Table 14-9. Analysis of Diastolic Blood Pressure (Continuous)

(a) MODEL 1: RANCH HANDS VS. COMPARISONS – UNADJUSTED

Occupational Category	Group	n	Mean[a]	Difference of Means (95% C.I.)[b]	p-Valne[c]
All	***Ranch Hand***	***859***	***74.55***	***–0.06 --***	***0.883***
	Comparison	***1,232***	***74.61***		
Officer	Ranch Hand	334	74.17	–0.04 --	0.952
	Comparison	484	74.21		
Enlisted Flyer	Ranch Hand	149	75.22	0.12 --	0.905
	Comparison	186	75.10		
Enlisted Groundcrew	Ranch Hand	376	74.63	–0.17 --	0.780
	Comparison	562	74.80		

[a] Transformed from square root scale.
[b] Difference of means after transformation to original scale; confidence interval on difference of means not presented because analysis was performed on square root scale.
[c] P-value is based on difference of means on square root scale.

(b) MODEL 1: RANCH HANDS VS. COMPARISONS – ADJUSTED

Occupational Category	Group	n	Adjusted Mean[a]	Difference of Adj. Means (95% C.I.)[b]	p-Value[c]
All	***Ranch Hand***	***822***	***75.68***	***0.06 --***	***0.889***
	Comparison	***1,189***	***75.62***		
Officer	Ranch Hand	322	75.29	–0.08 --	0.907
	Comparison	472	75.37		
Enlisted Flyer	Ranch Hand	140	76.47	0.33 --	0.752
	Comparison	178	76.13		
Enlisted Groundcrew	Ranch Hand	360	75.37	0.08 --	0.898
	Comparison	539	75.29		

[a] Transformed from square root scale.
[b] Difference of means after transformation to original scale; confidence interval on difference of means not presented because analysis was performed on square root scale.
[c] P-value is based on difference of means on square root scale.

(c) MODEL 2: RANCH HANDS – INITIAL DIOXIN – UNADJUSTED

Initial Dioxin Category Summary Statistics				Analysis Results for Log_2 (Initial Dioxin)[b]		
Initial Dioxin	n	Mean[a]	Adj. Mean[ab]	R^2	Slope (Std. Error)[c]	p-Value
Low	155	74.07	74.24	0.023	0.025 (0.019)	0.190
Medium	161	75.16	75.17			
High	160	76.07	75.89			

[a] Transformed from square root scale.
[b] Adjusted for percent body fat at the time of the blood measurement of dioxin.
[c] Slope and standard error based on square root of diastolic blood pressure versus log_2 (initial dioxin).

Note: Low = 27–63 ppt; Medium = >63–152 ppt; High = >152 ppt.

Table 14-9. Analysis of Diastolic Blood Pressure (Continuous) (Continued)

(d) MODEL 2: RANCH HANDS – INITIAL DIOXIN – ADJUSTED

Initial Dioxin Category Summary Statistics			Analysis Results for Log_2 (Initial Dioxin)		
Initial Dioxin	n	Adj. Mean[a]	R^2	Adj. Slope (Std. Error)[b]	p-Value
Low	150	76.09	0.073	0.019 (0.023)	0.425
Medium	150	77.21			
High	157	77.40			

[a] Transformed from square root scale.
[b] Slope and standard error based on square root of diastolic blood pressure versus log_2 (initial dioxin).

Note: Low = 27–63 ppt; Medium = >63–152 ppt; High = >152 ppt.

(e) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – UNADJUSTED

Dioxin Category	n	Mean[a]	Adj. Mean[ab]	Difference of Adj. Mean vs. Comparisons (95% C.I.)[c]	p-Value[d]
Comparison	1,195	74.58	74.57		
Background RH	376	73.87	74.14	–0.43 --	0.432
Low RH	233	74.26	74.19	–0.38 --	0.569
High RH	243	75.93	75.65	1.08 --	0.099
Low plus High RH	476	75.11	74.93	0.36 --	0.468

[a] Transformed from square root scale.
[b] Adjusted for percent body fat at the time of the blood measurement of dioxin.
[c] Difference of means after transformation to original scale; confidence interval on difference of means not presented because analysis was performed on square root scale.
[d] P-value is based on difference of means on square root scale.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

Table 14-9. Analysis of Diastolic Blood Pressure (Continuous) (Continued)

(f) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – ADJUSTED

Dioxin Category	n	Adj. Mean[a]	Difference of Adj. Mean vs. Comparisons (95% C.L.)[b]	p-Value[c]
Comparison	1,155	75.67		
Background RH	360	75.56	–0.11 --	0.844
Low RH	221	75.23	–0.44 --	0.515
High RH	236	76.69	1.02 --	0.135
Low plus High RH	457	75.98	0.31 --	0.544

[a] Transformed from square root scale.
[b] Difference of means after transformation to original scale; confidence interval on difference of means not presented because analysis was performed on square root scale.
[c] P-value is based on difference of means on square root scale.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

(g) MODEL 4: RANCH HANDS – 1987 DIOXIN – UNADJUSTED

1987 Dioxin Category Summary Statistics			Analysis Results for Log_2 (1987 Dioxin +1)		
1987 Dioxin	n	Mean[a]	R^2	Slope (Std. Error)[b]	p-Value
Low	284	73.97	0.007	0.031 (0.013)	0.014
Medium	281	73.76			
High	287	75.94			

[a] Transformed from square root scale.
[b] Slope and standard error based on square root of diastolic blood pressure versus log_2 (1987 dioxin + 1).

Note: Low = ≤7.9 ppt; Medium = >7.9–19.6 ppt; High = >19.6 ppt.

(h) MODEL 4: RANCH HANDS – 1987 DIOXIN – ADJUSTED

1987 Dioxin Category Summary Statistics			Analysis Results for Log_2 (1987 Dioxin + 1)		
1987 Dioxin	n	Adj. Mean[a]	R^2	Adjusted Slope (Std. Error)[b]	p-Value
Low	271	75.59	0.061	0.016 (0.016)	0.315
Medium	271	75.01			
High	275	77.24			

[a] Transformed from square root scale.
[b] Slope and standard error based on square root of diastolic blood pressure versus log_2 (1987 dioxin + 1).

Note: Low = ≤7.9 ppt; Medium = >7.9–19.6 ppt; High = >19.6 ppt.

14.2.2.2.4 Diastolic Blood Pressure (Discrete)

All unadjusted and adjusted analyses of diastolic blood pressure in its dichotomous form were nonsignificant (Table 14-10(a–h): p>0.19 for each analysis).

Table 14-10. Analysis of Diastolic Blood Pressure (Discrete)

(a) MODEL 1: RANCH HANDS VS. COMPARISONS – UNADJUSTED

Occupational Category	Group	n	Number (%) High	Est. Relative Risk (95% C.I.)	p-Value
All	***Ranch Hand***	***859***	***45 (5.2)***	***1.06 (0.71,1.58)***	***0.769***
	Comparison	***1,232***	***61 (5.0)***		
Officer	Ranch Hand	334	20 (6.0)	1.34 (0.72,2.49)	0.360
	Comparison	484	22 (4.5)		
Enlisted Flyer	Ranch Hand	149	8 (5.4)	1.26 (0.46,3.45)	0.649
	Comparison	186	8 (4.3)		
Enlisted Groundcrew	Ranch Hand	376	17 (4.5)	0.81 (0.44,1.49)	0.499
	Comparison	562	31 (5.5)		

(b) MODEL 1: RANCH HANDS VS. COMPARISONS – ADJUSTED

Occupational Category	Adjusted Relative Risk (95% C.I.)	p-Value
All	***1.02 (0.67,1.56)***	***0.916***
Officer	1.21 (0.62,2.35)	0.576
Enlisted Flyer	1.18 (0.41,3.37)	0.760
Enlisted Groundcrew	0.84 (0.44,1.59)	0.584

(c) MODEL 2: RANCH HANDS – INITIAL DIOXIN – UNADJUSTED

Initial Dioxin Category Summary Statistics			Analysis Results for Log_2 (Initial Dioxin)[a]	
Initial Dioxin	n	Number (%) High	Estimated Relative Risk (95% C.I.)[b]	p-Value
Low	155	7 (4.5)	1.04 (0.79,1.37)	0.793
Medium	161	12 (7.5)		
High	160	10 (6.3)		

[a] Adjusted for percent body fat at the time of the blood measurement of dioxin.
[b] Relative risk for a twofold increase in initial dioxin.

Note: Low = 27–63 ppt; Medium = >63–152 ppt; High = >152 ppt.

(d) MODEL 2: RANCH HANDS – INITIAL DIOXIN – ADJUSTED

Analysis Results for Log_2 (Initial Dioxin)		
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
457	1.15 (0.80,1.67)	0.446

[a] Relative risk for a twofold increase in initial dioxin.

Table 14-10. Analysis of Diastolic Blood Pressure (Discrete) (Continued)

(e) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – UNADJUSTED

Dioxin Category	n	Number (%) High	Est. Relative Risk (95% C.I.)[ab]	p-Value
Comparison	1,195	59 (4.9)		
Background RH	376	15 (4.0)	0.85 (0.47,1.52)	0.576
Low RH	233	12 (5.2)	1.04 (0.55,1.96)	0.915
High RH	243	17 (7.0)	1.37 (0.78,2.41)	0.267
Low plus High RH	476	29 (6.1)	1.20 (0.75,1.90)	0.447

[a] Relative risk and confidence interval relative to Comparisons.
[b] Adjusted for percent body fat at the time of the blood measurement of dioxin.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

(f) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – ADJUSTED

Dioxin Category	n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
Comparison	1,155		
Background RH	360	0.78 (0.41,1.48)	0.449
Low RH	221	0.91 (0.45,1.83)	0.792
High RH	236	1.46 (0.80,2.68)	0.221
Low plus High RH	457	1.16 (0.71,1.91)	0.551

[a] Relative risk and confidence interval relative to Comparisons.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

(g) MODEL 4: RANCH HANDS – 1987 DIOXIN – UNADJUSTED

1987 Dioxin Category Summary Statistics			Analysis Results for Log_2 (1987 Dioxin + 1)	
1987 Dioxin	n	Number (%) High	Estimated Relative Risk (95% C.I.)[a]	p-Value
Low	284	14 (4.9)	1.14 (0.94,1.39)	0.198
Medium	281	9 (3.2)		
High	287	21 (7.3)		

[a] Relative risk for a twofold increase in 1987 dioxin.

Note: Low = ≤7.9 ppt; Medium = >7.9–19.6 ppt; High = >19.6 ppt.

Table 14-10. Analysis of Diastolic Blood Pressure (Discrete) (Continued)

(h) MODEL 4: RANCH HANDS – 1987 DIOXIN – ADJUSTED		
Analysis Results for Log_2 (1987 Dioxin + 1)		
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
817	1.20 (0.89,1.61)	0.228

[a] Relative risk for a twofold increase in 1987 dioxin.

14.2.2.2.5 Heart Sounds

All Model 1 and Model 2 analyses of heart sounds were nonsignificant (Table 14-11(a–d): p>0.11 for each analysis).

Table 14-11. Analysis of Heart Sounds

(a) MODEL 1: RANCH HANDS VS. COMPARISONS – UNADJUSTED					
Occupational Category	Group	n	Number (%) Abnormal	Est. Relative Risk (95% C.I.)	p-Value
All	***Ranch Hand***	***859***	***31 (3.6)***	***0.71 (0.45,1.10)***	***0.116***
	Comparison	***1,232***	***62 (5.0)***		
Officer	Ranch Hand	334	11 (3.3)	0.60 (0.29,1.23)	0.164
	Comparison	484	26 (5.4)		
Enlisted Flyer	Ranch Hand	149	7 (4.7)	0.78 (0.30,2.08)	0.625
	Comparison	186	11 (5.9)		
Enlisted Groundcrew	Ranch Hand	376	13 (3.5)	0.77 (0.39,1.52)	0.452
	Comparison	562	25 (4.4)		

(b) MODEL 1: RANCH HANDS VS. COMPARISONS – ADJUSTED		
Occupational Category	Adjusted Relative Risk (95% C.I.)	p-Value
All	***0.71 (0.45,1.13)***	***0.139***
Officer	0.60 (0.28,1.29)	0.190
Enlisted Flyer	0.65 (0.23,1.84)	0.419
Enlisted Groundcrew	0.86 (0.42,1.74)	0.675

(c) MODEL 2: RANCH HANDS – INITIAL DIOXIN – UNADJUSTED				
Initial Dioxin Category Summary Statistics			Analysis Results for Log_2 (Initial Dioxin)[a]	
Initial Dioxin	n	Number (%) Abnormal	Estimated Relative Risk (95% C.I.)[b]	p-Value
Low	155	6 (3.9)	1.01 (0.73,1.40)	0.958
Medium	161	10 (6.2)		
High	160	6 (3.8)		

[a] Adjusted for percent body fat at the time of the blood measurement of dioxin.
[b] Relative risk for a twofold increase in initial dioxin.

Note: Low = 27–63 ppt; Medium = >63–152 ppt; High = >152 ppt.

Table 14-11. Analysis of Heart Sounds (Continued)

(d) MODEL 2: RANCH HANDS – INITIAL DIOXIN – ADJUSTED

Analysis Results for Log_2 (Initial Dioxin)		
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
457	1.28 (0.83,1.98)	0.266

[a] Relative risk for a twofold increase in initial dioxin.

(e) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – UNADJUSTED

Dioxin Category	n	Number (%) Abnormal	Est. Relative Risk (95% C.I.)[ab]	p-Value
Comparison	1,195	60 (5.0)		
Background RH	376	9 (2.4)	0.48 (0.24,0.99)	0.047
Low RH	233	10 (4.3)	0.84 (0.42,1.67)	0.622
High RH	243	12 (4.9)	0.94 (0.50,1.79)	0.857
Low plus High RH	476	22 (4.6)	0.89 (0.54,1.48)	0.656

[a] Relative risk and confidence interval relative to Comparisons.
[b] Adjusted for percent body fat at the time of the blood measurement of dioxin.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

(f) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – ADJUSTED

Dioxin Category	n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
Comparison	1,155		
Background RH	360	0.45 (0.21,0.97)	0.041
Low RH	221	0.80 (0.39,1.61)	0.528
High RH	236	1.05 (0.52,2.11)	0.901
Low plus High RH	457	0.92 (0.54,1.56)	0.750

[a] Relative risk and confidence interval relative to Comparisons.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

Table 14-11. Analysis of Heart Sounds (Continued)

(g) MODEL 4: RANCH HANDS – 1987 DIOXIN – UNADJUSTED

1987 Dioxin Category Summary Statistics			Analysis Results for Log_2 (1987 Dioxin + 1)	
1987 Dioxin	n	Number (%) Abnormal	Estimated Relative Risk (95% C.I.)[a]	p-Value
Low	284	8 (2.8)	1.16 (0.92,1.46)	0.220
Medium	281	9 (3.2)		
High	287	14 (4.9)		

[a] Relative risk for a twofold increase in 1987 dioxin.

Note: Low = ≤7.9 ppt; Medium = >7.9–19.6 ppt; High = >19.6 ppt.

(h) MODEL 4: RANCH HANDS – 1987 DIOXIN – ADJUSTED

Analysis Results for Log_2 (1987 Dioxin + 1)		
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
817	1.24 (0.89,1.73)	0.193

[a] Relative risk for a twofold increase in 1987 dioxin.

The unadjusted and adjusted Model 3 analyses each showed a significant difference between Ranch Hands in the background dioxin category and Comparisons (Table 14-11(e,f): Est. RR=0.48, p=0.047; Adj. RR=0.45, p=0.041, respectively). The percentage of participants with abnormal heart sounds was lower for Ranch Hands in the background dioxin category (2.4%) than for Comparisons (5.0%).

Model 4 unadjusted and adjusted analyses showed no significant association between heart sounds and 1987 dioxin (Table 14-11(g,h): p>0.19 for each analysis).

14.2.2.2.6 Overall Electrocardiograph

The unadjusted and adjusted Model 1 analyses of overall ECG showed no overall group difference between Ranch Hands and Comparisons (Table 14-12(a,b): p>0.68 for each contrast). Stratifying by occupation revealed a marginally significant group difference within the enlisted groundcrew stratum for both the unadjusted and adjusted analyses (Table 14-12(a,b): Est. RR=0.77, p=0.096; Adj. RR=0.76, p=0.095, respectively). The percentage of enlisted groundcrew with abnormal overall ECG results was lower for Ranch Hands (23.4%) than for Comparisons (28.3%).

Both the unadjusted and adjusted Model 2 analyses of overall ECG were nonsignificant (Table 14-12(c,d): p>0.17 for each analysis).

The unadjusted Model 3 analyses of overall ECG did not show any of the Ranch Hand categories to be significantly different from the Comparison group (Table 14-12(e): p>0.60 for each contrast). After adjusting for covariates, a marginally significant difference between Ranch Hands in the low dioxin category and Comparisons was revealed (Table 14-12(f): Adj. RR=0.73, p=0.063). The percentage of abnormal overall ECG results was lower for Ranch Hands (30.9%) than for Comparisons (31.2%). Both the unadjusted and adjusted Model 4 analyses were nonsignificant (Table 14-12(g,h): p>0.39 for each analysis).

Table 14-12. Analysis of Overall Electrocardiograph (ECG)

(a) MODEL 1: RANCH HANDS VS. COMPARISONS – UNADJUSTED

Occupational Category	Group	n	Number (%) Abnormal	Est. Relative Risk (95% C.L)	p-Value
All	***Ranch Hand***	***859***	***268 (31.2)***	***1.00 (0.83,1.21)***	***0.988***
	Comparison	***1,232***	***384 (31.2)***		
Officer	Ranch Hand	334	120 (35.9)	1.10 (0.82,1.48)	0.506
	Comparison	484	163 (33.7)		
Enlisted Flyer	Ranch Hand	149	60 (40.3)	1.35 (0.86,2.11)	0.190
	Comparison	186	62 (33.3)		
Enlisted Groundcrew	Ranch Hand	376	88 (23.4)	0.77 (0.57,1.05)	0.096
	Comparison	562	159 (28.3)		

(b) MODEL 1: RANCH HANDS VS. COMPARISONS – ADJUSTED

Occupational Category	Adjusted Relative Risk (95% C.I.)	p-Value
All	***0.96 (0.78,1.18)***	***0.688***
Officer	1.07 (0.79,1.47)	0.655
Enlisted Flyer	1.24 (0.76,2.00)	0.389
Enlisted Groundcrew	0.76 (0.55,1.05)	0.095

(c) MODEL 2: RANCH HANDS – INITIAL DIOXIN – UNADJUSTED

Initial Dioxin Category Summary Statistics			Analysis Results for Log_2 (Initial Dioxin)[a]	
Initial Dioxin	n	Number (%) Abnormal	Estimated Relative Risk (95% C.I.)[b]	p-Value
Low	155	51 (32.9)	0.90 (0.77,1.05)	0.171
Medium	161	47 (29.2)		
High	160	48 (30.0)		

[a] Adjusted for percent body fat at the time of the blood measurement of dioxin.
[b] Relative risk for a twofold increase in initial dioxin.

Note: Low = 27–63 ppt; Medium = >63–152 ppt; High = >152 ppt.

(d) MODEL 2: RANCH HANDS – INITIAL DIOXIN – ADJUSTED

Analysis Results for Log_2 (Initial Dioxin)		
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
457	1.14 (0.93,1.39)	0.200

[a] Relative risk for a twofold increase in initial dioxin.

Table 14-12. Analysis of Overall Electrocardiograph (ECG) (Continued)

(e) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – UNADJUSTED

Dioxin Category	n	Number (%) Abnormal	Est. Relative Risk (95% C.I.)[ab]	p-Value
Comparison	1,195	373 (31.2)		
Background RH	376	118 (31.4)	1.06 (0.82,1.36)	0.659
Low RH	233	72 (30.9)	0.98 (0.72,1.33)	0.883
High RH	243	74 (30.5)	0.92 (0.68,1.25)	0.602
Low plus High RH	476	146 (30.7)	0.95 (0.75,1.20)	0.659

[a] Relative risk and confidence interval relative to Comparisons.
[b] Adjusted for percent body fat at the time of the blood measurement of dioxin.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

(f) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – ADJUSTED

Dioxin Category	n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
Comparison	1,155		
Background RH	360	1.00 (0.76,1.32)	0.980
Low RH	221	0.73 (0.52,1.02)	0.063
High RH	236	1.10 (0.78,1.54)	0.578
Low plus High RH	457	0.90 (0.70,1.16)	0.423

[a] Relative risk and confidence interval relative to Comparisons.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

(g) MODEL 4: RANCH HANDS – 1987 DIOXIN – UNADJUSTED

1987 Dioxin Category Summary Statistics			Analysis Results for Log_2 (1987 Dioxin + 1)	
1987 Dioxin	n	Number (%) Abnormal	Estimated Relative Risk (95% C.I.)[a]	p-Value
Low	284	84 (29.6)	0.96 (0.87,1.06)	0.391
Medium	281	93 (33.1)		
High	287	87 (30.3)		

[a] Relative risk for a twofold increase in 1987 dioxin.

Note: Low = ≤7.9 ppt; Medium = >7.9–19.6 ppt; High = >19.6 ppt.

Table 14-12. Analysis of Overall Electrocardiograph (ECG) (Continued)

(h) MODEL 4: RANCH HANDS – 1987 DIOXIN – ADJUSTED		
Analysis Results for Log_2 (1987 Dioxin + 1)		
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
817	1.02 (0.89,1.17)	0.753

[a] Relative risk for a twofold increase in 1987 dioxin.

14.2.2.2.7 Right Bundle Branch Block

All unadjusted and adjusted analysis results of right bundle branch block were nonsignificant (Table 14-13(a–h): p>0.27 for each analysis).

Table 14-13. Analysis of Right Bundle Branch Block

(a) MODEL 1: RANCH HANDS VS. COMPARISONS – UNADJUSTED					
Occupational Category	Group	n	Number (%) Yes	Est. Relative Risk (95% C.I.)	p-Value
All	***Ranch Hand***	***859***	***21 (2.4)***	***0.91 (0.52,1.58)***	***0.739***
	Comparison	***1,232***	***33 (2.7)***		
Officer	Ranch Hand	334	8 (2.4)	0.89 (0.36,2.17)	0.796
	Comparison	484	13 (2.7)		
Enlisted Flyer	Ranch Hand	149	8 (5.4)	1.45 (0.51,4.10)	0.482
	Comparison	186	7 (3.8)		
Enlisted Groundcrew	Ranch Hand	376	5 (1.3)	0.57 (0.20,1.61)	0.288
	Comparison	562	13 (2.3)		

(b) MODEL 1: RANCH HANDS VS. COMPARISONS – ADJUSTED		
Occupational Category	Adjusted Relative Risk (95% C.I.)	p-Value
All	***0.88 (0.49,1.56)***	***0.650***
Officer	0.89 (0.36,2.22)	0.807
Enlisted Flyer	1.47 (0.49,4.44)	0.493
Enlisted Groundcrew	0.55 (0.19,1.59)	0.271

(c) MODEL 2: RANCH HANDS – INITIAL DIOXIN – UNADJUSTED				
Initial Dioxin Category Summary Statistics			Analysis Results for Log_2 (Initial Dioxin)[a]	
Initial Dioxin	n	Number (%) Yes	Estimated Relative Risk (95% C.I.)[b]	p-Value
Low	155	5 (3.2)	0.93 (0.59,1.46)	0.747
Medium	161	4 (2.5)		
High	160	3 (1.9)		

[a] Adjusted for percent body fat at the time of the blood measurement of dioxin.
[b] Relative risk for a twofold increase in initial dioxin.

Note: Low = 27–63 ppt; Medium = >63–152 ppt; High = >152 ppt.

Table 14-13. Analysis of Right Bundle Branch Block (Continued)

(d) MODEL 2: RANCH HANDS – INITIAL DIOXIN – ADJUSTED

Analysis Results for Log_2 (Initial Dioxin)		
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
462	1.12 (0.62,2.04)	0.707

[a] Relative risk for a twofold increase in initial dioxin.

Note: Results are not adjusted for race and family history of heart disease before age 45 because of the sparse number of Ranch Hands with a right bundle branch block.

(e) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – UNADJUSTED

Dioxin Category	n	Number (%) Yes	Est. Relative Risk (95% C.I.)[ab]	p-Value
Comparison	1,195	31 (2.6)		
Background RH	376	9 (2.4)	0.93 (0.44,1.98)	0.852
Low RH	233	5 (2.1)	0.82 (0.32,2.14)	0.688
High RH	243	7 (2.9)	1.10 (0.48,2.54)	0.818
Low plus High RH	476	12 (2.5)	0.96 (0.48,1.89)	0.895

[a] Relative risk and confidence interval relative to Comparisons.
[b] Adjusted for percent body fat at the time of the blood measurement of dioxin.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

(f) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – ADJUSTED

Dioxin Category	n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
Comparison	1,155		
Background RH	360	1.04 (0.47,2.29)	0.920
Low RH	221	0.55 (0.19,1.60)	0.273
High RH	236	1.19 (0.49,2.88)	0.704
Low plus High RH	457	0.82 (0.39,1.71)	0.594

[a] Relative risk and confidence interval relative to Comparisons.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

Table 14-13. Analysis of Right Bundle Branch Block (Continued)

(g) MODEL 4: RANCH HANDS – 1987 DIOXIN – UNADJUSTED

1987 Dioxin Category Summary Statistics			Analysis Results for Log_2 (1987 Dioxin + 1)	
1987 Dioxin	n	Number (%) Yes	Estimated Relative Risk (95% C.I.)[a]	p-Value
Low	284	6 (2.1)	1.03 (0.77,1.38)	0.845
Medium	281	8 (2.8)		
High	287	7 (2.4)		

[a] Relative risk for a twofold increase in 1987 dioxin.

Note: Low = ≤7.9 ppt; Medium = >7.9–19.6 ppt; High = >19.6 ppt.

(h) MODEL 4: RANCH HANDS – 1987 DIOXIN – ADJUSTED

Analysis Results for Log_2 (1987 Dioxin + 1)		
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
817	1.02 (0.69,1.50)	0.922

[a] Relative risk for a twofold increase in 1987 dioxin.

Note: Results are not adjusted for race because of the sparse number of Ranch Hands with a right bundle branch block.

14.2.2.2.8 Left Bundle Branch Block

The unadjusted and adjusted Model 1 analyses of left bundle branch block were nonsignificant (Table 14-14(a,b): p≥0.15 for each contrast).

Table 14-14. Analysis of Left Bundle Branch Block

(a) MODEL 1: RANCH HANDS VS. COMPARISONS – UNADJUSTED

Occupational Category	Group	n	Number (%) Yes	Est. Relative Risk (95% C.I.)	p-Value
All	***Ranch Hand***	***859***	***5 (0.6)***	***0.60 (0.21,1.70)***	***0.317***
	Comparison	***1,232***	***12 (1.0)***		
Officer	Ranch Hand	334	2 (0.6)	0.48 (0.10,2.39)	0.370
	Comparison	484	6 (1.2)		
Enlisted Flyer	Ranch Hand	149	1 (0.7)	--	0.911[a]
	Comparison	186	0 (0.0)		
Enlisted Groundcrew	Ranch Hand	376	2 (0.5)	0.50 (0.10,2.47)	0.391
	Comparison	562	6 (1.1)		

[a] P-value determined using a chi-square test with continuity correction because of the sparse number of participants with a left bundle branch block.
--: Results not presented because of the sparse number of participants with a left bundle branch block.

Table 14-14. Analysis of Left Bundle Branch Block (Continued)

(b) MODEL 1: RANCH HANDS VS. COMPARISONS – ADJUSTED

Occupational Category	Adjusted Relative Risk (95% C.I.)	p-Value
All	***0.47 (0.15,1.50)***	***0.182***
Officer	0.21 (0.02,1.76)	0.150
Enlisted Flyer	--	--
Enlisted Groundcrew	0.56 (0.11,2.83)	0.479

--: Results not presented because of the sparse number of participants with a left bundle branch block.

Note: Results are not adjusted for race because of the sparse number of participants with a left bundle branch block.

(c) MODEL 2: RANCH HANDS – INITIAL DIOXIN – UNADJUSTED

Initial Dioxin Category Summary Statistics			Analysis Results for Log_2 (Initial Dioxin)[a]	
Initial Dioxin	n	Number (%) Yes	Estimated Relative Risk (95% C.I.)[b]	p-Value
Low	155	1 (0.6)	0.21 (0.01,6.22)	0.213
Medium	161	0 (0.0)		
High	160	0 (0.0)		

[a] Adjusted for percent body fat at the time of the blood measurement of dioxin.
[b] Relative risk for a twofold increase in initial dioxin.

Note: Low = 27–63 ppt; Medium = >63–152 ppt; High = >152 ppt.

(d) MODEL 2: RANCH HANDS – INITIAL DIOXIN – ADJUSTED

Analysis Results for Log_2 (Initial Dioxin)		
n	Adjusted Relative Risk (95% C.I.)	p-Value
--	--	--

--: Results not presented because of the sparse number of Ranch Hands with a left bundle branch block.

(e) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – UNADJUSTED

Dioxin Category	n	Number (%) Yes	Est. Relative Risk (95% C.I.)[ab]	p-Value
Comparison	1,195	12 (1.0)		
Background RH	376	4 (1.1)	1.17 (0.37,3.68)	0.792
Low RH	233	1 (0.4)	0.42 (0.05,3.23)	0.403
High RH	243	0 (0.0)	--	0.237[c]
Low plus High RH	476	1 (0.2)	--	0.174[c]

[a] Relative risk and confidence interval relative to Comparisons.
[b] Adjusted for percent body fat at the time of the blood measurement of dioxin.
[c] P-value determined using a chi-square test with continuity correction because of the sparse number of participants with left bundle branch block.
--: Results not presented because of the sparse number of participants with a left bundle branch block.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

Table 14-14. Analysis of Left Bundle Branch Block (Continued)

(f) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – ADJUSTED

Dioxin Category	n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
Comparison	1,155		
Background RH	360	0.87 (0.23,3.33)	0.838
Low RH	221	0.37 (0.05,2.91)	0.341
High RH	236	--	--
Low plus High RH	457	--	--

[a] Relative risk and confidence interval relative to Comparisons.
--: Results not presented because of the sparse number of participants with a left bundle branch block.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

Results are not adjusted for race because of the sparse number of participants with a left bundle branch block.

(g) MODEL 4: RANCH HANDS – 1987 DIOXIN – UNADJUSTED

1987 Dioxin Category Summary Statistics			Analysis Results for Log_2 (1987 Dioxin + 1)	
1987 Dioxin	n	Number (%) Yes	Estimated Relative Risk (95% C.I.)[a]	p-Value
Low	284	1 (0.4)	0.69 (0.35,1.36)	0.271
Medium	281	4 (1.4)		
High	287	0 (0.0)		

[a] Relative risk for a twofold increase in 1987 dioxin.

Note: Low = ≤7.9 ppt; Medium = >7.9–19.6 ppt; High = >19.6 ppt.

(h) MODEL 4: RANCH HANDS – 1987 DIOXIN – ADJUSTED

Analysis Results for Log_2 (1987 Dioxin + 1)		
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
823	0.56 (0.23,1.39)	0.199

[a] Relative risk for a twofold increase in 1987 dioxin.

Note: Results are not adjusted for race and diabetic class because of the sparse number of participants with a left bundle branch block.

The unadjusted Model 2 analysis showed no significant association between left bundle branch block and initial dioxin (Table 14-14(c): p=0.213). Because of a sparse number of Ranch Hands with a left bundle branch block, the adjusted Model 2 analysis was not performed.

All unadjusted and adjusted Model 3 and 4 analyses were nonsignificant (Table 14-14(e–h): p>0.17 for each analysis).

14.2.2.2.9 Non-Specific ST- and T-Wave Changes

All unadjusted and adjusted analyses of non-specific ST- and T-wave changes were nonsignificant (Table 14-15(a–h): p≥0.18 for each analysis).

Table 14-15. Analysis of Non-Specific ST- and T-Wave Changes

(a) MODEL 1: RANCH HANDS VS. COMPARISONS – UNADJUSTED

Occupational Category	Group	n	Number (%) Yes	Est. Relative Risk (95% C.I.)	p-Value
All	***Ranch Hand***	***859***	***160 (18.6)***	***1.04 (0.83,1.30)***	***0.724***
	Comparison	***1,232***	***222 (18.0)***		
Officer	Ranch Hand	334	70 (21.0)	1.09 (0.77,1.53)	0.641
	Comparison	484	95 (19.6)		
Enlisted Flyer	Ranch Hand	149	33 (22.1)	1.27 (0.74,2.17)	0.380
	Comparison	186	34 (18.3)		
Enlisted Groundcrew	Ranch Hand	376	57 (15.2)	0.90 (0.63,1.29)	0.570
	Comparison	562	93 (16.5)		

(b) MODEL 1: RANCH HANDS VS. COMPARISONS – ADJUSTED

Occupational Category	Adjusted Relative Risk (95% C.I.)	p-Value
All	***1.00 (0.79,1.27)***	***0.984***
Officer	1.03 (0.71,1.48)	0.882
Enlisted Flyer	1.22 (0.69,2.14)	0.495
Enlisted Groundcrew	0.88 (0.60,1.29)	0.517

(c) MODEL 2: RANCH HANDS – INITIAL DIOXIN – UNADJUSTED

Initial Dioxin Category Summary Statistics			Analysis Results for Log_2 (Initial Dioxin)[a]	
Initial Dioxin	n	Number (%) Yes	Estimated Relative Risk (95% C.I.)[b]	p-Value
Low	155	32 (20.6)	0.91 (0.76,1.08)	0.280
Medium	161	34 (21.1)		
High	160	31 (19.4)		

[a] Adjusted for percent body fat at the time of the blood measurement of dioxin.
[b] Relative risk for a twofold increase in initial dioxin.

Note: Low = 27–63 ppt; Medium = >63–152 ppt; High = >152 ppt.

(d) MODEL 2: RANCH HANDS – INITIAL DIOXIN – ADJUSTED

Analysis Results for Log_2 (Initial Dioxin)		
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
457	1.15 (0.91,1.44)	0.237

[a] Relative risk for a twofold increase in initial dioxin.

Table 14-15. Analysis of Non-Specific ST- and T-Wave Changes (Continued)

(e) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – UNADJUSTED

Dioxin Category	n	Number (%) Yes	Est. Relative Risk (95% C.I.)[ab]	p-Value
Comparison	1,195	218 (18.2)		
Background RH	376	59 (15.7)	0.91 (0.66,1.25)	0.545
Low RH	233	47 (20.2)	1.12 (0.78,1.59)	0.537
High RH	243	50 (20.6)	1.08 (0.76,1.52)	0.677
Low plus High RH	476	97 (20.4)	1.10 (0.84,1.44)	0.502

[a] Relative risk and confidence interval relative to Comparisons.
[b] Adjusted for percent body fat at the time of the blood measurement of dioxin.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

(f) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – ADJUSTED

Dioxin Category	n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
Comparison	1,155		
Background RH	360	0.82 (0.58,1.15)	0.242
Low RH	221	0.91 (0.62,1.32)	0.614
High RH	236	1.26 (0.86,1.84)	0.238
Low plus High RH	457	1.07 (0.80,1.43)	0.628

[a] Relative risk and confidence interval relative to Comparisons.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

(g) MODEL 4: RANCH HANDS – 1987 DIOXIN – UNADJUSTED

1987 Dioxin Category Summary Statistics			Analysis Results for Log_2 (1987 Dioxin + 1)	
1987 Dioxin	n	Number (%) Yes	Estimated Relative Risk (95% C.I.)[a]	p-Value
Low	284	43 (15.1)	1.06 (0.94,1.19)	0.361
Medium	281	52 (18.5)		
High	287	61 (21.3)		

[a] Relative risk for a twofold increase in 1987 dioxin.

Note: Low = ≤7.9 ppt; Medium = >7.9–19.6 ppt; High = >19.6 ppt.

Table 14-15. Analysis of Non-Specific ST- and T-Wave Changes (Continued)

(h) MODEL 4: RANCH HANDS – 1987 DIOXIN – ADJUSTED		
	Analysis Results for Log_2 (1987 Dioxin + 1)	
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
817	1.12 (0.95,1.32)	0.180

[a] Relative risk for a twofold increase in 1987 dioxin.

14.2.2.2.10 Bradycardia

The Model 1 and 2 analyses of bradycardia did not show a significant association with dioxin in either the unadjusted or adjusted analysis (Table 14-16(a–d): p≥0.12 for each analysis).

Table 14-16. Analysis of Bradycardia

(a) MODEL 1: RANCH HANDS VS. COMPARISONS – UNADJUSTED					
Occupational Category	Group	n	Number (%) Yes	Est. Relative Risk (95% C.I.)	p-Value
All	***Ranch Hand***	***859***	***24 (2.8)***	***0.69 (0.42,1.14)***	***0.142***
	Comparison	***1,232***	***49 (4.0)***		
Officer	Ranch Hand	334	15 (4.5)	0.69 (0.36,1.29)	0.245
	Comparison	484	31 (6.4)		
Enlisted Flyer	Ranch Hand	149	5 (3.4)	1.26 (0.36,4.43)	0.722
	Comparison	186	5 (2.7)		
Enlisted Groundcrew	Ranch Hand	376	4 (1.1)	0.45 (0.15,1.40)	0.170
	Comparison	562	13 (2.3)		

(b) MODEL 1: RANCH HANDS VS. COMPARISONS – ADJUSTED		
Occupational Category	Adjusted Relative Risk (95% C.I.)	p-Value
All	***0.69 (0.41,1.16)***	***0.151***
Officer	0.74 (0.38,1.42)	0.360
Enlisted Flyer	1.14 (0.32,4.09)	0.846
Enlisted Groundcrew	0.36 (0.10,1.30)	0.120

(c) MODEL 2: RANCH HANDS – INITIAL DIOXIN – UNADJUSTED				
Initial Dioxin Category Summary Statistics			Analysis Results for Log_2 (Initial Dioxin)[a]	
Initial Dioxin	n	Number (%) Yes	Estimated Relative Risk (95% C.I.)[b]	p-Value
Low	155	4 (2.6)	0.86 (0.44,1.65)	0.631
Medium	161	2 (1.2)		
High	160	1 (0.6)		

[a] Adjusted for percent body fat at the time of the blood measurement of dioxin.
[b] Relative risk for a twofold increase in initial dioxin.

Note: Low = 27–63 ppt; Medium = >63–152 ppt; High = >152 ppt.

Table 14-16. Analysis of Bradycardia (Continued)

(d) MODEL 2: RANCH HANDS – INITIAL DIOXIN – ADJUSTED

Analysis Results for Log_2 (Initial Dioxin)		
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
466	0.98 (0.44,2.22)	0.971

[a] Relative risk for a twofold increase in initial dioxin.

Note: Results are not adjusted for race, diabetic class, and family history of heart disease before age 45 because of the sparse number of Ranch Hands with bradycardia.

(e) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – UNADJUSTED

Dioxin Category	n	Number (%) Yes	Est. Relative Risk (95% C.I.)[ab]	p-Value
Comparison	1,195	47 (3.9)		
Background RH	376	16 (4.3)	0.95 (0.53,1.71)	0.867
Low RH	233	5 (2.1)	0.55 (0.21,1.39)	0.204
High RH	243	2 (0.8)	0.23 (0.05,0.95)	0.042
Low plus High RH	476	7 (1.5)	0.35 (0.14,0.85)	0.020

[a] Relative risk and confidence interval relative to Comparisons.
[b] Adjusted for percent body fat at the time of the blood measurement of dioxin.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

(f) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – ADJUSTED

Dioxin Category	n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
Comparison	1,155		
Background RH	360	0.81 (0.44,1.49)	0.497
Low RH	221	0.49 (0.17,1.40)	0.183
High RH	236	0.35 (0.08,1.50)	0.156
Low plus High RH	457	0.41 (0.16,1.05)	0.062

[a] Relative risk and confidence interval relative to Comparisons.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

Table 14-16. Analysis of Bradycardia (Continued)

(g) MODEL 4: RANCH HANDS – 1987 DIOXIN – UNADJUSTED

1987 Dioxin Category Summary Statistics			Analysis Results for Log_2 (1987 Dioxin + 1)	
1987 Dioxin	n	Number (%) Yes	Estimated Relative Risk (95% C.I.)[a]	p-Value
Low	284	11 (3.9)	0.77 (0.56,1.05)	0.084
Medium	281	9 (3.2)		
High	287	3 (1.0)		

[a] Relative risk for a twofold increase in 1987 dioxin.

Note: Low = ≤7.9 ppt; Medium = >7.9–19.6 ppt; High = >19.6 ppt.

(h) MODEL 4: RANCH HANDS – 1987 DIOXIN – ADJUSTED

Analysis Results for Log_2 (1987 Dioxin + 1)		
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
828	0.98 (0.65,1.49)	0.932

[a] Relative risk for a twofold increase in 1987 dioxin.

Note: Results are not adjusted for family history of heart disease before age 45 because of the sparse number of Ranch Hands with bradycardia.

The unadjusted Model 3 analysis of bradycardia revealed two significant contrasts: Ranch Hands in the high dioxin category versus Comparisons and Ranch Hands in the low plus high dioxin category versus Comparisons (Table 14-16(e): Est. RR=0.23, p=0.042; Est. RR=0.35, p=0.020, respectively). The percentage of participants with bradycardia was higher for Comparisons (3.9%) than for Ranch Hands in the high dioxin category (0.8%) or Ranch Hands in the low plus high dioxin category (1.5%). After covariate adjustment, there was a marginally significant difference between Ranch Hands in the low plus high dioxin category and Comparisons (Table 14-16(f): Adj. RR=0.41, p=0.062).

The unadjusted Model 4 analysis of bradycardia revealed a marginally significant inverse association between bradycardia and 1987 dioxin (Table 14-16(g): Est. RR=0.77, p=0.084). The percentages of participants with bradycardia in the low, medium, and high 1987 dioxin categories were 3.9, 3.2, and 1.0, respectively. After covariate adjustment, the results became nonsignificant (Table 14-16(h): p=0.932).

14.2.2.2.11 Tachycardia

The unadjusted and adjusted Model 1 analyses of tachycardia were nonsignificant (Table 14-17(a,b): p>0.12 for each contrast).

Table 14-17. Analysis of Tachycardia

(a) MODEL 1: RANCH HANDS VS. COMPARISONS – UNADJUSTED

Occupational Category	Group	n	Number (%) Yes	Est. Relative Risk (95% C.I.)	p-Value
All	***Ranch Hand***	***859***	***6 (0.7)***	***2.16 (0.61,7.68)***	***0.228***
	Comparison	***1,232***	***4 (0.3)***		
Officer	Ranch Hand	334	1 (0.3)	1.45 (0.09,23.27)	0.793
	Comparison	484	1 (0.2)		
Enlisted Flyer	Ranch Hand	149	3 (2.0)	--	0.174[a]
	Comparison	186	0 (0.0)		
Enlisted Groundcrew	Ranch Hand	376	2 (0.5)	1.00 (0.17,5.99)	0.997
	Comparison	562	3 (0.5)		

[a] P-value determined using a chi-square test with continuity correction because of the sparse number of participants with tachycardia.
--: Results not presented because of the sparse number of participants with tachycardia.

(b) MODEL 1: RANCH HANDS VS. COMPARISONS – ADJUSTED

Occupational Category	Adjusted Relative Risk (95% C.I.)	p-Value
All	***2.94 (0.69,12.51)***	***0.129***
Officer	--	--
Enlisted Flyer	--	--
Enlisted Groundcrew	1.54 (0.19,12.63)	0.685

--: Results not presented because of the sparse number of participants with tachycardia.

Note: Results are not adjusted for family history of heart disease because of the sparse number of participants with tachycardia.

(c) MODEL 2: RANCH HANDS – INITIAL DIOXIN – UNADJUSTED

Initial Dioxin Category Summary Statistics			Analysis Results for Log_2 (Initial Dioxin)[a]	
Initial Dioxin	n	Number (%) Yes	Estimated Relative Risk (95% C.I.)[b]	p-Value
Low	155	0 (0.0)	1.38 (0.72,2.68)	0.340
Medium	161	1 (0.6)		
High	160	3 (1.9)		

[a] Adjusted for percent body fat at the time of the blood measurement of dioxin.
[b] Relative risk for a twofold increase in initial dioxin.

Note: Low = 27–63 ppt; Medium = >63–152 ppt; High = >152 ppt.

Table 14-17. Analysis of Tachycardia (Continued)

(d) MODEL 2: RANCH HANDS – INITIAL DIOXIN -- ADJUSTED

Analysis Results for Log_2 (Initial Dioxin)		
n	Adjusted Relative Risk (95% C.I.)	p-Value
--	--	--

--: Results not presented because of the sparse number of Ranch Hands with tachycardia.

(e) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – UNADJUSTED

Dioxin Category	n	Number (%) Yes	Est. Relative Risk (95% C.I.)[ab]	p-Value
Comparison	1,195	3 (0.3)		
Background RH	376	1 (0.3)	1.33 (0.14,13.00)	0.806
Low RH	233	0 (0.0)	--	0.999[c]
High RH	243	4 (1.6)	5.30 (1.15,24.53)	0.033
Low plus High RH	476	4 (0.8)	--	0.206[c]

[a] Relative risk and confidence interval relative to Comparisons.
[b] Adjusted for percent body fat at the time of the blood measurement of dioxin.
[c] P-value determined using a chi-square test with continuity correction because of the sparse number of participants with tachycardia.
--: Results not presented because of the sparse number of participants with tachycardia.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

(f) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – ADJUSTED

Dioxin Category	n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
Comparison	1,155		
Background RH	360	2.01 (0.16,24.61)	0.585
Low RH	221	--	--
High RH	236	8.10 (1.19,55.01)	0.032
Low plus High RH	457	--	--

[a] Relative risk and confidence interval relative to Comparisons.
--: Results not presented because of the sparse number of participants with tachycardia.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

Results are not adjusted for family history of heart disease because of the sparse number of participants with tachycardia.

Table 14-17. Analysis of Tachycardia (Continued)

(g) MODEL 4: RANCH HANDS – 1987 DIOXIN – UNADJUSTED

1987 Dioxin Category Summary Statistics			Analysis Results for Log_2 (1987 Dioxin + 1)	
1987 Dioxin	n	Number (%) Yes	Estimated Relative Risk (95% C.I.)[a]	p-Value
Low	284	1 (0.4)	1.56 (0.92,2.63)	0.111
Medium	281	0 (0.0)		
High	287	4 (1.4)		

[a] Relative risk for a twofold increase in 1987 dioxin.

Note: Low = ≤7.9 ppt; Medium = >7.9–19.6 ppt; High = >19.6 ppt.

(h) MODEL 4: RANCH HANDS – 1987 DIOXIN – ADJUSTED

Analysis Results for Log_2 (1987 Dioxin + 1)		
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
825	1.55 (0.85,2.84)	0.165

[a] Relative risk for a twofold increase in 1987 dioxin.

Note: Results are not adjusted for occupation, current alcohol use, personality type, family history of heart disease, and diabetic class because of the sparse number of participants with tachycardia.

The unadjusted Model 2 analysis showed no significant association between tachycardia and initial dioxin (Table 14-17(c): p=0.340). Because of a sparse number of Ranch Hands with tachycardia, the adjusted Model 2 analysis was not performed.

The unadjusted and adjusted Model 3 analyses each showed a significant difference between Ranch Hands in the high dioxin category and Comparisons (Table 14-17(e,f): Est. RR=5.30, p=0.033; Adj. RR=8.10, p=0.032, respectively). The percentage of participants with tachycardia for Ranch Hands in the high dioxin categories was 1.6 versus 0.3 percent for Comparisons.

The unadjusted and adjusted Model 4 analyses were nonsignificant (Table 14-17(g,h): p>0.11 for each analysis).

14.2.2.2.12 Arrhythmia

All unadjusted and adjusted analyses of arrhythmia were nonsignificant (Table 14-18(a–h): p>0.11 for each analysis).

Table 14-18. Analysis of Arrhythmia

(a) MODEL 1: RANCH HANDS VS. COMPARISONS – UNADJUSTED

Occupational Category	Group	n	Number (%) Yes	Est. Relative Risk (95% C.I.)	p-Value
All	***Ranch Hand***	***859***	***51 (5.9)***	***1.08 (0.74,1.57)***	***0.686***
	Comparison	***1,232***	***68 (5.5)***		
Officer	Ranch Hand	334	25 (7.5)	1.49 (0.84,2.63)	0.176
	Comparison	484	25 (5.2)		
Enlisted Flyer	Ranch Hand	149	13 (8.7)	1.39 (0.61,3.13)	0.433
	Comparison	186	12 (6.5)		
Enlisted Groundcrew	Ranch Hand	376	13 (3.5)	0.61 (0.32,1.19)	0.147
	Comparison	562	31 (5.5)		

(b) MODEL 1: RANCH HANDS VS. COMPARISONS – ADJUSTED

Occupational Category	Adjusted Relative Risk (95% C.I.)	p-Value
All	***1.02 (0.69,1.52)***	***0.913***
Officer	1.39 (0.75,2.55)	0.296
Enlisted Flyer	1.26 (0.54,2.97)	0.591
Enlisted Groundcrew	0.62 (0.31,1.25)	0.180

(c) MODEL 2: RANCH HANDS – INITIAL DIOXIN – UNADJUSTED

Initial Dioxin Category Summary Statistics			Analysis Results for Log_2 (Initial Dioxin)[a]	
Initial Dioxin	n	Number (%) Yes	Estimated Relative Risk (95% C.I.)[b]	p-Value
Low	155	13 (8.4)	0.81 (0.60,1.10)	0.158
Medium	161	11 (6.8)		
High	160	8 (5.0)		

[a] Adjusted for percent body fat at the time of the blood measurement of dioxin.
[b] Relative risk for a twofold increase in initial dioxin.

Note: Low = 27–63 ppt; Medium = >63–152 ppt; High = >152 ppt.

(d) MODEL 2: RANCH HANDS – INITIAL DIOXIN – ADJUSTED

Analysis Results for Log_2 (Initial Dioxin)		
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
457	1.00 (0.68,1.48)	0.981

[a] Relative risk for a twofold increase in initial dioxin.

Table 14-18. Analysis of Arrhythmia (Continued)

(e) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – UNADJUSTED

Dioxin Category	n	Number (%) Yes	Est. Relative Risk (95% C.I.)[ab]	p-Value
Comparison	1,195	65 (5.4)		
Background RH	376	18 (4.8)	0.90 (0.53,1.54)	0.703
Low RH	233	19 (8.2)	1.54 (0.90,2.61)	0.114
High RH	243	13 (5.3)	0.96 (0.52,1.77)	0.886
Low plus High RH	476	32 (6.7)	1.21 (0.77,1.88)	0.409

[a] Relative risk and confidence interval relative to Comparisons.
[b] Adjusted for percent body fat at the time of the blood measurement of dioxin.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

(f) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – ADJUSTED

Dioxin Category	n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
Comparison	1,155		
Background RH	360	0.87 (0.49,1.57)	0.647
Low RH	221	1.17 (0.65,2.11)	0.596
High RH	236	1.10 (0.57,2.12)	0.774
Low plus High RH	457	1.13 (0.70,1.83)	0.604

[a] Relative risk and confidence interval relative to Comparisons.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

(g) MODEL 4: RANCH HANDS – 1987 DIOXIN – UNADJUSTED

1987 Dioxin Category Summary Statistics			Analysis Results for Log_2 (1987 Dioxin + 1)	
1987 Dioxin	n	Number (%) Yes	Estimated Relative Risk (95% C.I.)[a]	p-Value
Low	284	14 (4.9)	0.99 (0.82,1.20)	0.932
Medium	281	20 (7.1)		
High	287	16 (5.6)		

[a] Relative risk for a twofold increase in 1987 dioxin.

Note: Low = ≤7.9 ppt; Medium = >7.9–19.6 ppt; High = >19.6 ppt.

Table 14-18. Analysis of Arrhythmia (Continued)

(h) MODEL 4: RANCH HANDS – 1987 DIOXIN – ADJUSTED		
	Analysis Results for Log_2 (1987 Dioxin + 1)	
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
817	1.12 (0.85,1.49)	0.422

[a] Relative risk for a twofold increase in 1987 dioxin.

14.2.2.2.13 Evidence of Prior Myocardial Infarction

The Model 1 unadjusted and adjusted analyses of prior myocardial infarction from the ECG showed no significant group differences over all participants or within each occupational stratum (Table 14-19(a,b): p>0.64 for each contrast).

Table 14-19. Analysis of Evidence of Prior Myocardial Infarction

(a) MODEL 1: RANCH HANDS VS. COMPARISONS – UNADJUSTED					
Occupational Category	Group	n	Number (%) Yes	Est. Relative Risk (95% C.I.)	p-Value
All	***Ranch Hand***	***859***	***34 (4.0)***	***0.92 (0.59,1.42)***	***0.698***
	Comparison	***1,232***	***53 (4.3)***		
Officer	Ranch Hand	334	15 (4.5)	0.94 (0.48,1.83)	0.862
	Comparison	484	23 (4.8)		
Enlisted Flyer	Ranch Hand	149	7 (4.7)	0.97 (0.35,2.67)	0.952
	Comparison	186	9 (4.8)		
Enlisted Groundcrew	Ranch Hand	376	12 (3.2)	0.85 (0.41,1.75)	0.657
	Comparison	562	21 (3.7)		

(b) MODEL 1: RANCH HANDS VS. COMPARISONS – ADJUSTED		
Occupational Category	Adjusted Relative Risk (95% C.I.)	p-Value
All	***0.90 (0.56,1.43)***	***0.649***
Officer	0.88 (0.43,1.78)	0.718
Enlisted Flyer	1.02 (0.35,2.96)	0.972
Enlisted Groundcrew	0.86 (0.40,1.85)	0.709

Table 14-19. Analysis of Evidence of Prior Myocardial Infarction (Continued)

(c) MODEL 2: RANCH HANDS – INITIAL DIOXIN – UNADJUSTED

Initial Dioxin Category Summary Statistics			Analysis Results for Log_2 (Initial Dioxin)[a]	
Initial Dioxin	n	Number (%) Yes	Estimated Relative Risk (95% C.I.)[b]	p-Value
Low	155	5 (3.2)	1.05 (0.75,1.46)	0.793
Medium	161	9 (5.6)		
High	160	7 (4.4)		

[a] Adjusted for percent body fat at the time of the blood measurement of dioxin.
[b] Relative risk for a twofold increase in initial dioxin.

Note: Low = 27–63 ppt; Medium = >63–152 ppt; High = >152 ppt.

(d) MODEL 2: RANCH HANDS – INITIAL DIOXIN – ADJUSTED

Analysis Results for Log_2 (Initial Dioxin)		
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
457	1.84 (1.13,2.99)	0.012

[a] Relative risk for a twofold increase in initial dioxin.

Note: Results are not adjusted for race because of the sparse number of Ranch Hands with evidence of a prior myocardial infarction.

(e) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – UNADJUSTED

Dioxin Category	n	Number (%) Yes	Est. Relative Risk (95% C.I.)[ab]	p-Value
Comparison	1,195	53 (4.4)		
Background RH	376	12 (3.2)	0.75 (0.39,1.42)	0.374
Low RH	233	11 (4.7)	1.06 (0.54,2.06)	0.867
High RH	243	10 (4.1)	0.88 (0.44,1.76)	0.722
Low plus High RH	476	21 (4.4)	0.96 (0.57,1.62)	0.891

[a] Relative risk and confidence interval relative to Comparisons.
[b] Adjusted for percent body fat at the time of the blood measurement of dioxin.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

Table 14-19. Analysis of Evidence of Prior Myocardial Infarction (Continued)

(f) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – ADJUSTED

Dioxin Category	n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
Comparison	1,155		
Background RH	360	0.69 (0.34,1.37)	0.285
Low RH	221	0.79 (0.39,1.61)	0.524
High RH	236	1.11 (0.52,2.36)	0.783
Low plus High RH	457	0.94 (0.54,1.65)	0.841

[a] Relative risk and confidence interval relative to Comparisons.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

(g) MODEL 4: RANCH HANDS – 1987 DIOXIN – UNADJUSTED

1987 Dioxin Category Summary Statistics			Analysis Results for Log_2 (1987 Dioxin + 1)	
1987 Dioxin	n	Number (%) Yes	Estimated Relative Risk (95% C.I.)[a]	p-Value
Low	284	7 (2.5)	1.09 (0.87,1.38)	0.447
Medium	281	12 (4.3)		
High	287	14 (4.9)		

[a] Relative risk for a twofold increase in 1987 dioxin.

Note: Low = ≤7.9 ppt; Medium = >7.9–19.6 ppt; High = >19.6 ppt.

(h) MODEL 4: RANCH HANDS – 1987 DIOXIN – ADJUSTED

Analysis Results for Log_2 (1987 Dioxin + 1)		
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
817	1.33 (0.95,1.87)	0.089

[a] Relative risk for a twofold increase in 1987 dioxin.

The unadjusted Model 2 analysis revealed no significant association between initial dioxin and prior myocardial infarction (Table 14-19(c): p=0.793). After adjusting for covariates, the results became significant (Table 14-19(d): Adj. RR=1.84, p=0.012). The percentages of participants with evidence of prior myocardial infarction in the low, medium, and high initial dioxin categories were 3.2, 5.6, and 4.4, respectively.

The unadjusted and adjusted Model 3 analyses of prior myocardial infarction did not show any of the Ranch Hand categories to be significantly different from the Comparisons (Table 14-19(e,f): p>0.28 for each contrast).

The unadjusted Model 4 analysis revealed no significant association between 1987 dioxin and evidence of prior myocardial infarction (Table 14-19(g): p=0.447). After adjusting for covariates, the results became marginally significant (Table 14-19(h): Adj. RR=1.33, p=0.089). The percentages of participants with evidence of prior myocardial infarction in the low, medium, and high 1987 dioxin categories were 2.5, 4.3, and 4.9, respectively.

14.2.2.2.14 ECG: Other Diagnoses

The Model 1 unadjusted and adjusted analyses of other ECG diagnoses showed no significant group differences over all participants or within each occupational stratum (Table 14-20(a,b): p>0.15 for each contrast).

Table 14-20. Analysis of ECG: Other Diagnoses

(a) MODEL 1: RANCH HANDS VS. COMPARISONS – UNADJUSTED

Occupational Category	Group	n	Number (%) Yes	Est. Relative Risk (95% C.I.)	p-Value
All	***Ranch Hand***	***859***	***3 (0.3)***	***4.31 (0.45,41.55)***	***0.168***
	Comparison	***1,232***	***1 (0.1)***		
Officer	Ranch Hand	334	1 (0.3)	--	0.852[a]
	Comparison	484	0 (0.0)		
Enlisted Flyer	Ranch Hand	149	0 (0.0)	--	--
	Comparison	186	0 (0.0)		
Enlisted Groundcrew	Ranch Hand	376	2 (0.5)	3.00 (0.27,33.20)	0.370
	Comparison	562	1 (0.2)		

[a] P-value determined using a chi-square test with continuity correction because of the sparse number of participants with other abnormal ECG diagnoses.
--: Results not presented because of the sparse number of participants with other abnormal ECG diagnoses.

(b) MODEL 1: RANCH HANDS VS. COMPARISONS – ADJUSTED

Occupational Category	Adjusted Relative Risk (95% C.I.)	p-Value
All	***4.67 (0.47,46.79)***	***0.153***
Officer	--	--
Enlisted Flyer	--	--
Enlisted Groundcrew	3.29 (0.28,38.94)	0.346

--: Results not presented because of the sparse number of participants with other abnormal ECG diagnoses.

Note: Results are not adjusted for family history of heart disease before age 45 and diabetic class because of the sparse number of participants with other abnormal ECG diagnoses. Results for all occupations combined also are not adjusted for occupation because of the sparse number of participants with other abnormal ECG diagnoses.

Table 14-20. Analysis of ECG: Other Diagnoses (Continued)

(c) MODEL 2: RANCH HANDS – INITIAL DIOXIN – UNADJUSTED

Initial Dioxin Category Summary Statistics			Analysis Results for Log_2 (Initial Dioxin)[a]	
Initial Dioxin	n	Number (%) Yes	Estimated Relative Risk (95% C.I.)[b]	p-Value
Low	155	0 (0.0)	1.53 (0.62,3.79)	0.381
Medium	161	0 (0.0)		
High	160	2 (1.3)		

[a] Adjusted for percent body fat at the time of the blood measurement of dioxin.
[b] Relative risk for a twofold increase in initial dioxin.

Note: Low = 27–63 ppt; Medium = >63–152 ppt; High = >152 ppt.

(d) MODEL 2: RANCH HANDS – INITIAL DIOXIN – ADJUSTED

Analysis Results for Log_2 (Initial Dioxin)		
n	Adjusted Relative Risk (95% C.I.)	p-Value
--	--	--

--: Results not presented because of the sparse number of Ranch Hands with other abnormal ECG diagnoses.

(e) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – UNADJUSTED

Dioxin Category	n	Number (%) Yes	Est. Relative Risk (95% C.I.)[ab]	p-Value
Comparison	1,195	1 (0.1)		
Background RH	376	1 (0.3)	2.59 (0.16,41.85)	0.503
Low RH	233	0 (0.0)	--	0.999[c]
High RH	243	2 (0.8)	12.49 (1.10,142.56)	0.042
Low plus High RH	476	2 (0.4)	--	0.409[c]

[a] Relative risk and confidence interval relative to Comparisons.
[b] Adjusted for percent body fat at the time of the blood measurement of dioxin.
[c] P-value determined using a chi-square test with continuity correction because of the sparse number of participants with other abnormal ECG diagnoses.
--: Results not presented because of the sparse number of participants with other abnormal ECG diagnoses.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

Table 14-20. Analysis of ECG: Other Diagnoses (Continued)

(f) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – ADJUSTED

Dioxin Category	n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
Comparison	1,186		
Background RH	368	2.89 (0.16,52.97)	0.474
Low RH	227	--	--
High RH	239	12.41 (1.00,154.15)	0.050
Low plus High RH	466	--	--

[a] Relative risk and confidence interval relative to Comparisons.
--: Results not presented because of the sparse number of participants with other abnormal ECG diagnoses.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

Results are not adjusted for occupation, family history of heart disease before age 45, and diabetic class because of the sparse number of participants with other abnormal ECG diagnoses.

(g) MODEL 4: RANCH HANDS – 1987 DIOXIN – UNADJUSTED

1987 Dioxin Category Summary Statistics			Analysis Results for Log_2 (1987 Dioxin + 1)	
1987 Dioxin	n	Number (%) Yes	Estimated Relative Risk (95% C.I.)[a]	p-Value
Low	284	1 (0.4)	1.27 (0.63,2.59)	0.512
Medium	281	0 (0.0)		
High	287	2 (0.7)		

[a] Relative risk for a twofold increase in 1987 dioxin.

Note: Low = ≤7.9 ppt; Medium = >7.9–19.6 ppt; High = >19.6 ppt.

(h) MODEL 4: RANCH HANDS – 1987 DIOXIN – ADJUSTED

Analysis Results for Log_2 (1987 Dioxin + 1)		
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
834	1.47 (0.58,3.73)	0.413

[a] Relative risk for a twofold increase in 1987 dioxin.

Note: Results are not adjusted for occupation, current cigarette smoking, family history of heart disease before age 45, and diabetic class because of the sparse number of Ranch Hands with other abnormal ECG diagnoses.

The unadjusted Model 2 analysis revealed no significant results (Table 14-20(c): p=0.381). Because of the sparse number of Ranch Hands with other ECG diagnoses, the adjusted Model 2 analysis was not performed.

The unadjusted and adjusted Model 3 analyses each revealed a significant difference between Ranch Hands in the high dioxin category and Comparisons (Table 14-20(e,f): Est. RR=12.49, p=0.042; Adj. RR=12.41, p=0.050, respectively). The percentage of Ranch Hands in the high dioxin category was 0.8 versus 0.1 percent for the Comparisons.

Both the unadjusted and adjusted Model 4 analyses did not reveal a significant association between 1987 dioxin and other ECG diagnoses (Table 14-20(g,h): p<0.41 for each analysis).

14.2.2.3 Physical Examination Variables – Peripheral Vascular Function

14.2.2.3.1 Funduscopic Examination

The unadjusted and adjusted Model 1 analyses of funduscopic examination did not reveal a group difference between Ranch Hands and Comparisons when all occupations were combined (Table 14-21(a,b): p>0.56 for each contrast). Stratifying by occupation revealed a significant group difference within the enlisted groundcrew stratum in both the unadjusted and adjusted analyses (Table 14-21(a,b): Est. RR=0.62, p=0.033; Adj. RR=0.62, p=0.047, respectively). Ranch Hand enlisted groundcrew had fewer abnormal funduscopic examination results (8.8%) than did Comparison enlisted groundcrew (13.3%).

Table 14-21. Analysis of Funduscopic Examination

(a) MODEL 1: RANCH HANDS VS. COMPARISONS – UNADJUSTED

Occupational Category	Group	n	Number (%) Abnormal	Est. Relative Risk (95% C.I.)	p-Value
All	***Ranch Hand***	***858***	***105 (12.2)***	***0.96 (0.74,1.25)***	***0.767***
	Comparison	***1,231***	***156 (12.7)***		
Officer	Ranch Hand	333	42 (12.6)	1.28 (0.83,1.99)	0.267
	Comparison	484	49 (10.1)		
Enlisted Flyer	Ranch Hand	149	30 (20.1)	1.21 (0.69,2.09)	0.508
	Comparison	185	32 (17.3)		
Enlisted Groundcrew	Ranch Hand	376	33 (8.8)	0.62 (0.41,0.96)	0.033
	Comparison	562	75 (13.3)		

(b) MODEL 1: RANCH HANDS VS. COMPARISONS – ADJUSTED

Occupational Category	Adjusted Relative Risk (95% C.I.)	p-Value
All	***0.92 (0.69,1.22)***	***0.562***
Officer	1.27 (0.79,2.02)	0.321
Enlisted Flyer	1.06 (0.59,1.91)	0.852
Enlisted Groundcrew	0.62 (0.39,0.99)	0.047

Table 14-21. Analysis of Funduscopic Examination (Continued)

(c) MODEL 2: RANCH HANDS – INITIAL DIOXIN – UNADJUSTED

Initial Dioxin Category Summary Statistics			Analysis Results for Log_2 (Initial Dioxin)[a]	
Initial Dioxin	n	Number (%) Abnormal	Estimated Relative Risk (95% C.I.)[b]	p-Value
Low	155	20 (12.9)	0.93 (0.76,1.15)	0.520
Medium	161	24 (14.9)		
High	160	18 (11.3)		

[a] Adjusted for percent body fat at the time of the blood measurement of dioxin.
[b] Relative risk for a twofold increase in initial dioxin.

Note: Low = 27–63 ppt; Medium = >63–152 ppt; High = >152 ppt.

(d) MODEL 2: RANCH HANDS – INITIAL DIOXIN – ADJUSTED

Analysis Results for Log_2 (Initial Dioxin)		
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
457	1.14 (0.87,1.50)	0.342

[a] Relative risk for a twofold increase in initial dioxin.

(e) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – UNADJUSTED

Dioxin Category	n	Number (%) Abnormal	Est. Relative Risk (95% C.I.)[ab]	p-Value
Comparison	1,194	149 (12.5)		
Background RH	375	43 (11.5)	0.99 (0.69,1.43)	0.963
Low RH	233	30 (12.9)	1.02 (0.67,1.56)	0.921
High RH	243	32 (13.2)	0.98 (0.65,1.49)	0.933
Low plus High RH	476	62 (13.0)	1.00 (0.73,1.38)	0.993

[a] Relative risk and confidence interval relative to Comparisons.
[b] Adjusted for percent body fat at the time of the blood measurement of dioxin.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

Table 14-21. Analysis of Funduscopic Examination (Continued)

(f) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – ADJUSTED

Dioxin Category	n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
Comparison	1,154		
Background RH	359	1.04 (0.70,1.55)	0.842
Low RH	221	0.82 (0.52,1.30)	0.402
High RH	236	0.95 (0.60,1.51)	0.836
Low plus High RH	457	0.89 (0.63,1.26)	0.500

[a] Relative risk and confidence interval relative to Comparisons.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

(g) MODEL 4: RANCH HANDS – 1987 DIOXIN – UNADJUSTED

1987 Dioxin Category Summary Statistics			Analysis Results for Log_2 (1987 Dioxin + 1)	
1987 Dioxin	n	Number (%) Abnormal	Estimated Relative Risk (95% C.I.)[a]	p-Value
Low	283	30 (10.6)	1.00 (0.87,1.15)	0.951
Medium	281	36 (12.8)		
High	287	39 (13.6)		

[a] Relative risk for a twofold increase in 1987 dioxin.

Note: Low = ≤7.9 ppt; Medium = >7.9–19.6 ppt; High = >19.6 ppt.

(h) MODEL 4: RANCH HANDS – 1987 DIOXIN – ADJUSTED

Analysis Results for Log_2 (1987 Dioxin + 1)		
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
816	1.03 (0.85,1.24)	0.767

[a] Relative risk for a twofold increase in 1987 dioxin.

The unadjusted and adjusted analyses in Models 2 through 4 were nonsignificant (Table 14-21(c–h): p>0.34 for each analysis).

14.2.2.3.2 Carotid Bruits

All Model 1 through 4 unadjusted and adjusted analyses were nonsignificant (Table 14-22(a–h): p>0.21 for each analysis).

Table 14-22. Analysis of Carotid Bruits

(a) MODEL 1: RANCH HANDS VS. COMPARISONS – UNADJUSTED

Occupational Category	Group	n	Number (%) Abnormal	Est. Relative Risk (95% C.I.)	p-Value
All	***Ranch Hand***	***859***	***23 (2.7)***	***1.00 (0.58,1.71)***	***0.999***
	Comparison	***1,232***	***33 (2.7)***		
Officer	Ranch Hand	334	6 (1.8)	0.72 (0.27,1.94)	0.515
	Comparison	484	12 (2.5)		
Enlisted Flyer	Ranch Hand	149	8 (5.4)	2.05 (0.66,6.41)	0.215
	Comparison	186	5 (2.7)		
Enlisted Groundcrew	Ranch Hand	376	9 (2.4)	0.84 (0.37,1.91)	0.673
	Comparison	562	16 (2.8)		

(b) MODEL 1: RANCH HANDS VS. COMPARISONS – ADJUSTED

Occupational Category	Adjusted Relative Risk (95% C.I.)	p-Value
All	***0.94 (0.53,1.65)***	***0.823***
Officer	0.72 (0.26,1.99)	0.524
Enlisted Flyer	1.94 (0.58,6.46)	0.283
Enlisted Groundcrew	0.78 (0.33,1.86)	0.578

(c) MODEL 2: RANCH HANDS – INITIAL DIOXIN – UNADJUSTED

Initial Dioxin Category Summary Statistics			Analysis Results for Log_2 (Initial Dioxin)[a]	
Initial Dioxin	n	Number (%) Abnormal	Estimated Relative Risk (95% C.I.)[b]	p-Value
Low	155	3 (1.9)	1.06 (0.70,1.59)	0.797
Medium	161	5 (3.1)		
High	160	5 (3.1)		

[a] Adjusted for percent body fat at the time of the blood measurement of dioxin.
[b] Relative risk for a twofold increase in initial dioxin.

Note: Low = 27–63 ppt; Medium = >63–152 ppt; High = >152 ppt.

(d) MODEL 2: RANCH HANDS – INITIAL DIOXIN – ADJUSTED

Analysis Results for Log_2 (Initial Dioxin)		
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
457	1.15 (0.62,2.11)	0.658

[a] Relative risk for a twofold increase in initial dioxin.

Table 14-22. Analysis of Carotid Bruits (Continued)

(e) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – UNADJUSTED

Dioxin Category	n	Number (%) Abnormal	Est. Relative Risk (95% C.I.)[ab]	p-Value
Comparison	1,195	31 (2.6)		
Background RH	376	9 (2.4)	0.93 (0.44,1.98)	0.853
Low RH	233	5 (2.1)	0.82 (0.32,2.14)	0.687
High RH	243	8 (3.3)	1.27 (0.57,2.80)	0.561
Low plus High RH	476	13 (2.7)	1.02 (0.53,2.00)	0.943

[a] Relative risk and confidence interval relative to Comparisons.
[b] Adjusted for percent body fat at the time of the blood measurement of dioxin.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

(f) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – ADJUSTED

Dioxin Category	n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
Comparison	1,155		
Background RH	360	1.06 (0.47,2.38)	0.893
Low RH	221	0.69 (0.25,1.86)	0.460
High RH	236	1.01 (0.41,2.45)	0.991
Low plus High RH	457	0.84 (0.41,1.71)	0.625

[a] Relative risk and confidence interval relative to Comparisons.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

(g) MODEL 4: RANCH HANDS – 1987 DIOXIN – UNADJUSTED

1987 Dioxin Category Summary Statistics			Analysis Results for Log_2 (1987 Dioxin + 1)	
1987 Dioxin	n	Number (%) Abnormal	Estimated Relative Risk (95% C.I.)[a]	p-Value
Low	284	7 (2.5)	1.02 (0.77,1.36)	0.897
Medium	281	7 (2.5)		
High	287	8 (2.8)		

[a] Relative risk for a twofold increase in 1987 dioxin.

Note: Low = ≤7.9 ppt; Medium = >7.9–19.6 ppt; High = >19.6 ppt.

Table 14-22. Analysis of Carotid Bruits (Continued)

(b) MODEL 4: RANCH HANDS – 1987 DIOXIN – ADJUSTED

Analysis Results for Log_2 (1987 Dioxin + 1)		
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
817	0.94 (0.65,1.36)	0.755

[a] Relative risk for a twofold increase in 1987 dioxin.

14.2.2.3.3 Radial Pulses

The unadjusted and adjusted Model 1 analyses of radial pulses were nonsignificant (Table 14-23(a,b): p>0.11 for each contrast).

Table 14-23. Analysis of Radial Pulses

(a) MODEL 1: RANCH HANDS VS. COMPARISONS – UNADJUSTED

Occupational Category	Group	n	Number (%) Abnormal	Est. Relative Risk (95% C.I.)	p-Value
All	***Ranch Hand***	***859***	***7 (0.8)***	***2.52 (0.74,8.64)***	***0.131***
	Comparison	***1,232***	***4 (0.3)***		
Officer	Ranch Hand	334	2 (0.6)	1.45 (0.20,10.36)	0.710
	Comparison	484	2 (0.4)		
Enlisted Flyer	Ranch Hand	149	0 (0.0)	--	--
	Comparison	186	0 (0.0)		
Enlisted Groundcrew	Ranch Hand	376	5 (1.3)	3.77 (0.73,19.55)	0.114
	Comparison	562	2 (0.4)		

--: Results not presented because of the sparse number of participants with an abnormal radial pulse.

(b) MODEL 1: RANCH HANDS VS. COMPARISONS – ADJUSTED

Occupational Category	Adjusted Relative Risk (95% C.I.)	p-Value
All	***2.85 (0.67,12.16)***	***0.143***
Officer	1.24 (0.16,9.95)	0.837
Enlisted Flyer	--	--
Enlisted Groundcrew	5.69 (0.54,60.05)	0.148

--: Results not presented because of the sparse number of participants with an abnormal radial pulse.

Note: Results for all occupations combined are not adjusted for occupation because of the sparse number of participants with an abnormal radial pulse.

Table 14-23. Analysis of Radial Pulses (Continued)

(c) MODEL 2: RANCH HANDS – INITIAL DIOXIN – UNADJUSTED

Initial Dioxin Category Summary Statistics			Analysis Results for Log_2 (Initial Dioxin)[a]	
Initial Dioxin	n	Number (%) Abnormal	Estimated Relative Risk (95% C.I.)[b]	p-Value
Low	155	2 (1.3)	0.58 (0.17,1.99)	0.334
Medium	161	0 (0.0)		
High	160	1 (0.6)		

[a] Adjusted for percent body fat at the time of the blood measurement of dioxin.
[b] Relative risk for a twofold increase in initial dioxin.

Note: Low = 27–63 ppt; Medium = >63–152 ppt; High = >152 ppt.

(d) MODEL 2: RANCH HANDS – INITIAL DIOXIN – ADJUSTED

Analysis Results for Log_2 (Initial Dioxin)		
n	Adjusted Relative Risk (95% C.I.)	p-Value
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--: Results not presented because of the sparse number of Ranch Hands with an abnormal radial pulse.

(e) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – UNADJUSTED

Dioxin Category	n	Number (%) Abnormal	Est. Relative Risk (95% C.I.)[ab]	p-Value
Comparison	1,195	4 (0.3)		
Background RH	376	4 (1.1)	2.78 (0.69,11.27)	0.153
Low RH	233	2 (0.9)	2.64 (0.48,14.54)	0.264
High RH	243	1 (0.4)	1.41 (0.16,12.80)	0.759
Low plus High RH	476	3 (0.6)	1.92 (0.40,9.18)	0.414

[a] Relative risk and confidence interval relative to Comparisons.
[b] Adjusted for percent body fat at the time of the blood measurement of dioxin.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

Table 14-23. Analysis of Radial Pulses (Continued)

(f) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – ADJUSTED

Dioxin Category	n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
Comparison	1,155		
Background RH	360	3.27 (0.64,16.71)	0.155
Low RH	221	3.82 (0.53,27.51)	0.183
High RH	236	1.26 (0.11,14.89)	0.856
Low plus High RH	457	2.15 (0.36,13.04)	0.404

[a] Relative risk and confidence interval relative to Comparisons.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

Results are not adjusted for occupation because of the sparse number of participants with an abnormal radial pulse.

(g) MODEL 4: RANCH HANDS – 1987 DIOXIN – UNADJUSTED

1987 Dioxin Category Summary Statistics			Analysis Results for Log_2 (1987 Dioxin + 1)	
1987 Dioxin	n	Number (%) Abnormal	Estimated Relative Risk (95% C.I.)[a]	p-Value
Low	284	2 (0.7)	0.75 (0.43,1.32)	0.305
Medium	281	4 (1.4)		
High	287	1 (0.3)		

[a] Relative risk for a twofold increase in 1987 dioxin.

Note: Low = ≤7.9 ppt; Medium = >7.9–19.6 ppt; High = >19.6 ppt.

(h) MODEL 4: RANCH HANDS – 1987 DIOXIN – ADJUSTED

Analysis Results for Log_2 (1987 Dioxin + 1)		
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
817	0.61 (0.30,1.21)	0.140

[a] Relative risk for a twofold increase in 1987 dioxin.

Note: Results are not adjusted for occupation because of the sparse number of Ranch Hands with an abnormal radial pulse.

The unadjusted Model 2 analysis showed no significant association between radial pulses and initial dioxin (Table 14-23(c): p=0.334). Because of the sparse number of Ranch Hands with abnormal radial pulses, the adjusted Model 2 analysis was not performed.

All Model 3 and 4 analyses of radial pulses were nonsignificant (Table 14-23(e–h): p≥0.14 for each analysis).

14.2.2.3.4 Femoral Pulses

The unadjusted Model 1 analysis of femoral pulses revealed a marginally significant overall group difference between Ranch Hands and Comparisons (Table 14-24(a): Est. RR=1.83, p=0.080). Stratifying by occupation did not reveal any significant difference between Ranch Hands and Comparisons within each occupational stratum (Table 14-24(a): p>0.12 for each contrast). The percentage of participants with abnormal femoral pulses was greater for the Ranch Hands (2.2%) than for Comparisons (1.2%). The adjusted analysis did not show a significant difference between Ranch Hands and Comparisons over all occupations or within each occupational stratum (Table 14-24(b): p>0.17 for each contrast).

Table 14-24. Analysis of Femoral Pulses

(a) MODEL 1: RANCH HANDS VS. COMPARISONS – UNADJUSTED

Occupational Category	Group	n	Number (%) Abnormal	Est. Relative Risk (95% C.I.)	p-Value
All	***Ranch Hand***	***859***	***19 (2.2)***	***1.83 (0.93,3.63)***	***0.080***
	Comparison	***1,231***	***15 (1.2)***		
Officer	Ranch Hand	334	7 (2.1)	1.27 (0.46,3.55)	0.643
	Comparison	484	8 (1.7)		
Enlisted Flyer	Ranch Hand	149	5 (3.4)	2.11 (0.50,8.96)	0.313
	Comparison	185	3 (1.6)		
Enlisted Groundcrew	Ranch Hand	376	7 (1.9)	2.65 (0.77,9.10)	0.123
	Comparison	562	4 (0.7)		

(b) MODEL 1: RANCH HANDS VS. COMPARISONS – ADJUSTED

Occupational Category	Adjusted Relative Risk (95% C.I.)	p-Value
All	***1.66 (0.79,3.49)***	***0.178***
Officer	1.51 (0.52,4.38)	0.448
Enlisted Flyer	1.48 (0.27,8.02)	0.652
Enlisted Groundcrew	2.08 (0.55,7.87)	0.282

(c) MODEL 2: RANCH HANDS – INITIAL DIOXIN – UNADJUSTED

Initial Dioxin Category Summary Statistics			Analysis Results for Log_2 (Initial Dioxin)[a]	
Initial Dioxin	n	Number (%) Abnormal	Estimated Relative Risk (95% C.I.)[b]	p-Value
Low	155	3 (1.9)	0.97 (0.61,1.53)	0.890
Medium	161	5 (3.1)		
High	160	4 (2.5)		

[a] Adjusted for percent body fat at the time of the blood measurement of dioxin.
[b] Relative risk for a twofold increase in initial dioxin.

Note: Low = 27–63 ppt; Medium = >63–152 ppt; High = >152 ppt.

Table 14-24. Analysis of Femoral Pulses (Continued)

(d) MODEL 2: RANCH HANDS – INITIAL DIOXIN – ADJUSTED

Analysis Results for Log_2 (Initial Dioxin)		
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
457	1.17 (0.61,2.24)	0.641

[a] Relative risk for a twofold increase in initial dioxin.

Note: Results are not adjusted for race because of the sparse number of participants with an abnormal femoral pulse.

(e) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – UNADJUSTED

Dioxin Category	n	Number (%) Abnormal	Est. Relative Risk (95% C.I.)[ab]	p-Value
Comparison	1,194	15 (1.3)		
Background RH	376	7 (1.9)	1.39 (0.56,3.45)	0.481
Low RH	233	6 (2.6)	2.10 (0.81,5.48)	0.128
High RH	243	6 (2.5)	2.13 (0.81,5.56)	0.125
Low plus High RH	476	12 (2.5)	2.11 (0.98,4.56)	0.056

[a] Relative risk and confidence interval relative to Comparisons.
[b] Adjusted for percent body fat at the time of the blood measurement of dioxin.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

(f) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – ADJUSTED

Dioxin Category	n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
Comparison	1,154		
Background RH	360	1.22 (0.44,3.36)	0.702
Low RH	221	1.71 (0.58,4.98)	0.329
High RH	236	2.45 (0.76,7.90)	0.134
Low plus High RH	457	2.06 (0.85,4.96)	0.108

[a] Relative risk and confidence interval relative to Comparisons.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

Table 14-24. Analysis of Femoral Pulses (Continued)

(g) MODEL 4: RANCH HANDS – 1987 DIOXIN – UNADJUSTED

1987 Dioxin Category Summary Statistics			Analysis Results for Log_2 (1987 Dioxin + 1)	
1987 Dioxin	n	Number (%) Abnormal	Estimated Relative Risk (95% C.I.)[a]	p-Value
Low	284	5 (1.8)	1.01 (0.75,1.38)	0.927
Medium	281	5 (1.8)		
High	287	9 (3.1)		

[a] Relative risk for a twofold increase in 1987 dioxin.

Note: Low = ≤7.9 ppt; Medium = >7.9–19.6 ppt; High = >19.6 ppt.

(h) MODEL 4: RANCH HANDS – 1987 DIOXIN – ADJUSTED

Analysis Results for Log_2 (1987 Dioxin + 1)		
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
817	1.29 (0.83,2.03)	0.255

[a] Relative risk for a twofold increase in 1987 dioxin.

The Model 2 analyses did not reveal a significant association between femoral pulses and initial dioxin in either the unadjusted or adjusted analyses (Table 14-24(c,d): p>0.64 for each analysis).

The unadjusted Model 3 analysis showed a marginally significant difference between Ranch Hands in the low plus high dioxin category and Comparisons (Table 14-24(e): Est. RR=2.11, p=0.056). The percentage of abnormal femoral pulses for Ranch Hands in the low plus high dioxin category was 2.5 versus 1.3 percent for Comparisons. The adjusted analysis did not find any contrasts to be significant (Table 14-24(f): p>0.10 for each contrast).

The unadjusted and adjusted Model 4 analyses did not show a significant association between 1987 dioxin and femoral pulses (Table 14-24(g,h): p>0.25 for each analysis).

14.2.2.3.5 Popliteal Pulses

All unadjusted and adjusted Model 1 through 4 analyses were not significant (Table 14-25(a–h): p≥0.41 for each analysis).

Table 14-25. Analysis of Popliteal Pulses

(a) MODEL 1: RANCH HANDS VS. COMPARISONS – UNADJUSTED

Occupational Category	Group	n	Number (%) Abnormal	Est. Relative Risk (95% C.I.)	p-Value
All	***Ranch Hand***	***859***	***23 (2.7)***	***1.18 (0.68,2.06)***	***0.561***
	Comparison	***1,230***	***28 (2.3)***		
Officer	Ranch Hand	334	7 (2.1)	0.84 (0.33,2.16)	0.717
	Comparison	483	12 (2.5)		
Enlisted Flyer	Ranch Hand	149	5 (3.4)	1.57 (0.41,5.96)	0.506
	Comparison	185	4 (2.2)		
Enlisted Groundcrew	Ranch Hand	376	11 (2.9)	1.38 (0.60,3.16)	0.445
	Comparison	562	12 (2.1)		

Table 14-25. Analysis of Popliteal Pulses (Continued)

(b) MODEL 1: RANCH HANDS VS. COMPARISONS – ADJUSTED

Occupational Category	Adjusted Relative Risk (95% C.I.)	p-Value
All	*1.04 (0.56,1.90)*	*0.911*
Officer	0.95 (0.35,2.52)	0.911
Enlisted Flyer	0.99 (0.21,4.82)	0.995
Enlisted Groundcrew	1.13 (0.46,2.79)	0.784

(c) MODEL 2: RANCH HANDS – INITIAL DIOXIN – UNADJUSTED

Initial Dioxin Category Summary Statistics			Analysis Results for Log_2 (Initial Dioxin)[a]	
Initial Dioxin	n	Number (%) Abnormal	Estimated Relative Risk (95% C.I.)[b]	p-Value
Low	155	4 (2.6)	0.89 (0.57,1.38)	0.601
Medium	161	6 (3.7)		
High	160	4 (2.5)		

[a] Adjusted for percent body fat at the time of the blood measurement of dioxin.
[b] Relative risk for a twofold increase in initial dioxin.

Note: Low = 27–63 ppt; Medium = >63–152 ppt; High = >152 ppt.

(d) MODEL 2: RANCH HANDS – INITIAL DIOXIN – ADJUSTED

Analysis Results for Log_2 (Initial Dioxin)		
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
457	0.97 (0.53,1.78)	0.924

[a] Relative risk for a twofold increase in initial dioxin.

Note: Results are not adjusted for race because of the sparse number of Ranch Hands with an abnormal popliteal pulse.

(e) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – UNADJUSTED

Dioxin Category	n	Number (%) Abnormal	Est. Relative Risk (95% C.I.)[ab]	p-Value
Comparison	1,193	28 (2.3)		
Background RH	376	9 (2.4)	0.94 (0.44,2.03)	0.879
Low RH	233	7 (3.0)	1.31 (0.56,3.03)	0.535
High RH	243	7 (2.9)	1.33 (0.57,3.08)	0.512
Low plus High RH	476	14 (2.9)	1.32 (0.69,2.53)	0.410

[a] Relative risk and confidence interval relative to Comparisons.
[b] Adjusted for percent body fat at the time of the blood measurement of dioxin.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

Table 14-25. Analysis of Popliteal Pulses (Continued)

(f) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – ADJUSTED

Dioxin Category	n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
Comparison	1,153		
Background RH	360	0.88 (0.37,2.05)	0.760
Low RH	221	1.15 (0.45,2.92)	0.776
High RH	236	1.08 (0.40,2.86)	0.884
Low plus High RH	457	1.11 (0.53,2.30)	0.781

[a] Relative risk and confidence interval relative to Comparisons.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

(g) MODEL 4: RANCH HANDS – 1987 DIOXIN – UNADJUSTED

1987 Dioxin Category Summary Statistics			Analysis Results for Log_2 (1987 Dioxin + 1)	
1987 Dioxin	n	Number (%) Abnormal	Estimated Relative Risk (95% C.I.)[a]	p-Value
Low	284	6 (2.1)	0.98 (0.74,1.30)	0.891
Medium	281	7 (2.5)		
High	287	10 (3.5)		

[a] Relative risk for a twofold increase in 1987 dioxin.

Note: Low = ≤7.9 ppt; Medium = >7.9–19.6 ppt; High = >19.6 ppt.

(h) MODEL 4: RANCH HANDS – 1987 DIOXIN – ADJUSTED

Analysis Results for Log_2 (1987 Dioxin + 1)		
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
817	1.02 (0.72,1.46)	0.908

[a] Relative risk for a twofold increase in 1987 dioxin.

14.2.2.3.6 Dorsalis Pedis Pulses

All unadjusted and adjusted analyses of dorsalis pedis pulses were nonsignificant (Table 14-26(a–h): p>0.11 for each analysis).

Table 14-26. Analysis of Dorsalis Pedis Pulses

(a) MODEL 1: RANCH HANDS VS. COMPARISONS – UNADJUSTED

Occupational Category	Group	n	Number (%) Abnormal	Est. Relative Risk (95% C.I.)	p-Value
All	***Ranch Hand***	***859***	***69 (8.0)***	***1.04 (0.76,1.44)***	***0.796***
	Comparison	***1,230***	***95 (7.7)***		
Officer	Ranch Hand	334	27 (8.1)	1.24 (0.73,2.11)	0.429
	Comparison	483	32 (6.6)		
Enlisted Flyer	Ranch Hand	149	18 (12.1)	1.36 (0.67,2.74)	0.392
	Comparison	185	17 (9.2)		
Enlisted Groundcrew	Ranch Hand	376	24 (6.4)	0.76 (0.46,1.28)	0.305
	Comparison	562	46 (8.2)		

(b) MODEL 1: RANCH HANDS VS. COMPARISONS – ADJUSTED

Occupational Category	Adjusted Relative Risk (95% C.I.)	p-Value
All	***0.97 (0.69,1.37)***	***0.857***
Officer	1.27 (0.73,2.22)	0.398
Enlisted Flyer	1.33 (0.62,2.86)	0.463
Enlisted Groundcrew	0.64 (0.37,1.12)	0.117

(c) MODEL 2: RANCH HANDS – INITIAL DIOXIN – UNADJUSTED

Initial Dioxin Category Summary Statistics			Analysis Results for Log_2 (Initial Dioxin)[a]	
Initial Dioxin	n	Number (%) Abnormal	Estimated Relative Risk (95% C.I.)[b]	p-Value
Low	155	12 (7.7)	0.90 (0.69,1.17)	0.417
Medium	161	16 (9.9)		
High	160	12 (7.5)		

[a] Adjusted for percent body fat at the time of the blood measurement of dioxin.
[b] Relative risk for a twofold increase in initial dioxin.

Note: Low = 27–63 ppt; Medium = >63–152 ppt; High = >152 ppt.

(d) MODEL 2: RANCH HANDS – INITIAL DIOXIN – ADJUSTED

Analysis Results for Log_2 (Initial Dioxin)		
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
457	1.11 (0.78,1.57)	0.561

[a] Relative risk for a twofold increase in initial dioxin.

Table 14-26. Analysis of Dorsalis Pedis Pulses (Continued)

(e) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – UNADJUSTED

Dioxin Category	n	Number (%) Abnormal	Est. Relative Risk (95% C.I.)[a,b]	p-Value
Comparison	1,193	95 (8.0)		
Background RH	376	29 (7.7)	0.91 (0.59,1.40)	0.664
Low RH	233	22 (9.4)	1.22 (0.75,1.98)	0.429
High RH	243	18 (7.4)	0.98 (0.58,1.65)	0.931
Low plus High RH	476	40 (8.4)	1.09 (0.74,1.61)	0.670

[a] Relative risk and confidence interval relative to Comparisons.
[b] Adjusted for percent body fat at the time of the blood measurement of dioxin.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

(f) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – ADJUSTED

Dioxin Category	n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
Comparison	1,153		
Background RH	360	0.94 (0.59,1.50)	0.792
Low RH	221	0.99 (0.58,1.70)	0.977
High RH	236	0.89 (0.50,1.58)	0.685
Low plus High RH	457	0.94 (0.61,1.43)	0.761

[a] Relative risk and confidence interval relative to Comparisons.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

(g) MODEL 4: RANCH HANDS – 1987 DIOXIN – UNADJUSTED

1987 Dioxin Category Summary Statistics			Analysis Results for Log_2 (1987 Dioxin + 1)	
1987 Dioxin	n	Number (%) Abnormal	Estimated Relative Risk (95% C.I.)[a]	p-Value
Low	284	21 (7.4)	0.99 (0.84,1.17)	0.913
Medium	281	25 (8.9)		
High	287	23 (8.0)		

[a] Relative risk for a twofold increase in 1987 dioxin.

Note: Low = ≤7.9 ppt; Medium = >7.9–19.6 ppt; High = >19.6 ppt.

Table 14-26. Analysis of Dorsalis Pedis Pulses (Continued)

(h) MODEL 4: RANCH HANDS – 1987 DIOXIN – ADJUSTED		
Analysis Results for Log_2 (1987 Dioxin + 1)		
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
817	1.07 (0.85,1.33)	0.580

[a] Relative risk for a twofold increase in 1987 dioxin.

14.2.2.3.7 Posterior Tibial Pulses

All unadjusted and adjusted Models 1 through 4 analyses of posterior tibial pulses were nonsignificant (Table 14-27(a–h): p>0.11 for each analysis).

Table 14-27. Analysis of Posterior Tibial Pulses

(a) MODEL 1: RANCH HANDS VS. COMPARISONS – UNADJUSTED					
Occupational Category	Group	n	Number (%) Abnormal	Est. Relative Risk (95% C.I.)	p-Value
All	***Ranch Hand***	***859***	***58 (6.8)***	***1.32 (0.91,1.90)***	***0.142***
	Comparison	***1,228***	***64 (5.2)***		
Officer	Ranch Hand	334	22 (6.6)	1.41 (0.77,2.57)	0.263
	Comparison	483	23 (4.8)		
Enlisted Flyer	Ranch Hand	149	14 (9.4)	1.36 (0.62,2.98)	0.449
	Comparison	183	13 (7.1)		
Enlisted Groundcrew	Ranch Hand	376	22 (5.9)	1.19 (0.67,2.10)	0.562
	Comparison	562	28 (5.0)		

(b) MODEL 1: RANCH HANDS VS. COMPARISONS – ADJUSTED		
Occupational Category	Adjusted Relative Risk (95% C.I.)	p-Value
All	***1.25 (0.84,1.86)***	***0.280***
Officer	1.40 (0.73,2.68)	0.307
Enlisted Flyer	1.17 (0.49,2.78)	0.724
Enlisted Groundcrew	1.16 (0.62,2.16)	0.649

(c) MODEL 2: RANCH HANDS – INITIAL DIOXIN – UNADJUSTED				
Initial Dioxin Category Summary Statistics			Analysis Results for Log_2 (Initial Dioxin)[a]	
Initial Dioxin	n	Number (%) Abnormal	Estimated Relative Risk (95% C.I.)[b]	p-Value
Low	155	9 (5.8)	1.01 (0.77,1.33)	0.925
Medium	161	15 (9.3)		
High	160	10 (6.3)		

[a] Adjusted for percent body fat at the time of the blood measurement of dioxin.
[b] Relative risk for a twofold increase in initial dioxin.

Note: Low = 27–63 ppt; Medium = >63–152 ppt; High = >152 ppt.

Table 14-27. Analysis of Posterior Tibial Pulses (Continued)

(d) MODEL 2: RANCH HANDS – INITIAL DIOXIN – ADJUSTED

Analysis Results for Log_2 (Initial Dioxin)		
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
457	1.16 (0.81,1.65)	0.417

[a] Relative risk for a twofold increase in initial dioxin.

(e) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – UNADJUSTED

Dioxin Category	n	Number (%) Abnormal	Est. Relative Risk (95% C.I.)[ab]	p-Value
Comparison	1,191	63 (5.3)		
Background RH	376	22 (5.9)	1.04 (0.63,1.73)	0.865
Low RH	233	18 (7.7)	1.52 (0.88,2.61)	0.135
High RH	243	16 (6.6)	1.34 (0.76,2.36)	0.320
Low plus High RH	476	34 (7.1)	1.42 (0.92,2.19)	0.113

[a] Relative risk and confidence interval relative to Comparisons.
[b] Adjusted for percent body fat at the time of the blood measurement of dioxin.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

(f) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – ADJUSTED

Dioxin Category	n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
Comparison	1,151		
Background RH	360	1.08 (0.62,1.89)	0.784
Low RH	221	1.31 (0.71,2.39)	0.387
High RH	236	1.21 (0.63,2.30)	0.571
Low plus High RH	457	1.25 (0.77,2.03)	0.358

[a] Relative risk and confidence interval relative to Comparisons.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.

Table 14-27. Analysis of Posterior Tibial Pulses (Continued)

(g) MODEL 4: RANCH HANDS – 1987 DIOXIN – UNADJUSTED

1987 Dioxin Category Summary Statistics			Analysis Results for Log_2 (1987 Dioxin + 1)	
1987 Dioxin	n	Number (%) Abnormal	Estimated Relative Risk (95% C.I.)[a]	p-Value
Low	284	18 (6.3)	1.03 (0.86,1.24)	0.746
Medium	281	16 (5.7)		
High	287	22 (7.7)		

[a] Relative risk for a twofold increase in 1987 dioxin.

Note: Low = ≤7.9 ppt; Medium = >7.9–19.6 ppt; High = >19.6 ppt.

(h) MODEL 4: RANCH HANDS – 1987 DIOXIN – ADJUSTED

Analysis Results for Log_2 (1987 Dioxin + 1)		
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
817	1.12 (0.88,1.43)	0.354

[a] Relative risk for a twofold increase in 1987 dioxin.

14.2.2.3.8 Leg Pulses

Leg pulses were not significantly associated with dioxin in any of the unadjusted and adjusted Models 1 through 4 analyses (Table 14-28(a–h): p>0.15 for each analysis).

Table 14-28. Analysis of Leg Pulses

(a) MODEL 1: RANCH HANDS VS. COMPARISONS – UNADJUSTED

Occupational Category	Group	n	Number (%) Abnormal	Est. Relative Risk (95% C.I.)	p-Value
All	***Ranch Hand***	***859***	***94 (10.9)***	***1.10 (0.83,1.47)***	***0.496***
	Comparison	***1,228***	***123 (10.0)***		
Officer	Ranch Hand	334	36 (10.8)	1.34 (0.83,2.15)	0.228
	Comparison	483	40 (8.3)		
Enlisted Flyer	Ranch Hand	149	25 (16.8)	1.48 (0.79,2.74)	0.218
	Comparison	183	22 (12.0)		
Enlisted Groundcrew	Ranch Hand	376	33 (8.8)	0.79 (0.51,1.23)	0.300
	Comparison	562	61 (10.9)		

Table 14-28. Analysis of Leg Pulses (Continued)

(b) MODEL 1: RANCH HANDS VS. COMPARISONS – ADJUSTED

Occupational Category	Adjusted Relative Risk (95% C.I.)	p-Value
All	***1.03 (0.76,1.40)***	***0.850***
Officer	1.30 (0.79,2.16)	0.306
Enlisted Flyer	1.46 (0.74,2.88)	0.270
Enlisted Groundcrew	0.71 (0.44,1.14)	0.158

(c) MODEL 2: RANCH HANDS – INITIAL DIOXIN – UNADJUSTED

Initial Dioxin Category Summary Statistics			Analysis Results for Log_2 (Initial Dioxin)[a]	
Initial Dioxin	n	Number (%) Abnormal	Estimated Relative Risk (95% C.I.)[b]	p-Value
Low	155	15 (9.7)	0.96 (0.77,1.20)	0.739
Medium	161	22 (13.7)		
High	160	16 (10.0)		

[a] Adjusted for percent body fat at the time of the blood measurement of dioxin.
[b] Relative risk for a twofold increase in initial dioxin.

Note: Low = 27–63 ppt; Medium = >63–152 ppt; High = >152 ppt.

(d) MODEL 2: RANCH HANDS – INITIAL DIOXIN – ADJUSTED

Analysis Results for Log_2 (Initial Dioxin)		
n	Adjusted Relative Risk (95% C.I.)[a]	p-Value
457	1.13 (0.84,1.51)	0.433

[a] Relative risk for a twofold increase in initial dioxin.

(e) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY – UNADJUSTED

Dioxin Category	n	Number (%) Abnormal	Est. Relative Risk (95% C.I.)[ab]	p-Value
Comparison	1,191	122 (10.2)		
Background RH	376	39 (10.4)	0.95 (0.65,1.40)	0.812
Low RH	233	29 (12.4)	1.26 (0.82,1.94)	0.298
High RH	243	24 (9.9)	1.01 (0.64,1.61)	0.957
Low plus High RH	476	53 (11.1)	1.13 (0.80,1.59)	0.498

[a] Relative risk and confidence interval relative to Comparisons.
[b] Adjusted for pereent body fat at the time of the blood measurement of dioxin.

Note: RH = Ranch Hand.
Comparison: 1987 Dioxin ≤ 10 ppt.
Background (Ranch Hand): 1987 Dioxin ≤ 10 ppt.
Low (Ranch Hand): 1987 Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 94 ppt.
High (Ranch Hand): 1987 Dioxin > 10 ppt, Initial Dioxin > 94 ppt.