

Air Force Health Study

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

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Volume IX

SERUM DIOXIN ANALYSIS OF
1987 EXAMINATION RESULTS

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LIST OF APPENDICES

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

LIST OF APPENDICES (Continued)

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

TABLE OF CONTENTS - REPORT

VOLUME I

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

VOLUME II

CHAPTER 7 - Malignancy Assessment

VOLUME III

CHAPTER 8 - Neurological Assessment
CHAPTER 9 - Psychological Assessment

VOLUME IV

CHAPTER 10 - Gastrointestinal Assessment
CHAPTER 11 - Dermatologic Assessment

VOLUME V

CHAPTER 12 - Cardiovascular Assessment
CHAPTER 13 - Hematologic Assessment

VOLUME VI

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

VOLUME VII

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

VOLUME VIII

APPENDIX A through J

VOLUME IX

APPENDIX K through R

Appendix K

Cardiovascular Assessment

TABLE K-1.

Summary of Dioxin-by-Covariate Interactions for Cardiovascular Variables

Ranch Hands - Log₂ (Initial Dioxin)							
Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Initial Dioxin	n	Percent Yes	Adj. Relative Risk (95% C.I.) ^a	p-Value
Reported/ Verified Essential Hypertension (Maximal-- 12-3 [d])	Initial-by- Differential Cortisol Response	≤0.6	Low	45	35.6	1.17 (0.94,1.44)	0.157
			Medium	107	41.1		
			High	56	50.0		
		>0.6-4.0	Low	63	23.8	0.95 (0.77,1.18)	0.645
			Medium	110	38.2		
			High	59	32.2		
		>4.0	Low	55	34.6	0.90 (0.67,1.20)	0.459
			Medium	92	31.5		
			High	30	43.3		

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Interaction	Stratum	Current Dioxin Category	n	Percent Yes	Contrast	Adj. Relative Risk (95% C.I.)	p-Value
Reported/ Verified Essential Hypertension (12-3 [j])	Categorized Current Dioxin-by- Age	Born ≥1942	Background	299	24.4	All		0.021
			Unknown	111	15.3	U vs. B	0.68 (0.37,1.23)	0.202
			Low	76	32.9	L vs. B	1.66 (0.94,2.93)	0.078
			High	103	36.9	H vs. B	1.56 (0.95,2.56)	0.082
		Born <1942	Background	397	38.8	All		0.998
			Unknown	204	34.3	U vs. B	0.98 (0.68,1.42)	0.920
			Low	97	41.2	L vs. B	1.01 (0.63,1.62)	0.967
			High	47	46.8	H vs. B	1.09 (0.57,2.05)	0.802

TABLE K-1. (Continued)

Summary of Dioxin-by-Covariate Interactions for Cardiovascular Variables

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Initial Dioxin	n	Percent Yes	Adj. Relative Risk (95% C.I.) ^a	p-Value
Reported Heart Disease (Excluding Essential Hypertension) (Minimal-- 12-4 [c])	Initial-by- Race	Black	Low	10	70.0	0.27 (0.08,0.92)	0.036
			Medium	13	46.2		
			High	3	33.3		
		Non-Black	Low	100	40.0	0.99 (0.82,1.18)	0.879
			Medium	211	34.1		
			High	109	29.4		
Verified Heart Disease (Excluding Essential Hypertension) (Minimal-- 12-5 [c])	Initial-by- Race	Black	Low	10	70.0	0.27 (0.08,0.89)	0.032
			Medium	13	46.2		
			High	3	33.3		
		Non-Black	Low	100	40.0	0.99 (0.83,1.19)	0.920
			Medium	211	33.7		
			High	109	29.4		

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Interaction	Stratum	Current Dioxin Category	n	Percent Yes	Contrast	Adj. Relative Risk (95% C.I.)	p-Value
Reported/ Verified Myocardial Infarction (12-6 [j])	Categorized Current Dioxin-by- Differential Cortisol Response	≤0.6	Background	236	3.0	All		<0.001
			Unknown	93	3.2	U vs. B	0.83 (0.20,3.35)	0.793
			Low	61	14.8	L vs. B	6.43 (2.21,18.68)	0.001
			High	55	0.0	H vs. B	--	0.454
		>0.6-4.0	Background	228	4.4	All		0.721
			Unknown	102	2.0	U vs. B	0.47 (0.10,2.22)	0.339
			Low	63	3.2	L vs. B	0.67 (0.14,3.27)	0.619
			High	61	1.6	H vs. B	0.52 (0.21,1.30)	0.164
		>4.0	Background	203	7.4	All		0.364
			Unknown	108	3.7	U vs. B	0.54 (0.17,1.69)	0.289
			Low	50	2.0	L vs. B	0.28 (0.04,2.24)	0.231
			High	34	5.9	H vs. B	1.34 (0.53,3.34)	0.535

TABLE K-1. (Continued)

Summary of Dioxin-by-Covariate Interactions for Cardiovascular Variables

Ranch Hands - Log ₂ (Initial Dioxin)							
Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Initial Dioxin	n	Adj. Mean	Adj. Slope (Std. Error) ^b	p-Value
Systolic Blood Pressure (Continuous) (Minimal-- 12-7 [c])	Initial-by- Age	Born≥1942 0	Low	12	130.61	0.464 (1.512)	0.759
			Medium	25	136.39		
			High	26	132.63		
	Initial-by- Lifetime Cigarette Smoking History	Born≥1942 >0-10	Low	17	127.21	-0.851 (1.568)	0.588
			Medium	37	129.11		
			High	29	126.78		
		Born≥1942 >10	Low	12	135.59	-3.972 (1.601)	0.014
			Medium	42	130.18		
			High	19	125.84		
		Born<1942 0	Low	20	130.39	1.512 (2.145)	0.481
			Medium	30	129.72		
			High	11	133.74		
		Born<1942 >0-10	Low	17	130.77	3.906 (2.580)	0.131
			Medium	30	128.04		
			High	4	142.65		
Born<1942 >10	Low	32	132.72	1.488 (1.385)	0.283		
	Medium	58	131.95				
	High	22	137.55				
Systolic Blood Pressure (Continuous) (Maximal-- 12-7 [d])	Initial-by- Lifetime Cigarette Smoking History	0	Low	58	129.91	1.457 (0.829)	0.079
			Medium	85	130.50		
			High	48	134.92		
	>0-10	Low	46	124.65	1.008 (0.928)	0.278	
		Medium	87	127.75			
		High	47	132.77			
	>10	Low	68	133.10	-0.753 (0.737)	0.308	
		Medium	146	132.10			
		High	58	131.13			

TABLE K-1. (Continued)

Summary of Dioxin-by-Covariate Interactions for Cardiovascular Variables

Ranch Hands - Log₂ (Current Dioxin) and Time								
Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Time (Yrs.)	Adj. Mean/(n) Current Dioxin			Adj. Slope (Std. Error) ^b	p-Value
				Low	Medium	High		
Systolic Blood Pressure (Continuous) (Minimal-- 12-7 [g])	Current-by- Time-by-Family History of Heart Disease	Yes	≤18.6	125.03 (14)	129.51 (22)	133.76 (8)	4.018 (2.759)	0.072 ^c 0.146 ^d
			>18.6	131.79 (11)	138.52 (27)	130.18 (16)	-2.075 (1.942)	0.286 ^d
		No	≤18.6	134.06 (42)	128.57 (87)	130.65 (34)	-1.322 (1.208)	0.411 ^c 0.274 ^d
			>18.6	131.23 (37)	130.10 (86)	130.29 (47)	-0.032 (1.015)	0.975 ^d
Systolic Blood Pressure (Continuous) (Maximal-- 12-7 [h])	Current-by- Time-by-Age	Born ≥1942	≤18.6	125.26 (46)	130.22 (79)	128.08 (51)	0.938 (0.888)	0.116 ^c 0.291 ^d
			>18.6	121.97 (11)	132.51 (50)	128.77 (55)	-1.194 (1.044)	0.253 ^d
		Born <1942	≤18.6	135.15 (56)	129.34 (86)	133.45 (16)	-1.825 (1.332)	0.030 ^c 0.171 ^d
			>18.6	130.41 (57)	129.97 (104)	136.38 (32)	1.737 (0.973)	0.075 ^d

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Interaction	Stratum	Current Dioxin Category	n	Adj. Mean	Contrast	Difference of Adj. Means (95% C.I.)	p- Value
Systolic Blood Pressure (Continuous) (12-7 [j])	Categorized Current Dioxin-by- Age	Born ≥1942	Background	287	125.11	All		0.278
			Unknown	106	125.70	U vs. B	0.60 (-3.12,4.31)	0.753
			Low	74	129.34	L vs. B	4.23 (0.00,8.47)	0.051
			High	101	125.98	H vs. B	0.87 (-2.91,4.66)	0.650
		Born <1942	Background	375	130.76	All		0.076
			Unknown	195	129.23	U vs. B	-1.53 (-4.41,1.36)	0.299
			Low	99	127.14	L vs. B	-3.62 (-7.30,0.06)	0.054
			High	48	133.98	H vs. B	3.22 (-1.77,8.22)	0.206

TABLE K-1. (Continued)
Summary of Dioxin-by-Covariate Interactions for
Cardiovascular Variables

Ranch Hands - Log₂ (Initial Dioxin)							
Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Initial Dioxin	n	Percent Abnormal	Adj. Relative Risk (95% C.I.) ^a	p-Value
Systolic Blood Pressure (Discrete) (Minimal-- 12-8 [c])	Initial-by- Personality Type	Type A	Low	52	26.9	0.70 (0.48,1.00)	0.050
			Medium	95	17.9		
			High	44	11.4		
		Type B	Low	55	20.0	1.11 (0.85,1.43)	0.447
			Medium	122	21.3		
			High	63	27.0		

Ranch Hands - Log ₂ (Current Dioxin) and Time								
Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Time (Yrs.)	Percent Abnormal/(n) Current Dioxin			Adj. Relative Risk (95% C.I.) ^a	p-Value
				Low	Medium	High		
Systolic Blood Pressure (Discrete) (Minimal-- 12-8 [gl])	Current-by- Time-by- Personality Type	Type A	≤18.6	32.3 (31)	20.5 (44)	5.6 (18)	0.41 (0.20,0.85)	0.076 ^e
			>18.6	10.0 (20)	19.6 (51)	14.8 (27)		0.017 ^f
								0.542 ^f
		Type B	≤18.6	12.0 (25)	12.3 (65)	37.5 (24)	1.57 (1.01,2.45)	0.024 ^e
			>18.6	35.7 (28)	25.8 (62)	22.2 (36)		0.047 ^f
								0.298 ^f
Systolic Blood Pressure (Discrete) (Maximal-- 12-8 [h])	Current-by- Time-by- Personality Type	Type A	≤18.6	16.3 (49)	25.0 (76)	7.7 (26)	0.71 (0.46,1.08)	0.228 ^e
			>18.6	9.4 (32)	19.7 (71)	15.8 (38)		0.106 ^f
								0.851 ^f
		Type B	≤18.6	15.2 (46)	10.7 (84)	29.7 (37)	1.33 (0.95,1.87)	0.078 ^e
			>18.6	23.5 (34)	27.5 (80)	25.0 (48)		0.094 ^f
								0.486 ^f

TABLE K-1. (Continued)

Summary of Dioxin-by-Covariate Interactions for Cardiovascular Variables

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Interaction	Stratum	Current Dioxin Category	n	Percent Abnormal	Contrast	Adj. Relative Risk (95% C.I.)	p-Value
Systolic Blood Pressure (Discrete) (12-8 [jj])	Categorized Current Dioxin-by- Age	Born ≥1942	Background	287	11.8	All		0.144
			Unknown	105	9.5	U vs. B	1.09 (0.50,2.39)	0.825
			Low	74	21.6	L vs. B	2.30 (1.15,4.59)	0.018
			High	100	17.0	H vs. B	1.29 (0.66,2.51)	0.452
	Categorized Current Dioxin-by- Differential Cortisol Response	Born <1942 ≤0.6	Background	136	25.7	All		0.947
			Unknown	64	25.0	U vs. B	1.02 (0.50,2.08)	0.949
			Low	31	29.0	L vs. B	1.14 (0.47,2.78)	0.776
			High	14	21.4	H vs. B	0.76 (0.20,2.92)	0.684
		Born <1942 >0.6-4.0	Background	125	27.2	All		0.016
			Unknown	62	8.1	U vs. B	0.29 (0.10,0.79)	0.016
			Low	40	15.0	L vs. B	0.40 (0.15,1.07)	0.068
			High	19	31.6	H vs. B	0.99 (0.34,2.90)	0.982
		Born <1942 >4.0	Background	113	26.6	All		0.007
			Unknown	69	27.5	U vs. B	1.21 (0.61,2.41)	0.590
			Low	27	3.7	L vs. B	0.08 (0.01,0.66)	0.019
			High	14	35.7	H vs. B	1.12 (0.33,3.79)	0.852

TABLE K-1. (Continued)

Summary of Dioxin-by-Covariate Interactions for Cardiovascular Variables

Ranch Hands - Log₂ (Current Dioxin) and Time								
Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Time (Yrs.)	Percent Abnormal/(n) Current Dioxin			Adj. Relative Risk (95% C.I.) ^a	p-Value
				Low	Medium	High		
Heart Sounds (Minimal-- 12-9 [g])	Current-by- Time-by- Family History of Heart Disease	Yes	≤18.6	14.3 (14)	0.0 (22)	0.0 (9)	--	--
			>18.6	0.0 (11)	12.0 (25)	6.3 (16)	2.66 (0.92,7.67)	0.070 ^f
	Current-by- Time-by- Lifetime Cigarette Smoking History	No 0	≤18.6	6.7 (15)	0.0 (23)	9.1 (11)	0.63 (0.18,2.21)	0.014 0.467 ^f
			>18.6	37.5 (8)	0.0 (20)	0.0 (17)	--	--
		No >0-10	≤18.6	0.0 (13)	2.8 (36)	7.7 (13)	2.00 (0.51,7.78)	-- 0.319 ^f
			>18.6	11.1 (9)	0.0 (21)	0.0 (13)	--	--
		No >10	≤18.6	5.9 (17)	0.0 (31)	0.0 (12)	--	--
			>18.6	4.8 (21)	4.4 (46)	5.9 (17)	1.29 (0.59,2.83)	0.520 ^f

TABLE K-1. (Continued)

Summary of Dioxin-by-Covariate Interactions for Cardiovascular Variables

Ranch Hands - Log ₂ (Current Dioxin) and Time								
Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Time (Yrs.)	Percent Abnormal/(n) Current Dioxin			Adj. Relative Risk (95% C.I.) ^a	p-Value
				Low	Medium	High		
Heart Sounds (Maximal-- 12-9 [h])	Current-by- Time-by- Family History of Heart Disease	Yes	≤18.6	17.4 (23)	5.4 (37)	0.0 (11)	0.21 (0.04,1.06)	0.002 ^e 0.059 ^f
			>18.6	5.3 (19)	2.9 (35)	12.5 (24)	1.90 (0.96,3.76)	0.065 ^f
	Current-by- Time-by- Lifetime Cigarette Smoking History	No 0	≤18.6	3.3 (30)	2.5 (40)	7.1 (14)	1.08 (0.44,2.63)	0.378 ^e 0.868 ^f
			>18.6	0.0 (14)	11.1 (27)	0.0 (23)	0.56 (0.16,1.98)	0.365 ^f
		No >0-10	≤18.6	0.0 (23)	2.4 (42)	4.4 (23)	3.11 (0.91,10.67)	-- 0.071 ^f
			>18.6	0.0 (8)	3.9 (26)	0.0 (17)	--	--
		No >10	≤18.6	3.7 (27)	2.1 (48)	0.0 (20)	0.40 (0.06,2.80)	0.126 ^e 0.353 ^f
			>18.6	0.0 (27)	4.6 (66)	4.4 (23)	1.61 (0.85,3.04)	0.147 ^f
	Current-by- Time-by-Age	Born≥1942	≤18.6	8.7 (46)	4.9 (81)	2.0 (51)	0.72 (0.40,1.30)	0.704 ^e 0.276 ^f
			>18.6	9.1 (11)	12.0 (50)	9.1 (55)	0.83 (0.52,1.33)	0.436 ^f
		Born<1942	≤18.6	8.8 (57)	11.6 (86)	29.4 (17)	1.40 (0.88,2.25)	0.440 ^e 0.158 ^f
			>18.6	10.5 (57)	16.4 (104)	21.9 (32)	1.12 (0.81,1.56)	0.498 ^f

TABLE K-1. (Continued)

Summary of Dioxin-by-Covariate Interactions for Cardiovascular Variables

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Interaction	Stratum	Current Dioxin Category	n	Percent Abnormal	Contrast	Adj. Relative Risk (95% C.I.)	p-Value
ECG: Bradycardia (12-14 [j])	Categorized Current Dioxin-by- Race	Black	Background	42	0.0	All		0.005
			Unknown	11	18.2	U vs. B	--	0.080
			Low	9	10.0	L vs. B	--	0.352
			High	6	0.0	H vs. B	--	--
		Non-Black	Background	625	6.2	All		0.188
			Unknown	292	5.5	U vs. B	0.86 (0.47,1.59)	0.636
			Low	165	3.0	L vs. B	0.47 (0.18,1.22)	0.121
			High	144	2.8	H vs. B	0.44 (0.15,1.27)	0.128

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Initial Dioxin	n	Percent Abnormal	Adj. Relative Risk (95% C.I.) ^a	p-Value
ECG: Arrhythmia (Minimal-- 12-15 [c])	Initial-by- Personality Type	Type A	Low	52	1.9	2.54 (1.32,4.89)	0.005
			Medium	95	1.1		
			High	44	9.1		
		Type B	Low	55	1.8	1.06 (0.62,1.81)	0.837
			Medium	123	7.3		
			High	64	1.6		

TABLE K-1. (Continued)

Summary of Dioxin-by-Covariate Interactions for Cardiovascular Variables

Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Time (Yrs.)	Percent Abnormal/(n) Current Dioxin			Adj. Relative Risk (95% C.I.) ^a	p-Value
				Low	Medium	High		
ECG: Arrhythmia (Maximal-- 12-15 [h])	Current-by- Time-by- Differential Cortisol Response	≤0.6						0.314 ^e
			≤18.6	0.0 (26)	5.7 (53)	10.0 (20)	1.97 (0.91,4.28)	0.086 ^f
			>18.6	0.0 (21)	1.9 (54)	2.9 (34)	1.08 (0.39,2.99)	0.888 ^f
		>0.6-4.0					--	--
			≤18.6	0.0 (34)	0.0 (62)	3.9 (26)	--	--
			>18.6	12.0 (25)	5.8 (52)	0.0 (33)	0.36 (0.12,1.12)	0.077 ^f
		>4.0						0.848 ^e
			≤18.6	5.6 (36)	0.0 (45)	11.8 (17)	1.41 (0.61,3.29)	0.421 ^f
			>18.6	21.1 (19)	4.6 (44)	12.5 (16)	1.57 (0.81,3.05)	0.185 ^f

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Initial Dioxin	n	Adj. Mean	Adj. Slope (Std. Error) ^g	p-Value
Diastolic Blood Pressure (Continuous) (Maximal-- 12-17 [d])	Initial-by- Personality Type	Type A	Low	87	77.99	-0.757 (0.401)	0.060
			Medium	141	77.21		
			High	64	75.85		
		Type B	Low	76	75.97	0.882 (0.362)	0.015
			Medium	169	77.96		
			High	84	79.30		

TABLE K-1. (Continued)

Summary of Dioxin-by-Covariate Interactions for Cardiovascular Variables

Ranch Hands and Comparisons by Current Dioxin Category								
Variable/ (Table Ref.)	Interaction	Stratum	Current Dioxin Category	n	Adj. Mean	Contrast	Difference of Adj. Means (95% C.I.)	p-Value
Diastolic Blood Pressure (Continuous) (12-17 [j])	Categorized Current Dioxin-by- Personality Type	Type A Yes	Background	52	74.70	All		0.591
			Unknown	34	74.10	U vs. B	-0.60 (-4.50,3.29)	0.762
			Low	14	77.79	L vs. B	3.09 (-2.24,8.42)	0.256
			High	12	73.76	H vs. B	-0.94 (-6.61,4.73)	0.745
	Categorized Current Dioxin-by- Family History of Heart Disease	Type A No	Background	223	74.87	All		0.440
			Unknown	112	76.07	U vs. B	1.20 (-0.85,3.26)	0.252
			Low	59	75.27	L vs. B	0.40 (-2.18,2.99)	0.759
			High	50	73.63	H vs. B	-1.23 (-4.02,1.55)	0.385
		Type B Yes	Background	85	74.10	All		<0.001
			Unknown	40	71.73	U vs. B	-2.37 (-5.76,1.02)	0.171
			Low	24	81.02	L vs. B	6.92 (2.84,11.00)	<0.001
			High	19	78.39	H vs. B	4.29 (-0.19,8.77)	0.061
		Type B No	Background	299	74.22	All		0.065
			Unknown	111	73.58	U vs. B	-0.64 (-2.61,1.33)	0.523
			Low	73	74.94	L vs. B	0.72 (-1.58,3.02)	0.541
			High	62	77.28	H vs. B	3.06 (0.57,5.56)	0.016

TABLE K-1. (Continued)

Summary of Dioxin-by-Covariate Interactions for Cardiovascular Variables

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Interaction	Stratum	Current Dioxin Category	n	Percent Abnormal	Contrast	Adj. Relative Risk (95% C.I.)	p-Value
Funduscopy Examination (12-19 [f])	Categorized Current Dioxin-by- Differential Cortisol Response	≤0.6	Background	236	1.7	All		0.476
			Unknown	93	1.1	U vs. B	0.55 (0.06,5.07)	0.600
			Low	61	0.0	L vs. B		--
			High	55	0.0	H vs. B		--
		>0.6-4.0	Background	228	0.0	All		--
			Unknown	102	0.0	U vs. B	--	--
			Low	63	1.6	L vs. B	--	0.432
			High	61	1.6	H vs. B	--	0.422
		>4.0	Background	203	0.0	All		--
			Unknown	108	1.9	U vs. B	--	0.240
			Low	50	0.0	L vs. B	--	--
			High	34	0.0	H vs. B	--	--

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Initial Dioxin	n	Percent Abnormal	Adj. Relative Risk (95% C.I.) ^a	p-Value
Femoral Pulses (Minimal-- 12-22 [c])	Initial-by- Personality Type	Type A	Low	51	0.0	3.28 (1.03,10.44)	0.045
			Medium	95	0.0		
			High	41	4.9		
		Type B	Low	55	0.0	0.65 (0.28,1.51)	0.319
			Medium	121	6.6		
			High	62	0.0		
Femoral Pulses (Maximal-- 12-22 [d])	Initial-by- Personality Type	Type A	Low	87	0.0	3.09 (1.06,8.96)	0.038
			Medium	139	0.0		
			High	62	3.2		
		Type B	Low	75	2.7	0.86 (0.49,1.52)	0.604
			Medium	169	5.3		
			High	83	0.0		

TABLE K-1. (Continued)

Summary of Dioxin-by-Covariate Interactions for
Cardiovascular Variables

Ranch Hands - Log ₂ (Current Dioxin) and Time								
Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Time (Yrs.)	Percent Abnormal/(n) Current Dioxin			Adj. Relative Risk (95% C.I.)	p-Value
				Low	Medium	High		
Femoral Pulses (Maximal-- 12-22 [h])	Current-by- Time-by- Percent Body Fat	Normal ≤0.6	≤18.6	0.0 (27)	4.7 (43)	6.7 (15)	1.79 (0.63,5.13)	0.307 ^e
			>18.6	6.3 (16)	0.0 (41)	4.2 (24)	0.01 (0.00,4.74)	0.266 ^f
	Current-by- Time-by- Differential Cortisol Response	Normal >0.6-4.0	≤18.6	0.0 (29)	0.0 (48)	0.0 (16)	--	--
			>18.6	0.0 (24)	2.3 (43)	0.0 (26)	--	--
		Normal >4.0	≤18.6	3.1 (32)	0.0 (35)	0.0 (15)	--	--
			>18.6	6.3 (16)	2.8 (36)	0.0 (10)	0.97 (0.22,4.31)	0.965 ^f
		Obese ≤0.6	≤18.6	0.0 (0)	0.0 (9)	0.0 (5)	--	--
			>18.6	0.0 (5)	14.3 (14)	0.0 (10)	--	--
		Obese >0.6-4.0	≤18.6	0.0 (3)	0.0 (14)	0.0 (9)	--	--
			>18.6	0.0 (2)	12.5 (8)	0.0 (8)	--	--
		Obese >4.0	≤18.6	0.0 (3)	0.0 (10)	0.0 (3)	--	--
			>18.6	0.0 (3)	0.0 (7)	25.0 (4)	--	--

TABLE K-1. (Continued)

Summary of Dioxin-by-Covariate Interactions for Cardiovascular Variables

Ranch Hands and Comparisons by Current Dioxin Category								
Variable/ (Table Ref.)	Interaction	Stratum	Current Dioxin Category	n	Percent Abnormal	Contrast	Adj. Relative Risk (95% C.I.)	p-Value
Femoral Pulses (12-22 [j])	Categorized Current Dioxin-by- Personality Type	Type A	Background	277	0.0	All		--
			Unknown	147	0.0	U vs. B	--	--
			Low	74	0.0	L vs. B	--	--
			High	62	3.2	H vs. B	--	0.066
		Type B	Background	383	1.3	All		0.296
			Unknown	153	3.3	U vs. B	2.53 (0.71,8.97)	0.151
			Low	98	4.1	L vs. B	3.47 (0.90,13.39)	0.071
			High	86	1.2	H vs. B	1.44 (0.16,12.93)	0.745

TABLE K-1. (Continued)

Summary of Dioxin-by-Covariate Interactions for Cardiovascular Variables

Ranch Hands - Log₂ (Current Dioxin) and Time								
Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Time (Yrs.)	Percent Abnormal/(n) Current Dioxin			Adj. Relative Risk (95% C.I.) ^a	p-Value
				Low	Medium	High		
Popliteal Pulses (Minimal 12-23 [g])	Current-by- Time-by- Family History of Heart Disease	Yes	≤18.6	7.1 (14)	0.0 (22)	0.0 (9)	--	--
			>18.6	0.0 (11)	3.7 (27)	0.0 (15)	--	--
		No	≤18.6	2.4 (41)	4.6 (88)	0.0 (34)	0.71 (0.21,2.45)	0.791 ^e 0.589 ^f
			>18.6	5.4 (37)	7.1 (85)	0.0 (44)	0.58 (0.24,1.38)	0.217 ^f
			≤18.6	2.9 (35)	0.0 (50)	0.0 (15)	--	--
			>18.6	0.0 (20)	0.0 (34)	0.0 (32)	--	--
Popliteal Pulses (Maximal-- 12-23 [h])	Current-by- Time-by- Lifetime Cigarette Smoking History	0	≤18.6	2.9 (35)	0.0 (50)	0.0 (15)	--	--
			>18.6	0.0 (20)	0.0 (34)	0.0 (32)	--	--
		>0-10	≤18.6	0.0 (30)	7.7 (52)	0.0 (27)	0.86 (0.31,2.40)	0.625 ^e 0.778 ^f
			>18.6	0.0 (11)	5.9 (34)	5.6 (18)	1.20 (0.47,3.04)	0.708 ^f
		>10	≤18.6	0.0 (30)	1.7 (58)	4.6 (22)	2.50 (0.57,10.95)	0.120 ^e 0.225 ^f
			>18.6	5.7 (35)	6.2 (81)	3.1 (32)	0.69 (0.35,1.36)	0.279 ^f

TABLE K-1. (Continued)

Summary of Dioxin-by-Covariate Interactions for Cardiovascular Variables

Ranch Hands - Log ₂ (Initial Dioxin)							
Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Initial Dioxin	n	Percent Abnormal	Adj. Relative Risk (95% C.I.) ^a	p-Value
Dorsalis Pedis Pulses (Minimal-- 12-24 [c])	Initial-by- Differential Cortisol Response	≤0.6	Low	35	17.1	0.90 (0.61,1.32)	0.578
			Medium	79	20.3		
			High	40	15.0		
		>0.6-4.0	Low	42	4.8	1.42 (0.99,2.05)	0.056
			Medium	80	11.3		
			High	45	20.0		
		>4.0	Low	29	6.9	1.55 (0.79,3.05)	0.207
			Medium	60	8.3		
			High	20	10.0		
Leg Pulses (Minimal-- 12-26 [c])	Initial-by- Age	Born ≥1942	Low	38	18.4	0.86 (0.60,1.22)	0.396
			Medium	103	10.7		
			High	69	13.0		
		Born <1942	Low	68	8.8	1.41 (1.03,1.93)	0.030
			Medium	116	25.0		
			High	36	27.8		

Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Time (Yrs.)	Percent Abnormal/(n) Current Dioxin			Adj. Relative Risk (95% C.I.) ^a	p-Value
				Low	Medium	High		
Leg Pulses (Minimal-- 12-26 [g])	Current-by- Time-by- Lifetime Cigarette Smoking History	0						0.159 ^e
			≤18.6	22.2 (18)	10.0 (30)	8.3 (12)	0.51 (0.19,1.36)	0.175 ^f
			>18.6	0.0 (11)	11.1 (27)	12.5 (24)		0.733 ^f
		>0-10						0.634 ^e
			≤18.6	20.0 (15)	14.0 (43)	23.5 (17)	1.65 (0.85,3.23)	0.140 ^f
			>18.6	18.2 (11)	25.0 (28)	28.6 (14)		0.335 ^f
		>10						0.003 ^e
			≤18.6	0.0 (22)	18.4 (38)	14.3 (14)	2.73 (1.29,5.75)	0.008 ^f
			>18.6	23.1 (26)	24.1 (58)	13.6 (22)		0.231 ^f

TABLE K-1. (Continued)

Summary of Dioxin-by-Covariate Interactions for Cardiovascular Variables

Ranch Hands - Log ₂ (Initial Dioxin)									
Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Initial Dioxin	n	Percent Abnormal	Adj. Relative Risk (95% C.I.) ^a	p-Value		
Peripheral and All Pulses (Minimal-- 12-27 [c])	Initial-by- Age	Born≥1942	Low	38	21.1	0.83 (0.59,1.18)	0.306		
			Medium	103	10.7				
			High	69	13.0				
		Born<1942	Low	68	8.8	1.41 (1.04,1.93)	0.029		
			Medium	116	25.0				
			High	36	27.8				
Ranch Hands - Log ₂ (Current Dioxin) and Time									
Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Time (Yrs.)	Percent Abnormal/(n) Current Dioxin			Adj. Relative Risk (95% C.I.) ^a	p-Value	
				Low	Medium	High			
Peripheral and All Pulses (Minimal-- 12-27 [g])	Current-by- Time-by- Lifetime Cigarette Smoking History	0						0.295 ^e	
			≤18.6	22.2 (18)	10.0 (30)	8.3 (12)	0.51 (0.19,1.38)	0.185 ^f	
			>18.6	9.1 (11)	11.1 (27)	12.5 (24)		0.856 ^f	
		>0-10							0.807 ^e
			≤18.6	20.0 (15)	14.0 (43)	23.5 (17)	1.68 (0.88,3.23)	0.118 ^f	
			>18.6	18.2 (11)	25.0 (28)	28.6 (14)		0.170 ^f	
		>10							0.003 ^e
			≤18.6	0.0 (22)	18.4 (38)	14.3 (14)	2.71 (1.29,5.70)	0.008 ^f	
			>18.6	23.1 (26)	24.1 (58)	13.6 (22)		0.237 ^f	

TABLE K-1. (Continued)

**Summary of Dioxin-by-Covariate Interactions for
Cardiovascular Variables**

^aRelative risk for a twofold increase in dioxin.

^bAdjusted slope and standard error based on systolic blood pressure versus $\log_2$ dioxin.

^cTest of significance for homogeneity of slopes (current dioxin continuous, time categorized).

^dTest of significance for slope equal to 0 (current dioxin continuous, time categorized).

^eTest of significance for homogeneity of relative risks (current dioxin continuous, time categorized).

^fTest of significance for relative risk equal to 1 (current dioxin continuous, time categorized).

^gAdjusted slope and standard error based on diastolic blood pressure versus $\log_2$ dioxin.

--: Relative risk/confidence interval/p-value not given due to the sparse number of abnormalities.

Note: Initial Dioxin: Minimal--Low: 52-93 ppt; Medium: >93-292 ppt; High: >292 ppt.

Maximal--Low: 25-56.9 ppt; Medium: >56.9-218 ppt; High: >218 ppt.

Current Dioxin: Minimal--Low: >10-14.65 ppt; Medium: >14.65-45.75 ppt; High: >45.75 ppt.

Maximal--Low: >5-9.01 ppt; Medium: >9.01-33.3 ppt; High: >33.3 ppt.

All: All categories.

Background (B) (Comparisons): Current Dioxin ≤ 10 ppt.

Unknown (U) (Ranch Hands): Current Dioxin ≤ 10 ppt.

Low (L) (Ranch Hands): 15 ppt < Current Dioxin ≤ 33.3 ppt.

High (H) (Ranch Hands): Current Dioxin >33.3 ppt.

TABLE K-2.

**Summary of Models Without Adjustment for Percent Body Fat and
Cholesterol for Cardiovascular Variables**

Ranch Hands - Log₂ (Initial Dioxin)				
Variable/ (Table Ref.)	Assumption	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Reported/ Verified Essential Hypertension (12-3 [c])	Minimal (n=440)	1.09 (0.92,1.29)	0.295	DRKYR (p=0.080) HRTDIS (p=0.007)
Reported/ Verified Essential Hypertension (12-3 [d])	Maximal (n=617)	1.10 (0.97,1.25)	0.124	RACE (p=0.385) PACKYR (p=0.252) DRKYR (p=0.049) DIFCORT (p=0.326) HRTDIS (p<0.001)

Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Table Ref.)	Assumption	Time (Yrs.)	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Reported/ Verified Essential Hypertension (12-3 [g])	Minimal (n=428)	≤18.6	1.25 (0.95,1.65)	0.217 ^b	DRKYR (p=0.051)
		>18.6	1.00 (0.79,1.26)	0.108 ^c	DIFCORT (p=0.106)
				0.991 ^c	HRTDIS (p=0.005)
Reported/ Verified Essential Hypertension (12-3 [h])	Maximal (n=638)	≤18.6	1.25 (1.03,1.52)	0.336 ^b	AGE (p=0.025)
		>18.6	1.10 (0.93,1.32)	0.023 ^c	RACE (p=0.265)
				0.271 ^c	PACKYR (p=0.326) DRKYR (p=0.068) HRTDIS (p<0.001)

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Current Dioxin Category	n	Contrast	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks
Reported/ Verified Essential Hypertension (12-3 [j])	Background	701	All Categories		0.002	AGE (p<0.007) DRKYR (p=0.047)
	Unknown	317	Unknown vs. Background	0.78 (0.58,1.04)	0.094	HRTDIS (p=0.056)
	Low	175	Low vs. Background	1.27 (0.90,1.81)	0.178	
	High	151	High vs. Background	1.70 (1.17,2.49)	0.006	
	Total	1,344				

TABLE K-2. (Continued)

Summary of Models Without Adjustment for Percent Body Fat and Cholesterol for Cardiovascular Variables

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Table Ref.)	Assumption	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Reported/Verified Myocardial Infarction (12-6 [d])	Maximal (n=638)	1.26 (0.95,1.68)	0.121	AGE (p<0.001) DRKYR (p=0.026)

Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Table Ref.)	Assumption	Time (Yrs.)	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Reported/Verified Myocardial Infarction (12-6 [h])	Maximal (n=638)	≤18.6 >18.6	1.62 (0.99,2.66) 1.06 (0.72,1.56)	0.182 ^b 0.055 ^c 0.752 ^c	AGE (p<0.001) DRKYR (p=0.022)

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Table Ref.)	Assumption	Initial Dioxin	n	Adj. Mean	Adj. Slope (Std. Error) ^d	p-Value	Covariate Remarks
Systolic Blood Pressure (Continuous) (12-7 [c])	Minimal (n=446)	Low Medium High	110 224 112	129.98** 129.53** 131.55**	0.614 (0.702)**	0.382**	INIT*AGE (p=0.033) INIT*PACKYR (p=0.031) RACE (p=0.175)
Systolic Blood Pressure (Continuous) (12-7 [d])	Maximal (n=647)	Low Medium High	173 320 154	128.31** 129.73** 133.12**	0.964 (0.489)**	0.049**	INIT*PACKYR (p=0.013) AGE (p<0.001) RACE (p=0.042)

TABLE K-2. (Continued)

Summary of Models Without Adjustment for Percent Body Fat and Cholesterol for Cardiovascular Variables

Ranch Hands - Log ₂ (Current Dioxin) and Time								
Variable/ (Table Ref.)	Time Assumption(Yrs.)	Adj. Mean/(n) Current Dioxin			Adj. Slope (Std. Error) ^d	p-Value	Covariate Remarks	
		Low	Medium	High				
Systolic Blood Pressure (Continuous) (12-7 [g])	Minimal (n=433)	≤18.6	131.22 (56)	128.68 (110)	131.93 (43)	-0.117 (1.126)	0.929 ^e 0.917 ^f	RACE (p=0.158) PERS (p=0.197) HRTDIS
		>18.6	131.11 (48)	132.10 (113)	130.46 (63)	0.013 (0.920)	0.989 ^f	(p=0.224)
	Maximal (n=647)	≤18.6	129.03 (103)	129.59 (167)	131.47 (68)	0.854 (0.743)	0.824 ^e 0.251 ^f	AGE (p=0.002) RACE (p=0.018) PACKYR
		>18.6	127.31 (68)	129.78 (154)	133.32 (87)	1.073 (0.689)	0.120 ^f	(p=0.063)

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Current Dioxin Category	Adj. n	Mean	Contrast	Difference of Adj. Means (95% C.I.)	p-Value	Covariate Remarks
Systolic Blood Pressure (Continuous) (12-7 [j])	Background	667	128.95**	All Categories		0.012**	DXCAT*AGE (p=0.022)
	Unknown	303	126.89**	Unknown vs. Background	-2.06 (-4.37,0.26)**	0.082**	RACE (p=0.074)
	Low	174	129.25**	Low vs. Background	0.30 (-2.53,3.13)**	0.837**	DIFCORT
	High	150	132.61**	High vs. Background	3.67 (0.60,6.73)**	0.019**	(p=0.005) HRTDIS
	Total	1,294					(p=0.067)

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Table Ref.)	Assumption	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Systolic Blood Pressure (Discrete) (12-8 [c])	Minimal (n=433)	0.97 (0.79,1.19)**	0.764**	INIT*PERS (p=0.043) RACE (p=0.119)
	Maximal (n=647)	1.12 (0.97,1.31)	0.127	AGE (p=0.011) RACE (p=0.012)
Systolic Blood Pressure (Discrete) (12-8 [d])				

TABLE K-2. (Continued)

Summary of Models Without Adjustment for Percent Body Fat and Cholesterol for Cardiovascular Variables

Ranch Hands - Log₂ (Current Dioxin) and Time					
Variable/ (Table Ref.)	Assumption	Time (Yrs.)	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Systolic Blood Pressure (Discrete) (12-8 [g])	Minimal (n=433)	≤18.6	****	****	CURR*TIME*PERS (p=0.002) RACE (p=0.128)
		>18.6	****	****	
Systolic Blood Pressure (Discrete) (12-8 [h])	Maximal (n=624)	≤18.6	1.08 (0.85,1.37)**	0.552**b 0.508**c	CURR*TIME*PERS (p=0.040) RACE (p=0.025) HRTDIS (p=0.060)
		>18.6	0.99 (0.81,1.21)**	0.887**c	

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Current Dioxin Category	n	Contrast	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks
Systolic Blood Pressure (Discrete) (12-8 [j])	Background	666	All Categories		****	DXCAT*AGE (p=0.002) RACE (p=0.084)
	Unknown	301	Unknown vs. Background	****	****	PACKYR (p=0.064)
	Low	173	Low vs. Background	****	****	PERS (p=0.102)
	High	148	High vs. Background	****	****	DIFCORT (p=0.134) HRTDIS (p=0.056)
	Total	1,288				

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Table Ref.)	Assumption	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Overall Electrocardiograph (12-10 [c])	Minimal (n=446)	1.07 (0.85,1.35)	0.583	AGE (p<0.001) RACE (p=0.134)

TABLE K-2. (Continued)

Summary of Models Without Adjustment for Percent Body Fat and Cholesterol for Cardiovascular Variables

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Current Dioxin Category	n	Contrast	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks
ECG: Right Bundle Branch Block (12-11 [f])	Background	703	All Categories		0.634	AGE (p=0.002) RACE (p=0.028)
	Unknown	320	Unknown vs. Background	1.07 (0.20,5.75)	0.935	
	Low	177	Low vs. Background	1.92 (0.36,10.24)	0.447	
	High	155	High vs. Background	..	0.552	
	Total	1,355				

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Table Ref.)	Assumption	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
ECG: Nonspecific ST- and T-Wave Changes (12-13 [c])	Minimal (n=446)	1.02 (0.78,1.34)	0.874	AGE (p<0.001) RACE (p=0.021) PACKYR (p=0.033)
ECG: Nonspecific ST- and T-Wave Changes (12-13 [d])	Maximal (n=647)	1.12 (0.92,1.36)	0.265	AGE (p<0.001) RACE (p=0.031) PACKYR (p=0.012)

Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Table Ref.)	Assumption	Time (Yrs.)	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
ECG: Nonspecific ST- and T-Wave Changes (12-13 [g])	Minimal (n=446)	≤18.6	1.19 (0.73,1.94)	0.396 ^b	AGE (p<0.001) RACE (p=0.024) PACKYR (p=0.039)
		>18.6	0.92 (0.66,1.30)	0.478 ^c	
				0.654 ^c	
ECG: Nonspecific ST- and T-Wave Changes (12-13 [h])	Maximal (n=647)	≤18.6	1.17 (0.84,1.63)**	0.703** ^b	CURR*TIME*AGE (p=0.015) RACE (p=0.046) PACKYR (p=0.016)
		>18.6	1.08 (0.84,1.39)**	0.356** ^c	
				0.545** ^c	

TABLE K-2. (Continued)

Summary of Models Without Adjustment for Percent Body Fat and Cholesterol for Cardiovascular Variables

Ranch Hands and Comparisons by Current Dioxin Category							
Variable/ (Table Ref.)	Current Dioxin Category	n	Contrast	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks	
ECG: Nonspecific ST- and T-Wave Changes (12-13 [j])	Background	703	All Categories		0.142	AGE (p<0.001)	
	Unknown	320	Unknown vs. Background	0.69 (0.43,1.11)	0.130	RACE (p=0.047)	
	Low	177	Low vs. Background	1.22 (0.73,2.04)	0.458	PACKYR (p=0.020)	
	High	155	High vs. Background	1.46 (0.83,2.56)	0.194		
	Total	1,355					
ECG: Bradycardia (12-14 [j])	Background	667	All Categories		0.142**	DXCAT*RACE (p=0.025)	
	Unknown	303	Unknown vs. Background	1.08 (0.61,1.94)**	0.785**	PACKYR (p=0.007)	
	Low	174	Low vs. Background	0.56 (0.23,1.36)**	0.203**	DIFCORT (p=0.024)	
	High	150	High vs. Background	0.41 (0.14,1.17)**	0.095**	HRTDIS (p=0.040)	
	Total	1,294					
ECG: Other Diagnoses (12-16 [j])	Background	669	All Categories		0.105	AGE (p<0.001)	
	Unknown	303	Unknown vs. Background	0.94 (0.66,1.33)	0.722	PERS (p=0.092)	
	Low	173	Low vs. Background	1.04 (0.68,1.59)	0.867		
	High	150	High vs. Background	0.51 (0.28,0.91)	0.024		
	Total	1,295					

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Table Ref.)	Assumption	Initial Dioxin	n	Adj. Mean	Adj. Slope (Std. Error) [§]	p-Value	Covariate Remarks
Diastolic Blood Pressure (Continuous) (12-17 [c])	Minimal (n=433)	Low	107	77.41	0.228 (0.373)	0.542	RACE (p=0.031) PERS (p=0.059) HRTDIS (p=0.014)
		Medium	218	79.19			
		High	108	78.02			
Diastolic Blood Pressure (Continuous) (12-17 [d])	Maximal (n=624)	Low	164	****	****	****	INIT*PERS (p=0.005) RACE (p=0.019)
		Medium	311	****			
		High	149	****			

TABLE K-2. (Continued)

Summary of Models Without Adjustment for Percent Body Fat and Cholesterol for Cardiovascular Variables

Ranch Hands - Log ₂ (Current Dioxin) and Time								
Variable/ (Table Ref.)	Time Assumption(Yrs.)	Adj. Mean/(n) Current Dioxin			Adj. Slope (Std. Error) ^g	p-Value	Covariate Remarks	
		Low	Medium	High				
Diastolic Blood Pressure (Continuous) (12-17 [g])	Minimal (n=433)	≤18.6	76.58 (56)	78.69 (110)	77.29 (43)	0.349 (0.606)	0.735 ^e 0.565 ^f	RACE (p=0.034) PERS (p=0.064) HRTDIS (p=0.015)
		>18.6	77.96 (48)	79.67 (113)	78.14 (63)	0.084 (0.495)	0.865 ^f	
Diastolic Blood Pressure (Continuous) (12-17 [h])	Maximal (n=647)	≤18.6	76.48 (103)	77.00 (167)	76.58 (68)	0.202 (0.401)	0.728 ^e 0.614 ^f	RACE (p=0.029)
		>18.6	76.63 (68)	77.31 (154)	78.74 (87)	0.392 (0.372)	0.292 ^f	

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Current Dioxin Category	n	Adj. Mean	Contrast	Difference of Adj. Means (95% C.I.)	p-Value	Covariate Remarks
Diastolic Blood Pressure (Continuous) (12-17 [j])	Background	664	74.64**	All Categories		0.002**	DXCAT*PERS (p=0.012)
	Unknown	298	73.81**	Unknown vs. Background	-0.83 (-2.10,0.44)**	0.199**	DXCAT*HRTDIS (p=0.011)
	Low	171	76.49**	Low vs. Background	1.85 (0.29,3.40)**	0.020**	AGE (p=0.008)
	High	144	76.71**	High vs. Background	2.06 (0.37,3.76)**	0.017**	DRKYR (p=0.017)
	Total	1,277					DIFCORT (p=0.011)

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Table Ref.)	Assumption	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Diastolic Blood Pressure (Discrete) (12-18 [c])	Minimal (n=446)	0.88 (0.60,1.28)	0.500	AGE (p=0.116) HRTDIS (p=0.062)

TABLE K-2. (Continued)

Summary of Models Without Adjustment for Percent Body Fat and Cholesterol for Cardiovascular Variables

Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Table Ref.)	Assumption	Time (Yrs.)	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Diastolic Blood Pressure (Discrete) (12-18 [g])	Minimal (n=446)	≤18.6 >18.6	0.83 (0.43,1.60) 0.84 (0.52,1.37)	0.977 ^b 0.585 ^c 0.490 ^c	AGE (p=0.074) HRTDIS (p=0.066)

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Current Dioxin Category	n	Contrast	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks
Diastolic Blood Pressure (Discrete) (12-18 [j])	Background	703	All Categories		0.285	PACKYR (p=0.077)
	Unknown	320	Unknown vs. Background	0.71 (0.34,1.48)	0.364	
	Low	177	Low vs. Background	1.62 (0.81,3.24)	0.170	
	High	155	High vs. Background	1.26 (0.56,2.80)	0.577	
	Total	1,355				

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Table Ref.)	Assumption	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Femoral Pulses (12-22 [c])	Minimal (n=427)	0.99 (0.54,1.82)**	0.970**	INIT*PERS (p=0.029) AGE (p=0.011) DIFCORT (p=0.043) HRTDIS (p=0.070)
Femoral Pulses (12-22 [d])	Maximal (n=618)	1.09 (0.69,1.72)**	0.709**	INIT*PERS (p=0.040) AGE (p=0.008) PACKYR (p=0.097) HRTDIS (p=0.048)

TABLE K-2. (Continued)

**Summary of Models Without Adjustment for Percent Body Fat and
Cholesterol for Cardiovascular Variables**

Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Table Ref.)	Assumption	Time (Yrs.)	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Femoral Pulses (12-22 [g])	Minimal (n=427)	≤18.6	1.30 (0.38,4.42)	0.421 ^b	AGE (p=0.039)
		>18.6	0.69 (0.29,1.63)	0.678 ^c	PERS (p=0.148)
				0.400 ^c	DIFCORT (p=0.058) HRTDIS (p=0.080)
Femoral Pulses (12-22 [h])	Maximal (n=616)	≤18.6	1.22 (0.49,3.02)	0.633 ^b	AGE (p=0.018)
		>18.6	0.93 (0.53,1.66)	0.675 ^c	PACKYR (p=0.114)
				0.818 ^c	PERS (p=0.046) DIFCORT (p=0.333) HRTDIS (p=0.052)

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Current Dioxin Category	n	Contrast	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks
Dorsalis Pedis Pulses (12-24 [j])	Background	658	All Categories		0.087	AGE (p=0.001) PERS (p=0.145)
	Unknown	297	Unknown vs. Background	1.17 (0.74,1.86)	0.498	DIFCORT (p=0.141)
	Low	172	Low vs. Background	1.65 (0.99,2.75)	0.056	
	High	146	High vs. Background	1.86 (1.07,3.26)	0.029	
	Total	1,273				

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Table Ref.)	Assumption	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Posterior Tibial Pulses (12-25 [c])	Minimal (n=430)	1.04 (0.65,1.66)	0.886	AGE (p<0.001) DIFCORT (p<0.001)
Posterior Tibial Pulses (12-25 [d])	Maximal (n=603)	1.34 (0.93,1.91)	0.124	AGE (p<0.001) PERS (p=0.102) DIFCORT (p<0.001)

TABLE K-2. (Continued)

Summary of Models Without Adjustment for Percent Body Fat and Cholesterol for Cardiovascular Variables

Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Table Ref.)	Assumption	Time (Yrs.)	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Posterior Tibial Pulses (12-25 [g])	Minimal (n=430)			0.866 ^b	AGE (p<0.001)
		≤18.6	0.98 (0.35,2.72)	0.971 ^c	DIFCORT (p<0.001)
		>18.6	0.89 (0.48,1.63)	0.698 ^c	
Posterior Tibial Pulses (12-25 [h])	Maximal (n=619)			0.414 ^b	AGE (p<0.001)
		≤18.6	1.65 (0.84,3.26)	0.146 ^c	DIFCORT (p<0.001)
		>18.6	1.18 (0.76,1.85)	0.465 ^c	

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Current Dioxin Category	n	Contrast	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks
Posterior Tibial Pulses (12-25 [j])	Background	694	All Categories		<0.001	AGE (p<0.001)
	Unknown	316	Unknown vs. Background	0.43 (0.12,1.50)	0.185	
	Low	176	Low vs. Background	4.21 (1.92,9.22)	<0.001	
	High	153	High vs. Background	1.01 (0.22,4.61)	0.987	
	Total	1,339				

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Table Ref.)	Assumption	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Leg Pulses (12-26 [c])	Minimal (n=430)	1.15 (0.92,1.44)**	0.235**	INIT*AGE (p=0.029) DIFCORT (p=0.028)

Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Table Ref.)	Assumption	Time (Yrs.)	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Leg Pulses (12-26 [g])	Minimal (n=430)			0.201** ^b	CURR*TIME*PACKYR (p=0.035)
		≤18.6	1.35 (0.92,1.97)	0.126** ^c	AGE (p=0.003)
		>18.6	0.99 (0.73,1.33)	0.943** ^c	DIFCORT (p=0.017)

TABLE K-2. (Continued)

**Summary of Models Without Adjustment for Percent Body Fat and
Cholesterol for Cardiovascular Variables**

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Current Dioxin Category	n	Contrast	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks
Leg Pulses (12-26 [j])	Background	660	All Categories		0.011	AGE (p<0.001) PERS (p=0.118)
	Unknown	299	Unknown vs. Background	1.06 (0.69,1.62)	0.799	
	Low	172	Low vs. Background	1.95 (1.24,3.08)	0.004	
	High	148	High vs. Background	1.84 (1.09,3.10)	0.023	
	Total	1,279				

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Table Ref.)	Assumption	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
Peripheral and All Pulses (12-27 [c])	Minimal (n=430)	1.13 (0.90,1.42)**	0.297**	INIT*AGE (p=0.021) DIFCORT (p=0.027)

^aRelative risk for a twofold increase in dioxin.

^bTest of significance for homogeneity of relative risks (current dioxin continuous, time categorized).

^cTest of significance for relative risk equal to 1 (current dioxin continuous, time categorized).

^dSlope and standard error based on systolic blood pressure versus log₂ dioxin.

^eTest of significance for homogeneity of slopes (current dioxin continuous, time categorized).

^fTest of significance for slope equal to 0 (current dioxin continuous, time categorized).

^gSlope and standard error based on diastolic blood pressure versus log₂ dioxin.

--: Relative risk, confidence interval, and p-value not given due to the sparse number of abnormalities.

** Covariate interaction with dioxin (log₂ [initial dioxin], log₂ [current dioxin] and time, categorized current dioxin) (0.01<p≤0.05); summary statistics (adjusted mean, adjusted slope, adjusted standard error, adjusted relative risk, confidence interval and p-value) derived from a model fitted after deletion of this interaction.

**** Covariate interaction with dioxin (log₂ [initial dioxin], log₂ [current dioxin] and time, categorized current dioxin) (p≤0.01); summary statistics (adjusted mean, adjusted slope, adjusted standard error, adjusted relative risk, confidence interval and p-value) not presented.

Note: Initial Dioxin: Minimal--Low: 52-93 ppt; Medium: >93-292 ppt; High: >292 ppt.

Maximal--Low: 25-56.9 ppt; Medium: >56.9-218 ppt; High: >218 ppt.

Current Dioxin: Minimal--Low: >10-14.65 ppt; Medium: >14.65-45.75 ppt; High: >45.75 ppt.

Maximal--Low: >5-9.01 ppt; Medium: >9.01-33.3 ppt; High: >33.3 ppt.

Background (Comparisons): Current Dioxin ≤10 ppt.

Unknown (Ranch Hands): Current Dioxin ≤10 ppt.

Low (Ranch Hands): 15 ppt < Current Dioxin ≤33.3 ppt.

High (Ranch Hands): Current Dioxin >33.3 ppt.

TABLE K-3.

**Summary of Dioxin-by-Covariate Interactions Without Adjustment for
Percent Body Fat and Cholesterol for Cardiovascular Variables**

Ranch Hands - Log ₂ (Initial Dioxin)							
Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Initial Dioxin	n	Adj. Mean	Adj. Slope (Std. Error) ^a	p-Value
Systolic Blood Pressure (Continuous) (Minimal-- 12-7 [c])	Initial-by- Age	Born ≥1942 0	Low	12	128.80	0.736 (1.548)	0.635
			Medium	25	135.43		
			High	26	131.01		
	Initial-by- Lifetime Cigarette Smoking History	Born ≥1942 >0-10	Low	17	126.79	-0.377 (1.604)	0.814
			Medium	37	125.77		
			High	29	125.65		
		Born ≥1942 >10	Low	12	131.69	-2.835 (1.623)	0.081
			Medium	44	127.01		
			High	19	125.24		
		Born <1942 0	Low	20	128.78	2.645 (2.177)	0.225
			Medium	30	128.54		
			High	11	134.12		
		Born <1942 >0-10	Low	17	129.65	4.349 (2.591)	0.094
			Medium	30	126.48		
			High	5	140.33		
		Born <1942 >10	Low	32	131.74	1.330 (1.412)	0.347
			Medium	58	131.38		
			High	22	136.62		
Systolic Blood Pressure (Continuous) (Maximal-- 12-7 [d])	Initial-by- Lifetime Cigarette Smoking History	0	Low	58	128.04	2.243 (0.834)	0.007
			Medium	85	129.87		
			High	48	135.50		
		>0-10	Low	47	123.12	1.541 (0.933)	0.099
			Medium	87	127.05		
			High	48	132.78		
		>10	Low	68	131.61	-0.359 (0.749)	0.632
			Medium	148	131.16		
			High	58	131.05		

TABLE K-3. (Continued)

Summary of Dioxin-by-Covariate Interactions Without Adjustment for Percent Body Fat and Cholesterol for Cardiovascular Variables

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Interaction	Stratum	Current Dioxin Category	n	Adj. Mean	Contrast	Difference of Adj. Means (95% C.I.)	p-Value
Systolic Blood Pressure (Continuous) (12-7 [j])	Categorized Current Dioxin-by-Age	Born ≥ 1942	Background	289	125.42	All		0.149
			Unknown	106	124.21	U vs. B	-1.21 (-5.02,2.60)	0.533
			Low	75	129.28	L vs. B	3.86 (-0.49,8.21)	0.082
			High	101	127.83	H vs. B	2.41 (-1.48,6.30)	0.225
		Born <1942	Background	378	131.51	All		0.019
			Unknown	197	128.68	U vs. B	-2.83 (-5.79,0.12)	0.060
			Low	99	128.70	L vs. B	-2.81 (-6.60, 0.98)	0.146
			High	49	136.22	H vs. B	4.70 (-0.39,9.80)	0.071

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Initial Dioxin	n	Percent Abnormal	Adj. Relative Risk (95% C.I.) ^b	p-Value
Systolic Blood Pressure (Discrete) (Minimal-- 12-8 [c])	Initial-by-Personality Type	Type A	Low	52	26.9	0.73 (0.51,1.05)	0.087
			Medium	95	17.9		
			High	44	11.4		
		Type B	Low	55	20.0	1.14 (0.88,1.47)	0.314
			Medium	123	21.1		
			High	64	26.6		

TABLE K-3. (Continued)

Summary of Dioxin-by-Covariate Interactions Without Adjustment for
Percent Body Fat and Cholesterol for Cardiovascular Variables

Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Time (Yrs.)	Percent Abnormal/(n) Current Dioxin			Adj. Relative Risk (95% C.I.) ^b	p-Value
				Low	Medium	High		
Systolic Blood Pressure (Discrete) (Minimal-- 12-8 [g])	Current-by- Time-by- Personality Type	Type A	≤18.6	32.3 (31)	20.5 (44)	5.6 (18)	0.44 (0.22,0.88)	0.037 ^c 0.021 ^d
			>18.6	10.0 (20)	19.6 (51)	14.8 (27)	1.02 (0.66,1.59)	0.926 ^d
		Type B	≤18.6	12.0 (25)	12.1 (66)	36.0 (25)	1.66 (1.07,2.56)	0.015 ^c 0.023 ^d
			>18.6	35.7 (28)	25.8 (62)	22.2 (36)	0.85 (0.60,1.20)	0.349 ^d
		Type A	≤18.6	16.3 (49)	25.0 (76)	7.7 (26)	0.81 (0.55,1.19)	0.295 ^c 0.282 ^d
			>18.6	9.4 (32)	19.7 (71)	15.8 (38)	1.05 (0.77,1.45)	0.744 ^d
Systolic Blood Pressure (Discrete) (Maximal-- 12-8 [h])	Current-by- Time-by- Personality Type	Type B	≤18.6	14.9 (47)	10.6 (85)	29.0 (38)	1.42 (1.03,1.96)	0.045 ^c 0.031 ^d
			>18.6	23.5 (34)	27.5 (80)	25.0 (48)	0.93 (0.71,1.22)	0.599 ^d

TABLE K-3. (Continued)

**Summary of Dioxin-by-Covariate Interactions Without Adjustment for
Percent Body Fat and Cholesterol for Cardiovascular Variables**

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Interaction	Stratum	Current Dioxin Category	n	Percent Abnormal	Contrast	Adj. Relative Risk (95% C.I.)	p-Value
Systolic Blood Pressure (Discrete) 12-8 [j])	Categorized Current Dioxin-by- Age	Born ≥1942	Background	289	11.8	All		0.109
			Unknown	105	9.5	U vs. B	0.79 (0.37,1.66)	0.529
			Low	75	21.3	L vs. B	2.01 (1.04,3.91)	0.038
			High	100	17.0	H vs. B	1.54 (0.82,2.92)	0.182
		Born <1942	Background	377	26.5	All		0.095
			Unknown	196	20.4	U vs. B	0.74 (0.49,1.13)	0.159
			Low	98	16.3	L vs. B	0.53 (0.30,0.96)	0.037
			High	48	29.2	H vs. B	1.10 (0.56,2.14)	0.781

Ranch Hands - Log₂ (Current Dioxin) and Time

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Time (Yrs.)	Percent Abnormal/(n) Current Dioxin			Adj. Relative Risk (95% C.I.) ^b	p-Value
				Low	Medium	High		
ECG: Nonspecific ST- and T-Wave Changes (Maximal-- 12-13 [h])	Current-by- Time-by-Age	Born ≥1942						0.705 ^c
			≤18.6	8.7 (46)	4.9 (81)	2.0 (51)	0.72 (0.40,1.29)	0.269 ^d
			>18.6	9.1 (11)	12.0 (50)	9.1 (55)	0.83 (0.52,1.31)	0.421 ^d
		Born <1942						0.222 ^c
			≤18.6	8.8 (57)	11.6 (86)	29.4 (17)	1.63 (1.04,2.54)	0.032 ^d
			>18.6	10.5 (57)	16.4 (104)	21.9 (32)	1.16 (0.84,1.59)	0.366 ^d

TABLE K-3. (Continued)

Summary of Dioxin-by-Covariate Interactions Without Adjustment for Percent Body Fat and Cholesterol for Cardiovascular Variables

Ranch Hands and Comparisons by Current Dioxin Category								
Variable/ (Table Ref.)	Interaction	Stratum	Current Dioxin Category	n	Percent Abnormal	Contrast	Adj. Relative Risk (95% C.I.)	p-Value
ECG: Bradycardia (12-14 [j])	Categorized Current Dioxin-by- Race	Black	Background	42	0.0	All		0.005
			Unknown	11	18.2	U vs. B	--	0.080
			Low	9	11.1	L vs. B	--	0.352
			High	6	0.0	H vs. B	--	--
		Non- Black	Background	625	6.2	All		0.118
			Unknown	292	5.5	U vs. B	0.93 (0.51,1.70)	0.805
			Low	165	3.0	L vs. B	0.46 (0.18,1.19)	0.110
			High	144	2.8	H vs. B	0.40 (0.14,1.14)	0.087

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Initial Dioxin	n	Adj. Mean	Adj. Slope (Std. Error) ^e	p-Value
Diastolic Blood Pressure (Continuous) (12-17 [d])	Initial-by- Personality Type	Type A	Low	87	77.49	-0.453 (0.404)	0.263
			Medium	141	77.25		
			High	64	76.22		
		Type B	Low	77	75.32	1.074 (0.365)	0.003
			Medium	170	77.80		
			High	85	79.25		

TABLE K-3. (Continued)

**Summary of Dioxin-by-Covariate Interactions Without Adjustment for
Percent Body Fat and Cholesterol for Cardiovascular Variables**

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Interaction	Stratum	Current Dioxin Category	n	Adj. Mean	Contrast	Difference of Adj. Means (95% C.I.)	p-Value
Diastolic Blood Pressure (Continuous) (12-17 [j])	Categorized Current Dioxin-by- Personality Type	Type A Yes	Background	52	74.79	A11		0.246
			Unknown	34	73.76	U vs. B	-1.03 (-5.01,2.95)	0.611
			Low	14	79.60	L vs. B	4.81 (-0.62,10.23)	0.083
			High	12	75.50	H vs. B	0.71 (-5.07,6.48)	0.810
	Categorized Current Dioxin-by- Family History of Heart Disease	Type A No	Background	226	74.78	A11		0.840
			Unknown	112	75.57	U vs. B	0.79 (-1.30,2.88)	0.460
			Low	59	75.30	L vs. B	0.52 (-2.11,3.16)	0.698
			High	50	74.37	H vs. B	-0.41 (-3.25,2.43)	0.777
		Type B Yes	Background	86	74.38	A11		<0.001
			Unknown	41	71.39	U vs. B	-2.99 (-6.42,0.43)	0.087
			Low	24	81.06	L vs. B	6.68 (2.52,10.84)	0.002
			High	20	77.40	H vs. B	3.01 (-1.46,7.49)	0.187
		Type B No	Background	300	74.29	A11		0.002
			Unknown	111	72.74	U vs. B	-1.55 (-3.55,0.45)	0.129
			Low	74	75.08	L vs. B	0.79 (-1.55,3.13)	0.507
			High	62	78.25	H vs. B	3.96 (1.43,6.50)	0.002

TABLE K-3. (Continued)

**Summary of Dioxin-by-Covariate Interactions Without Adjustment for
Percent Body Fat and Cholesterol for Cardiovascular Variables**

Ranch Hands • Log₂ (Initial Dioxin)							
Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Initial Dioxin	n	Percent Abnormal	Adj. Relative Risk (95% C.I.) ^b	p-Value
Femoral Pulses (Minimal-- 12-22 [c])	Initial-by- Personality Type	Type A	Low	51	0.0	3.01 (1.01,8.92)	0.047
			Medium	95	0.0		
			High	41	4.9		
		Type B	Low	55	0.0	0.64 (0.28,1.49)	0.304
			Medium	122	6.6		
			High	63	0.0		
Femoral Pulses (Maximal-- 12-22 [d])	Initial-by- Personality Type	Type A	Low	87	0.0	2.73 (1.02,7.33)	0.047
			Medium	139	0.0		
			High	62	3.2		
		Type B	Low	76	2.6	0.86 (0.50,1.48)	0.589
			Medium	170	5.3		
			High	84	0.0		
Leg Pulses (Minimal-- 12-26 [c])	Initial-by- Age	Born ≥1942	Low	38	18.4	0.89 (0.63,1.26)	0.520
			Medium	103	10.7		
			High	69	13.0		
		Born <1942	Low	68	8.8	1.41 (1.04,1.93)	0.029
			Medium	116	25.0		
			High	36	27.8		

TABLE K-3. (Continued)

Summary of Dioxin-by-Covariate Interactions Without Adjustment for Percent Body Fat and Cholesterol for Cardiovascular Variables

Ranch Hands - Log₂ (Current Dioxin) and Time								
Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Time (Yrs.)	Percent Abnormal/(n) Current Dioxin			Adj. Relative Risk (95% C.I.) ^b	p-Value
				Low	Medium	High		
Leg Pulses (Minimal-- 12-26 [g])	Current-by- Time-by- Lifetime Cigarette Smoking History	0	≤18.6	22.2 (18)	10.0 (30)	8.3 (12)	0.52 (0.19,1.43)	0.169 ^c
			>18.6	0.0 (11)	11.1 (27)	12.5 (24)	1.17 (0.56,2.42)	0.206 ^d
								0.678 ^d
		>0-10	≤18.6	20.0 (15)	14.0 (43)	23.5 (17)	1.68 (0.88,3.23)	0.807 ^c
			>18.6	18.2 (11)	25.0 (28)	28.6 (14)	1.52 (0.84,2.76)	0.118 ^d
								0.170 ^d
		>10	≤18.6	0.0 (22)	18.4 (38)	14.3 (14)	2.71 (1.29,5.70)	0.003 ^c
			>18.6	23.1 (26)	24.1 (58)	13.6 (22)	0.75 (0.47,1.20)	0.008 ^d
								0.237 ^d

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Initial Dioxin	n	Percent Abnormal	Adj. Relative Risk (95% C.I.) ^b	p-Value
Peripheral and All Pulses (Minimal-- 12-27 [c])	Initial-by- Age	Born ≥1942	Low	38	21.1	0.86 (0.61,1.22)	0.394
			Medium	103	10.7		
			High	69	13.0		
		Born <1942	Low	68	8.8	1.41 (1.04,1.92)	0.029
			Medium	116	25.0		
			High	36	27.8		

TABLE K-3. (Continued)

Summary of Dioxin-by-Covariate Interactions Without Adjustment for Percent Body Fat and Cholesterol for Cardiovascular Variables

^aAdjusted slope and standard error based on systolic blood pressure versus log₂ dioxin.

^bRelative risk for a twofold increase in dioxin.

^cTest of significance for homogeneity of relative risks (current dioxin continuous, time categorized).

^dTest of significance for relative risk equal to 1 (current dioxin continuous, time categorized).

^eAdjusted slope and standard error based on diastolic blood pressure versus log₂ dioxin.

--: Adjusted relative risk/confidence interval/p-value not presented due to the sparse number of abnormalities.

Note: Initial Dioxin: Minimal--Low: 52-93 ppt; Medium: >93-292 ppt; High: >292 ppt.

Maximal--Low: 25-56.9 ppt; Medium: >56.9-218 ppt; High: >218 ppt.

Current Dioxin: Minimal--Low: >10-14.65 ppt; Medium: >14.65-45.75 ppt; High: >45.75 ppt.

Maximal--Low: >5-9.01 ppt; Medium: >9.01-33.3 ppt; High: >33.3 ppt.

All: All categories.

Background (B) (Comparisons): Current Dioxin ≤10 ppt.

Unknown (U) (Ranch Hands): Current Dioxin ≤10 ppt.

Low (L) (Ranch Hands): 15 ppt < Current Dioxin ≤33.3 ppt.

High (H) (Ranch Hands): Current Dioxin >33.3 ppt.

TABLE K-4.

**Analysis of Verified Myocardial Infarction
(Diabetics Only)**

Ranch Hands - Log ₂ (Initial Dioxin) - Unadjusted					
Assumption	Initial Dioxin	n	Percent Yes	Est. Relative Risk (95% C.I.) ^a	p-Value
a) Minimal (n=63)	Low	13	7.7	0.74 (0.40,1.36)	0.299
	Medium	31	19.4		
	High	19	5.3		
b) Maximal (n=79)	Low	10	0.0	0.90 (0.55,1.46)	0.650
	Medium	38	18.4		
	High	31	6.5		
Ranch Hands - Log ₂ (Initial Dioxin) - Adjusted					
Assumption	Adj. Relative Risk (95% C.I.) ^a		p-Value	Covariate Remarks	
c) Minimal (n=63)	0.98 (0.50,1.94)		0.962	AGE (p=0.010)	
d) Maximal (n=79)	1.18 (0.67,2.09)		0.564	AGE (p=0.003)	

^aRelative risk for a twofold increase in dioxin.

Note: Minimal--Low: 52-93 ppt; Medium: >93-292 ppt; High: >292 ppt.

Maximal--Low: 25-56.9 ppt; Medium: >56.9-218 ppt; High: >218 ppt.

TABLE K-4. (Continued)

**Analysis of Verified Myocardial Infarction
(Diabetics Only)**

Ranch Hands - Log₂ (Current Dioxin) and Time - Unadjusted

Assumption	Time (Yrs.)	Percent Yes/(n) Current Dioxin			Est. Relative Risk (95% C.I.) ^a	p-Value
		Low	Medium	High		
e) Minimal (n=63)	≤18.6	10.0 (10)	9.1 (11)	0.0 (7)	0.46 (0.08,2.66)	0.647 ^b 0.379 ^c
	>18.6	16.7 (6)	25.0 (16)	7.7 (13)	0.70 (0.35,1.40)	0.311 ^c
f) Maximal (n=79)	≤18.6	0.0 (3)	11.8 (17)	0.0 (14)	0.69 (0.18,2.67)	0.730 ^b 0.589 ^c
	>18.6	14.3 (7)	19.1 (21)	11.8 (17)	0.88 (0.53,1.46)	0.629 ^c

Ranch Hands - Log₂ (Current Dioxin) and Time - Adjusted

Assumption	Time (Yrs.)	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
g) Minimal (n=63)	≤18.6	0.58 (0.08,4.36)	0.615 ^b 0.589 ^c	AGE (p=0.021)
	>18.6	0.96 (0.46,1.99)	0.904 ^c	
h) Maximal (n=79)	≤18.6	0.89 (0.19,4.22)	0.698 ^b 0.876 ^c	AGE (p=0.005)
	>18.6	1.20 (0.66,2.18)	0.547 ^c	

^aRelative risk for a twofold increase in dioxin.

^bTest of significance for homogeneity of relative risks (current dioxin continuous, time categorized).

^cTest of significance for relative risk equal to 1 (current dioxin continuous, time categorized).

Note: Minimal--Low: >10-14.65 ppt; Medium: >14.65-45.75 ppt; High: >45.75 ppt.

Maximal--Low: >5-9.01 ppt; Medium: >9.01-33.3 ppt; High: >33.3 ppt.

TABLE K-4. (Continued)

**Analysis of Verified Myocardial Infarction
(Diabetics Only)**

i) Ranch Hands and Comparisons by Current Dioxin Category - Unadjusted

Current Dioxin Category	n	Percent Yes	Contrast	Est. Relative Risk (95% C.I.)	p-Value
Background	61	9.8	All Categories		0.223
Unknown	19	5.3	Unknown vs. Background	0.51 (0.06,4.62)	0.545
Low	15	26.7	Low vs. Background	3.33 (0.79,13.81)	0.097
High	31	6.5	High vs. Background	0.63 (0.12,3.39)	0.589
Total	126				

j) Ranch Hands and Comparisons by Current Dioxin Category - Adjusted

Current Dioxin Category	n	Contrast	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks
Background	61	All Categories		0.358	AGE (p=0.045)
Unknown	19	Unknown vs. Background	0.37 (0.04,3.53)	0.381	
Low	15	Low vs. Background	2.36 (0.52,10.52)	0.263	
High	31	High vs. Background	0.71 (0.13,3.89)	0.688	
Total	126				

Note: Background (Comparisons): Current Dioxin ≤ 10 ppt.
 Unknown (Ranch Hands): Current Dioxin ≤ 10 ppt.
 Low (Ranch Hands): $15 \text{ ppt} < \text{Current Dioxin} \leq 33.3 \text{ ppt.}$
 High (Ranch Hands): Current Dioxin $> 33.3 \text{ ppt.}$

TABLE K-5.

**Analysis of Leg Pulses
(Diabetics Only)**

Ranch Hands - Log ₂ (Initial Dioxin) - Unadjusted					
Assumption	Initial Dioxin	n	Percent Abnormal	Est. Relative Risk (95% C.I.) ^a	p-Value
a) Minimal (n=57)	Low	12	16.7	0.92 (0.60,1.41)	0.686
	Medium	27	33.3		
	High	18	16.7		
b) Maximal (n=72)	Low	10	10.0	0.99 (0.69,1.40)	0.943
	Medium	32	37.5		
	High	30	13.3		

Ranch Hands - Log ₂ (Initial Dioxin) - Adjusted			
Assumption	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
c) Minimal (n=57)	1.14 (0.71,1.84)	0.575	AGE (p=0.011)
d) Maximal (n=72)	1.13 (0.76,1.68)	0.531	AGE (p=0.041)

^aRelative risk for a twofold increase in dioxin.

Note: Minimal--Low: 52-93 ppt; Medium: >93-292 ppt; High: >292 ppt.

Maximal--Low: 25-56.9 ppt; Medium: >56.9-218 ppt; High: >218 ppt.

TABLE K-5. (Continued)

Analysis of Leg Pulses
(Diabetics Only)Ranch Hands - Log₂ (Current Dioxin) and Time - Unadjusted

Assumption	Time (Yrs.)	Percent Abnormal/(n) Current Dioxin			Est. Relative Risk (95% C.I.) ^a	p-Value
		Low	Medium	High		
e) Minimal (n=57)	≤18.6	20.0 (10)	37.5 (8)	14.3 (7)	1.01 (0.49,2.09)	0.716 ^b 0.981 ^c
	>18.6	20.0 (5)	33.3 (15)	16.7 (12)	0.85 (0.49,1.49)	0.575 ^c
f) Maximal (n=72)	≤18.6	0.0 (3)	18.8 (16)	25.0 (12)	1.25 (0.66,2.40)	0.355 ^b 0.487 ^c
	>18.6	14.3 (7)	44.4 (18)	12.5 (16)	0.87 (0.57,1.33)	0.530 ^c

Ranch Hands - Log₂ (Current Dioxin) and Time - Adjusted

Assumption	Time (Yrs.)	Adj. Relative Risk (95% C.I.) ^a	p-Value	Covariate Remarks
g) Minimal (n=57)	≤18.6	1.37 (0.61,3.07)	0.585 ^b 0.432 ^c	AGE (p=0.010)
	>18.6	1.05 (0.57,1.92)	0.873 ^c	
h) Maximal (n=72)	≤18.6	1.51 (0.75,3.04)	0.304 ^b 0.243 ^c	AGE (p=0.043)
	>18.6	0.99 (0.62,1.58)	0.971 ^c	

^aRelative risk for a twofold increase in dioxin.^bTest of significance for homogeneity of relative risks (current dioxin continuous, time categorized).^cTest of significance for relative risk equal to 1 (current dioxin continuous, time categorized).Note: Minimal--Low: >10-14.65 ppt; Medium: >14.65-45.75 ppt; High: >45.75 ppt.Maximal--Low: >5-9.01 ppt; Medium: >9.01-33.3 ppt; High: >33.3 ppt.

TABLE K-5. (Continued)

**Analysis of Leg Pulses
(Diabetics Only)**

i) Ranch Hands and Comparisons by Current Dioxin Category - Unadjusted

Current Dioxin Category	n	Percent Abnormal	Contrast	Est. Relative Risk (95% C.I.)	p-Value
Background	60	18.3	All Categories		0.258
Unknown	18	16.7	Unknown vs. Background	0.89 (0.22,3.67)	0.871
Low	14	42.9	Low vs. Background	3.34 (0.95,11.59)	0.057
High	28	17.9	High vs. Background	0.97 (0.30,3.15)	0.957
Total	120				

j) Ranch Hands and Comparisons by Current Dioxin Category - Adjusted

Current Dioxin Category	n	Contrast	Adj. Relative Risk (95% C.I.)	p-Value	Covariate Remarks
Background	60	All Categories		0.380	AGE (p=0.125)
Unknown	18	Unknown vs. Background	0.75 (0.18,3.22)	0.699	
Low	14	Low vs. Background	2.76 (0.76,9.94)	0.119	
High	28	High vs. Background	1.01 (0.31,3.31)	0.992	
Total	120				

Note: Background (Comparisons): Current Dioxin ≤ 10 ppt.
 Unknown (Ranch Hands): Current Dioxin ≤ 10 ppt.
 Low (Ranch Hands): $15 \text{ ppt} < \text{Current Dioxin} \leq 33.3 \text{ ppt}$.
 High (Ranch Hands): Current Dioxin $> 33.3 \text{ ppt}$.