less than 2 years.....01 46-47/
- 2-5 years.....02
- 6-10 years.....03
- 11-15 years.....04
- 16-20 years.....05
- 21-25 years.....06
- 26-30 years.....07
- 31-35 years.....08
- 36-40 years.....09
- 40 or more years.....10

HAND CARD R

31. You mentioned that you have not smoked regularly for (TIME IN Q.30). Did you ever not smoke a pipe for a longer period of time?

- Yes.....1 48/
- No.....(SKIP TO Q.33).....2

32. How long did you not smoke a pipe at that time?

- ENTER DAYS: 49-50/
- OR WEEKS: 51-52/
- OR MONTHS: 53-54/
- OR YEARS: 55-56/

33. During the period when you were smoking the most heavily on a regular basis, about how many pipefuls of tobacco did you usually smoke in a day?

- ENTER NUMBER: PER DAY 57-58/
- (IF NOT EVERY DAY:) 0 PER MONTH 59-60/
- OR
- (IF NOT EVERY DAY:) 0 PER YEAR 61-62/

A. When was that?

- FROM
- 63-66/
- No Yr
- TO
- 67-70/
- No Yr

B-65

34. When you smoked a pipe, how deeply did you usually inhale? Would you say:

- As deeply into the chest as possible.....1 71/
- Only partly into the chest.....2
- As far back as the throat.....3
- Well back into the mouth, or.....4
- Just puff and don't really draw it in at all....5
- DON'T KNOW.....6

HAND CARD T

CURRENT CIGAR SMOKER SECTION

35. During your entire life have you smoked at least as many as 50 cigars?

- Yes.....1 72/
- No....(SKIP TO Q.51).....2

36. Do you now smoke cigars?

- Yes.....1 73/
- No....(SKIP TO Q.42).....2

37. On average, about how many cigars a day do you now smoke?

- ENTER NUMBER OF CIGARS PER DAY: 74-75/
- (IF NOT EVERY DAY:) 0 PER MONTH 76-77/
- OR
- (IF NOT EVERY DAY:) 0 PER YEAR 78-79/

38. For how many years have you been smoking (0 in Q.37) cigars per day/per month/per year??
- Less than 2 years.....01 10-11/
 - 2-5 years.....02
 - 6-10 years.....03
 - 11-15 years.....04
 - 16-20 years.....05
 - 21-25 years.....06
 - 26-30 years.....07
 - 31-35 years.....08
 - 36-40 years.....09
 - More than 40 years.....10

HAND CARD R

39. During the period when you were smoking the most heavily on a regular basis, about how many cigars did you usually smoke in a day.

- ENTER NUMBER: PER DAY 12-13/
- (IF NOT EVERY DAY:) PER MONTH 14-15/
- OR
- (IF NOT EVERY DAY:) PER YEAR 16-17/

A. When was that?

- FROM 18-21/
- Mo Tr
- TO 22-25/
- Mo Tr

B-06

40. When you smoke cigars, how deeply do you usually inhale? Would you say:
- As deeply into the chest as possible.....1 26/
 - Only partly into the chest.....2
 - As far back as the throat.....3
 - Well back into the mouth, or.....4
 - Just puff and don't really draw it in at all....5
 - DON'T KNOW.....8

HAND CARD Y

41. What type of cigars do you usually smoke?

- CODE ONE
- Filter tip or.....3 27/
 - Non-filter tip?.....2

A. Now I am going to show you a diagram of different size cigars. Please look at the picture of the (KIND OF CIGAR IN Q.41). Now considering your style of smoking--for example, how long you usually leave the cigar in an ashtray or just hold it in your hand--tell me the number which indicates how much of the cigar you actually smoke.

- Section 1.....1 28/
- Section 2.....2
- Section 3.....3
- Section 4.....4

HAND CARD U

SKIP TO Q.51

FORMER CIGAR SMOKER SECTION

42. How long has it been since you smoked cigars fairly regularly?
- ENTER DAYS: 29-30/
 - OR WEEKS: 31-32/
 - OR MONTHS: 33-34/
 - OR YEARS: 35-36/
 - NEVER SMOKED REGULARLY.....(SKIP TO Q.51).....1 37/

43. On the average, about how many cigars a day were you smoking at that time?

ENTER NUMBER OF CIGARS PER DAY: 38-39/
 (IF NOT EVERY DAY:) \$ PER MONTH 40-41/
 OR
 (IF NOT EVERY DAY:) \$ PER YEAR 42-43/

44. For how long did you smoke (NUMBER PER DAY IN Q.43) cigars per day?

Less than 2 years.....01 44-45/
 2-5 years.....02
 6-10 years.....03
 11-15 years.....04
 16-20 years.....05
 21-25 years.....06
 26-30 years.....07
 31-35 years.....08
 36-40 years.....09
 More than 40 years.....10

HAND CARD R

45. You mentioned that you have not smoked regularly for (TIME IN Q.42). Did you ever stay off cigars for a longer period of time?

Yes.....1 46/
 No.....(SKIP TO Q.47).....2

46. How long did you stay off cigars at that time?

ENTER DAYS: 47-48/
 OR WEEKS: 49-50/
 OR MONTHS: 51-52/
 OR YEARS: 53-54/

B-67

47. What type of cigars did you usually smoke just before you stopped smoking cigars regularly?

CODE ONE
 Filter tip or.....1 55/
 Non-filter tip?.....2

48. Now I am going to show you a diagram of different size cigars. Please look at the picture of the (KIND OF CIGAR IN Q.47). Now, considering your style of smoking--for example, how long you usually leave the cigar in an ashtray or just hold it in your hand--tell me the number which indicates how much of the cigar you actually smoke.

HAND CARD U

Section 1.....1 56/
 Section 2.....2
 Section 3.....3
 Section 4.....4

49. During the period when you were smoking the most on a regular basis, about how many cigars did you usually smoke in a day?

ENTER NUMBER: PER DAY 57-58/
 (IF NOT EVERY DAY:) \$ PER MONTH 59-60/
 OR
 (IF NOT EVERY DAY:) \$ PER YEAR 61-62/

A. When was that?

FROM

 Mo Yr 63-66/
 TO

 Mo Yr 67-70/

50. When you smoked a cigar, how deeply did you usually inhale? Would you say:

HAND
CARD
T

- As deeply into the chest as possible.....1 71/
- Only partly into the chest.....2
- As far back as the throat.....3
- Well back into the mouth, or.....4
- Just puff and don't really draw it in at all....5
- DON'T KNOW.....6

51. INTERVIEWER: DOES R CURRENTLY HAVE A SPOUSE OR PARTNER? (IS ANY "NO" CODED IN SECTION 5, Q's 2.6c or 8c?).

- YES.....1 72/
- NO.....(SKIP TO Q.53).....2

52. Does your (spouse/partner) smoke regularly any of the following?

	YES	NO	DON'T KNOW	
Cigarettes	1	2	6	73/
Cigare	1	2	6	74/
Pipe	1	2	6	75/

53. Approximately how much smoke is there in the air in your home?

- A lot.....1 76/
- A little.....2
- None.....(SKIP TO Q.56).....3

54. Approximately how many hours a week are you exposed to this smoke in your home?

HAND
CARD
V

- 10 hours or less.....1 77/
- 11 to 15 hours.....2
- 16 to 20 hours.....3
- 21 to 25 hours.....4
- 26 or more hours.....5

55. For how many years have you been exposed to smoke in this way? (CHECK ONLY ONE)

- Less than 1 year.....01 78-79/
- 1 to 4 years.....02
- 5 to 10 years.....03
- 11 to 15 years.....04
- 16 to 20 years.....05
- 21 to 30 years.....06
- More than 30 years.....07
- Don't know.....08

HAND
CARD
W

BEGIN DECK 55

56. INTERVIEWER: DOES R WORK? (IS "YES" CODED AT SEC 2, Q.4 OR "CURRENT JOB" CODED AT SEC 3, Q.1F?)

- Yes.....1 10/
- No.....(SKIP TO Q.62).....2

A. Approximately how much smoke is there in the air in the transportation you take to and from work (For example, your car, the train, the bus, etc.)?

- A lot.....1 11/
- A little.....2
- None.....(SKIP TO Q.59).....3

57. Approximately how many hours a week are you exposed to this smoke?

- 10 hours or less.....1 12/
- 11 to 15 hours.....2
- 16 to 20 hours.....3
- 21 to 25 hours.....4
- 26 or more hours.....5

HAND CARD V

58. For how many years have you been exposed to this smoke?

- Less than 1 year.....01 13-14/
- 1 to 4 years.....02
- 5 to 10 years.....03
- 11 to 15 years.....04
- 16 to 20 years.....05
- 21 to 30 years.....06
- More than 30 years.....07
- Don't Know.....08

HAND CARD W

59. Approximately how much smoke is there in the air where you work?

- A lot.....1 15/
- A little.....2
- None.....(SKIP TO Q.62)....3

60. Approximately how many hours a week are you exposed to this smoke?

- 10 hours or less.....1 16/
- 11 to 15 hours.....2
- 16 to 20 hours.....3
- 21 to 25 hours.....4
- 26 or more hours.....5

HAND CARD V

61. For how many years have you been exposed to this smoke at work?

- Less than 1 year.....01 17-18/
- 1 to 4 years.....02
- 5 to 10 years.....03
- 11 to 15 years.....04
- 16 to 20 years.....05
- 21 to 30 years.....06
- More than 30 years.....07

HAND CARD W

62. There are some questions that are asked in survey research that are difficult to ask directly because many people think they are too personal. While it is understandable that people feel this way, there is a real need for the information for the population as a whole. We now have a way that makes it possible for people to give information, without telling anyone about their own situation. Let me show you how this works; we will use the next question I have here as an example. HAND R CARD X. As you see, there are two questions on the card. One deals with the "real" question that the research is concerned with, the other is completely unrelated. Both questions can be answered "yes" or "no." One of the two questions is selected by chance and you answer it. (I'll show you how that works in a minute). I do not know which question you are answering. When all the questionnaires have been tallied, the researchers can tell how many people have smoked marijuana, but they have no way of knowing whether it was you or any other person in particular who has smoked marijuana.

HAND CARD X

HAND R COIN

It is very simple, as you will see. You will flip the coin. The question you will answer is selected by chance. In no way can a truthful answer prove harmful to you. There is no identifying information that can link you to your answers.

Please take the coin that you have been handed and flip it now. Don't tell me which side came up. If the coin shows heads, please answer only question 1. If the coin shows tails, please answer only question 2. I won't look to see if the coin comes up heads or tails; and you don't tell me which question you are answering. Just tell me if your answer is "yes" or "no".

- Yes.....1 19/
- No.....2
- Don't Know.....8

A. Now let's do that again, using the next question. HAND R CARD Y. Flip the coin again. If the coin turns up heads, please answer only question number 1. If the coin comes up tails, please answer only question number 2. Don't tell me the question. Is your answer "yes" or "no"?

HAND CARD Y

- Yes.....1 20/
- No.....2
- Don't Know.....8

63. Have you ever been arrested for a felony?
 Yes.....1 21/
 No....(SKIP TO Q.64).....2
- A. Have you ever been convicted of a felony?
 Yes.....1 22/
 No.....(SKIP TO Q.64).....2
- B. How many felonies have you been convicted of ?
 ENTER NUMBER: LLI 23-24/
- C. What month and year were you convicted of this/your first) felony?
 LLLLI 25-26/
 No Yr
- D. On what charge were you convicted?
 _____ 29-30/

- E. INTERVIEWER: HAS R EVER BEEN CONVICTED OF A SECOND FELONY? (IS 0
 IN Q.64B EQUAL TO 2 OR MORE?)
 Yes.....1 31/
 No....(SKIP TO Q.64).....2
- F. What month and year were you convicted of this/your first) felony?
 LLLLI 32-35/
 No Yr
- G. On what charge were you convicted?
 _____ 36-37/

B-70

63. (Continued)
 H. INTERVIEWER: HAS R EVER BEEN CONVICTED OF A THIRD FELONY? (IS 1
 IN Q.63B EQUAL TO 3 OR MORE?)
 Yes....(GO TO NEW DECK).....1 38/
 No.....2
-
- Next, I'd like some information about drinking alcoholic beverages.
64. Have you had any alcoholic beverages, including beer, wine, or liquor,
 since (DATE OF LAST INTERVIEW)?
 Yes.....1 39/
 No.....(SKIP TO SECTION 9).....2
65. Since (DATE OF LAST INTERVIEW) have you had a drink of beer?
 Yes.....1 40/
 No.....(SKIP TO Q.71).....2
-
66. How long has it been since your last drink of beer?
 Today.....01 41-42/
 1-7 days ago.....02
 8-14 days ago.....03
 15-30 days ago.....04
 1 month ago.....05
 2-3 months ago.....06
 4-6 months ago.....07
 7-12 months ago.....08
 More than 1 year ago.....09
- HAND
 CARD
 2
-
67. As you think back over the period of time between (DATE OF LAST
 INTERVIEW) and now, about how many cans or bottles of beer would you
 drink on a typical day when you drank beer?
 ENTER NUMBER OF CANS OR BOTTLES: LLI 43-44/

68. Again, thinking back over the period of time between (DATE OF LAST INTERVIEW) and now, about how regularly did you drink beer? PROBE IF NECESSARY: It's sometimes hard to remember. Just give me your best guess.

- More often than once a day.....01 45-46/
- Every day.....02
- 5 or 6 days a week.....03
- 3 or 4 days a week.....04
- 1 or 2 days a week.....05
- Less often than once a week.....06
- IF CANNOT DECIDE: Don't know.....09

HAND CARD AA

69. How large were the cans or bottles that you usually drank?

- Standard 12 oz. cans or bottles.....1 47/
- 16 oz. (half quart) cans or bottles.....2
- 32 oz. (full quart) cans or bottles.....3
- Less than 12 oz. cans or bottles.....4
- More than 32 oz. cans or bottles.....5
- Don't drink cans or bottles of beer.....6

HAND CARD BB

70. During the last 12 months that you drank since (DATE OF LAST INTERVIEW), how often did you have 6 or more cans of beer in a single day (3 quarts or more)?

- Every day or nearly every day.....01 48-49/
- 3-4 times a week.....02
- Once or twice a week.....03
- 1-3 times a month.....04
- 7-11 times a year.....05
- 3-6 times a year.....06
- Once or twice a year.....07
- Never.....09

HAND CARD CC

B-71

71. Since (DATE OF LAST INTERVIEW) have you had a drink of wine?

- Yes.....1 50/
- No....(SKIP TO Q.76).....2

72. How long has it been since your last drink of wine?

- Today.....01 51-52/
- 1-7 days ago.....02
- 8-14 days ago.....03
- 15-30 days ago.....04
- 1 month ago.....05
- 2-3 months ago.....06
- 4-6 months ago.....07
- 7-12 months ago.....08
- More than 1 year ago.....09

HAND CARD E

73. As you think back over the period of time between (DATE OF LAST INTERVIEW) and now, about how many glasses of wine would you drink on a typical day when you drank wine?

ENTER NUMBER OF GLASSES: [] [] 53-54/

74. Again, thinking back over the period of time between (DATE OF LAST INTERVIEW) and now, about how regularly did you drink wine? PROBE IF NECESSARY: It's sometimes hard to remember. Just give me your best guess.

- More often than once a day.....1 55/
- Every day.....2
- 5 or 6 days a week.....3
- 3 or 4 days a week.....4
- 1 or 2 days a week.....5
- Less often than once a week.....6

HAND CARD AA

IF CANNOT DECIDE: Don't know.....0

75. During the last 12 months that you drank since (DATE OF LAST INTERVIEW), how often did you have 8 or more glasses of wine in a single day (more than a fifth)?

- Every day or nearly every day.....01 56-57/
- 3-4 times a week.....02
- Once or twice a week.....03
- 1-3 times a month.....04
- 7-11 times a year.....05
- 3-6 times a year.....06
- Once or twice a year.....07
- Never.....08

HAND CARD CC

76. Since (DATE OF LAST INTERVIEW) have you had a drink containing liquor, such as whiskey, vodka, gin, brandy, etc.?

- Yes.....1 58/
- No...(SKIP TO Q.82).....2

77. How long has it been since your last drink of hard liquor?

- Today.....01 59-60/
- 1-7 days ago.....02
- 8-14 days ago.....03
- 15-30 days ago.....04
- 1 month ago.....05
- 2-3 months ago.....06
- 4-6 months ago.....07
- 7-12 months ago.....08
- More than 1 year ago.....09

HAND CARD S

78. As you think back over the period of time between (DATE OF LAST INTERVIEW) and now, about how many drinks of hard liquor would you drink on a typical day in which you drank hard liquor?

ENTER NUMBER OF DRINKS: [] [] 61-62/

79. Again, thinking back over the period of time between (DATE OF LAST INTERVIEW) and now, about how regularly did you drink hard liquor? PROBE IF NECESSARY: It's sometimes hard to remember. Just give me your best guess.

- More often than once a day.....1 63/
- Every day.....2
- 5 or 6 days a week.....3
- 3 or 4 days a week.....4
- 1 or 2 days a week.....5
- Less often than once a week.....6

HAND CARD RA

IF CANNOT DECIDE: Don't know.....8

80. About how many ounces of hard liquor are there in the drinks that you usually drink?

- One ounce (one shot).....1 64/
- 1.5 ounces (one jigger).....2
- 2 ounces (2 shots).....3
- 3 ounces (2 jiggers or 3 shots).....4
- 4 ounces (4 shots).....5
- 5 or more ounces (3 or more jiggers).....6
- Don't know.....8

HAND CARD DD

81. During the last 12 months that you drank since (DATE OF LAST INTERVIEW), how often did you have 8 or more drinks of hard liquor in a single day (a half pint or more)?

- Every day or nearly every day.....01 65-66/
- 3-4 times a week.....02
- Once or twice a week.....03
- 1-3 times a month.....04
- 7-11 times a year.....05
- 3-6 times a year.....06
- Once or twice a year.....07
- Never.....08

HAND CARD CC

B-72

82. Have you had a drink of beer, wine or hard liquor in the last 12 months?

Yes.....1 67/
No.....(SKIP TO SECTION 9).....2

83. About how often during the past 12 months did you drink enough to feel high -- that is, happier or more carefree than usual, maybe a little flushed or dizzy, but not drunk, for more than 24 hours in a row?

5 or more times.....01 68-69/
4 times.....02
3 times.....03
2 times.....04
Once.....05
Never in the past year, but
sometimes before that.....06
Never in my life.....07

HAND
CARD
EE

84. Now I would like to ask you some questions about experiences that many people have had with drinking. During the past year, . .

Yes No

A. Have you felt aggressive or angry while drinking?.....1 2 70/
B. Have you gotten into a heated argument while drinking?..1 2 71/
C. Have you gotten into a fight while drinking?.....1 2 72/
D. Have you deliberately tried to cut down or quit
drinking, but didn't manage to do so?.....1 2 73/
E. Were you afraid you might be an alcoholic or that
you might become one?.....1 2 74/
F. Once you started drinking, was it difficult for you
to stop before you became completely intoxicated?.....1 2 75/
G. Have you awakened the next day not being able to
remember things you had done while drinking?.....1 2 76/
H. Have you often taken a drink the first thing when
you got up in the morning?.....1 2 77/
I. Have your hands shaken a lot the morning after
drinking?.....1 2 78/
J. Have you sometimes gotten drunk when drinking by
yourself?.....1 2 79/
K. Have you sometimes kept on drinking after
promising yourself not to?.....1 2 80/

85. INTERVIEWER: HAS R WORKED THE PAST YEAR?

YES...(ASK A THROUGH E).....1 10/
NO...(SKIP TO Q.86).....2

During the past year:

Yes No

A. Have you stayed away from work because of a hangover?..1 2 11/
B. Have you gotten drunk when on the job?.....1 2 12/
C. Have you lost a job, or nearly lost one, because of
drinking?.....1 2 13/
D. Has drinking led to your quitting a job?.....1 2 14/
E. Has drinking hurt your chances for promotion or
raises or a better job?.....1 2 15/

86. When you were growing up, do you think your father drank occasionally,
drank frequently, had a drinking problem, or didn't he drink?

Drank occasionally.....1 16/
Drank frequently.....2
Had a drinking problem.....3
Didn't drink.....4
DON'T KNOW.....8

87. When you were growing up, do you think your mother drank occasionally,
drank frequently, had a drinking problem, or didn't she drink?

Drank occasionally.....1 17/
Drank frequently.....2
Had a drinking problem.....3
Didn't drink.....4
DON'T KNOW.....8

SECTION 9: RECREATION, LEISURE, AND PHYSICAL ACTIVITIES

Now we would like you to answer some questions about your leisure time activities.

INTERVIEWER: HAND R SELF-ADMINISTERED FORM 3.

Listed below are a series of Leisure Time and Physical Activities. Related activities are grouped under general headings. 1) Please read the list and circle number 1 for each activity you have performed in the last 12 months, and circle number 2 for those you have not. 2) Check which months you performed those activities. 3) Record the average number of days per month you performed those activities, and 4) Record how many hours and minutes you performed those activities, on an average day.

1. Have you participated three or more times in (READ EACH ITEM)?

	Yes	No	
Scuba diving	1	2	18/
Auto, boat, or motorcycle racing	1	2	19/
Skydiving	1	2	20/
Mountain climbing	1	2	21/
Hang gliding	1	2	22/
Plane racing or plane acrobatics, not including flight training or any assignments for the Armed Forces	1	2	23/
Surf board riding	1	2	24/
Sailing long distance in small sailing craft	1	2	25/
Skating fast down a high mountain slope	1	2	26/

2. INTERVIEWER: HAS R ANSWERED "YES" TO ANY QUESTIONS ON SELF-ADMINISTERED FORM 3 AND TO Q.1 ABOVE?

YES.....1 27/
 NO.....(SKIP TO SECTION 11).....2

SECTION 10: TOXIC SUBSTANCES

1. Have any of the recreation, leisure, and/or physical activities you've participated in since (DATE OF LAST INTERVIEW) brought you in contact with any of the following substances . . .

FOR EACH SUBSTANCE CIRCLE YES, ASK A THROUGH D.

A
 Since (DATE OF LAST INTERVIEW), in what month and year did your recreation, leisure and/or physical activities first bring you in contact with (SUBSTANCE)?

B
 Since (DATE OF LAST INTERVIEW), for how many years did you continue to come in contact with (SUBSTANCE)?

asbestos?.....1	2	20/	[] [] - [] [] MONTH YEAR	[] [] years 29-32/ 33-34/
industrial chemicals?.....1	2	35/	[] [] - [] [] MONTH YEAR	[] [] years 36-39/ 40-41/
insecticides or pesticides?.....1	2	42/	[] [] - [] [] MONTH YEAR	[] [] years 43-46/ 47-48/
degreasing chemicals?.....1	2	49/	[] [] - [] [] MONTH YEAR	[] [] years 50-53/ 54-55/
defoliants or herbicides?.....1	2	56/	[] [] - [] [] MONTH YEAR	[] [] years 57-60/ 61-62/
X-ray or nuclear radiation?.....1	2	63/	[] [] - [] [] MONTH YEAR	[] [] years 64-67/ 68-69/

B-74

1. (Continued)

C
Since (DATE OF LAST INTERVIEW), how many days per year did you come in contact with (SUBSTANCE)?

D
On the days you came in contact with (SUBSTANCE) how often did you use protective clothing or gear or wash to remove (SUBSTANCE)--all of the time, some of the time, or never?

E
Which of the following did you use?

HAND CARD
E CODE ALL THAT APPLY.

	73/				
70-72/ DAYS		All of the time.(ASK E)...1	air filter.....1	74/	
		Some of the time.(ASK E)..2	goggles.....2	75/	
		Never.....3	face shield.....3	76/	
			special clothing.....4	77/	
			washing facilities.....5	78/	
			Self contained or supplied		
			air breathing apparatus...6	79/	
			None.....0	80/	
BEGIN DECK 57	83/		air filter.....1	14/	
10-12/ DAYS		All of the time.(ASK E)...1	goggles.....2	15/	
		Some of the time.(ASK E)..2	face shield.....3	16/	
		Never.....3	special clothing.....4	17/	
			washing facilities.....5	18/	
			Self contained or supplied		
			air breathing apparatus...6	19/	
			None.....0	20/	
	24/		air filter.....1	25/	
21-23/ DAYS		All of the time.(ASK E)...1	goggles.....2	26/	
		Some of the time.(ASK E)..2	face shield.....3	27/	
		Never.....3	special clothing.....4	28/	
			washing facilities.....5	29/	
			Self contained or supplied		
			air breathing apparatus...6	30/	
			None.....0	31/	
	35/		air filter.....1	36/	
32-34/ DAYS		All of the time.(ASK E)...1	goggles.....2	37/	
		Some of the time.(ASK E)..2	face shield.....3	38/	
		Never.....3	special clothing.....4	39/	
			washing facilities.....5	40/	
			Self contained or supplied		
			air breathing apparatus...6	41/	
			None.....0	42/	
	46/		air filter.....1	47/	
43-45/ DAYS		All of the time.(ASK E)...1	goggles.....2	48/	
		Some of the time.(ASK E)..2	face shield.....3	49/	
		Never.....3	special clothing.....4	50/	
			washing facilities.....5	51/	
			Self contained or supplied		
			air breathing apparatus...6	52/	
			None.....0	53/	
	57/		air filter.....1	58/	
54-56/ DAYS		All of the time.(ASK E)...1	goggles.....2	59/	
		Some of the time.(ASK E)..2	face shield.....3	60/	
		Never.....3	special clothing.....4	61/	
			washing facilities.....5	62/	
			Self contained or supplied		
			air breathing apparatus...6	63/	
			None.....0	64/	

INTERVIEWER: HAND R SELF-ADMINISTERED FORM 4 AND GENERAL PURPOSE ANSWER SHEET

The Jenkins Activity Survey asks questions about aspects of behavior that have been found helpful in medical diagnosis. Each person is different, so there are no "right" or "wrong" answers.

For each question, choose the answer that is true for you. On your answer sheet, fill in the circle below the letter of your answer. Use a black lead pencil, and make your marks heavy and dark. Mark only one answer for each question. If you change your mind, erase the old mark completely.

B-75

SECTION 11: INCOME

Now I have some questions about your income.

1. Please tell me which letter on this card best represents the total household income in 1984 before taxes or other deductions for all people in your household, not including roomers. This amount should include wages, net income from business, interest, dividends, pensions, and any other money income. Tell me the letter that comes closest.

- A. \$5,000 - \$9,999.....01 66-67/
- B. \$10,000 - \$14,999.....02
- C. \$15,000 - \$19,999.....03
- D. \$20,000 - \$24,999.....04
- E. \$25,000 - \$29,999.....05
- F. \$30,000 - \$34,999.....06
- G. \$35,000 - \$39,999.....07
- H. \$40,000 - \$44,999.....08
- I. \$45,000 - \$49,999.....09
- J. \$50,000 - \$54,999.....10
- K. \$55,000 - \$59,999.....11
- L. \$60,000 - \$64,999.....12
- M. \$65,000 - \$69,999.....13
- N. \$70,000 - \$74,999.....14
- O. \$75,000 - \$79,999.....15
- P. \$80,000 - \$84,999.....16
- Q. \$85,000 - \$89,999.....17
- R. \$90,000 - \$94,999.....18
- S. \$95,000 - \$99,999.....19
- T. \$100,000 or more.....20

RAND
CARD
FF

2. Did you earn any income from any job during 1984? Do not include income from retirement plans or pensions.

Yes.....(ASK A).....1 68/

No.....(SKIP TO Q.3).....2

A. In which of these groups did your earnings from jobs in 1984 fall -- that is, before taxes or other deductions? Tell me the letter that comes closest.

- A. \$5,000 - \$9,999.....01 69-70/
- B. \$10,000 - \$14,999.....02
- C. \$15,000 - \$19,999.....03
- D. \$20,000 - \$24,999.....04
- E. \$25,000 - \$29,999.....05
- F. \$30,000 - \$34,999.....06
- G. \$35,000 - \$39,999.....07
- H. \$40,000 - \$44,999.....08
- I. \$45,000 - \$49,999.....09
- J. \$50,000 - \$54,999.....10
- K. \$55,000 - \$59,999.....11
- L. \$60,000 - \$64,999.....12
- M. \$65,000 - \$69,999.....13
- N. \$70,000 - \$74,999.....14
- O. \$75,000 - \$79,999.....15
- P. \$80,000 - \$84,999.....16
- Q. \$85,000 - \$89,999.....17
- R. \$90,000 - \$94,999.....18
- S. \$95,000 - \$99,999.....19
- T. \$100,000 or more.....20

RAND
CARD
FF

3. INTERVIEWER:

RECORD
TIME
ENDED

AM
PM

INTERVIEWER REMARKS

INTERVIEWER: Please complete these remarks as soon as you have finished the questionnaire.

1. Length of the interview:

(Section 1, p.1 through Section 12)

_____/_____/_____/ 75-77/
MINUTES

SECTION DECK 58

2. Date of the interview:

_____/_____/_____/ 10-15/
MONTH DAY YEAR

3. Race of Respondent:

White.....1 16/
Black.....2
Other.....3

4. In general, what was the respondent's attitude toward the interview?

Friendly and interested.....1 17/
Cooperative but not particularly interested.....2
Impatient and restless.....3
Hostile.....4

5. In general, was the respondent's understanding of the questions....

Good?.....1 18/
Fair?.....2
Poor?.....3

B-77

6. List the questions that confused, angered, or caused discomfort to the respondent or questions that you feel the respondent did not answer truthfully. EXPLAIN.

NONE.....0 19/

SECTION	QUESTION
A. _____ 20-21/	_____ 22-24/
B. _____ 25-26/	_____ 27-29/
C. _____ 30-31/	_____ 32-34/

Describe Problem: _____ 19/

7. List questions with skip errors, questions that were confusing to you, or questions that otherwise didn't work. EXPLAIN

NONE.....0 16/

SECTION	QUESTION
A. _____ 37-38/	_____ 39-41/
B. _____ 42-43/	_____ 44-46/
C. _____ 47-48/	_____ 49-51/

Describe Problem: _____ 16/

8. Please record your interviewer ID #: _____ 53-58/

9. Please sign your name: _____

AIR FORCE HEALTH SURVEY
TRANSMITTAL FORM

FORM
4428
5/65

Complete this form and enclose a copy with each case mailed to Chicago.

Int. ID # _____ Int. Name: _____ Date Mailed: _____

	QUANTITY <u>ENCLOSED</u>	If not enclosed, explain
Information Sheet	_____	
Children's Record Form	_____	
Supplementary Children's Record Form	_____	
Questionnaire	_____	
Self-Administered Form 1	_____	
Self-Administered Form 2	_____	
Self-Administered Form 3	_____	
Medical Consent Form	_____	


FOR OFFICE USE ONLY

Date received in Chicago: _____ All required forms present: _____ CIRCLE ONE
Yes No

APPENDIX C*

Physical Examination Methodology

*Original forms were color coded; limited photocopy quality.

CASE NUMBER										NAME:										GROUP #										
										DATE OF BIRTH:																				
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9										TODAY'S DATE MO DAY YR JAN 30 88 FEB 20 88 MAR 10 87 APR 8 88 MAY 8 88 JUN 7 90 JUL 6 91 AUG 6 92 SEP 4 93 OCT 3 94 NOV 2 95 DEC 1 96																				

VERSION 1.0 JRW:SCF 585

FAMILY HISTORY - PLEASE BLACKEN THE CIRCLE FOR ANY FAMILY MEMBER THAT HAS HAD ANY OF THE FOLLOWING:

REVIEWER'S COMMENTS:	BLOOD RELATIVES → NONE MOTHER FATHER SISTER BROTHER CHILD						
	DIABETES	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	EPILEPSY	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	CANCER	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	HIGH BLOOD PRESSURE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	HEART DISEASE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	STROKE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	ALLERGY	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	STOMACH TROUBLE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	NERVOUS TROUBLE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	BLOOD DISEASE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	DEFORMITIES	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	ARTHRITIS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	OTHER FAMILIAL DIS:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

→ PLEASE LIST HERE:

CURRENT FAMILY STATUS

FATHER: LIVING-AGE <input type="checkbox"/> DEAD-AGE <input type="checkbox"/>		CONDITION OF HEALTH? <input type="radio"/> EXCELLENT <input type="radio"/> GOOD <input type="radio"/> FAIR <input type="radio"/> POOR			
		CAUSE OF DEATH? <input type="text"/>			
MOTHER: LIVING-AGE <input type="checkbox"/> DEAD-AGE <input type="checkbox"/>		CONDITION OF HEALTH? <input type="radio"/> EXCELLENT <input type="radio"/> GOOD <input type="radio"/> FAIR <input type="radio"/> POOR			
		CAUSE OF DEATH? <input type="text"/>			
BROTHERS: NUMBER <input type="checkbox"/> LIVING <input type="checkbox"/> DEAD <input type="checkbox"/>		AGES <input type="text"/> CAUSES <input type="text"/>			
SISTERS: NUMBER <input type="checkbox"/> LIVING <input type="checkbox"/> DEAD <input type="checkbox"/>		AGES <input type="text"/> CAUSES <input type="text"/>			
ARE YOU MARRIED? <input type="checkbox"/> NO. OF YEARS <input type="checkbox"/> WIFE'S AGE <input type="checkbox"/>		HEALTH OF WIFE? <input type="radio"/> EXCELLENT <input type="radio"/> GOOD <input type="radio"/> FAIR <input type="radio"/> POOR			
IF WIFE IS DEAD, PLEASE GIVE AGE, YEAR, AND CAUSE OF DEATH: <input type="text"/>					
CHILDREN: BOYS' AGES <input type="text"/>		GIRLS' AGES <input type="text"/>		ALL HEALTHY? <input type="checkbox"/> ANY DEAD? <input type="checkbox"/> ANY BIRTH DEFECTS? <input type="checkbox"/>	

DO YOU HAVE ANY PHYSICAL OR NERVOUS COMPLAINTS?

YES NO EXPLAIN:

DO YOU HAVE ANY ALLERGIES OR SEVERE REACTIONS TO MEDICINES, FOODS, PLANTS, CHEMICALS, ETC.?

YES NO

PLEASE DESCRIBE:

PERSONAL HISTORY																					
<p>YES NO</p> <p><input type="radio"/> <input type="radio"/> SKIN TROUBLE</p> <p><input type="radio"/> <input type="radio"/> ACNE</p> <p><input type="radio"/> <input type="radio"/> EXCESS HAIR GROWTH</p> <p><input type="radio"/> <input type="radio"/> OTHER SKIN TROUBLE</p> <div style="border: 1px solid black; height: 20px; width: 100%; margin-top: 5px;"></div> <p><input type="radio"/> <input type="radio"/> CATARACTS</p> <p><input type="radio"/> <input type="radio"/> TONSILLITIS</p> <p><input type="radio"/> <input type="radio"/> SINUSITIS</p> <p><input type="radio"/> <input type="radio"/> GOUT</p> <p><input type="radio"/> <input type="radio"/> MEASLES</p> <p><input type="radio"/> <input type="radio"/> ASTHMA</p> <p><input type="radio"/> <input type="radio"/> BRONCHITIS</p> <p><input type="radio"/> <input type="radio"/> PLEURISY</p> <p><input type="radio"/> <input type="radio"/> PNEUMONIA</p> <p><input type="radio"/> <input type="radio"/> TUBERCULOSIS</p> <p><input type="radio"/> <input type="radio"/> HEART TROUBLE</p> <p><input type="radio"/> <input type="radio"/> STOMACH TROUBLE</p> <p><input type="radio"/> <input type="radio"/> ULCERS</p> <p><input type="radio"/> <input type="radio"/> GALLSTONES</p> <p><input type="radio"/> <input type="radio"/> JAUNDICE</p> <p><input type="radio"/> <input type="radio"/> LIVER TROUBLE</p>	<p>YES NO</p> <p><input type="radio"/> <input type="radio"/> HEPATITIS</p> <p><input type="radio"/> <input type="radio"/> WORMS</p> <p><input type="radio"/> <input type="radio"/> COLITIS</p> <p><input type="radio"/> <input type="radio"/> HEMORRHOIDS</p> <p><input type="radio"/> <input type="radio"/> KIDNEY STONES</p> <p><input type="radio"/> <input type="radio"/> KIDNEY TROUBLE</p> <p><input type="radio"/> <input type="radio"/> BLADDER TROUBLE</p> <p><input type="radio"/> <input type="radio"/> PROSTATE TROUBLE</p> <p><input type="radio"/> <input type="radio"/> SYPHILIS</p> <p><input type="radio"/> <input type="radio"/> GONORRHEA</p> <p><input type="radio"/> <input type="radio"/> FAINTING</p> <p><input type="radio"/> <input type="radio"/> FITS OR CONVULSIONS</p> <p><input type="radio"/> <input type="radio"/> DEPRESSION</p> <p><input type="radio"/> <input type="radio"/> NERVOUS BREAKDOWN</p> <p><input type="radio"/> <input type="radio"/> PARALYSIS</p> <p><input type="radio"/> <input type="radio"/> MUSCLE PAIN</p> <p><input type="radio"/> <input type="radio"/> MUSCLE WEAKNESS</p> <p><input type="radio"/> <input type="radio"/> NUMBNESS</p> <p><input type="radio"/> <input type="radio"/> LOSS OF SENSATION</p> <p><input type="radio"/> <input type="radio"/> LOSS OF SEX DRIVE</p> <p><input type="radio"/> <input type="radio"/> RHEUMATOID ARTHRITIS</p> <p><input type="radio"/> <input type="radio"/> SEVERE ARTHRITIS</p> <p><input type="radio"/> <input type="radio"/> SYSTEMIC LUPUS ERYTHEMATOSIS</p>	<p>YES NO</p> <p><input type="radio"/> <input type="radio"/> ARTHRITIS</p> <p><input type="radio"/> <input type="radio"/> SCLERODERMA</p> <p><input type="radio"/> <input type="radio"/> RHEUMATIC FEVER</p> <p><input type="radio"/> <input type="radio"/> CANCER OR TUMOR</p> <p><input type="radio"/> <input type="radio"/> VARICOSE VEINS</p> <p><input type="radio"/> <input type="radio"/> PHLEBITIS</p> <p><input type="radio"/> <input type="radio"/> HERNIA (RUPTURE)</p> <p><input type="radio"/> <input type="radio"/> ANEMIA</p> <p><input type="radio"/> <input type="radio"/> POLIO</p> <p><input type="radio"/> <input type="radio"/> MUMPS</p> <p><input type="radio"/> <input type="radio"/> MALARIA</p> <p><input type="radio"/> <input type="radio"/> GOUT</p> <p><input type="radio"/> <input type="radio"/> DIABETES</p> <p><input type="radio"/> <input type="radio"/> MEASLES</p> <p><input type="radio"/> <input type="radio"/> DYSENTERY</p>	<p>← BLACKEN THE <input type="radio"/> CIRCLE NEXT TO ANY OF THESE CONDITIONS THAT YOU NOW HAVE OR HAVE HAD IN THE PAST, OTHERWISE BLACKEN <input type="radio"/>.</p> <p>REVIEWER'S COMMENTS:</p> <div style="border: 1px solid black; height: 100px; width: 100%; margin-top: 5px;"></div>																		
<p>LIST THE AVERAGE FOR EACH OF THE FOLLOWING DURING THE LAST 90 DAYS:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"></th> <th style="width: 10%; text-align: center;">PER DAY</th> <th style="width: 40%;"></th> </tr> </thead> <tbody> <tr> <td><input type="text"/> HOURS WORKED PER DAY</td> <td style="text-align: center;"><input type="text"/></td> <td>NUMBER CIGARETTES</td> </tr> <tr> <td><input type="text"/> HOURS SLEEP PER NIGHT</td> <td style="text-align: center;"><input type="text"/></td> <td>ALCOHOLIC DRINKS</td> </tr> <tr> <td><input type="text"/> DAYS WORKED PER WEEK</td> <td style="text-align: center;"><input type="text"/></td> <td>CUPS COFFEE</td> </tr> <tr> <td><input type="text"/> DAYS VACATION PER YEAR</td> <td style="text-align: center;"><input type="text"/></td> <td>CHEWING TOBACCO</td> </tr> <tr> <td></td> <td style="text-align: center;"><input type="text"/></td> <td>SNUFF</td> </tr> </tbody> </table>			PER DAY		<input type="text"/> HOURS WORKED PER DAY	<input type="text"/>	NUMBER CIGARETTES	<input type="text"/> HOURS SLEEP PER NIGHT	<input type="text"/>	ALCOHOLIC DRINKS	<input type="text"/> DAYS WORKED PER WEEK	<input type="text"/>	CUPS COFFEE	<input type="text"/> DAYS VACATION PER YEAR	<input type="text"/>	CHEWING TOBACCO		<input type="text"/>	SNUFF	<p>FOR THE PAST 90 DAYS OR MORE:</p> <p>DID YOU TAKE REGULAR EXERCISE? <input type="text"/></p> <p>WHAT IS YOUR USUAL WEIGHT? <input type="text"/> LBS</p> <p>WHAT IS THE MOST YOU EVER WEIGHED? <input type="text"/> LBS</p> <p style="text-align: center;">AT WHAT AGE?</p> <p>HAVE YOU RECENTLY LOST OR GAINED WEIGHT? <input type="text"/></p> <p style="text-align: center;">IF SO, HOW MUCH? (+/-) <input type="text"/> LBS</p>	
	PER DAY																				
<input type="text"/> HOURS WORKED PER DAY	<input type="text"/>	NUMBER CIGARETTES																			
<input type="text"/> HOURS SLEEP PER NIGHT	<input type="text"/>	ALCOHOLIC DRINKS																			
<input type="text"/> DAYS WORKED PER WEEK	<input type="text"/>	CUPS COFFEE																			
<input type="text"/> DAYS VACATION PER YEAR	<input type="text"/>	CHEWING TOBACCO																			
	<input type="text"/>	SNUFF																			


PAST HISTORY																					
<p>PLEASE LIST PREVIOUS OPERATIONS, INJURIES, AND SERIOUS ILLNESSES, INCLUDING THOSE INDICATED ABOVE</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">YEAR</th> <th>DESCRIPTION OF OPERATION, INJURY, OR SERIOUS ILLNESS</th> </tr> </thead> <tbody> <tr><td style="height: 20px;"></td><td></td></tr> <tr><td style="height: 20px;"></td><td></td></tr> <tr><td style="height: 20px;"></td><td></td></tr> <tr><td style="height: 20px;"></td><td></td></tr> <tr><td style="height: 20px;"></td><td></td></tr> <tr><td style="height: 20px;"></td><td></td></tr> <tr><td style="height: 20px;"></td><td></td></tr> <tr><td style="height: 20px;"></td><td></td></tr> <tr><td style="height: 20px;"></td><td></td></tr> </tbody> </table> <p style="text-align: center; font-weight: bold; font-size: 1.2em;">DO NOT MARK IN THIS SPACE</p>	YEAR	DESCRIPTION OF OPERATION, INJURY, OR SERIOUS ILLNESS																			<p>PLEASE BLACKEN THE CIRCLE IF YOU HAVE HAD REPEATED CASES OF ANY OF THE FOLLOWING IN THE PAST YEAR:</p> <p>YES NO</p> <p><input type="radio"/> <input type="radio"/> PNEUMONIA</p> <p><input type="radio"/> <input type="radio"/> KIDNEY INFECTIONS</p> <p><input type="radio"/> <input type="radio"/> SKIN BOILS</p> <p><input type="radio"/> <input type="radio"/> OTHER INFECTIONS</p> <p style="text-align: right;">SPECIFY ←</p>
YEAR	DESCRIPTION OF OPERATION, INJURY, OR SERIOUS ILLNESS																				
<p>WHEN WAS YOUR LAST PHYSICAL EXAM? <input type="text"/> MO <input type="text"/> YR</p> <p>ANY ABNORMALITY FOUND? YES <input type="radio"/> NO <input type="radio"/></p> <p>ARE YOU UNDER ANY MEDICAL TREATMENT NOW? YES <input type="radio"/> NO <input type="radio"/></p> <p>DID YOU TAKE ANY MEDICATIONS OR TREATMENT NOW OR OCCASIONALLY? <input type="radio"/> YES <input type="radio"/> NO</p> <p style="text-align: right;">PLEASE DESCRIBE: <input style="width: 150px;" type="text"/></p>																					
<p>YOUR PERSONAL PHYSICIAN</p>	<p>NAME <input style="width: 100%;" type="text"/></p> <p>STREET ADDRESS <input style="width: 100%;" type="text"/></p> <p>CITY, STATE, & ZIP <input style="width: 100%;" type="text"/></p>																				

<p>YES NO</p> <p><input type="radio"/> <input type="radio"/> 81. RECENT CHANGE IN BOWEL HABITS</p> <p><input type="radio"/> <input type="radio"/> 82. RECTAL TROUBLE OR PAIN</p> <p><input type="radio"/> <input type="radio"/> 83. PAIN IN THE KIDNEY REGION</p> <p><input type="radio"/> <input type="radio"/> 84. BLOOD OR PUS IN URINE</p> <p><input type="radio"/> <input type="radio"/> 85. ALBUMIN IN URINE</p> <p><input type="radio"/> <input type="radio"/> 86. SUGAR IN URINE</p> <p><input type="radio"/> <input type="radio"/> 87. SPELLS OF FREQUENT URINATION</p> <p><input type="radio"/> <input type="radio"/> 88. SEVERE BURNING OR PAIN ON URINATION</p> <p><input type="radio"/> <input type="radio"/> 89. PAINS OVER BLADDER OR LOW DOWN</p> <p><input type="radio"/> <input type="radio"/> 90. TROUBLE STARTING URINE</p> <p><input type="radio"/> <input type="radio"/> 91. URINARY STREAM HAS BECOME WEAK</p> <p><input type="radio"/> <input type="radio"/> 92. HARD TO EMPTY BLADDER COMPLETELY</p> <p><input type="radio"/> <input type="radio"/> 93. LOSE CONTROL OF PASSING URINE</p> <p><input type="radio"/> <input type="radio"/> 94. PAINFUL OR SORE GENITALS (PRIVATES)</p> <p><input type="radio"/> <input type="radio"/> 95. SWOLLEN OR PAINFUL JOINTS</p> <p><input type="radio"/> <input type="radio"/> 96. STIFFNESS OF MUSCLES OR JOINTS</p> <p><input type="radio"/> <input type="radio"/> 97. SEVERE PAINS IN ARMS OR LEGS</p> <p><input type="radio"/> <input type="radio"/> 98. PAINFUL FEET</p> <p><input type="radio"/> <input type="radio"/> 99. BACKACHE</p> <p><input type="radio"/> <input type="radio"/> 100. PAINS IN NECK</p> <p><input type="radio"/> <input type="radio"/> 101. EASY TO SUNBURN</p> <p><input type="radio"/> <input type="radio"/> 102. SUBJECT TO ACNE</p> <p><input type="radio"/> <input type="radio"/> 103. SUBJECT TO BOILS OR INFECTION</p> <p><input type="radio"/> <input type="radio"/> 104. SUBJECT TO ATHLETE'S FOOT, SKIN FUNGUS</p> <p><input type="radio"/> <input type="radio"/> 105. SUBJECT TO HIVES OR SKIN REACTIONS</p> <p><input type="radio"/> <input type="radio"/> 106. EASY BLEEDING OR BRUISING</p> <p><input type="radio"/> <input type="radio"/> 107. MOLE OR SORE WHICH IS NOT HEALING</p> <p><input type="radio"/> <input type="radio"/> 108. SEVERE DIZZINESS</p> <p><input type="radio"/> <input type="radio"/> 109. GENERALIZED WEAKNESS</p> <p><input type="radio"/> <input type="radio"/> 110. MUSCLE WEAKNESS</p>	<p>REVIEWER'S COMMENTS:</p>	<p>YES NO</p> <p><input type="radio"/> <input type="radio"/> 91. NAIL BITING</p> <p><input type="radio"/> <input type="radio"/> 92. SLEEP WALKING</p> <p><input type="radio"/> <input type="radio"/> 93. BED WETTING AFTER AGE 12</p> <p><input type="radio"/> <input type="radio"/> 94. CHRONICALLY TIRED OR OVERWORKED</p> <p><input type="radio"/> <input type="radio"/> 95. IRREGULAR LIVING HABITS</p> <p><input type="radio"/> <input type="radio"/> 96. CAN'T GO TO SLEEP OR STAY ASLEEP</p> <p><input type="radio"/> <input type="radio"/> 97. NEARLY ALWAYS IN POOR HEALTH</p> <p><input type="radio"/> <input type="radio"/> 98. CONSIDERED TO BE A NERVOUS PERSON</p> <p><input type="radio"/> <input type="radio"/> 99. FROM SICKLY OR NERVOUS FAMILY</p> <p><input type="radio"/> <input type="radio"/> 100. TREMBLE AND SWEAT EASILY</p> <p><input type="radio"/> <input type="radio"/> 101. HAVE TROUBLE MAKING UP YOUR MIND</p> <p><input type="radio"/> <input type="radio"/> 102. EASILY MIXED UP OR CONFUSED</p> <p><input type="radio"/> <input type="radio"/> 103. CLUMSY OR HAVE FREQUENT ACCIDENTS</p> <p><input type="radio"/> <input type="radio"/> 104. FEEL SAD, LONELY OR DEPRESSED</p> <p><input type="radio"/> <input type="radio"/> 105. CRY OFTEN</p> <p><input type="radio"/> <input type="radio"/> 106. WISH I WERE DEAD</p> <p><input type="radio"/> <input type="radio"/> 107. WORRY CONTINUALLY</p> <p><input type="radio"/> <input type="radio"/> 108. UPSET BY LITTLE THINGS</p> <p><input type="radio"/> <input type="radio"/> 109. A PERFECTIONIST</p> <p><input type="radio"/> <input type="radio"/> 110. SENSITIVE OR FEELINGS EASILY HURT</p> <p><input type="radio"/> <input type="radio"/> 111. OFTEN MISUNDERSTOOD</p> <p><input type="radio"/> <input type="radio"/> 112. OFTEN ACT ON SUDDEN IMPULSE</p> <p><input type="radio"/> <input type="radio"/> 113. EASILY ANGERED OR HAVE VIOLENT RAGES</p> <p><input type="radio"/> <input type="radio"/> 114. FREQUENTLY KEYED UP AND JITTERY</p> <p><input type="radio"/> <input type="radio"/> 115. EASILY SCARED BY SUDDEN NOISE</p> <p><input type="radio"/> <input type="radio"/> 116. HAVE BAD DREAMS OR THOUGHTS</p> <p><input type="radio"/> <input type="radio"/> 117. SUSPECT A SERIOUS DISEASE OR CANCER</p> <p><input type="radio"/> <input type="radio"/> 118. HAVING TROUBLE GETTING ALONG WITH SOMEONE AT HOME OR AT WORK</p>

EXPOSURE HISTORY

HAVE YOU EVER BEEN EXPOSED TO ANY OF THE FOLLOWING SUBSTANCES OR TYPES OF RADIATION? EXPOSURE IS DEFINED AS SKIN OR RESPIRATORY CONTACT OF MORE THAN ONE DAY'S DURATION. FOR EACH "YES" RESPONSE, PLEASE COMPLETE ONE OF THE THREE BLOCKS ON FORM AFHS-2B. COMMENT

<p>YES NO</p> <p><input type="radio"/> <input type="radio"/> COAL TAR</p> <p><input type="radio"/> <input type="radio"/> CREOSOTE</p> <p><input type="radio"/> <input type="radio"/> ANTHRACENE</p> <p><input type="radio"/> <input type="radio"/> BENZENE</p> <p><input type="radio"/> <input type="radio"/> BENZIDINE</p> <p><input type="radio"/> <input type="radio"/> NAPHTHYLAMINE</p> <p><input type="radio"/> <input type="radio"/> AMINODIPHENYL</p> <p><input type="radio"/> <input type="radio"/> MUSTARD GAS</p> <p><input type="radio"/> <input type="radio"/> VINYL CHLORIDE</p>	<p>REVIEWER'S COMMENTS:</p>	<p>YES NO</p> <p><input type="radio"/> <input type="radio"/> CHLOROMETHYL ETHER</p> <p><input type="radio"/> <input type="radio"/> ARSENIC</p> <p><input type="radio"/> <input type="radio"/> CHROMATES</p> <p><input type="radio"/> <input type="radio"/> ASBESTOS</p> <p><input type="radio"/> <input type="radio"/> CUTTING OILS</p> <p><input type="radio"/> <input type="radio"/> TRICHLOROETHYLENE</p> <p><input type="radio"/> <input type="radio"/> ULTRAVIOLET LIGHT (OTHER THAN SUN)</p> <p><input type="radio"/> <input type="radio"/> X-RAYS (OTHER THAN ROUTINE)</p> <p><input type="radio"/> <input type="radio"/> IONIZING RADIATION (OTHER THAN X-RAYS)</p>
	<p>REVIEWER'S NAME (PRINTED):</p>	

CASE NUMBER					NAME OF PARTICIPANT	
				B		
PAGE <input type="text"/> OF <input type="text"/>		FORM AFHS-2B				EXPOSURE HISTORY DETAILS


FOR EACH "YES" EXPOSURE AT THE END OF FORM AFHS-2A, PLEASE FILL OUT ONE OF THE FOLLOWING BLOCKS. USE ADDITIONAL SHEETS IF NECESSARY.

TYPE OF EXPOSURE (COAL TAR, ETC.)					WAS EXPOSURE RECEIVED ON THE JOB?		YES	NO
IF ON-THE-JOB EXPOSURE, JOB TITLE								
IF NOT ON-THE-JOB EXPOSURE, HOW EXPOSURE RECEIVED								
CHECK FREQUENCY OF EXPOSURE THAT BEST FITS YOUR EXPERIENCE		DAILY	WEEKLY	MONTHLY	YEARLY	IN WHAT YEAR(S) WERE YOU EXPOSED?		

TYPE OF EXPOSURE (COAL TAR, ETC.)					WAS EXPOSURE RECEIVED ON THE JOB?		YES	NO
IF ON-THE-JOB EXPOSURE, JOB TITLE								
IF NOT ON-THE-JOB EXPOSURE, HOW EXPOSURE RECEIVED								
CHECK FREQUENCY OF EXPOSURE THAT BEST FITS YOUR EXPERIENCE		DAILY	WEEKLY	MONTHLY	YEARLY	IN WHAT YEAR(S) WERE YOU EXPOSED?		

TYPE OF EXPOSURE (COAL TAR, ETC.)					WAS EXPOSURE RECEIVED ON THE JOB?		YES	NO
IF ON-THE-JOB EXPOSURE, JOB TITLE								
IF NOT ON-THE-JOB EXPOSURE, HOW EXPOSURE RECEIVED								
CHECK FREQUENCY OF EXPOSURE THAT BEST FITS YOUR EXPERIENCE		DAILY	WEEKLY	MONTHLY	YEARLY	IN WHAT YEAR(S) WERE YOU EXPOSED?		

TYPE OF EXPOSURE (COAL TAR, ETC.)					WAS EXPOSURE RECEIVED ON THE JOB?		YES	NO
IF ON-THE-JOB EXPOSURE, JOB TITLE								
IF NOT ON-THE-JOB EXPOSURE, HOW EXPOSURE RECEIVED								
CHECK FREQUENCY OF EXPOSURE THAT BEST FITS YOUR EXPERIENCE		DAILY	WEEKLY	MONTHLY	YEARLY	IN WHAT YEAR(S) WERE YOU EXPOSED?		

CASE NUMBER	NAME:	GROUP #																																																																																																					
	DATE OF BIRTH:																																																																																																						
<table border="1" style="font-size: small;"> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr> </table>	0	1		2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	<table border="1" style="font-size: small;"> <tr> <td>TODAY'S DATE</td> <td>MO</td> <td>JAN</td> <td>FEB</td> <td>MAR</td> <td>APR</td> <td>MAY</td> <td>JUN</td> <td>JUL</td> <td>AUG</td> <td>SEP</td> <td>OCT</td> <td>NOV</td> <td>DEC</td> </tr> <tr> <td>DAY</td> <td></td> <td>30</td> <td>28</td> <td>31</td> <td>30</td> <td>31</td> <td>30</td> <td>31</td> <td>31</td> <td>30</td> <td>31</td> <td>30</td> <td>31</td> </tr> <tr> <td>YR</td> <td></td> <td>85</td> <td>86</td> <td>87</td> <td>88</td> <td>89</td> <td>90</td> <td>91</td> <td>92</td> <td>93</td> <td>94</td> <td>95</td> <td>96</td> </tr> </table>	TODAY'S DATE	MO	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	DAY		30	28	31	30	31	30	31	31	30	31	30	31	YR		85	86	87	88	89	90	91	92	93	94	95
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YR		85	86	87	88	89	90	91	92	93	94	95	96																																																																																										
FORM AFHS-3A		PHYSICAL EXAMINATION																																																																																																					

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GENERAL APPEARANCE			
	APPEARANCE VS STATED AGE	APPEARANCE OF ILLNESS OR DISTRESS	HAIR DISTRIBUTION
WELL NOURISHED	YOUNGER THAN	YES	NORMAL
OBESE	OLDER THAN		
UNDER-NOURISHED	SAME AS	NO	ABNORMAL
Y N COMMENT			
DESCRIBE ANY ABNORMAL HAIR DISTRIBUTION:			

NOTE: FILL IN VITAL SIGNS WITH "0" IF REFUSED.

VITAL SIGNS							
HEIGHT CM	WEIGHT (UNDRRESSED) KG	TEMPERATURE ORAL °F	SITTING BLOOD PRESSURE NONDOMINANT ARM, HEART LEVEL		PULSE RATE	VPBs PER MINUTE	PULSE IS: <input type="checkbox"/> REGULAR <input type="checkbox"/> IRREGULAR <input type="checkbox"/> IRREGULARLY IRREGULAR DESCRIBE ANY IRREGULARITIES: Y N COMMENT
			SYSTOLIC	DIASTOLIC			
0 0 0	00 0 0	97 0 0	0 0 0	0 0 0	0 0 0	0 0	
1 1 1	00 1 1	98 1 1	1 1 1	1 1 1	1 1 1	1 1	
2 2 2	00 2 2	99 2 2	2 2 2	2 2 2	2 2 2	2 2	
3 3 3	00 3 3	100 3 3	3 3 3	3 3 3	3 3 3	3 3	
4 4 4	00 4 4	101 4 4	4 4 4	4 4 4	4 4 4	4 4	
5 5 5	00 5 5	102 5 5	5 5 5	5 5 5	5 5 5	5 5	
6 6 6	00 6 6	103 6 6	6 6 6	6 6 6	6 6 6	6 6	
7 7 7	00 7 7	104 7 7	7 7 7	7 7 7	7 7 7	7 7	
8 8 8	00 8 8	6 8 8	8 8 8	8 8 8	8 8 8	8 8	
9 9 9	00 9 9	9 9 9	9 9 9	9 9 9	9 9 9	9 9	

EYES							
<input type="radio"/> NORMAL <input type="radio"/> ABNORMAL <input type="radio"/> REFUSED	FUNDUSCOPIC				EXTERNAL		
		YES	NO		YES	NO	
		Y	N	↑ LIGHT REFLEX	Y	N	ARCUS SENILIS PRESENT
		Y	N	A-V NICKING	Y	N	ABNORMAL OCULAR PIGMENTATION
		Y	N	ARTERIOLAR SPASM	Y	N	DISK PALLOR
	Y	N	PAPILLEDEMA	Y	N	↑ CUPPING	
Y N COMMENT							
DESCRIBE VASCULAR LESIONS, HEMORRHAGES, EXUDATES, OR PAPILDEMA:							

ENT

- NORMAL
- ABNORMAL
- REFUSED

YES NO
 RIGHT TYMPANIC MEMBRANE INTACT
 LEFT TYMPANIC MEMBRANE INTACT
 NASAL ULCERATIONS
 COMMENT

DESCRIBE ABNORMALITY:

NECK

- NORMAL
- ABNORMAL
- REFUSED

THYROID GLAND
 PALPABLE NODULES
 ENLARGED TENDERNESS

LEFT **RIGHT**
 PAROTID GLAND ENLARGEMENT
 CAROTID PULSE ABSENT
 CAROTID BRUIT PRESENT
 COMMENT

DESCRIBE ABNORMALITY:

THORAX AND LUNGS

- NORMAL
- ABNORMAL
- REFUSED

YES NO
 ASYMMETRICAL EXPANSION
 HYPERRESONANCE
 DULLNESS
 WHEEZES
 RALES (NOTE LOCATION
 IN BOX BELOW)

**CHEST CIRCUMFERENCE (CM)
AT NIPPLE LEVEL**

EXPIRATION		INSPIRATION	
1	2	1	2
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

DESCRIBE ABNORMALITY:

COMMENT

HEART

- NORMAL
- ABNORMAL
- REFUSED


YES NO
 HEART SOUNDS NORMAL
 DISPLACEMENT OF APICAL IMPULSE
 PRECORDIAL THRUST

ABNORMAL HEART SOUND(S)
 NO
 S1 S2 S3 S4
 YES

MURMUR **CHEST AREA**
 NO SYSTOLIC AORTIC PULMONIC APEX MITRAL

 YES DIASTOLIC AORTIC PULMONIC APEX MITRAL
 COMMENT

DESCRIBE ANY ENLARGEMENT, IRREGULARITY OF RATE, MURMUR, OR THRILL:

CASE NUMBER										NAME:										GROUP #										
										DATE OF BIRTH:																				
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 C 0 1 2 3 4 5 6 7 8 9 D 0 1 2 3 4 5 6 7 8 9 E 0 1 2 3 4 5 6 7 8 9 F 0 1 2 3 4 5 6 7 8 9 G										TODAY'S DATE MO DAY YR JAN 30 86 FEB 20 86 MAR 10 87 APR 9 88 MAY 8 88 JUN 7 90 JUL 6 91 AUG 5 92 SEP 4 93 OCT 3 94 NOV 2 96 DEC 1 96																				

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FORM AFHS-3B PHYSICAL EXAMINATION (CONTINUED)

ABDOMEN

<input type="radio"/> NORMAL <input type="radio"/> ABNORMAL <input type="radio"/> REFUSED	YES NO <input type="radio"/> <input type="radio"/> HEPATOMEGALY <input type="radio"/> <input type="radio"/> SPLENOMEGALY <input type="radio"/> <input type="radio"/> TENDERNESS LIVER <input type="radio"/> <input type="radio"/> TENDERNESS SPLEEN <input type="radio"/> <input type="radio"/> OTHER TENDERNESS <input type="radio"/> <input type="radio"/> OTHER MASS	CM WAIST MEASUREMENT 10 20 30 40 50 60 70 80 90 0 1 2 3 4 5 6 7 8 9	LIVER SPAN 10 20 30 0 1 2 3 4 5 6 7 8 9	Y N COMMENT
---	---	--	---	-------------

DESCRIBE ABNORMALITY:

EXTREMITIES

<input type="radio"/> NORMAL <input type="radio"/> ABNORMAL <input type="radio"/> REFUSED	YES NO <input type="radio"/> <input type="radio"/> PITTING EDEMA <input type="radio"/> <input type="radio"/> NON-PITTING EDEMA <input type="radio"/> <input type="radio"/> ABSENCE (SPECIFY IN BOX BELOW)	YES NO <input type="radio"/> <input type="radio"/> CLUBBING OF NAILS <input type="radio"/> <input type="radio"/> VARICOSITIES <input type="radio"/> <input type="radio"/> LOSS OF HAIR ON TOES RIGHT <input type="radio"/> <input type="radio"/> LOSS OF HAIR ON TOES LEFT	Y N COMMENT
---	--	--	-------------

DESCRIBE EDEMA, SIGNS OF VASCULAR INSUFFICIENCY, OR ABSENCE OF PART OR ALL OF EXTREMITY:

PERIPHERAL PULSES

	NORMAL	DIMINISHED	ABSENT	REFUSED
RADIAL	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
FEMORAL	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
POPLITEAL	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
DORSALIS PEDIS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
POSTERIOR TIBIAL	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

COMMENTS:

MUSCULOSKELETAL			
<input type="radio"/> NORMAL <input type="radio"/> ABNORMAL <input type="radio"/> REFUSED	MUSCLES PRESENT ABSENT		SPINE PRESENT ABSENT
STRAIGHT LEG RAISING <input type="radio"/> NORMAL <input type="radio"/> ABNORMAL	<input type="radio"/>	<input type="radio"/>	WEAKNESS
	<input type="radio"/>	<input type="radio"/>	TENDERNESS
	<input type="radio"/>	<input type="radio"/>	ATROPHY
	<input type="radio"/>	<input type="radio"/>	ABNORMAL CONSISTENCY
	<input type="radio"/>	<input type="radio"/>	
<input checked="" type="radio"/> <input type="radio"/> COMMENT	TENDERNESS LEVEL		<input type="radio"/> CERVICAL <input type="radio"/> THORACIC <input type="radio"/> LUMBAR <input type="radio"/> SACRAL
COMMENTS:			

GENITOURINARY/RECTAL/HERNIA			
<input type="radio"/> NORMAL <input type="radio"/> ABNORMAL <input type="radio"/> REFUSED <input checked="" type="radio"/> <input type="radio"/> COMMENT	YES NO <input checked="" type="radio"/> <input type="radio"/> RT INGUINAL HERNIA <input checked="" type="radio"/> <input type="radio"/> LT INGUINAL HERNIA <input checked="" type="radio"/> <input type="radio"/> VARICOCELE <input checked="" type="radio"/> <input type="radio"/> HEMORRHOIDS	YES NO <input checked="" type="radio"/> <input type="radio"/> PROSTATIC ENLARGEMENT <input checked="" type="radio"/> <input type="radio"/> EPIDIDYMIS <input checked="" type="radio"/> <input type="radio"/> RECTAL MASS <input checked="" type="radio"/> <input type="radio"/> SCROTAL MASS ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ (DIAMETER-CM)	TESTES NORM. ABS. ENGL. ATROPH. LEFT <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> RIGHT <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
COMMENTS:			

LYMPH NODES							
<input type="radio"/> NORMAL <input type="radio"/> ABNORMAL <input type="radio"/> REFUSED		NON PALPABLE	ENLARGED	TENDER	HARD	FIXED	CONFLUENT
	CERVICAL	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	OCCIPITAL	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	SUPRACLAVICULAR	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	AXILLARY	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	EPIITROCHLEAR	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	INGUINAL	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	FEMORAL	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

OTHER TESTS ORDERED
<input checked="" type="radio"/> YES <input type="radio"/> NO
DESCRIBE: <input checked="" type="radio"/> <input type="radio"/> COMMENT

PRINTED NAME OF EXAMINING PHYSICIAN

SIGNATURE



CASE NUMBER										NAME:										GROUP #									
										DATE OF BIRTH:																			
0	1	2	3	4	5	6	7	8	9	TODAY'S DATE	MO	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC						
0	1	2	3	4	5	6	7	8	9		DAY	30	20	10	9	8	7	6	5	4	3	2	1						
0	1	2	3	4	5	6	7	8	9		YR	86	88	87	88	88	90	91	92	93	94	95	96						
0	1	2	3	4	5	6	7	8	9																				
0	1	2	3	4	5	6	7	8	9																				
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0	1	2	3	4	5	6	7	8	9																				

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FORM AFHS-4 DERMATOLOGIC EXAMINATION AND BIOPSY

SKIN

BLACKEN CIRCLE IF LESION IS OBSERVED REFUSED EXAMINATION

INDICATE TYPE AND LOCATION OF LESION ON ATTACHED ANATOMICAL CHART

YES	NO		YES	NO	
<input type="checkbox"/>	<input type="checkbox"/>	C COMEDONES	<input type="checkbox"/>	<input type="checkbox"/>	K PALMAR KERATOSES
<input type="checkbox"/>	<input type="checkbox"/>	L ACNEFORM LESIONS	<input type="checkbox"/>	<input type="checkbox"/>	X ACTINIC KERATOSES
<input type="checkbox"/>	<input type="checkbox"/>	S ACNEFORM SCARS	<input type="checkbox"/>	<input type="checkbox"/>	P PETECHIAE
<input type="checkbox"/>	<input type="checkbox"/>	D DEPIGMENTATION	<input type="checkbox"/>	<input type="checkbox"/>	E ECCHYMOSES
<input type="checkbox"/>	<input type="checkbox"/>	I INCLUSION CYSTS	<input type="checkbox"/>	<input type="checkbox"/>	O CONJUNCTIVAL ABNORMALITY
<input type="checkbox"/>	<input type="checkbox"/>	R CUTIS RHOMBOIDALIS	<input type="checkbox"/>	<input type="checkbox"/>	U ORAL MUCOSAL ABNORMALITY
<input type="checkbox"/>	<input type="checkbox"/>	H HYPERPIGMENTATION	<input type="checkbox"/>	<input type="checkbox"/>	F FINGER NAIL ABNORMALITY
<input type="checkbox"/>	<input type="checkbox"/>	J JAUNDICE	<input type="checkbox"/>	<input type="checkbox"/>	T TOE NAIL ABNORMALITY
<input type="checkbox"/>	<input type="checkbox"/>	A SPIDER ANGIOMATA	<input type="checkbox"/>	<input type="checkbox"/>	D DERMATOGRAPHIA
<input type="checkbox"/>	<input type="checkbox"/>	P PALMAR ERYTHEMA	<input type="checkbox"/>	<input type="checkbox"/>	B SUSPECTED BASAL CELL CARCINOMA
<input type="checkbox"/>	<input type="checkbox"/>	M SUSPECTED MELANOMA	<input type="checkbox"/>	<input type="checkbox"/>	S SUSPECTED SQUAMOUS CELL CARCINOMA

BIOPSY

SKIN BIOPSY PERFORMED	YES Y	NO N	CONSENT FORM OBTAINED	YES Y	NO N
BIOPSY LOCATION(S):			BIOPSY DIAGNOSIS:		

PHYSICAL FEATURES

EYE COLOR		HAIR COLOR						SKIN COLOR														
BROWN	GREY	10	20	30	40	50	60	70	80	90	0	1	2	3	4	5	6	7	8	9	10	
HAZEL	BLUE	0	1	2	3	4	5	6	7	8	9											
GREEN																						

PRINTED NAME OF EXAMINING PHYSICIAN

SIGNATURE

CASE NUMBER										NAME:										GROUP #																														
										DATE OF BIRTH:																																								
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9										TODAY'S DATE		MO	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	DAY	YR	30	20	10	9	8	7	6	5	4	3	2	1	86	85	87	88	89	90	91	92	93	94	95	96
										FORM AFHS-5										NEUROLOGICAL EXAMINATION																														



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HEAD AND NECK														
YES NO <input checked="" type="radio"/> <input checked="" type="radio"/> NORMAL TO PALPATION/INSPECTION <input checked="" type="radio"/> <input checked="" type="radio"/> ASYMMETRY <input checked="" type="radio"/> <input checked="" type="radio"/> DEPRESSION <input checked="" type="radio"/> <input checked="" type="radio"/> SCAR					NECK RANGE OF MOTION <input type="radio"/> NORMAL <input type="radio"/> ABNORMAL <input type="radio"/> REFUSAL					YES NO <input checked="" type="radio"/> <input checked="" type="radio"/> DECREASED LEFT <input checked="" type="radio"/> <input checked="" type="radio"/> DECREASED RIGHT <input checked="" type="radio"/> <input checked="" type="radio"/> DECREASED FORWARD <input checked="" type="radio"/> <input checked="" type="radio"/> DECREASED BACKWARD				

MOTOR SYSTEM												
HANDEDNESS <input type="radio"/> LEFT <input type="radio"/> RIGHT <input type="radio"/> REFUSED			GAIT <input type="radio"/> NORMAL <input type="radio"/> ABNORMAL <input type="radio"/> REFUSED			YES NO <input checked="" type="radio"/> <input checked="" type="radio"/> BROAD BASED <input checked="" type="radio"/> <input checked="" type="radio"/> SMALL STEPPED <input checked="" type="radio"/> <input checked="" type="radio"/> ATAXIC <input checked="" type="radio"/> <input checked="" type="radio"/> OTHER (SPECIFY)			ASSOCIATED MOVEMENT ARM SWING <input type="radio"/> NORMAL <input type="radio"/> ABNORMAL LEFT <input type="radio"/> ABNORMAL RIGHT			

MUSCLE STATUS									
BULK		NORMAL		ABNORMAL		INCREASED		DECREASED	
TONE: UPPER EXTREMITIES		<input type="radio"/>		<input type="radio"/>		LEFT		RIGHT	
LOWER EXTREMITIES		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>	
STRENGTH: DISTAL WRIST EXTENSORS		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>	
ANKLE/TOE FLEXORS		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>	
PROXIMAL DELTOIDS		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>	
HIP FLEXORS		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>	
<input type="radio"/> REFUSED									

ABNORMAL MOVEMENTS					COORDINATION									
TICS, CHOREAS, FASCICULATIONS <input type="radio"/> NO <input type="radio"/> YES → ① ② ③ ④					<input type="radio"/> REFUSED EQUILIBRATORY (ROMBERG)					NORMAL ABNORMAL LEFT RIGHT BOTH				
TENDERNESS <input type="radio"/> NO <input type="radio"/> YES → ① ② ③ ④					FINGER - NOSE - FINGER					<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>				
TREMOR <input type="radio"/> NO <input type="radio"/> YES					HEEL - KNEE - SHIN					<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>				
EXTREMITY LOWER LEFT UPPER LEFT LOWER RIGHT UPPER RIGHT					RAPIDLY ALTERNATING MOVEMENTS					<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>				
<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>					PRONATION/SUPINATION OF HANDS					<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>				
<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>					RAPID PATTING					<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>				

DEEP TENDON REFLEXES																	
(0 = ABSENT, 1 = SLUGGISH, 2 = ACTIVE, 3 = VERY ACTIVE, 4 = TRANSIENT CLONUS, 5 = SUSTAINED CLONUS)																	
LEFT					RIGHT												
BICEPS		①		②		③		④		⑤		⑥		⑦		⑧	
TRICEPS		①		②		③		④		⑤		⑥		⑦		⑧	
PATELLAR		①		②		③		④		⑤		⑥		⑦		⑧	
ACHILLES		①		②		③		④		⑤		⑥		⑦		⑧	
BABINSKI					<input type="radio"/> PRESENT <input type="radio"/> ABSENT					<input type="radio"/> PRESENT <input type="radio"/> ABSENT							

SKILLED ACTS														
SPEECH (ARTICULATION, APHASIA, AGNOSIA)														
<input type="radio"/> NORMAL					<input type="radio"/> GROSSLY ABNORMAL					<input type="radio"/> DYSARTHRIA <input type="radio"/> APHASIA <input type="radio"/> AGNOSIA				

MENINGEAL IRRITATION AND SENSORY SYSTEM

	- ABNORMAL -			
	NORMAL	LEFT	RIGHT	BOTH
STRAIGHT LEG RAISING	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
LIGHT TOUCH	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PIN PRICK	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
VIBRATION AT ANKLE (128 HZ)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
POSITION (GREAT TOE)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/> COMMENT				

NERVE STATUS (TENDERNESS, TUMORS, ETC.):


CRANIAL NERVES

LEFT	RIGHT		LEFT	RIGHT	V
<input type="radio"/>	<input type="radio"/>	I	<input type="radio"/>	<input type="radio"/>	CLENCH JAW SYMMETRIC
<input type="radio"/>	<input type="radio"/>	SENSE OF SMELL	<input type="radio"/>	<input type="radio"/>	CLENCH JAW DEVIATED
		PRESENT			
		ABSENT			
		II	<input type="radio"/>	<input type="radio"/>	SENSORY NORMAL
		FUNDUS	<input type="radio"/>	<input type="radio"/>	SENSORY ABNORMAL
<input type="radio"/>	<input type="radio"/>	NORMAL	<input type="radio"/>	<input type="radio"/>	CORNEAL REFLEX NORMAL
<input type="radio"/>	<input type="radio"/>	ABNORMAL	<input type="radio"/>	<input type="radio"/>	CORNEAL REFLEX ABNORMAL
<input type="radio"/>	<input type="radio"/>	DISC PALLOR/ATROPHY <input type="radio"/> NORMAL			
<input type="radio"/>	<input type="radio"/>	EXUDATE <input type="radio"/> NORMAL			
<input type="radio"/>	<input type="radio"/>	PAPILEDEMA <input type="radio"/> NORMAL			VII
<input type="radio"/>	<input type="radio"/>	HEMORRHAGE <input type="radio"/> NORMAL	<input type="radio"/>	<input type="radio"/>	SMILE NORMAL
<input type="radio"/>	<input type="radio"/>	FIELDS NORMAL (TO CONFRONTATIONS)	<input type="radio"/>	<input type="radio"/>	SMILE ABNORMAL
<input type="radio"/>	<input type="radio"/>	FIELDS ABNORMAL	<input type="radio"/>	<input type="radio"/>	PALPEBRAL FISSURE NORMAL
		III, IV, VI	<input type="radio"/>	<input type="radio"/>	PALPEBRAL FISSURE ABNORMAL
		PUPILES <input type="radio"/> EQUAL <input type="radio"/> UNEQUAL			IX, XI PALATE AND UVULA
		DIFFERENCE (MM) → ① ② ③ ④ ⑤			MOVEMENT NORMAL
<input type="radio"/>	<input type="radio"/>	EYE MOVEMENT NORMAL	<input type="radio"/>	<input type="radio"/>	MOVEMENT DEVIATED
<input type="radio"/>	<input type="radio"/>	EYE MOVEMENT ABNORMAL	<input type="radio"/>	<input type="radio"/>	
<input type="radio"/>	<input type="radio"/>	NYSTAGMUS ABSENT	<input type="radio"/>	<input type="radio"/>	PALATAL REFLEX NORMAL
<input type="radio"/>	<input type="radio"/>	NYSTAGMUS ROTARY: DRAW POSITION	<input type="radio"/>	<input type="radio"/>	PALATAL REFLEX ABNORMAL
<input type="radio"/>	<input type="radio"/>	NYSTAGMUS VERTICAL ON CONTINUATION			
<input type="radio"/>	<input type="radio"/>	NYSTAGMUS HORIZONTAL FORM			
<input type="radio"/>	<input type="radio"/>	PTOSIS PRESENT	<input type="radio"/>	<input type="radio"/>	XII
<input type="radio"/>	<input type="radio"/>	PTOSIS ABNORMAL	YES <input type="radio"/>	NO <input type="radio"/>	TONGUE PROTRUDED IN MIDLINE
		PUPIL SHAPE/POSITION	<input type="radio"/>	<input type="radio"/>	ATROPHY OF TONGUE
		ROUND			
<input type="radio"/>	<input type="radio"/>	OTHER			
<input type="radio"/>	<input type="radio"/>	LIGHT REACTION NORMAL			MENTAL STATUS
<input type="radio"/>	<input type="radio"/>	LIGHT REACTION ABNORMAL			(ALERT, CLEAR, COOPERATIVE, ETC.)
<input type="radio"/>	<input type="radio"/>	EYEBALL POSITION NORMAL			GROSS ABNORMALITIES? <input type="radio"/> NO <input type="radio"/> YES
<input type="radio"/>	<input type="radio"/>	EYEBALL POSITION ABNORMAL			SPECIFY

PRINTED NAME OF EXAMINING PHYSICIAN


SIGNATURE

YES NO
 ADDITIONAL COMMENTS ENTERED ON
 FORM AFHS 7

CASE NUMBER										NAME:																																																								
										DATE OF BIRTH:																																																								
										<table border="1"> <tr> <td>TODAY'S DATE</td> <td>MO</td> <td>DAY</td> <td>JAN</td> <td>FEB</td> <td>MAR</td> <td>APR</td> <td>MAY</td> <td>JUN</td> <td>JUL</td> <td>AUG</td> <td>SEP</td> <td>OCT</td> <td>NOV</td> <td>DEC</td> </tr> <tr> <td></td> <td></td> <td></td> <td>30</td> <td>20</td> <td>10</td> <td>9</td> <td>8</td> <td>7</td> <td>6</td> <td>5</td> <td>4</td> <td>3</td> <td>2</td> <td>1</td> </tr> <tr> <td></td> <td></td> <td></td> <td>85</td> <td>86</td> <td>87</td> <td>88</td> <td>89</td> <td>90</td> <td>91</td> <td>92</td> <td>93</td> <td>94</td> <td>95</td> <td>96</td> </tr> </table>													TODAY'S DATE	MO	DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC				30	20	10	9	8	7	6	5	4	3	2	1				85	86	87	88	89	90	91	92	93	94	95
TODAY'S DATE	MO	DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC																																																				
			30	20	10	9	8	7	6	5	4	3	2	1																																																				
			85	86	87	88	89	90	91	92	93	94	95	96																																																				
										FORM AFHS-G												HALSTEAD NEUROPSYCHOLOGICAL TEST BATTERY																																												

VERSION 1.0 JRW SCF 585

TRAILS A 100 200 300 400 500 10 20 30 40 50 60 70 80 90 0 1 2 3 4 5 6 7 8 9										TRAILS B 100 200 300 400 500 10 20 30 40 50 60 70 80 90 0 1 2 3 4 5 6 7 8 9									
LOGICAL MEMORY IMMEDIATE 10 20 0 1 2 3 4 5 6 7 8 9 30' DELAY 10 20 0 1 2 3 4 5 6 7 8 9					MEMORY FOR DESIGNS IMMEDIATE 10 20 0 1 2 3 4 5 6 7 8 9 30' DELAY 10 20 0 1 2 3 4 5 6 7 8 9														
CATEGORIES ONE 0 1 2 3 4 5 6 7 8 TWO 10 20 30 40 0 1 2 3 4 5 6 7 8 9 THREE 10 20 30 40 0 1 2 3 4 5 6 7 8 9 FOUR 10 20 30 40 0 1 2 3 4 5 6 7 8 9					FIVE 10 20 30 40 0 1 2 3 4 5 6 7 8 9 SIX 10 20 30 40 0 1 2 3 4 5 6 7 8 9 SEVEN 10 20 0 1 2 3 4 5 6 7 8 9					TOTAL 100 10 0 20 1 30 2 40 3 50 4 60 5 70 6 80 7 90 8 9									
TPT BOTH MIN 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 SEC 0 1 2 3 4 5 6 7 8 9 10 20 30 40 50 DOMINANT MIN 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 SEC 0 1 2 3 4 5 6 7 8 9 10 20 30 40 50 NON DOMINANT MIN 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 SEC 0 1 2 3 4 5 6 7 8 9 10 20 30 40 50 TOTAL <input type="text"/> <input type="text"/> MIN SEC										MEMORY 0 1 2 3 4 5 6 7 8 9 10 LOC 0 1 2 3 4 5 6 7 8 9 10									
SEASHORE RHYTHM # CORRECT 10 20 30 0 1 2 3 4 5 6 7 8 9										RANK 1 2 3 4 5 6 7 8 9 10									
SPEECH PERCEPTION # OF ERRORS 10 20 30 40 50 60 0 1 2 3 4 5 6 7 8 9																			
GRIP STRENGTH DOMINANT 10 20 30 40 50 60 70 80 90 1 2 3 4 5 6 7 8 9 NON DOMINANT 10 20 30 40 50 60 70 80 90 1 2 3 4 5 6 7 8 9					TAPPING DOMINANT 10 20 30 40 50 60 70 80 90 1 2 3 4 5 6 7 8 9 NON DOMINANT 10 20 30 40 50 60 70 80 90 1 2 3 4 5 6 7 8 9					DOMINANT IS: LEFT <input type="checkbox"/> RIGHT <input type="checkbox"/> IMPAIRMENT INDEX 0 1 2 3 4 5 6 7 8 9 10									
PRINTED NAME OF EXAMINER										SIGNATURE									

CASE NUMBER					NAME OF PARTICIPANT	LAST	FIRST	MI	
				B					
CONTINUATION OF FORM AFHS-_____					FORM AFHS-7 CONTINUATION				

USE THIS FORM TO RECORD COMMENTS, OBSERVATIONS, OR PHYSICAL FINDINGS FOR WHICH THERE IS INADEQUATE SPACE ON THE OPTICAL MARK SENSE FORMS. PLEASE INDICATE THE ORGAN SYSTEM, IF APPROPRIATE, IN EACH COMMENT BLOCK.

ORGAN SYSTEM:
COMMENTS:


ORGAN SYSTEM:
COMMENTS:

ORGAN SYSTEM:
COMMENTS:

ORGAN SYSTEM:
COMMENTS:

PRINTED NAME OF EXAMINING PHYSICIAN
--

SIGNATURE	DATE
------------------	-------------

CASE NUMBER										NAME:												GROUP #												
										DATE OF BIRTH:																								
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 C 0 1 2 3 4 5 6 7 8 9 D 0 1 2 3 4 5 6 7 8 9 E 0 1 2 3 4 5 6 7 8 9 F 0 1 2 3 4 5 6 7 8 9 G										TODAY'S DATE MO JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC DAY 30 20 10 9 8 7 6 5 4 3 2 1 YR 85 86 87 88 89 90 91 92 93 94 95 96																								
FORM AFHS-8										VIETNAM COMBAT INDEX																								

VERSION 1.0 JRW:SCF 585

INSTRUCTIONS

INSTRUCTIONS ARE INCLUDED WITH EACH QUESTION. BELOW IS AN EXAMPLE OF THE CORRECT WAY TO ANSWER EACH QUESTION.

EXAMPLE: DO YOU PLAN TO DO ANY OF THE FOLLOWING NEXT WEEK? (PLEASE BLACKEN EITHER "YES" OR "NO")

- | | | |
|--------|---|--------------------------|
| YES NO | <input type="radio"/> N VISIT A RELATIVE | (I WILL VISIT A RELATIVE |
| | <input checked="" type="radio"/> GO TO A MUSEUM | AND GO TO A MOVIE NEXT |
| | <input type="radio"/> GO TO A MOVIE | WEEK) |

AIRCRAFT


PLEASE INDICATE WHETHER YOU SERVED OR FLEW IN ANY OF THE FOLLOWING AIRCRAFT WHILE IN VIETNAM: (DO NOT INCLUDE TRANSPORTATION TO OR FROM VIETNAM)

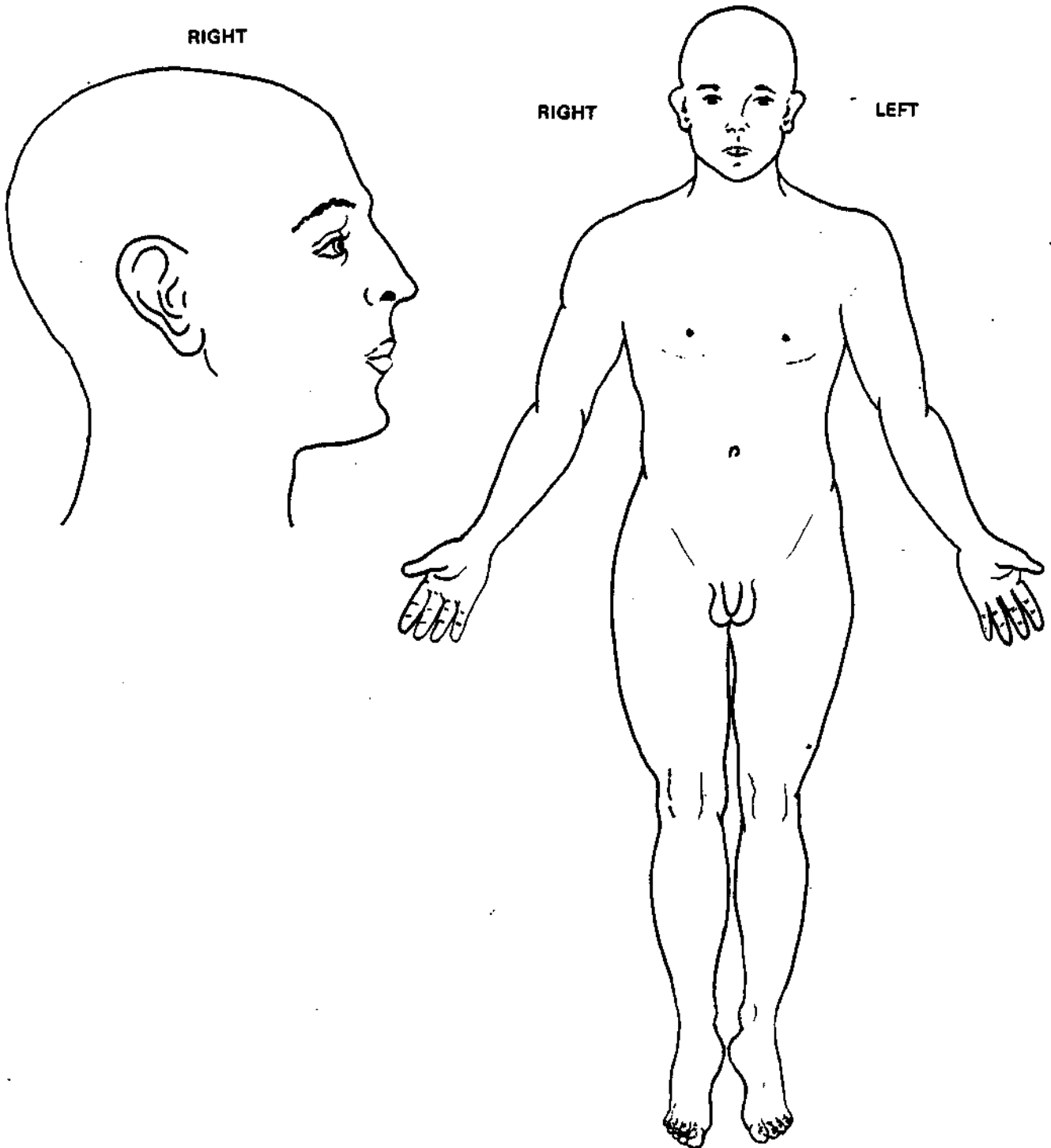
- | | | | | | | |
|---|--------|--|--------|--|--------|---|
| WERE YOU EVER A CREW MEMBER? | YES NO | <input checked="" type="radio"/> F-4 | YES NO | <input checked="" type="radio"/> C-7 | YES NO | <input checked="" type="radio"/> C-130 (GUNSHIP) |
| | | <input checked="" type="radio"/> F-5 | | <input checked="" type="radio"/> C-54 | | <input checked="" type="radio"/> HELICOPTER GUNSHIP |
| | | <input checked="" type="radio"/> F-105 | | <input checked="" type="radio"/> C-118 | | <input checked="" type="radio"/> OTHER AIRCRAFT |
| <input checked="" type="radio"/> YES <input type="radio"/> NO | | <input checked="" type="radio"/> B-52 | | <input checked="" type="radio"/> C-123 | | <input type="text"/> SPECIFY |
| | | <input checked="" type="radio"/> B-66 | | <input checked="" type="radio"/> C-130 | | |

EXPERIENCES

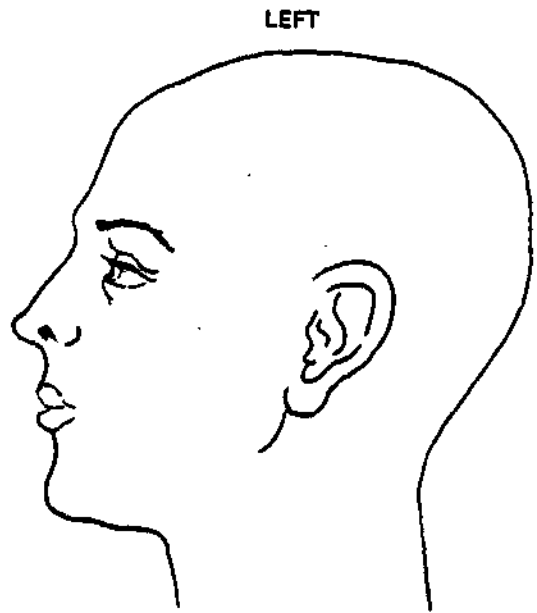
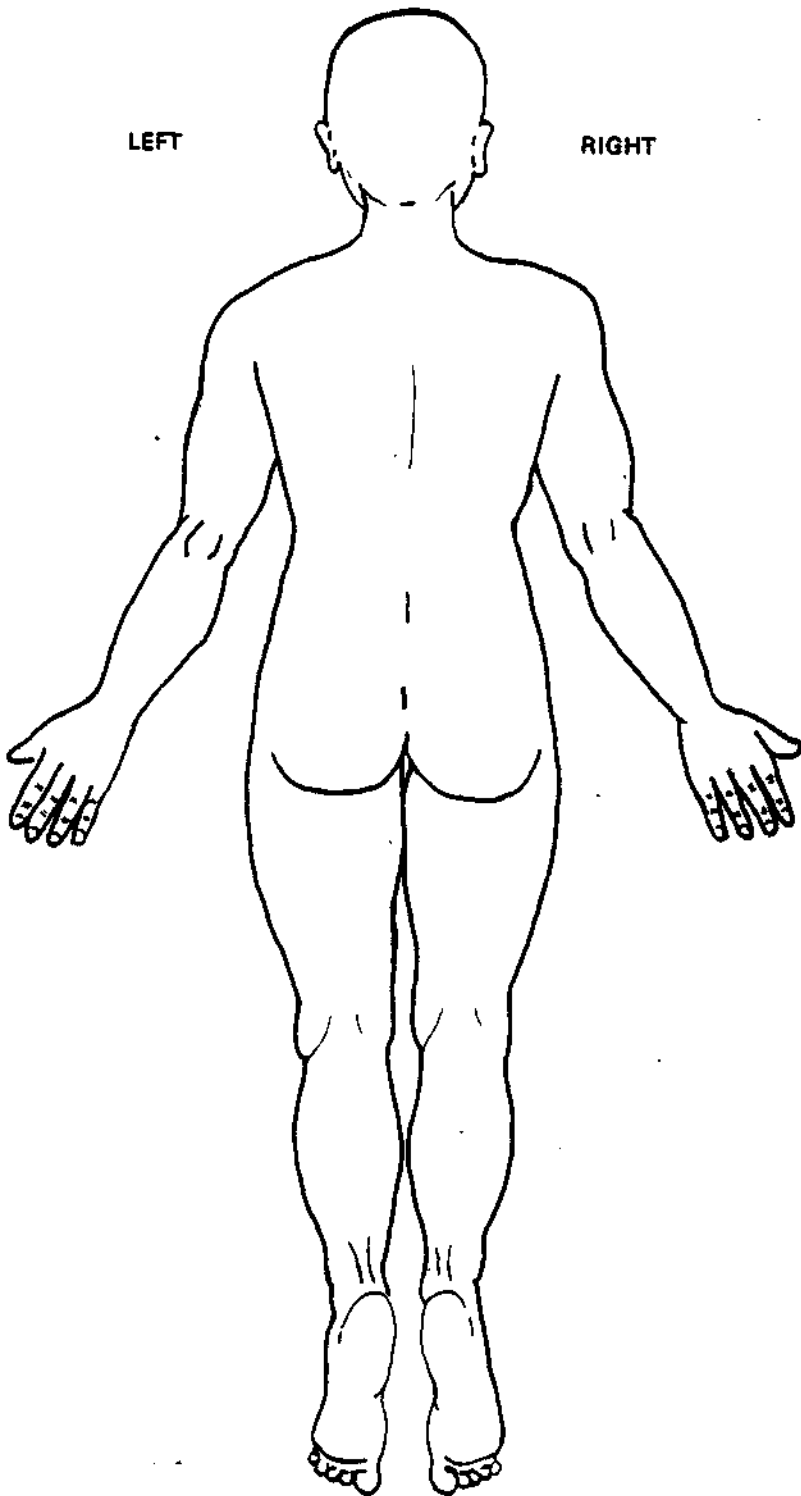
BELOW IS A LIST OF DIFFERENT COMBAT ROLES AND FLYING EXPERIENCES THAT AIR FORCE PERSONNEL HAD DURING THE VIETNAM WAR. FOR EACH STATEMENT, PLEASE BLACKEN THE "YES" CIRCLE IF YOU HAD THAT EXPERIENCE DURING THE VIETNAM WAR OR THE "NO" CIRCLE IF YOU DID NOT. PLEASE BLACKEN EITHER "YES" OR "NO" FOR EACH EXPERIENCE.

- | | | | |
|--------|--|--------|--|
| YES NO | <input checked="" type="radio"/> RECEIVED COMBAT PAY | YES NO | <input checked="" type="radio"/> FLEW IN AN AIRCRAFT THAT RECEIVED BATTLE DAMAGE |
| | <input checked="" type="radio"/> CRASH LANDED, BAILED OUT, OR SHOT DOWN | | <input checked="" type="radio"/> RECEIVED INCOMING ARTILLERY OR ROCKET FIRE AT HOME BASE OR CAMP |
| | <input checked="" type="radio"/> RECEIVED SNIPER OR SAPPER FIRE IN OR AROUND BASE | | <input checked="" type="radio"/> ENCOUNTERED MINES OR BOOBY TRAPS |
| | <input checked="" type="radio"/> MOVED KILLED OR WOUNDED PERSONNEL | | <input checked="" type="radio"/> KILLED VC OR NVA IN STRAFING OR BOMBING RUNS |
| | <input checked="" type="radio"/> SERVED AS A FORWARD AIR CONTROLLER (FAC) | | <input checked="" type="radio"/> WOUNDED |
| | <input checked="" type="radio"/> FLEW IN THE SAME AIRCRAFT WHEN FELLOW CREWMEMBER WAS WOUNDED OR KILLED | | <input checked="" type="radio"/> HAD A CLOSE FRIEND KILLED IN ACTION |
| | <input checked="" type="radio"/> FLEW IN THE SAME FORMATION OR ON THE SAME SORTIE WHEN A FELLOW CREWMEMBER WAS WOUNDED OR KILLED | | <input checked="" type="radio"/> ENGAGED VC OR NVA IN A FIREFIGHT |
| | | | <input checked="" type="radio"/> CAPTURED BY THE ENEMY |

CASE NUMBER					LAST	FIRST	MI	
				B	NAME OF PARTICIPANT			
ATTACHMENT TO FORM AFHS-_____					FORM AFHS-9 ANATOMICAL CHART			




(OVER)



PRINTED NAME OF EXAMINING PHYSICIAN

SIGNATURE	DATE
-----------	------

CASE NUMBER				NAME OF PARTICIPANT			
			B	LAST	FIRST	MI	
DATE ECG RECORDED		MO	DAY	YR	FORM AFHS-10		
ECG TECHNICIAN (INITIALS)				ELECTROCARDIOGRAM REPORT			


12-LEAD SCALAR ELECTROCARDIOGRAM	
<input type="checkbox"/> NORMAL	COMMENTS:
<input type="checkbox"/> ABNORMAL	
<input type="checkbox"/> RBBB	
<input type="checkbox"/> LBBB	
<input type="checkbox"/> NON-SPECIFIC T-WAVE CHANGES	
<input type="checkbox"/> TACHYCARDIA	
<input type="checkbox"/> BRADYCARDIA	
<input type="checkbox"/> ARRHYTHMIA	

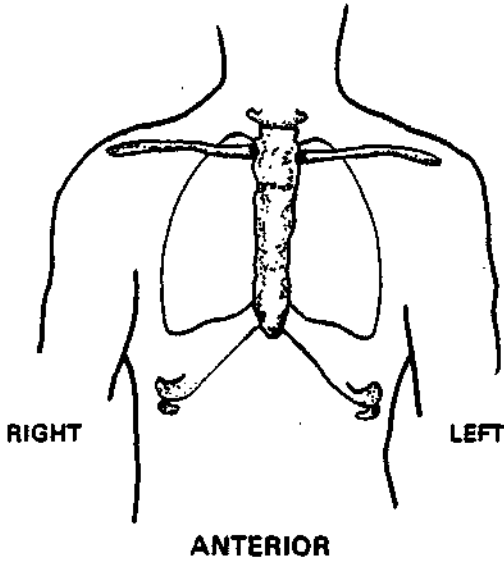
PARTICIPANT COMPLIANCE WITH 4-HOUR ABSTINENCE: YES _____ No _____

RHYTHM STRIP
INTERPRETATION OF ARRHYTHMIA:

PRINTED NAME OF CARDIOLOGIST

SIGNATURE	DATE
-----------	------

CASE NUMBER					NAME OF PARTICIPANT			
				B	LAST	FIRST	MI	
DATE OF X-RAY		MO	DAY	YR	FORM AFHS-11				PA CHEST X-RAY EXAMINATION
X-RAY TECHNICIAN (INITIALS)								




PLEASE MARK THE LOCATION OF ANY SUSPECTED ABNORMALITY(IES) WITH AN ENCIRCLED NUMBER AND DESCRIBE BELOW.

INTERPRETATION OF PA CHEST FILM		
<input type="checkbox"/> NORMAL	<input checked="" type="checkbox"/>	<input type="checkbox"/> ABNORMAL
<p>COMMENTS:</p> 		

PRINTED NAME OF RADIOLOGIST

SIGNATURE	DATE
-----------	------

CASE NUMBER				LAST			FIRST			MI				
				NAME OF PARTICIPANT										
DATE OF ANTIGEN ADMINISTRATION		MO	DAY	YR	FORM AFHS-12 DELAYED SKIN TESTS									
TIME OF ANTIGEN ADMINISTRATION														
ADMINISTERED BY (INITIALS)														

RESULTS

E = ERYTHEMA, MEASURED IN mm
I = INDURATION, MEASURED IN mm

ANTIGEN:		24-HOUR READING	48-HOUR READING
CANDIDA ALBICANS	1:1000 W/V		
MUMPS	2 CFU		
TRICHOPHYTON	1:1000 W/V		
STAPH-PHAGE-LYSATE	STAPH=6 TO 9 x 10 ⁴ CFU PHAGE=0.5 TO 5 x 10 ⁷ PFU		
TIME OF DAY THAT SKIN TESTS WERE READ			
SKIN TESTS READ BY (INITIALS)			

IS PARTICIPANT ON SYSTEMIC CORTICOSTEROIDS OR IMMUNOSUPPRESSANTS?	YES	NO	DOSAGE:
---	-----	----	---------

COMMENTS:

PRINTED NAME OF REVIEWER

SIGNATURE	DATE
------------------	-------------

APPENDIX D

Study Selection and Participation Bias

TELEPHONE QUESTIONNAIRE

1. Compared to other people your age, would you say that your health is:

- Excellent.....1
- Good.....2
- Fair.....3
- Poor.....4

2. Are you currently taking prescribed medicines for any illness or condition?

Yes.....1 (ANSWER A) No.....2 (GO TO QUESTION 3)

A. For what illness or condition are you taking prescribed medicines?

3. Within the last six months, did illness or injury keep you from going to work or from holding a job? Please do not count work around the house as a job.

Yes.....1 (ANSWER A and B) No.....2 (GO TO QUESTION 4)

A. How many days or weeks did you miss from work within the past six months?

Days Missed | ____ | ____ | ____ |
OR
Weeks Missed | ____ | ____ | ____ |

Not Able to Work at all.....995

B. What illnesses or conditions caused you to miss work or prevented you from holding a job?

4. Do you need the help of another person, or use of special equipment, to take care of personal needs such as eating, bathing, dressing, or getting up or around the house? [By "special equipment" we mean anything you use to help yourself, like a wheelchair, railing, walker, cane or other device, which is not usually used by most people.]

Yes.....1 (ANSWER A and B) No.....2 (GO TO QUESTION 5)

A. Is this help required because of a condition you've already mentioned, or because of some other health condition?

Another condition.....1 (ANSWER B) Condition.....2 (GO TO already mentioned QUESTION 5)

B. What illness or condition is that?

5. Now on to a different subject. Did you earn any income from any job in 1984?

Yes.....1 (ANSWER A) No.....2 (DO NOT ANSWER A)

A. What was your income in 1984?

Less than \$20,000.....1
\$20,000 to \$40,000.....2
More than \$40,000.....3

NAME _____
CASE ID | _ | _ | _ | _ | _ | _ |
PHONE # () _____

TABLE D-1.

Correlation Matrix of 26 Variables at Baseline,
as Determined by 1,154 Nonblack Comparisons

	D B P	W B C	S K I N	M M P I D	B U N	U S G	P U L S E	N C V E	S E M E N	R B C	P U L M	G L U C	E C G	P I Q	C N S	N C V A	C H O L	A L K P H O S	C O P R O	A L A	T 4	T E S T	S E D	G T P	
TBILI	.06	-.08	.01	.02	.02	.02	-.04	<.01	.02	.05	.02	.04	.01	-.10	-.01	-.01	.02	.08	-.01	-.06	-.07	.03	<.01	-.08	.14
DBP		<.01	.03	.06	.02	-.04	.05	-.02	<.01	.03	<.01	.20	-.10	-.03	.03	.15	-.09	.23	.08	-.01	<.01	<.01	-.19	.12	.16
WBC			.09	.07	-.04	-.09	.03	-.06	.02	.15	-.07	.12	-.05	.24	-.18	.04	-.07	.06	.15	.10	.10	.10	.05	.14	<.01
SKIN				.06	-.01	.03	<.01	-.05	.05	.02	-.04	.06	-.04	.06	-.07	.01	-.06	<.01	.04	.10	.06	.04	-.02	.03	<.01
MMPID					-.04	-.04	.02	-.04	.03	.04	.02	.12	-.03	-.01	-.18	.05	-.01	.10	.06	-.01	-.03	.03	-.01	.10	.03
BUN						.22	.02	-.02	-.01	.01	<.01	.02	-.02	-.04	.07	-.03	-.01	.03	-.04	-.15	-.06	<.01	-.09	.06	-.09
USG							<.01	-.02	-.02	.06	.09	.11	.03	-.08	<.01	-.05	-.01	-.07	<.01	-.12	.01	.02	-.11	-.02	-.07
PULSE								<.01	.08	<.01	-.06	.11	-.10	.06	-.04	.05	-.06	.05	.07	-.08	-.02	.04	-.05	.08	-.01
NCVE									-.06	.08	.12	-.06	.04	.05	.07	-.10	.30	.02	<.01	-.02	-.01	.02	.02	-.10	-.08
SEMEN										-.02	-.10	.05	-.04	.04	<.10	-.02	.01	<.01	<.01	.03	-.08	<.01	<.01	.11	.02
RBC											.07	.08	-.03	<.01	-.10	-.05	.10	.13	.07	-.11	.01	.20	.02	-.20	-.08
PULM												.01	<.01	-.07	-.03	-.10	.14	<.01	-.04	-.04	.07	-.03	-.06	-.02	-.02
GLUC													.07	.03	-.05	.06	-.10	.17	.12	-.05	-.02	.05	-.23	.13	.09
ECG														.01	.01	-.06	.03	-.02	-.07	.03	-.01	.03	.02	-.07	-.08
PLAT															-.03	<.01	-.02	.07	.05	.09	-.05	.08	.02	.08	<.01
IQ																-.06	-.07	-.04	-.08	.02	<.01	-.18	-.06	-.09	-.04
CNS																	-.13	.03	.04	.05	.01	-.03	.04	.12	.15
NCVA																		<.01	-.04	-.06	-.04	.07	.08	-.06	-.02
CHOL																			.03	<.01	-.04	.06	-.05	.18	.09
ALKPHOS																				-.03	-.01	.06	-.04	.13	.21
COPRO																					.22	-.06	.08	.02	.05
ALA																						-.12	-.03	-.04	-.03
T4																							.04	.07	.02
TEST																								-.13	<.01
SED																									.06

D-3

TABLE D-2.

Correlation Matrix of 20 Variables at First Followup, as Determined by 1,293 Comparisons

	D B P	W B C	S K I N	M M P I D	B U N	U S G	P U L S E	R B C	G L U C	E C G	P L A T	C N S	G G T P	C H O L	A L K P H O S	C O P R O	T 4	S E D	T E S T
TBILI	.01	-.14	.01	.15	-.01	-.04	-.01	.06	.04	.05	-.08	-.01	.15	.05	.03	.01	.05	.01	<.01
DBP		-.03	.04	<.01	.05	<.01	.01	.02	.07	.06	<.01	<.01	.01	<.01	<.01	.03	-.02	<.01	.08
WBC			.08	.09	-.11	<.01	.05	.14	.03	.03	.28	.05	.03	.06	.17	.13	.13	.18	.04
SKIN				<.01	-.01	.03	-.02	<.01	<.01	<.01	-.02	-.03	<.01	-.01	-.04	<.01	<.01	<.01	.01
MMPID					-.02	.03	.05	.03	.10	.09	.07	.08	.03	.13	.02	<.01	.02	.13	-.08
BUN						.12	.02	-.01	<.01	.09	-.06	-.05	.10	.06	-.05	.15	-.03	<.01	-.17
USG							.02	.01	.06	-.01	-.03	.03	<.01	.03	.08	-.05	-.02	.03	-.05
PULSE								<.01	.05	.05	-.01	.01	.03	<.01	<.01	.04	.01	.08	-.05
RBC									<.01	<.01	.01	-.04	.14	.08	-.01	-.08	.22	-.26	.04
GLUC										.10	-.07	-.02	.22	.15	.07	.10	.01	.16	-.26
ECG											.01	.06	.08	.07	.08	<.01	.03	.13	-.09
PLAT												.04	-.06	.05	.08	<.01	.04	.12	.04
CNS													.09	-.04	.16	<.01	.01	.09	.01
GGTP														.06	.35	.12	.03	.17	-.05
CHOL															.03	-.04	.02	.18	-.06
ALKPHOS																.04	.08	.27	-.07
COPRO																	<.01	.17	.04
T4																		.05	.13
SED																			-.23

D-4

APPENDIX E
Statistical Methods

RUN: Initial screening models:
 Model A = all main effects
 Model B = Model A + all 2-way interactions
 Model C = Model B + all 3-way interactions involving exposure group (E)

TEST: compare C with B for 3-way interactions: Is p-value > 0.05 for the global test of all 3-way interactions AND p-value > 0.05 for each individual 3-way interaction? (i.e., can all 3-way interactions be dropped?)

E-1

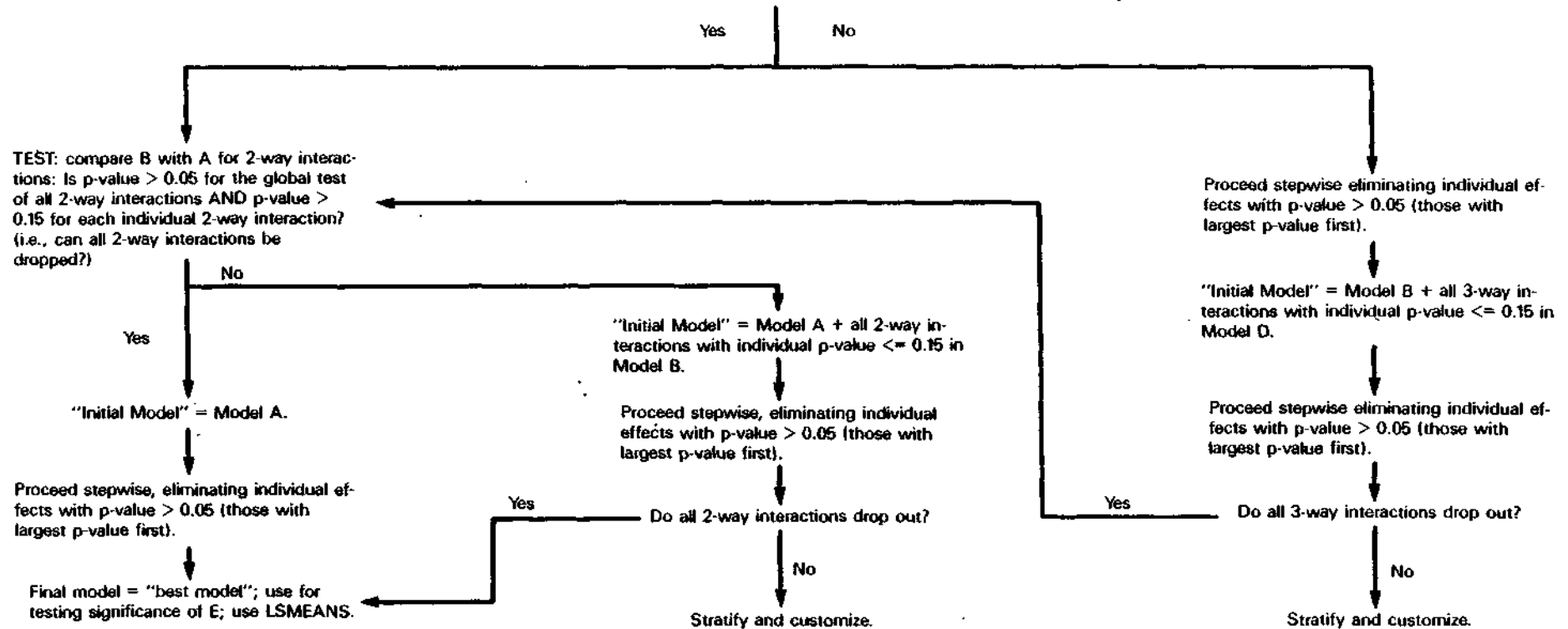


Figure E-1.
 Modeling Strategy

Continuous Dependent Variable:

Use SAS® general linear models (GLM) procedure and follow the chart.

Dichotomous Dependent Variable:

Use BMDP®-LR (logistic regression) with MLR option, and follow the chart. If the number of covariates is huge, use ACE option for Models A, B, C.

Polychotomous Dependent Variable:

Use BMDP®-4F (log-linear model) adding "delta" = 0.1 to each cell, and follow the chart. Use LAMB and COV options for parameter estimates when "best model" found.

APPENDIX F
Exposure Index

TABLE F-1.

Herbicide Orange Equivalent Gallons and
Ranch Hand Manning by Month

Mo./Yr.	Gallons Sprayed	Pilot (Occ. 1)	Navigator (Occ. 2)	Officer- Other (Occ. 3)	Enlisted Flyer (Occ. 4)	Enlisted- Other (Occ. 5)
10/61	0	0	0	0	0	0
11/61	0	5	11	1	6	14
12/61	0	9	2	1	7	20
01/62	191,426	14	2	1	7	23
02/62	324,216	14	2	1	7	23
03/62	191,426	15	2	1	7	20
04/62	0	16	2	1	6	14
05/62	0	15	3	1	6	13
06/62	0	12	2	0	5	7
07/62	0	13	2	0	5	4
08/62	0	11	2	0	5	5
09/62	334,126	12	2	0	5	6
10/62	334,126	9	1	0	5	6
11/62	0	10	0	0	5	5
12/62	90,879	8	0	0	4	5
01/63	0	9	0	0	5	4
02/63	0	7	1	0	5	4
03/63	0	12	1	0	5	6
04/63	0	12	1	0	5	6
05/63	0	10	1	0	5	7
06/63	174,024	10	1	0	4	7
07/63	259,150	11	1	0	8	6
08/63	0	8	0	0	8	4
09/63	0	10	1	1	9	4
10/63	339,588	7	1	1	9	6
11/63	377,172	6	1	1	10	6
12/63	942,630	5	1	1	6	6
01/64	121,454	7	1	1	7	5
02/64	363,758	5	1	0	7	4
03/64	755,312	8	1	0	5	4
04/64	56799	9	1	0	6	2
05/64	152,271	10	2	0	5	2
06/64	612,709	7	3	0	5	2
07/64	282,789	9	3	0	6	3
08/64	777,669	9	3	0	5	3
09/64	1,413,945	8	3	0	4	2
10/64	1,413,945	9	3	0	4	2
11/64	1,413,945	11	3	0	4	1
12/64	1,413,945	10	3	0	6	1
01/65	1,296,116	11	4	0	6	1
02/65	1,437,510	12	5	0	6	1
03/65	730,538	13	4	1	6	1

TABLE F-1. (continued)

Herbicide Orange Equivalent Gallons and
Ranch Hand Manning by Month

Mo./Yr.	Gallons Sprayed	Pilot (Occ. 1)	Navigator (Occ. 2)	Officer- Other (Occ. 3)	Enlisted Flyer (Occ. 4)	Enlisted- Other (Occ. 5)
04/65	659,841	14	3	1	6	2
05/65	1,767,431	15	4	1	6	2
06/65	0	16	4	1	7	4
07/65	942,630	19	4	1	7	3
08/65	26,500	19	4	1	7	3
09/65	44,650	22	4	1	6	3
10/65	78,850	23	4	1	6	6
11/65	106,900	24	6	1	10	12
12/65	148,525	23	5	1	11	12
01/66	152,450	21	6	1	10	16
02/66	129,150	22	6	1	10	26
03/66	135,600	21	4	2	10	32
04/66	141,050	22	5	2	10	37
05/66	183,900	21	6	2	9	38
06/66	191,830	20	6	2	10	41
07/66	112,300	21	8	2	9	45
08/66	192,050	26	8	2	11	46
09/66	213,970	28	9	2	12	62
10/66	122,040	34	8	3	16	85
11/66	164,800	41	8	4	18	104
12/66	212,100	45	9	5	28	123
01/67	202,360	49	9	5	28	123
02/67	363,830	59	13	5	28	116
03/67	285,400	51	13	4	28	114
04/67	208,300	50	14	4	33	108
05/67	251,320	53	15	4	34	101
06/67	335,860	55	13	3	36	105
07/67	253,884	51	15	3	37	163
08/67	162,895	63	13	4	32	160
09/67	298,615	60	18	5	33	161
10/67	265,335	55	19	5	36	149
11/67	372,425	55	17	6	33	145
12/67	383,605	58	18	6	34	129
01/68	333,595	54	19	6	33	127
02/68	27,450	65	19	6	35	141
03/68	48,200	69	20	5	34	160
04/68	307,740	72	20	6	36	161
05/68	336,300	75	18	6	32	160
06/68	226,325	77	18	6	37	164

TABLE F-1. (continued)

Herbicide Orange Equivalent Gallons and
Ranch Hand Manning by Month

Mo./Yr.	Gallons Sprayed	Pilot (Occ. 1)	Navigator (Occ. 2)	Officer- Other (Occ. 3)	Enlisted Flyer (Occ. 4)	Enlisted- Other (Occ. 5)
07/68	258,100	84	19	7	42	187
08/68	289,160	91	18	9	45	192
09/68	216,300	89	22	8	44	147
10/68	72,250	89	20	8	49	155
11/68	189,100	101	17	7	53	153
12/68	218,750	94	17	8	51	154
01/69	264,450	98	19	7	51	154
02/69	197,450	91	18	5	51	166
03/69	356,500	90	17	5	53	172
04/69	339,800	94	20	6	54	161
05/69	353,800	93	19	6	54	151
06/69	383,533	88	19	7	57	155
07/69	287,425	91	16	6	55	152
08/69	299,100	85	16	6	55	155
09/69	206,800	83	15	6	61	142
10/69	181,000	83	17	6	61	122
11/69	205,100	90	16	6	60	118
12/69	276,900	76	16	5	52	114
01/70	186,350	66	15	5	54	116
02/70	152,100	58	15	5	41	122
03/70	153,730	59	13	5	39	125
04/70	45,700	54	13	5	37	109
05/70	0	51	14	5	29	94
06/70	0	47	14	3	18	84
07/70	0	44	11	2	16	74
08/70	0	40	9	1	14	63
09/70	0	40	7	1	13	43
10/70	0	34	6	1	14	37
11/70	0	30	5	1	15	35
12/70	0	25	4	1	13	30
01/71	0	23	4	1	14	28
02/71	0	23	4	1	14	28
03/71	0	23	4	1	14	28
04/71	0	23	4	1	14	28
05/71	0	23	4	1	14	28
06/71	0	28	4	1	14	28
07/71	0	29	4	1	14	28
08/71	0	29	4	1	14	28
09/71	0	29	4	1	14	28
10/71	0	29	4	1	14	28

Source: Baseline Morbidity Report, 24 February 1984.

APPENDIX G
General Health

APPENDIX G: General Health

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TABLE G-1.

Summary Statistics for
General Health Covariates by Group

Covariate	Covariate Category	Group		p-Value
		Ranch Hand Percent	Comparison Percent	
Race	Black	5.9	6.4	0.673
	Nonblack	94.1	93.6	
Occupation	Officer	37.4	37.4	0.727
	Enlisted Flyer	17.4	16.2	
	Enlisted Groundcrew	45.2	46.3	
		<u>Mean±SE</u>	<u>Mean±SE</u>	
Age (at Baseline)	--	43.94±0.24	43.85±0.22	0.789
Personality Score	--	-1.18±0.29	-1.56±0.25	0.332

-- Covariate not categorized for these results.

TABLE G-2.

Unadjusted Analysis for Self-Perception of Health by Group
(Original Comparisons Only)

Group	Self-Perception of Health								Total
	Excellent		Good		Fair		Poor		
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	
Ranch Hand	490	48.2	434	42.7	74	7.3	18	1.8	1,016
Original Comparison	490	51.3	403	42.2	55	5.8	7	0.7	955

p=0.075

TABLE G-3.

Unadjusted Analysis for Appearance of Acute
Illness or Distress by Group
(Original Comparisons Only)

Group	Acute Illness or Distress				Total	p-Value*
	Yes		No			
	Number	Percent	Number	Percent		
Ranch Hand	4	0.4	1,010	99.6	1,014	0.340
Original Comparison	6	0.6	949	99.4	955	

*Fisher's exact test, 1-sided.

TABLE G-4.

Unadjusted Analysis for Appearance of Relative Age by Group
(Original Comparisons Only)

Group	Appearance of Relative Age						Total	p-Value
	Younger		Same		Older			
	Number	Percent	Number	Percent	Number	Percent		
Ranch Hand	16	1.6	957	94.3	42	4.1	1,015	0.454
Original Comparison	9	0.9	906	94.9	40	4.2	955	

TABLE G-5.

**Adjusted Relative Risks of Appearance of
Relative Age by Occupation
(Original Comparisons Only)**

Occupation	Adjusted Relative Risk	95% C.I.	p-Value
Officer	3.27	(0.67,15.8)	0.142
Enlisted Flyer	0.47	(0.20,1.12)	0.089
Enlisted Groundcrew	1.17	(0.65,2.08)	0.603

TABLE G-6.

**Unadjusted Analysis for Sedimentation Rate by Group
(Original Comparisons Only)**

Group	Sedimentation Rate				Total	p-Value
	Normal ≤20 mm/hr		Abnormal >20 mm/hr			
	Number	Percent	Number	Percent		
Ranch Hand	957	94.2	59	5.8	1,016	0.059
Original Comparison	918	96.1	37	3.9	955	

TABLE G-7.

Unadjusted Analysis for Percent Body Fat by Group
(Original Comparisons Only)

Group	Percent Body Fat				Total	p-Value
	Lean/Normal <25%		Obese >25%			
	Number	Percent	Number	Percent		
Ranch Hand	831	81.8	185	18.2	1,016	0.230
Original Comparison	759	79.6	195	20.4	954	

APPENDIX B

Malignancy

APPENDIX H: Malignancy

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TABLE H-1.

Unadjusted Analyses of Followup Participants with Verified and Suspected Neoplasms in the Baseline-Followup Interval by Group (Nonblacks and Blacks, Original Comparisons Only)

Site	Neoplasm Behavior and Status	Group*				Total**	p-Value***
		Ranch Hand		Original Comparison			
		Number**	Percent	Number**	Percent		
Skin	Malignant						
	Verified	37	3.6	31	3.2	68	0.711
	Verified and Suspected	47	4.6	45	4.7	92	0.999
	Benign						
	Verified	76	7.5	65	6.8	141	0.600
	Verified and Suspected	78	7.7	68	7.1	146	0.667
	Uncertain Behavior and Unspecified Nature:						
	Verified	1	0.1	1	0.1	2	0.999
	Verified and Suspected	1	0.1	1	0.1	2	0.999
	Any Skin Neoplasm ^a						
Verified	114	11.2	96	10.1	210	0.422	
Verified and Suspected	124	12.2	113	11.8	237	0.835	
Systemic	Malignant						
	Verified	8	0.8	6	0.6	14	0.791
	Verified and Suspected	12	1.2	11	1.2	23	0.999
	Benign						
	Verified	42	4.1	41	4.3	83	0.911
	Verified and Suspected	48	4.7	49	5.1	97	0.679
	Uncertain Behavior and Unspecified Nature:						
	Verified	6	0.6	6	0.6	12	0.999
	Verified and Suspected	6	0.6	9	0.9	15	0.442
	Any Systemic Neoplasm ^b						
Verified	55	5.4	51	5.3	106	0.999	
Verified and Suspected	65	6.4	66	6.9	131	0.652	

TABLE H-1. (continued)

Unadjusted Analyses of Followup Participants with Verified and Suspected Neoplasms in the Baseline-Followup Interval by Group (Nonblacks and Blacks, Original Comparisons Only)

Site	Neoplasm Behavior and Status	Group*				Total**	p-Value***
		Ranch Hand		Original Comparison			
		Number**	Percent	Number**	Percent		
All Neoplasms	Malignant, Benign, Uncertain Behavior, Unspecified Nature ^c						
	Verified	161	15.9	140	14.7	301	0.491
	Verified and Suspected	177	17.4	169	17.7	346	0.906

*Sample sizes: 1,016 Ranch Hands, 955 Original Comparisons.

**Number of participants.

***Fisher's exact test.

^aParticipant has one or more malignant, benign, or unspecified skin neoplasms.

^bParticipant has one or more malignant, or benign skin or systemic neoplasms.

^cParticipant has one or more malignant, benign, or unspecified systemic neoplasms.

TABLE H-2.

Unadjusted Analyses of Nonblack Followup Participants with Verified and Suspected Malignant Skin Neoplasms in the Baseline-Followup Interval by Cell Type and Group (Original Comparisons Only)

Cell Type	Status	Statistic*	Group**				Est. Relative Risk (95% C.I.)	p-Value
			Ranch Hand		Original Comparison			
Basal Cell Carcinoma	Verified	Number/% Total Neoplasms	29 42	3.0%	22 31	2.5%	1.24 (0.71,2.18)	0.480
	Verified & Suspected	Number/% Total Neoplasms	36 53	3.8%	36 46	4.0%	0.94 (0.58,1.50)	0.811
Squamous Cell Carcinoma	Verified	Number/% Total Neoplasms	4 6	0.4%	3 3	0.3%	1.25 (0.28,5.61)	0.999
	Verified & Suspected	Number/% Total Neoplasms	4 6	0.4%	3 3	0.3%	1.25 (0.28,5.61)	0.999
Melanoma	Verified	Number/% Total Neoplasms	1 2	0.1%	3 3	0.3%	0.31 (0.03,3.01)	0.359
	Verified & Suspected	Number/% Total Neoplasms	1 2	0.1%	4 4	0.4%	0.23 (0.03,2.10)	0.204
All Malignant Skin Neoplasms	Verified	Number/% Total Neoplasms	37 56	3.9%	31 41	3.5%	1.13 (0.69,1.83)	0.711
	Verified & Suspected	Number/% Total Neoplasms	47 70	4.9%	45 58	5.0%	0.98 (0.64,1.49)	0.999
Sun-Exposure Related Malignant Neoplasms ^a	Verified	Number/% Total Neoplasms	32 47	3.4%	25 33	2.8%	1.21 (0.71,2.06)	0.504
	Verified & Suspected	Number/% Total Neoplasms	39 58	4.1%	39 50	4.4%	0.94 (0.59,1.47)	0.817

*Number and percent of participants; total number of malignant neoplasms of specified cell type.

**Number of participants -- 956 Ranch Hands, 897 Original Comparisons.

^aBasal cell carcinoma, melanoma, and malignant epithelial neoplasms NOS.

TABLE H-3.

Association Between Baseline-Followup Interval Basal Cell Carcinoma Incidence
and the Covariates for Combined Followup Ranch Hand and Comparison Nonblack Participants

Covariate	Covariate Category	Verified			Verified and Suspected		
		Number*	Percent	p-Value	Number*	Percent	p-Value
Age	Born \geq 1942	11	1.3	0.001	14	1.6	<0.001
	Born 1923-41	43	3.6		61	5.1	
	Born \leq 1922	5	5.8		9	10.3	
Occupation	Officer	31	3.7	0.047	47	5.5	0.003
	Enlisted Flyer	11	3.1		14	3.9	
	Enlisted Groundcrew	17	1.8		23	2.4	
Total Lifetime Smoking (Pack-Years)	0	16	2.6	0.023	21	3.4	0.005
	>0-20	21	2.1		28	2.8	
	>20-40	12	3.1		24	6.1	
	>40	10	6.4		11	7.0	
Total Lifetime Alcohol Consumption (Drink-Years)	0	4	2.8	0.980	5	3.6	0.800
	>0-5	20	2.8		27	3.8	
	>5-30	18	2.8		24	3.7	
	>30-100	13	2.7		24	5.0	
	>100	4	3.9		4	3.9	
Ethnic Background ^a	A	49	3.1	0.333	72	4.6	0.046
	B	8	1.9		9	2.1	
	C	1	1.6		1	1.6	
	D	0	0.0		0	0.0	
Skin Color	Dark	0	0.0	0.156	0	0.0	0.232
	Medium	1	1.4		2	2.7	
	Pale	3	1.0		5	1.6	
	Dark Peach	43	3.4		56	4.4	
	Pale Peach	12	2.3		21	4.0	

TABLE H-3. (continued)

Association Between Baseline-Followup Interval Basal Cell Carcinoma Incidence
and the Covariates for Combined Followup Ranch Hand and Comparison Nonblack Participants

Covariate	Covariate Category	Verified			Verified and Suspected		
		Number*	Percent	p-Value	Number*	Percent	p-Value
Eye Color	Brown	18	2.8	0.590	24	3.7	0.998
	Hazel	17	3.7		18	4.0	
	Green	2	1.7		5	4.2	
	Grey	2	2.2		4	4.3	
	Blue	20	2.4		33	3.9	
Hair Color	Black	11	2.5	0.152	16	3.6	0.040
	Dark Brown	25	2.4		37	3.6	
	Light Brown	18	3.2		24	4.3	
	Red	2	12.5		3	18.8	
	Blond	3	2.8		4	3.7	
Residential History (Average Latitude)	≥37°	21	1.9	0.008	31	2.7	0.004
	<37°	38	3.7		53	5.2	
Skin Reaction to First 30 Min. of Sun Exposure	Burns	7	2.8	0.001	11	4.5	<0.001
	Usually Burns	24	5.6		32	7.5	
	Burns Mildly	17	2.1		22	2.7	
	Rarely Burns	11	1.6		19	2.8	
Skin Reaction to >2 Hrs. of Sun After First Exposure	Burns Painfully	2	1.7	<0.001	4	3.3	0.027
	Burns	21	6.2		23	6.8	
	Becomes Red	22	2.1		35	3.4	
	No Reaction	14	2.1		22	3.3	
Skin Reaction After Repeated Exposure to Sun	Freckles, No Tan	0	0	<0.001	1	2.2	0.001
	Tans Mildly	20	6.4		25	8.0	
	Tans Moderately	22	2.2		33	3.2	
	Tans Deep Brown	16	2.0		24	3.1	

TABLE H-3. (continued)

Association Between Baseline-Followup Interval Basal Cell Carcinoma Incidence
and the Covariates for Combined Followup Ranch Hand and Comparison Nonblack Participants

Covariate	Covariate Category	Verified			Verified and Suspected		
		Number*	Percent	p-Value	Number*	Percent	p-Value
Sun Reaction Index	Tends to Burn	2	1.4	<0.001	4	2.8	<0.001
	Mild Reaction	27	6.0		32	7.1	
	Tends to Tan	29	1.9		47	3.0	
Exposures to Carcinogens	Asbestos	Yes	10	0.519	17	3.7	0.999
		No	49		67			3.9
	Nonmedical x rays	Yes	17	0.272	26	5.3	0.084
		No	42		58			3.5
	Industrial Chemicals	Yes	28	0.511	40	3.6	0.437
		No	31		44			4.2
	Herbicides	Yes	40	0.142	57	4.5	0.072
		No	19		27			3.0
	Insecticides	Yes	40	0.281	55	4.2	0.365
		No	19		29			3.4
	Degreasing Chemicals	Yes	35	0.894	47	3.7	0.735
		No	24		37			4.1
Composite Carcinogen Exposure	Yes	15	0.523	18	3.7	0.999	
	No	42		64			3.9

TABLE H-3. (continued)

Association Between Baseline-Followup Interval Basal Cell Carcinoma Incidence
and the Covariates for Combined Followup Ranch Hand and Comparison Nonblack Participants

Covariate	Covariate Category	Verified			Verified and Suspected			
		Number*	Percent	p-Value	Number*	Percent	p-Value	
Exposure to Individual Carcinogens	Anthracene	Yes	0	0.0	0.999	0	0.0	0.999
		No	59	2.7		84	3.9	
	Arsenic	Yes	2	4.9	0.301	3	7.3	0.206
		No	56	2.6		80	3.8	
	Benzene	Yes	4	5.4	0.140	5	6.8	0.207
		No	55	2.6		79	3.8	
	Benzidine	Yes	1	9.1	0.263	1	9.1	0.354
		No	58	2.7		83	3.9	
	Chromates	Yes	3	3.6	0.484	4	4.8	0.558
		No	54	2.6		78	3.8	
	Coal Tar	Yes	1	1.5	0.999	2	2.9	0.999
		No	58	2.8		82	3.9	
	Creosote	Yes	6	3.8	0.441	7	4.4	0.669
		No	53	2.6		77	3.8	
Aminodiphenyl	Yes	0	0.0	0.999	0	0.0	0.999	
	No	58	2.7		83	3.9		
Chloromethyl Ether	Yes	1	4.8	0.442	1	4.8	0.566	
	No	58	2.7		83	3.9		
Mustard Gas	Yes	0	0.0	0.999	0	0.0	0.999	
	No	59	2.7		84	3.9		

TABLE H-3. (continued)

Association Between Baseline-Followup Interval Basal Cell Carcinoma Incidence
and the Covariates for Combined Followup Ranch Hand and Comparison Nonblack Participants

Covariate	Covariate Category	Verified			Verified and Suspected			
		Number*	Percent	p-Value	Number*	Percent	p-Value	
Exposure to Individual Carcinogens (continued)	Naphthylamine	Yes	3	5.8	0.161	4	7.7	0.136
		No	55	2.6		79	3.7	
	Cutting Oils	Yes	9	4.0	0.200	12	5.3	0.271
		No	50	2.6		72	3.7	
	Trichloroethylene	Yes	4	2.2	0.814	6	3.3	0.842
		No	55	2.8		78	3.9	
	Ultraviolet Light	Yes	2	4.6	0.339	2	4.6	0.688
		No	57	2.7		82	3.9	
	Vinyl Chloride	Yes	0	0.0	0.999	1	3.2	0.999
		No	59	2.8		83	3.9	

*Number of participants with basal cell carcinoma.

^aEthnic Background:

A - English, Welsh, Scottish, Irish.

B - Scandinavian, German, Polish, Russian, other Slavic, Jewish, French.

C - Spanish, Italian, Greek.

D - Mexican, American Indian, Asian.

TABLE H-4.

**Association Between Baseline-Followup Interval Sun Exposure-Related Skin Malignancy Incidence
and the Covariates for Combined Followup Ranch Hand and Comparison Nonblack Participants**

Covariate	Covariate Category	Verified			Verified and Suspected		
		Number*	Percent	p-Value	Number*	Percent	p-Value
Age	Born \geq 1942	14	1.6	0.004	19	2.2	<0.001
	Born 1923-41	46	3.8		64	5.4	
	Born \leq 1922	5	5.8		9	10.3	
Occupation	Officer	33	3.9	0.077	50	5.9	0.006
	Enlisted Flyer	12	3.3		15	4.2	
	Enlisted Groundcrew	20	2.1		27	2.8	
Total Lifetime Smoking (Pack-Years)	0	19	3.1	0.012	24	3.9	0.007
	>0-20	22	2.2		31	3.1	
	>20-40	13	3.3		25	6.4	
	>40	11	7.0		12	7.6	
Total Lifetime Alcohol Consumption (Drink-Years)	0	4	2.8	0.858	5	3.6	0.736
	>0-5	22	3.1		29	4.0	
	>5-30	18	2.8		26	4.0	
	>30-100	15	3.1		26	5.4	
	>100	5	4.8		5	4.8	
Ethnic Background	A	54	3.4	0.213	78	4.9	0.036
	B	8	1.9		10	2.4	
	C	1	1.6		1	1.6	
	D	0	0.0		0	0.0	
Skin Color	Dark	0	0.0	0.116	0	0.0	0.213
	Medium	1	1.4		2	2.7	
	Pale	4	1.3		6	2.0	
	Dark Peach	48	3.8		62	4.9	
	Pale Peach	12	2.3		22	4.2	

TABLE H-4. (continued)

Association Between Baseline-Followup Interval Sun Exposure-Related Skin Malignancy Incidence and the Covariates for Combined Followup Ranch Hand and Comparison Nonblack Participants

Covariate	Covariate Category	Verified			Verified and Suspected		
		Number*	Percent	p-Value	Number*	Percent	p-Value
Eye Color	Brown	20	3.1	0.461	27	4.2	0.999
	Hazel	19	4.2		20	4.4	
	Green	2	1.7		5	4.2	
	Grey	2	2.2		4	4.3	
	Blue	22	2.6		36	4.2	
Hair Color	Black	12	2.7	0.171	17	3.9	0.051
	Dark Brown	27	2.6		40	3.9	
	Light Brown	20	3.6		26	4.6	
	Red	2	12.5		3	18.8	
	Blond	4	3.7		6	5.6	
Residential History (Average Latitude)	≥37°	24	2.1	0.011	34	3.0	0.003
	<37°	41	4.0		58	5.7	
Skin Reaction to First 30 Min. of Sun Exposure	Burns	8	3.2	<0.001	13	5.3	<0.001
	Usually Burns	26	6.1		34	7.9	
	Burns Mildly	20	2.5		26	3.2	
	Rarely Burns	11	1.6		19	2.8	
Skin Reaction to >2 Hrs. of Sun After First Exposure	Burns Painfully	4	3.3	0.001	6	5.0	0.016
	Burns	22	6.5		25	7.4	
	Becomes Red	24	2.3		38	3.6	
	No Reaction	15	2.3		23	3.5	
Skin Reaction After Repeated Exposure to Sun	Freckles, No Tan	0	0	<0.001	1	2.2	<0.001
	Tans Mildly	22	7.0		27	8.6	
	Tans Moderately	23	2.3		35	3.4	
	Tans Deep Brown	19	2.4		28	3.6	

TABLE H-4. (continued)

Association Between Baseline-Followup Interval Sun Exposure-Related Skin Malignancy Incidence and the Covariates for Combined Followup Ranch Hand and Comparison Nonblack Participants

Covariate	Covariate Category	Verified			Verified and Suspected		
		Number*	Percent	p-Value	Number*	Percent	p-Value
Sun Reaction Index	Tends to Burn	4	2.8	<0.001	6	4.1	<0.001
	Mild Reaction	28	6.2		34	7.5	
	Tends to Tan	32	2.1		51	3.3	
Exposures to Carcinogens	Asbestos	Yes	10	0.283	17	3.7	0.602
		No	55		75			4.4
	Nonmedical X Rays	Yes	18	0.367	27	5.5	0.129
		No	47		65			3.9
	Industrial Chemicals	Yes	33	0.900	45	4.0	0.594
		No	32		47			4.5
	Herbicides	Yes	43	0.203	61	4.8	0.130
		No	22		31			3.4
	Insecticides	Yes	42	0.523	58	4.4	0.664
		No	23		34			4.0
	Degreasing Chemicals	Yes	37	0.899	50	4.0	0.451
		No	28		42			4.6
Composite Carcinogen Exposure		Yes	15	0.879	18	3.7	0.608
		No	48		72			4.4

TABLE H-4. (continued)

Association Between Baseline-Followup Interval Sun Exposure-Related Skin Malignancy Incidence
and the Covariates for Combined Followup Ranch Hand and Comparison Nonblack Participants

Covariate	Covariate Category	Verified			Verified and Suspected			
		Number*	Percent	p-Value	Number*	Percent	p-Value	
Exposure to Individual Carcinogens	Anthracene	Yes	0	0.0	0.999	0	0.0	0.999
		No	65	3.0		92	4.3	
	Arsenic	Yes	2	4.9	0.343	3	7.3	0.246
		No	62	2.9		88	4.1	
	Benzene	Yes	4	5.4	0.280	5	6.8	0.241
		No	61	2.9		87	4.2	
	Benzidine	Yes	1	9.1	0.285	1	9.1	0.380
		No	64	3.0		91	4.2	
	Chromates	Yes	3	3.6	0.734	4	4.8	0.777
		No	60	2.9		86	4.1	
	Coal Tar	Yes	1	1.5	0.721	2	2.9	0.999
		No	64	3.1		90	4.3	
Creosote	Yes	6	3.8	0.473	7	4.4	0.839	
	No	59	2.9		85	4.2		
Aminodiphenyl	Yes	0	0.0	0.999	0	0.0	0.999	
	No	64	3.0		91	4.2		
Chloromethyl Ether	Yes	1	4.8	0.475	1	4.8	0.600	
	No	64	3.0		91	4.3		
Mustard Gas	Yes	0	0.0	0.999	0	0.0	0.999	
	No	65	3.0		92	4.3		

TABLE H-4. (continued)

Association Between Baseline-Followup Interval Sun Exposure-Related Skin Malignancy Incidence and the Covariates for Combined Followup Ranch Hand and Comparison Nonblack Participants

Covariate	Covariate Category	Verified			Verified and Suspected			
		Number*	Percent	p-Value	Number*	Percent	p-Value	
Exposure to Individual Carcinogens (continued)	Naphthylamine	Yes	3	5.8	0.197	4	7.7	0.277
		No	61	2.9		87	4.1	
	Cutting Oils	Yes	9	4.0	0.406	12	5.3	0.384
		No	56	2.9		80	4.1	
	Trichloroethylene	Yes	4	2.2	0.653	6	3.3	0.701
		No	61	3.1		86	4.4	
	Ultraviolet Light	Yes	2	4.6	0.384	2	4.6	0.711
		No	63	3.0		90	4.3	
	Vinyl Chloride	Yes	0	0.0	0.999	1	3.2	0.999
		No	65	3.1		91	4.3	

*Number of participants with sun exposure-related skin malignancies.

^aEthnic Background:

- A - English, Welsh, Scottish, Irish.
- B - Scandinavian, German, Polish, Russian, other Slavic, Jewish, French.
- C - Spanish, Italian, Greek.
- D - Mexican, American Indian, Asian.

TABLE H-5.

Summary Results of Main Effects Models for Selection
of Covariates for Basal Cell Carcinomas in the Baseline-Followup Interval

Covariate	Category	Basal Cell Carcinoma in Baseline-Followup Interval	
		p-Value	
		Model 1 ^a	Model 2 ^b
Group	Ranch Hand, Comparison	0.264	0.259
Age	Born \geq 1942, 1923-1941, \leq 1922	0.001	0.002
Occupation	Officer, Enlisted Flyer, Enlisted Groundcrew	0.683	0.609
Lifetime Smoking	0-20, >20-40, >40 Pack-years	0.091	0.096
Lifetime Alcohol	0-30, >30	0.743	0.819
Ethnic Background ^c	A, Not A	0.391	0.425
Skin Color	Peach, Not Peach	0.084	0.055
Hair Color	Blond or Red, Other	0.880	0.761
Reaction of Skin to 30 Minutes Sun	Burns, Usually Burns, Other	0.195	--
Reaction of Skin to >2 Hours of Sun	Burns Painfully, Burns, Other	0.007	--
Reaction of Skin to Repeated Sun Exposure	Freckles With no Tan, Tans Easily, Other	<0.001	--
Sun-Reaction Index	Burns With Freckles, Intermediate Reaction, Tans Easily	--	<0.001
Residential History	<37° N latitude, \geq 37° N latitude	0.006	0.008

^aModel includes three reactions of skin to sun variables.

^bModel includes sun-reaction index.

^cEthnic background: A - English, Welsh, Scottish, Irish.

TABLE H-6.

Adjusted Analyses of Nonblack Followup Participants for Malignant
Skin Neoplasm Incidence During Baseline-Followup Interval
(Original Comparisons Only)

Variable	Status	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks*
Basal Cell Carcinoma	Verified	1.46 (0.82,2.61)	0.198	AGE (p<0.001) LAT (p=0.015) SUNREAC (p=0.001) GRP*SUNREAC (marginal: p=0.051)
	Verified & Suspected	****	****	GRP*SUNREAC (p=0.007) AGE (p<0.001) LAT (p=0.006)
Sun-Exposure Skin Neoplasms	Verified	****	****	GRP*SKIN (p=0.036) AGE (p<0.001) SUNREAC (p=0.003) LAT (p=0.015)
	Verified & Suspected	****	****	GRP*SUNREAC (p=0.030) SKIN*SUNREAC (p=0.042) AGE (p<0.001) LAT (p=0.008)

*Abbreviations:

LAT: average lifetime residential latitude
SUNREAC: sun reaction index
GRP: group
OCC: occupation
SKIN: skin color

****Group-by-covariate interactions--adjusted relative, confidence interval, and p-value are not presented.

TABLE H-7.

Summary of Group-by-Covariate Interactions for
Malignant Skin Neoplasms in the Baseline-Followup Interval
(Nonblacks Only)

Variable	Interaction	Stratification	Statistic	Group				Adj. Relative Risk (95% C.I.)	p-Value
				Ranch Hand		Comparison			
				Number	Percent	Number	Percent		
		Officer	n	372		475			
			Yes	14	3.8	16	3.4	1.14 (0.54,2.40)	0.726
			No	358	96.2	459	96.6		
		Enlisted Flyer	n	166		193			
Basal Cell Carcinoma (Verified Only)	Group-by- Occupation		Yes	9	5.4	2	1.0	6.50 (1.36,31.01)	0.019
			No	157	94.6	191	99.0		
		Enlisted Groundcrew	n	416		539			
			Yes	6	1.4	11	2.0	0.81 (0.29,2.23)	0.680
			No	410	98.6	528	98.0		

TABLE H-7. (continued)

Summary of Group-by-Covariate Interactions for
Malignant Skin Neoplasms in the Baseline-Followup Interval
(Nonblacks Only)

Variable	Interaction	Stratification	Statistic	Group				Adj. Relative Risk (95% C.I.)	p-Value
				Ranch Hand		Comparison			
				Number	Percent	Number	Percent		
		Burns Easily	n	68		77			
			Yes	0	0	4	5.2	-- ^a	0.121 ^b
			No	68	100	73	94.8		
			n	192		262			
Basal Cell Carcinoma (Verified Plus Suspected)	Group-by-Sun Reaction Index	Intermediate Reaction	Yes	17	8.9	15	5.7	1.76 (0.84,3.69)	0.134
			No	175	91.1	247	94.3		
			n	693		867			
		Tans Easily	Yes	19	2.7	28	3.2	0.90 (0.50,1.64)	0.731
			No	674	97.3	839	96.8		

^aAdjusted relative risk not calculated because of a zero cell count.

^bFisher's exact test.

TABLE H-8.

Summary of Group-by-Covariate Interactions for
Malignant Skin Neoplasms in the Baseline-Followup Interval
(Original Comparisons Only*)

Variable	Interaction	Stratification	Statistic	Group				Adj. Relative Risk (95% C.I.)	p-Value
				Ranch Hand		Original Comparison			
				Number	Percent	Number	Percent		
		Burns Easily	n	68		56			
			Yes	0	0	2	3.6	-- ^a	0.202 ^b
			No	68	100	54	96.4		
			n	192		186			
Basal Cell Carcinoma (Verified Only)	Group-by-Sun Reaction Index	Intermediate	Yes	15	7.8	6	3.2	2.81 (1.05,7.55)	0.040
			No	177	92.2	180	96.8		
		Tans Easily	n	694		653			
			Yes	14	2.0	13	2.0	1.13 (0.52,2.43)	0.758
			No	680	98.0	640	98.0		

TABLE H-8. (continued)

Summary of Group-by-Covariate Interactions for
 Malignant Skin Neoplasms in the Baseline-Followup Interval
 (Original Comparisons Only*)

Variable	Interaction	Stratification	Statistic	Group		Original Comparison	Adj. Relative Risk (95% C.I.)	p-Value
				Ranch Hand	Number				Percent	Number	Percent
			n	68		55		
	Burns Easily		Yes	0	0	4	7.3	-- ^a
			No	68	100	51	92.7	0.038 ^b
Basal Cell Carcinoma (Verified Plus Suspected)	Group-by-Sun Reaction Index	Intermediate	n	192		185		
			Yes	17	8.9	8	4.3	2.38 (0.98,5.76)
			No	175	91.1	177	95.7	0.055
	Tans Easily		n	694		646		
			Yes	19	2.7	23	3.6	0.86 (0.46,1.60)
			No	675	97.3	623	96.4	0.627

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TABLE H-8. (continued)

Summary of Group-by-Covariate Interactions for
Malignant Skin Neoplasms in the Baseline-Followup Interval
(Original Comparisons Only*)

Variable	Interaction	Stratification	Statistic	Group				Adj. Relative Risk (95% C.I.)	p-Value
				Ranch Hand		Original Comparison			
				Number	Percent	Number	Percent		
Sun Exposure Related Neoplasms (Verified Only)	Group-by- Skin Color	Peach	n	768		744		0.20 (0.02,1.80)	0.150
			Yes	31	4.0	20	2.7		
		No	737	96.0	724	97.3			
		n	185		150				
Not Peach	Yes	1	0.5	4	2.7	1.70 (0.95,3.04)	0.073		
	No	184	99.5	146	97.3				

TABLE H-8. (continued)

Summary of Group-by-Covariate Interactions for
Malignant Skin Neoplasms in the Baseline-Followup Interval
(Original Comparisons Only*)

Variable	Interaction	Stratification	Statistic	Group		Number	Percent	Adj. Relative Risk (95% C.I.)	p-Value
				Ranch Hand	Original Comparison				
Sun Exposure Related Neoplasms (Verified Plus Suspected)	Group-by- Sun Reaction Index	Burns Easily	n	68		56		0.47 (0.08,2.74)	0.401
			Yes	2	2.9	4	7.1		
			No	66	97.1	52	92.9		
	Intermediate	n	192		186		2.74 (1.14,6.63)	0.025	
		Yes	18	9.4	8	4.3			
		No	174	90.6	178	95.7			
Tans Easily	n	693		652		0.75 (0.41,1.37)	0.343		
	Yes	19	2.7	26	4.0				
	No	674	97.3	626	96.0				

*Blacks excluded.

^aAdjusted relative risk not calculated because of a zero cell count.

^bFisher's exact test.

TABLE H-9.

Followup Participants With Verified Malignant Systemic
Neoplasms in Baseline-Followup Interval by Group
(Original Comparisons Only)

Site	Group		Total
	Ranch Hand	Original Comparison	
Oral Cavity and Pharynx	2 ^{a, b}	0	2
Thyroid Gland	0	1	1
Bronchus and Lung	1	0	1
Colon	0	3 ^{c, d}	3
Kidney and Bladder	2	1	3
Prostate	1	1	2
Testicles	1	0	1
Connective and Other Soft Tissue	<u>1</u>	<u>0</u>	<u>1</u>
Total	8	6	14

^aIncludes one Ranch Hand with separate malignancies of tongue and epiglottis and also malignant neoplasm of bone.

^bIncludes one Ranch Hand with separate malignant neoplasms of tongue and oropharynx and secondary malignant neoplasm of other site.

^cIncludes one comparison with secondary malignant neoplasms of liver and bone and bone marrow.

^dIncludes one comparison with secondary malignant neoplasm of liver.

TABLE H-10.

Unadjusted Analyses of Followup Participants with Verified and Suspected Malignant Systemic Neoplasms in the Baseline-Followup Interval by Group (Original Comparisons Only)

Status	Statistic	Group				Est. Relative Risk (95% C.I.)	p-Value
		Ranch Hand		Original Comparison			
Verified	Number/%	8	0.8%	6	0.6%	1.26 (0.43,3.63)	0.791
	Total Neoplasms	12		9			
Verified & Suspected	Number/%	12	1.2%	11	1.2%	1.03 (0.45,2.34)	0.999
	Total Neoplasms	23		14			

TABLE H-11.

Association Between Baseline-Followup Interval Incidence of All Malignant Systemic Neoplasms Combined and the Covariates for the Combined Followup Ranch Hand and Comparison Groups

Covariate	Covariate Category	Verified			Verified and Suspected		
		Number*	Percent	p-Value	Number*	Percent	p-Value
Age	Born \geq 1942	1	0.1	<0.001	4	0.4	0.001
	Born 1923-41	10	0.8		16	1.3	
	Born \leq 1922	4	4.6		4	4.6	
Race	Nonblack	15	0.7	0.999	23	1.1	0.999
	Black	0	0.0		1	0.7	
Occupation	Officer	10	1.2	0.056	13	1.5	0.193
	Enlisted Flyer	2	0.5		4	1.0	
	Enlisted Groundcrew	3	0.3		7	0.7	
Total Lifetime Smoking (Pack-Years)	0	2	0.3	0.220	4	0.6	0.374
	>0-20	6	0.6		11	1.0	
	>20-40	5	1.2		7	1.7	
	>40	2	1.3		2	1.3	
Total Lifetime Alcohol Consumption (Drink-Years)	0	0	0	0.082	1	0.7	0.233
	>0-5	2	0.3		5	0.7	
	>5-30	3	0.4		5	0.7	
	>30-100	7	1.4		9	1.8	
	>100	1	0.9		2	1.9	
Exposures to Carcinogens	Asbestos	Yes	3	0.999	5	1.0	0.999
		No	12		0.7			19	1.1
	Nonmedical X Rays	Yes	5	0.364	10	1.9	0.049
		No	10		0.6			14	0.8

TABLE H-11. (continued)

Association Between Baseline-Followup Interval Incidence of All Malignant Systemic Neoplasms Combined and the Covariates for the Combined Followup Ranch Hand and Comparison Groups

Covariate	Covariate Category	Verified			Verified and Suspected			
		Number*	Percent	p-Value	Number*	Percent	p-Value	
Exposures to Carcinogens (continued)	Industrial Chemicals	Yes	5	0.4	0.196	11	0.9	0.682
		No	10	0.9		13	1.2	
	Herbicides	Yes	9	0.7	0.999	14	1.1	0.999
		No	6	0.6		10	1.0	
Insecticides	Yes	4	0.3	0.014	10	0.7	0.091	
	No	11	1.2		14	1.5		
Degreasing Chemicals	Yes	6	0.5	0.191	14	1.0	0.999	
	No	9	0.9		10	1.0		
Composite Carcinogen Exposure	Yes	4	0.8	0.757	5	1.0	0.999	
	No	11	0.6		18	1.0		
Exposure to Individual Carcinogens	Anthracene	Yes	0	0.0	0.999	0	0.0	0.999
		No	15	0.7		24	1.0	
	Arsenic	Yes	0	0	0.999	2	4.8	0.069
		No	15	0.7		22	1.0	
Benzene	Yes	1	1.2	0.424	1	1.2	0.587	
	No	14	0.6		23	1.0		
Benzidine	Yes	1	7.1	0.088	1	7.1	0.131	
	No	14	0.6		22	1.0		

TABLE H-11. (continued)

Association Between Baseline-Followup Interval Incidence of All Malignant Systemic Neoplasms Combined and the Covariates for the Combined Followup Ranch Hand and Comparison Groups

Covariate	Covariate Category	Verified			Verified and Suspected			
		Number*	Percent	p-Value	Number*	Percent	p-Value	
Exposure to Individual Carcinogens (continued)	Chromates	Yes	2	2.3	0.110	2	2.3	0.232
		No	13	0.6					22	1.0
	Coal Tar	Yes	2	2.7	0.079	2	2.7	0.175
		No	13	0.6					22	1.0
	Creosote	Yes	1	0.6	0.999	3	1.8	0.240
		No	14	0.7					21	1.0
	Aminodiphenyl	Yes	0	0	0.999	1	16.7	0.061
		No	15	0.7					23	1.0
	Chloromethyl Ether	Yes	1	4.4	0.140	2	8.7	0.023
		No	14	0.6					22	1.0
	Mustard Gas	Yes	0	0	0.999	1	11.1	0.090
		No	15	0.7					23	1.0
	Naphthylamine	Yes	2	3.6	0.050	3	5.4	0.019
		No	13	0.6					21	0.9
	Cutting Oils	Yes	3	1.2	0.204	5	2.1	0.100
		No	12	0.6					19	0.9
Trichloroethylene	Yes	3	1.5	0.135	4	2.0	0.149	
	No	12	0.6					20	1.0

TABLE H-11. (continued)

Association Between Baseline-Followup Interval Incidence of All Malignant Systemic Neoplasms Combined and the Covariates for the Combined Followup Ranch Hand and Comparison Groups

Covariate	Covariate Category	Verified			Verified and Suspected			
		Number*	Percent	p-Value	Number*	Percent	p-Value	
Exposure to Individual Carcinogens (continued)	Ultraviolet Light	Yes	1	2.0	0.286	1	2.0	0.417
		No	14	0.6		23	1.0	
	Vinyl Chloride	Yes	0	0.0	0.999	1	3.0	0.294
		No	15	0.7		23	1.0	

*Number of participants with malignant systemic neoplasms.

TABLE H-12.

Adjusted Analyses of Followup Participants for the Incidence of All
Malignant Systemic Neoplasms During the Baseline-Followup Interval
(Original Comparisons Only)

Variable	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks
Systemic Neoplasms (Verified)	1.47 (0.50,4.33)	0.481	AGE (p<0.001)
Systemic Neoplasms (Verified & Suspected)	****	****	GRP*OCC (p=0.028) AGE (p<0.001) RACE*PACKYR (p=0.032)

****Group-by-covariate interaction--adjusted relative risk, confidence interval, and p-value not presented.

TABLE H-13.

Summary of Group-by-Occupation Interaction for All Malignant Systemic Neoplasms (Verified Plus Suspected) During the Baseline-Followup Interval

Variable	Interaction	Stratification	Statistic	Group				Adj. Relative Risk (95% C.I.)	p-Value
				Ranch Hand		Comparison			
				Number	Percent	Number	Percent		
Systemic Cancer (Verified Plus Suspected)	Group-by-Occupation	Officer	n	380		484		0.79 (0.25,2.44)	0.679
			Yes	5	1.3	8	1.7		
			No	375	98.7	476	98.3		
		Enlisted Flyer	n	175		209		-- ^a	0.042 ^b
			Yes	4	2.3	0	0		
			No	171	97.7	209	100		
Enlisted Groundcrew		n	457		598		0.93 (0.20,4.26)	0.923	
		Yes	3	0.7	4	0.7			
		No	454	99.3	594	99.3			

^aAdjusted relative risk not calculated because of a zero cell.

^bFisher's exact test.

TABLE H-14.

Summary of Group-by-Occupation Interaction for All Malignant Systemic Neoplasms (Verified Plus Suspected) During the Baseline-Followup Interval (Original Comparisons Only)

Variable	Interaction	Stratification	Statistic	Group				Adj. Relative Risk (95% C.I.) p-Value	
				Ranch Hand		Original Comparison			
				Number	Percent	Number	Percent		
All Systemic Cancer (Verified Plus Suspected)	Group-by-Occupation	Officers	n	380		350		0.72 (0.22,2.30)	0.577
			Yes	5	1.3	7	2.0		
			No	375	98.7	343	98.0		
		Enlisted Flyers	n	175		174		-- ^a	0.123 ^b
			Yes	4	2.9	0	0.0		
			No	171	97.1	174	100.0		
Enlisted Groundcrew	n	457		430		0.71 (0.16,3.28)	0.666		
	Yes	3	0.7	4	0.9				
		No	454	99.3	426	99.1			

^aAdjusted relative risk not calculated because of a zero cell count.

^bFisher's exact test.

TABLE H-15.

**Unadjusted Analyses of Followup Participants with Lifetime Occurrence
of Verified and Suspected Lifetime Neoplasms by Group
(Nonblacks and Blacks, Original Comparisons Only)**

Site	Neoplasm Behavior and Status	Group				Total**	p-Value***
		Ranch Hand		Comparison			
		Number**	Percent	Number**	Percent		
Skin	Malignant						
	Verified	66	6.5	48	5.0	114	0.177
	Verified and Suspected	75	7.4	62	6.5	137	0.479
	Benign						
	Verified	84	8.3	67	7.0	151	0.310
	Verified and Suspected	86	8.5	70	7.3	156	0.360
	Uncertain Behavior and Unspecified Nature:						
	Verified	1	0.1	1	0.1	2	0.999
	Verified and Suspected	1	0.1	1	0.1	2	0.999
	Any Skin Neoplasm ^a						
Verified	150	14.8	111	11.6	261	0.046	
Verified and Suspected	159	15.7	128	13.4	287	0.160	
Systemic	Malignant						
	Verified	17	1.7	14	1.5	31	0.722
	Verified and Suspected	21	2.1	19	2.0	40	0.999
	Benign						
	Verified	51	5.0	52	5.5	103	0.687
	Verified and Suspected	57	5.6	60	6.3	117	0.568
	Uncertain Behavior and Unspecified Nature:						
	Verified	15	1.5	11	1.2	26	0.560
	Verified and Suspected	15	1.5	14	1.5	29	0.999
	Any Systemic Neoplasm ^b						
Verified	81	8.0	71	7.4	152	0.673	
Verified and Suspected	91	9.0	86	9.0	177	0.999	

TABLE H-15. (continued)

Unadjusted Analyses of Followup Participants with Lifetime Occurrence
of Verified and Suspected Lifetime Neoplasms by Group
(Nonblacks and Blacks, Original Comparisons Only)

Site	Neoplasm Behavior and Status	Group				Total**	p-Value***
		Ranch Hand		Comparison			
		Number**	Percent	Number**	Percent		
All Neoplasms	Malignant, Benign, Uncertain Behavior, Unspecified Nature ^c						
	Verified	216	21.3	167	17.5	383	0.035
	Verified and Suspected	231	22.7	196	20.5	427	0.251

*Sample sizes: 1,016 Ranch Hands, 955 Original Comparisons.

**Number of participants.

***Fisher's exact test.

^aParticipant has one or more malignant, benign, or unspecified skin neoplasms.

^bParticipant has one or more malignant, benign, or unspecified systemic neoplasms.

^cParticipant has one or more malignant or benign skin or systemic neoplasms.

TABLE H-16.

**Unadjusted Analyses of Nonblack Followup Participants with Lifetime Occurrence
of Verified and Suspected Lifetime Malignant Skin Neoplasms by Cell Type and Group
(Original Comparisons Only)**

Cell Type	Status	Statistic	Group				Est. Relative Risk (95% C.I.)	p-Value
			Ranch Hand		Original Comparison			
Basal Cell Carcinoma	Verified	Number/% Total Neoplasms	53 77	5.5%	34 52	3.8%	1.49 (0.96,2.32)	0.079
	Verified & Suspected	Number/% Total Neoplasms	59 88	6.2%	48 68	5.4%	1.16 (0.79,1.72)	0.486
Squamous Cell Carcinoma	Verified	Number/% Total Neoplasms	4 6	0.4%	5 6	0.6%	0.75 (0.20,2.80)	0.747
	Verified & Suspected	Number/% Total Neoplasms	4 6	0.4%	5 6	0.6%	0.75 (0.20,2.80)	0.747
Melanoma	Verified	Number/% Total Neoplasms	5 6	0.5%	5 6	0.6%	0.94 (0.27,3.25)	0.999
	Verified & Suspected	Number/% Total Neoplasms	5 6	0.5%	6 7	0.7%	0.78 (0.24,2.57)	0.768
All Malignant Skin Neoplasms	Verified	Number/% Total Neoplasms	66 103	6.9%	48 73	5.4%	1.31 (0.89,1.93)	0.176
	Verified & Suspected	Number/% Total Neoplasms	75 117	7.9%	62 90	6.9%	1.15 (0.81,1.63)	0.478
Sun-Exposure Related Malignant Neoplasms*	Verified	Number/% Total Neoplasms	59 90	6.2%	39 58	4.4%	1.45 (0.96,2.19)	0.096
	Verified & Suspected	Number/% Total Neoplasms	65 101	6.8%	53 75	5.9%	1.16 (0.80,1.69)	0.448

*Number and percent of participants; total number of malignant neoplasms of specified cell type.

**Number of participants -- 956 Ranch Hands and 897 Original Comparisons.

*Basal cell carcinoma, melanoma, and malignant epithelial neoplasms NOS.

TABLE B-17.

Association Between Lifetime Incidence of Sun-Exposure Related Skin Malignancies
and the Covariates for Combined Followup Ranch Hand and Comparison Nonblack Participants

Covariate	Covariate Category	Verified			Verified and Suspected		
		Number*	Percent	p-Value	Number*	Percent	p-Value
Age	Born \geq 1942	8	9.2	$<$ 0.001	28	3.2	$<$ 0.001
	Born 1923-41	83	6.9		99	8.3	
	Born \leq 1922	23	2.6		12	13.8	
Occupation	Officer	60	7.1	0.009	75	8.8	0.001
	Enlisted Flyer	17	4.7		20	5.6	
	Enlisted Groundcrew	37	3.9		44	4.6	
Total Lifetime Smoking (Pack-Years)	0	35	5.7	0.021	40	6.5	0.012
	$>$ 0-20	40	4.0		49	4.9	
	$>$ 20-40	24	6.1		34	8.7	
	$>$ 40	15	9.6		16	10.2	
Total Lifetime Alcohol Consumption (Drink-Years)	0	8	5.7	0.140	9	6.4	0.341
	$>$ 0-5	39	5.4		45	6.3	
	$>$ 5-30	29	4.4		36	5.5	
	$>$ 30-100	24	5.0		35	7.3	
	$>$ 100	11	10.6		11	10.6	
Ethnic Background ^a	A	95	6.0	0.055	118	7.5	0.007
	B	16	3.8		17	4.0	
	C	1	1.6		1	1.6	
	D	0	0.0		0	0.0	
Skin Color	Dark	0	0.0	0.285	0	0.0	0.190
	Medium	2	2.7		2	2.7	
	Pale	10	3.3		12	3.9	
	Dark Peach	76	6.0		90	7.1	
	Pale Peach	26	5.0		35	6.7	

TABLE H-17. (continued)

Association Between Lifetime Incidence of Sun-Exposure Related Skin Malignancies
and the Covariates for Combined Followup Ranch Hand and Comparison Nonblack Participants

Covariate	Covariate Category	Verified			Verified and Suspected		
		Number*	Percent	p-Value	Number*	Percent	p-Value
Eye Color	Brown	34	5.3	0.466	40	6.2	0.960
	Hazel	31	6.8		32	7.0	
	Green	4	3.4		7	5.9	
	Grey	5	5.4		7	7.5	
	Blue	40	4.7		53	6.2	
Hair Color	Black	22	5.0	0.230	26	5.9	0.096
	Dark Brown	46	4.4		58	5.6	
	Light Brown	36	6.4		42	7.5	
	Red	2	12.5		3	18.8	
	Blond	8	7.4		10	9.3	
Residential History (Average Latitude)	≥37°	48	4.2	0.026	56	4.9	0.003
	<37°	66	6.5		83	8.1	
Skin Reaction to First 30 Min. of Sun Exposure	Burns	23	9.3	<0.001	28	11.3	<0.001
	Usually Burns	39	9.1		47	11.0	
	Burns Mildly	34	4.2		38	4.7	
	Rarely Burns	17	2.5		25	3.7	
Skin Reaction to >2 Hrs of Sun After First Exposure	Burns Painfully	13	10.8	<0.001	15	12.5	<0.001
	Burns	32	9.5		35	10.4	
	Becomes Red	46	4.4		59	5.7	
	No Reaction	23	3.5		30	4.5	
Skin Reaction After Repeated Exposure to Sun	Freckles, No Tan	5	11.1	<0.001	6	13.3	<0.001
	Tans Mildly	33	10.5		38	12.1	
	Tans Moderately	40	3.9		51	5.0	
	Tans Deep Brown	35	4.5		43	5.5	

TABLE H-17. (continued)

Association Between Lifetime Incidence of Sun-Exposure Related Skin Malignancies
and the Covariates for Combined Followup Ranch Hand and Comparison Nonblack Participants

Covariate	Covariate Category	Verified			Verified and Suspected		
		Number*	Percent	p-Value	Number*	Percent	p-Value
Sun Reaction Index	Tends to Burn	14	9.7	<0.001	16	11.0	<0.001
	Mild Reaction	42	9.3		48	10.6	
	Tends to Tan	57	3.7		74	4.7	
Exposures to Carcinogens	Asbestos	Yes	19	0.288	26	5.7	0.520
		No	95		113			6.6
	Nonmedical X Rays	Yes	31	0.252	39	7.9	0.143
		No	83		100			6.0
	Industrial Chemicals	Yes	54	0.336	65	5.8	0.220
		No	60		74			7.1
	Herbicides	Yes	74	0.144	91	7.2	0.076
		No	40		48			5.3
	Insecticides	Yes	76	0.200	90	6.9	0.324
		No	38		49			5.7
	Degreasing Chemicals	Yes	64	0.697	77	6.1	0.534
		No	50		62			6.9
Composite Carcinogen Exposure	Yes	21	4.3	0.355	24	4.9	0.141
	No	91	5.5		113	6.8	

TABLE E-17. (continued)

Association Between Lifetime Incidence of Sun-Exposure Related Skin Malignancies
and the Covariates for Combined Followup Ranch Hand and Comparison Nonblack Participants

Covariate	Covariate Category	<u>Verified</u>			<u>Verified and Suspected</u>			
		Number*	Percent	p-Value	Number*	Percent	p-Value	
Exposure to Individual Carcinogens	Anthracene	Yes	0	0.0	0.999	0	0.0	0.999
		No	114	5.3		139	6.4	
	Arsenic	Yes	4	9.8	0.163	5	12.2	0.181
		No	109	5.1		133	6.3	
	Benzene	Yes	6	8.1	0.281	7	9.5	0.327
		No	108	5.2		132	6.3	
	Benzidine	Yes	1	9.1	0.449	1	9.1	0.519
		No	113	5.3		138	6.4	
	Chromates	Yes	4	4.8	0.999	5	6.0	0.999
		No	108	5.2		132	6.4	
	Coal Tar	Yes	2	2.9	0.580	3	4.4	0.799
		No	112	5.3		136	6.5	
	Creosote	Yes	9	5.7	0.715	10	6.3	0.999
		No	105	5.2		129	6.4	
	Aminodiphenyl	Yes	0	0.0	0.999	0	0.0	0.999
		No	113	5.2		138	6.4	
	Chloromethyl Ether	Yes	2	9.5	0.305	2	9.5	0.641
		No	112	5.2		137	6.4	
	Mustard Gas	Yes	0	0.0	0.999	0	0.0	0.999
No		114	5.3		139	6.4		

TABLE H-17. (continued)

**Association Between Lifetime Incidence of Sun-Exposure Related Skin Malignancies
and the Covariates for Combined Followup Ranch Hand and Comparison Nonblack Participants**

Covariate	Covariate Category	<u>Verified</u>			<u>Verified and Suspected</u>			
		Number*	Percent	p-Value	Number*	Percent	p-Value	
Exposure to Individual Carcinogens (continued)	Naphthylamine	Yes	3	5.8	0.751	4	7.7	0.570
		No	110	5.2		134	6.3	
	Cutting Oils	Yes	12	5.3	0.999	15	6.6	0.886
		No	102	5.3		124	6.4	
	Trichloroethylene	Yes	5	2.7	0.120	7	3.8	0.156
		No	109	5.5		132	6.7	
	Ultraviolet Light	Yes	5	11.4	0.078	5	11.4	0.200
		No	109	5.1		134	6.3	
	Vinyl Chloride	Yes	0	0.0	0.406	1	3.2	0.718
		No	114	5.3		138	6.5	

*Number of participants with sun-exposure related skin malignancies.

*Ethnic Background:

A—English, Welsh, Scottish, Irish.

B—Scandinavian, German, Polish, Russian, other Slavic, Jewish, French.

C—Spanish, Italian, Greek.

D—Mexican, American Indian, Asian.

TABLE H-18.

Summary of Group-by-Covariate Interactions for
Lifetime Malignant Skin Neoplasm Incidence
(Nonblacks Only)

Variable	Interaction	Stratification	Statistic	Ranch Hand		Original Comparison		Adj. Relative Risk (95% C.I.)	p-Value
				Number	Percent	Number	Percent		
		Burns Easily	n	68		77			
			Yes	3	4.4	9	11.7	0.29 (0.07,1.28)	0.102
			No	65	95.6	68	88.3		
		Intermediate	n	192		262			
Basal Cell Carcinoma (Verified Plus Suspected)	Group-by-Sun Reaction Index	Reaction	Yes	25	13.0	21	8.0	1.97 (1.04,3.73)	0.038
			No	167	87.0	241	92.0		
		Tans Easily	n	693		867			
			Yes	31	4.5	36	4.2	1.15 (0.70,1.88)	0.591
			No	662	95.5	831	95.8		

TABLE H-19.

Adjusted Analyses of Nonblack Followup Participants
for Lifetime Malignant Skin Neoplasm Incidence
(Original Comparisons Only)

Variable	Status	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks
Basal Cell Carcinoma	Verified	****	****	GRP*SUNREAC (p=0.010) SKIN*SUNREAC (p<0.001) OCC*AGE (p=0.010) OCC*SUNREAC (p=0.007) LAT (p=0.006)
	Verified & Suspected	****	****	GRP*SUNREAC (p=0.003) AGE (p<0.001) LAT (p=0.002) SUNREAC*OCC (p=0.043) SKIN*SUNREAC (p<0.001)
Sun-Exposure Skin Neoplasms	Verified	****	****	GRP*SUNREAC (p=0.045) SKIN*LAT (p=0.028) SKIN*SUNREAC (p<0.001) OCC*AGE (p=0.023)
	Verified & Suspected	****	****	GRP*SUNREAC (p=0.016) AGE (p<0.001) SUNREAC*LAT (p=0.017) SKIN*SUNREAC (p<0.001)

****Group-by-covariate interactions--adjusted relative risk, confidence interval, and p-value not presented.

TABLE H-20.

Summary of Group-by-Covariate Interactions
for Lifetime Malignant Skin Neoplasm Incidence
(Original Comparisons Only*)

Variable	Interaction	Stratification	Statistic	Ranch Hand		Group Original Comparison		Adj. Relative Risk (95% C.I.)	p-Value
				Number	Percent	Number	Percent		
			n	68		56			
		Burns Easily	Yes	3	4.4	6	10.7	0.17 (0.02,1.67)	0.128
			No	65	95.6	50	89.3		
			n	192		186			
Basal Cell Carcinoma (Verified Only)	Group-by-Sun Reaction Index	Intermediate	Yes	23	12.0	8	4.3	3.76 (1.60,8.86)	0.002
			No	169	88.0	178	95.7		
			n	693		652			
		Tans Easily	Yes	27	3.9	19	2.9	1.45 (0.79,2.67)	0.226
			No	666	96.1	633	97.1		

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TABLE H-20. (continued)

Summary of Group-by-Covariate Interactions for
Lifetime Malignant Skin Neoplasm Incidence
(Original Comparisons Only*)

Variable	Interaction	Stratification	Statistic	Group				Adj. Relative Risk (95% C.I.)	p-Value
				Ranch Hand		Original Comparison			
				Number	Percent	Number	Percent		
		Burns Easily	n	68		56			
			Yes	3	4.4	8	14.3	0.19 (0.03,1.15)	0.070
			No	65	95.6	48	85.7		
Basal Cell Carcinoma (Verified Plus Suspected)	Group-by- Sun Reaction Index	Intermediate	n	192		186			
			Yes	25	13.0	10	5.4	3.25 (1.47,7.18)	0.003
			No	167	87.0	176	94.6		
		Tans Easily	n	693		652			
			Yes	31	4.5	29	4.4	1.10 (0.65,1.86)	0.719
			No	662	95.5	623	95.6		

TABLE H-20. (continued)

Summary of Group-by-Covariate Interactions for
Lifetime Malignant Skin Neoplasm Incidence
(Original Comparisons Only*)

Variable	Interaction	Stratification	Statistic	Ranch Hand		Group Original Comparison		Adj. Relative Risk (95% C.I.)	p-Value
				Number	Percent	Number	Percent		
		Burns Easily	n	68		56			
			Yes	7	10.3	8	14.3	1.20 (0.34,4.22)	0.777
			No	61	89.7	48	85.7		
Sun Exposure Related Cancers (Verified Plus Suspected)	Group-by-Sun Reaction Index	Intermediate	n	192		186			
			Yes	26	13.5	10	5.4	3.98 (1.70,9.33)	0.002
			No	166	86.5	176	94.6		
		Tans Easily	n	693		652			
			Yes	32	4.6	34	5.2	1.17 (0.31,4.41)	0.819
			No	661	95.4	618	94.8		

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TABLE H-20. (continued)

Summary of Group-by-Covariate Interactions for
Lifetime Malignant Skin Neoplasm Incidence
(Original Comparisons Only*)

Variable	Interaction	Stratification	Statistic	Group				Adj. Relative Risk (95% C.I.)	p-Value
				Ranch Hand		Original Comparison			
				Number	Percent	Number	Percent		
		Burns Easily	n	68		56		0.80 (0.25,2.53)	0.700
			Yes	7	10.3	6	10.7		
			No	61	89.7	50	89.3		
Sun Exposure Related Cancers (Verified Only)	Group-by- Sun Reaction Index	Intermediate	n	192		186		3.42 (1.56,7.51)	0.002
			Yes	24	12.5	8	4.3		
			No	168	87.5	178	95.7		
		Tans Easily	n	693		652		0.97 (0.59,1.61)	0.911
			Yes	28	4.0	24	3.7		
			No	665	96.0	628	96.3		

*Blacks excluded.

TABLE H-21.

Summary of Followup Participants With Lifetime Incidence of
Verified Malignant Systemic Neoplasms by Group
(Original Comparisons Only)

Site	Group		Total
	Ranch Hand	Original Comparison	
Eye	1	0	1
Oral Cavity and Pharynx	3 ^{a, b}	0	3
Larynx	0	1	1
Thyroid Gland	0	2	2
Bronchus and Lung	2	0	2
Colon	0	4 ^{c, d}	4
Kidney and Bladder	4	3	7
Prostate	2	2	4
Testicles	3	0	3
Connective and Other Soft Tissue	1	1	2
Ill-Defined Sites	<u>1</u> ^e	<u>1</u> ^f	<u>2</u>
Total	17	14	31

^aIncludes one Ranch Hand with separate malignancies of tongue and epiglottis and also malignant neoplasm of bone.

^bIncludes one Ranch Hand with separate malignant neoplasms of tongue and oropharynx and secondary malignant neoplasm of other site.

^cIncludes one Comparison with secondary malignant neoplasms of liver and bone and bone marrow.

^dIncludes one Comparison with secondary malignant neoplasm of liver.

^eMalignant neoplasm of thorax.

^fMalignant neoplasm of face, head, or neck.

TABLE H-22.

Unadjusted Analyses of the Lifetime Incidence Rates
of All Malignant Systemic Neoplasms Combined, by Group
(Original Comparisons Only)

Status	Statistic	Group		Est. Relative Risk (95% C.I.)	p-Value
		Ranch Hand	Original Comparison		
Verified	Number/%	17 1.7%	14 1.5%	1.14 (0.56,2.33)	0.722
	Total Neoplasms	25	19		
Verified & Suspected	Number/%	21 2.1%	19 2.0%	1.04 (0.56,1.95)	0.999
	Total Neoplasms	36	24		

TABLE H-23.

Summary of Group-by-Occupation Interactions
for Lifetime Incidence of All Malignant
Systemic Neoplasms Combined

Variable	Interaction	Stratification	Statistic	Group				Adj. Relative Risk (95% C.I.)	p-Value
				Ranch Hand		Comparison			
				Number	Percent	Number	Percent		
		Officer	n	380		484			
			Yes	8	2.1	12	2.5	0.84 (0.34, 2.08)	0.698
			No	372	97.9	472	97.5		
Malignant Systemic Neoplasm (Verified Only)	Group-by- Occupation	Enlisted	n	177		210			
			Yes	5	2.8	0	0	-- ^a	0.019 ^b
		Flyer	No	172	97.2	210	100		
		Enlisted	n	459		599			
		Groundcrew	Yes	4	0.9	5	0.8	1.07 (0.28, 4.03)	0.922
			No	455	99.1	594	99.2		

^aAdjusted relative risk not calculated because of a zero cell.

^bFisher's exact test.

TABLE H-23. (continued)

Summary of Group-by-Occupation Interactions
for Lifetime Incidence of All Malignant
Systemic Neoplasms Combined

Variable	Interaction	Stratification	Statistic	Group				Adj. Relative Risk (95% C.I.)	p-Value
				Ranch Hand		Comparison			
				Number	Percent	Number	Percent		
		Officer	n	380		484		0.80 (0.34,1.89)	0.616
			Yes	9	2.4	14	2.9		
			No	371	97.6	470	97.1		
Malignant Systemic Neoplasm (Verified plus Suspected)	Group-by- Occupation	Enlisted Flyer	n	175		209		-- ^a	0.004 ^b
			Yes	7	4.0	0	0		
			No	168	96.0	209	100		
		Enlisted Groundcrew	n	457		598		0.79 (0.26,2.47)	0.690
			Yes	5	1.1	8	1.3		
					No	452	98.9	590	98.7

^aAdjusted relative risk not calculated because of a zero cell.

^bFisher's exact test.

TABLE H-24.

Adjusted Analyses for Lifetime Incidence of All
Malignant Systemic Neoplasms Combined
(Original Comparisons Only)

Variable	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks
Malignant Systemic Neoplasms (Verified)	****	****	GRP*OCC (p=0.034) AGE (p<0.001)
Malignant Systemic Neoplasms (Verified & Suspected)	****	****	GRP*OCC (p=0.003) AGE (p<0.001) RACE*PACKYR (p=0.033)

****Group-by-covariate interaction--adjusted relative risk, confidence interval, and p-value not presented.

TABLE H-25.

Summary of Group-by-Occupation Interactions
for Lifetime Incidence of All Malignant
Systemic Neoplasms Combined
(Original Comparisons Only)

Variable	Interaction	Stratification	Statistic	Group				Adj. Relative Risk (95% C.I.)	p-Value
				Ranch Hand		Original Comparison			
				Number	Percent	Number	Percent		
		Officer	n	380		350			
			Yes	8	2.1	9	2.6	0.90 (0.34,2.38)	0.834
			No	372	97.9	341	97.4		
Malignant Systemic Neoplasms (Verified Only)	Group-by- Occupation	Enlisted Flyer	n	177		174			
			Yes	5	2.8	0	0	-- ^a	0.061 ^b
			No	172	97.2	174	100		
		Enlisted Groundcrew	n	459		431			
			Yes	4	0.9	5	1.2	0.81 (0.21,3.07)	0.757
			No	455	99.1	426	98.8		

TABLE H-25. (continued)

Summary of Group-by-Occupation Interactions
for Lifetime Incidence of All Malignant
Systemic Neoplasms Combined
(Original Comparisons Only)

Variable	Interaction	Stratification	Statistic	Group				Adj. Relative Risk (95% C.I.)	p-Value
				Ranch Hand		Original Comparison			
				Number	Percent	Number	Percent		
		Officer	n	380		350			
			Yes	9	2.4	11	3.1	0.81 (0.33,1.98)	0.638
			No	371	97.6	339	96.9		
		Enlisted Flyer	n	175		174			
	Group-by- Occupation		Yes	7	4.0	0	0	-- ^a	0.015 ^a
			No	168	96.0	174	100		
		Enlisted Groundcrew	n	457		430			
			Yes	5	1.1	8	1.9	0.59 (0.19,1.85)	0.369
			No	452	98.9	422	98.1		

^aAdjusted relative risk not calculated because of zero cell.

^bFisher's exact test.

TABLE H-26.

Unadjusted Exposure Index Analyses for Followup Participants
for Occurrence of Malignant Neoplasms
in the Baseline-Followup Interval

Variable	Occupation	Statistic	Exposure Index ^a						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Basal Cell Carcinoma (Verified Only) ^b	Officer	n	125		127		121		Overall		0.178
		Abnormal	3	2.4	8	6.3	3	2.5	M vs. L	2.73 (0.71,10.55)	0.216
		Normal	122	97.6	119	93.7	118	97.5	H vs. L	1.03 (0.21,5.23)	0.999
	Enlisted Flyer	n	54		61		52		Overall		0.073
		Abnormal	6	11.1	2	3.3	1	1.9	M vs. L	0.27 (0.05,1.41)	0.145
		Normal	48	88.9	59	96.7	51	98.1	H vs. L	0.16 (0.02,1.35)	0.113
	Enlisted Groundcrew	n	138		149		129		Overall		0.627
		Abnormal	3	2.2	2	1.3	1	0.8	M vs. L	0.61 (0.10,3.72)	0.674
		Normal	135	97.8	147	98.7	128	99.2	H vs. L	0.35 (0.04,3.42)	0.623
Basal Cell Carcinoma (Verified and Suspected) ^b	Officer	n	125		127		121		Overall		0.042
		Abnormal	4	3.3	12	9.4	4	3.3	M vs. L	3.16 (0.99,10.07)	0.068
		Normal	121	96.8	115	90.6	121	96.7	H vs. L	1.03 (0.25,4.23)	0.999
	Enlisted Flyer	n	54		61		52		Overall		0.073
		Abnormal	6	11.1	2	3.3	1	1.9	M vs. L	0.27 (0.05,1.41)	0.145
		Normal	48	88.9	59	96.7	51	98.1	H vs. L	0.16 (0.02,1.35)	0.113
	Enlisted Groundcrew	n	138		149		129		Overall		0.372
		Abnormal	4	2.9	2	1.3	1	0.8	M vs. L	0.46 (0.08,2.53)	0.432
		Normal	134	97.1	147	98.7	128	99.2	H vs. L	0.26 (0.03,2.37)	0.372

TABLE H-26. (continued)

Unadjusted Exposure Index Analyses for Followup Participants
for Occurrence of Malignant Neoplasms
in the Baseline-Followup Interval

Variable	Occupation	Statistic	Exposure Index ^a						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Sun-Exposure Related Malignancies (Verified Only) ^b	Officer	n	125		127		121		Overall		0.096
		Abnormal	3	2.4	9	7.1	3	2.5	M vs. L	3.10 (0.82,11.74)	0.136
		Normal	122	97.6	118	92.9	118	97.5	H vs. L	1.03 (0.21,5.23)	0.999
	Enlisted Flyer	n	54		61		52		Overall		0.073
		Abnormal	6	11.1	2	3.3	1	1.9	M vs. L	0.27 (0.05,1.41)	0.145
		Normal	48	88.9	59	96.7	51	98.1	H vs. L	0.16 (0.02,1.35)	0.113
	Enlisted Groundcrew	n	138		149		129		Overall		0.929
		Abnormal	3	2.2	3	2.0	2	1.6	M vs. L	0.93 (0.18,4.66)	0.999
		Normal	135	97.8	146	98.0	127	98.4	H vs. L	0.71 (0.12,4.31)	0.999
Sun-Exposure Related Malignancies (Verified and Suspected) ^b	Officer	n	125		127		121		Overall		0.021
		Abnormal	4	3.2	13	10.2	4	3.3	M vs. L	3.45 (1.09,10.89)	0.042
		Normal	121	96.8	114	89.8	117	96.7	H vs. L	1.03 (0.25,4.23)	0.999
	Enlisted Flyer	n	54		61		52		Overall		0.073
		Abnormal	6	11.1	2	3.3	1	1.9	M vs. L	0.27 (0.05,1.41)	0.145
		Normal	48	88.9	59	96.7	51	98.1	H vs. L	0.16 (0.02,1.35)	0.113
	Enlisted Groundcrew	n	138		149		129		Overall		0.742
		Abnormal	4	2.9	3	2.0	2	1.6	M vs. L	0.69 (0.15,3.13)	0.714
		Normal	134	97.1	146	98.0	127	98.4	M vs. L	0.53 (0.10,2.93)	0.685

TABLE E-26. (continued)

Unadjusted Exposure Index Analyses for Followup Participants
for Occurrence of Malignant Neoplasms
in the Baseline-Followup Interval

Variable	Occupation	Statistic	Exposure Index ^a						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Systemic Malignancies (Verified Only) ^c	Officer	n	127		130		123		Overall		0.186
		Abnormal	1	0.8	3	2.3	0	0.0	M vs. L	2.98 (0.31,29.00)	0.622
		Normal	126	99.2	127	97.7	123	100.0	H vs. L	0.34 (0.01,8.46)*	0.999
	Enlisted Flyer	n	55		65		57		Overall		0.612
		Abnormal	1	1.8	1	1.5	0	0.0	M vs. L	0.84 (0.05,13.81)	0.999
		Normal	54	98.2	64	98.5	57	100.0	H vs. L	0.32 (0.01,7.92)*	0.491
	Enlisted Groundcrew	n	154		163		142		Overall		0.598
		Abnormal	0	0.0	1	0.6	1	0.7	M vs. L	2.85 (0.12,70.55)*	0.999
		Normal	154	100.0	162	99.4	141	99.3	H vs. L	3.28 (0.13,81.06)*	0.480
Systemic Malignancies (Verified and Suspected) ^c	Officer	n	127		130		123		Overall		0.081
		Abnormal	1	0.8	4	3.1	0	0.0	M vs. L	4.00 (0.44,36.29)	0.370
		Normal	126	99.2	126	96.9	123	100.0	H vs. L	0.34 (0.01,8.46)*	0.999
	Enlisted Flyer	n	55		65		57		Overall		0.708
		Abnormal	2	3.6	1	1.5	1	1.8	M vs. L	0.41 (0.04,4.69)	0.593
		Normal	53	96.4	64	98.5	56	98.2	H vs. L	0.47 (0.04,5.37)	0.615
	Enlisted Groundcrew	n	154		163		142		Overall		0.323
		Abnormal	0	0.0	1	0.6	2	1.4	M vs. L	2.85 (0.12,70.55)*	0.999
		Normal	154	100.0	162	99.4	140	98.6	H vs. L	5.50 (0.26,115.51)*	0.229

^aNumber and percent of total participants.^bNonblacks only.^cBlacks and nonblacks.

*0.5 added to each cell to calculate relative risk and confidence interval, due to zero cell frequency.

TABLE H-27.

Unadjusted Exposure Index Analysis for Followup Participants
for Lifetime Occurrence of Malignant Neoplasms

Variable	Occupation	Statistic	Exposure Index ^a						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Basal Cell Carcinoma (Verified Only) ^b	Officer	n	125		127		121		Overall		0.641
		Abnormal	7	5.6	11	8.7	9	7.4	M vs. L	1.60 (0.60,4.27)	0.464
		Normal	118	94.4	116	91.3	112	92.6	H vs. L	1.36 (0.49,3.76)	0.613
	Enlisted Flyer	n	54		61		52		Overall		0.030
		Abnormal	7	13.0	2	3.3	1	1.9	M vs. L	0.23 (0.05,1.15)	0.081
		Normal	47	87.0	59	96.7	51	98.1	H vs. L	0.13 (0.02,1.11)	0.060
	Enlisted Groundcrew	n	138		149		129		Overall		0.984
		Abnormal	5	3.6	6	4.0	5	3.9	M vs. L	1.12 (0.33,3.74)	0.999
		Normal	133	96.4	143	96.0	124	96.1	H vs. L	1.07 (0.30,3.80)	0.999
Basal Cell Carcinoma (Verified and Suspected) ^b	Officer	n	125		127		121		Overall		0.419
		Abnormal	8	6.4	14	11.0	10	8.3	M vs. L	1.81 (0.73,4.49)	0.265
		Normal	117	93.6	113	89.0	111	91.7	H vs. L	1.32 (0.50,3.46)	0.630
	Enlisted Flyer	n	54		61		52		Overall		0.030
		Abnormal	7	13.0	2	3.3	1	1.9	M vs. L	0.23 (0.05,1.15)	0.081
		Normal	47	87.0	59	96.7	51	98.1	H vs. L	0.13 (0.02,1.11)	0.060
	Enlisted Groundcrew	n	138		149		129		Overall		0.980
		Abnormal	6	4.3	6	4.0	5	3.9	M vs. L	0.92 (0.29,2.93)	0.999
		Normal	132	95.7	143	96.0	124	96.1	H vs. L	0.89 (0.26,2.98)	0.999

TABLE H-27. (continued)

Unadjusted Exposure Index Analysis for Followup Participants
for Lifetime Occurrence of Malignant Neoplasms

Variable	Occupation	Statistic	Exposure Index ^a						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Sun-Exposure Related Malignancies (Verified Only) ^b	Officer	n	125		127		121		Overall		0.625
		Abnormal	9	7.2	13	10.2	9	7.4	M vs. L	1.47 (0.61,3.57)	0.504
		Normal	116	92.8	114	89.8	112	92.6	H vs. L	1.04 (0.40,2.70)	0.999
	Enlisted Flyer	n	54		61		52		Overall		0.058
		Abnormal	7	13.0	3	4.9	1	1.9	M vs. L	0.35 (0.09,1.42)	0.186
		Normal	47	87.0	58	95.1	51	98.1	H vs. L	0.13 (0.02,1.11)	0.060
	Enlisted Groundcrew	n	138		149		129		Overall		0.910
		Abnormal	5	3.6	7	4.7	5	3.9	M vs. L	1.31 (0.41,4.23)	0.772
		Normal	133	96.4	142	95.3	124	96.1	H vs. L	1.07 (0.30,3.80)	0.999
Sun-Exposure Related Malignancies (Verified and Suspected) ^b	Officer	n	125		127		121		Overall		0.382
		Abnormal	10	8.0	16	12.6	10	8.3	M vs. L	1.66 (0.72,3.81)	0.301
		Normal	115	92.0	111	87.4	111	91.7	H vs. L	1.04 (0.42,2.59)	0.999
	Enlisted Flyer	n	54		61		52		Overall		0.058
		Abnormal	7	13.0	3	4.9	1	1.9	M vs. L	0.35 (0.09,1.42)	0.186
		Normal	47	87.0	58	95.1	51	98.1	H vs. L	0.13 (0.02,1.11)	0.060
	Enlisted Groundcrew	n	138		149		129		Overall		0.945
		Abnormal	6	4.3	7	4.7	5	3.9	M vs. L	1.09 (0.36,3.31)	0.999
		Normal	132	95.7	142	95.3	124	96.1	M vs. L	0.89 (0.26, 2.98)	0.999

TABLE B-27. (continued)

Unadjusted Exposure Index Analysis for Followup Participants
for Lifetime Occurrence of Malignant Neoplasms

Variable	Occupation	Statistic	Exposure Index ^a						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Systemic Malignancies (Verified Only) ^c	Officer	n	127		130		123		Overall		0.876
		Abnormal	2	1.6	3	2.3	3	2.4	M vs. L	1.48 (0.24,8.99)	0.999
		Normal	125	98.4	127	97.7	120	97.6	H vs. L	1.56 (0.26,9.52)	0.680
	Enlisted Flyer	n	55		65		57		Overall		0.825
		Abnormal	2	3.6	2	3.1	1	1.8	M vs. L	0.84 (0.12,6.18)	0.999
		Normal	53	96.4	63	96.9	56	98.2	H vs. L	0.47 (0.04,5.37)	0.615
	Enlisted Groundcrew	n	154		163		142		Overall		0.205
		Abnormal	0	0.0	3	1.8	1	0.7	M vs. L	6.74 (0.35,131.53)*	0.248
		Normal	154	100.0	160	98.2	141	99.3	H vs. L	3.28 (0.13,81.06)*	0.480
Systemic Malignancies (Verified and Suspected) ^c	Officer	n	127		130		123		Overall		0.730
		Abnormal	2	1.6	4	3.1	3	2.4	M vs. L	1.98 (0.36,11.03)	0.684
		Normal	125	98.4	126	96.9	120	97.6	H vs. L	1.56 (0.26,9.52)	0.680
	Enlisted Flyer	n	55		65		57		Overall		0.784
		Abnormal	3	5.5	2	3.1	2	3.5	M vs. L	0.55 (0.09,3.42)	0.660
		Normal	52	94.5	63	96.9	55	96.5	H vs. L	0.63 (0.10,3.93)	0.676
	Enlisted Groundcrew	n	154		163		142		Overall		0.261
		Abnormal	0	0.0	3	1.8	2	1.4	M vs. L	6.74 (0.35,131.53)*	0.248
		Normal	154	100.0	160	98.2	140	98.6	H vs. L	5.50 (0.26,115.51)*	0.229

^aNumber and percent of total participants.^bNonblacks only.^cBlacks and nonblacks.

*0.5 added to each cell to calculate relative risk and confidence interval due to zero cell.

APPENDIX I
Neurological Assessment

APPENDIX I: Neurological Assessment

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TABLE I-1.

Unadjusted Exposure Index Analyses for Neurological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Snell	Officer	n	127		130		123		Overall		0.361
		Abnormal	2	1.6	0	0.0	1	0.8	M vs. L	0.19 (0.01,4.05)*	0.243
		Normal	125	98.4	130	100.0	122	99.2	H vs. L	0.51 (0.05,5.72)	0.999
	Enlisted Flyer	n	55		65		57		Overall		0.739
		Abnormal	1	1.8	1	1.5	2	3.5	M vs. L	0.84 (0.05,13.81)	0.999
		Normal	54	98.2	64	98.5	55	96.5	H vs. L	1.96 (0.17,22.30)	0.999
	Enlisted Groundcrew	n	154		163		142		Overall		0.995
		Abnormal	1	0.7	1	0.6	1	0.7	M vs. L	0.94 (0.06,15.23)	0.999
		Normal	153	99.3	162	99.4	141	99.3	H vs. L	1.09 (0.07,17.51)	0.999
Visual Fields	Officer	n	127		130		123		Overall		0.593
		Abnormal	1	0.8	0	0.0	1	0.8	M vs. L	0.32 (0.01,8.01)*	0.494
		Normal	126	99.2	130	100.0	122	99.2	H vs. L	1.03 (0.06,16.70)	0.999
	Enlisted Flyer	n	55		65		57		Overall		0.328
		Abnormal	1	1.8	0	0.0	0	0.0	M vs. L	0.28 (0.01,6.95)*	0.458
		Normal	54	98.2	65	100.0	57	100.0	H vs. L	0.32 (0.01,7.92)*	0.491
	Enlisted Groundcrew	n	154		163		142		Overall		0.356
		Abnormal	2	1.3	0	0.0	1	0.7	M vs. L	0.19 (0.01,3.92)*	0.235
		Normal	152	98.7	163	100.0	141	99.3	H vs. L	0.54 (0.05,6.01)	0.999

TABLE I-1. (continued)

Unadjusted Exposure Index Analyses for Neurological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Light Reaction	Officer	n	126		130		123		Overall		0.133
		Abnormal	2	1.6	0	0.0	0	0.0	M vs. L	0.19 (0.01,4.01)*	0.241
		Normal	124	98.4	130	100.0	123	100.0	H vs. L	0.20 (0.01,4.24)*	0.498
	Enlisted Flyer	n	55		65		57		Overall		0.328
		Abnormal	1	1.8	0	0.0	0	0.0	M vs. L	0.28 (0.01,6.95)*	0.458
		Normal	54	98.2	65	100.0	57	100.0	H vs. L	0.32 (0.01,7.92)*	0.491
	Enlisted Groundcrew	n	154		163		142		Overall		0.866
		Abnormal	2	1.3	2	1.2	1	0.7	M vs. L	0.94 (0.13,6.79)	0.999
		Normal	152	98.7	161	98.8	141	99.3	H vs. L	0.54 (0.05,6.01)	0.999
Ocular Movements	Officer	n	127		130		123		Overall		0.368
		Abnormal	1	0.8	0	0.0	0	0.0	M vs. L	0.32 (0.01,8.01)*	0.494
		Normal	126	99.2	130	100.0	123	100.0	H vs. L	0.34 (0.01,8.46)*	0.999
	Enlisted Flyer	n	55		65		57		Overall		0.612
		Abnormal	1	1.8	1	1.5	0	0.0	M vs. L	0.84 (0.05,13.81)	0.999
		Normal	54	98.2	64	98.5	57	100.0	H vs. L	0.32 (0.01,7.92)*	0.491
	Enlisted Groundcrew	n	154		163		142		Overall		0.995
		Abnormal	1	0.7	1	0.6	1	0.7	M vs. L	0.94 (0.06,15.23)	0.999
		Normal	153	99.3	162	99.4	141	99.3	H vs. L	1.09 (0.07,17.51)	0.999

TABLE I-1. (continued)

Unadjusted Exposure Index Analyses for Neurological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Facial Sensation	Officer	n	126		130		123		Overall		0.617
		Abnormal	1	0.8	1	0.8	0	0.0	M vs. L	0.97 (0.06,15.66)	0.999
		Normal	125	99.2	129	99.2	123	100.0	H vs. L	0.34 (0.01,8.40)*	0.999
	Enlisted Flyer	n	55		65		57		Overall		0.328
		Abnormal	1	1.8	0	0.0	0	0.0	M vs. L	0.28 (0.01,6.95)*	0.458
		Normal	54	98.2	65	100.0	57	100.0	H vs. L	0.32 (0.01,7.92)*	0.491
	Enlisted Groundcrew	n	154		163		141		Overall		0.372
		Abnormal	1	0.7	0	0.0	0	0.0	M vs. L	0.31 (0.01,7.74)*	0.486
		Normal	153	99.3	163	100.0	141	100.0	H vs. L	0.36 (0.02,8.95)*	0.999
Corneal Reflex	Officer	n	125		130		123		Overall		—
		Abnormal	0	0.0	0	0.0	0	0.0	M vs. L	—	—
		Normal	125	100.0	130	100.0	123	100.0	H vs. L	—	—
	Enlisted Flyer	n	55		65		57		Overall		—
		Abnormal	0	0.0	0	0.0	0	0.0	M vs. L	—	—
		Normal	55	100.0	65	100.0	57	100.0	H vs. L	—	—
	Enlisted Groundcrew	n	152		161		142		Overall		—
		Abnormal	0	0.0	0	0.0	0	0.0	M vs. L	—	—
		Normal	152	100.0	161	100.0	142	100.0	H vs. L	—	—

TABLE I-1. (continued)

Unadjusted Exposure Index Analyses for Neurological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Jaw Clench	Officer	n	127		130		123		Overall		0.368
		Abnormal	1	0.8	0	0.0	0	0.0	M vs. L	0.32 (0.01,8.01)*	0.494
		Normal	126	99.2	130	100.0	123	100.0	H vs. L	0.34 (0.01,8.46)*	0.999
	Enlisted Flyer	n	55		65		57		Overall		0.328
		Abnormal	1	1.8	0	0.0	0	0.0	M vs. L	0.28 (0.01,6.95)*	0.458
		Normal	54	98.2	65	100.0	57	100.0	H vs. L	0.32 (0.01,7.92)*	0.491
	Enlisted Groundcrew	n	154		163		142		Overall		—
		Abnormal	0	0.0	0	0.0	0	0.0	M vs. L	—	—
		Normal	154	100.0	163	100.0	142	100.0	H vs. L	—	—
Smile	Officer	n	127		130		123		Overall		0.618
		Abnormal	1	0.8	1	0.8	0	0.0	M vs. L	0.98 (0.06,15.79)	0.999
		Normal	126	99.2	129	99.2	123	100.0	H vs. L	0.34 (0.01,8.46)*	0.999
	Enlisted Flyer	n	55		65		57		Overall		0.612
		Abnormal	1	1.8	1	1.5	0	0.0	M vs. L	0.84 (0.05,13.81)	0.999
		Normal	54	98.2	64	98.5	57	100.0	H vs. L	0.32 (0.01,7.92)*	0.491
	Enlisted Groundcrew	n	154		163		142		Overall		0.323
		Abnormal	0	0.0	1	0.6	2	1.4	M vs. L	2.85 (0.12,70.55)*	0.999
		Normal	154	100.0	162	99.4	140	98.6	H vs. L	5.50 (0.26,115.5)*	0.229

TABLE I-1. (continued)

Unadjusted Exposure Index Analyses for Neurological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Palpebral Fissures	Officer	n	127		130		122		Overall		0.801
		Abnormal	1	0.8	2	1.5	1	0.8	M vs. L	1.97 (0.18,21.99)	0.999
		Normal	126	99.2	128	98.5	121	99.2	H vs. L	1.04 (0.06,16.84)	0.999
	Enlisted Flyer	n	55		65		57		Overall		0.420
		Abnormal	0	0.0	1	1.5	0	0.0	M vs. L	2.58 (0.10,64.65)*	0.999
		Normal	55	100.0	64	98.5	57	100.0	H vs. L	—	—
	Enlisted Groundcrew	n	154		163		142		Overall		0.598
		Abnormal	0	0.0	1	0.6	1	0.7	M vs. L	2.85 (0.12,70.55)*	0.999
		Normal	154	100.0	162	99.4	141	99.3	H vs. L	3.28 (0.13,81.06)*	0.480
Balance	Officer	n	127		130		123		Overall		—
		Abnormal	0	0.0	0	0.0	0	0.0	M vs. L	—	—
		Normal	127	100.0	130	100.0	123	100.0	H vs. L	—	—
	Enlisted Flyer	n	55		64		57		Overall		—
		Abnormal	0	0.0	0	0.0	0	0.0	M vs. L	—	—
		Normal	55	100.0	64	100.0	57	100.0	H vs. L	—	—
	Enlisted Groundcrew	n	154		163		142		Overall		0.574
		Abnormal	1	0.7	0	0.0	1	0.7	M vs. L	0.31 (0.01,7.74)*	0.486
		Normal	153	99.3	163	100.0	141	99.3	H vs. L	1.09 (0.07,17.51)*	0.999

TABLE I-1. (continued)

Unadjusted Exposure Index Analyses for Neurological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Gag Reflex	Officer	n	126		130		123		Overall		—
		Abnormal	0	0.0	0	0.0	0	0.0	M vs. L	—	—
		Normal	126	100.0	130	100.0	123	100.0	H vs. L	—	—
	Enlisted Flyer	n	55		65		57		Overall		0.328
		Abnormal	1	1.8	0	0.0	0	0.0	M vs. L	0.28 (0.01,6.95)*	0.458
		Normal	54	98.2	65	100.0	57	100.0	H vs. L	0.32 (0.01,7.92)*	0.491
	Enlisted Groundcrew	n	153		163		142		Overall		—
		Abnormal	0	0.0	0	0.0	0	0.0	M vs. L	—	—
		Normal	153	100.0	163	100.0	142	100.0	H vs. L	—	—
Speech	Officer	n	127		130		123		Overall		—
		Abnormal	0	0.0	0	0.0	0	0.0	M vs. L	—	—
		Normal	127	100.0	130	100.0	123	100.0	H vs. L	—	—
	Enlisted Flyer	n	55		65		57		Overall		0.328
		Abnormal	1	1.8	0	0.0	0	0.0	M vs. L	0.28 (0.01,6.95)*	0.458
		Normal	54	98.2	65	100.0	57	100.0	H vs. L	0.32 (0.01,7.92)*	0.491
	Enlisted Groundcrew	n	154		163		142		Overall		0.574
		Abnormal	1	0.7	0	0.0	1	0.7	M vs. L	0.31 (0.01,7.74)*	0.486
		Normal	153	99.3	163	100.0	141	99.3	H vs. L	1.09 (0.07,17.51)	0.999

TABLE I-1. (continued)

Unadjusted Exposure Index Analyses for Neurological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Tongue Position Relative to Midline	Officer	n	127		130		123		Overall		0.368
		Abnormal	1	0.8	0	0.0	0	0.0	M vs. L	0.32 (0.01,8.01)*	0.494
		Normal	126	99.2	130	100.0	123	100.0	H vs. L	0.34 (0.01,8.46)*	0.999
	Enlisted Flyer	n	55		65		57		Overall		0.328
		Abnormal	1	1.8	0	0.0	0	0.0	M vs. L	0.28 (0.01,6.95)*	0.458
		Normal	54	98.2	65	100.0	57	100.0	H vs. L	0.32 (0.01,7.92)*	0.491
	Enlisted Groundcrew	n	153		163		142		Overall		0.404
		Abnormal	0	0.0	1	0.6	0	0.0	M vs. L	2.83 (0.12,70.09)*	0.999
		Normal	153	100.0	162	99.4	142	100.0	H vs. L	—	—
Palate and Uvula Movement	Officer	n	126		130		123		Overall		0.365
		Abnormal	1	0.8	0	0.0	0	0.0	M vs. L	0.32 (0.01,7.94)*	0.492
		Normal	125	99.2	130	100.0	123	100.0	H vs. L	0.34 (0.01,8.40)*	0.999
	Enlisted Flyer	n	55		65		57		Overall		0.328
		Abnormal	1	1.8	0	0.0	0	0.0	M vs. L	0.28 (0.01,6.95)*	0.458
		Normal	54	98.2	65	100.0	57	100.0	H vs. L	0.32 (0.01,7.92)*	0.491
	Enlisted Groundcrew	n	153		163		142		Overall		—
		Abnormal	0	0.0	0	0.0	0	0.0	M vs. L	—	—
		Normal	153	100.0	163	100.0	142	100.0	H vs. L	—	—

TABLE I-1. (continued)

Unadjusted Exposure Index Analyses for Neurological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Neck Range of Motion	Officer	n	127		130		123		Overall		0.924
		Abnormal	9	7.1	9	6.9	10	8.1	M vs. L	0.98 (0.37,2.54)	0.999
		Normal	118	92.9	121	93.1	113	91.9	H vs. L	1.16 (0.46,2.96)	0.814
	Enlisted Flyer	n	55		65		57		Overall		0.891
		Abnormal	5	9.1	6	9.2	4	7.0	M vs. L	1.02 (0.29,3.53)	0.999
		Normal	50	90.9	59	90.8	53	93.0	H vs. L	0.76 (0.19,2.97)	0.740
	Enlisted Groundcrew	n	154		163		142		Overall		0.250
		Abnormal	9	5.8	6	3.7	3	2.1	M vs. L	0.62 (0.21,1.77)	0.433
		Normal	145	94.2	157	96.3	139	97.9	H vs. L	0.35 (0.09,1.31)	0.142
Cranial Nerve Function Index	Officer	n	122		130		123		Overall		0.734
		Abnormal	15	12.3	12	9.2	13	10.7	M vs. L	0.73 (0.33,1.62)	0.542
		Normal	107	87.7	118	90.8	109	89.3	H vs. L	0.85 (0.39,1.87)	0.841
	Enlisted Flyer	n	55		64		57		Overall		0.754
		Abnormal	7	12.7	8	12.5	5	8.8	M vs. L	0.98 (0.33,2.90)	0.999
		Normal	48	87.3	56	87.5	52	91.2	H vs. L	0.66 (0.20,2.22)	0.554
	Enlisted Groundcrew	n	151		161		141		Overall		0.512
		Abnormal	15	9.9	12	7.5	9	6.4	M vs. L	0.73 (0.33,1.62)	0.546
		Normal	136	90.1	149	92.5	132	93.6	H vs. L	0.62 (0.26,1.46)	0.290

TABLE I-1. (continued)

Unadjusted Exposure Index Analyses for Neurological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Cranial Nerve Function Index (Neck Range of Motion Excluded)	Officer	n	122		130		122		Overall		0.136
		Abnormal	8	6.6	3	2.3	3	2.5	M vs. L	0.34 (0.09,1.30)	0.127
		Normal	114	93.4	127	97.7	119	97.5	H vs. L	0.36 (0.09,1.39)	0.216
	Enlisted Flyer	n	55		64		57		Overall		0.791
		Abnormal	3	5.5	2	3.1	2	3.5	M vs. L	0.56 (0.09,3.47)	0.661
		Normal	52	94.5	62	96.9	55	96.5	H vs. L	0.63 (0.10,3.93)	0.676
	Enlisted Groundcrew	n	151		161		141		Overall		0.785
		Abnormal	8	5.3	6	3.7	7	5.0	M vs. L	0.69 (0.23,2.04)	0.590
		Normal	143	94.7	155	96.3	134	95.0	H vs. L	0.93 (0.33,2.65)	0.999
Pin Prick	Officer	n	126		127		122		Overall		0.713
		Abnormal	9	7.1	6	4.7	7	5.7	M vs. L	0.65 (0.22,1.87)	0.440
		Normal	117	92.9	121	95.3	115	94.3	H vs. L	0.79 (0.29,2.20)	0.797
	Enlisted Flyer	n	55		64		57		Overall		0.584
		Abnormal	5	9.1	3	4.7	5	8.8	M vs. L	0.49 (0.11,2.16)	0.469
		Normal	50	90.9	61	95.3	52	91.2	H vs. L	0.96 (0.26,3.52)	0.999
	Enlisted Groundcrew	n	152		162		138		Overall		0.052
		Abnormal	13	8.6	8	4.9	3	2.2	M vs. L	0.56 (0.22,1.38)	0.259
		Normal	139	91.4	154	95.1	135	97.8	H vs. L	0.24 (0.07,0.85)	0.020

TABLE I-1. (continued)

Unadjusted Exposure Index Analyses for Neurological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Light Touch	Officer	n	126		127		122		Overall		0.141
		Abnormal	9	7.1	4	3.2	3	2.5	M vs. L	0.42 (0.13,1.41)	0.167
		Normal	117	92.9	123	96.8	119	97.5	H vs. L	0.33 (0.09,1.24)	0.137
	Enlisted Flyer	n	55		64		57		Overall		0.619
		Abnormal	3	5.5	2	3.1	4	7.0	M vs. L	0.56 (0.09,3.47)	0.661
		Normal	52	94.5	62	96.9	53	93.0	H vs. L	1.31 (0.28,6.13)	0.999
	Enlisted Groundcrew	n	152		162		138		Overall		0.834
		Abnormal	5	3.3	5	3.1	3	2.2	M vs. L	0.94 (0.27,3.30)	0.999
		Normal	147	96.7	157	96.9	135	97.8	H vs. L	0.65 (0.15,2.79)	0.725
Muscle Status	Officer	n	127		130		123		Overall		0.428
		Abnormal	5	3.9	2	1.5	5	4.1	M vs. L	0.38 (0.07,2.00)	0.278
		Normal	122	96.1	128	98.5	118	95.9	H vs. L	1.03 (0.29,3.66)	0.999
	Enlisted Flyer	n	55		65		57		Overall		0.992
		Abnormal	1	1.8	1	1.5	1	1.8	M vs. L	0.84 (0.05,13.81)	0.999
		Normal	54	98.2	64	98.5	56	98.2	H vs. L	0.96 (0.06,15.81)	0.999
	Enlisted Groundcrew	n	154		163		142		Overall		0.781
		Abnormal	3	2.0	5	3.1	3	2.1	M vs. L	1.59 (0.37,6.78)	0.724
		Normal	151	98.0	158	96.9	139	97.9	H vs. L	1.09 (0.22,5.47)	0.999

TABLE I-1. (continued)

Unadjusted Exposure Index Analyses for Neurological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Vibratory Sensation	Officer	n	126		127		122		Overall		0.542
		Abnormal	3	2.4	1	0.8	3	2.5	M vs. L	0.33 (0.03,3.17)	0.370
		Normal	123	97.6	126	99.2	119	97.5	H vs. L	1.03 (0.21,5.22)	0.999
	Enlisted Flyer	n	55		64		57		Overall		0.628
		Abnormal	0	0.0	1	1.6	1	1.8	M vs. L	2.62 (0.11,65.68)*	0.999
		Normal	55	100.0	63	98.4	56	98.2	H vs. L	2.95 (0.12,73.90)*	0.999
	Enlisted Groundcrew	n	152		162		138		Overall		0.166
		Abnormal	0	0.0	2	1.2	0	0.0	M vs. L	4.75 (0.23,99.76)*	0.499
		Normal	152	100.0	160	98.8	138	100.0	H vs. L	—	—
Patellar Reflex	Officer	n	127		130		123		Overall		0.156
		Abnormal	0	0.0	1	0.8	3	2.4	M vs. L	2.95 (0.12,73.18)*	0.999
		Normal	127	100.0	129	99.2	120	97.6	H vs. L	7.41 (0.38,144.90)*	0.118
	Enlisted Flyer	n	55		65		57		Overall		0.992
		Abnormal	1	1.8	1	1.5	1	1.8	M vs. L	0.84 (0.05,13.81)	0.999
		Normal	54	98.2	64	98.5	56	98.2	H vs. L	0.96 (0.06,15.81)	0.999
	Enlisted Groundcrew	n	154		163		142		Overall		0.170
		Abnormal	3	2.0	0	0.0	1	0.7	M vs. L	0.13 (0.01,2.58)*	0.114
		Normal	151	98.0	163	100.0	141	99.3	H vs. L	0.36 (0.04,3.47)	0.624

TABLE I-1. (continued)

Unadjusted Exposure Index Analyses for Neurological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Achilles Reflex	Officer	n	124		129		123		Overall		0.774
		Abnormal	8	6.5	6	4.7	8	6.5	M vs. L	0.71 (0.24,2.10)	0.591
		Normal	116	93.5	123	95.3	115	93.5	H vs. L	1.01 (0.37,2.78)	0.999
	Enlisted Flyer	n	55		64		57		Overall		0.059
		Abnormal	5	9.1	0	0.0	4	7.0	M vs. L	0.07 (0.004,1.32)*	0.019
		Normal	50	90.9	64	100.0	53	93.0	H vs. L	0.76 (0.19,2.97)	0.740
Enlisted Groundcrew	n	153		163		141		Overall		0.920	
	Abnormal	10	6.5	9	5.5	8	5.7	M vs. L	0.84 (0.33,2.12)	0.814	
	Normal	143	93.5	154	94.5	133	94.3	H vs. L	0.86 (0.33,2.25)	0.812	
Biceps Reflex	Officer	n	127		130		123		Overall		0.344
		Abnormal	1	0.8	0	0.0	2	1.6	M vs. L	0.32 (0.01,8.01)*	0.494
		Normal	126	99.2	130	100.0	121	98.4	H vs. L	2.08 (0.19,23.27)	0.618
	Enlisted Flyer	n	55		65		57		Overall		0.420
		Abnormal	0	0.0	1	1.5	0	0.0	M vs. L	2.58 (0.10,64.65)	0.999
		Normal	55	100.0	64	98.5	57	100.0	H vs. L	—	—
Enlisted Groundcrew	n	154		163		142		Overall		0.515	
	Abnormal	1	0.7	3	1.8	1	0.7	M vs. L	2.87 (0.30,27.88)	0.623	
	Normal	153	99.3	160	98.2	141	99.3	H vs. L	1.09 (0.07,17.51)	0.999	

TABLE I-1. (continued)

Unadjusted Exposure Index Analyses for Neurological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Babinski Reflex	Officer	n	127		128		122		Overall		—
		Abnormal	0	0.0	0	0.0	0	0.0	M vs. L	—	—
		Normal	127	100.0	128	100.0	122	100.0	H vs. L	—	—
	Enlisted Flyer	n	55		65		57		Overall		—
		Abnormal	0	0.0	0	0.0	0	0.0	M vs. L	—	—
		Normal	55	100.0	65	100.0	57	100.0	H vs. L	—	—
	Enlisted Groundcrew	n	153		162		142		Overall		0.329
		Abnormal	2	1.3	0	0.0	2	1.4	M vs. L	0.19 (0.01,3.92)*	0.235
		Normal	151	98.7	162	100.0	140	98.6	H vs. L	1.08 (0.15,7.76)	0.999
Tremor	Officer	n	127		130		123		Overall		0.248
		Abnormal	5	3.9	1	0.8	3	2.4	M vs. L	0.19 (0.02,1.64)	0.117
		Normal	122	96.1	129	99.2	120	97.6	H vs. L	0.61 (0.14,2.61)	0.722
	Enlisted Flyer	n	55		65		57		Overall		0.609
		Abnormal	1	1.8	3	4.6	3	5.3	M vs. L	2.61 (0.26,25.86)	0.624
		Normal	54	98.2	62	95.4	54	94.7	H vs. L	3.00 (0.30,29.76)	0.618
	Enlisted Groundcrew	n	154		163		142		Overall		0.312
		Abnormal	5	3.3	4	2.5	1	0.7	M vs. L	0.75 (0.20,2.85)	0.744
		Normal	149	96.7	159	97.5	141	99.3	H vs. L	0.21 (0.02,1.83)	0.216

TABLE I-1. (continued)

Unadjusted Exposure Index Analyses for Neurological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Coordination	Officer	n	127		130		123		Overall		0.603
		Abnormal	0	0.0	1	0.8	1	0.8	M vs. L	2.95 (0.12,73.18)*	0.999
		Normal	127	100.0	129	99.2	122	99.2	H vs. L	3.12 (0.13,77.39)*	0.492
	Enlisted Flyer	n	55		64		57		Overall		0.415
		Abnormal	0	0.0	1	1.6	0	0.0	M vs. L	2.62 (0.11,65.68)*	0.999
		Normal	55	100.0	63	98.4	57	100.0	H vs. L	—	—
Enlisted Groundcrew	n	154		163		142		Overall		0.516	
	Abnormal	2	1.3	1	0.6	3	2.1	M vs. L	0.47 (0.04,5.23)	0.613	
	Normal	152	98.7	162	99.4	139	97.9	H vs. L	1.64 (0.27,9.96)	0.674	
Romberg Sign	Officer	n	127		130		123		Overall		—
		Abnormal	0	0.0	0	0.0	0	0.0	M vs. L	—	—
		Normal	127	100.0	130	100.0	123	100.0	H vs. L	—	—
	Enlisted Flyer	n	55		64		57		Overall		—
		Abnormal	0	0.0	0	0.0	0	0.0	M vs. L	—	—
		Normal	55	100.0	64	100.0	57	100.0	H vs. L	—	—
Enlisted Groundcrew	n	154		163		142		Overall		0.574	
	Abnormal	1	0.7	0	0.0	1	0.7	M vs. L	0.31 (0.01,7.74)	0.486	
	Normal	153	99.3	163	100.0	141	99.3	H vs. L	1.09 (0.07,17.51)	0.999	

TABLE I-1. (continued)

Unadjusted Exposure Index Analyses for Neurological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Gait	Officer	n	127		130		123		Overall		0.591
		Abnormal	3	2.4	1	0.8	2	1.6	M vs. L	0.32 (0.03,3.12)	0.366
		Normal	124	97.6	129	99.2	121	98.4	H vs. L	0.68 (0.11,4.16)	0.999
	Enlisted Flyer	n	55		65		57		Overall		0.370
		Abnormal	2	3.6	2	3.1	0	0.0	M vs. L	0.84 (0.12,6.18)	0.999
		Normal	53	96.4	63	96.9	57	100.0	H vs. L	0.19 (0.01,3.97)*	0.239
	Enlisted Groundcrew	n	154		163		142		Overall		0.580
		Abnormal	4	2.6	2	1.2	4	2.8	M vs. L	0.47 (0.08,2.58)	0.437
		Normal	150	97.4	161	98.8	138	97.2	H vs. L	1.09 (0.27,4.43)	0.999
ONS Summary Index	Officer	n	127		130		123		Overall		0.123
		Abnormal	8	6.3	2	1.5	4	3.3	M vs. L	0.23 (0.05,1.12)	0.058
		Normal	119	93.7	128	98.5	119	96.7	H vs. L	0.50 (0.15,1.71)	0.377
	Enlisted Flyer	n	55		64		57		Overall		0.810
		Abnormal	3	5.5	5	7.8	3	5.3	M vs. L	1.47 (0.34,6.45)	0.724
		Normal	52	94.5	59	92.2	54	94.7	H vs. L	0.96 (0.19,4.99)	0.999
	Enlisted Groundcrew	n	154		163		142		Overall		0.585
		Abnormal	10	6.5	7	4.3	6	4.2	M vs. L	0.65 (0.24,1.74)	0.459
		Normal	144	93.5	156	95.7	136	95.8	H vs. L	0.64 (0.23,1.80)	0.448

*Estimated relative risk and confidence interval calculated after adding 0.5 to each cell.

—No abnormal present in contrast; estimated relative risk, confidence interval, and p-value not calculated.

TABLE I-2.

Interaction Summaries of Adjusted Exposure
Index Analyses for Selected Neurological Variables

Variable	Interaction (Occupation)	Stratification	Statistic	Exposure Index						Contrast	Adj. Relative Risk (95% C.I.)	p-Value	
				Low		Medium		High					
				Number	Percent	Number	Percent	Number	Percent				
Cranial Nerve Function Index	Exposure Index-by- Diabetic Class (Enlisted Groundcrew)	Diabetic	n	7		12		14		Overall		0.339*	
			Abnormal	0	0.0	3	25.0	2	14.3	M vs. L	5.53 (0.25,124.40)**	0.263*	
			Normal	7	100.0	9	75.0	12	85.7	H vs. L	3.00 (0.13,71.31)**	0.533*	
		Impaired	n	11		14		18		Overall		0.114*	
			Abnormal	0	0.0	2	14.3	0	0.0	M vs. L	4.60 (0.20,106.30)**	0.487*	
			Normal	11	100.0	12	85.7	18	100.0	H vs. L	—	—	
	Normal ^a	n	133		135		109		Overall		0.336		
		Abnormal	15	11.3	7	5.2	7	6.4	M vs. L	0.55 (0.21,1.44)	0.225		
		Normal	118	88.7	128	94.8	102	93.6	H vs. L	0.56 (0.22,1.44)	0.228		
	Light Touch	Exposure Index-by- Insecticide	Yes ^b	n	38		45		40		Overall		0.086
				Abnormal	1	2.6	2	4.4	4	10.0	M vs. L	0.42 (0.02,8.81)	0.573
				Normal	37	97.4	43	95.6	36	90.0	H vs. L	5.48 (0.41,71.54)	0.194
Exposure (Enlisted Flyer)		No	n	17		19		17		Overall		0.111*	
			Abnormal	2	11.8	0	0.0	0	0.0	M vs. L	0.16 (0.01,3.56)**	0.216*	
			Normal	15	88.2	19	100.0	17	100.0	H vs. L	0.18 (0.01,3.98)**	0.485*	

TABLE I-2. (continued)

Interaction Summaries of Adjusted Exposure
Index Analyses for Selected Neurological Variables

Variable	Interaction (Occupation)	Stratification	Statistic	Exposure Index						Contrast	Adj. Relative Risk (95% C.I.)	p-Value
				Low		Medium		High				
				Number	Percent	Number	Percent	Number	Percent			
Muscle Status		Born ≥ 1942	n	87		129		82		Overall		0.539*
			Abnormal	1	1.1	2	1.6	0	0.0	M vs. L	1.35 (0.12,15.17)*	0.999*
			Normal	86	98.9	127	98.4	82	100.0	H vs. L	0.35 (0.01,8.70)**	0.999*
	Exposure Index-by- Age (Enlisted Groundcrew)	Born 1923-1941	n	63		33		54		Overall		0.436*
			Abnormal	1	1.6	2	6.1	3	5.6	M vs. L	4.00 (0.35,45.84)*	0.271*
			Normal	62	98.4	31	93.9	51	94.4	H vs. L	3.65 (0.37,36.13)*	0.334*
		Born ≤ 1922	n	4		1		6		Overall		0.051*
			Abnormal	1	25.0	1	100.0	0	0.0	M vs. L	7.00 (0.17,291.34)**	0.400*
			Normal	3	75.0	0	0.0	6	100.0	H vs. L	0.18 (0.01,5.68)**	0.400*
Achilles Reflex		Born $\geq 1942^b$	n	86		129		81		Overall		0.309
			Abnormal	2	2.3	6	4.7	1	1.2	M vs. L	2.18 (0.43,11.12)	0.346
			Normal	84	97.7	123	95.3	80	98.8	H vs. L	0.57 (0.05,6.37)	0.644
	Exposure Index-by- Age (Enlisted Groundcrew)	Born 1923-1941 ^b	n	63		33		54		Overall		0.649
			Abnormal	5	7.9	2	6.1	6	11.1	M vs. L	0.64 (0.11,3.75)	0.624
			Normal	58	92.1	31	93.9	48	88.9	H vs. L	1.40 (0.38,5.19)	0.616
		Born ≤ 1922	n	4		1		6		Overall		0.100*
			Abnormal	3	75.0	1	100.0	1	16.7	M vs. L	1.29 (0.03,53.51)**	0.999*
			Normal	1	25.0	0	0.0	5	83.3	H vs. L	0.07 (0.003,1.51)*	0.190*

TABLE I-2. (continued)

Interaction Summaries of Adjusted Exposure
Index Analyses for Selected Neurological Variables

Variable	Interaction (Occupation)	Stratification	Statistic	Exposure Index						Contrast	Adj. Relative Risk (95% C.I.)	p-Value
				Low		Medium		High				
				Number	Percent	Number	Percent	Number	Percent			
Central Nervous System Index	Exposure Index-by- Insecticide	Yes ^b	n	102		113		95		Overall		0.560
			Abnormal	4	3.9	7	6.2	3	3.2	H vs. L	1.68 (0.48,5.95)	0.419
			Normal	98	96.1	106	93.8	92	96.8	H vs. L	0.87 (0.19,3.99)	0.853
	Exposure (Enlisted Groundcrew)	No	n	52		50		47		Overall		0.050*
			Abnormal	6	11.5	0	0.0	3	6.4	H vs. L	0.07 (0.004,1.29)**	0.027*
			Normal	46	88.5	50	100.0	44	93.6	H vs. L	0.38 (0.10,1.54)*	0.209*

*Estimated relative risk or p-value, based on stratified tables.

**Estimated relative risk and confidence interval calculated after adding 0.5 to each cell.

—No abnormal participants present in contrast; adjusted relative risk, p-value, and confidence interval not presented.

^aResults adjusted for age.

^bResults adjusted for diabetic class.

Note: Small sample sizes may affect validity of overall p-value.

TABLE I-3.

Exclusions and Missing Data
for Neurological Assessment by Group
(Original Comparisons Only)

Data Category	Group		Total
	Ranch Hand	Original Comparison	
Lifetime Alcohol History (Drink-years); Missing Data	39	27	66
Peripheral Edema (Exclusion Category for Pin Prick, Light Touch, and Ankle Vibration)	13	12	25
Diabetic Class (Missing Data)	0	3	3
Positive Syphilis Serology (RPR and FTA); Exclusion Category	0	0	0

TABLE I-4.

Unadjusted Analyses for Verified Neurological
Diseases by Group*--1982-1985
(Original Comparisons Only)

Disease Category	Group Abnormalities				Total	p-Value**
	Ranch Hand		Original Comparison			
	Number	Percent	Number	Percent		
Inflammatory Diseases	0	0.0	0	0.0	0	—
Hereditary and Degenerative Diseases	2	0.2	0	0.0	2	0.500
Peripheral Disorders	18	1.8	20	2.1	38	0.626
Disorders of the Eye	5	0.5	5	0.5	10	0.999
Disorders of the Ear	6	0.6	6	0.6	12	0.999
Other Disorders	8	0.8	3	0.3	11	0.288

*Based on 1,016 Ranch Hands and 955 Original Comparisons; some participants may be classified in more than one category.

**Fisher's exact test.

TABLE I-5.

Unadjusted Analyses for Verified Neurological
Diseases by Group*--Baseline and First Followup Studies Combined
(Original Comparisons Only)

Disease Category	Group Abnormalities				Total	p-Value ^{** , a}
	Ranch Hand		Original Comparison			
	Number	Percent	Number	Percent		
Inflammatory Diseases	3	0.3	2	0.2	5	0.999
Hereditary and Degenerative Diseases	2	0.2	3	0.3	5	0.678
Peripheral Disorders	23	2.3	27	2.8	50	0.475
Disorders of the Eye	16	1.6	16	1.7	32	0.861
Disorders of the Ear	24	2.4	26	2.7	50	0.668
Other Disorders	15	1.5	12	1.3	27	0.703

*Based on 1,016 Ranch Hands and 955 Original Comparisons; some participants may be classified in more than one category.

**Fisher's exact test.

^aGroup significance for patterns of disease: p=0.702.

TABLE I-6.

Unadjusted Analyses for Cranial Nerve
Function by Group (Original Comparisons Only)

Variable	Cranial Nerve	Statistic	Group				Est. Relative Risk (95% C.I.)	p-Value
			Ranch Hand		Original Comparison			
			Number	Percent	Number	Percent		
Smell	I Olfactory	n	1,016		955		1.05 (0.42,2.58)	0.999
		Abnormal	10	1.0	9	0.9		
		Normal	1,006	99.0	946	99.1		
Visual Fields	II Optic	n	1,016		955		1.41 (0.40,5.02)	0.754
		Abnormal	6	0.6	4	0.4		
		Normal	1,010	99.4	951	99.6		
Light Reaction	III Oculomotor	n	1,015		954		1.08 (0.39,2.98)	0.999
		Abnormal	8	0.8	7	0.7		
		Normal	1,007	99.2	947	99.3		
Ocular Movements	III Oculomotor IV Trochlear VI Abducens	n	1,016		955		1.13 (0.34,3.71)	0.999
		Abnormal	6	0.6	5	0.5		
		Normal	1,010	99.4	950	99.5		
Facial Sensation	V Trigeminal	n	1,014		953		1.88 (0.34,10.31)	0.688
		Abnormal	4	0.4	2	0.2		
		Normal	1,010	99.6	951	99.8		
Jaw Clench	V Trigeminal	n	1,016		955		1.88 (0.17,20.79)	0.999
		Abnormal	2	0.2	1	0.1		
		Normal	1,014	99.8	954	99.9		
Smile	VII Facial	n	1,016		955		3.31 (0.69,15.95)	0.181
		Abnormal	7	0.7	2	0.2		
		Normal	1,009	99.3	953	99.8		
Palpebral Fissures	VII Facial	n	1,015		955		1.32 (0.42,4.17)	0.775
		Abnormal	7	0.7	5	0.5		
		Normal	1,008	99.3	950	99.5		

TABLE I-6. (continued)

Unadjusted Analyses for Cranial Nerve
Function by Group (Original Comparisons Only)

Variable	Cranial Nerve	Statistic	Group				Est. Relative Risk (95% C.I.)	p-Value
			Ranch Hand		Original Comparison			
			Number	Percent	Number	Percent		
Balance	VIII Acoustic	n	1,015		955		1.88 (0.17,20.81)	0.999
		Abnormal	2	0.2	1	0.1		
		Normal	1,013	99.8	954	99.9		
Gag Reflex	IX Glosso-pharyngeal	n	1,014		955		0.94 (0.06,15.08)	0.999
		Abnormal	1	0.1	1	0.1		
		Normal	1,013	99.9	954	99.9		
Speech	X Vagus	n	1,016		954		6.59 (0.34,127.80)*	0.250
		Abnormal	3	0.3	0	0.0		
		Normal	1,013	99.7	954	100.0		
Tongue Position Relative to Midline	X Vagus	n	1,015		955		6.61 (0.34,128.06)*	0.250
		Abnormal	3	0.3	0	0.0		
		Normal	1,012	99.7	955	100.0		
Palate and Uvula Movement	XI Spinal Accessory	n	1,014		955		1.89 (0.17,20.83)	0.999
		Abnormal	2	0.2	1	0.1		
		Normal	1,012	99.8	954	99.9		
Neck Range of Motion	XII Hypoglossal	n	1,016		955		0.89 (0.62,1.28)	0.579
		Abnormal	61	6.0	64	6.7		
		Normal	955	94.0	891	93.3		
Cranial Nerve Function Index		n	1,003		941		1.01 (0.75,1.37)	0.939
		Abnormal	96	9.6	89	9.5		
		Normal	907	90.4	852	90.5		

TABLE I-6. (continued)

Unadjusted Analyses for Cranial Nerve
Function by Group (Original Comparisons Only)

Variable	Cranial Nerve	Statistic	Group				Est. Relative Risk (95% C.I.)	p-Value
			Ranch Hand		Original Comparison			
			Number	Percent	Number	Percent		
Cranial Nerve Function Index (Neck Range of Motion Excluded)	n		1,003		941			
	Abnormal		42	4.2	29	3.1	1.34 (0.85,2.23)	0.226
	Normal		961	95.8	912	96.9		

*Estimated relative risk and confidence interval calculated after adding 0.5 to each cell.

TABLE I-7.

Adjusted Analyses for Selected Variables of Cranial Nerve Function by Group (Original Comparisons Only)

Variable	Statistic	Group		Original Comparison		Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks*
		Ranch Hand Number	Percent	Number	Percent			
Neck Range of Motion	n	1,016		955				
	Abnormal	61	6.0	64	6.7	0.92 (0.64,1.57)	0.647	AGE(p<0.001)
	Normal	955	94.0	891	93.3			
Cranial Nerve Function Index	n	1,003		941				
	Abnormal	96	9.6	89	9.5	1.04 (0.76,1.41)	0.812	AGE(p<0.001)
	Normal	907	90.4	852	90.5			
Cranial Nerve Function Index (Neck Range of Motion Excluded)	n	964		911				DIAB*INS(p=0.032) OCC*DRKYR(p=0.016) OCC*DIAB(p=0.032)
	Abnormal	38	3.9	28	3.1	1.27 (0.77,2.12)	0.350	
	Normal	926	96.1	883	96.9			
	Alternative Model—Includes Missing Drink-Year Participants ^{a, b}							
	n	1,003		938				DIAB*INS(p=0.022) OCC*DIAB(p=0.027)
	Abnormal	42	4.2	28	3.0	1.41 (0.86,2.32)	0.170	
	Normal	961	95.8	910	97.0			

*Abbreviations:

DIAB: diabetic class
 INS: insecticide exposure
 OCC: occupation
 DRKYR: drink-years

^aLifetime alcohol consumption (drink-years) not used as a covariate.

^b66 missing drink-year participants: 4/39 Ranch Hands abnormal; 0/27 Original Comparisons abnormal.

TABLE I-8.

Unadjusted Analyses for Peripheral Nerve Function by Group
(Original Comparisons Only)

Variable	Statistic	Group				Est. Relative Risk (95% C.I.)	p-Value
		Ranch Hand		Original Comparison			
		Number	Percent	Number	Percent		
Pin Prick	n	1,003		943		0.89 (0.62,1.28)	0.573
	Abnormal	59	5.9	62	6.6		
	Normal	944	94.1	881	93.4		
Light Touch	n	1,003		943		1.09 (0.68,1.75)	0.809
	Abnormal	38	3.8	33	3.5		
	Normal	965	96.2	910	96.5		
Muscle Status	n	1,016		955		0.94 (0.54,1.63)	0.888
	Abnormal	26	2.6	26	2.7		
	Normal	990	97.4	929	97.3		
Vibratory Sensation	n	1,003		943		1.48 (0.57,3.84)	0.482
	Abnormal	11	1.1	7	0.7		
	Normal	992	98.9	936	99.3		
Patellar Reflex	n	1,016		954		0.74 (0.33,1.63)	0.547
	Abnormal	11	1.1	14	1.5		
	Normal	1,005	98.9	940	98.5		
Achilles Reflex	n	1,009		950		0.87 (0.60,1.26)	0.510
	Abnormal	58	5.7	62	6.5		
	Normal	951	94.3	888	93.5		
Biceps Reflex	n	1,016		955		0.85 (0.34,2.09)	0.819
	Abnormal	9	0.9	10	1.0		
	Normal	1,007	99.1	945	99.0		
Babinski Reflex	n	1,011		951		0.94 (0.24,3.77)	0.999
	Abnormal	4	0.4	4	0.4		
	Normal	1,007	99.6	947	99.6		

TABLE I-9.

Adjusted Analyses for Selected Variables of
Peripheral Nerve Function by Group
(Original Comparisons Only)

Variable	Statistic	Group				Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks*
		Ranch Hand		Original Comparison				
		Number	Percent	Number	Percent			
Pin Prick	n	1,003		941		****	****	GRP*DIAB(p=0.001) AGE(p<0.001)
	Abnormal	59	5.9	61	6.5			
	Normal	944	94.1	880	93.5			
Light Touch	n	964		914		1.12 (0.69,1.82)	0.652	AGE(p=0.049) DRKYR(p=0.014)
	Abnormal	37	3.8	31	3.4			
	Normal	927	96.2	883	96.6			
Muscle Status	n	977		925		1.04 (0.57,1.89)	0.893	DRKYR*AGE(p=0.037) DIAB*INS(p=0.028)
	Abnormal	25	2.6	24	2.6			
	Normal	952	97.4	901	97.4			
Achilles Reflex	n	1,009		947		0.92 (0.63,1.35)	0.677	AGE(p<0.001) DIAB(p<0.001)
	Abnormal	58	5.7	61	6.4			
	Normal	951	94.3	886	93.6			

*Additional Abbreviation:

GRP: group

****Group-by-covariate interaction—adjusted relative risk, confidence interval, and p-value are not presented.

TABLE I-10.

Summary of Group-by-Diabetic Class
Interaction for Pin Prick
(Original Comparisons Only)

Variable	Interaction	Stratification	Statistic	Group				Adj. Relative Risk (95% C.I.)	p-Value
				Ranch Hand		Original Comparison			
				Number	Percent	Number	Percent		
Pin Prick	Group-by- Diabetic Class	Abnormal	n	76		74		2.03 (0.76,5.43)	0.161
			Abnormal	13	17.1	7	9.5		
			Normal	63	82.9	67	90.5		
	Impaired	n	105		135		0.08 (0.01,0.61)	0.015	
		Abnormal	1	1.0	14	10.4			
		Normal	104	99.0	121	89.6			
	Normal	n	822		732		1.01 (0.65,1.57)	0.951	
		Abnormal	45	5.5	40	5.5			
		Normal	777	94.5	692	94.5			

TABLE I-11.

Unadjusted Analyses for CNS Coordination Variables by Group
(Original Comparisons Only)

Variable	Statistic	Group				Est. Relative Risk (95% C.I.)	p-Value
		Ranch Hand		Original Comparison			
		Number	Percent	Number	Percent		
Tremor	n	1,016		955			
	Abnormal	26	2.6	14	1.5	1.77 (0.92,3.40)	0.110
	Normal	990	97.4	941	98.5		
Coordination	n	1,015		955			
	Abnormal	9	0.9	7	0.7	1.21 (0.45,3.27)	0.804
	Normal	1,006	99.1	948	99.3		
Romberg Sign	n	1,015		955			
	Abnormal	2	0.2	1	0.1	1.88 (0.17,20.81)	0.999
	Normal	1,013	99.8	954	99.9		
Gait	n	1,016		954			
	Abnormal	20	2.0	11	1.2	1.72 (0.82,3.61)	0.153
	Normal	996	98.0	943	98.8		
CNS Summary Index	n	1,015		954			
	Abnormal	48	4.7	29	3.0	1.58 (0.99,2.53)	0.062
	Normal	967	95.3	925	97.0		

TABLE I-12.

Adjusted Analyses for Selected Variables of
CNS Coordination by Group (Original Comparisons Only)

Variable	Statistic	Ranch Hand		Original Comparison		Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks
		Number	Percent	Number	Percent			
Tremor	n	1,016		952				
	Abnormal	26	2.6	14	1.5	1.68 (0.87,3.25)	0.112	DIAB(p=0.002)
	Normal	990	97.4	938	98.5			
Gait	n	1,016		951				
	Abnormal	20	2.0	10	1.1	1.85 (0.86,3.99)	0.105	DIAB(p=0.035)
	Normal	996	98.0	941	98.9			
CNS Summary Index	n	1,015		951				
	Abnormal	48	4.7	28	2.9	1.58 (0.98,2.55)	0.055	DIAB(p=0.009)
	Normal	967	95.3	923	97.1			

TABLE I-13.

Longitudinal Analysis of Romberg Sign and Babinski Reflex:
 A Contrast of Baseline and Followup Examination Abnormalities
 (Original Comparisons Only)

Variable	Group	1982 Baseline Exam	1985 Followup Exam		Odds Ratio (OR)*	p-Value (OR _{RH} vs OR _{OC})
			Abnormal	Normal		
Romberg Sign	Ranch	Abnormal	2	188	0	0.31
	Hand	Normal	0	777		
	Original Comparison	Abnormal	0	180	0.006	
Babinski Reflex	Ranch	Abnormal	1	7	0.43	0.07
	Hand	Normal	3	953		
	Original Comparison	Abnormal	0	1	4.00	

*Odds Ratio:
$$\frac{\text{Number Normal Baseline, Abnormal Followup}}{\text{Number Abnormal Baseline, Normal Followup}}$$

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Psychological Assessment

APPENDIX J: Psychological Assessment

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TABLE J-1.

Summary of Kolmogorov-Smirnov Tests on MMPI for Officers

Parameter*	Group	Mean Score	Standard Deviation	Kolmogorov-Smirnov p-Value
Anxiety	Ranch Hand	52.82	7.38	0.281
	Comparison	53.64	7.77	
Consistency	Ranch Hand	49.23	6.92	0.995
	Comparison	49.23	6.62	
Defensiveness	Ranch Hand	49.64	6.64	0.990
	Comparison	49.61	6.97	
Denial	Ranch Hand	59.47	7.31	0.877
	Comparison	59.81	7.46	
Depression	Ranch Hand	55.11	10.17	0.999
	Comparison	55.27	10.28	
Hypochondria	Ranch Hand	55.60	8.85	0.970
	Comparison	55.02	8.76	
Hysteria	Ranch Hand	60.45	7.00	0.627
	Comparison	59.97	7.47	
Mania/Hypomania	Ranch Hand	54.36	8.94	0.092
	Comparison	53.39	9.12	
Masculinity/ Femininity	Ranch Hand	58.83	8.64	0.366
	Comparison	58.10	9.07	
Paranoia	Ranch Hand	53.71	7.34	0.975
	Comparison	53.91	7.34	
Psychopathic/ Deviate	Ranch Hand	56.82	8.87	0.837
	Comparison	57.08	10.02	
Schizophrenia	Ranch Hand	54.80	8.48	0.942
	Comparison	55.14	9.02	
Social Introversion	Ranch Hand	46.56	7.43	0.594
	Comparison	47.19	7.77	
Validity	Ranch Hand	0.93	3.11	0.776
	Comparison	0.89	3.20	

*n=380 Ranch Hands; n=480 Comparisons (except for validity, where n=483 Comparisons).

TABLE J-2.

Summary of Kolmogorov-Smirnov Tests on MMPI for Enlisted Flyers

Parameter*	Group	Mean Score	Standard Deviation	Kolmogorov-Smirnov p-Value
Anxiety	Ranch Hand	54.78	9.73	0.678
	Comparison	55.09	10.09	
Consistency	Ranch Hand	52.24	10.30	0.995
	Comparison	51.83	8.22	
Defensiveness	Ranch Hand	53.05	7.96	0.270
	Comparison	52.00	8.31	
Denial	Ranch Hand	55.95	8.73	0.807
	Comparison	56.95	8.50	
Depression	Ranch Hand	58.21	11.79	0.744
	Comparison	58.32	11.86	
Hypochondria	Ranch Hand	58.48	12.16	0.496
	Comparison	59.25	12.85	
Hysteria	Ranch Hand	60.00	8.94	0.366
	Comparison	61.32	9.47	
Mania/Hypomania	Ranch Hand	55.05	10.00	0.496
	Comparison	54.99	9.87	
Masculinity/ Femininity	Ranch Hand	55.79	7.85	0.776
	Comparison	56.57	8.46	
Paranoia	Ranch Hand	52.77	8.43	0.695
	Comparison	51.92	7.83	
Psychopathic/ Deviate	Ranch Hand	57.48	11.40	0.088
	Comparison	58.95	10.79	
Schizophrenia	Ranch Hand	56.56	13.03	0.178
	Comparison	57.06	11.49	
Social Introversion	Ranch Hand	50.35	8.89	0.678
	Comparison	49.48	8.14	
Validity	Ranch Hand	3.93	42.48	0.864
	Comparison	6.31	54.96	

*n=176 Ranch Hands; n=208 Comparisons (except for validity, where n=177 Ranch Hands and n=210 Comparisons).

TABLE J-3.

Summary of Kolmogorov-Smirnov Tests on MMPI
for Enlisted Groundcrew

Parameter*	Group	Mean Score	Standard Deviation	Kolmogorov- Smirnov p-Value
Anxiety	Ranch Hand	55.86	10.96	0.993
	Comparison	55.61	9.58	
Consistency	Ranch Hand	53.05	10.64	0.877
	Comparison	52.03	8.43	
Defensiveness	Ranch Hand	52.42	8.27	0.970
	Comparison	52.60	8.35	
Denial	Ranch Hand	55.53	8.57	0.118
	Comparison	56.52	8.88	
Depression	Ranch Hand	58.79	12.98	0.594
	Comparison	57.66	10.78	
Hypochondria	Ranch Hand	58.44	13.22	0.142
	Comparison	57.13	11.12	
Hysteria	Ranch Hand	60.36	9.80	0.577
	Comparison	59.78	8.99	
Mania/Hypomania	Ranch Hand	55.26	9.78	0.450
	Comparison	56.33	10.17	
Masculinity/ Femininity	Ranch Hand	56.18	8.24	0.292
	Comparison	57.18	8.82	
Paranoia	Ranch Hand	53.12	9.05	0.393
	Comparison	53.73	8.47	
Psychopathic/ Deviate	Ranch Hand	59.01	11.29	0.728
	Comparison	59.26	10.66	
Schizophrenia	Ranch Hand	58.20	14.22	0.837
	Comparison	57.36	11.12	
Social Introversion	Ranch Hand	51.86	9.82	0.107
	Comparison	50.43	8.71	
Validity	Ranch Hand	1.97	26.48	0.999
	Comparison	0.89	4.80	

*n=458 Ranch Hands; n=598 Comparisons (except for validity, where n=459 Ranch Hands and n=599 Comparisons).

TABLE J-4.

**Summary of Group-by-Covariate Interactions
for Psychological Variables**

Variable	Interaction	Stratification	Statistic	Group				Adj. Relative Risk (95% C.I.)	p-Value
				Ranch	Hand	Comparison			
Anxiety	Group-by-Education	High School	n	564		685		1.39 (0.92,2.08)	0.114
			Number/% Abnormal Normal	57 507	10.1% 89.9%	49 636	7.2% 92.8%		
		College	n	448		600			
			Number/% Abnormal Normal	16 432	3.6% 96.4%	30 570	5.0% 95.0%		
Consistency	Group-by-Education	High School	n	537		661		1.81 (1.00,3.28)	0.051
			Number/% Abnormal Normal	30 507	5.6% 94.4%	19 642	2.9% 97.5%		
		College	n	437		585			
			Number/% Abnormal Normal	6 431	1.4% 98.6%	15 570	2.6% 97.4%		
Depression	Group-by-Combat Index	Low	n	192		490		1.73 (1.03,2.91)	0.039
			Number/% Abnormal Normal	28 164	14.6% 85.4%	40 450	8.2% 91.8%		
		Medium	n	368		417			
			Number/% Abnormal Normal	37 331	10.1% 89.9%	38 379	9.1% 90.9%		
		High	n	414		339			
			Number/% Abnormal Normal	43 371	10.4% 89.6%	47 292	13.9% 86.1%		

TABLE J-4. (continued)

Summary of Group-by-Covariate Interactions
for Psychological Variables

Variable	Interaction	Stratification	Statistic	Group		Adj. Relative Risk (95% C.I.)	p-Value	
				Ranch Hand	Comparison			
Paranoia	Group-by Age	Born \geq 1942	n	410	545			
			Number/% Abnormal Normal	15 395	3.7% 96.3%	19 526	3.5% 96.5%	0.88 (0.43,1.77)	0.712
		Born <1942	n	602	740			
			Number/% Abnormal Normal	16 586	2.7% 97.3%	9 731	1.2% 98.8%	2.63 (1.11,6.20)	0.027
Schizophrenia	Group-by- Education	High School	n	537	665			
			Number/% Abnormal Normal	72 465	13.4% 86.6%	63 602	9.5% 90.5%	1.51 (1.05,2.16)	0.033
		College	n	439	585			
			Number/% Abnormal Normal	18 421	4.1% 95.9%	37 548	6.3% 93.7%	0.63 (0.35,1.12)	0.119
Social Introversion	Group-by- Combat Index	Low	n	198	509			
			Number/% Abnormal Normal	11 187	5.6% 94.4%	6 503	1.2% 98.8%	4.86 (1.77,13.36)	0.002
		Medium	n	384	427			
			Number/% Abnormal Normal	6 378	1.6% 98.4%	4 423	0.9% 99.1%	1.59 (0.44,5.68)	0.478
		High	n	430	349			
			Number/% Abnormal Normal	9 421	2.1% 97.9%	9 340	2.6% 97.4%	0.82 (0.32,2.09)	0.677

TABLE J-4. (continued)

Summary of Group-by-Covariate Interactions
for Psychological Variables

Variable	Interaction	Stratification	Statistic	Group				Adj. Relative Risk (95% C.I.)	p-Value
				Ranch	Hand	Comparison			
Validity	Group-by-Race	Nonblack	n	954		1,206		1.20 (0.97,1.49)	0.095
			Number/%						
			>0	208	21.8%	235	19.5%		
		0	746	78.2%	971	80.5%			
		Black	n	60		83		0.46 (0.22,0.96)	0.038
			Number/%						
>0	15		25.0%	35	42.2%				
0	45	75.0%	48	57.8%					
Total CMI	Group-by-Education	High School	n	529		655		--	<0.001
			Number/%						
			Adj. Mean*	37.18		31.43			
		95% C.I.*	(30.25,45.65)		(25.46,38.76)				
		College	n	433		574		--	0.657
			Number/%						
Adj. Mean*	23.72			24.22					
95% C.I.*	(19.10,29.41)		(19.57,29.91)						
M-R Subscore	Group-by-Education	High School	n	555		675		Overall: Medium vs. Low 1.37 (1.07,1.75) High vs. Low 1.33 (0.82,2.15)	0.030 0.014 0.254
			Number/%						
			0 (Low)	246	44.3%	352	52.1%		
			1-10(Medium)	267	48.1%	283	41.9%		
			>10 (High)	42	7.6%	40	5.9%		
		College	n	443		590		Overall: Medium vs. Low 0.91 (0.70,1.18) High vs. Low 0.80 (0.35,1.84)	0.699 0.465 0.597
			Number/%						
			0 (Low)	292	65.9%	373	63.2%		
			1-10(Medium)	141	31.8%	200	33.9%		
			>10 (High)	10	2.3%	17	2.9%		

*Transformed from $\log(X+1)$ scale, where X was the number of questions answered "yes."
 --No relative risk given for Total CMI, which was analyzed as a continuous variable.

TABLE J-5.

Summary of Kolmogorov-Smirnov Tests on CMI

Stratification	Group	Sample Size	Mean Score	Standard Deviation	Kolmogorov-Smirnov p-Value
<u>Age</u>					
Born \geq 1942	Ranch Hand	402	15.88	15.21	<0.001
	Comparison	543	13.07	12.40	
Born 1923-1941	Ranch Hand	562	15.49	12.99	0.281
	Comparison	674	14.64	12.52	
Born \leq 1922	Ranch Hand	36	18.56	15.94	0.970
	Comparison	51	16.57	9.27	
<u>Race</u>					
Nonblack	Ranch Hand	941	15.63	13.83	0.003
	Comparison	1,187	13.94	12.00	
Black	Ranch Hand	59	17.81	16.91	0.481
	Comparison	81	15.68	17.01	
<u>Education</u>					
High School	Ranch Hand	556	18.88	15.80	<0.001
	Comparison	677	15.77	13.50	
College	Ranch Hand	444	11.85	10.18	0.999
	Comparison	591	12.08	10.63	
<u>Current Alcohol Use</u>					
Drinker	Ranch Hand	851	15.16	13.12	0.024
	Comparison	1,092	13.72	12.00	
Nondrinker	Ranch Hand	148	18.84	17.71	0.149
	Comparison	176	16.06	14.38	
<u>Occupation</u>					
Officer	Ranch Hand	377	11.23	9.01	0.807
	Comparison	476	10.88	9.09	
Enlisted Flyer	Ranch Hand	174	17.72	14.84	0.220
	Comparison	204	15.63	13.53	
Enlisted Groundcrew	Ranch Hand	449	18.80	16.06	0.007
	Comparison	588	16.06	13.69	

TABLE J-6.

Unadjusted Exposure Index Analyses for Psychological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index			Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low	Medium	High			
Anxiety	Officer	n	127	130	123	Overall		0.876
		Number/%						
		Abnormal	2 1.6%	3 2.3%	3 2.4%	H vs. L	1.48 (0.24,8.99)	0.999
		Normal	125 98.4%	127 97.7%	120 97.6%	H vs. L	1.56 (0.26,9.52)	0.680
	Enlisted Flyer	n	54	65	57	Overall		0.211
		Number/%						
		Abnormal	8 14.8%	4 6.2%	4 7.0%	H vs. L	0.38 (0.11,1.33)	0.137
		Normal	46 85.2%	61 93.8%	53 93.0%	H vs. L	0.43 (0.12,1.54)	0.230
	Enlisted Groundcrew	n	154	163	141	Overall		0.560
Number/%								
Abnormal		19 12.3%	18 11.0%	12 8.5%	H vs. L	0.88 (0.44,1.75)	0.730	
	Normal	135 87.7%	145 89.0%	129 91.5%	H vs. L	0.66 (0.31,1.42)	0.343	
Consistency	Officer	n	127	130	123	Overall		0.380
		Number/%						
		Abnormal	2 1.6%	2 1.5%	0 0.0%	H vs. L	0.98 (0.14,7.04)	0.999
		Normal	125 98.4%	128 98.5%	123 100.0%	H vs. L	0.20 (0.01,4.28)*	0.498
	Enlisted Flyer	n	54	65	57	Overall		0.476
		Number/%						
		Abnormal	4 7.4%	2 3.1%	2 3.5%	H vs. L	0.40 (0.07,2.26)	0.409
		Normal	50 92.6%	63 96.9%	55 96.5%	H vs. L	0.46 (0.08,2.59)	0.430
	Enlisted Groundcrew	n	154	163	141	Overall		0.813
Number/%								
Abnormal		9 5.8%	9 5.5%	6 4.3%	H vs. L	0.94 (0.36,2.44)	0.999	
	Normal	145 94.2%	154 94.5%	135 95.7%	H vs. L	0.72 (0.25,2.07)	0.603	

TABLE J-6. (continued)

Unadjusted Exposure Index Analyses for Psychological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low	Medium		High					
Defensiveness	Officer	n	127		130		123		Overall		0.603
		Number/% Abnormal	0	0.0%	1	0.8%	1	0.8%	M vs. L	2.95 (0.12,73.18)*	0.999
		Normal	127	100.0%	129	99.2%	122	99.2%	H vs. L	3.12 (0.13,77.39)*	0.492
	Enlisted Flyer	n	54		65		57		Overall		0.991
		Number/% Abnormal	1	1.9%	1	1.5%	1	1.8%	M vs. L	0.83 (0.05,13.56)	0.999
		Normal	53	98.1%	64	98.5%	56	98.2%	H vs. L	0.95 (0.06,15.52)	0.999
	Enlisted Groundcrew	n	154		163		141		Overall		0.697
		Number/% Abnormal	6	3.9%	5	3.1%	7	5.0%	M vs. L	0.78 (0.23,2.61)	0.765
		Normal	148	96.1%	158	96.9%	134	95.0%	H vs. L	1.29 (0.42,3.93)	0.779
Denial	Officer	n	127		130		123		Overall		0.094
		Number/% Abnormal	6	4.7%	2	1.5%	1	0.8%	M vs. L	0.32 (0.06,1.59)	0.169
		Normal	121	95.3%	128	98.5%	122	99.2%	H vs. L	0.17 (0.02,1.39)	0.120
	Enlisted Flyer	n	54		65		57		Overall		0.366
		Number/% Abnormal	2	3.7%	2	3.1%	0	0.0%	M vs. L	0.83 (0.11,6.06)	0.999
		Normal	52	96.3%	63	96.9%	57	100.0%	H vs. L	0.18 (0.01,3.89)*	0.234
	Enlisted Groundcrew	n	154		163		141		Overall		0.326
		Number/% Abnormal	2	1.3%	0	0.0%	2	1.4%	M vs. L	0.19 (0.01,3.92)*	0.235
		Normal	152	98.7%	163	100.0%	139	98.6%	H vs. L	1.09 (0.15,7.87)	0.999

TABLE J-6. (continued)

Unadjusted Exposure Index Analyses for Psychological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index			Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low	Medium	High			
Depression	Officer	n	127	130	123	Overall		0.517
		Number/%						
		Abnormal	8 6.3%	6 4.6%	10 8.1%	M vs. L	0.72 (0.24,2.14)	0.593
		Normal	119 93.7%	124 95.4%	113 91.9%	H vs. L	1.32 (0.50,3.45)	0.631
	Enlisted Flyer	n	54	65	57	Overall		0.223
		Number/%						
		Abnormal	11 20.4%	7 10.8%	6 10.5%	M vs. L	0.47 (0.17,1.32)	0.199
		Normal	43 79.6%	58 89.2%	51 89.5%	H vs. L	0.46 (0.16,1.35)	0.191
	Enlisted Groundcrew	n	154	163	141	Overall		0.695
Number/%								
Abnormal		25 16.2%	21 12.9%	20 14.2%	M vs. L	0.76 (0.41,1.43)	0.428	
	Normal	129 83.8%	142 87.1%	121 85.8%	H vs. L	0.85 (0.45,1.62)	0.746	
Hypochondria	Officer	n	127	130	123	Overall		0.530
		Number/%						
		Abnormal	10 7.9%	6 4.6%	9 7.3%	M vs. L	0.57 (0.20,1.61)	0.312
		Normal	117 92.1%	124 95.4%	114 92.7%	H vs. L	0.92 (0.36,2.36)	0.999
	Enlisted Flyer	n	54	65	57	Overall		0.059
		Number/%						
		Abnormal	11 20.4%	4 6.2%	10 17.5%	M vs. L	0.26 (0.08,0.86)	0.026
		Normal	43 79.6%	61 93.8%	47 82.5%	H vs. L	0.83 (0.32,2.15)	0.810
	Enlisted Groundcrew	n	154	163	141	Overall		0.176
Number/%								
Abnormal		25 16.2%	18 11.0%	26 18.4%	M vs. L	0.64 (0.33,1.23)	0.192	
	Normal	129 83.8%	145 89.0%	115 81.6%	H vs. L	1.17 (0.64,2.13)	0.646	

TABLE J-6. (continued)

Unadjusted Exposure Index Analyses for Psychological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
Hysteria	Officer	n	127		130		123		Overall		0.200
		Number/%							M vs. L	1.28 (0.46,3.53)	0.797
		Abnormal	7	5.5%	9	6.9%	14	11.4%	H vs. L	2.20 (0.86,5.66)	0.113
			120	94.5%	121	93.1%	109	88.6%			
	Enlisted Flyer	n	54		65		57		Overall		0.198
		Number/%							M vs. L	0.40 (0.14,1.16)	0.115
		Abnormal	11	20.4%	6	9.2%	7	12.3%	H vs. L	0.55 (0.20,1.54)	0.307
			43	79.6%	59	90.8%	50	87.7%			
	Enlisted Groundcrew	n	154		163		141		Overall		0.065
Number/%								M vs. L	0.49 (0.25,0.95)	0.035	
Abnormal		28	18.2%	16	9.8%	25	17.7%	H vs. L	0.97 (0.54,1.76)	0.999	
		126	81.8%	147	90.2%	116	82.3%				
Mania/ Hypomania	Officer	n	127		130		123		Overall		0.585
		Number/%							M vs. L	0.60 (0.19,1.87)	0.407
		Abnormal	8	6.3%	5	3.9%	8	6.5%	H vs. L	1.04 (0.38,2.85)	0.999
			119	93.7%	125	96.1%	115	93.5%			
	Enlisted Flyer	n	54		65		57		Overall		0.623
		Number/%							M vs. L	1.73 (0.41,7.27)	0.509
		Abnormal	3	5.6%	6	9.2%	6	10.5%	H vs. L	2.00 (0.47,8.44)	0.491
			51	94.4%	59	90.8%	51	89.5%			
	Enlisted Groundcrew	n	154		163		141		Overall		0.568
Number/%								M vs. L	0.85 (0.35,2.06)	0.823	
Abnormal		11	7.1%	10	6.1%	6	4.3%	H vs. L	0.58 (0.21,1.61)	0.326	
		143	92.9%	153	93.9%	135	95.7%				

TABLE J-6. (continued)

Unadjusted Exposure Index Analyses for Psychological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index			Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low	Medium	High			
Masculinity/ Femininity	Officer	n	127	130	123	Overall		0.142
		Number/% Abnormal	7 5.5%	15 11.5%	15 12.2%	M vs. L	2.24 (0.88,5.68)	0.118
		Normal	120 94.5%	115 88.5%	108 87.8%	H vs. L	2.38 (0.94,6.06)	0.075
	Enlisted Flyer	n	54	65	57	Overall		0.478
		Number/% Abnormal	1 1.9%	4 6.2%	2 3.5%	M vs. L	3.48 (0.38,32.06)	0.375
		Normal	53 98.1%	61 93.8%	55 96.5%	H vs. L	1.93 (0.17,21.89)	0.999
	Enlisted Groundcrew	n	154	163	141	Overall		0.360
		Number/% Abnormal	10 6.5%	5 3.1%	7 5.0%	M vs. L	0.46 (0.15,1.37)	0.189
		Normal	144 93.5%	158 96.9%	134 95.0%	H vs. L	0.75 (0.28,2.03)	0.625
Paranoia	Officer	n	127	130	123	Overall		0.194
		Number/% Abnormal	1 0.8%	1 0.8%	4 3.3%	M vs. L	0.98 (0.06,15.79)	0.999
		Normal	126 99.2%	129 99.2%	119 96.7%	H vs. L	4.24 (0.47,38.44)	0.208
	Enlisted Flyer	n	54	65	57	Overall		0.447
		Number/% Abnormal	3 5.6%	1 1.5%	3 5.3%	M vs. L	0.27 (0.03,2.63)	0.328
		Normal	51 94.4%	64 98.5%	54 94.7%	H vs. L	0.94 (0.18,4.90)	0.999
	Enlisted Groundcrew	n	154	163	141	Overall		0.735
		Number/% Abnormal	5 3.3%	6 3.7%	7 5.0%	M vs. L	1.14 (0.34,3.81)	0.999
		Normal	149 96.7%	157 96.3%	134 95.0%	H vs. L	1.56 (0.48,5.02)	0.560

TABLE J-6. (continued)

Unadjusted Exposure Index Analyses for Psychological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index			Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low	Medium	High			
Psychopathic/ Deviate	Officer	n	127	130	123	Overall		0.545
		Number/% Abnormal	9 7.1%	7 5.4%	11 8.9%	M vs. L	0.75 (0.27,2.07)	0.614
		Normal	118 92.9%	123 94.6%	112 91.1%	H vs. L	1.29 (0.51,3.23)	0.646
	Enlisted Flyer	n	54	65	57	Overall		0.593
		Number/% Abnormal	8 14.8%	11 16.9%	6 10.5%	M vs. L	1.17 (0.43,3.16)	0.806
		Normal	46 85.2%	54 83.1%	51 89.5%	H vs. L	0.68 (0.22,2.10)	0.574
Enlisted Groundcrew	n	154	163	141	Overall		0.220	
	Number/% Abnormal	25 16.2%	18 11.0%	25 17.7%	M vs. L	0.64 (0.33,1.23)	0.192	
	Normal	129 83.8%	145 89.0%	116 82.3%	H vs. L	1.11 (0.61,2.04)	0.758	
Schizophrenia	Officer	n	127	130	123	Overall		0.546
		Number/% Abnormal	5 3.9%	4 3.1%	2 1.6%	M vs. L	0.78 (0.20,2.95)	0.747
		Normal	122 96.1%	126 96.9%	121 98.4%	H vs. L	0.40 (0.08,2.12)	0.447
	Enlisted Flyer	n	54	65	57	Overall		0.519
		Number/% Abnormal	8 14.8%	6 9.2%	5 8.8%	M vs. L	0.59 (0.19,1.80)	0.400
		Normal	46 85.2%	59 90.8%	52 91.2%	H vs. L	0.55 (0.17,1.81)	0.385
Enlisted Groundcrew	n	154	163	141	Overall		0.600	
	Number/% Abnormal	18 11.7%	25 15.3%	21 14.9%	M vs. L	1.37 (0.71,2.62)	0.413	
	Normal	136 88.3%	138 84.7%	120 85.1%	H vs. L	1.32 (0.67,2.60)	0.492	

TABLE J-6. (continued)

Unadjusted Exposure Index Analyses for Psychological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index				Contrast	Est. Relative Risk (95% C.I.)	p-Value	
			Low	Medium	High					
Social Introversion	Officer	n	127	130	123		Overall		0.385	
		Number/% Abnormal	1 0.8%	2 1.5%	0 0.0%		M vs. L	1.97 (0.18,21.99)	0.999	
		Normal	126 99.2%	128 98.5%	123 100.0%		H vs. L	0.34 (0.01,8.46)*	0.999	
	Enlisted Flyer	n	54	65	57		Overall		0.696	
		Number/% Abnormal	2 3.7%	1 1.5%	1 1.8%		M vs. L	0.41 (0.04,4.61)	0.590	
		Normal	52 96.3%	64 98.5%	56 98.2%		H vs. L	0.46 (0.04,5.27)	0.611	
	Enlisted Groundcrew	n	154	163	141		Overall		0.635	
		Number/% Abnormal	8 5.2%	5 3.1%	6 4.3%		M vs. L	0.58 (0.19,1.81)	0.403	
		Normal	146 94.8%	158 96.9%	135 95.7%		H vs. L	0.81 (0.27,2.40)	0.788	
	Validity	Officer	n	127	130	123		Overall		0.052
			Number/% >0	32 25.2%	34 26.2%	18 14.6%		M vs. L	1.05 (0.60,1.84)	0.887
			0	95 74.8%	96 73.8%	105 85.4%		H vs. L	0.51 (0.27,0.97)	0.041
Enlisted Flyer		n	55	65	57		Overall		0.310	
		Number/% Abnormal	10 18.2%	8 12.3%	13 22.8%		M vs. L	0.63 (0.23,1.73)	0.445	
		Normal	45 81.8%	57 87.7%	44 77.2%		H vs. L	1.33 (0.53,3.35)	0.642	
Enlisted Groundcrew		n	154	163	142		Overall		0.802	
		Number/% >0	34 22.1%	39 23.9%	36 25.4%		M vs. L	1.11 (0.66,1.87)	0.790	
		0	120 77.9%	124 76.1%	106 74.6%		H vs. L	1.20 (0.70,2.05)	0.584	

TABLE J-6. (continued)

Unadjusted Exposure Index Analyses for Psychological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index			Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low	Medium	High			
Total Cornell Medical Index	Officer	n	126	128	123	Overall		0.049
		Mean**	7.99	8.55	10.04	M vs. L	--	0.506
		95% C.I.**	(6.84,9.31)	(7.52,9.69)	(8.99,11.20)	H vs. L	--	0.018
	Enlisted Flyer	n	53	65	56	Overall		0.906
		Mean**	13.69	13.13	13.96	M vs. L	--	0.784
		95% C.I.**	(10.63, 17.56)	(11.16, 15.42)	(11.51, 16.88)	H vs. L	--	0.906
	Enlisted Groundcrew	n	153	159	137	Overall		0.304
		Mean**	14.46	13.03	14.92	M vs. L	--	0.252
		95% C.I.**	(12.64, 16.52)	(11.57, 14.65)	(13.05, 17.05)	H vs. L	--	0.745
M-R Subscore	Officer	n	125	128	121	Overall		0.247
		Number/%						
		>0	41 32.8%	37 28.9%	47 38.8%	M vs. L	0.83 (0.49,1.42)	0.586
	0	84 67.2%	91 71.1%	74 61.2%	H vs. L	1.30 (0.77,2.19)	0.353	
	Enlisted Flyer	n	53	65	56	Overall		0.400
		Number/%						
		Abnormal	22 41.5%	35 53.8%	26 46.4%	M vs. L	1.64 (0.79,3.42)	0.200
	Normal	31 58.5%	30 46.2%	30 53.6%	H vs. L	1.22 (0.57,2.61)	0.700	
	Enlisted Groundcrew	n	154	157	139	Overall		0.592
		Number/%						
		>0	91 59.1%	87 55.4%	74 53.2%	M vs. L	0.86 (0.55,1.35)	0.567
	0	63 40.9%	70 44.6%	65 46.8%	H vs. L	0.79 (0.50,1.25)	0.346	

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TABLE J-6. (continued)

Unadjusted Exposure Index Analyses for Psychological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index			Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low	Medium	High			
A-H Area Subscore	Officer	n	113	112	114	Overall		0.980
		Number/%						
		>0	57 50.4%	56 50.0%	56 49.1%	M vs. L	0.98 (0.58,1.66)	0.999
	0	56 49.6%	56 50.0%	58 50.9%	H vs. L	0.95 (0.56,1.60)	0.895	
	Enlisted Flyer	n	50	60	50	Overall		0.946
		Number/%						
		>0	33 66.0%	39 65.0%	34 68.0%	M vs. L	0.96 (0.43,2.11)	0.999
	0	17 34.0%	21 35.0%	16 32.0%	H vs. L	1.10 (0.48,2.52)	0.999	
	Enlisted Groundcrew	n	136	150	129	Overall		0.557
Number/%								
>0		93 68.4%	96 64.0%	90 69.8%	M vs. L	0.82 (0.50,1.34)	0.455	
0	43 31.6%	54 36.0%	39 30.2%	H vs. L	1.07 (0.63,1.80)	0.894		
HRB Impair- ment Index	Officer	n	126	130	121	Overall		0.401
		Number/%						
		Abnormal	29 23.0%	31 23.9%	21 17.4%	M vs. L	1.05 (0.59,1.87)	0.884
	Normal	97 77.0%	99 76.1%	100 82.6%	H vs. L	0.70 (0.38,1.32)	0.342	
	Enlisted Flyer	n	52	65	57	Overall		0.253
		Number/%						
		Abnormal	20 38.5%	35 53.9%	27 47.4%	M vs. L	1.87 (0.89,3.92)	0.136
	Normal	32 61.5%	30 46.1%	30 52.6%	H vs. L	1.44 (0.67,3.09)	0.439	
	Enlisted Groundcrew	n	153	163	139	Overall		0.272
Number/%								
Abnormal		64 41.8%	72 44.2%	49 35.3%	M vs. L	1.10 (0.71,1.72)	0.733	
Normal	89 58.2%	91 55.8%	90 64.7%	H vs. L	0.76 (0.47,1.22)	0.280		

*Estimated relative risk and confidence interval calculated after adding 0.5 to each cell.

**Converted from log (X+1) scale, where X was the number of questions answered "yes."

--No relative risk given for Total Cornell Medical Index, which was analyzed as a continuous variable.

TABLE J-7.

Interaction Summaries of Adjusted Exposure Index Analyses for Psychological Variables

Variable	Interaction (Occupation)	Stratification	Statistic	Exposure Index						Contrast	Adj. Relative Risk (95% C.I.)	p-Value
				Low	Medium	High						
Anxiety	Exposure Index-by- Race (Enlisted Groundcrew)	Nonblack	n	138		149		128		Overall		0.932*
			Number/% Abnormal	14	10.1%	16	10.7%	12	9.4%	M vs. L	1.07 (0.50,2.27)*	0.999*
			Normal	124	89.9%	133	89.3%	116	90.6%	H vs. L	0.92 (0.41,2.06)*	0.999*
		Black	n	16		14		13		Overall		0.074*
			Number/% Abnormal	5	31.3%	2	14.3%	0	0.0%	M vs. L	0.37 (0.06,2.29)*	0.399*
			Normal	11	68.7%	12	85.7%	13	100.0%	H vs. L	0.08 (0.004,1.56)**	0.048*
Denial	Exposure Index-by- Age (Officer)	Born >=1942	n	43		22		11		Overall		0.455*
			Number/% Abnormal	2	4.7%	0	0.0%	0	0.0%	M vs. L	0.37 (0.02,8.02)**	0.545*
			Normal	41	95.3%	22	100.0%	11	100.0%	H vs. L	0.72 (0.03,16.12)**	0.999*
		Born 1923- 1941(a)	n	79		93		109		Overall		0.337
			Number/% Abnormal	3	3.8%	1	1.1%	1	0.9%	M vs. L	0.27 (0.03,2.61)	0.255
			Normal	76	96.2%	92	98.9%	108	99.1%	H vs. L	0.25 (0.03,2.49)	0.238
		Born <=1922	n	5		15		3		Overall		0.558*
			Number/% Abnormal	1	20.0%	1	6.7%	0	0.0%	M vs. L	0.29 (0.01,5.66)*	0.447*
			Normal	4	80.0%	14	93.3%	3	100.0%	H vs. L	0.43 (0.01,14.08)**	0.999*

TABLE J-7. (continued)

Interaction Summaries of Adjusted Exposure Index Analyses for Psychological Variables

Variable	Interaction (Occupation)	Stratification	Statistic	Exposure Index						Contrast	Adj. Relative Risk (95% C.I.)	p-Value
				Low		Medium		High				
Depression	Exposure Index-by- Race (Enlisted Groundcrew)	Nonblack	n	138		149		128		Overall		0.856*
			Number/% Abnormal	21	15.2%	20	13.4%	20	15.6%	M vs. L	0.86 (0.45,1.67)*	0.737*
			Normal	117	84.8%	129	86.6%	108	84.4%	H vs. L	1.03 (0.53,2.01)*	0.999*
		Black	n	16		14		13		Overall		0.092*
			Number/% Abnormal	4	25.0%	1	7.1%	0	0.0%	M vs. L	0.23 (0.02,2.37)*	0.336*
			Normal	12	75.0%	13	92.9%	13	100.0%	H vs. L	0.10 (0.01,2.11)**	0.107*
Hypochondria	Exposure Index-by- Education (Officer)	High School	n	11		17		24		Overall		0.011*
			Number/% Abnormal	4	36.4%	3	17.7%	0	0.0%	M vs. L	0.38 (0.07,2.16)*	0.381*
			Normal	7	63.6%	14	82.3%	24	100.0%	H vs. L	0.03 (0.002,0.71)**	0.006*
		College	n	116		113		99		Overall		0.120*
			Number/% Abnormal	6	5.2%	3	2.7%	9	9.1%	M vs. L	0.50 (0.12,2.05)*	0.499*
			Normal	110	94.8%	110	97.3%	90	90.9%	H vs. L	1.83 (0.63,5.34)*	0.293*
Hypochondria	Exposure Index-by- Race (Enlisted Groundcrew)	Nonblack	n	134		146		119				
			Number/% Abnormal	17	12.7%	15	10.3%	25	21.0%	M vs. L	0.82 (0.39,1.74)	0.606
			Normal	117	87.3%	131	89.7%	94	79.0%	H vs. L	1.67 (0.83,3.33)	0.148
		Black	n	14		14		12				
			Number/% Abnormal	6	42.9%	3	21.4%	1	8.3%	M vs. L	0.31 (0.06,1.70)	0.179
			Normal	8	57.1%	11	78.6%	11	91.7%	H vs. L	0.10 (0.01,1.02)	0.052

TABLE J-7. (continued)

Interaction Summaries of Adjusted Exposure Index Analyses for Psychological Variables

Interaction Summaries of Adjusted Exposure Index Analyses for Psychological Variables

Variable	Interaction (Occupation)	Stratification	Statistic	Exposure Index						Contrast	Adj. Relative Risk (95% C.I.)	p-Value
				Low	Medium	High						
Hysteria	Exposure Index-by- Education (Officer)	High School	n	11		17		24		Overall		0.129*
			Number/% Abnormal	2	18.2%	2	11.8%	0	0.0%	M vs. L	0.60 (0.07,5.03)*	0.999*
			Normal	9	81.8%	15	88.2%	24	100.0%	H vs. L	0.08 (0.003,1.77)**	0.092*
		College(b)	n	116		113		99		Overall		0.025
			Number/% Abnormal	5	4.3%	7	6.2%	14	14.1%	M vs. L	1.17 (0.35,3.92)	0.795
			Normal	111	95.7%	106	93.8%	85	85.9%	H vs. L	3.49 (1.17,10.32)	0.024
Hysteria	Exposure Index-by- Race (Enlisted Groundcrew)	Nonblack	n	138		149		128		Overall		0.029*
			Number/% Abnormal	23	16.7%	13	8.7%	25	19.5%	M vs. L	0.48 (0.23,0.99)*	0.050*
			Normal	115	83.3%	136	91.3%	103	80.5%	H vs. L	1.21 (0.65,2.27)*	0.633*
		Black	n	16		14		13		Overall		0.094*
			Number/% Abnormal	5	31.2%	3	21.4%	0	0.0%	M vs. L	0.60 (0.11,3.15)*	0.689*
			Normal	11	68.8%	11	78.6%	13	100.0%	H vs. L	0.08 (0.004,1.56)**	0.048*
Mania/ Hypomania	Exposure Index-by- Drink-years (Officer)	0	n	5		0		6		Overall		—
			Number/% Abnormal	0	0.0%	—	—	0	0.0%	M vs. L	—	—
			Normal	5	100.0%	—	—	6	100.0%	H vs. L	—	—
		0-50	n	105		109		92		Overall		0.207*
			Number/% Abnormal	8	7.6%	5	4.6%	2	2.2%	M vs. L	0.58 (0.18,1.84)*	0.402*
			Normal	97	92.4%	104	95.4%	90	97.8%	H vs. L	0.27 (0.06,1.30)*	0.108*
>50	n	15		18		22		Overall		0.016*		
	Number/% Abnormal	0	0.0%	0	0.0%	5	22.7%	M vs. L	—	—		
	Normal	15	100.0%	18	100.0%	17	77.3%	H vs. L	9.74 (0.50,190.8)**	0.067*		

TABLE J-7. (continued)

Interaction Summaries of Adjusted Exposure Index Analyses for Psychological Variables

Variable	Interaction (Occupation)	Stratification	Statistic	Exposure Index						Contrast	Adj. Relative Risk (95% C.I.)	p-Value	
				Low	Medium	High							
Masculinity/ Femininity	Exposure Index-by- Education (Officer)	High School	n	11		16		24					
			Number/% Abnormal	1	9.1%	4	25.0%	1	4.2%	M vs. L	5.96 (0.53,67.59)	0.150	
			Normal	10	90.9%	12	75.0%	23	95.8%	H vs. L	0.33 (0.02,6.55)	0.467	
		College	n	114		110		96					
			Number/% Abnormal	6	5.3%	11	10.0%	13	13.5%	M vs. L	3.03 (1.01,9.08)	0.048	
			Normal	108	94.7%	99	90.0%	83	86.5%	H vs. L	4.48 (1.49,13.44)	0.008	
Paranoia	Exposure Index-by- Age (Officer)	Born ≥1942	n	43		22		11		Overall		0.288*	
			Number/% Abnormal	0	0.0%	1	4.5%	0	0.0%	M vs. L	6.07 (0.24,155.30)**	0.338*	
			Normal	43	100.0%	21	95.5%	11	100.0%	H vs. L	—	—	
		Born <1942	n	84		108		112		Overall		0.106*	
			Number/% Abnormal	1	1.2%	0	0.0%	4	3.6%	M vs. L	0.26 (0.01,6.38)**	0.437*	
			Normal	83	98.8%	108	100.0%	108	96.4%	H vs. L	3.07 (0.34,28.02)*	0.394*	
Paranoia	Exposure Index-by- Age (Enlisted Flyer)	Born ≥1942	n	11		18		9		Overall		0.565*	
			Number/% Abnormal	0	0.0%	1	5.6%	0	0.0%	M vs. L	1.97 (0.07,52.71)**	0.999*	
			Normal	11	100.0%	17	94.4%	9	100.0%	H vs. L	—	—	
		Born <1942	n	43		47		48		Overall		0.195*	
			Number/% Abnormal	3	7.0%	0	0.0%	3	6.3%	M vs. L	0.12 (0.01,2.43)**	0.105*	
			Normal	40	93.0%	47	100.0%	45	93.7%	H vs. L	0.89 (0.17,4.66)*	0.999*	

TABLE J-7. (continued)

Interaction Summaries of Adjusted Exposure Index Analyses for Psychological Variables

Variable	Interaction (Occupation)	Stratification	Statistic	Exposure Index						Contrast	Adj. Relative Risk (95% C.I.)	p-Value
				Low	Medium	High						
Paranoia	Exposure Index-by- Race (Enlisted Groundcrew)	Nonblack	n	138		149		128		Overall		0.348*
			Number/% Abnormal	3	2.2%	5	3.4%	7	5.5%	M vs. L	1.56 (0.37,6.66)*	0.724
			Normal	135	97.8%	144	96.6%	121	94.5%	H vs. L	2.60 (0.66,10.30)*	0.204*
		Black	n	16		14		13		Overall		0.422*
			Number/% Abnormal	2	12.5%	1	7.1%	0	0.0%	M vs. L	0.54 (0.04,6.67)*	0.999*
			Normal	14	87.5%	13	92.9%	13	100.0%	H vs. L	0.22 (0.01,4.89)**	0.488*
Psychopathic/ Deviate	Exposure Index-by- Education (Enlisted Groundcrew)	High School	n	110		131		108		Overall		
			Number/% Abnormal	16	14.5%	15	11.5%	24	22.2%	M vs. L	0.75 (0.35,1.64)	0.475
			Normal	94	85.5%	116	88.5%	84	77.8%	H vs. L	1.50 (0.72,3.09)	0.278
		College	n	38		29		23		Overall		
			Number/% Abnormal	8	21.1%	3	10.3%	1	4.3%	M vs. L	0.52 (0.12,2.23)	0.377
			Normal	30	78.9%	26	89.7%	22	95.7%	H vs. L	0.12 (0.01,1.11)	0.062

TABLE J-7. (continued)

Interaction Summaries of Adjusted Exposure Index Analyses for Psychological Variables

Variable	Interaction (Occupation)	Stratification	Statistic	Exposure Index			Contrast	Adj. Relative Risk (95% C.I.)	p-Value
				Low	Medium	High			
Total CMI		0	n	5	0	6	M vs. L	(c)	—
			Adj. Mean	4.01	—	6.87	M vs. L	(c)	0.228
			95% C.I.	(1.77, 8.06)	—	(3.57, 12.53)			
	Exposure Index-by- Drink-years (Officer Enlisted)	0-50	n	104	107	92	M vs. L	(c)	0.964
			Adj. Mean	6.95	6.98	8.40	H vs. L	(c)	0.058
			95% C.I.	(5.10, 9.37)	(5.13, 9.39)	(6.19, 11.29)			
	>50	n	15	17	22	M vs. L	(c)	0.007	
		Adj. Mean	13.74	7.17	9.27	H vs. L	(c)	0.080	
		95% C.I.	(8.91, 20.92)	(4.68, 10.75)	(6.34, 13.36)				

TABLE J-7. (continued)

Interaction Summaries of Adjusted Exposure Index Analyses for Psychological Variables

Variable	Interaction (Occupation)	Stratification	Statistic	Exposure Index			Contrast	Adj. Relative Risk (95% C.I.)	p-Value
				Low	Medium	High			
Total CMI		High School	n	2	4	4	M vs. L	(c)	0.018
		0	Adj. Mean	4.00	17.79	11.32	M vs. L	(c)	0.106
			95% C.I.	(1.01,11.48)	(8.68,35.49)	(5.31, 23.09)			
		High School	n	25	36	27	M vs. L	(c)	0.191
		0-50	Adj. Mean	16.06	12.68	10.87	M vs. L	(c)	0.045
			95% C.I.	(11.23,22.81)	(9.27,17.23)	(7.82, 14.97)			
	Exposure Index-by- Education	High School	n	14	10	11	M vs. L	(c)	0.509
		>50	Adj. Mean	16.32	19.64	18.27	M vs. L	(c)	0.680
			95% C.I.	(10.59,24.87)	(12.38,30.85)	(11.68, 28.27)			
	Exposure Index-by- Drink-Years (Enlisted Flyer)	College	n	1	1	0	M vs. L	(c)	0.049
0		Adj. Mean	0.84	10.17	—	M vs. L	(c)	—	
		95% C.I.	(0,5.66)	(2.13,38.86)	—				
	College	n	6	10	8	M vs. L	(c)	0.100	
	0-50	Adj. Mean	6.43	11.84	11.92	M vs. L	(c)	0.112	
		95% C.I.	(3.25,11.97)	(7.33,18.81)	(7.06 19.72)				
	College	n	0	0	1	M vs. L	(c)	—	
	>50	Adj. Mean	—	—	20.55	M vs. L	(c)	—	
		95% C.I.	—	—	(5.04, 75.84)				

TABLE J-7. (continued)

Interaction Summaries of Adjusted Exposure Index Analyses for Psychological Variables

Variable	Interaction (Occupation)	Stratification	Statistic	Exposure Index			Contrast	Adj. Relative Risk (95% C.I.)	p-Value		
				Low	Medium	High					
M-R Subscore	Exposure Index-by-Drink-years (Enlisted Flyer)	0	n	3	5	4	Overall		0.060*		
			Number/%								
			>0	0	0.0%	4	80.0%	3	75.0%	M vs. L	21.00 (0.64,690.0)**
		0	3	100.0%	1	20.0%	1	25.0%	H vs. L	16.33 (0.48,555.6)**	0.143*
		0-50(a)	n	31	46	35	Overall			0.054	
			Number/%								
	>0		12	38.7%	25	54.3%	10	28.6%	M vs. L	1.98 (0.77,5.09)	0.158
		0	19	61.3%	21	45.7%	25	71.4%	H vs. L	0.65 (0.23,1.83)	0.410
	>50(a)	n	14	10	12	Overall			0.440		
		Number/%									
		>0	7	50.0%	5	50.0%	9	75.0%	M vs. L	1.00 (0.20,5.07)	1.000
		0	7	50.0%	5	50.0%	3	25.0%	H vs. L	2.67 (0.49,14.46)	0.255

TABLE J-7. (continued)

Interaction Summaries of Adjusted Exposure Index Analyses for Psychological Variables

Variable	Interaction (Occupation)	Stratification	Statistic	Exposure Index						Contrast	Adj. Relative Risk (95% C.I.)	p-Value	
				Low		Medium		High					
A-H Area Subscore	0 Drink-years	High School	n	2		4		4		Overall		0.007*	
		0 Drink-years	Number/%										
			Abnormal	0	0.0	4	100.0	4	100.0	M vs. L	45.00 (0.67,3043)**	0.067*	
			Normal	2	100.0	0	0.0	0	0.0	H vs. L	45.00 (0.67,3043)**	0.067*	
		0-50 Drink-years	n	22		33		22		Overall		0.035*	
			Number/%										
	Abnormal		18	81.8	18	54.5	10	45.5	M vs. L	0.27 (0.07,0.96)*	0.047*		
	0-50 Drink-years	Normal	4	18.2	15	45.5	12	54.5	Y vs. L	0.19 (0.05,0.73)*	0.027*		
		Exposure Index-by- Education	High School	n	14		9		11		Overall		0.583*
			>50 Drink-years	Number/%									
	Abnormal			10	71.4	8	88.9	9	81.8	M vs. L	3.20 (0.30,34.59)*	0.611*	
	Exposure Index-by- Drink-years (Enlisted Flyer)	>50 Drink-years	Normal	4	28.6	1	11.1	2	18.2	H vs. L	1.80 (0.26,12.30)*	0.661*	
			College	n	0		1		1		Overall		—
		0 Drink-years	Abnormal	0	—	0	0.0	0	0.0	M vs. L	—	—	
0-50 Drink-years	Normal	0	—	1	100.0	1	100.0	H vs. L	—	—			
	0-50 Drink-years	n	6		10		7		Overall		0.115*		
		Number/%											
Abnormal		1	16.7	6	60.0	5	71.4	M vs. L	7.50 (0.62,90.65)*	0.145*			
0-50 Drink-years	Normal	5	83.3	4	40.0	2	28.6	H vs. L	12.50 (0.84,186.30)*	0.103*			
	College >50 Drink-years	n	0		0		1		Overall		—		
		Number/%											
Abnormal		0	—	0	—	1	100.0	M vs. L	—	—			
College >50 Drink-years	Normal	0	—	0	—	0	0.0	H vs. L	—	—			

TABLE J-7. (continued)

Interaction Summaries of Adjusted Exposure Index Analyses for Psychological Variables

Variable	Interaction (Occupation)	Stratification	Statistic	Exposure Index						Contrast	Adj. Relative Risk (95% C.I.)	p-Value
				Low	Medium	High						
HRB Impairment Index	Exposure Index-by- Race (Enlisted Groundcrew)	Nonblack	n	132		144		115				
			Number/%									
			Abnormal	48	36.4%	59	41.0%	40	34.8%	M vs. L	1.88 (1.09,3.25)	0.024
		Normal	84	63.6%	85	59.0%	75	65.2%	H vs. L	0.77 (0.43,1.40)	0.400	
		Black	n	13		14		12				
			Number/%									
Abnormal	11		84.6%	10	71.4%	3	25.0%	M vs. L	0.39 (0.05,2.72)	0.340		
Normal	2	15.4%	4	28.6%	9	75.0%	H vs. L	0.06 (0.01,0.44)	0.006			

*Unadjusted estimate of relative risk and confidence interval, or p-value, based on stratified tables.

**Unadjusted estimate of relative risk and confidence interval calculated after adding 0.5 to each cell.

(a) Results have been adjusted for education.

(b) Results have been adjusted for age.

—Zero counts in cells do not allow for calculation of percent, relative risk, confidence interval, or p-value.

(c) No relative risk given for total OMI, which was analyzed continuously.

Note: Small sample sizes may affect validity of overall p-value.

Note: Results without (*) or (**) are adjusted for all other main effects in model (age, race, education, drink-years, and combat index [for MMPI variables]), unless otherwise noted.

Note: Participants judged to have PTSD are eliminated from analysis of Total OMI, Section M-R Subscore, Section A-H Area Subscore, and HRB Impairment Index.

TABLE J-8.

**Unadjusted Analyses for Reported Psychological Illnesses by Group:
Baseline and First Followup Studies Combined*
(Original Comparisons Only)**

Type of Illness	<u>Group Abnormalities</u>				Total	p-Value**
	<u>Ranch Hand</u>		<u>Original Comparison</u>			
	Number	Percent	Number	Percent		
Psychoses	14	1.4	8	0.8	22	0.289
Alcohol Dependence	9	0.9	4	0.4	13	0.268
Anxiety	7	0.7	8	0.8	15	0.798
Other Neuroses	72	7.1	46	4.8	118	0.037

*Analyses based on 1,016 Ranch Hands and 955 Original Comparisons; some participants had more than one illness.

**Fisher's exact test.

TABLE J-9.

Summary of Kolmogorov-Smirnov Tests on MMPI for Officers
(Original Comparisons Only)

Parameter*	Group	Mean Score	Standard Deviation	Kolmogorov-Smirnov p-Value
Anxiety	Ranch Hand	52.82	7.38	0.328
	Original Comparison	53.22	7.06	
Consistency	Ranch Hand	49.23	6.92	0.995
	Original Comparison	49.02	5.50	
Defensiveness	Ranch Hand	49.64	6.64	0.822
	Original Comparison	49.69	7.14	
Denial	Ranch Hand	59.47	7.31	0.901
	Original Comparison	59.46	7.40	
Depression	Ranch Hand	55.11	10.17	0.975
	Original Comparison	54.86	9.38	
Hypochondria	Ranch Hand	55.60	8.85	0.990
	Original Comparison	54.96	8.09	
Hysteria	Ranch Hand	60.45	7.00	0.711
	Original Comparison	59.79	6.81	
Mania/Hypomania	Ranch Hand	54.36	8.94	0.436
	Original Comparison	53.68	9.10	
Masculinity/ Femininity	Ranch Hand	58.83	8.64	0.577
	Original Comparison	58.14	8.94	
Paranoia	Ranch Hand	53.71	7.34	0.995
	Original Comparison	53.57	6.86	
Psychopathic/ Deviate	Ranch Hand	56.82	8.87	0.644
	Original Comparison	56.61	9.65	
Schizophrenia	Ranch Hand	54.80	8.48	0.661
	Original Comparison	54.66	7.89	
Social Introversion	Ranch Hand	46.56	7.43	0.627
	Original Comparison	47.13	7.60	
Validity	Ranch Hand	0.93	3.11	0.594
	Original Comparison	0.80	2.86	

*n=380 Ranch Hands; n=350 Original Comparisons.

TABLE J-10.

Summary of Kolmogorov-Smirnov Tests on MMPI for Enlisted Flyers
(Original Comparisons Only)

Parameter*	Group	Mean Score	Standard Deviation	Kolmogorov-Smirnov p-Value
Anxiety	Ranch Hand	54.78	9.73	0.993
	Original Comparison	54.16	8.78	
Consistency	Ranch Hand	52.24	10.30	0.923
	Original Comparison	51.41	8.15	
Defensiveness	Ranch Hand	53.05	7.96	0.353
	Original Comparison	52.09	8.34	
Denial	Ranch Hand	55.95	8.73	0.760
	Original Comparison	56.81	8.44	
Depression	Ranch Hand	58.21	11.79	0.760
	Original Comparison	57.27	10.35	
Hypochondria	Ranch Hand	58.48	12.16	0.577
	Original Comparison	58.44	11.71	
Hysteria	Ranch Hand	60.00	8.94	0.465
	Original Comparison	60.70	8.77	
Mania/Hypomania	Ranch Hand	55.05	10.00	0.155
	Original Comparison	55.50	9.42	
Masculinity/ Femininity	Ranch Hand	55.79	7.85	0.877
	Original Comparison	56.22	8.39	
Paranoia	Ranch Hand	52.77	8.43	0.877
	Original Comparison	51.72	7.68	
Psychopathic/ Deviate	Ranch Hand	57.48	11.40	0.163
	Original Comparison	57.85	9.72	
Schizophrenia	Ranch Hand	56.56	13.03	0.496
	Original Comparison	56.27	10.59	
Social Introversion	Ranch Hand	50.35	8.89	0.194
	Original Comparison	49.00	7.94	
Validity	Ranch Hand	3.93	42.48	0.864
	Original Comparison	7.18	60.31	

*n=176 Ranch Hands; n=172 Original Comparisons (except for validity, where n=177 Ranch Hands and n=174 Original Comparisons).

TABLE J-11.

Summary of Kolmogorov-Smirnov Tests on MMPI
for Enlisted Groundcrew
(Original Comparisons Only)

Parameter*	Group	Mean Score	Standard Deviation	Kolmogorov-Smirnov p-Value
Anxiety	Ranch Hand	55.86	10.96	0.877
	Original Comparison	55.72	9.34	
Consistency	Ranch Hand	53.05	10.64	0.728
	Original Comparison	51.78	8.19	
Defensiveness	Ranch Hand	52.42	8.27	0.923
	Original Comparison	52.69	8.51	
Denial	Ranch Hand	55.53	8.57	0.112
	Original Comparison	56.80	8.72	
Depression	Ranch Hand	58.79	12.98	0.661
	Original Comparison	57.85	10.63	
Hypochondria	Ranch Hand	58.44	13.22	0.577
	Original Comparison	57.50	11.30	
Hysteria	Ranch Hand	60.36	9.80	0.644
	Original Comparison	59.75	8.84	
Mania/Hypomania	Ranch Hand	55.26	9.78	0.822
	Original Comparison	55.69	9.72	
Masculinity/ Femininity	Ranch Hand	56.18	8.24	0.304
	Original Comparison	57.24	8.49	
Paranoia	Ranch Hand	53.12	9.05	0.340
	Original Comparison	53.73	8.48	
Psychopathic/ Deviate	Ranch Hand	59.01	11.29	0.644
	Original Comparison	59.34	10.70	
Schizophrenia	Ranch Hand	58.20	14.22	0.328
	Original Comparison	57.58	10.64	
Social Introversion	Ranch Hand	51.86	9.82	0.353
	Original Comparison	50.99	8.63	
Validity	Ranch Hand	1.97	26.48	0.999
	Original Comparison	0.97	5.41	

*n=458 Ranch Hands; n=430 Original Comparisons (except for validity, where n=459 Ranch Hands and n=431 Original Comparisons).

TABLE J-12.

Summary of Kolmogorov-Smirnov Tests on CMI
(Original Comparisons Only)

Stratification	Group	Sample Size	Mean Score	Standard Deviation	Kolmogorov-Smirnov p-Value
<u>Age</u>					
Born \geq 1942	Ranch Hand	402	15.88	15.21	<0.001
	Original Comparison	366	12.95	11.57	
Born 1923-1941	Ranch Hand	562	15.49	12.99	0.776
	Original Comparison	528	14.55	11.88	
Born \leq 1922	Ranch Hand	36	18.56	15.94	0.980
	Original Comparison	45	16.47	9.28	
<u>Race</u>					
Nonblack	Ranch Hand	941	15.63	13.83	0.038
	Original Comparison	882	13.96	11.47	
Black	Ranch Hand	59	17.81	16.91	0.561
	Original Comparison	57	14.82	14.62	
<u>Education</u>					
High School	Ranch Hand	556	18.88	15.80	<0.001
	Original Comparison	524	15.62	13.12	
College	Ranch Hand	444	11.85	10.18	0.577
	Original Comparison	415	11.99	9.16	
<u>Current Alcohol Use</u>					
Drinker	Ranch Hand	851	15.16	13.12	0.170
	Original Comparison	812	13.77	11.32	
Nondrinker	Ranch Hand	148	18.84	17.71	0.162
	Original Comparison	127	15.61	13.69	
<u>Occupation</u>					
Officer	Ranch Hand	377	11.23	9.01	0.970
	Original Comparison	345	10.99	7.53	
Enlisted Flyer	Ranch Hand	174	17.72	14.84	0.270
	Original Comparison	170	15.31	12.51	
Enlisted Groundcrew	Ranch Hand	449	18.80	16.06	0.003
	Original Comparison	424	15.96	13.48	

TABLE J-13.

Unadjusted Analyses for MMPI by Group
(Original Comparisons Only)

Variable	Statistic	Group				Est. Relative Risk (95% C.I.)	p-Value
		Ranch Hand		Original Comparison			
		Number	Percent	Number	Percent		
Anxiety	n	1,014		952			
	Abnormal	73	7.2	49	5.1	1.43 (0.98,2.08)	0.062
	Normal	941	92.8	903	94.9		
Consistency	n	1,014		952			
	Abnormal	36	3.6	22	2.3	1.56 (0.91,2.67)	0.111
	Normal	978	96.4	930	97.7		
Defensiveness	n	1,014		952			
	Abnormal	23	2.3	30	3.2	0.71 (0.41,1.24)	0.265
	Normal	991	97.7	922	96.8		
Denial	n	1,014		952			
	Abnormal	17	1.7	37	3.9	0.42 (0.24,0.75)	0.003
	Normal	997	98.3	915	96.1		
Depression	n	1,014		952			
	Abnormal	114	11.2	87	9.1	1.26 (0.94,1.69)	0.136
	Normal	900	88.8	865	90.9		
Hypochondria	n	1,014		952			
	Abnormal	119	11.7	91	9.6	1.26 (0.94,1.68)	0.125
	Normal	895	88.3	861	90.4		
Hysteria	n	1,014		952			
	Abnormal	123	12.1	89	9.4	1.34 (1.00,1.79)	0.050
	Normal	891	87.9	863	90.6		

TABLE J-13. (continued)

Unadjusted Analyses for MMPI by Group
(Original Comparisons Only)

Variable	Statistic	Group				Est. Relative Risk (95% C.I.)	p-Value
		Ranch Hand		Original Comparison			
		Number	Percent	Number	Percent		
Mania/Hypomania	n	1,014		952			
	Abnormal	63	6.2	56	5.9	1.06 (0.73,1.54)	0.777
	Normal	951	93.8	896	94.1		
Masculinity/ Femininity	n	1,014		952			
	Abnormal	66	6.5	83	8.7	0.73 (0.52,1.02)	0.073
	Normal	948	93.5	869	91.3		
Paranoia	n	1,014		952			
	Abnormal	31	3.1	17	1.8	1.73 (0.95,3.16)	0.079
	Normal	983	96.9	935	98.2		
Psychopathic/ Deviate	n	1,014		952			
	Abnormal	120	11.8	104	10.9	1.09 (0.83,1.45)	0.570
	Normal	894	88.2	848	89.1		
Schizophrenia	n	1,014		952			
	Abnormal	94	9.3	71	7.5	1.27 (0.92,1.75)	0.166
	Normal	920	90.7	881	92.5		
Social Introversion	n	1,014		952			
	Abnormal	26	2.6	14	1.5	1.76 (0.92,3.40)	0.109
	Normal	988	97.4	938	98.5		
Validity	n	1,016		955			
	>0	224	22.0	198	20.7	1.08 (0.87,1.34)	0.510
	0	792	78.0	757	79.3		

TABLE J-14.

Adjusted Analyses for MMPI by Group
(Original Comparisons Only)

Variable	Group		Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks*
	Ranch Hand Total	Original Comparison Total			
Anxiety	1,012	950	1.39 (0.95,2.05)	0.092	EDUC (p<0.001) AGE*CI (p=0.010)
Consistency	976	926	****	****	AGE (p=0.025) RACE*DRKYR (p=0.024) GRP*EDUC (p=0.034)
Defensiveness	976	926	0.68 (0.38,1.19)	0.175	EDUC (p<0.001) AGE*DRKYR (p=0.043)
Denial	974	924	0.43 (0.23,0.80)	0.006	AGE*DRKYR (p=0.026) EDUC*CI (p=0.040)
Depression	1,014	952	1.26 (0.94,1.70)	0.120	EDUC (p<0.001)
Hypochondria	1,014	952	1.29 (0.96,1.72)	0.091	AGE (p=0.005) EDUC (p<0.001)
Hysteria	1,014	952	1.37 (1.02,1.83)	0.033	AGE (p=0.001) EDUC (p<0.001)
Mania/Hypomania	974	924	0.97 (0.66,1.43)	0.882	AGE (p=0.048) CI (p=0.010) DRKYR (p=0.016)

TABLE J-14. (continued)

Adjusted Analyses for MMPI by Group
(Original Comparisons Only)

Variable	Group		Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks*
	Ranch Hand Total	Original Comparison Total			
Masculinity/ Femininity	1,014	952	0.71 (0.51,1.00)	0.047	EDUC (p<0.001) RACE*AGE (p=0.006)
Paranoia	1,012	950	****	****	AGE*CI (p=0.004) GRP*AGE (p=0.040)
Psychopathic/ Deviate	974	924	1.13 (0.84,1.52)	0.433	EDUC (p=0.010) AGE*CI (p>0.001) RACE*DRKYR (p=0.001)
Schizophrenia	976	926	1.27 (0.91,1.77)	0.153	EDUC (p<0.001) RACE*DRKYR (p=0.003)
Social Introversion	1,014	952	1.72 (0.89,3.31)	0.099	AGE (p=0.005)
Validity	1,014	953	****	****	AGE*CI (p=0.034) GRP*RACE (p=0.016) GRP*CI (p=0.030)

*Abbreviations:

EDUC: education
CI: combat index
DRKYR: drink-years
GRP: group

****Group-by-covariate interaction: adjusted relative risk, confidence interval, and p-value are not presented.

TABLE J-15.

**Unadjusted Analyses for the Cornell
Medical Index (CMI) by Group
(Original Comparisons Only)**

Variable	Statistic	Group		Est. Relative Risk (95% C.I.)	p-Value
		Ranch Hand	Original Comparison		
Total CMI	n Mean* 95% C.I.*	1,000 11.74 (11.17,12.35)	939 10.55 (10.02,11.11)	--	0.004
M-R Subscore Subscore	n Number/%	998	936	Overall	0.198
	0 (Low)	538 53.9%	531 56.7%	Medium vs. Low	
	1-10 (Medium)	408 40.9%	370 39.5%	1.09 (0.91,1.31)	0.371
	>10 (High)	52 5.2%	35 3.8%	High vs. Low 1.47 (0.99,2.29)	0.095
A-H Area Subscore	n Number/%	914	1,148	Overall	0.106
	0 (Low)	360 39.4%	375 44.1%	Medium vs. Low	
	1-3 (Medium)	449 49.1%	394 46.3%	1.19 (0.97,1.45)	0.090
	4-8 (High)	105 11.5%	82 9.6%	High vs. Low 1.33 (0.97,1.84)	0.086

*Transformed from log (X+1) scale, where X was the number of questions answered "yes."

--No relative risk given for Total CMI, which was analyzed as a continuous variable.

TABLE J-16.

Adjusted Analyses for CMI Variables by Group
(Original Comparisons Only)

Variable	Statistic	Group		Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks*
		Ranch Hand	Original Comparison			
Total CMI	n Adj. Mean 95% C.I.	962 **** ****	913 **** ****	--	****	PTSD (p<0.001) RACE*DRKYR (p=0.027) AGE*EDUC (p=0.010) GRP*EDUC (p=0.002)
M-R Subscore	n	998	935	****	****	AGE (p<0.001) PTSD (p<0.001) GRP*EDUC (p=0.006)
A-H Area Subscore	n	914	850	Overall Medium vs. Low: 1.20 (0.99,1.47) High vs. Low: 1.32 (0.92,1.89)	0.108 0.063 0.132	AGE (p<0.001) EDUC (p<0.001) PTSD (p<0.001)

****Group-by-covariate interaction -- adjusted mean/relative risk, confidence interval, and p-value are not presented.

--No relative risk given for total CMI, which was analyzed as a continuous variable.

*Additional Abbreviations:

PTSD: post-traumatic stress disorder

TABLE J-17.

Summary Results for the Halstead-Reitan
 Battery Impairment Index Unadjusted and Adjusted Analyses
 (Original Comparisons Only)

Analysis	Statistic	Group				Est. Relative Risk (95% C.I).	p-Value	Covariate Remarks
		Ranch Hand		Original Comparison				
		Number	Percent	Number	Percent			
Unadjusted Analysis	n	1,006		947		1.04 (0.86,1.26)	0.703	
	Abnormal	348	34.6	319	33.7			
	Normal	658	65.4	628	66.3			
Adjusted Analysis	n	1,006		947		1.10 (0.90,1.34)	0.359	AGE (p<0.001) RACE (p<0.001) EDUC (p<0.001)

TABLE J-18.

Summary of Group-by-Covariate Interactions
for Psychological Variables
(Original Comparisons Only)

Variable	Interaction	Stratification	Statistic	Group		Adj. Relative Risk (95% C.I.)	p-Value	
				Ranch Hand	Original Comparison			
Consistency	Group-by- Education	High School	n	537	516			
			Number/% Abnormal	30	5.6%	13	2.5%	2.31 (1.18,4.50)	0.014
		Normal	507	94.4%	503	97.5%		
		College	n	437	585			
Number/% Abnormal	6	1.4%	15	2.6%	0.61 (0.22,1.74)	0.359		
Normal	431	98.6%	570	97.4%				
Paranoia	Group-by- Age	Born \geq 1942	n	410	545			
			Number/% Abnormal	15	3.7%	19	3.5%	0.96 (0.44,2.13)	0.927
		Normal	395	96.3%	526	96.5%		
		Born <1942	n	602	740			
Number/% Abnormal	16	2.7%	9	1.2%	3.85 (1.36,10.94)	0.011		
Normal	586	97.3%	731	98.8%				

TABLE J-18. (continued)

Summary of Group-by-Covariate Interactions
for Psychological Variables
(Original Comparisons Only)

Variable	Interaction	Stratification	Statistic	Group		Original Comparison	Adj. Relative Risk (95% C.I.)	p-Value
				Ranch Hand				
Validity	Group-by- Race	Nonblack CI=Low	n	178		353		
			Number/%					
			>0	47	26.4%	73	20.7%	1.49 (0.98,2.26)
		0	131	73.6%	280	79.3%		
		n	367		295			
		Number/%						
		>0	78	21.3%	43	14.6%	1.60 (1.07,2.38)	0.021
		0	289	78.7%	252	85.4%		
		n	409		247			
	Number/%							
	>0	83	20.3%	57	23.1%	0.83 (0.57,1.20)	0.319	
	0	326	79.7%	190	76.9%			
n	20		24					
Number/%								
>0	6	30.0%	9	37.5%	0.55 (0.24,1.29)	0.170		
0	14	70.0%	15	62.5%				
n	18		12					
Number/%								
>0	6	33.3%	5	41.7%	0.59 (0.25,1.41)	0.239		
0	12	66.7%	7	58.3%				
n	22		22					
Number/%								
>0	3	13.6%	11	50.0%	0.31 (0.13,0.71)	0.006		
0	19	86.4%	11	50.0%				

TABLE J-18. (continued)

Summary of Group-by-Covariate Interactions
for Psychological Variables
(Original Comparisons Only)

Variable	Interaction	Stratification	Statistic	Group		Adj. Relative Risk (95% C.I.)	p-Value	
				Ranch Hand	Original Comparison			
Total CMI	Group-by-Education	High School	n	529	511	—	<0.001	
			Adj. Mean* 95% C.I.*	35.50 (28.09,44.79)	29.65 (23.27,37.70)			
		College	n	433	402	—	0.498	
			Adj. Mean* 95% C.I.*	22.70 (17.76,28.95)	23.49 (18.37,29.97)			
M-R Subscore	Group-by-Education	High School	n	555	521	Overall	0.015	
			Number/%			Med vs. Low		
			0 (Low)	246	44.3%	281	53.9%	1.42 (1.11,1.82)	0.005
		1-10 (Med)	267	48.1%	213	40.9%	High vs. Low	
		>10 (High)	42	7.6%	27	5.2%	1.51 (0.84,2.70)	0.167
		College	n	443	414	Overall	0.196	
Number/%				Med vs. Low				
0 (Low)	292		65.9%	250	60.4%	0.77 (0.58,1.02)	0.071	
1-10 (Med)	141		31.8%	156	37.7%	High vs. Low		
>10 (High)	10	2.3%	8	1.9%	0.99 (0.34,2.87)	0.991		

*Converted from log (X+1) scale, where X was the number of questions answered "yes".

—No relative risk given for Total CMI, which was analyzed as a continuous variable.

APPENDIX K

Gastrointestinal Assessment

APPENDIX K: Gastrointestinal Assessment

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TABLE K-1.

Summary of Group-by-Covariate Interactions for Hepatic Function Variables and Porphyrin Determinations Analyzed Continuously

Variable	Interaction	Stratification	Statistic	Group		p-Value
				Ranch Hand	Comparison	
SGOT	Group-by-Current Alcohol Use (Drinks/day)	<1	n	652	843	0.889
			Mean	32.2	32.3	
			Adj. Mean	33.4	33.4	
			95% C.I.	(32.4,34.4)	(32.5,34.4)	
		1-4	n	275	335	0.010
			Mean	35.3	33.4	
			Adj. Mean	36.5	34.4	
			95% C.I.	(35.1,38.0)	(33.2,35.7)	
		>4	n	76	108	0.477
Mean	37.5		38.1			
Adj. Mean	38.2		39.4			
95% C.I.	(35.7,40.9)		(37.2,41.8)			
SGPT	Group-by-Current Alcohol Use (Drinks/day)	<1	n	652	843	0.011
			Mean	20.5	21.9	
			Adj. Mean	19.8	21.1	
			95% C.I.	(18.6,21.2)	(19.8,22.5)	
		1-4	n	275	335	0.428
			Mean	23.4	22.6	
			Adj. Mean	22.2	21.5	
			95% C.I.	(20.2,24.3)	(19.7,23.5)	
		>4	n	76	108	0.058
Mean	23.9		27.0			
Adj. Mean	23.3		26.7			
95% C.I.	(19.7,27.5)		(22.8,31.3)			

K-1

TABLE K-1. (continued)

Summary of Group-by-Covariate Interactions for Hepatic Function Variables and Porphyrin Determinations Analyzed Continuously

Variable	Interaction	Stratification	Statistic	Group		p-Value
				Ranch Hand	Comparison	
Alkaline Phosphatase	Group-by-Industrial Chemicals	Exposed to Industrial Chemicals	n	504	681	<0.001
			Mean	94.8	89.9	
		Adj. Mean	102.4	97.2		
		95% C.I.	(97.9,107.2)	(93.1,101.5)		
LDH	Group-by-Age	Born \geq 1942	n	499	604	0.973
			Mean	88.9	88.7	
		Adj. Mean	88.5	88.5		
		95% C.I.	(84.9,92.1)	(85.0,92.1)		
LDH	Group-by-Age	Born 1923-1941	n	408	547	0.425
			Mean	122.2	121.2	
		Adj. Mean	124.8	123.6		
		95% C.I.	(121.9,127.7)	(121.0,126.3)		
LDH	Group-by-Age	Born 1923-1941	n	565	691	0.217
			Mean	123.8	125.3	
		Adj. Mean	127.0	128.6		
		95% C.I.	(124.5,129.7)	(126.1,131.1)		
LDH	Group-by-Age	Born \leq 1922	n	36	51	0.966
			Mean	135.1	135.5	
		Adj. Mean	138.9	139.1		
		95% C.I.	(130.8,147.5)	(132.2,146.5)		

TABLE K-1. (continued)

Summary of Group-by-Covariate Interactions for Hepatic Function
Variables and Porphyrin Determinations Analyzed Continuously

Variable	Interaction	Stratification	Statistic	Group		p-Value
				Ranch Hand	Comparison	
Trigly- cerides	Group-by-Age	Born ≥ 1942	n	406	546	0.321
			Mean	107.1	110.2	
			Adj. Mean	95.6	99.7	
			95% C.I.	(88.0,103.9)	(92.5,107.4)	
		Born 1923-1941	n	561	689	0.784
			Mean	126.0	124.5	
Born ≤ 1922	Adj. Mean	116.8	115.6	0.039		
	95% C.I.	(108.6,125.5)	(108.0,123.8)			
	n	36	51			
	Mean	139.0	105.6			
Uropor- phyrins	Group-by- Blood Urea Nitrogen (BUN)	BUN ≤ 14	Adj. Mean	130.7	98.3	<0.001
			95% C.I.	(105.4,161.9)	(81.9,118.0)	
			n	547	701	
			Mean	16.2	18.4	
		BUN > 14	Adj. Mean	16.3	18.6	0.686
			95% C.I.	(15.4,17.4)	(17.6,19.7)	
BUN > 14	n	453	582	0.686		
	Mean	17.8	17.4			
	Adj. Mean	17.9	17.6			
	95% C.I.	(16.8,19.2)	(16.6,18.7)			

TABLE K-2.

Summary of Group-by-Covariate Interactions for Hepatic Function Variables
and Porphyrin Determinations Analyzed Categorically

Variable	Interaction	Stratification	Statistic	Group		Comparison		Adj. Relative Risk (95% C.I.)	p-Value
				Number	Percent	Number	Percent		
Direct Bilirubin	Group-by- Industrial Chemicals	Exposed to Industrial Chemicals	n	507		683		1.89 (1.05,3.42)	0.035
			High	27	5.3	20	2.9		
			Normal	480	94.7	663	97.1		
		Not Exposed to Industrial Chemicals	n	496		603			
High	11		2.2	23	3.8				
		Normal	485	97.8	580	96.2	0.58 (0.28,1.20)	0.143	
Trigly- cerides	Group-by- Occupation	Officer	n	376		484		1.77 (1.04,3.01)	0.035
			High	34	9.0	26	5.4		
			Normal	342	91.0	458	94.6		
		Enlisted Flyer	n	177		209			
			High	15	8.5	14	6.7		
		Normal	162	91.5	195	93.3			
Enlisted Groundcrew	n	456		596					
	High	19	4.2	39	6.5				
Normal	437	95.8	557	93.5	0.63 (0.36,1.10)	0.104			

TABLE K-3.

Unadjusted Categorical Exposure Index Analyses for Hepatic Function Variables by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
SGOT	Officer	n	126		130		120		Overall		0.519
		Abnormal	9	7.1	14	10.8	9	7.5	M vs. L	1.57 (0.65,3.77)	0.384
		Normal	117	92.9	116	89.2	111	92.5	H vs. L	1.05 (0.40,2.75)	0.999
	Enlisted Flyer	n	55		65		57		Overall		0.234
		Abnormal	1	1.8	6	9.2	4	7.0	M vs. L	5.49 (0.64,47.09)	0.123
		Normal	54	98.2	59	90.8	53	93.0	H vs. L	4.08 (0.44,37.67)	0.364
	Enlisted Groundcrew	n	154		160		142		Overall		0.065
		Abnormal	7	4.5	13	8.1	17	12.0	M vs. L	1.86 (0.72,4.79)	0.249
		Normal	147	95.5	147	91.9	125	88.0	H vs. L	2.86 (1.15,7.11)	0.031
SGPT	Officer	n	126		130		120		Overall		0.669
		Abnormal	22	17.5	20	15.4	16	13.3	M vs. L	0.86 (0.44,1.67)	0.736
		Normal	104	82.5	110	84.6	104	86.7	H vs. L	0.73 (0.36,1.46)	0.384
	Enlisted Flyer	n	55		65		57		Overall		0.105
		Abnormal	2	3.6	10	15.4	6	10.5	M vs. L	4.82 (1.01,23.03)	0.037
		Normal	53	96.4	55	84.6	51	89.5	H vs. L	3.12 (0.60,16.17)	0.272
	Enlisted Groundcrew	n	154		160		142		Overall		0.265
		Abnormal	17	11.0	27	16.9	17	12.0	M vs. L	1.64 (0.85,3.14)	0.147
		Normal	137	89.0	133	83.1	125	88.0	H vs. L	1.10 (0.54,2.24)	0.856

TABLE K-3. (continued)

Unadjusted Categorical Exposure Index Analyses for Hepatic Function Variables by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
GGTP	Officer	n	126		130		120		Overall		0.859
		Abnormal	11	8.7	9	6.9	9	7.5	M vs. L	0.78 (0.31,1.95)	0.646
		Normal	115	91.3	121	93.1	111	92.5	H vs. L	0.73 (0.36,1.46)	0.384
	Enlisted Flyer	n	55		65		57		Overall		0.950
		Abnormal	5	9.1	7	10.8	6	10.5	M vs. L	1.21 (0.36,4.04)	0.999
		Normal	50	90.9	58	89.2	51	89.5	H vs. L	1.18 (0.34,4.10)	0.999
	Enlisted Groundcrew	n	154		160		142		Overall		0.773
		Abnormal	16	10.4	13	8.1	14	9.9	M vs. L	0.76 (0.35,1.64)	0.561
		Normal	138	89.6	147	91.9	128	90.1	H vs. L	0.94 (0.44,2.01)	0.999
Alkaline Phosphatase	Officer	n	126		130		120		Overall		0.448
		Abnormal	4	3.2	7	5.4	3	2.5	M vs. L	1.74 (0.50,6.08)	0.540
		Normal	122	96.8	123	94.6	117	97.5	H vs. L	0.78 (0.17,3.57)	0.999
	Enlisted Flyer	n	55		65		57		Overall		0.258
		Abnormal	1	1.8	5	7.7	5	8.8	M vs. L	4.50 (0.51,39.74)	0.217
		Normal	54	98.2	60	92.3	52	91.2	H vs. L	5.19 (0.59,45.96)	0.206
	Enlisted Groundcrew	n	154		160		142		Overall		0.378
		Abnormal	8	5.2	10	6.3	13	9.2	M vs. L	1.22 (0.47,3.17)	0.810
		Normal	146	94.8	150	93.8	129	90.8	H vs. L	1.84 (0.74,4.58)	0.257

TABLE K-3. (continued)

Unadjusted Categorical Exposure Index Analyses for Hepatic Function Variables by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Total Bilirubin	Officer	n	126		130		120		Overall		0.846
		Abnormal	3	2.4	2	1.5	3	2.5	M vs. L	0.64 (0.11,3.90)	0.680
		Normal	123	97.6	128	98.5	117	97.5	H vs. L	1.05 (0.21,5.31)	0.999
	Enlisted Flyer	n	55		65		57		Overall		0.353
		Abnormal	0	0.0	1	1.5	2	3.5	M vs. L	21.58 (0.10,64.65)	0.999
		Normal	55	100.0	64	98.5	55	96.5	H vs. L	5.00 (0.24,106.54)	0.496
	Enlisted Groundcrew	n	154		160		142		Overall		0.374
		Abnormal	7	4.5	3	1.9	6	4.2	M vs. L	0.40 (0.10,1.58)	0.211
		Normal	147	95.5	157	98.1	136	95.8	H vs. L	0.93 (0.30,2.83)	0.999
Direct Bilirubin	Officer	n	126		130		120		Overall		0.327
		Abnormal	2	1.6	5	3.8	6	5.0	M vs. L	2.48 (0.47,13.02)	0.447
		Normal	124	98.4	125	96.2	114	95.0	H vs. L	3.26 (0.65,16.50)	0.164
	Enlisted Flyer	n	55		65		57		Overall		0.624
		Abnormal	2	3.6	5	7.7	3	5.3	M vs. L	2.21 (0.41,11.86)	0.451
		Normal	53	96.4	60	92.3	54	94.7	H vs. L	1.47 (0.24,9.17)	0.999
	Enlisted Groundcrew	n	154		160		142		Overall		0.834
		Abnormal	4	2.6	6	3.8	5	3.5	M vs. L	1.46 (0.40,5.28)	0.750
		Normal	150	97.4	154	96.3	137	96.5	H vs. L	1.37 (0.36,5.20)	0.742

TABLE K-4.

**Unadjusted Continuous Exposure Index Analyses for Hepatic Function Variables
and Two Porphyrin Determinations by Occupation**

Variable	Occupation	Statistic	Exposure Index			Contrast	p-Value
			Low	Medium	High		
SGOT	Officer	n	126	130	120	Overall	0.695
		Mean	33.3	34.5	33.8	M vs. L	0.400
		95% C.I.	(31.5,35.3)	(32.6,36.5)	(31.9,35.8)	H vs. L	0.757
	Enlisted Flyer	n	55	65	57	Overall	0.289
		Mean	30.9	33.3	33.2	M vs. L	0.151
		95% C.I.	(28.5,33.4)	(31.0,35.8)	(30.7,35.8)	H vs. L	0.192
	Enlisted Groundcrew	n	154	160	142	Overall	0.418
		Mean	32.9	33.2	34.4	M vs. L	0.801
		95% C.I.	(31.4,34.5)	(31.7,34.8)	(32.8,36.1)	H vs. L	0.211
SGPT	Officer	n	126	130	120	Overall	0.712
		Mean	22.5	22.1	21.3	M vs. L	0.804
		95% C.I.	(20.5,24.6)	(20.2,24.2)	(19.4,23.39)	H vs. L	0.421
	Enlisted Flyer	n	55	65	57	Overall	0.061
		Mean	18.5	21.9	22.0	M vs. L	0.037
		95% C.I.	(16.4,20.8)	(19.7,24.5)	(19.6,24.7)	H vs. L	0.041
	Enlisted Groundcrew	n	154	160	142	Overall	0.495
		Mean	20.9	22.3	21.5	M vs. L	0.237
		95% C.I.	(19.3,22.6)	(20.7,24.1)	(19.9,23.4)	H vs. L	0.595

TABLE K-4. (continued)

Unadjusted Continuous Exposure Index Analyses for Hepatic Function Variables
and Two Porphyrin Determinations by Occupation

Variable	Occupation	Statistic	Exposure Index			Contrast	p-Value
			Low	Medium	High		
GGTP	Officer	n	126	130	120	Overall	0.885
		Mean	31.4	32.7	32.6	M vs. L	0.653
		95% C.I.	(27.8,35.5)	(29.0,36.9)	(28.7,36.9)	H vs. L	0.688
	Enlisted Flyer	n	55	65	57	Overall	0.243
		Mean	29.7	34.9	37.1	M vs. L	0.225
		95% C.I.	(24.6,35.9)	(29.3,41.5)	(30.8,44.7)	H vs. L	0.104
	Enlisted Groundcrew	n	154	160	142	Overall	0.412
		Mean	34.7	33.0	31.1	M vs. L	0.527
		95% C.I.	(31.1,38.7)	(29.6,36.7)	(27.8,34.9)	H vs. L	0.183
Alkaline Phosphatase	Officer	n	126	130	120	Overall	0.735
		Mean	87.2	86.8	88.9	M vs. L	0.893
		95% C.I.	(83.5,91.1)	(83.2,90.6)	(85.0,92.9)	H vs. L	0.546
	Enlisted Flyer	n	55	65	57	Overall	0.189
		Mean	88.9	96.3	95.2	M vs. L	0.086
		95% C.I.	(83.1,95.0)	(90.5,102.4)	(89.1,101.6)	H vs. L	0.153
	Enlisted Groundcrew	n	154	160	142	Overall	0.535
		Mean	93.2	95.1	96.2	M vs. L	0.484
		95% C.I.	(89.7,96.9)	(91.5,98.8)	(92.4,100.2)	H vs. L	0.270

TABLE K-4. (continued)

**Unadjusted Continuous Exposure Index Analyses for Hepatic Function Variables
and Two Porphyrin Determinations by Occupation**

Variable	Occupation	Statistic	Exposure Index			Contrast	p-Value
			Low	Medium	High		
Total Bilirubin	Officer	n	126	130	120	Overall	0.382
		Mean	0.76	0.73	0.77	M vs. L	0.324
		95% C.I.	(0.72,0.80)	(0.69,0.77)	(0.73,0.81)	H vs. L	0.722
	Enlisted Flyer	n	55	65	57	Overall	0.045
		Mean	0.66	0.73	0.76	M vs. L	0.092
		95% C.I.	(0.61,0.72)	(0.67,0.78)	(0.70,0.83)	H vs. L	0.014
	Enlisted Groundcrew	n	126	130	120	Overall	0.373
		Mean	0.74	0.75	0.78	M vs. L	0.783
		95% C.I.	(0.70,0.78)	(0.71,0.78)	(0.74,0.82)	H vs. L	0.182
Direct Bilirubin	Officer	n	126	130	120	Overall	0.606
		Mean	0.18	0.17	0.19	M vs. L	0.484
		95% C.I.	(0.17,0.21)	(0.16,0.19)	(0.17,0.21)	H vs. L	0.784
	Enlisted Flyer	n	55	65	57	Overall	0.684
		Mean	0.16	0.18	0.18	M vs. L	0.455
		95% C.I.	(0.14,0.20)	(0.15,0.21)	(0.15,0.21)	H vs. L	0.440
	Enlisted Groundcrew	n	126	130	120	Overall	0.541
		Mean	0.17	0.15	0.19	M vs. L	0.277
		95% C.I.	(0.15,0.19)	(0.17,0.20)	(0.16,0.19)	H vs. L	0.728

TABLE K-4. (continued)

**Unadjusted Continuous Exposure Index Analyses for Hepatic Function Variables
and Two Porphyrin Determinations by Occupation**

Variable	Occupation	Statistic	Exposure Index			Contrast	p-Value
			Low	Medium	High		
LDH	Officer	n	126	130	120	Overall	0.489
		Mean	125.1	124.2	121.8	M vs. L	0.742
		95% C.I.	(121.2,129.1)	(120.4,128.1)	(117.9,125.8)	H vs. L	0.246
	Enlisted Flyer	n	55	65	57	Overall	0.118
		Mean	120.2	117.6	126.2	M vs. L	0.533
		95% C.I.	(114.4,126.4)	(112.4,123.3)	(120.2,132.5)	H vs. L	0.175
	Enlisted Groundcrew	n	154	160	142	Overall	0.031
		Mean	123.1	122.3	127.9	M vs. L	0.710
		95% C.I.	(120.1,126.2)	(119.4,125.3)	(124.6,131.2)	H vs. L	0.037
Cholesterol	Officer	n	126	130	120	Overall	0.122
		Mean	220.7	211.8	210.7	M vs. L	0.093
		95% C.I.	(213.3,228.3)	(204.8,219.0)	(203.5,218.2)	H vs. L	0.063
	Enlisted Flyer	n	55	65	57	Overall	0.203
		Mean	221.1	213.9	227.7	M vs. L	0.351
		95% C.I.	(210.2,232.6)	(204.2,224.2)	(216.6,239.3)	H vs. L	0.418
	Enlisted Groundcrew	n	154	160	142	Overall	0.873
		Mean	211.4	211.1	213.3	M vs. L	0.984
		95% C.I.	(205.4,217.6)	(205.2,217.2)	(207.0,219.8)	H vs. L	0.677

TABLE K-4. (continued)

Unadjusted Continuous Exposure Index Analyses for Hepatic Function Variables
and Two Porphyrin Determinations by Occupation

Variable	Occupation	Statistic	Exposure Index			Contrast	p-Value
			Low	Medium	High		
Triglycerides	Officer	n	126	130	120	Overall	0.624
		Mean	114.2	117.9	125.1	M vs. L	0.728
		95% C.I.	(100.2,130.1)	(103.8,134.1)	(109.5,142.9)	H vs. L	0.338
	Enlisted Flyer	n	55	65	57	Overall	0.953
		Mean	123.8	119.9	123.1	M vs. L	0.775
		95% C.I.	(105.2,145.7)	(103.2,139.3)	(104.9,144.5)	H vs. L	0.811
	Enlisted Groundcrew	n	154	160	142	Overall	0.796
		Mean	118.7	113.8	117.9	M vs. L	0.528
		95% C.I.	(108.1,130.3)	(103.9,124.7)	(107.0,129.9)	H vs. L	0.919

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TABLE K-5.

Summary of Adjusted Exposure Index, Analyses Involving Interactions with a Continuous Covariate for Hepatic Function Variables

Variable	Occupation	Interaction Covariate	p-Value Interaction	Exposure Index Level	Slope	p-Value on Test of Slope Against Null Hypothesis of Zero Slope
SGOT	Enlisted Flyer	Current Alcohol Use	<0.001	Low	-0.012	0.266
				Medium	0.068	0.004
				High	0.029	0.138
SGOT	Enlisted Groundcrew	Current Alcohol Use	<0.001	Low	0.004	0.628
				Medium	0.047	<0.001
				High	0.062	<0.001
SGPT	Enlisted Groundcrew	Current Alcohol Use	0.006	Low	-0.026	0.097
				Medium	0.027	0.189
				High	0.071	0.013
GGTP	Enlisted Flyer	Current Alcohol Use	0.003	Low	0.022	0.455
				Medium	0.183	<0.001
				High	0.154	0.006
GGTP	Enlisted Groundcrew	Current Alcohol Use	0.009	Low	0.035	0.129
				Medium	0.091	<0.001
				High	0.170	<0.001
Direct Bilirubin	Enlisted Flyer	Current Alcohol Use	0.017	Low	0.013	0.445
				Medium	0.097	<0.001
				High	0.065	0.090
Cholesterol	Enlisted Groundcrew	Current Alcohol Use	0.006	Low	0.003	0.591
				Medium	-0.008	0.285
				High	0.033	0.002

TABLE K-5. (continued)

Summary of Adjusted Exposure Index, Analyses Involving Interactions with a Continuous Covariate for Hepatic Function Variables

Variable	Occupation	Interaction Covariate	p-Value Interaction	Exposure Index Level	Slope	p-Value on Test of Slope Against Null Hypothesis of Zero Slope
LDH	Enlisted Groundcrew	Current Alcohol Use	0.025	Low	-0.005	0.322
				Medium	0.016	0.020
				High	0.003	0.728
Triglycerides	Enlisted Flyer	Age	0.012	Low	0.014	0.286
				Medium	0.015	0.247
				High	0.038	0.032

TABLE K-6.

Summary of Adjusted Exposure Index, Analyses Involving Interactions with a Categorical Covariate for Hepatic Function Variables

Variable	Occupation	Interaction Covariate	Stratification	Exposure Index Level	Adjusted Mean (n)	Interaction p-Value
Total Bilirubin	Enlisted Groundcrew	Race	Black	Low	0.63 (14)	0.007
				Medium	0.90 (13)	
				High	0.70 (13)	
			Nonblack	Low	0.75 (138)	
				Medium	0.73 (147)	
				High	0.80 (127)	

TABLE K-7.

**Unadjusted Analyses for Baseline and
Interval History of Liver Disease by Group
(Verified by Medical Record Review)
(Original Comparisons Only)**

Disease	Statistic	Group				Est. Relative Risk (95% C.I.)	p-Value
		Ranch Hand		Comparison			
		Number	Percent	Number	Percent		
Hepatitis (Viral and Alcoholic)	n	1,016		955			
	Yes	37	3.6	34	3.6	1.02 (0.64,1.65)	0.999
	No	979	96.4	921	96.4		
Jaundice	n	1,016		955			
	Yes	20	2.0	21	2.2	0.89 (0.48,1.66)	0.754
	No	996	98.0	934	97.8		
Cirrhosis	n	1,016		955			
	Yes	3	0.5	1	0.1	2.83 (0.29,27.21)	0.625
	No	1,013	99.5	954	99.9		
Enlarged Liver	n	1,016		955			
	Yes	17	1.7	15	1.6	1.07 (0.53,2.15)	0.999
	No	999	98.3	940	98.4		
Miscel- laneous Liver Disorders	n	1,016		955			
	Yes	17	1.7	7	0.7	2.31 (0.95,5.58)	0.065
	No	999	98.3	948	99.3		

TABLE K-8.

Unadjusted Analyses of Enlarged Livers
 Diagnosed at Physical Examination by Group*
 (Original Comparisons Only)

Group	Enlarged Liver				Total	p-Value
	Yes		No			
	Number	Percent	Number	Percent		
Ranch Hand	8	0.8	1,002	99.2	1,010	0.227
Original Comparison	3	0.3	950	99.7	953	

*Excludes participants with positive HB_sAg.

TABLE K-9.

Unadjusted Continuous and Categorical Analyses for Hepatic Function Variables
and Two Porphyrin Determinations by Group
(Original Comparisons Only)

Variable	Statistic	Group		Original Comparison	Est. Relative Risk (95% C.I.)	p-Value
		Ranch Hand				
SGOT	n	1,009		952	—	0.903
	Mean	33.5		33.4		
	95% C.I.	(32.9,34.1)		(32.8,34.0)		
	Number/%				0.94 (0.68,1.30)	0.701
	Normal	929	92.1%	872 91.6%		
High	80	7.9%	80 8.4%			
SGPT	n	1,009		952	—	0.060
	Mean	21.6		22.5		
	95% C.I.	(21.0,22.3)		(21.8,23.2)		
	Number/%				0.94 (0.73,1.22)	0.651
	Normal	872	86.4%	816 85.7%		
High	137	13.6%	136 14.3%			
GGTP	n	1,009		952	—	0.921
	Mean	32.8		32.7		
	95% C.I.	(31.4,34.3)		(31.3,34.2)		
	Number/%				0.94 (0.69, 1.28)	0.682
	Normal	919	91.1%	862 90.6%		
High	90	8.9%	90 9.4%			
Alkaline Phosphatase	n	1,009		952	—	0.044
	Mean	91.8		89.7		
	95% C.I.	(90.4,93.3)		(88.3,91.2)		
	Number/%				1.31 (0.87,1.97)	0.205
	Normal	953	94.5%	911 95.7%		
High	56	5.5%	41 4.3%			

TABLE K-9. (continued)

Unadjusted Continuous and Categorical Analyses for Hepatic Function Variables
and Two Porphyrin Determinations by Group
(Original Comparisons Only)

Variable	Statistic	Group		Original Comparison	Est. Relative Risk (95% C.I.)	p-Value
		Ranch Hand				
Total Bilirubin	n	1,009		952		0.772
	Mean	0.74		0.75	—	
	95% C.I.	(0.73,0.76)		(0.73,0.76)		
	Number/%					0.77 (0.46, 1.28)
	Normal	982	97.3%	919	96.5%	
High	27	2.7%	33	3.5%		
Direct Bilirubin	n	1,009		952		0.795
	Mean	0.28		0.28	—	
	95% C.I.	(0.27,0.28)		(0.27,0.28)		
	Number/%					1.13 (0.70, 1.82)
	Normal	971	96.2%	920	96.6%	
High	38	3.8%	32	3.4%		
LDH	n	1,009		952		0.449
	Mean	123.5		124.3	—	
	95% C.I.	(122.2,124.8)		(122.8,125.7)		
	Number/%					0.86 (0.36,2.02)
	Normal	999	99.0%	941	98.8%	
High	10	1.0%	11	1.2%		
Cholesterol	n	1,009		952		0.205
	Mean	214.3		216.7	—	
	95% C.I.	(211.8,216.8)		(214.0,219.3)		
	Number/%					0.76 (0.60,0.96)
	Normal	863	85.5%	778	81.7%	
High	146	14.5%	174	18.3%		

TABLE K-9. (continued)

Unadjusted Continuous and Categorical Analyses for Hepatic Function Variables
and Two Porphyrin Determinations by Group
(Original Comparisons Only)

Variable	Statistic	Group		Original Comparison	Est. Relative Risk (95% C.I.)	p-Value
		Ranch Hand				
Triglycerides	n	1,009		952	—	0.908
	Mean	118.5		118.1		
	95% C.I.	(113.8,123.3)		(113.4,122.9)		
	Number/%				1.06 (0.74,1.51)	0.767
	Normal	941	93.3%	891 93.6%		
High	68	6.7%	61 6.4%			
Uroporphyrin	n	1,006		949	—	0.176
	Mean	16.9		17.7		
	95% C.I.	(16.2,17.7)		(16.9,18.4)		
Coproporphyrin	n	1,008		950	—	0.053
	Mean	119.1		115.0		
	95% C.I.	(116.2,122.0)		(112.0,118.0)		

— No relative risk or confidence interval given for continuous analyses.

TABLE K-10.

Adjusted Continuous and Categorical Analyses for Hepatic Function Variables
and Two Porphyrin Determinations by Group (Original Comparisons Only)

Variable	Analysis	Statistic	Group		Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks*
			Ranch Hand	Original Comparison			
SGOT	CC	n Adj. Mean 95% C.I.	1,003 34.69 (33.66,35.75)	949 34.64 (33.61,35.70)		0.908	ALC*DC (p<0.001) AGE*ALC (p=0.033) RACE (p=0.003)
	CD	n Adj. Mean 95% C.I.	1,003 35.97 (34.82,37.17)	949 35.99 (34.83,37.18)		0.974	RACE (p=0.004) ALC (p<0.001) IC (p=0.032) DC (p=0.044)
	DD	n	1,003	949	0.93 (0.66,1.29)	0.655	AGE*ALC (p<0.001) OCC*ALC (p<0.001) RACE (p=0.026)
SGPT	CC	n Adj. Mean 95% C.I.	1,003 21.52 (20.89,22.17)	949 22.53 (21.86,23.23)		0.035	ALC*DC (p=0.002) AGE*ALC (p=0.006)
	CD	n Adj. Mean 95% C.I.	1,003 21.49 (20.21,22.86)	949 22.52 (21.18,23.96)		0.032	ALC*DC (p=0.043) AGE*ALC (p=0.008)
	DD	n	1,003	949	0.91 (0.70,1.18)	0.467	AGE (p=0.008) ALC (p=0.003)

TABLE K-10. (continued)

Adjusted Continuous and Categorical Analyses for Hepatic Function Variables
and Two Porphyrin Determinations by Group (Original Comparisons Only)

Variable	Analysis	Statistic	Group		Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks*
			Ranch Hand	Original Comparison			
GGTP	CC	n Adj. Mean 95% C.I.	1,003 37.47 (34.93,40.20)	949 37.39 (34.84,40.12)	—	0.941	ALC*DC (p<0.001) AGE*DC (p=0.029) RACE*IC (p=0.005)
	CD	n Adj. Mean 95% C.I.	1,003 42.35 (38.17,46.98)	949 42.24 (38.08,46.86)	—	0.932	AGE*ALC (p=0.006) RACE (p<0.001)
	DD	n	1,003	949	0.94 (0.68,1.28)	0.680	AGE*ALC (p=0.005) RACE (p=0.049)
Alkaline Phosphatase	CC	n Adj. Mean 95% C.I.	1,003 91.5 (89.1,93.9)	950 89.1 (86.8, 91.5)	—	0.020	RACE*IC (p=0.002) WINE (p<0.001) AGE (p<0.001) OCC (p<0.001)
	CD	n Adj. Mean 95% C.I.	1,003 **** ****	950 **** ****	—	****	GRP*IC (p=0.006) AGE*IC (p=0.040) RACE*IC (p=0.002) WINE (p<0.001) OCC (p<0.001)
	DD	n	1,003	950	1.39 (0.91,2.12)	0.121	WINE*DC (p=0.010) AGE*IC (p=0.006) RACE*IC (p=0.004) OCC*IC (p=0.011) GRP*IC (marginal) (p=0.052)

TABLE K-10. (continued)

Adjusted Continuous and Categorical Analyses for Hepatic Function Variables
and Two Porphyrin Determinations by Group (Original Comparisons Only)

Variable	Analysis	Statistic	Group		Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks*
			Ranch Hand	Original Comparison			
Total Bilirubin	CC	n Adj. Mean 95% C.I.	1,003 0.78 (0.75,0.81)	949 0.78 (0.75,0.82)		0.714	OCC*RACE (p=0.002) ALC*RACE (p=0.008) AGE*DC (p=0.043)
	CD	n Adj. Mean 95% C.I.	1,003 0.84 (0.80,0.88)	949 0.84 (0.80,0.88)		0.774	OCC*RACE (p=0.003) OCC*ALC (p=0.047) RACE*ALC (p=0.002)
	DD	n	1,009	952	0.77 (0.46,1.29)	0.314	RACE (p<0.001)
Direct Bilirubin	CC	n Adj. Mean 95% C.I.	1,003 0.278 (0.271,0.285)	949 0.276 (0.269,0.283)		0.746	ALC (p<0.001)
	CD	n Adj. Mean 95% C.I.	1,003 0.308 (0.291,0.325)	949 0.305 (0.288,0.323)		0.673	IC*DC (p=0.014) ALC*DC (p=0.012) ALC*RACE (p=0.030) ALC*OCC (p=0.007)
	DD	n	1,003	949	****	****	GRP*IC (p=0.010) RACE (p=0.014) ALC (p=0.016)

TABLE K-10. (continued)

Adjusted Continuous and Categorical Analyses for Hepatic Function Variables
and Two Porphyrin Determinations by Group (Original Comparisons Only)

Variable	Analysis	Statistic	Group		Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks*
			Ranch Hand	Original Comparison			
LDH	CC	n Adj. Mean 95% C.I.	1,009 **** ****	952 **** ****	—	****	GRP*AGE (p=0.038) IC*RACE (p=0.029) IC*OCC (p=0.049)
	CD	n Adj. Mean 95% C.I.	1,009 129.4 (126.5,132.2)	952 130.0 (127.2,132.9)	—	0.555	AGE (p<0.001) RACE (p=0.006)
	DD	n	1,003	949	0.85 (0.36,2.01)	0.706	ALC (p=0.046)
Cholesterol	CC	n Adj. Mean 95% C.I.	1,003 219.3 (214.1,224.6)	949 221.3 (216.0,226.6)	—	0.301	OCC*RACE (p=0.003) DC*RACE (p=0.006) AGE (p<0.001) ALC (p<0.001) IC (p=0.016)
	CD	n Adj. Mean 95% C.I.	1,003 223.7 (217.3,230.3)	949 226.0 (219.6,232.5)	—	0.243	OCC*RACE (p=0.029) ALC (p<0.001) AGE (p<0.001)
	DD	n	1,003	949	0.74 (0.58,0.94)	0.015	RACE*ALC (p=0.009) AGE (p=0.020) OCC (p=0.037)

TABLE K-10. (continued)

Adjusted Continuous and Categorical Analyses for Hepatic Function Variables
and Two Porphyrin Determinations by Group (Original Comparisons Only)

Variable	Analysis	Statistic	Group		Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks*
			Ranch Hand	Original Comparison			
Triglycerides	CC	n Adj. Mean 95% C.I.	1,003 **** ****	949 **** ****	—	****	GRP*AGE (p=0.012) ALC (p<0.001) RACE (p<0.001) OCC (p<0.001)
	CD	n Adj. Mean 95% C.I.	1,003 112.7 (103.4,122.9)	949 112.3 (103.1,122.4)	—	0.904	OCC (p<0.001) RACE (p<0.001) AGE (p<0.001) ALC (p=0.007)
	DD	n	1,003	949	1.06 (0.74,1.51)	0.770	AGE*ALC (p=0.023) RACE (p=0.044)
Uroporphyrin	CC	n Adj. Mean 95% C.I.	1,000 **** ****	946 **** ****	—	****	GRP*BUN (p=0.014) OCC*DC (p=0.006) ALC (p=0.048)

TABLE K-10. (continued)

Adjusted Continuous and Categorical Analyses for Hepatic Function Variables
and Two Porphyrin Determinations by Group (Original Comparisons Only)

Variable	Analysis	Statistic	Group		Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks*
			Ranch Hand	Original Comparison			
Coproporphyrin	CC	n	1,002	947	—	0.066	ALC (p<0.001) BUN (p<0.001)
		Adj. Mean	119.1	115.2			
		95% C.I.	(116.2,121.9)	(112.4,118.2)			

*Abbreviations:

GRP: group
 OCC: occupation
 ALC: current alcohol use
 WINE: wine consumption
 DC: exposure to degreasing chemicals
 IC: exposure to industrial chemicals
 BUN: blood urea nitrogen

— No relative risk or confidence interval given for continuous analyses.

***Group-by-covariate interaction—adjusted mean/relative risk, confidence interval, and p-value not presented.

TABLE K-11.
Summary of Group-by-Covariate Interactions for Hepatic Function Variables
(Original Comparisons Only)

Variable	Interaction	Stratification	Statistic	Group		p-Value
				Ranch Hand	Original Comparison	
Alkaline Phosphatase	Group-by-Industrial Chemicals	Exposed to Industrial Chemicals	n	504	506	0.001
			Mean	94.8	90.0	
			Adj. Mean	96.9	92.1	
			95% C.I.	(93.5,100.6)	(88.8,95.5)	
		Not Exposed to Industrial Chemicals	n	499	444	0.608
			Mean	88.9	89.5	
			Adj. Mean	92.5	93.3	
			95% C.I.	(89.3,95.8)	(90.0,96.7)	
LDH	Group-by-Age	Born \geq 1942	n	408	369	0.756
			Mean	122.2	121.7	
			Adj. Mean	124.1	123.6	
		Born 1923-1941	95% C.I.	(121.1,127.1)	(120.6,126.7)	0.295
			n	565	538	
			Mean	123.8	125.2	
		Born \leq 1922	Adj. Mean	126.4	127.8	0.913
			95% C.I.	(123.7,129.1)	(125.1,130.5)	
			n	36	45	
		Born \leq 1922	Mean	135.1	134.6	0.913
			Adj. Mean	138.0	137.4	
			95% C.I.	(129.9,146.5)	(130.1,145.1)	

TABLE K-11.

Summary of Group-by-Covariate Interactions for Hepatic Function Variables (continued)
(Original Comparisons Only)

Variable	Interaction	Stratification	Statistic	Group		p-Value
				Ranch Hand	Original Comparison	
Triglycerides	Group-by-Age	Born \geq 1942	n	406	368	0.055
			Mean	107.14	110.24	
			Adj. Mean	95.55	98.49	
			95% C.I.	(87.62,104.20)	(90.12,107.63)	
		Born 1923-1941	n	561	536	0.824
			Mean	125.98	124.23	
			Adj. Mean	116.13	115.14	
			95% C.I.	(107.59,125.35)	106.64,124.31)	
		Born \leq 1922	n	36	45	0.510
Mean	139.00		106.00			
Adj. Mean	129.40		98.40			
95% C.I.	(104.04,160.94)		(80.80,119.83)			
Uroporphyrin	Group-by-BUN	BUN \leq 14	n	547	509	0.005
			Mean	16.23	18.18	
			Adj. Mean	16.39	18.45	
			95% C.I.	(15.41,17.44)	(17.33,19.65)	
		BUN $>$ 14	n	453	547	0.479
			Mean	17.79	17.15	
			Adj. Mean	18.02	17.45	
			95% C.I.	(16.85,19.27)	(16.30,18.67)	

TABLE K-12.

Summary of Group-by-Covariate Interactions for Variables and
and Porphyrin Determinations Analyzed Categorically
(Original Comparisons Only)

Variable	Interaction	Stratification	Statistic	Group				Adj. Relative Risk (95% C.I.)	p-Value
				Ranch Hand		Comparison			
				Number	Percent	Number	Percent		
Direct Bilirubin	Group-by- Industrial Chemicals	Exposed to Industrial Chemicals	n	507		506		1.96 (1.02,3.80)	0.045
			High	27	5.3	14	2.8		
		Normal	480	94.7	492	97.2			
		Not Exposed to Industrial Chemicals	n	496		443		0.53 (0.25,1.15)	0.107
			High	11	2.2	18	4.1		
		Normal	485	97.8	425	95.9			

TABLE K-13.

Unadjusted Analysis for Interval History of Skin Bruises,
 Skin Patches, or Skin Sensitivity by Group
 (Original Comparisons Only)

Group	Bruises, Patches, or Sensitivity				Total	p-Value
	Yes		No			
	Number	Percent	Number	Percent		
Ranch Hand	265	26.2	746	73.8	1,011	0.003
Original Comparison	195	20.5	758	79.5	953	

TABLE K-14.

**Unadjusted Analyses for Porphyrin Abnormalities by Group and Skin Patch, Bruise,
or Sensitivity Reported at Followup Questionnaire
(Original Comparisons Only)**

Group	Skin Patch, Bruise, or Reported Sensitivity	Abnormal Porphyrin Findings for a Participant						Total	p-Value*
		0		1		2			
		Number	Percent	Number	Percent	Number	Percent		
Both Groups	Yes	412	89.8	45	9.8	2	0.4	459	0.754
	No	1,361	91.0	129	8.6	6	0.4	1496	
Ranch Hand	Yes	239	90.5	24	9.1	1	0.4	264	0.950
	No	670	90.3	70	9.4	2	0.3	742	
Original Comparison	Yes	173	88.7	21	10.8	1	0.5	195	0.419
	No	691	91.6	59	7.8	4	0.5	754	

*Chi-square test, 2 d.f.

TABLE K-15.

Unadjusted Analyses for Uroporphyrin Abnormalities by Skin Patch, Bruise,
or Sensitivity Reported at Followup Questionnaire and by Group
(Original Comparisons Only)

Variable	Stratification	Statistic	Group				Est. Relative Risk (95% C.I.)	p-Value
			Ranch Hand		Original Comparison			
			Number	Percent	Number	Percent		
Uropor- phyrins	Skin Patch, Bruise, or Sensitivity Reported	n	264		195		0.98 (0.41,2.38)	0.999
		Abnormal	12	4.5	9	4.6		
	Normal	252	95.5	186	95.4			
Uropor- phyrins	Skin Patch, Bruise, or Sensitivity Not Reported	n	742		754		1.07 (0.69,1.67)	0.821
		Abnormal	42	5.7	40	5.3		
		Normal	700	94.3	714	94.7		

TABLE K-16.

Longitudinal Results for SGOT, SGPT, and GGTP:
 A Contrast of Baseline and First Followup
 Examination Test Means
 (Original Comparisons Only)

Variable	Group	Total	Means		p-Value* (Equality of Difference)
			1982 Baseline	1985 Followup	
SGOT	Ranch Hand Original	971	32.91	33.73	0.90
	Comparison	872	32.93	33.69	
SGPT	Ranch Hand Original	971	20.08	21.82	0.86
	Comparison	872	20.51	22.36	
GGTP	Ranch Hand Original	971	39.26	33.16	0.78
	Comparison	872	38.76	32.56	

*Analyzed in log units.

APPENDIX L

Dermatological Evaluation

APPENDIX L: Dermatological Evaluation

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TABLE L-1.

Unadjusted Exposure Index Analyses for Dermatological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Comedones	Officer	n	127		130		123		Overall		0.198
		Abnormal	19	15.0	31	23.8	25	20.3	M vs. L	1.78 (0.95,3.35)	0.084
		Normal	108	85.0	99	76.2	98	79.7	H vs. L	1.45 (0.75,2.80)	0.320
	Enlisted Flyer	n	55		65		57		Overall		0.225
		Abnormal	23	41.8	19	29.2	16	28.1	M vs. L	0.58 (0.27,1.23)	0.180
		Normal	32	58.2	46	70.8	41	71.9	H vs. L	0.54 (0.25,1.19)	0.165
	Enlisted Groundcrew	n	154		163		142		Overall		0.393
		Abnormal	40	26.0	36	22.1	41	28.9	M vs. L	0.81 (0.48,1.35)	0.433
		Normal	114	74.0	127	77.9	101	71.1	H vs. L	1.16 (0.69,1.93)	0.603
Acneiform Lesions	Officer	n	127		130		123		Overall		0.720
		Abnormal	19	15.0	21	16.2	23	18.7	M vs. L	1.10 (0.56,2.15)	0.864
		Normal	108	85.0	109	83.8	100	81.3	H vs. L	1.31 (0.67,2.54)	0.500
	Enlisted Flyer	n	55		65		57		Overall		0.994
		Abnormal	8	14.5	9	13.8	8	14.0	M vs. L	0.94 (0.34,2.64)	0.999
		Normal	47	85.5	56	86.2	49	86.0	H vs. L	0.96 (0.33,2.77)	0.999
	Enlisted Groundcrew	n	154		163		142		Overall		0.806
		Abnormal	31	20.1	36	22.1	33	23.2	M vs. L	1.13 (0.66,1.93)	0.682
		Normal	123	79.9	127	77.9	109	76.8	H vs. L	1.20 (0.69,2.09)	0.573

TABLE L-1. (continued)

Unadjusted Exposure Index Analyses for Dermatological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Acneiform Scars	Officer	n	127		130		123		Overall		0.175
		Abnormal	7	5.5	13	10.0	15	12.2	M vs. L	1.91 (0.73,4.94)	0.245
		Normal	120	94.5	117	90.0	108	87.8	H vs. L	2.38 (0.94,6.06)	0.075
	Enlisted Flyer	n	55		65		57		Overall		0.401
		Abnormal	12	21.8	12	18.5	7	12.3	M vs. L	0.81 (0.33,1.99)	0.655
		Normal	43	78.2	53	81.5	50	87.7	H vs. L	0.50 (0.18,1.39)	0.214
	Enlisted Groundcrew	n	154		163		142		Overall		0.135
		Abnormal	22	14.3	29	17.8	33	23.2	M vs. L	1.30 (0.71,2.38)	0.446
		Normal	132	85.7	134	82.2	109	76.8	H vs. L	1.82 (1.00,3.30)	0.053
Depigmentation	Officer	n	127		130		123		Overall		0.008
		Abnormal	14	11.0	5	3.8	19	15.4	M vs. L	0.32 (0.11,0.93)	0.033
		Normal	113	89.0	125	96.2	104	84.6	H vs. L	1.48 (0.70,3.09)	0.352
	Enlisted Flyer	n	55		65		57		Overall		0.509
		Abnormal	10	18.2	7	10.8	8	14.0	M vs. L	0.54 (0.19,1.54)	0.298
		Normal	45	81.8	58	89.2	49	86.0	H vs. L	0.74 (0.27,2.03)	0.613
	Enlisted Groundcrew	n	154		163		142		Overall		0.045
		Abnormal	15	9.7	7	4.3	17	12.0	M vs. L	0.42 (0.17,1.05)	0.076
		Normal	139	90.3	156	95.7	125	88.0	M vs. L	1.26 (0.60,2.63)	0.578

TABLE L-1. (continued)

Unadjusted Exposure Index Analyses for Dermatological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Inclusion Cysts	Officer	n	127		130		123		Overall		0.221
		Abnormal	11	8.7	20	15.4	13	10.6	M vs. L	1.92 (0.88,4.19)	0.125
		Normal	116	91.3	110	84.6	110	89.4	H vs. L	1.25 (0.54,2.90)	0.671
	Enlisted Flyer	n	55		65		57		Overall		0.857
		Abnormal	6	10.9	9	13.8	8	14.0	M vs. L	1.31 (0.44,3.95)	0.783
		Normal	49	89.1	56	86.2	49	86.0	H vs. L	1.33 (0.43,4.13)	0.777
	Enlisted Groundcrew	n	154		163		142		Overall		0.836
		Abnormal	16	10.4	15	9.2	16	11.3	M vs. L	0.87 (0.42,1.84)	0.850
		Normal	138	89.6	148	90.8	126	88.7	H vs. L	1.10 (0.53,2.28)	0.853
Hyperpigmentation	Officer	n	127		130		123		Overall		0.922
		Abnormal	23	18.1	23	17.7	20	16.3	M vs. L	0.97 (0.51,1.84)	0.999
		Normal	104	81.9	107	82.3	103	83.7	H vs. L	0.88 (0.46,1.70)	0.739
	Enlisted Flyer	n	55		65		57		Overall		0.579
		Abnormal	13	23.6	13	20.0	16	28.1	M vs. L	0.81 (0.34,1.93)	0.662
		Normal	42	76.4	52	80.0	41	71.9	H vs. L	1.26 (0.54,2.95)	0.669
	Enlisted Groundcrew	n	154		163		142		Overall		0.452
		Abnormal	41	26.6	47	28.8	32	22.5	M vs. L	1.12 (0.68,1.83)	0.707
		Normal	113	73.4	116	71.2	110	77.5	H vs. L	0.80 (0.47,1.36)	0.422

TABLE I-1. (continued)

Unadjusted Exposure Index Analyses for Dermatological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Other Abnormalities	Officer	n	127		130		123		Overall		0.122
		Abnormal	73	57.5	87	67.0	85	69.1	M vs. L	1.50 (0.90,2.49)	0.125
		Normal	54	42.5	43	33.0	38	30.9	H vs. L	1.66 (0.98,2.78)	0.067
	Enlisted Flyer	n	55		65		57		Overall		0.071
		Abnormal	43	78.2	43	66.2	33	57.9	M vs. L	0.55 (0.24,1.24)	0.160
		Normal	12	21.8	22	33.8	24	42.1	H vs. L	0.38 (0.17,0.88)	0.027
	Enlisted Groundcrew	n	154		163		142		Overall		0.237
		Abnormal	87	56.5	78	47.9	79	55.6	M vs. L	0.71 (0.45,1.10)	0.144
		Normal	67	43.5	85	52.1	63	44.4	H vs. L	0.97 (0.61,1.53)	0.907
Dermatology Index	Officer	n	127		130		123		Overall		0.300
		>0 (Abnormal)	46	36.2	56	43.1	56	45.5	M vs. L	1.33 (0.81,2.20)	0.308
		0 (Normal)	81	63.8	74	56.9	67	54.5	H vs. L	1.47 (0.89,2.44)	0.157
	Enlisted Flyer	n	55		65		57		Overall		0.579
		>0 (Abnormal)	33	60.0	34	52.3	29	50.9	M vs. L	0.73 (0.35,1.51)	0.462
		0 (Normal)	22	40.0	31	47.7	28	49.1	H vs. L	0.69 (0.33,1.46)	0.349
	Enlisted Groundcrew	n	154		163		142		Overall		0.348
		>0 (Abnormal)	74	48.1	77	47.2	78	54.9	M vs. L	0.97 (0.62,1.50)	0.911
		0 (Normal)	80	51.9	86	52.8	64	45.1	H vs. L	1.32 (0.83,2.08)	0.247

TABLE L-2.

Interaction Summaries of Adjusted Exposure
Index Analyses of Dermatological Variables

Variable	Interaction (Occupation)	Stratification	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
				Low		Medium		High				
				Number	Percent	Number	Percent	Number	Percent			
Acneiform Scars ^a	Nonblack, No pre-SEA Acne	n	99		77		76		Overall		0.006*	
		Abnormal	0	0.0	6	7.8	8	10.5	M vs. L	18.09 (1.00,326.31)**	0.006*	
		Normal	99	100.0	71	92.2	68	89.5	H vs. L	24.69 (1.40,434.96)**	0.001*	
	Exposure Index-by- Race	Nonblack, pre-Sea Acne	n	25		49		44		Overall		0.833
			Abnormal	5	20.0	7	14.3	6	13.6	M vs. L	0.73 (0.20,2.68)	0.630
			Normal	20	80.0	42	85.7	38	86.4	H vs. L	0.67 (0.17,2.56)	0.555
	Exposure Index-by- Presence of pre-SEA Acne (Officer)	Black, No pre-SEA Acne	n	1		2		1		Overall		0.135*
			Abnormal	1	100.0	0	0.0	0	0.0	M vs. L	0.07 (0.001,5.49)**	0.333*
			Normal	0	0.0	2	100.0	1	100.0	H vs. L	0.11 (0.001,10.27)**	0.999*
		Black, pre-SEA Acne	n	1		1		1		Overall		0.135*
			Abnormal	1	100.0	0	0.0	1	100.0	M vs. L	0.11 (0.001,10.27)**	0.999*
			Normal	0	0.0	1	100.0	0	0.0	H vs. L	—	—
Acneiform Scars	Exposure Index-by- Presence of pre-SEA Acne	No pre-SEA Acne	n	101		105		99				
			Abnormal	16	15.8	15	14.3	16	16.2	M vs. L	0.86 (0.39,1.86)	0.695
			Normal	85	84.2	90	85.7	83	83.8	H vs. L	1.11 (0.51,2.39)	0.799
	(Enlisted Groundcrew)	Pre-SEA Acne	n	51		57		41				
			Abnormal	6	11.8	14	24.6	17	41.5	M vs. L	2.24 (0.79,6.39)	0.131
			Normal	45	88.2	43	75.4	24	58.5	H vs. L	5.38 (1.45,19.96)	0.012

TABLE L-2. (continued)

Interaction Summaries of Adjusted Exposure Index Analyses of Dermatological Variables

Variable	Interaction (Occupation)	Stratification	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
				Low		Medium		High				
				Number	Percent	Number	Percent	Number	Percent			
Depigmentation	Exposure Index-by-Presence of pre-SEA Acne (Enlisted Groundcrew)	No pre-SEA Acne	n	101		105		99		Overall		0.314*
			Abnormal	13	12.9	7	6.7	11	11.1	M vs. L	0.48 (0.19,1.27)*	0.161*
			Normal	88	87.1	98	93.3	88	88.9	H vs. L	0.85 (0.36,1.99)*	0.828*
	Pre-SEA Acne	n	51		57		41		Overall		0.006*	
		Abnormal	2	3.9	0	0.0	6	14.6	M vs. L	0.17 (0.01, 3.67)**	0.221*	
		Normal	49	96.1	57	100.0	35	85.4	H vs. L	4.20 (0.80,22.05)*	0.133*	
Dermatology Index	Exposure Index-by-Race	Nonblack, No pre-SEA Acne	n	99		77		76		Overall		0.025*
			Abnormal	32	32.3	40	51.9	35	46.1	M vs. L	2.26 (1.23,4.18)*	0.013*
			Normal	67	67.7	37	48.1	41	53.9	H vs. L	1.78 (0.96,3.31)*	0.084*
		Nonblack, pre-SEA Acne	n	25		49		44		Overall		0.222*
			Abnormal	12	48.0	15	30.6	20	45.5	M vs. L	0.48 (0.18,1.29)*	0.202*
			Normal	13	52.0	34	69.4	24	54.5	H vs. L	0.90 (0.34,2.41)*	0.999*
	Exposure Index-by-Presence of pre-SEA Acne (Officer)	Black, No pre-SEA Acne	n	1		2		1		Overall		0.135*
			Abnormal	1	100.0	0	0.0	0	0.0	M vs. L	0.07 (0.001,5.49)**	0.333*
			Normal	0	0.0	2	100.0	1	100.0	H vs. L	0.11 (0.001,10.27)**	0.999*
		Black, pre-SEA Acne	n	1		1		1		Overall		0.223*
			Abnormal	1	100.0	0	0.0	1	100.0	M vs. L	0.11 (0.001,10.27)**	0.999*
			Normal	0	0.0	1	100.0	0	0.0	H vs. L	—	—

TABLE L-2. (continued)

Interaction Summaries of Adjusted Exposure
Index Analyses of Dermatological Variables

FOOTNOTES, Table L-2

^aResults presented for acneiform scars (officers) are based on stratification into the four categories shown. Unadjusted results are presented for all strata except nonblack Ranch Hands with pre-SEA acne. These results are adjusted for age.

*Unadjusted estimate of relative risk and confidence interval, or p-value, based on stratified tables.

**Unadjusted estimate of relative risk and confidence interval calculated after adding 0.5 to each cell.

—No normal participants present in contrast; estimated relative risk, confidence interval and p-value not presented.

Note: Small sample sizes may affect validity of overall p-value.

Note: Results without (*) or (**) are adjusted for all other main effects in model (age, race, presence of pre-SEA acne), unless otherwise noted.

TABLE L-3.

Unadjusted Analysis for Reported Historical Occurrence of Acne by Group (Original Comparisons Only)

Group	Acne				Total	Summary Statistics
	Yes		No			
	Number	Percent	Number	Percent		
Ranch Hand	412	40.6	604	59.4	1,016	Est. RR: 1.18 95% C.I.: (0.99,1.42) p-Value: 0.071
Original Comparison	349	36.5	606	63.5	955	
Total	761		1,210		1,971	

TABLE L-4.

Unadjusted Analysis for Reported Historical Occurrence Relative to 1961 by Group* (Original Comparisons Only)

Group	Occurrence of Acne				Total	Summary Statistics
	Post-1961		Pre-1961			
	Number	Percent	Number	Percent		
Ranch Hand	239	58.3	171	41.7	410	Est. RR (for post-1961 cases): 1.14 95% C.I.: (0.85, 1.52) p-Value: 0.418
Original Comparison	192	55.2	156	44.8	348	
Total	431		327		758	

*Three participants deleted due to missing data on time of occurrence.

TABLE L-5.

**Unadjusted Analysis for Reported Historical Occurrence of Acne
Relative to SEA Tour of Duty for Post-1961 Acne by Group*
(Original Comparisons Only)**

Group	Post-1961 Acne						Total	p-Value
	Pre-SEA		Post-SEA		Pre- and Post-SEA			
	Number	Percent	Number	Percent	Number	Percent		
Ranch Hand	58	25.4	80	35.1	90	39.5	228	0.155
Original								
Comparison	48	26.2	81	44.2	54	29.5	183	
Total	106		161		144		411	

*Twenty post-1961 participants with acne deleted due to missing data on time of occurrence.

TABLE L-6.

**Adjusted Analysis for Duration of Acne (in Years)
for Post-1961 Acne by Group***

Group	Total	Adjusted Mean**	95% C.I.**	p-Value	Covariate Remarks
Ranch Hand	219	8.18	(7.43,8.96)	0.070	Time Reference to SEA (p<0.001)
Original					
Comparison	175	7.15	(6.38,7.97)		
Total	394				

*Seventeen participants deleted due to missing data on time of occurrence.

**Converted from square root scale.

TABLE L-7.

Results Discussed Narratively
in Questionnaire Data Section of Chapter
(Original Comparisons Only)

Description	p-Value
● Effect due to SEA category in continuous analysis of duration of acne	<0.001
● Interaction between group and SEA category in continuous analysis of duration of acne	0.286
● Categorical analysis of duration of acne -- p-value for group difference	
<u>SEA Category</u>	
pre-SEA	0.718
post-SEA	0.592
pre- and post-SEA	0.753
● Intersection of Venn diagram circles (temples, ears, and eyes) -- p-value for group difference	
<u>SEA Category</u>	
post-SEA and pre- and post-SEA	0.133
post-SEA	0.627

TABLE L-8.

Unadjusted Analyses for
Dermatological Variables by Group
(Original Comparisons Only)

Variable	Statistic	Group				Est. Relative Risk (95% C.I.)	p-Value
		Ranch Hand		Original Comparison			
		Number	Percent	Number	Percent		
Comedones	n	1,016		954		0.90 (0.74,1.11)	0.352
	Abnormal	250	24.6	253	26.5		
	Normal	766	75.4	701	73.5		
Acneiform Lesions	n	1,016		954		1.14 (0.90,1.43)	0.288
	Abnormal	188	18.5	159	16.7		
	Normal	828	81.5	795	83.3		
Acneiform Scars	n	1,016		954		1.12 (0.87,1.44)	0.401
	Abnormal	150	14.8	128	13.4		
	Normal	866	85.2	826	86.6		
Depigmentation	n	1,016		954		0.83 (0.63,1.10)	0.219
	Abnormal	102	10.0	113	11.8		
	Normal	914	90.0	841	88.2		
Inclusion Cysts	n	1,016		954		0.90 (0.68,1.18)	0.442
	Abnormal	114	11.2	118	12.4		
	Normal	902	88.8	836	87.6		
Hyperpigmentation	n	1,016		954		0.95 (0.77,1.18)	0.668
	Abnormal	228	22.4	222	23.3		
	Normal	788	77.6	732	76.7		

TABLE L-8. (continued)

Unadjusted Analyses for
Dermatological Variables by Group
(Original Comparisons Only)

Variable	Statistic	Group				Est. Relative Risk (95% C.I.)	p-Value
		Ranch Hand		Original Comparison			
		Number	Percent	Number	Percent		
Other Abnormalities	n	1,016		954		1.03 (0.86,1.23)	0.783
	Abnormal	608	59.8	565	59.2		
	Normal	408	40.2	389	40.8		
Dermatology Index	n	1,016		954		Overall	0.816
	0	533	52.5	497	52.1	1 vs. 0 0.99 (0.81,1.20)	0.919
	1	318	31.3	301	31.6	2 vs. 0 0.97 (0.73,1.29)	0.885
	2	121	11.9	116	12.2	3 vs. 0 0.91 (0.56,1.48)	0.711
	3	34	3.3	35	3.7	4 vs. 0 1.87 (0.63,5.49)	0.304
	4	10	1.0	5	0.5		

TABLE L-9.

Adjusted Analyses for
Dermatological Variables by Group
(Original Comparisons Only)

Variable	Group		Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks
	Ranch Hand Total	Original Comparison Total			
Comedones	1,007	946	0.93 (0.75,1.14)	0.469	RACE (p<0.001) AGE (p<0.001) OCC*SEA ACNE (p=0.047)
Acneiform Lesions	1,007	946	1.13 (0.89,1.43)	0.315	AGE (p<0.001) RACE (p=0.034) SEA ACNE (p=0.007)
Acneiform Scars	1,007	946	1.12 (0.86,1.45)	0.417	AGE (p<0.001) RACE (p<0.001) SEA ACNE (p<0.001)
Depigmentation	1,016	954	0.83 (0.63,1.10)	0.202	RACE (p=0.010)
Inclusion Cysts	1,016	954	0.90 (0.68,1.18)*	0.442*	--
Hyperpigmentation	1,007	946	0.95 (0.76,1.17)	0.608	RACE (p<0.001) SEA ACNE (p=0.008)

TABLE L-9. (continued)

Adjusted Analyses for
Dermatological Variables by Group
(Original Comparisons Only)

Variable	Group		Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks
	Ranch Hand Total	Original Comparison Total			
Other Abnormalities	1,016	954	1.07 (0.89,1.30)	0.459	AGE (p<0.001) RACE (p<0.001)
Dermatology Index	1,007	946	****	****	OCC (p=0.013) GROUP*SEA ACNE (p=0.030)

*No significant covariates in adjusted analysis; consequently, estimated relative risk, confidence interval, and p-value are from unadjusted analysis.

****Group-by-covariate interaction; adjusted relative risk, confidence interval, and p-value are not presented.

Abbreviations:

OCC: Occupation
SEA ACNE: Presence of pre-SEA acne

TABLE L-10.

Summary of Group-by-Presence of Pre-SEA Acne
Interaction for Dermatology Index
(Original Comparisons Only)

Variable	Interaction	Stratification	Statistic	Group				Contrast	Adj. Relative Risk (95% C.I.)	p-Value
				Ranch Hand		Original Comparison				
			n	Number	Percent	Number	Percent			
Dermatology Index	Group-by-presence-of-pre-SEA acne	No	n	684		653				
			0	360	52.6	370	56.7			
			1	234	34.2	202	30.9	1 vs. 0	1.19 (0.94,1.52)	0.153
			2	69	10.1	61	9.3	2 vs. 0	1.17 (0.80,1.70)	0.422
			3	16	2.3	19	2.9	3 vs. 0	0.87 (0.44,1.71)	0.689
		4	5	0.7	1	0.2	4 vs. 0	4.16 (0.61,28.48)	0.146	
		n	323		293					
		Yes	0	167	51.7	122	41.6			
			1	82	25.4	98	33.4	1 vs. 0	0.62 (0.42,0.90)	0.012
	2		51	15.8	55	18.8	2 vs. 0	0.68 (0.44,1.07)	0.097	
	3		18	5.6	15	5.1	3 vs. 0	0.89 (0.43,1.83)	0.745	
	4		5	1.5	3	1.0	4 vs. 0	1.20 (0.30,4.88)	0.797	

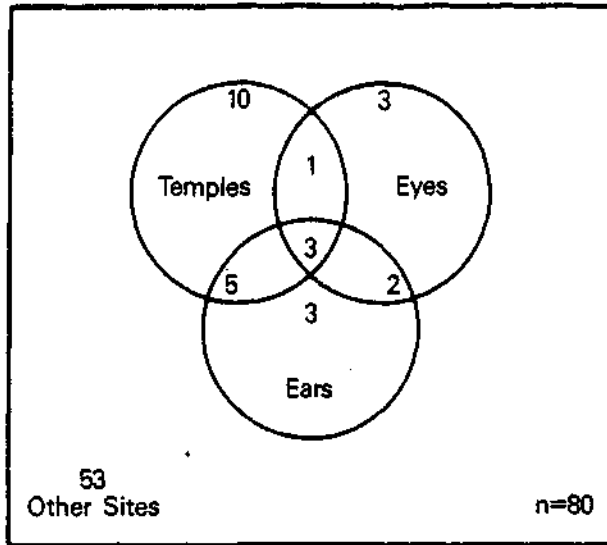
TABLE L-11.

Longitudinal Analysis of the Dermatology Index:
 A Contrast of Baseline and First Followup Examination Abnormalities
 (Original Comparisons Only)

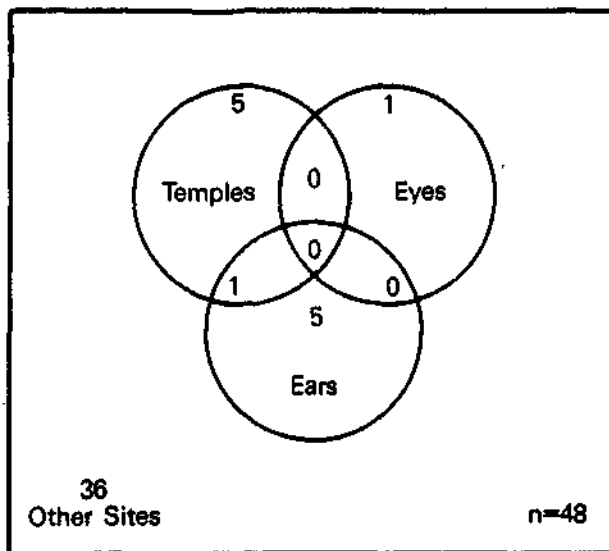
Group	1982 Baseline Exam	1985 Followup Exam		Odds Ratio (OR)*	p-Value (OR _{RH} vs. OR _{OC})
		Abnormal	Normal		
Ranch Hand	Abnormal	241	136	1.68	0.53
	Normal	228	366		
Original Comparison	Abnormal	222	109	1.85	
	Normal	202	339		

*Odds Ratio:
$$\frac{\text{Number Normal Baseline, Abnormal Followup}}{\text{Number Abnormal Baseline, Normal Followup}}$$

Ranch Hand



Original Comparison

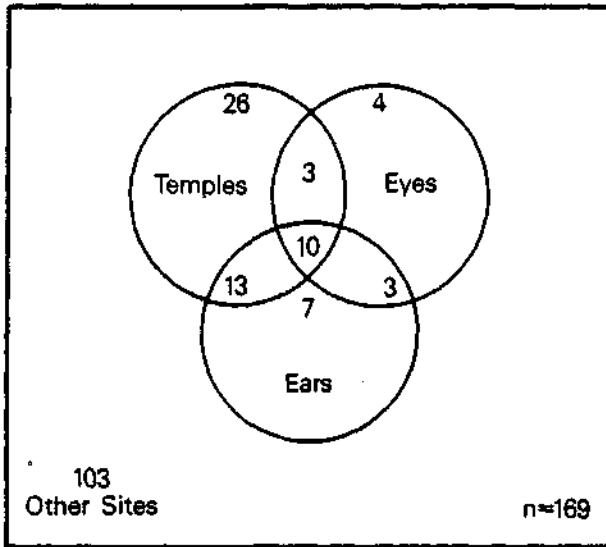


p = 0.374
(8 Categories)

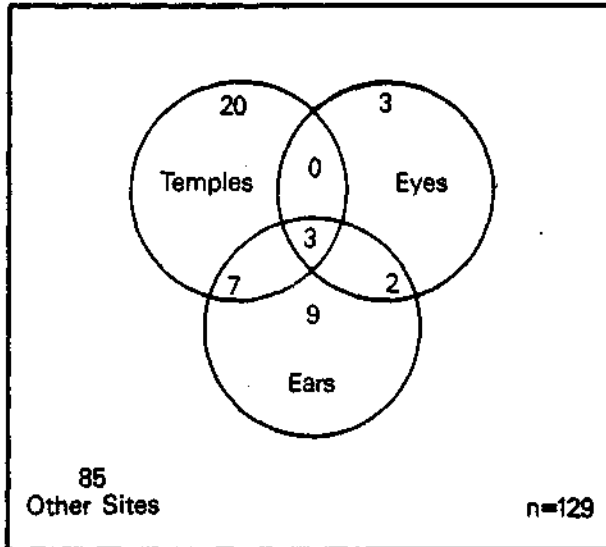
p = 0.310
(7 Categories;
Other Sites Deleted)

Figure L-1.
Location of Post-SEA and Pre- and
Post-SEA Acne by Group
(Original Comparisons Only)

Ranch Hand



Original Comparison



$p = 0.492$
(8 Categories)

$p = 0.449$
(7 Categories;
Other Sites Deleted)

Figure L-2.
Location of Post-SEA Acne by Group
(Original Comparisons Only)

APPENDIX M

Cardiovascular Assessment

APPENDIX M: CARDIOVASCULAR ASSESSMENT

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TABLE M-1.

**Association Between Reported Essential Hypertension and the Covariates
in the Combined Ranch Hand and Comparison Groups**

Covariate	Covariate Category	Total	Percent Abnormal	p-Value
Age	Born \geq 1942	934	20.4	<0.001
	Born <1942	1,214	29.6	
Race	Black	126	27.8	0.647
	Nonblack	2,022	25.5	
Occupation	Officer	807	27.6	0.108
	Enlisted Flyer	354	27.1	
	Enlisted Groundcrew	987	23.5	
Current Smoking	0	1,262	28.8	<0.001
	>0 - 20	463	22.0	
	>20	422	20.4	
Pack-Years Smoking	0	512	28.7	0.120
	>0 - 10	760	23.6	
	>10	869	25.7	
Cholesterol	\leq 200	766	19.7	<0.001
	>200 - 230	650	26.6	
	>230	732	31.0	
HDL	\leq 40	719	27.5	0.309
	>40 - 50	754	25.3	
	>50	675	24.0	
Cholesterol-HDL Ratio	\leq 4.2	717	20.6	<0.001
	>4.2 - <5.5	743	26.0	
	\geq 5.5	688	30.5	
Percent Body Fat	<10	10	0.0	<0.001
	10 - 25	1,758	21.0	
	>25	379	47.8	
Personality Score	<-5	829	26.8	0.202
	-5 - 5	731	26.7	
	>5	580	22.9	
Differential Cortisol	\leq 0.6	704	29.1	0.030
	>0.6 - 4.0	745	24.4	
	>4.0	683	23.3	
Current Alcohol Use (Drinks/Day)	0	592	25.2	0.011
	>0 - 1	809	22.5	
	>1	738	29.1	
Drink-Years Alcohol	\leq 1.25	691	25.9	0.005
	>1.25 - 25	719	21.8	
	>25	666	29.4	

TABLE M-2.

**Association Between Reported Heart Disease and the Covariates
in the Combined Ranch Hand and Comparison Groups**

Covariate	Covariate Category	Total	Percent Abnormal	p-Value
Age	Born \geq 1942	934	22.7	<0.001
	Born <1942	1,214	30.3	
Race	Black	126	31.0	0.354
	Nonblack	2,022	26.8	
Occupation	Officer	807	30.6	0.014
	Enlisted Flyer	354	24.9	
	Enlisted Groundcrew	987	24.8	
Current Smoking	0	1,262	27.5	0.342
	>0 - 20	463	28.1	
	>20	422	24.2	
Pack-Years Smoking	0	512	28.1	0.667
	>0 - 10	760	25.9	
	>10	869	27.3	
Cholesterol	\leq 200	766	26.5	0.361
	>200 - 230	650	25.5	
	>230	732	28.8	
HDL	\leq 40	719	26.6	0.326
	>40 - 50	754	25.6	
	>50	675	29.0	
Cholesterol-HDL Ratio	\leq 4.2	717	29.6	0.009
	>4.2 - <5.5	743	23.0	
	\geq 5.5	688	28.6	
Percent Body Fat	<10	10	30.0	0.849
	10 - 25	1,758	27.2	
	>25	379	25.9	
Personality Score	<-5	829	27.5	0.214
	-5 - 5	731	24.9	
	>5	580	29.1	
Differential Cortisol	\leq 0.6	704	24.6	0.212
	>0.6 - 4.0	745	27.9	
	>4.0	683	28.4	
Current Alcohol Use (Drinks/Day)	0	592	27.4	0.297
	>0 - 1	809	28.6	
	>1	738	25.1	
Drink-Years Alcohol	\leq 1.25	691	26.8	0.537
	>1.25 - 25	719	25.7	
	>25	666	28.4	

TABLE M-3.

Association Between Reported Myocardial Infarction and the Covariates
in the Combined Ranch Hand and Comparison Groups

Covariate	Covariate Category	Total	Percent Abnormal	p-Value
Age	Born \geq 1942	934	0.4	<0.001
	Born <1942	1,214	3.1	
Race	Black	126	0.8	0.523
	Nonblack	2,022	2.0	
Occupation	Officer	807	1.5	0.477
	Enlisted Flyer	354	2.3	
	Enlisted Groundcrew	987	2.2	
Current Smoking	0	1,262	1.4	0.083
	>0 - 20	463	3.0	
	>20	422	2.4	
Pack-Years Smoking	0	512	0.2	0.001
	>0 - 10	760	1.8	
	>10	869	3.1	
Cholesterol	\leq 200	766	1.2	0.093
	>200 - 230	650	2.0	
	>230	732	2.7	
HDL	\leq 40	719	2.8	0.096
	>40 - <50	754	1.9	
	>50	675	1.2	
Cholesterol-HDL Ratio	\leq 4.2	717	1.0	0.002
	>4.2 - <5.5	743	1.5	
	\geq 5.5	688	3.5	
Percent Body Fat	<10	10	0.0	0.867
	10 - 25	1,758	1.9	
	>25	379	2.1	
Personality Score	<-5	829	1.9	0.195
	-5 - 5	731	2.6	
	>5	580	1.2	
Differential Cortisol	\leq 0.6	704	2.0	0.973
	>0.6 - 4.0	745	1.9	
	>4.0	683	2.0	
Current Alcohol Use (Drinks/Day)	0	592	2.4	0.365
	>0 - 1	809	2.1	
	>1	738	1.4	
Drink-Years Alcohol	\leq 1.25	691	2.6	0.034
	>1.25 - 25	719	0.8	
	>25	666	2.2	

TABLE M-4.

**Cardiovascular Morbidity-Mortality Analysis
(Ranch Hands and Comparisons*)**

<u>Endpoint</u>	<u>Status</u>	<u>Ranch Hands</u> n=1,257			<u>Comparisons*</u> n=1,253		
		<u>Event</u>			<u>Event</u>		
		<u>Yes</u>	<u>No</u>	<u>Total</u>	<u>Yes</u>	<u>No</u>	<u>Total</u>
Death (Any Cause) or Verified Heart Disease	Dead	66	0	66	77	0	77
	Living, Fully Compliant ^a	251	823	1,074	187	768	955
	Living, not Fully Compliant ^b	27.4 ^c	89.6 ^c	117	43.3 ^c	177.7 ^c	221
	Estimated Percent Events	27.4%			24.5%		
Death (Any Cause) or Verified Myocardial Infarction	Dead	66	0	66	77	0	77
	Living, Fully Compliant ^a	13	1,061	1,074	9	946	955
	Living, not Fully Compliant ^b	1.4 ^c	115.6 ^c	117	2.1 ^c	218.9 ^c	221
	Estimated Percent Events	6.4%			7.0%		
Fatal or Nonfatal Verified Heart Disease	Dead	5	61	66	3	74	77
	Living, Fully Compliant ^a	251	823	1,074	187	768	955
	Living, not Fully Compliant ^b	27.4 ^c	89.6 ^c	117	43.3 ^c	177.7 ^c	221
	Estimated Percent Events	22.5%			18.6%		
Fatal or Nonfatal Verified Myocardial Infarction or Fatal Heart Disease	Dead	1	65	66	2	75	77
	Living, Fully Compliant ^a	13	1,061	1,074	9	946	955
	Living, not Fully Compliant ^b	1.4 ^c	115.6 ^c	117	2.1 ^c	218.9 ^c	221
	Estimated Percent Events	1.2%			1.0%		

*Comparison: first Comparison of the randomly ordered set matched to the Ranch Hands.

^aFully compliant at Baseline or third-year followup examination.

^bNot fully compliant at Baseline and not fully compliant at third-year followup examination.

^cEstimated using event rate in living, fully compliants.

TABLE M-5.

**Summary of Group-by-Covariate Interactions
for Central Cardiac Function Variables (Diabetics Excluded)**

Variable	Interaction	Stratification	Adj. Relative Risk (95% C.I.)	p-Value
Systolic Blood Pressure (Continuous Analysis)	Group-by-Age (Blacks)	Age (Baseline): 35	4.56 (-1.91,11.03)*	0.170
		Age (Baseline): 53	-16.01 (-27.52,-4.50)*	0.008
ECG (Overall)	Group-by-Pack-years Smoking	Pack-years: 0	0.70 (0.50,0.98)	0.038
		Pack-years: 30	1.25 (0.89,1.76)	0.197
ECG: Arrythmia	Group-by-Pack-years Smoking (21% Body Fat)	Pack-years: 0	0.58 (0.30,1.10)	0.093
		Pack-years: 30	1.59 (0.83,3.04)	0.162
	Group-by-Percent Body Fat (7 Pack-years Smoking)	10% Body Fat	0.23 (0.07,0.78)	0.018
		30% Body Fat	1.88 (0.66,5.34)	0.234

*Difference in group means (Ranch Hand-Comparison) and associated p-value given, rather than relative risk, for continuous analysis of dependent variables.

TABLE M-6.

Summary of Group-by-Covariate Interactions
for Peripheral Vascular Function Variables (Diabetics Excluded)

Variable	Interaction	Stratification	Adj. Relative Risk (95% C.I.)	p-Value
Popliteal Pulses (Manual)	Group-by-Race	Black	6.74 (0.72,63.40)	0.095
		Nonblack	0.55 (0.28,1.12)	0.099
Dorsalis Pedis Pulses (Manual)	Group-by-Occupation	Officer	0.70 (0.45,1.09)	0.116
		Enlisted Flyer	1.70 (0.86,3.34)	0.124
		Enlisted Groundcrew	1.32 (0.84,2.06)	0.222
Posterior Tibial Pulses (Manual)	Group-by-Occupation	Officer	0.33 (0.09,1.18)	0.087
		Enlisted Flyer	4.33 (1.14,16.50)	0.032
		Enlisted Groundcrew	1.22 (0.58,2.57)	0.603
Leg Pulses (Manual)	Group-by-Occupation (21% Body Fat)	Officer	0.62 (0.41,0.94)	0.026
		Enlisted Flyer	1.55 (0.87,2.76)	0.136
		Enlisted Groundcrew	1.24 (0.85,1.81)	0.271
	Group-by-Percent Body Fat (Officer)	Nonobese ($\leq 25\%$)	0.66 (0.42,1.04)	0.084
		Obese ($>25\%$)	0.44 (0.17,1.12)	0.072
	Group-by-Percent Body Fat (Enlisted Flyer)	Nonobese ($\leq 25\%$)	1.36 (0.73,2.55)	0.177
		Obese ($>25\%$)	1.83 (0.76,4.38)	0.332
Group-by-Percent Body Fat (Enlisted Groundcrew)	Nonobese ($\leq 25\%$)	1.20 (0.79,1.83)	0.818	
	Obese ($>25\%$)	0.91 (0.39,2.10)	0.390	
Peripheral Pulses (Manual)	Group-by-Occupation	Officer	0.64 (0.42,0.96)	0.030
		Enlisted Flyer	1.45 (0.82,2.56)	0.204
		Enlisted Groundcrew	1.16 (0.80,1.69)	0.441
All Pulses (Manual)	Group-by-Occupation	Officer	0.64 (0.42,0.96)	0.030
		Enlisted Flyer	1.45 (0.82,2.57)	0.204
		Enlisted Groundcrew	1.14 (0.78,1.66)	0.490

TABLE M-7.

Unadjusted Exposure Index Analyses
for Reported and Verified Heart Disease by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value	
			Low		Medium		High					
			Number	Percent	Number	Percent	Number	Percent				
M-7 Reported Essential Hypertension	Officer	n	119		122		109		Overall		0.850	
		Abnormal	31	26.0	33	27.0	32	29.4	M vs. L	1.05 (0.59,1.86)	0.857	
		Normal	88	74.0	89	73.0	77	70.6	H vs. L	1.18 (0.66,2.11)	0.575	
	Enlisted Flyer	n	54		56		53		Overall		0.525	
		Abnormal	14	25.9	14	25.0	18	34.0	M vs. L	0.95 (0.40,2.48)	0.912	
		Normal	40	74.1	42	75.0	35	66.0	H vs. L	1.47 (0.64,3.38)	0.363	
	Enlisted Groundcrew	n	148		151		130		Overall		0.490	
		Abnormal	33	22.3	42	27.8	30	23.1	M vs. L	1.34 (0.79,2.27)	0.271	
		Normal	115	77.7	109	72.2	100	76.9	H vs. L	1.05 (0.60,1.83)	0.881	
	Verified Essential Hypertension	Officer	n	119		122		109		Overall		0.413
			Abnormal	23	19.3	22	18.0	27	24.8	M vs. L	0.92 (0.48,1.76)	0.795
			Normal	96	80.7	100	82.0	82	75.2	H vs. L	1.37 (0.73,2.58)	0.322
Enlisted Flyer		n	54		56		53		Overall		0.514	
		Abnormal	11	20.4	8	14.3	12	22.6	M vs. L	0.65 (0.24,1.77)	0.401	
		Normal	43	79.6	48	85.7	41	77.4	H vs. L	1.14 (0.45,2.88)	0.772	
Enlisted Groundcrew		n	148		151		130		Overall		0.375	
		Abnormal	28	18.9	38	25.2	26	20.0	M vs. L	1.44 (0.83,2.50)	0.194	
		Normal	120	81.1	113	74.8	104	80.0	H vs. L	1.07 (0.59,1.94)	0.818	

TABLE M-7. (continued)

Unadjusted Exposure Index Analyses
for Reported and Verified Heart Disease by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value	
			Low		Medium		High					
			Number	Percent	Number	Percent	Number	Percent				
M S	Officer	n	119		122		109		Overall		0.607	
		Abnormal	41	34.4	40	32.8	31	28.4	M vs. L	0.93 (0.54,1.58)	0.787	
		Normal	78	65.6	82	67.2	78	71.6	H vs. L	0.76 (0.43,1.33)	0.332	
	Reported Heart Disease	Enlisted Flyer	n	54		56		53		Overall		0.306
			Abnormal	15	27.8	19	33.9	11	20.8	M vs. L	1.34 (0.59,3.01)	0.484
			Normal	39	72.2	37	66.1	42	79.2	H vs. L	0.68 (0.28,1.66)	0.401
		Enlisted Groundcrew	n	148		151		130		Overall		0.008
			Abnormal	42	28.4	25	16.6	41	31.5	M vs. L	0.50 (0.29,0.87)	0.015
			Normal	106	71.6	126	83.4	89	68.5	H vs. L	1.16 (0.70,1.95)	0.569
	Verified Heart Disease	Officer	n	119		122		109		Overall		0.665
			Abnormal	37	31.1	35	28.7	28	25.7	M vs. L	0.89 (0.51,1.55)	0.682
			Normal	82	68.9	87	71.3	81	74.3	H vs. L	0.77 (0.43,1.37)	0.368
Enlisted Flyer		n	54		56		53		Overall		0.335	
		Abnormal	14	25.9	16	28.6	9	17.0	M vs. L	1.14 (0.49,2.65)	0.757	
		Normal	40	74.1	40	71.4	44	83.0	H vs. L	0.58 (0.23,1.50)	0.263	
Enlisted Groundcrew		n	148		151		130		Overall		0.002	
		Abnormal	37	25.0	16	10.6	32	24.6	M vs. L	0.36 (0.19,0.67)	0.001	
		Normal	111	75.0	135	89.4	98	75.4	H vs. L	0.98 (0.57,1.76)	0.994	

TABLE M-7. (continued)

Unadjusted Exposure Index Analyses
for Reported and Verified Heart Disease by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
67 Reported Myocardial Infarction	Officer	n	119		122		109		Overall		0.256
		Abnormal	1	0.8	4	3.3	1	0.9	M vs. L	4.00 (0.44,36.3)	0.219
		Normal	118	99.2	118	96.7	108	99.1	H vs. L	1.09 (0.07,17.7)	0.952
	Enlisted Flyer	n	54		56		53		Overall		0.061
		Abnormal	0	0.0	1	0.8	4	7.6	M vs. L	—	—
		Normal	54	100.0	55	98.2	49	92.4	H vs. L	—	—
	Enlisted Groundcrew	n	148		151		130		Overall		0.592
		Abnormal	3	2.0	2	1.3	4	3.1	M vs. L	0.65 (0.11,3.94)	0.638
		Normal	145	98.0	149	98.7	126	96.9	H vs. L	1.53 (0.34,6.98)	0.582
Verified Myocardial Infarction	Officer	n	119		122		109		Overall		—
		Abnormal	0	0.0	4	3.3	0	0.0	M vs. L	—	—
		Normal	119	100.0	118	96.7	109	100.0	H vs. L	—	—
	Enlisted Flyer	n	54		56		53		Overall		—
		Abnormal	0	0.0	1	1.8	1	1.9	M vs. L	—	—
		Normal	54	100.0	55	98.2	52	98.1	H vs. L	—	—
	Enlisted Groundcrew	n	148		151		130		Overall		—
		Abnormal	2	1.4	0	0.0	1	0.8	M vs. L	—	—
		Normal	146	98.6	151	100.0	129	99.2	H vs. L	—	—

— Analysis not performed due to sparse cells.

TABLE 4-8.

Unadjusted Exposure Index Analyses
for Central Cardiac Function Variables by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Systolic Blood Pressure	Officer	n	119		122		109		Overall		0.996
		Abnormal	8	6.7	8	6.6	7	6.4	M vs. L	0.97 (0.35,2.69)	0.960
		Normal	111	93.3	114	93.4	102	93.6	H vs. L	0.95 (0.34,2.63)	0.928
	Enlisted Flyer	n	54		56		53		Overall		0.927
		Abnormal	4	7.4	4	7.1	3	5.7	M vs. L	0.96 (0.23,4.05)	0.960
		Normal	50	92.6	52	92.9	50	94.3	H vs. L	0.75 (0.16,3.53)	0.719
	Enlisted Groundcrew	n	148		151		130		Overall		0.166
		Abnormal	5	3.4	13	8.6	8	6.2	M vs. L	2.69 (0.94,7.76)	0.066
		Normal	143	96.6	138	91.4	122	93.8	H vs. L	1.88 (0.60,5.88)	0.280
Heart Sounds	Officer	n	119		122		109		Overall		0.844 ^a
		Abnormal	4	3.4	4	3.3	5	4.6	M vs. L	0.97 (0.24,3.99)	0.968
		Normal	115	96.6	118	96.7	104	95.4	H vs. L	1.38 (0.36,5.29)	0.638
	Enlisted Flyer	n	54		56		53				—
		Abnormal	1	1.8	2	3.6	0	0.0		—	—
		Normal	53	98.2	54	96.4	53	100.0		—	—
	Enlisted Groundcrew	n	148		150		130		Overall		0.167
		Abnormal	6	4.0	2	1.3	7	5.4	M vs. L	0.32 (0.06,1.61)	0.168
		Normal	142	96.0	148	98.7	123	94.6	H vs. L	1.35 (0.44,4.12)	0.603

TABLE M-8. (continued)

Unadjusted Exposure Index Analyses
for Central Cardiac Function Variables by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value	
			Low		Medium		High					
			Number	Percent	Number	Percent	Number	Percent				
ECG (Overall)	Officer	n	119		122		109		Overall		0.347	
		Abnormal	13	10.9	21	17.2	14	12.8	M vs. L	1.70 (0.81,3.57)	0.165	
		Normal	106	89.1	101	82.8	95	87.2	H vs. L	1.20 (0.54,2.69)	0.653	
	Enlisted Flyer	n	54		56		53		Overall		0.614	
		Abnormal	9	16.7	13	23.2	9	17.0	M vs. L	1.51 (0.59,3.90)	0.395	
		Normal	45	83.3	43	76.8	44	83.0	H vs. L	1.02 (0.37,2.82)	0.968	
	Enlisted Groundcrew	n	148		151		130		Overall		0.266	
		Abnormal	17	11.5	10	6.6	15	11.5	M vs. L	0.55 (0.24,1.24)	0.147	
		Normal	131	88.5	141	93.4	115	88.5	H vs. L	1.01 (0.48,2.10)	0.992	
	Right Bundle Branch Block	Officer	n	119		122		109				—
			Abnormal	0	0.0	1	0.8	0	0.0		—	—
			Normal	119	100.0	121	99.2	109	100.0		—	—
Enlisted Flyer		n	54		56		53				—	
		Abnormal	1	1.8	0	0.0	0	0.0		—	—	
		Normal	53	98.2	56	100.0	53	100.0		—	—	
Enlisted Groundcrew		n	148		151		130				—	
		Abnormal	1	0.7	0	0.0	2	1.5		—	—	
		Normal	147	99.3	151	100.0	128	98.5		—	—	

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TABLE M-8. (continued)

Unadjusted Exposure Index Analyses
for Central Cardiac Function Variables by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Left Bundle Branch Block	Officer	n	119		122		109				—
		Abnormal	0	0.0	0	0.0	0	0.0			—
		Normal	119	100.0	122	100.0	109	100.0			—
	Enlisted Flyer	n	54		56		53				—
		Abnormal	0	0.0	0	0.0	0	0.0			—
		Normal	54	100.0	56	100.0	53	100.0			—
	Enlisted Groundcrew	n	148		151		130				—
		Abnormal	0	0.0	0	0.0	0	0.0			—
		Normal	148	100.0	151	100.0	130	100.0			—
Nonspecific ST-T Wave Changes	Officer	n	119		122		109		Overall		0.340
		Abnormal	8	6.7	15	12.3	11	10.1	M vs. L	1.94 (0.79,4.77)	0.147
		Normal	111	93.3	107	87.7	98	89.9	H vs. L	1.56 (0.60,4.03)	0.363
	Enlisted Flyer	n	54		56		53		Overall		0.171
		Abnormal	4	7.4	11	19.6	7	13.2	M vs. L	3.06 (0.91,10.28)	0.072
		Normal	50	92.6	45	80.4	46	86.8	H vs. L	1.90 (0.52,6.92)	0.327
	Enlisted Groundcrew	n	148		151		130		Overall		0.126
		Abnormal	15	10.1	7	4.6	7	5.4	M vs. L	0.43 (0.17,1.09)	0.075
		Normal	133	89.9	144	95.4	123	94.6	H vs. L	0.50 (0.20,1.28)	0.150

TABLE M-8. (continued)

Unadjusted Exposure Index Analyses
for Central Cardiac Function Variables by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Bradycardia	Officer	n	119		122		109		Overall		0.975
		Abnormal	7	5.9	8	6.6	7	6.4	M vs. L	1.12 (0.39,3.20)	0.826
		Normal	112	94.1	114	93.4	102	93.6	H vs. L	1.10 (0.37,3.24)	0.865
	Enlisted Flyer	n	54		56		53		Overall		0.205
		Abnormal	1	1.8	5	8.9	2	3.8	M vs. L	5.20 (0.59,46.04)	0.139
		Normal	53	98.2	51	91.1	51	96.2	H vs. L	2.08 (0.18,23.63)	0.555
	Enlisted Groundcrew	n	148		151		130		Overall		0.078
		Abnormal	9	6.1	2	1.3	4	3.1	M vs. L	0.21 (0.04,0.98)	0.047
		Normal	139	93.9	149	98.7	126	96.9	H vs. L	0.49 (0.15,1.63)	0.246
Tachycardia	Officer	n	119		122		109				—
		Abnormal	0	0.0	0	0.0	0	0.0		—	—
		Normal	119	100.0	122	100.0	109	100.0		—	—
	Enlisted Flyer	n	54		56		53				—
		Abnormal	0	0.0	0	0.0	0	0.0		—	—
		Normal	54	100.0	56	100.0	53	100.0		—	—
	Enlisted Groundcrew	n	148		151		130				—
		Abnormal	0	0.0	0	0.0	0	0.0		—	—
		Normal	148	100.0	151	100.0	130	100.0		—	—

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TABLE M-8. (continued)

Unadjusted Exposure Index Analyses
for Central Cardiac Function Variables by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Other ECG Diagnoses	Officer	n	119		122		109		Overall		0.311
		Abnormal	14	11.8	21	17.2	12	11.0	M vs. L	1.56 (0.75,3.23)	0.234
		Normal	105	88.2	101	82.8	97	89.0	H vs. L	0.93 (0.41,2.10)	0.857
	Enlisted Flyer	n	54		56		53				0.265
		Abnormal	9	16.7	5	8.9	4	7.6	M vs. L	0.49 (0.15,1.57)	0.230
		Normal	45	83.3	51	91.1	49	92.4	H vs. L	0.42 (0.12,1.42)	0.159
	Enlisted Groundcrew	n	148		151		130				0.645
		Abnormal	13	8.8	9	6.0	10	7.7	M vs. L	0.66 (0.27,1.59)	0.352
		Normal	135	91.2	142	94.0	120	92.3	H vs. L	0.87 (0.37,2.04)	0.741
Arrhythmia	Officer	n	119		122		109		Overall		0.166 ^a
		Abnormal	6	5.0	3	2.5	1	0.9	M vs. L	0.47 (0.12,1.94)	0.298
		Normal	113	95.0	119	97.5	108	99.1	H vs. L	0.17 (0.02,1.47)	0.110
	Enlisted Flyer	n	54		56		53				—
		Abnormal	2	3.7	0	0.0	1	1.9		—	—
		Normal	52	96.3	56	100.0	52	98.1		—	—
	Enlisted Groundcrew	n	148		151		130		Overall		0.482
		Abnormal	7	4.7	4	2.6	7	5.4	M vs. L	0.55 (0.16,1.91)	0.347
		Normal	141	95.3	147	97.4	123	94.6	H vs. L	1.15 (0.39,3.36)	0.582

^aOverall analysis; sparse cells, chi-square test may not be valid.

— Analysis not performed due to sparse cells.

TABLE M-9.

Unadjusted Exposure Index Analyses
for Diastolic Blood Pressure, Funduscopy Abnormalities,
Carotid Bruits, and Manual Pulse Readings by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Diastolic Blood Pressure	Officer	n	119		122		109		Overall		0.585
		Abnormal	8	6.7	7	5.7	10	9.2	M vs. L	0.84 (0.30,2.41)	0.749
		Normal	111	93.3	115	94.3	99	90.8	H vs. L	1.40 (0.53,3.69)	0.497
	Enlisted Flyer	n	54		56		53		Overall		0.903
		Abnormal	5	9.3	5	8.9	6	11.3	M vs. L	0.96 (0.26,3.53)	0.952
		Normal	49	90.7	51	91.1	47	88.7	H vs. L	1.25 (0.36,4.38)	0.726
	Enlisted Groundcrew	n	148		151		130		Overall		0.434
		Abnormal	11	7.4	17	11.3	10	7.7	M vs. L	1.58 (0.71,3.50)	0.258
		Normal	137	92.6	134	88.7	120	92.3	H vs. L	1.04 (0.43,2.53)	0.936
Funduscopy Examination	Officer	n	119		122		109		Overall		0.337 ^a
		Abnormal	2	1.7	0	0.0	2	1.8		—	—
		Normal	117	98.3	122	100.0	107	98.2		—	—
	Enlisted Flyer	n	54		56		53			—	—
		Abnormal	1	1.8	0	0.0	0	0.0		—	—
		Normal	53	98.2	56	100.0	53	100.0		—	—
	Enlisted Groundcrew	n	148		150		130			—	—
		Abnormal	1	0.7	0	0.0	1	0.8		—	—
		Normal	147	99.3	150	100.0	129	99.2		—	—

TABLE M-9. (continued)

Unadjusted Exposure Index Analyses
for Diastolic Blood Pressure, Funduscopy Abnormalities,
Carotid Bruits, and Manual Pulse Readings by Occupation

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Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Carotid Bruits	Officer	n	120		122		109		Overall	—	0.388 ^a
		Abnormal	3	1.7	1	0.8	0	0.0			
		Normal	117	98.3	121	99.2	109	100.0			
	Enlisted Flyer	n	54		56		53		—	—	—
		Abnormal	0	0.0	0	0.0	2	3.8			
		Normal	54	100.0	56	100.0	51	96.2			
	Enlisted Groundcrew	n	148		150		130		—	—	—
		Abnormal	0	0.0	0	0.0	2	1.5			
		Normal	148	100.0	150	100.0	128	98.5			
Radial Pulses	Officer	n	118		119		108		Overall	—	0.342 ^a
		Abnormal	2	1.7	0	0.0	2	1.8			
		Normal	116	98.3	119	100.0	106	98.2			
	Enlisted Flyer	n	54		55		53		—	—	—
		Abnormal	0	0.0	0	0.0	0	0.0			
		Normal	54	100.0	55	100.0	53	100.0			
	Enlisted Groundcrew	n	146		149		127		—	—	—
		Abnormal	0	0.0	0	0.0	0	0.0			
		Normal	146	100.0	149	100.0	127	100.0			

TABLE M-9. (continued)

Unadjusted Exposure Index Analyses
for Diastolic Blood Pressure, Funduscopy Abnormalities,
Carotid Bruits, and Manual Pulse Readings by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Femoral Pulses (Manual)	Officer	n	118		119		108		Overall		0.379 ^a
		Abnormal	1	0.8	1	0.8	3	2.8		—	—
		Normal	117	99.2	118	99.2	105	97.2		—	—
	Enlisted Flyer	n	54		55		53		Overall		0.334
		Abnormal	1	1.8	2	3.6	4	7.6	M vs. L	2.00 (0.18,22.7)	0.575
		Normal	53	98.2	53	96.4	49	92.4	H vs. L	4.33 (0.47,39.8)	0.197
	Enlisted Groundcrew	n	146		149		127		Overall		0.088
		Abnormal	5	3.4	0	0.0	3	2.4		—	—
		Normal	141	96.6	149	100.0	124	97.6	H vs. L	0.68 (0.16,2.91)	0.603
Popliteal Pulses (Manual)	Officer	n	118		119		108				—
		Abnormal	0	0.0	1	0.8	1	0.9		—	—
		Normal	118	100.0	118	99.2	107	99.1		—	—
	Enlisted Flyer	n	54		55		53		Overall		0.224 ^a
		Abnormal	2	3.7	0	0.0	3	5.7		—	—
		Normal	52	96.3	55	100.0	50	94.3		—	—
	Enlisted Groundcrew	n	146		149		127		Overall		0.692 ^a
		Abnormal	4	2.7	2	1.3	3	2.4	M vs. L	0.48 (0.09,2.68)	0.407
		Normal	142	97.3	147	98.7	124	97.6	H vs. L	0.86 (0.19,3.92)	0.841

TABLE M-9. (continued)

Unadjusted Exposure Index Analyses
for Diastolic Blood Pressure, Funduscopy Abnormalities,
Carotid Bruits, and Manual Pulse Readings by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Dorsalis Pedis Pulses (Manual)	Officer	n	118		119		108		Overall		0.418
		Abnormal	15	12.7	13	10.9	8	7.4	M vs. L	0.84 (0.38,1.86)	0.667
		Normal	103	87.3	106	89.1	100	92.6	H vs. L	0.55 (0.22,3.35)	0.194
	Enlisted Flyer	n	54		55		53		Overall		0.716
		Abnormal	6	11.1	9	16.4	8	15.1	M vs. L	1.57 (0.52,4.75)	0.430
		Normal	48	88.9	46	83.6	45	84.9	H vs. L	1.42 (0.46,4.42)	0.542
	Enlisted Groundcrew	n	146		149		127		Overall		0.555
		Abnormal	17	11.6	12	8.0	14	11.0	M vs. L	0.66 (0.31,1.45)	0.303
		Normal	129	88.4	137	92.0	113	89.0	H vs. L	0.94 (0.44,1.99)	0.841
Posterior Tibial Pulses (Manual)	Officer	n	118		119		108				—
		Abnormal	1	0.8	2	1.7	0	0.0		—	—
		Normal	117	99.2	117	98.3	108	100.0		—	—
	Enlisted Flyer	n	54		55		53		Overall		0.879 ^a
		Abnormal	3	5.6	3	5.4	4	7.6	M vs. L	0.98 (0.19,5.09)	0.984
		Normal	51	94.4	52	94.6	49	92.4	H vs. L	1.39 (0.30,6.52)	0.674
	Enlisted Groundcrew	n	146		149		127		Overall		0.859
		Abnormal	4	2.7	5	3.4	5	3.9	M vs. L	1.23 (0.32,4.68)	0.757
		Normal	142	97.3	144	96.6	122	96.1	H vs. L	1.45 (0.38,5.54)	0.582

TABLE M-9. (continued)

Unadjusted Exposure Index Analyses
for Diastolic Blood Pressure, Funduscopy Abnormalities,
Carotid Bruits, and Manual Pulse Readings by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value	
			Low		Medium		High					
			Number	Percent	Number	Percent	Number	Percent				
M-19 All Leg Pulses (Manual)	Officer	n	118		119		108		Overall		0.932	
		Abnormal	15	12.7	14	11.8	12	11.1	M vs. L	0.92 (0.42,1.99)	0.826	
		Normal	103	87.3	105	88.2	96	89.0	H vs. L	0.86 (0.38,1.93)	0.711	
	Enlisted Flyer	n	54		55		53		Overall		0.848	
		Abnormal	9	16.7	11	20.0	11	20.8	M vs. L	1.25 (0.47,3.31)	0.653	
		Normal	45	83.3	44	80.0	42	79.2	H vs. L	1.31 (0.49,3.48)	0.589	
	Enlisted Groundcrew	n	146		149		127		Overall		0.659	
		Abnormal	23	15.8	18	12.1	18	14.2	M vs. L	0.73 (0.38,1.43)	0.363	
		Normal	123	84.2	131	87.9	109	85.8	H vs. L	0.88 (0.45,1.72)	0.719	
	Peripheral Pulses (Manual)	Officer	n	118		119		108		Overall		0.904
			Abnormal	16	13.6	14	11.8	13	12.0	M vs. L	0.85 (0.39,1.83)	0.697
			Normal	102	86.4	105	88.2	95	88.0	H vs. L	0.87 (0.40,1.91)	0.734
Enlisted Flyer		n	54		55		53		Overall		0.848	
		Abnormal	9	16.7	11	20.0	11	20.8	M vs. L	1.25 (0.47,3.31)	0.653	
		Normal	45	83.3	44	80.0	42	79.2	H vs. L	1.31 (0.49,3.48)	0.589	
Enlisted Groundcrew		n	146		149		127		Overall		0.659	
		Abnormal	23	15.8	18	12.1	18	14.2	M vs. L	0.73 (0.38,1.43)	0.363	
		Normal	123	84.2	131	87.9	109	85.8	H vs. L	0.88 (0.45,1.72)	0.719	

TABLE M-9. (continued)

Unadjusted Exposure Index Analyses
for Diastolic Blood Pressure, Fundoscopic Abnormalities,
Carotid Bruits, and Manual Pulse Readings by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
All Pulses (Manual)	Officer	n	118		119		108				0.904
		Abnormal	16	13.6	14	11.8	13	12.0	M vs. L	0.85 (0.39,1.83)	0.697
		Normal	102	86.4	105	88.2	95	88.0	H vs. L	0.87 (0.40,1.91)	0.734
	Enlisted Flyer	n	54		55		53				0.848
		Abnormal	9	16.7	11	20.0	11	20.8	M vs. L	1.25 (0.47,3.31)	0.653
		Normal	45	83.3	44	80.0	42	79.2	H vs. L	1.31 (0.49,3.48)	0.589
	Enlisted Groundcrew	n	146		149		127				0.659
		Abnormal	23	15.8	18	12.1	18	14.2	M vs. L	0.73 (0.38,1.43)	0.363
		Normal	123	84.2	131	87.9	109	85.8	H vs. L	0.88 (0.45,1.72)	0.719

*Overall analysis; sparse cells, chi-square test may not be valid.

— Analysis not performed due to sparse cells.

TABLE M-10.

Unadjusted Exposure Index Analyses for
Peripheral Vascular System Doppler Pulse Readings by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Radial Pulses	Officer	n	119		122		109				—
		Abnormal	1	0.8	0	0.0	0	0.0			—
		Normal	118	99.2	122	100.0	109	100.0			—
	Enlisted Flyer	n	54		56		53				—
		Abnormal	0	0.0	0	0.0	0	0.0			—
		Normal	54	100.0	56	100.0	53	100.0			—
	Enlisted Groundcrew	n	148		151		130				—
		Abnormal	1	0.7	0	0.0	1	0.8			—
		Normal	147	99.3	151	100.0	129	99.2			—
Femoral Pulses	Officer	n	119		122		109				—
		Abnormal	1	0.8	0	0.0	0	0.0			—
		Normal	118	99.2	122	100.0	109	100.0			—
	Enlisted Flyer	n	54		56		53				—
		Abnormal	0	0.0	1	1.8	1	1.9			—
		Normal	54	100.0	55	98.2	52	98.1			—
	Enlisted Groundcrew	n	148		151		130		Overall		0.304 ^a
		Abnormal	1	0.7	0	0.0	2	1.5			—
		Normal	147	99.3	151	100.0	128	98.5			—

TABLE M-10. (continued)

Unadjusted Exposure Index Analyses for
Peripheral Vascular System Doppler Pulse Readings by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Popliteal Pulses	Officer	n	119		122		109				—
		Abnormal	1	0.8	2	1.6	0	0.0			—
		Normal	118	99.2	120	98.4	109	100.0			—
	Enlisted Flyer	n	54		56		53				—
		Abnormal	0	0.0	2	3.6	1	1.9			—
		Normal	54	100.0	54	96.4	52	98.1			—
	Enlisted Groundcrew	n	148		151		130		Overall		0.123 ^a
		Abnormal	1	0.7	0	0.0	3	2.3			—
		Normal	147	99.3	151	100.0	127	97.7			—
Dorsalis Pedis Pulses	Officer	n	119		121		109		Overall		0.967
		Abnormal	33	27.7	35	28.9	30	27.5	M vs. L	1.06 (0.60,1.86)	0.841
		Normal	86	72.3	86	71.1	79	72.5	H vs. L	0.99 (0.55,1.77)	0.968
	Enlisted Flyer	n	54		56		52		Overall		0.848
		Abnormal	11	20.4	13	23.2	13	25.0	M vs. L	1.18 (0.48,2.93)	0.719
		Normal	43	79.6	43	76.8	39	75.0	H vs. L	1.30 (0.52,3.25)	0.569
	Enlisted Groundcrew	n	147		151		129		Overall		0.967
		Abnormal	32	21.8	32	21.2	29	22.5	M vs. L	0.97 (0.56,1.68)	0.904
		Normal	115	78.2	119	78.8	100	77.5	H vs. L	1.04 (0.59,1.84)	0.889

TABLE M-10. (continued)

Unadjusted Exposure Index Analyses for
Peripheral Vascular System Doppler Pulse Readings by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Posterior Tibial Pulses	Officer	n	119		121		109		Overall		0.410
		Abnormal	2	1.7	5	4.1	2	1.8	M vs. L	2.52 (0.48,13.3)	0.276
		Normal	117	98.3	116	95.9	107	98.2	H vs. L	1.09 (0.15,7.90)	0.928
	Enlisted Flyer	n	54		56		52		Overall		0.248 ^a
		Abnormal	0	0.0	3	5.4	2	3.8		—	—
		Normal	54	100.0	53	94.6	50	96.2		—	—
	Enlisted Groundcrew	n	147		151		130		Overall		0.193 ^a
		Abnormal	2	1.4	0	0.0	3	2.3		—	—
		Normal	145	98.6	151	100.0	127	97.7		—	—
Leg Pulses	Officer	n	119		121		109		Overall		0.822
		Abnormal	33	27.7	38	31.4	32	29.4	M vs. L	1.19 (0.68,2.08)	0.535
		Normal	86	72.3	83	68.6	77	70.6	H vs. L	1.08 (0.61,1.93)	0.787
	Enlisted Flyer	n	54		56		52		Overall		0.666
		Abnormal	11	20.4	15	26.8	14	26.9	M vs. L	1.43 (0.58,3.48)	0.430
		Normal	43	79.6	41	73.2	38	73.1	H vs. L	1.44 (0.58,3.55)	0.430
	Enlisted Groundcrew	n	147		151		129		Overall		0.955
		Abnormal	33	22.4	32	21.2	29	22.5	M vs. L	0.93 (0.54,1.61)	0.795
		Normal	114	77.8	119	78.8	100	77.5	H vs. L	1.00 (0.57,1.77)	1.000

TABLE M-10. (continued)

Unadjusted Exposure Index Analyses for
Peripheral Vascular System Doppler Pulse Readings by Occupation

Variable	Occupation	Statistic	Exposure Index						Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low		Medium		High				
			Number	Percent	Number	Percent	Number	Percent			
Peripheral Pulses	Officer	n	119		121		109		Overall		0.822
		Abnormal	33	27.7	38	31.4	32	29.4	M vs. L	1.19 (0.68,2.08)	0.535
		Normal	86	72.3	83	68.6	77	70.6	H vs. L	1.08 (0.61,1.93)	0.787
	Enlisted Flyer	n	54		56		52		Overall		0.666
		Abnormal	11	20.4	15	26.8	14	26.9	M vs. L	1.43 (0.58,3.48)	0.430
		Normal	43	79.6	41	73.2	38	73.1	H vs. L	1.44 (0.58,3.55)	0.430
	Enlisted Groundcrew	n	147		151		129		Overall		0.894
		Abnormal	34	23.1	32	21.2	30	23.3	M vs. L	0.89 (0.52,1.54)	0.689
		Normal	113	76.9	119	78.8	99	76.7	H vs. L	1.01 (0.58,1.76)	0.984
All Pulses	Officer	n	119		121		109		Overall		0.822
		Abnormal	33	27.7	38	31.4	32	29.4	M vs. L	1.19 (0.68,2.08)	0.535
		Normal	86	72.3	83	68.6	77	70.6	H vs. L	1.08 (0.61,1.93)	0.787
	Enlisted Flyer	n	54		56		52		Overall		0.666
		Abnormal	11	20.4	15	26.8	14	26.9	M vs. L	1.43 (0.58,3.48)	0.430
		Normal	43	79.6	41	73.2	38	73.1	H vs. L	1.44 (0.58,3.55)	0.430
	Enlisted Groundcrew	n	147		151		129		Overall		0.894
		Abnormal	34	23.1	32	21.2	30	23.3	M vs. L	0.89 (0.52,1.54)	0.689
		Normal	113	76.9	119	78.8	99	76.7	H vs. L	1.01 (0.58,1.76)	0.984

^aOverall analysis; sparse cells, chi-square test may not be valid.

-- Analysis not performed due to sparse cells.

TABLE M-11.

**Association Between Central and Peripheral Abnormalities and
Verified Heart Disease in the Combined
Ranch Hand and Comparison Groups**

Variable	Stratification	Total	Essential Hypertension		Heart Disease*		Myocardial Infarction	
			Percent Abnormal	p-Value	Percent Abnormal	p-Value	Percent Abnormal	p-Value
Systolic Pressure	≤140	2,002	17.5	<0.001	21.7	0.556	1.0	0.386
	>140	145	61.4		24.1		2.1	
Diastolic Pressure	≤90	1,966	14.8	<0.001	22.4	0.043	1.1	0.790
	>90	180	81.7		15.6		0.6	
ECG	Normal	1,858	18.8	<0.001	17.4	<0.001	0.3	<0.001
	Abnormal	290	30.7		50.3		5.9	
Heart Sounds	Normal	2,084	20.1	0.036	21.4	0.017	0.9	<0.001
	Abnormal	63	31.8		34.9		6.4	
Funduscopic Examination	Normal	2,134	20.2	0.008	21.6	0.014	1.0	0.999
	Abnormal	13	53.8		53.8		0.0	
Carotid Bruits	Normal	2,132	20.3	0.080	21.8	0.775	1.0	0.999
	Abnormal	14	42.9		28.6		0.0	
Peripheral Pulses (Manual)	Normal	1,806	20.0	0.547	21.5	0.725	0.9	0.391
	Abnormal	314	21.7		22.6		1.6	
Peripheral Pulses (Doppler)	Normal	1,611	20.6	0.754	20.4	0.007	0.9	0.306
	Abnormal	529	19.8		26.1		1.5	

*Excluding hypertension.

TABLE M-12.

Unadjusted Analyses for Reported and Verified Heart Disease by Group
(Original Comparisons Only)

Variable	Statistic	Group				Est. Relative Risk (95% C.I.)	p-Value
		Ranch Hand		Original Comparison			
		Number	Percent	Number	Percent		
Reported Essential Hypertension	n	942		888			
	Yes	247	26.2	231	26.0	1.01 (0.82,1.24)	0.920
	No	695	73.8	657	74.0		
Verified Essential Hypertension	n	942		888			
	Yes	195	20.7	184	20.7	1.00 (0.80,1.25)	0.992
	No	747	79.3	704	79.3		
Reported Heart Disease (Excluding Hypertension)	n	942		888			
	Yes	265	28.1	234	26.4	1.09 (0.89,1.34)	0.390
	No	677	71.9	654	73.6		
Verified Heart Disease (Excluding Hypertension)	n	942		888			
	Yes	224	23.8	180	20.3	1.23 (0.98,1.53)	0.070
	No	718	76.2	708	79.7		
Reported Myocardial Infarction	n	942		888			
	Yes	20	2.1	18	2.0	1.05 (0.55,1.99)	0.889
	No	922	97.9	870	98.0		
Verified Myocardial Infarction	n	942		888			
	Yes	9	1.0	11	1.2	0.77 (0.32,1.87)	0.562
	No	933	99.0	877	98.8		

TABLE M-13.

Adjusted Analyses for Reported and Verified Heart Disease
(Original Comparisons Only)

Variable	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks*
Reported Essential Hypertension	1.12 (0.90,1.40)	0.312	AGE (p<0.001), CSMOK (p<0.001), CHOL (p<0.001), %BFAT (p<0.001), ALC (p=0.003)
Verified Essential Hypertension	1.10 (0.86,1.39)	0.447	CSMOK (p=0.015), CHOL (p<0.001), %BFAT (p<0.001), PS (p=0.024), ALC (p=0.028)
Reported Heart Disease	1.14 (0.92,1.40)	0.230	AGE (p<0.001), RACE (p=0.046)
Verified Heart Disease	1.28 (1.02,1.60)	0.032	AGE (p<0.001)
Reported Myocardial Infarction	1.16 (0.58,2.32)	0.682	AGE (p<0.001), OCC (p=0.005), CHOL (p=0.040)
Verified Myocardial Infarction	0.90 (0.36,2.24)	0.810	AGE (p<0.001), CHOL (p=0.021)

*Abbreviations:

CSMOK: Current smoking
 CHOL: Cholesterol
 %BFAT: Percent body fat
 ALC: Current alcohol use (drinks/day)
 PS: Personality score
 OCC: Occupation

TABLE M-14.

Unadjusted Analyses for Central Cardiac Function by Group (Diabetics Excluded)
(Original Comparisons Only)

Variable	Statistic	Group				Est. Relative Risk (95% C.I.)	p-Value
		Ranch Hand		Original Comparison			
		Number	Percent	Number	Percent		
Systolic Blood Pressure	n	942		888		0.83 (0.58,1.20)	0.322
	Abnormal	60	6.4	67	7.6		
	Normal	882	93.6	821	92.4		
Heart Sounds	n	941		888		1.09 (0.64,1.84)	0.757
	Abnormal	31	3.3	27	3.0		
	Normal	910	96.7	861	97.0		
ECG (Overall)	n	942		888		0.90 (0.69,1.18)	0.441
	Abnormal	121	12.8	125	14.1		
	Normal	821	87.2	763	85.9		
ECG: RBBB	n	942		888		0.79 (0.24,2.58)	0.689
	Abnormal	5	0.5	6	0.7		
	Normal	937	99.5	882	99.3		
ECG: LBBB	n	942		888		--	--
	Abnormal	0	0.0	0	0.0		
	Normal	942	100.0	888	100.0		
ECG: Nonspecific T-Wave Changes	n	942		888		1.03 (0.75,1.42)	0.857
	Abnormal	85	9.0	78	8.8		
	Normal	857	91.0	810	91.2		

TABLE M-14. (continued)

Unadjusted Analyses for Central Cardiac Function by Group (Diabetics Excluded)
(Original Comparisons Only)

Variable	Statistic	Group				Est. Relative Risk (95% C.I.)	p-Value
		Ranch Hand		Original Comparison			
		Number	Percent	Number	Percent		
ECG: Bradycardia	n	942		888		1.12 (0.72,1.75)	0.610
	Abnormal	45	4.8	38	4.3		
	Normal	897	95.2	850	95.7		
ECG: Tachycardia	n	942		888		--	--
	Abnormal	0	0.0	0	0.0		
	Normal	942	100.0	888	100.0		
ECG: Arrhythmia	n	942		888		0.91 (0.55,1.50)	0.711
	Abnormal	31	3.3	32	3.6		
	Normal	911	96.7	856	96.4		
ECG: Other Diagnoses	n	942		888		0.99 (0.74,1.34)	0.968
	Abnormal	97	10.3	92	10.4		
	Normal	845	89.7	796	89.6		

--No relative risk given, since no abnormalities are present.

TABLE M-15.

Adjusted Analyses for Central Cardiac Function (Diabetics Excluded)*
(Original Comparisons Only)

Variable	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks**
Systolic Blood Pressure (Discrete)	0.95 (0.65,1.38)	0.772	AGE (p<0.001) CHOL (p=0.001) %BFAT (p<0.001) PS (p=0.001)
Systolic Blood Pressure (Continuous)	-0.152 (-1.401,1.097) ^a	0.811 ^a	AGE*OCC (p=0.018) CSMOK (p<0.001) CHOL (p<0.001) %BFAT (p<0.001) PS (p=0.001) ALC (p<0.001)
Heart Sounds	1.26 (0.73,2.17)	0.407	AGE (p<0.001) RACE (p=0.002) OCC (p=0.048) CHOL/HDL (p<0.001)
ECG (Overall)	****	****	AGE (p<0.001) RACE (p=0.023) %BFAT (p<0.001) GRP*PACKYR (p=0.034)
ECG: RBBB	0.85 (0.26,2.81)	0.787	AGE (p=0.015)
ECG: Nonspecific ST-T-Wave Changes	1.20 (0.85,1.69)	0.294	AGE (p<0.001) RACE (p=0.033) CHOL (p=0.009) %BFAT (p<0.001)
ECG: Bradycardia	1.16 (0.74,1.82)	0.509	OCC (p=0.019) CHOL/HDL (p<0.001)

TABLE M-15. (continued)

Adjusted Analyses for Central Cardiac Function (Diabetics Excluded)*
(Original Comparisons Only)

Variable	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks**
ECG: Arrhythmia	****	****	AGE (p<0.001) OCC (p<0.001) GRP*PACKYR (p=0.034) GRP*%BFAT (p=0.016)
ECG: Other Diagnoses	****	****	AGE (p<0.001) GRP*OCC (p=0.036)

*Some adjusted analyses did not explore effects of all covariates due to sparse number of abnormalities (see text).

**Additional Abbreviations:

CHOL/HDL: cholesterol to HDL ratio

GRP: group

PACKYR: pack-years of smoking

***Group-by-covariate interaction--relative risk/difference in group means, 95% confidence interval, and p-value not presented.

*Difference in group means (Ranch Hand-Original Comparison) and associated p-value given, rather than relative risk, for continuous analysis of dependent variables.

TABLE M-16.

Summary of Group-by-Covariate Interactions
for Central Cardiac Function Variables (Diabetics Excluded)
(Original Comparisons Only)

Variable	Interaction	Stratification	Adj. Relative Risk (95% C.I.)	p-Value
ECG (Overall)	Group-by-Pack-Years Smoking	Pack-Years: 0	0.76 (0.53,1.10)	0.142
		Pack-Years: 30	1.24 (0.87,1.78)	0.234
ECG: Arrhythmia	Group-by-Pack-Years Smoking (21% Body Fat)	Pack-Years: 0	0.59 (0.30,1.18)	0.134
		Pack-Years: 30	1.55 (0.72,3.33)	0.263
	Group-by-Percent Body Fat (7 Pack-Years Smoking)	10% Body Fat	0.17 (0.05,0.62)	0.007
		30% Body Fat	2.46 (0.76,7.99)	0.136
ECG: Other Diagnoses	Group-by-Occupation	Officer	1.73 (1.06,2.85)	0.030
		Enlisted Flyer	0.75 (0.38,1.47)	0.401
		Enlisted Groundcrew	0.73 (0.44,1.22)	0.234

TABLE M-17.

**Unadjusted Analyses for Peripheral Vascular Function by Group
(Diabetics Excluded)
(Original Comparisons Only)**

Variable	Statistic	Group				Est. Relative Risk (95% C.I.)	p-Value
		Ranch Hand		Original Comparison			
		Number	Percent	Number	Percent		
Diastolic Blood Pressure	n	942		887		0.98 (0.70,1.36)	0.889
	Abnormal	79	8.4	76	8.6		
	Normal	863	91.6	811	91.4		
Funduscopy Examination	n	941		888		1.10 (0.37,3.29)	0.865
	Abnormal	7	0.7	6	0.7		
	Normal	934	99.3	882	99.3		
Carotid Bruits	n	941		887		1.10 (0.37,3.28)	0.865
	Abnormal	7	0.7	6	0.7		
	Normal	934	99.3	881	99.3		
Radial Pulses (Manual)	n	929		876		0.54 (0.16,1.84)	0.322
	Abnormal	4	0.4	7	0.8		
	Normal	925	99.6	869	99.2		
Radial Pulses (Doppler)	n	942		886		0.70 (0.16,3.16)	0.646
	Abnormal	3	0.3	4	0.4		
	Normal	939	99.7	882	99.6		
Femoral Pulses (Manual)	n	929		876		0.90 (0.48,1.66)	0.726
	Abnormal	20	2.2	21	2.4		
	Normal	909	97.8	855	97.6		

TABLE M-17. (continued)

Unadjusted Analyses for Peripheral Vascular Function by Group
(Diabetics Excluded)
(Original Comparisons Only)

Variable	Statistic	Group				Est. Relative Risk (95% C.I.)	p-Value
		Ranch Hand		Original Comparison			
		Number	Percent	Number	Percent		
Femoral Pulses (Doppler)	n Abnormal Normal	942 6 936	 0.6 99.4	887 3 884	 0.3 99.7	1.89 (0.47,7.57)	0.368
Popliteal Pulses (Manual)	n Abnormal Normal	929 16 913	 1.7 98.3	876 21 855	 2.4 97.6	0.71 (0.37,1.38)	0.312
Popliteal Pulses (Doppler)	n Abnormal Normal	942 10 932	 1.1 98.9	887 6 881	 0.7 99.3	1.58 (0.57,4.35)	0.379
Dorsalis Pedis Pulses (Manual)	n Abnormal Normal	929 102 827	 11.0 89.0	876 95 781	 10.8 89.2	1.01 (0.71,1.45)	0.928
Dorsalis Pedis Pulses (Doppler)	n Abnormal Normal	938 228 710	 24.3 75.7	885 203 682	 22.9 77.1	1.08 (0.87,1.34)	0.490
Posterior Tibial Pulses (Manual)	n Abnormal Normal	929 27 902	 2.9 97.1	876 24 852	 2.7 97.3	1.06 (0.61,1.85)	0.834
Posterior Tibial Pulses (Doppler)	n Abnormal Normal	939 19 920	 2.0 98.0	885 18 867	 2.0 98.0	0.99 (0.52,1.91)	0.984

TABLE M-17. (continued)

Unadjusted Analyses for Peripheral Vascular Function by Group
(Diabetics Excluded)
(Original Comparisons Only)

Variable	Statistic	Group				Est. Relative Risk (95% C.I.)	p-Value
		Ranch Hand		Original Comparison			
		Number	Percent	Number	Percent		
Leg Pulses (Manual)	n	929		876		0.91 (0.70,1.18)	0.472
	Abnormal	131	14.1	134	15.3		
	Normal	798	85.9	742	84.7		
Leg Pulses (Doppler)	n	938		885		1.07 (0.87,1.33)	0.516
	Abnormal	237	25.3	212	23.9		
	Normal	701	74.7	673	76.1		
Peripheral Pulses (Manual)	n	929		876		0.89 (0.69,1.16)	0.395
	Abnormal	133	14.3	138	15.8		
	Normal	796	85.7	738	84.2		
Peripheral Pulses (Doppler)	n	938		885		1.07 (0.87,1.33)	0.522
	Abnormal	239	25.5	214	24.2		
	Normal	699	74.5	671	75.8		
All Pulses (Manual)	n	929		876		0.89 (0.69,1.16)	0.395
	Abnormal	133	14.3	138	15.8		
	Normal	796	85.7	738	84.2		
All Pulses (Doppler)	n	938		884		1.07 (0.86,1.32)	0.529
	Abnormal	239	25.5	214	24.2		
	Normal	699	74.5	670	75.8		

TABLE M-18.

Adjusted Analyses for Peripheral Vascular Function
(Diabetics Excluded)*
(Original Comparisons Only)

Variable	Statistical/Clinical Analysis	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks**
Diastolic Blood Pressure	Discrete	1.04 (0.74,1.46)	0.818	CHOL (p<0.001) %BFAT (p<0.001)
	Continuous	0.250 (-0.530,1.030) ^a	0.537 ^a	AGE (p=0.016) CSMOK (p<0.001) CHOL (p<0.001) %BFAT (p<0.001) ALC (p=0.004)
Funduscopy Examination		1.31 (0.42,4.09)	0.646	AGE (p<0.001) RACE (p<0.001) CHOL/HDL (p=0.010) ALC (p=0.032)
Carotid Bruits		0.95 (0.30,2.97)	0.928	AGE (p=0.018) DRKYR (p<0.001)
Radial Pulses	Manual Doppler	0.57 (0.17,1.96) _b	0.373	AGE (p=0.047)
		0.70 (0.16,3.16) ^b	0.646 ^b	—
Femoral Pulses	Manual	1.20 (0.60,2.36)	0.710	AGE (p<0.001) OCC (p=0.050) CHOL/HDL (p=0.043) %BFAT (p<0.001) DIFCORT (p=0.005)
	Doppler	1.87 (0.45,7.74)	0.384	AGE (p=0.001) CSMOK (p=0.001) CHOL/HDL (p=0.032)
Popliteal Pulses	Manual	****	****	AGE (p=0.002) RACE (p=0.002) PACKYR (p=0.006) CHOL/HDL (p=0.021) GRP*OCC (p=0.048)
	Doppler	1.66 (0.59,4.72)	0.337	AGE (p<0.001) RACE (p=0.015) CSMOK (p<0.001)
Dorsalis Pedis Pulses	Manual	1.06 (0.78,1.44)	0.704	AGE (p=0.004)
	Doppler	1.07 (0.86,1.33)	0.569	AGE (p=0.036) RACE (p=0.007) %BFAT (p=0.010)

TABLE M-18. (continued)

Adjusted Analyses for Peripheral Vascular Function
(Diabetics Excluded)*
(Original Comparisons Only)

Variable	Statistical/Clinical Analysis	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks**
Posterior Tibial Pulses	Manual	****	****	AGE (p=0.003) RACE (p<0.001) PACKYR (p=0.011) GRP*OCC (p=0.026)
	Doppler	1.07 (0.54,2.13)	0.849	AGE (p<0.001) RACE (p<0.001) CSMOK (p=0.010) CHOL/HDL (p=0.002)
Leg Pulses	Manual	****	****	AGE (p=0.001) GRP*OCC (p=0.038) GRP*%BFAT (p=0.010)
	Doppler	1.07 (0.86,1.33)	0.516	AGE (p=0.016) RACE (p=0.024) %BFAT (p=0.034)
Peripheral Pulses	Manual	****	****	AGE (p<0.001) GRP*%BFAT (p=0.036)
	Doppler	1.06 (0.86,1.32)	0.575	AGE (p=0.028) RACE (p=0.042) %BFAT (p=0.033)
All Pulses	Manual	****	****	AGE (p<0.001) GRP*%BFAT (p=0.036)
	Doppler	1.06 (0.86,1.32)	0.582	AGE (p=0.027) RACE (p=0.042) %BFAT (p=0.038)

*Some adjusted analyses did not explore effects of all covariates due to sparse number of abnormalities (see text).

**Additional Abbreviations:

DRNKYR: Drink-years of alcohol
DIFFCORT: Differential cortisol

^aDifference in group means (Ranch Hand - Original Comparison) and associated p-value given, rather than relative risk, continuous analysis of dependent variables.

^bUnadjusted for any covariates—same as for unadjusted results.

—No covariates significant.

****Group-by-covariate interaction—relative risk, 95% confidence interval, and p-value not presented.

TABLE M-19.

Summary of Group-by-Covariate Interactions
for Peripheral Vascular Function Variables (Diabetics Excluded)
(Original Comparisons Only)

Variable	Interaction	Stratification	Adj. Relative Risk (95% C.I.)	p-Value
Popliteal Pulses (Manual)	Group-by-Occupation	Officer	0.21 (0.02,2.54)	0.219
		Enlisted Flyer	4.68 (0.53,41.1)	0.165
		Enlisted Groundcrew	0.99 (0.38,2.55)	0.976
Posterior Tibial Pulses (Manual)	Group-by-Occupation	Officer	0.31 (0.05,1.82)	0.197
		Enlisted Flyer	3.68 (0.96,14.1)	0.057
		Enlisted Groundcrew	1.27 (0.56,2.87)	0.575
Leg Pulses (Manual)	Group-by-Occupation (21% Body Fat)	Officer	0.65 (0.41,1.01)	0.054
		Enlisted Flyer	1.52 (0.83,2.77)	0.174
		Enlisted Groundcrew	1.23 (0.81,1.87)	0.327
Peripheral Pulses (Manual)	Group-by-Percent Body Fat	10% Body Fat	1.87 (0.94,3.72)	0.073
		30% Body Fat	0.58 (0.34,0.98)	0.042
All Pulses (Manual)	Group-by-Percent Body Fat	10% Body Fat	1.87 (0.94,3.72)	0.073
		30% Body Fat	0.58 (0.34,0.98)	0.042

TABLE M-20.

Longitudinal Analysis of Pulse Index and Overall ECG:
 A Contrast of Baseline and First Followup Examination Abnormalities
 (Original Comparisons Only)

Variable	Group	1982 Baseline Exam	1985 Followup Exam		Odds* Ratio (OR)	p-Value (OR _{RH} vs OR _{OC})
			Abnormal	Normal		
All Pulses (Manual)	Ranch Hand	Abnormal	50	72	1.44	0.05
		Normal	104	743		
	Original Comparison	Abnormal	35	51	2.25	
		Normal	115	668		
ECG (Overall)	Ranch Hand	Abnormal	86	192	0.22	0.23
		Normal	43	650		
	Original Comparison	Abnormal	83	147	0.30	
		Normal	44	598		

*Odds Ratio: $\frac{\text{Number Normal Baseline, Abnormal Followup}}{\text{Number Abnormal Baseline, Normal Followup}}$

APPENDIX N

Hematological Evaluation

APPENDIX N: Hematological Evaluation

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TABLE N-1.

Summary Statistics for Hematological Covariates by Group

Covariate	Covariate Category	Group		p-Value
		Ranch Hand Percent	Comparison Percent	
Race	Black	5.9	6.4	0.679
	Nonblack	94.1	93.6	
Occupation	Officer	37.4	37.5	0.724
	Enlisted Flyer	17.5	16.2	
	Enlisted Groundcrew	45.2	46.3	
		<u>Mean±SE</u>	<u>Mean±SE</u>	
Age (At Baseline)	--	43.94±0.24	43.86±0.22	0.804
Current Smoking ^a	--	10.75±0.48	9.13±0.40	0.010
Smoking History (Pack-Years)	--	13.24±0.52	12.98±0.47	0.708

^aEquivalent cigarettes per day.

--Covariate not categorized for these results.

TABLE N-2.

**Summary of Group-by-Covariate
Interactions for Hematological Variables**

Variable	Interaction Covariates	Stratification	Ranch Hand-Comparison Group Difference \pm SE	p-Value	Direction of Result*
RBC	Occupation	<u>Officer</u>			
		Nonsmoker	-0.009 \pm 0.030	0.775	
	Smoking History	30 Pack-Years	-0.014 \pm 0.035	0.686	
		<u>Enlisted Flyer</u>			
		Nonsmoker	-0.066 \pm 0.053	0.212	
		30 Pack-Years	-0.001 \pm 0.046	0.975	
		<u>Enlisted Groundcrew</u>			
		Nonsmoker	-0.010 \pm 0.029	0.736	
		30 Pack-Years	-0.093 \pm 0.036	0.010	C>RH
	WBC ^a	Race	<u>Nonblack</u>		
<u>Nonsmoker</u>					
Smoking History		35	-0.010 \pm 0.020	0.609	
		53	0.002 \pm 0.021	0.942	
Occupation		30 Pack-Years			
		35	0.115 \pm 0.031	<0.001	RH>C
Age (At Baseline)		53	-0.017 \pm 0.019	0.369	
		<u>Black</u>			
		<u>Officer</u>			
		35	-0.550 \pm 0.184	0.003	C>RH
		53	-0.143 \pm 0.186	0.446	
		<u>Enlisted Flyer</u>			
		35	-0.341 \pm 0.172	0.050	C>RH
		53	0.067 \pm 0.134	0.618	
		<u>Enlisted Groundcrew</u>			
		35	-0.121 \pm 0.074	0.104	
	53	0.286 \pm 0.149	0.057	RH>C	

TABLE N-2. (continued)

Summary of Group-by-Covariate
Interactions for Hematological Variables

Variable	Interaction Covariates	Stratification	Ranch Hand-Comparison Group Difference \pm SE	p-Value	Direction of Result*
PLT ^a	Race	<u>Nonblack</u>			
		Nonsmoker	0.003 \pm 0.012	0.789	
	Smoking (Smoking History and Current Smoking)	30 Pack-Years, Currently 1 Pack/Day	0.103 \pm 0.042	0.014	RH>C
		<u>Black</u>			
		Nonsmoker	-0.050 \pm 0.050	0.317	
		30 Pack-Years, Currently 1 Pack/Day	0.258 \pm 0.096	0.007	RH>C

*RH>C: Variable mean in Ranch Hand group greater than variable mean in Comparison group.

C>RH: Variable mean in Comparison group greater than variable mean in Ranch Hand group.

^aUnits are on log scale.

TABLE N-3.

Interaction Summaries for Adjusted Continuous Exposure Index Analyses for Hematological Variables

Variable	Interaction (Occupation)	Stratification	Contrast	Exposure Index Level Difference \pm SE	p-Value	Direction of Result*	
RBC	Exposure Index-by-Race (Officer)	Nonblack	M vs. L	0.014 \pm 0.295	0.962		
			H vs. L	-0.180 \pm 0.372	0.630		
		Black	M vs. L	-0.047 \pm 0.402	0.908		
			H vs. L	0.516 \pm 0.502	0.304		
			35	M vs. L	-0.119 \pm 0.128	0.356	H > L
				H vs. L	0.261 \pm 0.151	0.086	
53	M vs. L	0.033 \pm 0.102	0.748				
	H vs. L	-0.172 \pm 0.102	0.093	L > H			
HGB	Exposure Index-by-Race (Officer)	Nonblack	M vs. L	-0.007 \pm 0.122	0.955		
			H vs. L	0.060 \pm 0.123	0.626		
		Black	M vs. L	0.089 \pm 0.874	0.919		
			H vs. L	2.227 \pm 0.960	0.021	H > L	
			35	M vs. L	-0.854 \pm 0.389	0.029	L > H
				H vs. L	0.626 \pm 0.457	0.172	
53	M vs. L	0.425 \pm 0.308	0.169				
	H vs. L	-0.339 \pm 0.308	0.272				
HCT	Exposure Index-by-Race (Officer)	Nonblack	M vs. L	-0.093 \pm 0.359	0.795		
			H vs. L	0.206 \pm 0.362	0.569		
		Black	M vs. L	-0.849 \pm 2.569	0.741		
			H vs. L	5.611 \pm 2.823	0.048	H > L	

TABLE N-3. (continued)

Interaction Summaries for Adjusted Continuous Exposure
Index Analyses for Hematological Variables

Variable	Interaction (Occupation)	Stratification	Contrast	Exposure Index Level Difference \pm SE	p-Value	Direction of Result*
HCT	Exposure Index by-Age (At Baseline) (Enlisted Flyer)	35	M vs. L	-2.332 \pm 1.141	0.042	L > M
			H vs. L	1.921 \pm 1.341	0.154	
		53	M vs. L	1.074 \pm 0.904	0.236	
			H vs. L	-0.887 \pm 0.904	0.328	
PLT ^a	Exposure Index- by-Current Smoking (Packs per Day) (Enlisted Flyer)	0	M vs. L	0.097 \pm 0.054	0.075	M > L
			H vs. L	-0.005 \pm 0.053	0.932	
		1	M vs. L	-0.015 \pm 0.042	0.710	
			H vs. L	-0.062 \pm 0.045	0.169	
		2	M vs. L	-0.128 \pm 0.068	0.064	L > M
			H vs. L	-0.118 \pm 0.078	0.132	
PLT ^a	Exposure Index- by-Race (Enlisted Groundcrew)	Nonblack	M vs. L	-0.015 \pm 0.025	0.557	
			H vs. L	-0.004 \pm 0.026	0.885	
		Black	M vs. L	0.156 \pm 0.079	0.049	M > L
			H vs. L	-0.036 \pm 0.081	0.659	

*H > L: Variable mean in high exposure index category greater than variable mean in low exposure index category.

L > H: Variable mean in low exposure index category greater than variable mean in high exposure index category.

L > M: Variable mean in low exposure index category greater than variable mean in medium exposure index category.

M > L: Variable mean in medium exposure index category greater than variable mean in low exposure index category.

^aUnits are in log scale.

TABLE N-4.

Unadjusted Categorical Analyses for
Hematological Variables by Group
(Original Comparisons Only)

Variable	Group	Abnormally Low		Normal		Abnormally High		Total	p-Value ^a
		Number	Percent	Number	Percent	Number	Percent		
RBC	Ranch Hand Original	30	3.0	976	96.2	8	0.8	1,014	0.598
	Comparison	36	3.8	910	95.4	8	0.8	954	
WBC	Ranch Hand Original	45	4.4	906	89.4	62	6.1	1,013	0.631
	Comparison	47	4.9	857	89.8	50	5.2	954	
HGB	Ranch Hand Original	39	3.8	752	74.2	223	22.0	1,014	0.867
	Comparison	34	3.6	717	75.2	203	21.3	954	
HCT	Ranch Hand Original	11	1.1	1,001	98.7	2	0.2	1,014	0.722
	Comparison	13	1.4	938	98.3	3	0.3	954	
MCV	Ranch Hand Original	10	1.0	857	84.5	147	14.5	1,014	0.904
	Comparison	11	1.2	809	84.8	134	14.0	954	
MCH	Ranch Hand Original	7	0.7	943	93.0	64	6.3	1,014	0.947
	Comparison	7	0.7	890	93.3	57	6.0	954	
MCHC	Ranch Hand Original	1	0.1	1,013	99.9	0	0.0	1,014	—
	Comparison	0	0.0	954	100.0	0	0.0	954	
PLT	Ranch Hand Original	5	0.5	987	97.4	21	2.1	1,013	0.760
	Comparison	2	0.2	935	98.0	17	1.8	954	

^aChi-square test, 2 d.f., except for HCT and PLT, which were obtained from continuity adjusted chi-square tests on 1 d.f. (Abnormally high category pooled with normal, and abnormally low category pooled with normal for HCT and PLT, respectively.)

—Only one abnormal MCHC value; p-value not given.

TABLE N-5.

**Unadjusted Continuous Analyses for
Hematological Variables (Contrast of Group Means)
(Original Comparisons Only)**

Variable	Group Mean \pm SE		Difference \pm SE	t-Statistic	p-Value
	Ranch Hand	Original Comparison			
RBC	4.964 \pm 0.012	4.974 \pm 0.012	-0.010 \pm 0.017	-0.61	0.540
WBC ¹	7.003	6.844	--	1.78	0.076
HGB	15.624 \pm 0.033	15.600 \pm 0.034	0.024 \pm 0.047	0.50	0.619
HCT	45.904 \pm 0.097	45.874 \pm 0.097	0.030 \pm 0.137	0.22	0.827
MCV	92.596 \pm 0.150	92.355 \pm 0.157	0.241 \pm 0.217	1.11	0.268
MCH	31.544 \pm 0.055	31.435 \pm 0.058	0.108 \pm 0.080	1.35	0.177
MCHC	34.040 \pm 0.021	34.009 \pm 0.613	0.030 \pm 0.029	1.06	0.291
PLT ¹	265.2	261.7	--	1.39	0.165

¹Means transformed from log scale.

--Difference and standard errors (SE) not presented, since variables were analyzed on logarithmic scale.

TABLE N-6.

Adjusted Categorical Analyses for Hematological Variables
 (Abnormal Versus Normal, Adjusted for Age, Race, Occupation, and Smoking)
 (Original Comparisons Only)

Variable	Abnormally Low vs. Normal		Abnormally High vs. Normal	
	Adj. Relative Risk (95% C.I.)	p-Value	Adj. Relative Risk (95% C.I.)	p-Value
RBC	0.81 (0.51,1.30)	0.380	0.95 (0.41,2.17)	0.898
WBC	0.95 (0.63,1.43)	0.730	1.16 (0.80,1.70)	0.431
HGB	1.10 (0.70,1.72)	0.692	1.05 (0.85,1.30)	0.662
HCT	0.84 (0.41,1.71) ^a	0.628 ^a	Sparse Data	
MCV				
Nonblack	1.92 (0.64,5.76)	0.242	1.09 (0.84,1.42)	0.503
Black	0.32 (0.09,1.11)	0.072	0.41 (0.12,1.34)	0.139
MCH	0.96 (0.40,2.30)	0.920	1.06 (0.74,1.52)	0.734
PLT	Sparse Data		1.13 (0.63,2.05) ^b	0.682 ^b

^aAbnormally low versus normal/abnormally high.

^bAbnormally high versus normal/abnormally low.

TABLE N-7.

Adjusted Continuous Analyses for Hematological Variables
 (Ranch Hand-Original Comparison Group Differences)
 (Original Comparisons Only)

Variable	Ranch Hand-Original Comparison Group Difference ±SE	p-Value	Covariate Remarks*
RBC	-0.018 ± 0.017	0.278	AGE (p<0.001) CSMOK (p=0.001) OCC*PACKYR (p=0.043)
WBC	****	****	GRP*RACE*OCC (p<0.001) GRP*AGE*RACE (p=0.013) GRP*AGE*PACKYR (p=0.013) GRP*RACE*PACKYR (p=0.022) PACKYR*CSMOK (p<0.001)
HGB	****	****	GRP*RACE*AGE (p=0.030) GRP*RACE*OCC (p=0.020) OCC*PACKYR (p=0.023) CSMOK (p<0.001)
HCT	****	****	GRP*RACE*AGE (p=0.026) GRP*RACE*OCC (p=0.011) AGE*OCC (p=0.009) CSMOK (p<0.001)
MCV	****	****	GRP*AGE*PACKYR (p=0.041) GRP*AGE*CSMOK (p=0.012) RACE*OCC (p=0.021) AGE*RACE (p<0.001)
MCH	****	****	GRP*AGE*CSMOK (p=0.026) AGE*RACE (p=0.001) OCC (p=0.001)
MCHC	0.030 ± 0.028	0.296	RACE (p<0.001)
PLT	****	****	GRP*RACE*PACKYR (p=0.011) GRP*AGE (p=0.040) OCC (p=0.005)

*CSMOK: current level of smoking (cigarettes per day)

PACKYR: smoking history (pack years)

OCC: occupation

GRP: group

****Group-by-covariate interaction--group difference, standard error (SE), and p-value not presented.

TABLE N-8.

Summary of Group-by-Covariate
Interactions for Hematological Variables
(Original Comparisons Only)

Variable	Interaction Covariates	Stratification	Ranch Hand-Original Comparison Group Difference \pm SE	p-Value	Direction of Result*
WBC ^a	Race	<u>Nonblack</u>			
		<u>Nonsmoker</u>			
	Smoking History	35			
		53	-0.014 \pm 0.021	0.511	
	Age (At Baseline)		0.014 \pm 0.022	0.508	
		<u>30 Pack-Years</u>			
		35	0.107 \pm 0.033	0.001	RH>OC
	53	-0.011 \pm 0.019	0.551		
		<u>Black</u>	-0.053 \pm 0.058	0.364	
		(No significant interactions)			

TABLE N-8. (continued)

Summary of Group-by-Covariate
Interactions for Hematological Variables
(Original Comparisons Only)

Variable	Interaction Covariates	Stratification	Ranch Hand-Original Comparison Group Difference \pm SE	p-Value	Direction of Result*	
HGB	Race	<u>Nonblack</u>				
		<u>Officer</u>				
	Occupation	35	0.151 \pm 0.113	0.181		
		53	-0.035 \pm 0.082	0.667		
	Age (At Baseline)	<u>Enlisted Flyer</u>				
		35	0.087 \pm 0.132	0.509		
		53	-0.100 \pm 0.121	0.410		
		<u>Enlisted Groundcrew</u>				
		35	0.026 \pm 0.080	0.744		
		53	-0.161 \pm 0.107	0.134		
		<u>Black</u>				
		<u>Officer</u>				
		35	-1.034 \pm 0.627	0.099	OC>RH	
		53	0.209 \pm 0.629	0.740		
		<u>Enlisted Flyer</u>				
		35	-1.398 \pm 0.613	0.023	OC>RH	
	53	-0.155 \pm 0.481	0.747			
	<u>Enlisted Groundcrew</u>					
35	-0.014 \pm 0.283	0.962				
53	1.230 \pm 0.526	0.020	RH>OC			

TABLE N-8. (continued)

Summary of Group-by-Covariate
Interactions for Hematological Variables
(Original Comparisons Only)

Variable	Interaction Covariates	Stratification	Ranch Hand-Original Comparison Group Difference \pm SE	p-Value	Direction of Result*
HCT	Race	<u>Nonblack</u>			
		<u>Officer</u>			
	Occupation	35	0.506 \pm 0.325	0.120	
		53	-0.174 \pm 0.237	0.462	
	Age (At Baseline)	<u>Enlisted Flyer</u>			
		35	0.390 \pm 0.377	0.301	
		53	-0.291 \pm 0.347	0.403	
		<u>Enlisted Groundcrew</u>			
		35	0.063 \pm 0.230	0.783	
		53	-0.617 \pm 0.307	0.045	OC>RH
	Black	<u>Officer</u>			
		35	-2.662 \pm 1.801	0.140	
		53	0.825 \pm 1.805	0.648	
		<u>Enlisted Flyer</u>			
35		-4.365 \pm 1.753	0.013	OC>RH	
53		-0.878 \pm 1.378	0.524		
	<u>Enlisted Groundcrew</u>				
	35	-0.050 \pm 0.806	0.950		
	53	3.436 \pm 1.497	0.022	RH>OC	

TABLE N-8. (continued)

Summary of Group-by-Covariate
Interactions for Hematological Variables
(Original Comparisons Only)

Variable	Interaction Covariates	Stratification	Ranch Hand-Original Comparison Group Difference \pm SE	p-Value	Direction of Result*
MCV	Smoking (Smoking History and Current Smoking)	<u>Nonsmoker</u>			
		35	0.692 \pm 0.418	0.098	RH>OC
	53	-0.136 \pm 0.417	0.743		
	Age (At Baseline)	<u>30 Pack-Years, Currently 1 Pack/Day</u>			
35		0.057 \pm 0.635	0.928		
		53	-0.582 \pm 0.412	0.158	
MCH	Current Smoking	<u>Nonsmoker</u>			
		35	0.126 \pm 0.141	0.373	
	Age (At Baseline)	53	0.158 \pm 0.132	0.232	
		<u>1 Pack/Day</u>			
		35	0.254 \pm 0.144	0.079	RH>OC
		53	-0.275 \pm 0.149	0.066	OC>RH
	<u>2 Pack/Day</u>				
		35	0.381 \pm 0.273	0.162	
		53	-0.707 \pm 0.281	0.012	OC>RH

TABLE N-8. (continued)

Summary of Group-by-Covariate
Interactions for Hematological Variables
(Original Comparisons Only)

Variable	Interaction Covariates	Stratification	Ranch Hand-Original Comparison Group Difference \pm SE	p-Value	Direction of Result*
PLT ^a	Race	<u>Nonblack</u>			
		<u>Nonsmoker</u>			
	Smoking History	35	0.030 \pm 0.016	0.061	RH>OC
		53	-0.017 \pm 0.018	0.354	
	Age (At Baseline)	<u>30 Pack-Years</u>			
		35	0.050 \pm 0.020	0.012	RH>OC
		53	0.003 \pm 0.016	0.858	
		<u>Black</u>			
		<u>Nonsmoker</u>			
		35	-0.082 \pm 0.051	0.111	OC>RH
	53	-0.129 \pm 0.054	0.016		
	<u>30 Pack-Years</u>				
35	0.261 \pm 0.103	0.011	RH>OC		
53	0.214 \pm 0.102	0.036	RH>OC		

*RH>OC: Variable mean in Ranch Hand group greater than variable mean in Original Comparison group.

OC>RH: Variable mean in Original Comparison group greater than variable mean in Ranch Hand group.

^aUnits are on log scale.

TABLE N-9.

Longitudinal Analyses for
 MCV, MCH, and PLT: A Contrast of
 Baseline and First Followup Examination Test Means
 (Original Comparisons Only)

Variable	Group	Total	Means		Difference (Followup-Baseline)	Error*	p-Value (Equality of Difference)
			Baseline	Followup			
MCV	Ranch Hand	971	88.89	92.60	+3.71	2.808	0.65
	Original Comparison	872	88.56	92.35	+3.79		
MCH	Ranch Hand	971	30.81	31.55	+0.74	0.873	0.21
	Original Comparison	872	30.63	31.44	+0.81		
PLT	Ranch Hand	971	276.90	271.50	-5.4	35.50	0.80
	Original Comparison	872	272.10	267.30	-4.8		

*Error = $\sqrt{\text{Subj} * \text{Time/Group mean squares}}$.

APPENDIX 0

Renal Assessment

TABLE O-1.

Unadjusted Exposure Index Analyses for Renal Variables by Occupation

Variable	Occupation	Statistic	Exposure Index			Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low	Medium	High			
Kidney Disease	Officer	n	127	130	123	Overall		0.226
		Number/% Abnormal	10 7.9%	11 8.5%	17 13.8%	M vs. L	1.08 (0.44,2.64)	0.999
		Normal	117 92.1%	119 91.5%	106 86.2%	H vs. L	1.88 (0.82,4.28)	0.155
	Enlisted Flyer	n	55	65	57	Overall		0.165
		Number/% Abnormal	7 12.7%	8 12.3%	2 3.5%	M vs. L	0.96 (0.33,2.85)	0.999
		Normal	48 87.3%	57 87.7%	55 96.5%	H vs. L	0.25 (0.05,1.26)	0.091
	Enlisted Groundcrew	n	153	163	141	Overall		0.214
		Number/% Abnormal	18 11.8%	11 6.7%	10 7.1%	M vs. L	0.54 (0.25,1.19)	0.172
		Normal	135 88.2%	152 93.3%	131 92.9%	H vs. L	0.57 (0.26,1.29)	0.233
Urinary Protein	Officer	n	127	130	123	Overall		0.696
		Number/% Abnormal	4 3.1%	2 1.5%	3 2.4%	M vs. L	0.48 (0.09,2.67)	0.443
		Normal	123 96.9%	128 98.5%	120 97.6%	H vs. L	0.77 (0.17,3.51)	0.999
	Enlisted Flyer	n	55	65	57	Overall		0.708
		Number/% Abnormal	2 3.6%	1 1.5%	1 1.8%	M vs. L	0.41 (0.04,4.69)	0.593
		Normal	53 96.4%	64 98.5%	56 98.2%	H vs. L	0.47 (0.04,5.37)	0.615
	Enlisted Groundcrew	n	154	163	142	Overall		0.726
		Number/% Abnormal	8 5.2%	7 4.3%	9 6.3%	M vs. L	0.82 (0.29,2.32)	0.794
		Normal	146 94.8%	156 95.7%	133 93.7%	H vs. L	1.24 (0.46,3.29)	0.804

TABLE O-1. (continued)

Unadjusted Exposure Index Analyses for Renal Variables by Occupation

Variable	Occupation	Statistic	Exposure Index			Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low	Medium	High			
Urinary Occult Blood	Officer	n	127	130	123	Overall		0.334
		Number/% Abnormal	17 13.4%	15 11.5%	22 17.9%	M vs. L	0.84 (0.40,1.77)	0.708
		Normal	110 86.6%	115 88.5%	101 82.1%	H vs. L	1.41 (0.71,2.81)	0.385
	Enlisted Flyer	n	55	65	57	Overall		0.325
		Number/% Abnormal	12 21.8%	14 21.5%	7 12.3%	M vs. L	0.98 (0.41,2.35)	0.999
		Normal	43 78.2%	51 78.5%	50 87.7%	H vs. L	0.50 (0.18,1.39)	0.214
	Enlisted Groundcrew	n	154	163	141	Overall		0.144
		Number/% Abnormal	25 16.2%	34 20.9%	36 25.5%	M vs. L	1.36 (0.77,2.41)	0.315
		Normal	129 83.8%	129 79.1%	105 74.5%	H vs. L	1.77 (1.00,3.13)	0.061
Urinary White Blood Cell Count	Officer	n	127	130	123	Overall		0.558
		Number/% Abnormal	11 8.7%	7 5.4%	10 8.1%	M vs. L	0.60 (0.23,1.60)	0.337
		Normal	116 91.3%	123 94.6%	113 91.9%	H vs. L	0.93 (0.38,2.28)	0.999
	Enlisted Flyer	n	55	65	57	Overall		0.763
		Number/% Abnormal	7 12.7%	8 12.3%	5 8.8%	M vs. L	0.96 (0.33,2.85)	0.999
		Normal	48 87.3%	57 87.7%	52 91.2%	H vs. L	0.66 (0.20,2.22)	0.554
	Enlisted Groundcrew	n	154	163	142	Overall		0.447
		Number/% Abnormal	20 13.0%	15 9.2%	19 13.4%	M vs. L	0.68 (0.33,1.38)	0.290
		Normal	134 87.0%	148 90.8%	123 86.6%	H vs. L	1.04 (0.53,2.03)	0.999

TABLE 0-1. (continued)
Unadjusted Exposure Index Analyses for Renal Variables by Occupation

Variable	Occupation	Statistic	Exposure Index			Contrast	Est. Relative Risk (95% C.I.)	p-Value
			Low	Medium	High			
Blood Urea Nitrogen	Officer	n	127	130	123	Overall		0.891
		Mean*	14.62	14.82	14.74	M vs. L	--	0.633
		95% C.I.*	(14.05, 15.19)	(14.20, 15.46)	(14.14, 15.35)	H vs. L	--	0.775
	Enlisted Flyer	n	55	65	57	Overall		0.983
		Mean*	13.84	13.80	13.93	M vs. L	--	0.963
		95% C.I.*	(12.79, 14.93)	(12.87, 14.77)	(13.15, 14.72)	H vs. L	--	0.895
	Enlisted Groundcrew	n	154	163	142	Overall		0.639
		Mean*	14.08	13.72	14.00	M vs. L	--	0.389
		95% C.I.*	(13.50, 14.67)	(13.15, 14.30)	(13.48, 14.52)	H vs. L	--	0.841
Urine Specific Gravity	Officer	n	127	130	123	Overall	--	0.786
		Mean	1.0144	1.0149	1.0150	M vs. L	--	0.554
		95% C.I.	(1.0132, 1.0156)	(1.0137, 1.0161)	(1.0137, 1.0162)	H vs. L	--	0.541
	Enlisted Flyer	n	55	65	57	Overall	--	0.358
		Mean	1.0159	1.0155	1.0141	M vs. L	--	0.803
		95% C.I.	(1.0139, 1.0178)	(1.0138, 1.0173)	(1.0123, 1.0158)	H vs. L	--	0.178
	Enlisted Groundcrew	n	154	163	142	Overall	--	0.967
		Mean	1.0167	1.0168	1.0166	M vs. L	--	0.885
		95% C.I.	(1.0156, 1.0178)	(1.0158, 1.0179)	(1.0154, 1.0179)	H vs. L	--	0.907

*Transformed from square root scale.

--No relative risk given for variables analyzed continuously.

TABLE 0-2.

Interaction Summaries of Adjusted Exposure Index Analyses for Renal Variables

Variable	Interaction (Occupation)	Stratification	Statistic	Exposure Index						Contrast	Adj. Relative Risk (95% C.I.)	p-Value	
				Low	Medium		High						
Urinary Protein	Diabetic		n	8		8		14		Overall	0.010*		
			Number/% Abnormal	3	37.5%	0	0.0%	0	0.0%	M vs. L	0.09 (0.004,2.16)**	0.200*	
			Normal	5	62.5%	8	100.0%	14	100.0%	H vs. L	0.05 (0.002,1.22)**	0.036*	
	Exposure Index-by- Diabetic Class (Officer)	Impaired		n	11		14		16		Overall	0.247*	
				Number/% Abnormal	1	9.1%	0	0.0%	0	0.0%	M vs. L	0.24 (0.01,6.53)**	0.440*
				Normal	10	90.9%	14	100.0%	16	100.0%	H vs. L	0.21 (0.008,5.71)**	0.407*
	Normal			n	108		108		93		Overall	0.190*	
				Number/% Abnormal	0	0.0%	2	1.9%	3	3.2%	M vs. L	5.09 (0.24,107.36)**	0.498*
				Normal	108	100.0%	106	98.1%	90	96.8%	H vs. L	8.39 (0.43,164.61)**	0.097*
Urinary Protein	Exposure Index-by- Race (Enlisted Groundcrew)	Nonblack	n	138		149		129		Overall	0.259*		
			Number/% Abnormal	4	2.9%	6	4.0%	9	7.0%	M vs. L	1.41 (0.39,5.09)*	0.751*	
			Normal	134	97.1%	143	96.0%	120	93.0%	H vs. L	2.51 (0.75,8.37)*	0.158*	
	Black		n	16		14		13		Overall	0.092*		
			Number/% Abnormal	4	25.0%	1	7.1%	0	0.0%	M vs. L	0.23 (0.02,2.37)*	0.336*	
			Normal	12	75.0%	13	92.9%	13	100.0%	H vs. L	0.10 (0.005,2.11)**	0.107*	
Urinary Occult Blood	Exposure Index-by- Age (Enlisted Groundcrew)	Born ≥1942	n	87		129		81					
			Number/% Abnormal	11	12.6%	23	17.8%	20	24.7%	M vs. L	1.56 (0.71,3.41)	0.252	
			Normal	76	87.4%	106	82.2%	61	75.3%	H vs. L	2.32 (0.73,7.32)	0.466	
	Born <1942		n	67		34		60					
			Number/% Abnormal	14	20.9%	11	32.4%	16	26.7%	M vs. L	1.73 (0.68,4.42)	0.265	
			Normal	53	79.1%	23	67.6%	44	73.3%	H vs. L	1.36 (0.59,3.12)	0.152	

TABLE O-2. (continued)

Interaction Summaries of Adjusted Exposure Index Analyses for Renal Variables

Variable	Interaction (Occupation)	Stratification	Statistic	Exposure Index			Contrast	Adj. Relative Risk (95% C.I.)	p-Value		
				Low	Medium	High					
Urinary White Blood Cell Count(a)	Exposure Index-by- Age	Born ≥1942	n	0	1	0	Overall		—		
			Number/%								
		Diabetic	Abnormal	0	—	1	100.0%	0	—	H vs. L	—
			Normal	0	—	0	0.0%	0	—	H vs. L	—
		Born ≥1942	n	1	1	0	Overall			0.157*	
			Number/%								
	Impaired	Abnormal	0	0.0%	1	100.0%	0	—	H vs. L	9.00 (0.10,831.78)** 0.999*	
		Normal	1	100.0%	0	0.0%	0	—	H vs. L	—	
	Exposure Index-by- Diabetic Class (Enlisted Flyer)	Born ≥1942	n	10	16	9	Overall			0.065*	
			Number/%								
		Normal	Abnormal	3	30.0%	0	0.0%	1	11.1%	H vs. L	0.07 (0.003,1.42)** 0.046*
			Normal	7	70.0%	16	100.0%	8	88.9%	H vs. L	0.29 (0.02,3.48)** 0.582*
		Born <1942	n	1	8	5	Overall			0.668*	
			Number/%								
Diabetic	Abnormal	0	0.0%	1	12.5%	0	0.0%	H vs. L	0.60 (0.02,23.07)** 0.999*		
	Normal	1	100.0%	7	87.5%	5	100.0%	H vs. L	—		
Born <1942	n	8	6	6	Overall			0.222*			
	Number/%										
Impaired	Abnormal	0	0.0%	2	33.3%	1	16.7%	H vs. L	9.44 (0.37,242.18)** 0.165*		
	Normal	8	100.0%	4	66.7%	5	83.3%	H vs. L	4.64 (0.16,135.57)** 0.429*		
Born <1942	n	35	33	37	Overall			0.805			
	Number/%										
Normal	Abnormal	4	11.4%	4	12.1%	3	8.1%	H vs. L	0.79 (0.16,3.90) 0.776		
	Normal	31	88.6%	29	87.9%	34	91.9%	H vs. L	0.58 (0.11,3.03) 0.515		

TABLE 0-2. (continued)

Interaction Summaries of Adjusted Exposure Index Analyses for Renal Variables

Variable	Interaction (Occupation)	Stratification	Statistic	Exposure Index			Contrast	Adj. Relative Risk (95% C.I.)	p-Value
				Low	Medium	High			
Blood Urea Nitrogen	Exposure Index-by- Race (Officer)	Nonblack	n	125	127	121	H vs. L	(b)	0.877
			Adj. Mean(c)	14.65	14.71	14.55	H vs. L	(b)	0.814
			95% C.I.(c)	(13.91,15.41)	(13.96,15.49)	(13.84,1.27)			
		Black	n	2	2	3	H vs. L	(b)	0.035
			Adj. Mean	16.93	10.65	19.51	H vs. L	(b)	0.494
			95% C.I.	(12.24,22.38)	(7.62,14.19)	(14.45,25.33)			

*Unadjusted estimate of relative risk and confidence interval, or p-value, based on stratified tables.

**Unadjusted estimate of relative risk and confidence interval calculated after adding 0.5 to each cell.

—Zero counts in cells do not allow for calculation of percent, relative risk, confidence interval, or p-value.

(a)Results presented for urinary white blood cell count are based on stratification into the six categories shown. Unadjusted results are presented for all strata except Ranch Bands in normal diabetic class, born before 1942. These results have been adjusted for race.

(b)No relative risk given for variables analyzed continuously.

(c)Transformed from square root scale.

Note: Small sample sizes may affect validity of overall p-value.

Note: Results without (*) or (**) are adjusted for all other main effects in model (age, race, and diabetic class), unless otherwise noted.

TABLE 0-3.

Unadjusted Analyses for Renal Variables by Group
(Original Comparisons Only)

Variable	Statistic	Group				Est. Relative Risk (95% C.I.)	p-Value
		Ranch Hand		Original Comparison			
		Number	Percent	Number	Percent		
Kidney Disease	n	1,014		954		0.93 (0.69,1.26)	0.701
	Yes	94	9.3	94	9.9		
	No	920	90.7	859	90.1		
Urinary Protein	n	1,016		954		1.25 (0.76,2.06)	0.449
	Abnormal	37	3.6	28	2.9		
	Normal	979	96.4	926	97.1		
Urinary Occult Blood	n	1,015		954		1.13 (0.89,1.43)	0.338
	Abnormal	182	17.9	155	16.2		
	Normal	833	82.1	799	83.8		
Urinary White Blood Cell Count	n	1,016		954		1.17 (0.86,1.59)	0.316
	Abnormal	102	10.0	83	8.7		
	Normal	914	90.0	871	91.3		
Blood Urea Nitrogen	n	1,016		955		--	0.318
	Mean*	14.21		14.37			
	95% C.I.*	(13.99,14.43)		(14.15,14.59)			
Urine Specific Gravity	n	1,016		954		--	0.365
	Mean	1.0157		1.0154			
	95% C.I.	(1.0153,1.0162)		(1.0150,1.0159)			

*Converted from square root scale.

--No relative risk given for variables analyzed continuously.

TABLE O-4.

Adjusted Analyses for Renal Variables by Group
(Original Comparisons Only)

Variable	Stratification	Statistic	Group		Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks*
			Ranch Hand	Original Comparison			
Kidney Disease		n	1,014	950	0.95 (0.70,1.28)	0.726	AGE (p=0.001)
Urinary Protein		n	1,016	942	****	****	OCC (p=0.007) AGE*DIAB (p=0.037) GRP*DIAB (p=0.003)
Urinary Occult Blood							GRP*OCC*RACE (p=0.020)
	Nonblack	n	955	887	1.14 (0.89,1.46)	0.299	AGE (p=0.003) OCC (p<0.001)
	Black Enlisted	n	53	51	1.43 (0.54,3.76)	0.465	GRP*OCC (p=0.051) AGE*DIAB (p=0.027)

TABLE 0-4. (continued)

Adjusted Analyses for Renal Variables by Group
(Original Comparisons Only)

Variable	Stratification	Statistic	Group		Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks*
			Ranch Hand	Original Comparison			
Urinary White Blood Cell Count	Nonblack	n	956	893	****	****	GRP*AGE*RACE (p=0.048) GRP*OCC*RACE (p=0.022)
	Black Enlisted	n	53	51	****	****	OCC (p=0.010) GRP*DIAB (p=0.054) GRP*AGE -(p=0.053)
Blood Urea Nitrogen		n	1,016	952		****	AGE (p<0.001)
		Adj. Mean	****	****	--		OCC (p=0.025)
		95% C.I.	****	****			RACE*DIAB (p=0.049) GRP*RACE (p=0.077)
Urine Specific Gravity		n	1,016	951			DIAB (p=0.011)
		Adj. Mean	****	****	--	****	OCC (p<0.001)
		95% C.I.	****	****			GRP*RACE (p=0.037)

*Abbreviations:

OCC: occupation

GRP: group

DIAB: diabetic class

****Group-by-covariate interaction--adjusted relative risk/group means, p-value, and confidence interval are not presented.

--No relative risk given for variables analyzed continuously.

TABLE 0-5.

Summary of Group-by-Covariate Interactions for Renal Variables
(Original Comparisons Only)

Variable	Interaction	Stratification	Statistic	Group		Adj. Relative Risk (95% C.I.)	p-Value		
				Ranch Hand	Original Comparison				
Urinary Protein	Group-by-Diabetic Class	Diabetic	n	78	76		0.57 (0.20,1.60)	0.286	
			Number/% Abnormal	7	9.0%	11			14.4%
			Normal	71	91.0%	65			85.5%
		Impaired	n	106	136		0.58 (0.19,1.75)	0.332	
			Number/% Abnormal	5	4.7%	11			8.1%
			Normal	101	95.3%	125			91.9%
		Normal	n	832	739		3.82 (1.56,9.37)	0.004	
			Number/% Abnormal	25	3.0%	6			0.8%
			Normal	807	97.0%	733			99.2%
Urinary Occult Blood	Group-by-Occupation (Black)	Officer	n	7	7		--	--	
			Number/% Abnormal	0	0.0%	3			42.9%
			Normal	7	100.0%	4			57.1%
		Enlisted Flyer	n	10	12		--	--	
			Number/% Abnormal	3	30.0%	1			8.3%
			Normal	7	70.0%	11			91.7%
		Enlisted Groundcrew	n	43	39		--	--	
			Number/% Abnormal	13	30.2%	9			23.1%
			Normal	30	69.8%	30			76.9%

TABLE 0-5. (continued)

Summary of Group-by-Covariate Interactions for Renal Variables
(Original Comparisons Only)

Variable	Interaction	Stratification	Statistic	Group		Original Comparison	Adj. Relative Risk (95% C.I.)	p-Value	
				Ranch Hand					
Urinary White Blood Cell Count	Nonblack: Group-by-Age	Born \geq 1942	n	14		12	0.90 (0.38,2.10)	0.799	
		Diabetic	Abnormal	1	7.1%	2			16.7%
			Normal	13	92.9%	10			83.3%
		Born \leq 1942	n	22		33			
		Impaired	Abnormal	2	9.1%	4			12.1%
			Normal	20	90.9%	29			87.9%
	Group-by-Diabetic Class	Born \geq 1942	n	344		298		2.08 (1.16,3.71)	0.014
		Normal	Abnormal	38	11.0%	13	4.4%		
			Normal	306	89.0%	285	95.6%		
		Born $<$ 1942	n	57		57			
		Diabetic	Abnormal	6	10.5%	12	21.1%		
			Normal	51	89.5%	45	78.9%		
Group-by-Diabetic Class	Born $<$ 1942	n	80		89		1.77 (0.75,4.17)	0.191	
	Impaired	Abnormal	14	17.5%	6	6.7%			
		Normal	66	82.5%	83	93.3%			
Group-by-Diabetic Class	Born $<$ 1942	n	439		404		0.89 (0.55,1.44)	0.639	
	Normal	Abnormal	31	7.1%	37	9.2%			
		Normal	408	92.9%	367	90.8%			

TABLE 0-5. (continued)

Summary of Group-by-Covariate Interactions for Renal Variables
(Original Comparisons Only)

Variable	Interaction	Stratification	Statistic	Group		Original Comparison	Adj. Relative Risk (95% C.I.)	p-Value	
				Ranch Hand					
Urinary White Blood Cell Count	Group-by-Occupation (Black)	Officer	n	7		7			
			Number/% Abnormal	0	0.0%	2	28.6%	--	--
			Normal	7	100.0%	5	71.4%		
		Enlisted Flyer	n	10		12			
			Number/% Abnormal	3	30.0%	0	0.0%	--	--
			Normal	7	70.0%	12	100.0%		
Enlisted Groundcrew	n	43		39		--	--		
	Number/% Abnormal	7	16.3%	7	17.9%				
	Normal	36	83.7%	32	82.1%				
Urinary White Blood Cell Count	Group-by-Age (Black Enlisted)	Born ≥1942	n	29		26			
			Number/% Abnormal	4	13.8%	5	19.2%	0.65 (0.15, 2.78)	0.565
			Normal	25	86.2%	21	80.8%		
		Born <1942	n	24		25			
			Number/% Abnormal	6	25.0%	2	8.0%	4.99 (0.79, 31.56)	0.088
			Normal	18	75.0%	23	92.0%		

TABLE 0-5. (continued)

Summary of Group-by-Covariate Interactions for Renal Variables
(Original Comparisons Only)

Variable	Interaction	Stratification	Statistic	Group		Adj. Relative Risk (95% C.I.)	p-Value
				Ranch Hand	Original Comparison		
Blood Urea Nitrogen	Group-by-Race	Nonblack	n	956	894	--	0.726
		Adj. Mean*	14.16	14.22			
		95% C.I.*	(13.86,14.47)	(13.92,14.53)			
		Black	n	60	58	--	0.057
		Adj. Mean*	12.43	13.63			
		95% C.I.*	(11.41,13.51)	(12.66,14.64)			
Urine Specific Gravity	Group-by-Race	Nonblack	n	956	893	--	0.104
		Adj. Mean	1.0163	1.0158			
		95% C.I.	(1.0157,1.0169)	(1.0151,1.0164)			
		Black	n	60	58	--	0.081
		Adj. Mean	1.0154	1.0177			
		95% C.I.	(1.0135,1.0173)	(1.0158,1.0196)			

--No relative risk given for variables analyzed continuously. Also, no relative risk or p-value given for interactions involving occupation for urinary occult blood and urinary white blood cell count; tables presented only for illustrative purposes.

*Transformed from square root scale.

APPENDIX P

Endocrine Assessment

APPENDIX P: Endocrine Assessment

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TABLE P-1.

Summary of Group-by-Covariate Interactions for Endocrinological Variables

Variable	Interaction	Stratification	Statistic	Group		p-Value	
				Ranch Hand	Comparison		
Testosterone	Group-by- % Body Fat	<10%	n	6	4	0.012	
			Mean	522.6	1044.8		
			Adj. Mean	654.4	1042.8		
				95% C.I.	(484.7,849.5)	(803.5,1313.2)	
		10-25%	n	815	1026	0.023	
	Mean		627.8	605.7			
	Adj. Mean		603.3	582.4			
			95% C.I.	(583.4,623.5)	(563.9,601.3)		
		>25%	n	179	257	0.706	
Mean	470.5		470.3				
Adj. Mean	463.0		456.7				
		95% C.I.	(435.0,491.9)	(432.9,481.2)			
Differential Cortisol	Group-by- Race-by- Age	Nonblack Born ≥1942	n	374	500	0.156	
			Mean	2.07	2.44		
			Adj. Mean	1.58	1.97		
			95% C.I.	(0.64,2.51)	(1.06,2.88)		
		Nonblack Born <1942	n	572	697	0.708	
	Mean		2.53	2.46			
	Adj. Mean		2.08	1.99			
	95% C.I.		(1.18,2.97)	(1.10,2.88)			
		Black Born ≥1942	n	32	47	0.003	
	Mean		0.17	2.78			
	Adj. Mean		-0.46	2.33			
	95% C.I.		(-2.11,1.18)	(0.89,3.76)			
	Black Born <1942	n	26	36	0.312		
Mean		3.24	2.30				
Adj. Mean		2.94	1.89				
95% C.I.		(1.22,4.67)	(0.32,3.46)				

TABLE P-2.

Unadjusted Exposure Index Analyses for Endocrinological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index			Contrast	p-Value
			Low	Medium	High		
T ₃ % Uptake	Officer	n	126	124	122	Overall	0.250
		Mean	28.01	28.35	27.96	M vs. L	0.177
		95% C.I.	(27.66,28.36)	(28.00,28.71)	(27.61,28.32)	H vs. L	0.857
	Enlisted Flyer	n	55	65	55	Overall	0.362
		Mean	27.31	27.59	27.83	M vs. L	0.411
		95% C.I.	(26.82,27.81)	(27.14,28.06)	(27.32,28.34)	H vs. L	0.155
	Enlisted Groundcrew	n	153	161	142	Overall	0.775
		Mean	27.68	27.65	27.53	M vs. L	0.865
		95% C.I.	(27.37,28.00)	(27.34,27.95)	(27.21,27.85)	H vs. L	0.493
TSH	Officer	n	126	124	122	Overall	0.283
		Mean	1.181	1.167	1.278	M vs. L	0.843
		95% C.I.	(1.089,1.286)	(1.076,1.271)	(1.173,1.397)	H vs. L	0.203
	Enlisted Flyer	n	55	65	55	Overall	0.181
		Mean	1.033	1.153	1.204	M vs. L	0.178
		95% C.I.	(0.924,1.162)	(1.035,1.292)	(1.068,1.367)	H vs. L	0.075
	Enlisted Groundcrew	n	153	161	142	Overall	0.738
		Mean	1.117	1.124	1.160	M vs. L	0.899
		95% C.I.	(1.043,1.199)	(1.051,1.204)	(1.079,1.250)	H vs. L	0.465

TABLE P-2. (continued)

Unadjusted Exposure Index Analyses for Endocrinological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index			Contrast	p-Value
			Low	Medium	High		
Testosterone	Officer	n	125	128	118	Overall	0.099
		Mean	599.4	547.4	558.0	M vs. L	0.041
		95% C.I.	(563.8,636.1)	(513.8,582.1)	(522.7,594.4)	H vs. L	0.112
	Enlisted Flyer	n	55	63	57	Overall	0.363
		Mean	588.7	637.4	584.9	M vs. L	0.244
		95% C.I.	(531.6,648.6)	(581.8,695.6)	(529.1,643.6)	H vs. L	0.929
	Enlisted Groundcrew	n	162	153	139	Overall	0.276
		Mean	609.3	641.4	603.4	M vs. L	0.205
		95% C.I.	(574.7,644.9)	(606.9,676.9)	(567.3,640.6)	H vs. L	0.820
Initial Cortisol	Officer	n	124	130	121	Overall	0.186
		Mean	11.97	11.43	12.28	M vs. L	0.239
		95% C.I.	(11.33,12.65)	(10.83,12.07)	(11.61,12.99)	H vs. L	0.531
	Enlisted Flyer	n	55	65	57	Overall	0.276
		Mean	11.97	11.08	11.13	M vs. L	0.001
		95% C.I.	(11.09,12.91)	(10.33,11.88)	(10.33,11.99)	H vs. L	0.092
	Enlisted Groundcrew	n	154	161	142	Overall	0.699
		Mean	11.69	11.33	11.50	M vs. L	0.397
		95% C.I.	(11.09,12.32)	(10.76,11.92)	(10.89,12.15)	H vs. L	0.678

TABLE P-2. (continued)

Unadjusted Exposure Index Analyses for Endocrinological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index			Contrast	p-Value
			Low	Medium	High		
2-Hour Cortisol	Officer	n	124	130	121	Overall	0.416
		Mean	9.27	9.16	9.69	M vs. L	0.789
		95% C.I.	(8.72,9.86)	(8.63,9.73)	(9.10,10.32)	H vs. L	0.324
	Enlisted Flyer	n	55	65	57	Overall	0.200
		Mean	8.43	9.48	9.06	M vs. L	0.074
		95% C.I.	(7.67,9.26)	(8.69,10.34)	(8.25,9.94)	H vs. L	0.286
	Enlisted Groundcrew	n	154	161	142	Overall	0.453
		Mean	9.64	9.29	9.17	M vs. L	0.358
		95% C.I.	(9.11,10.19)	(8.79,9.81)	(8.65,9.72)	H vs. L	0.229
Differential Cortisol	Officer	n	124	130	121	Overall	0.709
		Mean	2.69	2.31	2.59	M vs. L	0.424
		95% C.I.	(2.02,3.36)	(1.66,2.96)	(1.91,3.26)	H vs. L	0.829
	Enlisted Flyer	n	55	65	57	Overall	0.003
		Mean	3.43	1.20	2.30	M vs. L	<0.001
		95% C.I.	(2.50,4.36)	(0.34,2.06)	(1.39,3.22)	H vs. L	0.092
	Enlisted Groundcrew	n	154	161	142	Overall	0.726
		Mean	1.96	2.12	2.37	M vs. L	0.740
		95% C.I.	(1.26,2.66)	(1.44,2.81)	(1.64,3.09)	H vs. L	0.425

TABLE P-2. (continued)

Unadjusted Exposure Index Analyses for Endocrinological Variables by Occupation

Variable	Occupation	Statistic	Exposure Index			Contrast	p-Value
			Low	Medium	High		
2-Hour Post-prandial Glucose	Officer	n	121	113	124	Overall	0.892
		Mean	109.0	107.5	107.6	M vs. L	0.666
		95% C.I.	(104.3,113.8)	(103.0,112.3)	(102.9,112.6)	H vs. L	0.694
	Enlisted Flyer	n	54	62	56	Overall	0.051
		Mean	100.9	118.0	110.9	M vs. L	0.015
		95% C.I.	(92.1,110.6)	(108.3,128.5)	(101.4,121.4)	H vs. L	0.149
	Enlisted Groundcrew	n	150	156	140	Overall	0.674
		Mean	105.5	106.7	109.1	M vs. L	0.750
		95% C.I.	(100.1,111.1)	(101.4,112.4)	(103.3,115.2)	H vs. L	0.380

TABLE P-3.

Interaction Summaries of Adjusted Exposure Index Analyses for Endocrinological Variables

Variable	Interaction (Occupation)	Stratification	Statistic	Exposure Index			Contrast	p-Value
				Low	Medium	High		
Testosterone	Exposure Index-by-% Body Fat (Enlisted Groundcrew)	<10%	n	1	2	3		
			Adj. Mean	72.7	828.8	684.5	M vs. L	<0.001
			95% C.I.	(0.3,273.0)	(537.8,1182.5)	(465.4,945.8)	H vs. L	<0.001
		10-25%	n	125	128	105		
			Adj. Mean	630.0	646.2	644.7	M vs. L	0.527
			95% C.I.	(586.1,675.5)	(601.6,692.5)	(598.2,692.9)	H vs. L	0.585
		>25%	n	27	31	29		
			Adj. Mean	501.8	503.0	467.5	M vs. L	0.980
			95% C.I.	(433.9,574.7)	(437.6,573.0)	(400.7,539.6)	H vs. L	0.471
2-Hour Cortisol	Exposure Index-by-% Body Fat (Officer)	10-25%	n	102	110	99		
			Adj. Mean	8.31	8.50	9.05	M vs. L	0.629
			95% C.I.	(7.20,9.58)	(7.41,9.76)	(7.86,10.43)	H vs. L	0.079
		>25%	n	22	20	20		
			Adj. Mean	10.03	7.46	8.26	M vs. L	0.006
			95% C.I.	(8.27,12.18)	(6.12,9.10)	(6.77,10.07)	H vs. L	0.068
2-Hour Cortisol	Exposure Index-by-Race (Enlisted Groundcrew)	Nonblack	n	138	146	129		
			Adj. Mean	9.30	9.33	9.32	M vs. L	0.921
			95% C.I.	(8.30,10.42)	(8.38,10.41)	(8.33,10.43)	H vs. L	0.961
		Black	n	16	14	11		
			Adj. Mean	12.89	9.36	8.41	M vs. L	0.013
			95% C.I.	(10.59,15.67)	(7.61,11.52)	(7.48,10.48)	H vs. L	0.002

TABLE P-3. (continued)

Interaction Summaries of Adjusted Exposure Index Analyses for Endocrinological Variables

Variable	Interaction (Occupation)	Stratifi- cation	Statistic	Exposure Index			Contrast	p-Value
				Low	Medium	High		
Initial Cortisol	Exposure Index-by- % Body Fat (Officer)	10-25%	n	102	110	99		
			Adj. Mean	11.51	11.19	12.25	M vs. L	0.514
			95% C.I.	(10.13,13.08)	(9.89,12.66)	(10.80,13.91)	H vs. L	0.154
		>25%	n	22	20	20		
			Adj. Mean	12.28	9.59	10.26	M vs. L	0.010
			95% C.I.	(10.33,14.60)	(8.03,11.45)	(8.59,12.26)	H vs. L	0.060
Differential Cortisol	Exposure Index-by- Race-by- Personality Type (Enlisted Groundcrew)	Nonblack Type A	n	49	63	53		
			Adj. Mean	0.96	1.94	2.00	M vs. L	0.237
			95% C.I.	(-0.74,2.66)	(0.38,3.49)	(0.32,3.68)	H vs. L	0.223
		Nonblack Type B	n	89	83	76		
			Adj. Mean	2.29	1.36	1.64	M vs. L	0.158
			95% C.I.	(0.80,3.78)	(-0.12,2.84)	(0.14,3.14)	H vs. L	0.336
		Black Type A	n	8	5	4		
			Adj. Mean	-5.49	3.27	3.10	M vs. L	<0.001
95% C.I.	(-8.70,-2.28)		(-0.71,7.25)	(-1.30,7.49)	H vs. L	0.001		
Black Type B	n	8	9	7				
	Adj. Mean	1.16	2.99	0.48	M vs. L	0.384		
	95% C.I.	(-2.04,4.37)	(-0.07,6.05)	(-2.80,3.76)	H vs. L	0.762		

TABLE P-4.

Unadjusted Continuous and Categorical Analyses for Laboratory Endocrinological Variables by Group
(Original Comparisons Only)

Variable	Statistic	Group				Contrast	Est. Relative Risk (95% C.I.)	p-Value
		Ranch Hand		Original Comparison				
T ₃ % Uptake	n	1,003		936				
	Mean	27.79		27.68				0.203
	95% C.I.	(27.67,27.91)		(27.55,27.80)				
	Number/%							
	Low	7	0.7%	13	1.4%	Overall		0.322
	Normal	969	96.6%	898	95.9%	Low vs. Normal	0.50 (0.20,1.26)	0.177
High	27	2.7%	25	2.7%	High vs. Normal	1.00 (0.58,1.74)	0.999	
TSH	n	1,003		936				
	Mean	1.16		1.11			--	0.040
	95% C.I.	(1.13,1.19)		(1.08,1.14)				
	Number/%							
	Normal	996	99.3%	931	99.5%		1.31 (0.41,4.14)	0.775
	High	7	0.7%	5	0.5%			
Testosterone	n	1,000		952				
	Mean	597.31		570.90			--	0.006
	95% C.I.	(583.97,610.80)		(557.69,584.27)				
	Number/%							
	Low	38	3.8%	37	3.9%	Overall		0.955
	Normal	949	94.9%	904	95.0%	Low vs. Normal	0.98 (0.62,1.55)	0.999
High	13	1.3%	11	1.2%	High vs. Normal	1.13 (0.50,2.53)	0.839	
Initial Cortisol	n	1,009		949				
	Mean	11.62		11.67			--	0.729
	95% C.I.	(11.39,11.85)		(11.44,11.91)				
	Number/%							
	Low	52	5.2%	44	4.6%	Overall		0.864
	Normal	950	94.2%	898	94.6%	Low vs. Normal	1.12 (0.74,1.69)	0.603
High	7	0.7%	7	0.7%	High vs. Normal	0.95 (0.33,2.71)	0.999	

TABLE P-4. (continued)

Unadjusted Continuous and Categorical Analyses for Laboratory Endocrinological Variables by Group
(Original Comparisons Only)

Variable	Statistic	Group				Contrast	Est. Relative Risk (95% C.I.)	p-Value
		Ranch Hand		Original Comparison				
2-Hour Cortisol	n	1,009		949				
	Mean	9.30		9.32			--	0.924
	95% C.I.	(9.10,9.51)		(9.11,9.52)				
	Number/%							
	Low	0	0.0%	0	0.0%			
Normal	1,005	99.6%	946	99.7%				
	High	4	0.4%	3	0.3%		1.26 (0.28,5.62)	0.999
Differential Cortisol	n	1,009		949				
	Mean	2.30		2.38			--	0.692
	95% C.I.	(2.05,2.55)		(2.12,2.64)				
2-Hour Post-prandial Glucose	n	976		909				
	Mean	107.93		110.03			--	0.154
	95% C.I.	(105.90,110.01)		(108.03,112.07)				
	Number/%							
	Normal	836	85.7%	748	82.3%	Impaired vs. Normal	0.69 (0.53,0.91)	0.009
Impaired	106	10.9%	137	15.1%	Diabetic vs. Normal	1.27 (0.75,2.16)	0.423	
Diabetic	34	3.5%	24	2.6%				
Diabetes (Composite Indicator)	n	1,016		955				
	Number/%							
	Yes	74	7.3%	67	7.0%		1.04 (0.74,1.47)	0.861
No	942	92.7%	888	93.0%				

-- No relative risk or confidence interval given for continuous analysis.

TABLE P-5.

Adjusted Continuous and Categorical Analyses for Laboratory Endocrinological Variables by Group
(Original Comparisons Only)

Variable	Statistic	Group		Contrast	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks
		Ranch Hand	Original Comparison				
T ₃ % Uptake	n	998	933	Overall	—	0.332	OOC (p=0.025)
				Low vs. Normal	0.52 (0.45,2.36)	0.153	PERSTYPE (p=0.035)
				High vs. Normal	1.03 (0.59,1.78)	0.916	
TSH	n Adj. Mean 95% C.I.	1,003 1.16 (1.13,1.19)	936 1.11 (1.08,1.14)		—	0.020	AGE (p<0.001)
				High vs. Normal	1.31 (0.41,4.14)	0.775	
Testosterone	n Adj. Mean 95% C.I.	1,000 **** ****	951 **** ****		—	****	RACE (p=0.015) AGE*BFAT (p=0.039) GRP*BFAT (p=0.022)
Initial Cortisol	n Adj. Mean 95% C.I.	1,004 11.35 (10.49,12.27)	945 11.38 (10.52,12.32)	Overall		0.998	AGE (p<0.001)
				Low vs. Normal	1.01 90.63,1.61)	0.980	%BFAT (p<0.001)
				High vs. Normal	1.02 (0.42,2.52)	0.958	
Differential Cortisol	n Adj. Mean 95% C.I.	1,004 **** ****	945 **** ****		—	****	GRP*AGE*RACE (p=0.016) PERSTYPE (p=0.002) %BFAT (p=0.006)

TABLE P-5. (continued)

Adjusted Continuous and Categorical Analyses for Laboratory Endocrinological Variables by Group
(Original Comparisons Only)

Variable	Statistic	Group		Contrast	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks
		Ranch Hand	Original Comparison				
2-Hour Post-prandial Glucose	n	976	908				XBFAT (p<0.001) OCC (p=0.002) AGE*RACE (p=0.002)
	Adj. Mean	114.8	116.0			0.430	
	95% C.I.	(107.2,122.9)	(108.3,124.2)				
					Overall		0.023	AGE (p<0.001)
				Impaired vs. Normal	0.71 (0.54,0.93)	0.014	RACE (p=0.027)
				Diabetic vs. Normal	1.29 (0.71,2.38)	0.405	XBFAT (p<0.001)
Diabetes (Composite Indicator)	n	1,016	954		1.13 (0.80,1.61)	0.484	AGE (p<0.001) XBFAT (p<0.001) RACE (p=0.015)

***Group-by-covariate interaction—adjusted mean/relative risk, confidence interval, and p-value are not presented.
—No relative risk or confidence interval given for continuous analyses.

GRP: Group
OCC: Occupation
PERSTYPE: Personality type (A or B)
XBFAT: Percent body fat

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TABLE P-6.

Summary of Group-by-Covariate Interactions for Endocrinological Variables
(Original Comparisons Only)

Variable	Interaction	Stratification	Statistic	Group		p-Value
				Ranch Hand	Original Comparison	
Testosterone	Group-by- % Body Fat	<10%	n	6	3	
			Mean	522.6	1173.8	
			Adj. Mean	640.1	1074.7	0.014
			95% C.I.	(472.2,833.5)	(794.4,1397.2)	
		10-25%	n	815	757	
			Mean	627.8	595.9	
			Adj. Mean	602.3	577.7	0.013
			95% C.I.	(581.2,623.7)	(556.7,599.1)	
		>25%	n	179	191	
Mean	470.5		470.7			
Adj. Mean	461.5		459.1	0.891		
95% C.I.	(432.9,491.1)		(431.8,487.2)			
Differential Cortisol	Group-by- Race-by Age	Nonblack Born ≥1942	n	374	342	
			Mean	2.07	2.34	
			Adj. Mean	1.36	1.65	0.331
			95% C.I.	(0.38,2.34)	(0.67,2.64)	
		Nonblack Born <1942	n	572	545	
			Mean	2.53	2.36	
			Adj. Mean	1.85	1.66	0.419
			95% C.I.	(0.92,2.79)	(0.71,2.60)	
		Black Born ≥1942	n	32	27	
			Mean	0.17	3.05	
			Adj. Mean	-0.68	2.41	0.004
			95% C.I.	(-2.35,0.99)	(0.64,4.17)	
Black Born <1942	n	26	31			
	Mean	3.24	2.22			
	Adj. Mean	2.72	1.54	0.274		
	95% C.I.	(0.98,4.47)	(-0.14,3.23)			

APPENDIX Q

Immunological Evaluation

APPENDIX Q: Immunological Evaluation

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TABLE Q-1.

Summary of Group-by-Covariate Interactions for Immunological Variables

Variable	Interaction	Stratification	Statistic	Group		p-Value	
				Ranch Hand	Comparison		
Total T Cells	Group-by-Race	Nonblack	n	424	532	0.619	
			Adj. Mean 95% C.I.	1,616 (1,564, 1,669)	1,599 (1,554, 1,646)		
		Black	n	18	35	0.039	
			Adj. Mean 95% C.I.	1,566 (1,340, 1,810)	1,888 (1,705, 2,080)		
B Cells (Nonblacks Only)	Group-by- Lifetime Smoking (Pack-years)	0	n	128	149	0.004	
			Adj. Mean 95% C.I.	153.8 (135.6, 173.3)	189.9 (170.9, 210.0)		
		>0-20	n	200	265		0.998
			Adj. Mean 95% C.I.	199.5 (182.9, 216.9)	199.6 (185.3, 214.3)		
		>20-40	n	74	94	0.109	
			Adj. Mean 95% C.I.	200.4 (174.0, 228.7)	172.8 (151.5, 195.4)		
		>40	n	32	29	0.857	
			Adj. Mean 95% C.I.	219.9 (178.0, 266.3)	214.4 (172.5, 260.9)		
Monocytes	Group-by- Occupation Group-by- Current Alcohol Use (Drinks/day)	Officer 0	n	35	30	0.060	
			Adj. Mean 95% C.I.	44.19 (34.72, 56.23)	32.33 (24.88, 42.03)		
		Officer >0-2	n	100	131		0.569
			Adj. Mean 95% C.I.	40.43 (34.35, 47.59)	38.38 (33.00, 44.64)		
		Officer >2-4	n	31	37	0.689	
			Adj. Mean 95% C.I.	41.53 (32.00, 53.91)	44.35 (35.02, 56.17)		
		Officer >4	n	13	17	0.608	
			Adj. Mean 95% C.I.	37.65 (25.58, 55.43)	33.12 (25.18, 43.56)		
	Enlisted Flyer 0	n	21	27	0.232		
		Adj. Mean 95% C.I.	35.65 (26.32, 48.28)	45.10 (34.36, 59.20)			

TABLE Q-1. (continued)

Summary of Group-by-Covariate Interactions for Immunological Variables

Variable	Interaction	Stratification	Statistic	Group		p-Value
				Ranch Hand	Comparison	
Monocytes (Cont.)		Enlisted >0-2 Flyer	n Adj. Mean 95% C.I.	35 34.95 (27.53, 44.36)	50 43.22 (35.00, 53.37)	0.159
		Enlisted >2-4 Flyer	n Adj. Mean 95% C.I.	8 32.71 (20.35, 52.56)	9 56.23 (36.38, 86.89)	0.097
		Enlisted >4 Flyer	n Adj. Mean 95% C.I.	5 41.10 (22.28, 75.80)	11 36.17 (23.99, 54.54)	0.729
		Enlisted 0 Groundcrew	n Adj. Mean 95% C.I.	76 45.04 (37.89, 53.54)	96 48.98 (41.73, 57.50)	0.421
		Enlisted >0-2 Groundcrew	n Adj. Mean 95% C.I.	81 42.42 (35.81, 50.24)	120 41.59 (36.10, 47.91)	0.839
		Enlisted >2-4 Groundcrew	n Adj. Mean 95% C.I.	19 45.15 (33.05, 61.67)	17 37.37 (27.08, 51.57)	0.397
		Enlisted >4 Groundcrew	n Adj. Mean 95% C.I.	16 68.86 (49.04, 96.68)	23 35.32 (26.42, 47.23)	0.003
HLA-DR Cells	Group-by- Current Alcohol Use (Drinks/day)	0	n Adj. Mean 95% C.I.	142 593.1 (555.1, 632.2)	158 581.0 (544.4, 618.9)	0.650
		>0-2	n Adj. Mean 95% C.I.	223 559.5 (529.5, 590.3)	306 582.8 (557.0, 609.2)	0.232
		>2-4	n Adj. Mean 95% C.I.	58 553.4 (497.8, 611.9)	65 565.9 (512.7, 621.7)	0.750
		>4	n Adj. Mean 95% C.I.	36 563.7 (491.7, 640.6)	51 472.7 (417.7, 531.0)	0.052

TABLE Q-1. (continued)

Summary of Group-by-Covariate Interactions for Immunological Variables

Variable	Interaction	Stratification	Statistic	Group		p-Value	
				Ranch Hand	Comparison		
MLC Net Response	Group-by- Lifetime Smoking (Pack-years)	0	n	129	156	0.053	
			Adj. Mean	68,921	77,232		
			95% C.I.	(56,625, 82,424)	(64,572, 91,025)		
			>0-20	n	201	277	0.057
				Adj. Mean	67,976	74,333	
				95% C.I.	(56,990, 79,930)	(62,947, 86,665)	
			>20-40	n	71	88	0.128
				Adj. Mean	76,511	67,758	
				95% C.I.	(63,097, 91,216)	(55,676, 81,025)	
			>40	n	29	29	0.444
				Adj. Mean	71,116	63,991	
				95% C.I.	(54,784, 89,576)	(48,837, 81,189)	

TABLE 0-2.

Unadjusted Exposure Index Analyses for Cell Surface Markers by Occupation

Variable	Occupation	Statistic	Exposure Index			Contrast	p-Value
			Low	Medium	High		
Total T Cells	Officer	n	62	63	56	Overall	0.885
		Mean	1,594	1,550	1,578	M vs. L	0.626
		95% C.I.	(1471,1723)	(1429,1676)	(1449,1713)	H vs. L	0.865
	Enlisted Flyer	n	24	25	28	Overall	0.923
		Mean	1,677	1,659	1,622	M vs. L	0.901
		95% C.I.	(1477,1889)	(1464,1866)	(1439,1815)	H vs. L	0.697
	Enlisted Groundcrew	n	69	78	59	Overall	0.076
		Mean	1,759	1,555	1,586	M vs. L	0.032
		95% C.I.	(1623,1901)	(1434,1680)	(1446,1732)	H vs. L	0.091
Helper T Cells	Officer	n	62	63	55	Overall	0.970
		Mean	838.3	839.6	852.7	M vs. L	0.983
		95% C.I.	(755.8,925.1)	(757.7,925.8)	(764.5,945.8)	H vs. L	0.821
	Enlisted Flyer	n	24	26	27	Overall	0.832
		Mean	917.5	888.3	861.7	M vs. L	0.755
		95% C.I.	(789.3,1055.3)	(767.1,1018.5)	(744.5,987.5)	H vs. L	0.545
	Enlisted Groundcrew	n	69	76	59	Overall	0.296
		Mean	948.9	865.4	874.6	M vs. L	0.146
		95% C.I.	(867.6,1033.9)	(791.3,942.7)	(790.4,963.1)	H vs. L	0.227

TABLE Q-2. (continued).

Unadjusted Exposure Index Analyses for Cell Surface Markers by Occupation

Variable	Occupation	Statistic	Exposure Index			Contrast	p-Value
			Low	Medium	High		
Suppressor T Cells	Officer	n	62	64	56	Overall	0.287
		Mean	522.6	461.4	497.3	M vs. L	0.117
		95% C.I.	(467.9,583.6)	(413.8,514.4)	(442.7,558.7)	H vs. L	0.546
	Enlisted Flyer	n	24	26	28	Overall	0.891
		Mean	528.1	533.9	557.7	M vs. L	0.930
		95% C.I.	(443.1,629.3)	(451.1,631.9)	(474.1,656.0)	H vs. L	0.656
	Enlisted Groundcrew	n	69	77	59	Overall	0.123
		Mean	575.5	502.3	505.5	M vs. L	0.063
		95% C.I.	(518.9,638.3)	(455.4,554.0)	(451.9,565.3)	H vs. L	0.097
B Cells	Officer	n	62	64	55	Overall	0.453
		Mean	167.4	154.1	176.8	M vs. L	0.445
		95% C.I.	(143.5,193.2)	(131.5,178.4)	(150.7,205.0)	H vs. L	0.618
	Enlisted Flyer	n	24	25	26	Overall	0.262
		Mean	233.2	228.6	183.3	M vs. L	0.897
		95% C.I.	(185.4,286.6)	(182.1,280.3)	(142.7,228.9)	H vs. L	0.144
	Enlisted Groundcrew	n	69	73	59	Overall	0.966
		Mean	202.4	196.7	199.2	M vs. L	0.792
		95% C.I.	(173.3,233.8)	(168.8,226.8)	(168.1,233.0)	H vs. L	0.889

TABLE Q-2. (continued)

Unadjusted Exposure Index Analyses for Cell Surface Markers by Occupation

Variable	Occupation	Statistic	Exposure Index			Contrast	p-Value
			Low	Medium	High		
Monocytes	Officer	n	62	64	55	Overall	0.799
		Mean	43.32	46.85	47.39	M vs. L	0.584
		95% C.I.	(35.48,52.89)	(38.49,57.02)	(38.34,58.58)	H vs. L	0.546
	Enlisted Flyer	n	24	26	27	Overall	0.816
		Mean	36.91	37.52	41.76	M vs. L	0.940
		95% C.I.	(27.27,49.97)	(28.05,50.20)	(31.38,55.56)	H vs. L	0.563
	Enlisted Groundcrew	n	69	76	59	Overall	0.975
		Mean	46.97	47.03	48.18	M vs. L	0.992
		95% C.I.	(39.65,55.64)	(40.02,55.27)	(40.12,57.87)	H vs. L	0.842
HLA-DR Cells	Officer	n	62	63	56	Overall	0.750
		Mean	527.5	544.1	564.9	M vs. L	0.727
		95% C.I.	(463.9,595.1)	(480.0,612.2)	(495.8,638.7)	H vs. L	0.449
	Enlisted Flyer	n	24	26	28	Overall	0.932
		Mean	570.3	547.1	568.3	M vs. L	0.739
		95% C.I.	(475.4,673.9)	(457.7,644.5)	(480.3,663.7)	H vs. L	0.977
	Enlisted Groundcrew	n	69	76	58	Overall	0.973
		Mean	578.0	587.3	580.7	M vs. L	0.820
		95% C.I.	(521.7,637.1)	(533.2,644.0)	(519.4,645.6)	H vs. L	0.949

TABLE Q-2. (continued)

Unadjusted Exposure Index Analyses for Cell Surface Markers by Occupation

Variable	Occupation	Statistic	Exposure Index			Contrast	p-Value
			Low	Medium	High		
T ₄ /T ₈ Ratio	Officer	n	62	63	55	Overall	0.207
		Mean	1.732	2.002	1.758	M vs. L	0.106
		95% C.I.	(1.500,1.964)	(1.773,2.232)	(1.512,2.004)	H vs. L	0.881
	Enlisted Flyer	n	24	26	27	Overall	0.692
		Mean	1.793	1.781	1.625	M vs. L	0.955
		95% C.I.	(1.478,2.108)	(1.478,2.083)	(1.328,1.922)	H vs. L	0.449
	Enlisted Groundcrew	n	69	76	59	Overall	0.965
		Mean	1.751	1.780	1.780	M vs. L	0.812
		95% C.I.	(1.580,1.922)	(1.617,1.943)	(1.595,1.965)	H vs. L	0.822

TABLE Q-3.

Unadjusted Exposure Index Analyses for Functional Stimulation Tests by Occupation

Variable	Occupation	Statistic	Exposure Index			Contrast	p-Value
			Low	Medium	High		
Unstimulated Response (PHA)	Officer	n	61	64	56	Overall	0.047
		Mean	1,705	1,428	1,809	M vs. L	0.071
		95% C.I.	(1487,1955)	(1249,1632)	(1568,2087)	H vs. L	0.557
	Enlisted Flyer	n	24	26	28	Overall	0.466
		Mean	1,668	1,973	1,642	M vs. L	0.320
		95% C.I.	(1315,2114)	(1571,2478)	(1318,2045)	H vs. L	0.926
	Enlisted Groundcrew	n	69	78	58	Overall	0.818
		Mean	1,814	1,923	1,843	M vs. L	0.541
		95% C.I.	(1583,2079)	(1691,2186)	(1588,2139)	H vs. L	0.877
PHA Net Response	Officer	n	61	64	55	Overall	0.853
		Mean	213,383	205,057	209,661	M vs. L	0.575
		95% C.I.	(192,608, 234,158)	(184,775, 225,339)	(187,782 231,539)	H vs. L	0.809
	Enlisted Flyer	n	24	26	28	Overall	0.297
		Mean	245,179	209,656	219,358	M vs. L	0.131
		95% C.I.	(212,269, 278,089)	(178,038, 241,275)	(188,890, 249,827)	H vs. L	0.263
	Enlisted Groundcrew	n	69	78	58	Overall	0.414
		Mean	227,062	221,793	208,537	M vs. L	0.690
		95% C.I.	(208,219, 245,905)	(204,070, 239,515)	(187,984, 229,089)	H vs. L	0.194

TABLE Q-3. (continued)

Unadjusted Exposure Index Analyses for Functional Stimulation Tests by Occupation

Variable	Occupation	Statistic	Exposure Index			Contrast	p-Value
			Low	Medium	High		
Pokeweed Net Response	Officer	n	62	64	56	Overall	0.633
		Mean	85,479	86,250	96,107	M vs. L	0.947
		95% C.I.	(70,144, 102,328)	(71,074, 102,894)	(78,992, 114,899)	H vs. L	0.388
	Enlisted Flyer	n	24	26	28	Overall	0.004
		Mean	92,847	101,256	55,480	M vs. L	0.619
		95% C.I.	(71,008, 117,610)	(79,227, 125,985)	(40,058, 73,410)	H vs. L	0.011
	Enlisted Groundcrew	n	69	78	58	Overall	0.345
		Mean	77,859	92,188	87,540	M vs. L	0.151
		95% C.I.	(64,872, 92,030)	(78,815, 106,610)	(72,540, 103,950)	H vs. L	0.360
MLC Net Response	Officer	n	58	63	54	Overall	0.940
		Mean	74,175	78,069	76,486	M vs. L	0.727
		95% C.I.	(59,443, 90,536)	(63,516, 94,123)	(61,000, 93,722)	H vs. L	0.841
	Enlisted Flyer	n	23	26	26	Overall	0.724
		Mean	71,959	74,217	62,391	M vs. L	0.892
		95% C.I.	(50,336, 97,436)	(53,426, 98,416)	(43,471, 84,721)	H vs. L	0.550
	Enlisted Groundcrew	n	68	77	57	Overall	0.248
		Mean	69,460	85,901	81,091	M vs. L	0.102
		95% C.I.	(56,591, 83,647)	(72,345, 100,620)	(65,912, 97,842)	H vs. L	0.275

TABLE 0-4.

Interaction Summaries of Adjusted Exposure Index Analyses for Immunological Variables

Variable	Interaction (Occupation)	Stratification	Statistic	Exposure Index			Contrast	p-Value	
				Low	Medium	High			
Unstimulated Response (PHA)	Exposure Index-by- Lifetime	0	n	4	0	5	M vs. L	--	
			Adj. Mean	3,273	--	1,557	H vs. L	0.031	
	Alcohol Use (Drink/years) (Officer)	>0-5	n	22	22	16	M vs. L	0.655	
			Adj. Mean	2,118	1,975	2,770	H vs. L	0.125	
		>5-30	n	24	22	15	M vs. L	0.071	
			Adj. Mean	2,752	2,069	2,788	H vs. L	0.941	
		>30-100	n	10	17	16	M vs. L	0.628	
			Adj. Mean	2,357	2,120	1,892	H vs. L	0.319	
		>100	n	1	2	3	M vs. L	0.725	
			Adj. Mean	1,983	1,555	6,700	H vs. L	0.049	
	PHA Net Response	Exposure Index-by- Age (Officer)	Born \geq 1942	n	18	9	7	M vs. L	0.002
				Adj. Mean	261,397	153,534	299,002	H vs. L	0.302
Born 1923-1941		n	40	43	46	M vs. L	0.943		
		Adj. Mean	234,921	236,262	223,373	H vs. L	0.534		
Born \leq 1922		n	3	11	1	M vs. L	0.095		
		Adj. Mean	139,307	229,757	191,111	H vs. L	0.632		

TABLE Q-5.

**Unadjusted Analyses for Cell Surface Markers by Group
(Original Comparisons Only)**

Variable	Statistic	Group		p-Value
		Ranch Hand	Original Comparison	
Total T Cells	n	464	424	0.711
	Mean	1,606	1,592	
	95% C.I.	(1551,1662)	(1537,1648)	
Helper T Cells	n	461	423	0.765
	Mean	868.1	861.0	
	95% C.I.	(833.3,903.6)	(826.4,896.3)	
Suppressor T Cells	n	465	425	0.630
	Mean	521.9	529.7	
	95% C.I.	(498.5,546.5)	(505.7,554.8)	
B Cells	n	457	418	0.708
	Mean	185.2	188.1	
	95% C.I.	(173.8,197.0)	(176.5,200.1)	
Monocytes	n	462	424	0.744
	Mean	46.19	45.47	
	95% C.I.	(43.05,49.56)	(42.39,48.79)	
HLA-DR Cells	n	462	424	0.917
	Mean	571.6	569.9	
	95% C.I.	(547.6,596.2)	(546.1,594.3)	
T ₄ /T ₈ Ratio	n	461	421	0.410
	Mean	1.597	1.558	
	95% C.I.	(1.528,1.669)	(1.491,1.629)	

TABLE Q-6.

Adjusted Analyses for Cell Surface Markers by Group
(Original Comparisons Only)

Variable	Statistic	Group		p-Value	Covariate Remarks*
		Ranch Hand	Original Comparison		
Total T Cells	n	442	414		BATCH (p<0.001)
	Adj. Mean	****	****	****	GRP*RACE (p=0.028)
	95% C.I.	****	****		DRKYR*PACKYR (p=0.004) CSMOK (p<0.001) ALC (p=0.005) AGE (p=0.049)
Helper Cells	n	439	413		BATCH (p=0.014)
	Adj. Mean	862.9	867.5	0.835	DAY (BATCH) (p=0.007)
	95% C.I.	(829.8, 896.6)	(834.6, 901.1)		AGE (p<0.001) CSMOK (p<0.001) ALC*OCC (p=0.025) DRKYR*PACKYR (p=0.001)
Suppressor T Cells	n	465	425		BATCH (p<0.001)
	Adj. Mean	****	****	****	GRP*RACE (p=0.010)
	95% C.I.	****	****		OCC (p=0.021) AGE (p=0.006) CSMOK (p<0.001)
B Cells	n	455	416		BATCH (p<0.001)
	Adj. Mean	185.5	191.1	0.451	OCC (p=0.041)
	95% C.I.	(174.2, 197.1)	(179.6, 202.9)		AGE (p=0.005) ALC (p=0.002) CSMOK (p<0.001)
Monocytes	n	440	414		BATCH (p<0.001)
	Adj. Mean	****	****	****	DAY (BATCH) (p<0.001)
	95% C.I.	****	****		GRP*AGE (p=0.040) OCC (p=0.010) DRKYR (p=0.008) CSMOK (p<0.001) PACKYR (p=0.020)
HLA-DR Cells	n	461	423		BATCH (p<0.001)
	Adj. Mean	570.5	568.2	0.887	DAY (BATCH) (p=0.014)
	95% C.I.	(546.9, 594.5)	(545.0, 592.0)		OCC (p=0.017) CSMOK (p<0.001) AGE*PACKYR (p=0.007)

TABLE Q-6. (continued)

Adjusted Analyses for Cell Surface Markers by Group
(Original Comparisons Only)

Variable	Statistic	Group		p-Value	Covariate Remarks*
		Ranch Hand	Original Comparison		
T ₄ /T ₈ Ratio	n	461	421		BATCH (p<0.001)
	Adj. Mean	****	****	****	OCC (p=0.002)
	95% C.I.	****	****		GRP*CSMOK (p=0.016)

*Abbreviations:

BATCH: batch-to-batch variation among examination groups

DAY (BATCH): blood-draw day variation

ALC: current alcohol use

CSMOK: current smoking

OCC: occupation

GRP: group

DRKYR: lifetime alcohol use (drink-years)

PACKYR: lifetime smoking (pack-years)

****Group-by-covariate interaction - adjusted mean, confidence interval, and p-value not presented.

TABLE Q-7.

Summary of Group-by-Covariate Interactions for Cell Surface Markers
(Original Comparisons Only)

Variable	Interaction	Stratification	Statistic	Group		p-Value
				Ranch Hand	Original Comparison	
Total T Cells	Group-by-Race	Nonblack	n	424	391	0.324
			Adj. Mean	1,601.7	1,567.3	
			95% C.I.	(1,554.6, 1,649.6)	(1,518.6, 1,161.6)	
		Black	n	18	23	0.043
			Adj. Mean	1,558.3	1,888.6	
			95% C.I.	(1,338.6, 1,794.8)	(1,673.1, 2,117.1)	
Suppressor T Cells	Group-by-Race	Nonblack	n	444	402	0.960
			Adj. Mean	530.0	530.8	
			95% C.I.	(505.5, 555.6)	(506.2, 556.6)	
		Black	n	21	23	0.008
			Adj. Mean	497.5	708.8	
			95% C.I.	(411.0, 602.2)	(589.6, 852.2)	
Monocytes	Group-by-Age	Born \geq 1942	n	174	162	0.048
			Adj. Mean	41.39	48.02	
			95% C.I.	(36.88, 46.44)	(42.89, 53.76)	
		Born 1923-1941	n	247	232	0.058
			Adj. Mean	48.20	42.82	
			95% C.I.	(44.04, 52.76)	(39.02, 46.99)	
		Born \leq 1922	n	19	20	0.924
			Adj. Mean	47.88	46.90	
			95% C.I.	(35.06, 65.40)	(34.85, 63.13)	
T ₄ /T ₈ Ratio	Group-by-Current Smoking (Cigarettes/day)	0	n	277	273	0.454
			Adj. Mean	1.44	1.48	
			95% C.I.	(1.36, 1.52)	(1.40, 1.56)	
		>0-20	n	78	69	0.811
			Adj. Mean	1.70	1.73	
			95% C.I.	(1.54, 1.88)	(1.56, 1.92)	
		>20-40	n	90	71	0.004
			Adj. Mean	1.84	1.51	
			95% C.I.	(1.68, 2.01)	(1.36, 1.67)	
		>40	n	16	8	0.895
			Adj. Mean	1.70	1.75	
			95% C.I.	(1.38, 2.11)	(1.30, 2.35)	

TABLE Q-8.

**Unadjusted Analyses for Functional
Stimulation Tests by Group
(Original Comparisons Only)**

Variable	Statistic	Group		p-Value
		Ranch Hands	Original Comparison	
Unstimulated Response (PHA)	n	464	426	0.608
	Mean	1,669	1,640	
	95% C.I.	(1,578, 1,755)	(1,559, 1,724)	
PHA Net Response	n	463	425	0.168
	Mean	212,481	206,796	
	95% C.I.	(206,424, 218,539)	(200,733, 212,858)	
Pokeweed Net Response	n	465	426	0.522
	Mean	85,559	83,724	
	95% C.I.	(81,373, 89,849)	(79,579, 87,974)	
MLC Net Response	n	452	415	0.285
	Mean	79,451	82,387	
	95% C.I.	(75,485, 83,519)	(78,363, 86,512)	

TABLE Q-9.

Adjusted Analyses for Functional Stimulation Tests by Group
(Original Comparisons Only)

Variable	Statistic	Group		p-Value	Covariate Remarks
		Ranch Hand	Original Comparison		
Unstimulated Response (PHA)	n	464	426	0.613	BATCH (p<0.001) DAY (BATCH) (p<0.001) RACE (p<0.001) AGE (p<0.001)
	Adj. Mean	1,813	1,783		
	95% C.I.	(1,645, 1,997)	(1,620, 1,962)		
PHA Net Response	n	461	423	****	BATCH (p<0.001) DAY (BATCH) (p<0.001) GRP*OCC (p=0.017) RACE (p=0.005) AGE (p=0.001) ALC*CSMOK (p=0.037)
	Adj. Mean	****	****		
	95% C.I.	****	****		
Pokeweed Net Response	n	465	426	0.746	BATCH (p<0.001) DAY (BATCH) (p<0.001) OCC (p=0.046) CSMOK (p<0.001)
	Adj. Mean	92,684	91,738		
	95% C.I.	(86,712, 98,855)	(85,660, 98,023)		
MLC Net Response	n	431	405	0.197	BATCH (p<0.001) DAY (BATCH) (p<0.001) ALC (p<0.001) DRKYR (p=0.001) CSMOK (p<0.001)
	Adj. Mean	79,412	82,916		
	95% C.I.	(73,680, 85,359)	(76,848, 89,214)		

****Group-by-covariate interaction - adjusted mean, confidence interval, and p-value not presented.

TABLE Q-10.

Summary of Group-by-Covariate Interactions for Functional Stimulation Tests
(Original Comparisons Only)

Variable	Interaction	Stratification	Statistic	Group		p-Value
				Ranch Hand	Original Comparison	
PHA Net Response	Group-by-Occupation	Officer	n	180	163	0.280
			Adj. Mean	217,397	210,363	
			95% C.I.	(201,412, 233,382)	(193,843, 226,883)	
		Enlisted Flyer	n	78	77	0.003
			Adj. Mean	230,597	202,077	
			95% C.I.	(212,032, 249,162)	(183,749, 220,405)	
		Enlisted Groundcrew	n	203	183	0.504
			Adj. Mean	208,347	212,473	
			95% C.I.	(193,386, 223,308)	(197,550, 227,397)	
MLC Net Response	Group-by-Lifetime Smoking (Pack-years)	0	n	129	109	0.107
			Adj. Mean	78,900	87,110	
			95% C.I.	(69,737, 88,627)	(77,309, 97,496)	
		>0-20	n	201	206	0.079
			Adj. Mean	76,689	83,468	
			95% C.I.	(69,735, 83,973)	(76,169, 91,101)	
		>20-40	n	71	67	0.086
			Adj. Mean	86,904	75,456	
			95% C.I.	(77,241, 97,135)	(65,854, 85,711)	
>40	n	29	23	0.679		
	Adj. Mean	80,525	75,984			
	95% C.I.	(66,260, 96,180)	(60,806, 92,850)			

APPENDIX R
Pulmonary Disease

APPENDIX R: Pulmonary Disease

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APPENDIX R: Pulmonary Disease

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TABLE R-1.

**Unadjusted Analyses of Respiratory Variables by Group
(Original Comparisons Only)**

Variable	Statistic	Group				Est. Relative Risk (95% C.I.)	p-Value
		Ranch Hand		Original Comparison			
		Number	Percent	Number	Percent		
Asthma	n	1,016		954		0.98 (0.64,1.51)	0.92
	Abnormal	44	4.3	42	4.4		
	Normal	972	95.7	912	95.6		
Bronchitis	n	1,015		954		0.91 (0.71,1.19)	0.50
	Abnormal	129	12.7	131	13.7		
	Normal	886	87.3	823	86.3		
Pleurisy	n	1,016		953		0.98 (0.65,1.49)	0.92
	Abnormal	47	4.6	45	4.7		
	Normal	969	95.4	908	95.3		
Pneumonia	n	1,016		953		0.95 (0.76,1.18)	0.64
	Abnormal	195	19.2	191	20.0		
	Normal	821	80.8	762	80.0		
Tuberculosis	n	1,015		954		1.32 (0.43,3.97)	0.64
	Abnormal	7	0.7	5	0.5		
	Normal	1,008	99.3	949	99.5		
Thorax & Lungs	n	1,015		955		1.29 (0.87,1.92)	0.20
	Abnormal	61	6.0	45	4.7		
	Normal	954	94.0	910	95.3		

TABLE R-1. (continued)

Unadjusted Analyses of Respiratory Variables by Group
(Original Comparisons Only)

Variable	Statistic	Group				Est. Relative Risk (95% C.I.)	p-Value
		Ranch Hand		Original Comparison			
		Number	Percent	Number	Percent		
Asymmetrical Exp.	n	1,015		955		0.94 (0.16,5.49)	0.95
	Abnormal	2	0.2	2	0.2		
	Normal	1,013	99.8	953	99.8		
Hyperresonance	n	1,015		955		1.01 (0.60,1.69)	0.98
	Abnormal	30	3.0	28	2.9		
	Normal	985	97.0	927	97.1		
Dullness	n	1,015		955		--	0.17
	Abnormal	2	0.2	0	0.0		
	Normal	1,013	99.8	955	100.0		
Wheezes	n	1,015		955		1.42 (0.76,2.67)	0.28
	Abnormal	24	2.4	16	1.7		
	Normal	991	97.6	939	98.3		
Rales	n	1,015		955		1.41 (0.42,4.70)	0.59
	Abnormal	6	0.6	4	0.4		
	Normal	1,009	99.4	951	99.6		
X ray	n	1,012		951		0.83 (0.63,1.10)	0.20
	Abnormal	102	10.1	113	11.9		
	Normal	910	89.9	838	88.1		

TABLE R-2.

Adjusted Analyses of Respiratory Variables by Group
(Original Comparisons Only)

Variable	Group		Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks*
	Ranch Hand	Original Comparison			
Asthma	1,012	953	****	****	PACKYR (p=0.02) GRP*PACKYR (p=0.03)
Bronchitis	1,011	953	0.91 (0.70,1.18)	0.44	GRP*PACKYR (Borderline: p=0.09)
Pleurisy	1,012	952	****	****	GRP*PACKYR (p=0.0006)
Pneumonia	1,012	952	0.97 (0.77,1.22)	0.74	AGE (p=0.002)
Tuberculosis	1,011	953	1.32 (0.43,3.98)	0.60	GRP*PACKYR (Borderline: p=0.06)
Thorax and Lungs	1,011	954	1.33 (0.88,2.01)	0.14	AGE (p<0.0001) PACKYR (p<0.0001)
Asymmetrical Exp.	1,011	954	0.94 (0.16,5.50)	0.97	AGE*PACKYR (Borderline: p=0.08)
Hyperresonance	1,011	954	1.00 (0.58,1.74)	0.87	AGE (p<0.0001) PACKYR (p<0.0001) GRP*PACKYR (Borderline: p=0.09)

TABLE R-2. (continued)

Adjusted Analyses of Respiratory Variables by Group
(Original Comparisons Only)

Variable	Group		Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks*
	Ranch Hand	Original Comparison			
Dullness	1,011	954	--	--	None
Wheezes	1,011	954	1.43 (0.75,2.76)	0.25	PACKYR (p<0.0006)
Rales	1,011	954	1.42 (0.39,5.18)	0.59	AGE*PACKYR (p=0.04) GRP*AGE (p=0.09)
X Ray	1,008	950	0.86 (0.64,1.16)	0.31	AGE (p<0.0001) PACKYR (p=0.02) GRP*PACKYR (Borderline: p=0.07)

*Abbreviations

PACKYR: lifetime smoking history (pack-years)

GRP: group

TABLE R-3.

Summary of Group-by-Covariate Interactions for Respiratory Variables
(Original Comparisons Only)

Variable	Interaction	Stratification	Statistic	Group				Adj. Relative Risk (95% C.I.)	p-Value		
				Ranch Hand		Original Comparison					
				Number	Percent	Number	Percent				
Asthma	Group-by- Pack-Year	0	n	291		268		4.78 (1.39,15.56)	0.04		
			Abnormal	11	3.78	3	1.12				
			Normal	280	96.22	265	98.88				
		>0-10	n	284		280				1.33 (0.63,2.83)	0.46
			Abnormal	16	5.63	12	4.29				
			Normal	268	94.37	268	95.71				
		>10	n	437		405				0.57 (0.31,1.05)	0.07
			Abnormal	17	3.89	27	6.67				
			Normal	420	96.11	378	93.33				
Bronchitis	Group-by- Pack-Year	0	n	291		268		1.46 (0.86,2.48)	0.16		
			Abnormal	38	13.06	25	9.33				
			Normal	253	86.94	243	90.67				
		>0-10	n	284		280				0.93 (0.58,1.49)	0.75
			Abnormal	38	13.38	40	14.29				
			Normal	246	86.62	240	85.71				
		>10	n	436		405				0.70 (0.47,1.03)	0.07
			Abnormal	52	11.93	66	16.30				
			Normal	384	88.07	339	83.70				

TABLE R-3. (continued)

Summary of Group-by-Covariate Interactions for Respiratory Variables
(Original Comparisons Only)

Variable	Interaction	Stratification	Statistic	Group				Adj. Relative Risk (95% C.I.)	p-Value
				Ranch Hand		Original Comparison			
				Number	Percent	Number	Percent		
Pleurisy	Group-by- Pack-Year	0	n	291		267		1.48 (0.50,4.37)	0.49
			Abnormal	8	2.75	5	1.87		
			Normal	283	97.25	262	98.13		
		>0-10	n	284		280		4.67 (1.61,13.02)	<0.001
			Abnormal	18	6.34	4	1.43		
			Normal	266	93.66	276	98.57		
		>10	n	437		405		0.52 (0.30,0.90)	0.02
			Abnormal	21	4.81	36	8.89		
			Normal	416	95.19	369	91.11		
Tuberculosis	Group-by- Pack-Year	0	n	290		268		0.31 (0.05,2.34)	0.28
			Abnormal	1	0.34	3	1.12		
			Normal	289	99.66	265	98.88		
		>0-10	n	284		280		—	0.05
			Abnormal	4	1.41	0	0.00		
			Normal	280	98.59	280	100.00		
		>10	n	437		405		0.93 (0.16,5.42)	0.92
			Abnormal	2	0.46	2	0.49		
			Normal	435	99.54	403	99.51		

TABLE R-3. (continued)

Summary of Group-by-Covariate Interactions for Respiratory Variables
(Original Comparisons Only)

Variable	Interaction	Stratification	Statistic	Group				Adj. Relative Risk (95% C.I.)	p-Value
				Ranch Hand		Original Comparison			
				Number	Percent	Number	Percent		
Hyper-resonance	Group-by-Pack-Year	0	n	291		268		—	0.17
			Abnormal	2	0.69	0	0.00		
			Normal	289	99.31	268	100.00		
		>0-10	n	283		281		2.70 (0.75,9.27)	0.13
			Abnormal	8	2.83	3	1.07		
			Normal	275	97.17	278	98.93		
		>10	n	437		405		0.73 (0.40,1.33)	0.30
			Abnormal	20	4.58	25	6.17		
			Normal	417	95.42	380	93.83		
Rales	Group-by-Age	Born >1942	n	384		341		—	0.35
			Abnormal	1	0.26	0	0.00		
			Normal	383	99.74	341	100.00		
		Born 1922-1942	n	600		577		1.20 (0.34, 4.21)	0.78
			Abnormal	5	0.83	4	0.69		
			Normal	595	99.17	573	99.31		
		Born <1922	n	27		36		—	—
			Abnormal	0	0.00	0	0.00		
			Normal	27	100.00	36	100.00		

TABLE R-3. (continued)

Summary of Group-by-Covariate Interactions for Respiratory Variables
(Original Comparisons Only)

Variable	Interaction	Stratification	Statistic	Group				Adj. Relative Risk (95% C.I.)	p-Value		
				Ranch Hand		Original Comparison					
				Number	Percent	Number	Percent				
X Ray	Group-by-Pack-Year	0	n	290		266		0.45 (0.24,0.85)	0.01		
			Abnormal	15	5.17	29	10.90				
			Normal	275	94.83	237	89.10				
		>0-10	n	282		281				1.08 (0.62, 1.89)	0.79
			Abnormal	28	9.93	26	9.25				
			Normal	254	90.07	255	90.75				
		>10	n	436		403				0.93 (0.63, 1.37)	0.72
			Abnormal	59	13.53	58	14.39				
			Normal	377	86.47	345	85.61				

OFFICERS

The statistically significant bronchitis-by-exposure-by-age-by-pack-year interaction (p=0.009) shown in Table 20-5 is described here in Table R-4.

TABLE R-4.

Cross Tabulation of Bronchitis- (Abnormal, Total) by-Exposure Index Category-by-Age Category-by-Pack-Year Category for Ranch Hand Officers

Pack-Years	Age	Exposure Index								
		Low			Medium			High		
		Abnormal	Total	Percent	Abnormal	Total	Percent	Abnormal	Total	Percent
0	Born >1942	4	21	19	0	10	0	1	3	33
	Born 1922-1942	3	32	9	7	36	19	8	44	10
	Born <1922	0	3	0	0	3	0	0	0	
>0-10	Born >1942	1	14	7	2	7	29	0	0	
	Born 1922-1942	2	15	13	5	19	26	1	26	4
	Born <1922	0	0		0	3	0	0	1	0
>10	Born >1942	0	3	0	2	4	50	0	4	0
	Born 1922-1942	8	39	21	3	43	7	4	44	9
	Born <1922	0	0		1	5	20	0	1	0

The statistically significant pneumonia-by-exposure-by-age-by-pack-year interaction (p=0.040) shown in Table 20-5 is described here in Table R-5.

TABLE R-5.

Cross Tabulation of Pneumonia- (Abnormal, Total) by-Exposure Index Category-by-Age Category-by-Pack-Year Category for Ranch Hand Officers

Pack-Years	Age	Exposure Index								
		Low			Medium			High		
		Abnormal	Total	Percent	Abnormal	Total	Percent	Abnormal	Total	Percent
0	Born >1942	6	21	29	0	10	0	1	3	33
	Born 1922-1942	6	22	19	6	36	17	10	44	23
	Born <1922	0	3	0	1	3	33	0	0	
>0-10	Born >1942	1	14	7	1	7	14	0	0	
	Born 1922-1942	4	15	27	4	19	21	9	26	35
	Born <1922	0	0		0	3	0	1	1	100
>10	Born >1942	0	3	0	1	4	25	0	4	0
	Born 1922-1942	9	39	23	6	43	14	8	44	18
	Born <1922	0	0		1	5	20	0	1	0

The statistically significant hyperresonance-by-exposure-by-pack-year interaction (p=0.07) seen in Table 20-5 is tabulated in Table R-6.

TABLE R-6.

Cross Tabulation of Hyperresonance- (Abnormal, Total) by-Exposure Index Category-
by-Pack-Year Category for Ranch Hand Officers

Pack-Years	Exposure Index								
	Low			Medium			High		
	Abnormal	Total	Percent	Abnormal	Total	Percent	Abnormal	Total	Percent
0	0	56	0	0	49	0	1	47	2
>0-10	0	29	0	1	29	3	1	27	4
>10	5	42	12	1	52	2	0	49	0

The statistically significant thorax- and lung-by-exposure category interaction ($p=0.05$) shown in Table 20-5 is tabulated in Table R-7.

TABLE R-7.

Cross Tabulation of Thorax and Lung- (Abnormal, Total) by- Exposure Index Category for Ranch Hand Officers

Exposure Index								
Low			Medium			High		
Abnormal	Total	Percent	Abnormal	Total	Percent	Abnormal	Total	Percent
9	127	7	3	130	2	5	123	4

The statistically borderline significant x ray-by-exposure-category-by-age-by-pack-year interaction (p=0.08) seen in Table 20-5 is tabulated in Table R-8.

TABLE R-8.

Cross Tabulation of X Ray- (Abnormal, Total) by-Exposure Index Category-by-Age Category-by-Pack-Year Category for Ranch Hand Officers

Pack-Years	Age	Exposure Index								
		Low			Medium			High		
		Abnormal	Total	Percent	Abnormal	Total	Percent	Abnormal	Total	Percent
0	Born >1942	1	21	5	0	10	0	0	3	0
	Born 1922-1942	3	32	9	1	36	3	2	44	5
	Born <1922	0	3	0	0	3	0	0	0	
>0-10	Born >1942	0	14	0	0	6	0	0	0	
	Born 1922-1942	3	15	20	3	19	16	2	26	8
	Born <1922	0	0		1	3	33	0	1	0
>10	Born >1942	0	3	0	0	4	0	0	4	0
	Born 1922-1942	7	39	18	7	43	16	2	44	5
	Born <1922	0	0		1	5	20	1	1	100

ENLISTED FLYERS

The statistically significant bronchitis-by-exposure-by-age-by-pack-year interaction (p=0.005) seen in Table 20-6 is tabulated in Table R-9.

TABLE R-9.

Cross Tabulation of Bronchitis- (Abnormal, Total) by-Exposure Index
 Category-by-Age Category-by-Pack-Year Category for Ranch Hand Enlisted Flyers

Pack-Years	Age	Exposure Index								
		Low			Medium			High		
		Abnormal	Total	Percent	Abnormal	Total	Percent	Abnormal	Total	Percent
0	Born >1942	2	3	67	0	3	0	0	3	0
	Born ≤1942	0	6	0	0	6	0	1	11	9
>0-10	Born >1942	1	4	25	1	6	17	2	2	100
	Born ≤1942	1	13	8	1	9	11	0	7	0
>10	Born >1942	0	2	0	0	7	0	0	2	0
	Born ≤1942	3	26	12	6	32	19	3	31	10

The statistically borderline significant pleurisy-by-exposure-by-age-by-pack-year interaction (p=0.08) shown in Table 20-6 is tabulated in Table R-10.

TABLE R-10.

Cross Tabulation of Pleurisy- (Abnormal, Total) by-Exposure Index Category-by-Age Category-by-Pack-Year Category for Ranch Hand Enlisted Flyers

Pack-Years	Age	Exposure Index								
		Low			Medium			High		
		Abnormal	Total	Percent	Abnormal	Total	Percent	Abnormal	Total	Percent
0	Born >1942	0	3	0	0	3	0	0	3	0
	Born <1942	0	6	0	0	6	0	0	11	0
>0-10	Born >1942	1	4	25	0	6	0	1	2	50
	Born <1942	1	13	8	1	9	11	0	7	0
>10	Born >1942	1	2	50	0	7	0	0	2	0
	Born <1942	1	26	4	1	32	3	2	32	6

The statistically borderline significant pneumonia-by-exposure-by-age interaction (p=0.08) shown in Table 20-6 is tabulated in Table R-11.

TABLE R-11.

Cross Tabulation of Pneumonia- (Abnormal, Total) -by-Exposure Index
Category-by-Age Category for Ranch Hand Enlisted Flyers

Age	Exposure Index								
	Low			Medium			High		
	Abnormal	Total	Percent	Abnormal	Total	Percent	Abnormal	Total	Percent
Born >1942	4	9	44	2	16	13	0	7	0
Born <1942	10	45	22	10	47	21	13	50	26

The statistically borderline significant hyperresonance-by-exposure-by-pack-year category interaction (p=0.08) shown in Table 20-6 is tabulated in Table R-12.

TABLE R-12.

Cross Tabulation of Hyperresonance- (Abnormal, Total) by-Exposure Index Category-by-Pack-Year Category for Ranch Hand Enlisted Flyers

Pack-Years	Exposure Index								
	Low			Medium			High		
	Abnormal	Total	Percent	Abnormal	Total	Percent	Abnormal	Total	Percent
0	0	9	0	0	9	0	0	14	0
>0-10	0	17	0	2	15	13	0	9	0
>10	3	28	11	4	39	10	0	34	0

The statistically significant ($p=0.04$) thorax and lung-by-exposure interaction shown in Table 20-6 is tabulated in Table R-13.

TABLE R-13.

Cross Tabulation of Thorax and Lung Abnormalities- (Abnormal, Total)
by-Exposure Index Category for Ranch Hand Enlisted Flyers

Exposure Index								
Low			Medium			High		
Abnormal	Total	Percent	Abnormal	Total	Percent	Abnormal	Total	Percent
7	54	13	10	63	16	2	57	4

ENLISTED GROUND

The statistically significant asthma-by-exposure-by-age-by-pack-year interaction (p=0.02) shown in Table 20-7 is tabulated in Table R-14.

TABLE R-14.

Cross Tabulation of Asthma- (Abnormal, Total) by-Exposure Index Category-by-Age Category-by-Pack-Year Category for Ranch Hand Enlisted Groundcrew

Pack-Years	Age	Exposure Index								
		Low			Medium			High		
		Abnormal	Total	Percent	Abnormal	Total	Percent	Abnormal	Total	Percent
0	Born >1942	1	24	4	1	35	3	1	15	7
	Born 1922-1942	0	18	0	0	6	0	0	9	0
	Born <1922	0	0		0	0		0	0	
>0-10	Born >1942	0	37	0	2	47	4	4	36	11
	Born 1922-1942	1	16	16	1	7	14	0	13	0
	Born <1922	0	0		0	0		0	1	0
>10	Born >1942	0	22	0	4	46	9	0	25	0
	Born 1922-1942	4	33	12	0	21	0	2	37	5
	Born <1922	0	3	0	0	1	0	1	5	20

The statistically significant pleurisy-by-exposure-by-age interaction (p=0.03) shown in Table 20-7 is tabulated in Table R-15.

TABLE R-15.

Cross Tabulation of Pleurisy-(Abnormal, Total) by-Exposure Index Category-by-Age Category for Ranch Hand Enlisted Groundcrew

Age	Exposure Index								
	Low			Medium			High		
	Abnormal	Total	Percent	Abnormal	Total	Percent	Abnormal	Total	Percent
Born >1942	5	83	6	5	128	4	0	76	0
Born 1922-1942	7	67	10	0	34	0	5	59	8
Born <1922	0	3	0	0	1	0	0	6	0

The statistically significant wheeze-by-exposure-by-age interaction (p=0.009) shown in Table 20-7 is tabulated in Table R-16.

TABLE R-16.

Cross Tabulation of Wheezes- (Abnormal, Total) by-Exposure Index Category-by-Age Category for Ranch Hand Enlisted Groundcrew

Age	Exposure Index								
	Low			Medium			High		
	Abnormal	Total	Percent	Abnormal	Total	Percent	Abnormal	Total	Percent
Born >1942	2	83	2	1	127	1	3	76	4
Born 1922-1942	1	67	1	3	34	9	2	59	3
Born <1922	0	3	0	0	1	0	0	6	0

The statistically significant wheeze-by-exposure-by-pack-year interaction (p=0.02) shown in Table 20-7 is tabulated in Table R-17.

TABLE R-17.

Cross Tabulation of Wheezes- (Abnormal, Total) by-Exposure Index Category-by-Pack-Year Category for Ranch Hand Enlisted Groundcrew

Pack-Years	Exposure Index								
	Low			Medium			High		
	Abnormal	Total	Percent	Abnormal	Total	Percent	Abnormal	Total	Percent
0	0	42	0	3	41	0	0	24	0
>0-10	2	53	4	3	53	6	1	50	2
>10	1	58	2	1	68	1	4	67	6

The statistically borderline significant bronchitis-by-exposure category interaction ($p=0.08$) shown in Table 20-7 is tabulated in Table R-18.

TABLE R-18.

Cross Tabulation of Bronchitis- (Abnormal, Total) by-Exposure Index
Category for Ranch Hand Enlisted Groundcrew

Exposure Index								
Low			Medium			High		
Abnormal	Total	Percent	Abnormal	Total	Percent	Abnormal	Total	Percent
25	153	16	19	163	12	11	141	8

APPENDIX S

Glossary of Abbreviations

APPENDIX S: Glossary of Abbreviations
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TABLE S-1

GLOSSARY OF TECHNICAL AND MEDICAL ABBREVIATIONS

	-A-	CHECO	- contemporary historical evaluation and combat operations
A	- replacement Comparisons interviewed by Air Force staff	CHOL	- cholesterol
ACA®	- Automated Chemical Analyser	CMI	- Cornell Medical Index
ACTH	- adrenocorticotropic hormone	CNS	- central nervous system
AFHS	- Air Force Health Study	COPRO	- coproporphyrins
ALA	- delta-aminolevulinic acid	CPK	- creatine phosphokinase
ALKPHOS	- alkaline phosphatase	cpm	- counts per minute
	-B-	CUSUM	- cumulative sum
BA	- Bachelor of Arts	CV	- coefficient of variation
BMDP-4F®	- log-linear program		-D-
BMDP-LR®	- logistic regression program	DBP	- diastolic blood pressure
BS	- Bachelor of Science	DNA	- deoxyribonucleic acid
BSL-2	- National Institutes of Health Biosafety Level 2		-E-
BUN	- blood urea nitrogen	E	- erythema
	-C-	ECG	- electrocardiograph
CAD	- coronary artery disease	EEG	- electroencephalogram
CAP	- College of American Pathology		-F-
CATI	- computer-aided telephone interview	FC	- fully compliant
CBC	- complete blood count	FEF ₂₅₋₇₅	- forced midexpiratory flow rate
CFU	- colony forming unit	FEV	- forced expiratory volume
CHD	- coronary heart disease	FEV ₁	- forced expiratory volume in one second
		FIR CUSUM	- fast initial response cumulative sum

TABLE S-1 (continued)

GLOSSARY OF TECHNICAL AND MEDICAL ABBREVIATIONS

FSH	- follicle stimulating hormone	ICD-9-CMD	- International Classification of Disease 9th Revision, Clinical Modification
FTA	- fluorescent treponemal antibody		
FTI	- free thyroxine index	IQ	- intelligence quotient
FVC	- forced vital capacity		
	-G-		
		K-S	- Kolmogorov-Smirnov
GED	- General Equivalency Diploma		
			-L-
GGTP	- gamma-glutamyl transpeptidase	LBBB	- left bundle branch block
		LDH	- lactic dehydrogenase
GLUC	- glucose	LH	- leuteinizing hormone
	-H-		
HB _s Ag	- hepatitis B surface antigen		
			-M-
HCT	- hematocrit	MCH	- mean corpuscular hemoglobin
HD	- Hodgkin's Disease	MCHC	- mean corpuscular hemoglobin concentration
HDL	- high density lipoprotein		
HGB	- hemoglobin	MCV	- mean corpuscular volume
HLA	- histocompatibility antigens	MI	- myocardial infarction
		ML	- malignant lymphoma
HPF	- high-power field	MLC	- mixed lymphocyte culture
HRB	- Halstead-Reitan battery	MMPI	- Minnesota Multiphasic Personality Inventory
	-I-		
		MMPID	- MMPI depression scale
I	- induration		
			-N-
IARC	- International Agency for Research on Cancer	NIOSH	- National Institute for Occupational Safety and Health
ICD	- International Classification of Disease		

TABLE S-1 (continued)

GLOSSARY OF TECHNICAL AND MEDICAL ABBREVIATIONS

NC	- noncompliant	PULM	- FEV ₁ /FVC ratio
NCI	- National Cancer Institute	PULSE	- pulse index
NCVA	- nerve conduction velocity above the ankle	PWM	- pokeweed mitogen
NCVE	- nerve conduction velocity above the elbow		-Q-
NHL	- non-Hodgkin's lymphoma	QA	- quality assurance
NKC	- natural killer cell	QC	- quality control
NORC	- National Opinion Research Center	QRC	- Quality Review Committee
NOS	- not otherwise specified		-R-
	-O-	R	- replacement Comparisons
O	- original Comparisons	RBBB	- right bundle branch block
OMR	- Optical Mark Recognition	RBC	- red blood cell
	-P-	RIA	- radioimmunoassay
PBM	- peripheral blood mononuclear	RPR	- rapid plasma reagin
PC	- partially compliant	RVN	- Republic of Vietnam
PCB	- polychlorinated biphenyl		-S-
PCT	- porphyria cutanea tarda	S	- shifted original Comparisons
PHA	- phytohemagglutinin	SAIC	- Science Applications International Corporation
PLAT	- platelet count	SAS®	- Statistical Analysis System
PLT	- platelet count	SAS®-GLM	- Statistical Analysis System general linear model
PMR	- proportionate mortality ratio	SCRF	- Scripps Clinic and Research Foundation
POMS	- profile of mood states	SEA	- Southeast Asia
PTSD	- post-traumatic stress disorder		

TABLE S-1 (continued)

GLOSSARY OF TECHNICAL AND MEDICAL ABBREVIATIONS

SED	- sedimentation rate		-W-
SEMEN	- semen count	WAIS	- Wechsler Adult Intelligence Scale
SGOT	- serum glutamic-oxaloacetic transaminase	WBC	- white blood cell
SGPT	- serum glutamic-pyruvic transaminase		
SIRL	- Scripps Immunology Reference Laboratory		
SKIN	- skin index		
STS	- soft tissue sarcoma		

-T-

T ₃	- triiodothyronine
T ₄	- total thyroxine
TBILI	- total bilirubin
TCDD	- 2,3,7,8-tetrachlorodibenzo-p-dioxin
TEST	- testosterone
TLC	- total lymphocyte count
TSH	- thyroid stimulating hormone

-U-

USG	- urine specific gravity
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-V-

VA	- Veterans Administration
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TABLE S-2.

Glossary of Covariate and Statistical Abbreviations

	-A-	d.f.	- degrees of freedom
ALC	- current alcohol use (drinks/day)	DIAB	- diabetic class
Adj. RR	- adjusted relative risk	DIFCORT	- differential cortisol
		DRKYR	- lifetime alcohol history (drink-years)
	-B-		
BATCH	- batch-to-batch variation among examination groups		-E-
BUN	- blood urea nitrogen	EDUC	- education
		Est. RR	- estimated relative risk
	-C-		
C.I.	- confidence interval		-G-
CC	- continuous dependent variable, adjusted by continuous covariates	GRP	- group
			-H-
CD	- continuous dependent variable, adjusted by discrete covariates	H	- high exposure index level
CHOL	- cholesterol	HDL	- high density lipoprotein cholesterol
CHOL/HDL	- cholesterol to HDL ratio		-I-
CI	- combat index	IC	- exposure to industrial chemicals
CSMOK	- current smoking (packs/day)	INS	- exposure to insecticides
	-D-		-L-
DAY(BATCH)	- blood-draw day variation within batch	L	- low exposure index level
DC	- exposure to degreasing chemicals	LAT	- average lifetime residential latitude
DD	- discrete dependent variable, adjusted by discrete covariates	LOG	- logarithmic

TABLE S-2. (continued)

Glossary of Covariate and Statistical Abbreviations

-M-

M - medium exposure index level

-N-

NS - not significant

-O-

OCC - occupation

OR - odds ratio

-P-

PACKYR - lifetime smoking history (pack-years)

%BFAT - percent body fat

PERSTYPE - personality type

PS - personality score

PTSD - post-traumatic stress disorder

-R-

RR - relative risk

-S-

SE - standard error

SEA ACNE - presence of pre-SEA acne

SKIN - skin color

SQRT - square root

SUNREAC - sun-reaction index

-W-

WINE - wine consumption