

APPENDIX K-1.

Data Displays for the Cardiovascular Assessment

The following figures graphically display relationships between the dependent variables and measures of dioxin for the cardiovascular assessment. The panels are arranged as follows:

Panel	Group	Assumption	Dioxin Measure
a	Ranch Hand	Minimal	Initial
b	Ranch Hand	Maximal	Initial
c	Comparison	--	Current
d	Ranch Hand	--	Current

Dioxin measures are presented in original units, but spacing of intervals is based on the logarithm (base 2) scale, similar to the statistical analysis. The dependent variable is also presented in original units, but spacing is based on the scale used for analysis, as described in the chapter. For continuous variables, current dioxin values of 0.0 ppt are displayed as 0.3 ppt. For these variables, the reference line indicates the general relationship, unadjusted for any covariates, between the dependent variable and $\log_2$ dioxin. For discrete variables, the percent of participants that exhibited an abnormal condition is displayed on the vertical axis for given intervals of dioxin. The intervals of dioxin and the sample sizes for each of these intervals are given below. A list of figures found in this appendix follows the table. These sample sizes are based on excluding participants with a verified history of diabetes, a 2-hour postprandial glucose level of 200 mg/dl or more, or a verified pre-SEA heart condition. Sample sizes for an individual variable may differ due to other exclusions or missing data.

Dioxin Interval	Dioxin Scale Midpoint	Panel			
		a	b	c	d
		Sample Size			
0.0-0.5	0.25	0	0	42	8
>0.5-2.0	1	0	0	28	8
>2.0-8.0	4	0	0	681	249
>8.0-32.0	16	0	23	52	408
>32.0-128.0	64	219	417	1	158
>128.0-512.0	256	234	234	0	33
>512.0-2,048	1024	65	65	0	2
>2,048.0	4096	3	3	0	0

Figure		Page
K-1-1	Reported/Verified Essential Hypertension versus Dioxin	K-1-3
K-1-2	Reported Heart Disease (Excluding Essential Hypertension) versus Dioxin.....	K-1-4
K-1-3	Verified Heart Disease (Excluding Essential Hypertension) versus Dioxin.....	K-1-5
K-1-4	Reported/Verified Myocardial Infarction versus Dioxin	K-1-6
K-1-5	Systolic Blood Pressure (Continuous) versus Dioxin	K-1-7
K-1-6	Systolic Blood Pressure (Discrete) versus Dioxin.....	K-1-8
K-1-7	Heart Sounds versus Dioxin	K-1-9
K-1-8	Overall Electrocardiograph versus Dioxin.....	K-1-10
K-1-9	ECG: Right Bundle Branch Block versus Dioxin	K-1-11
K-1-10	ECG: Nonspecific ST- and T-Wave Changes versus Dioxin	K-1-12
K-1-11	ECG: Bradycardia versus Dioxin.....	K-1-13
K-1-12	ECG: Arrhythmia versus Dioxin.....	K-1-14
K-1-13	ECG: Other Diagnoses versus Dioxin.....	K-1-15
K-1-14	Diastolic Blood Pressure (Continuous) versus Dioxin.....	K-1-16
K-1-15	Diastolic Blood Pressure (Discrete) versus Dioxin.....	K-1-17
K-1-16	Fundusoscopic Examination versus Dioxin.....	K-1-18
K-1-17	Carotid Bruits versus Dioxin.....	K-1-19
K-1-18	Radial Pulses versus Dioxin	K-1-20
K-1-19	Femoral Pulses versus Dioxin	K-1-21
K-1-20	Popliteal Pulses versus Dioxin.....	K-1-22
K-1-21	Dorsalis Pedis Pulses versus Dioxin.....	K-1-23
K-1-22	Posterior Tibial Pulses versus Dioxin.....	K-1-24
K-1-23	Leg Pulses versus Dioxin	K-1-25
K-1-24	Peripheral Pulses versus Dioxin.....	K-1-26
K-1-25	All Pulses versus Dioxin	K-1-27

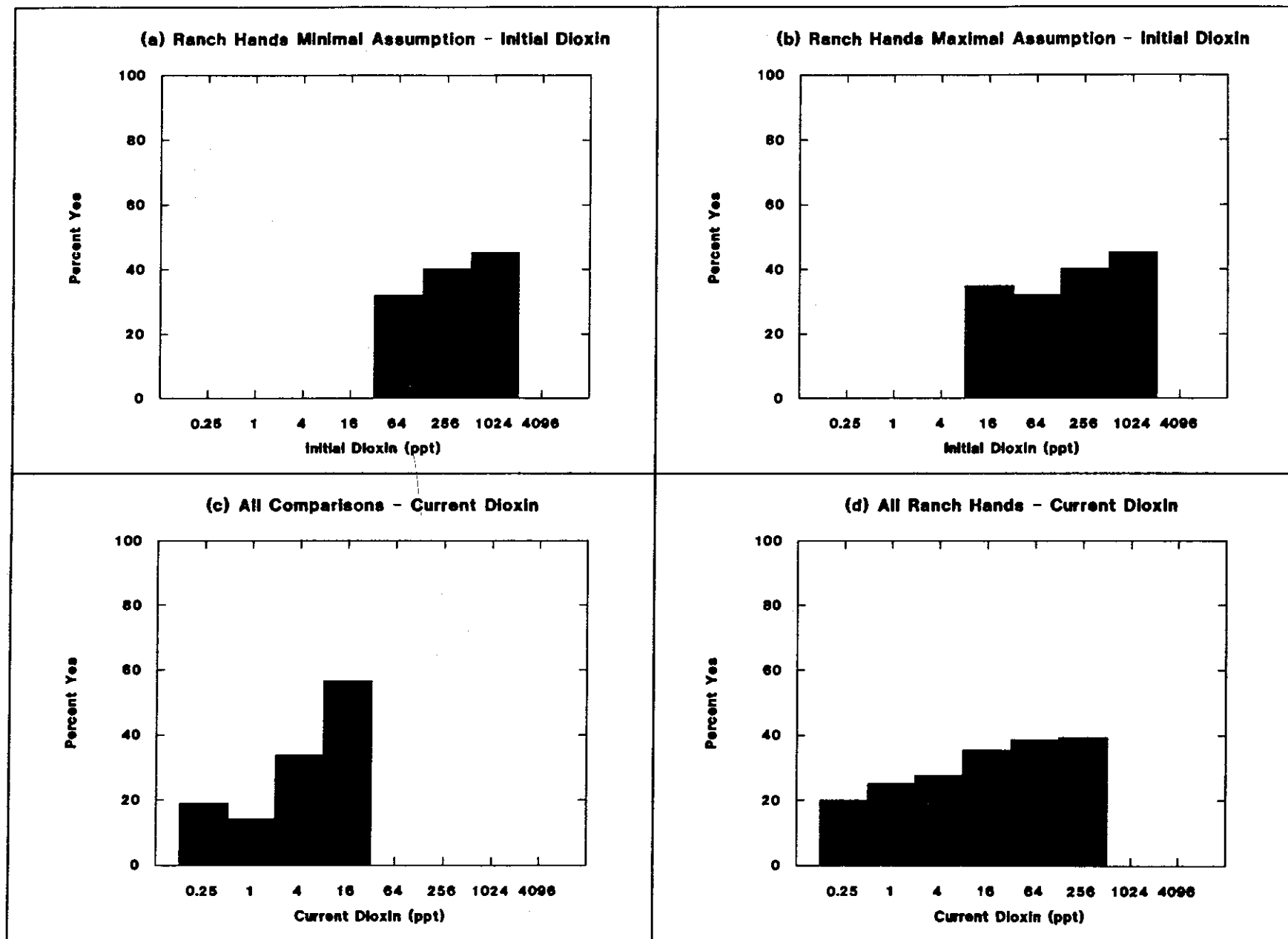


FIGURE K-1-1. Reported/Verified Essential Hypertension versus Dioxin

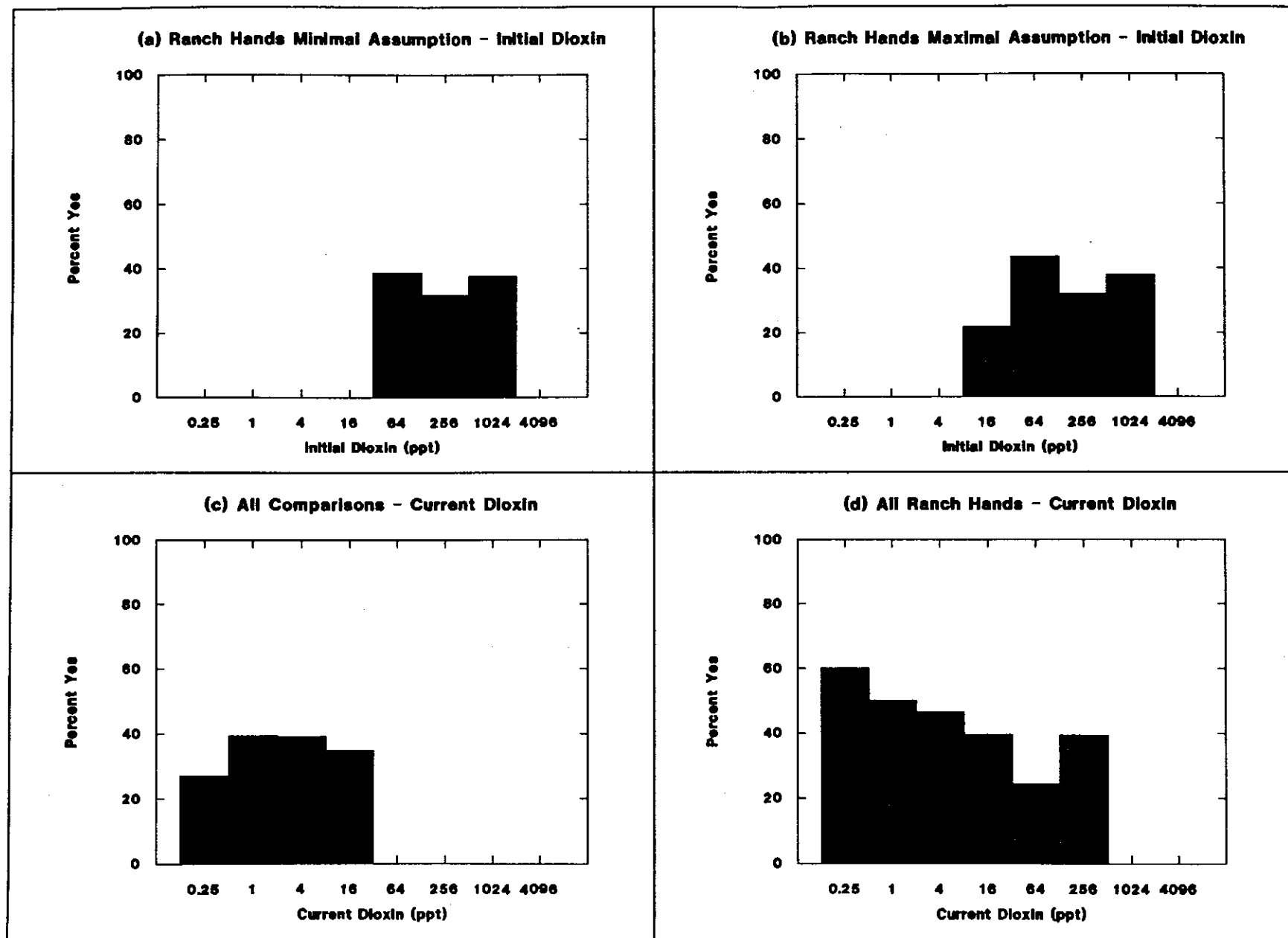


FIGURE K-1-2. Reported Heart Disease (excluding Essential Hypertension) versus Dioxin

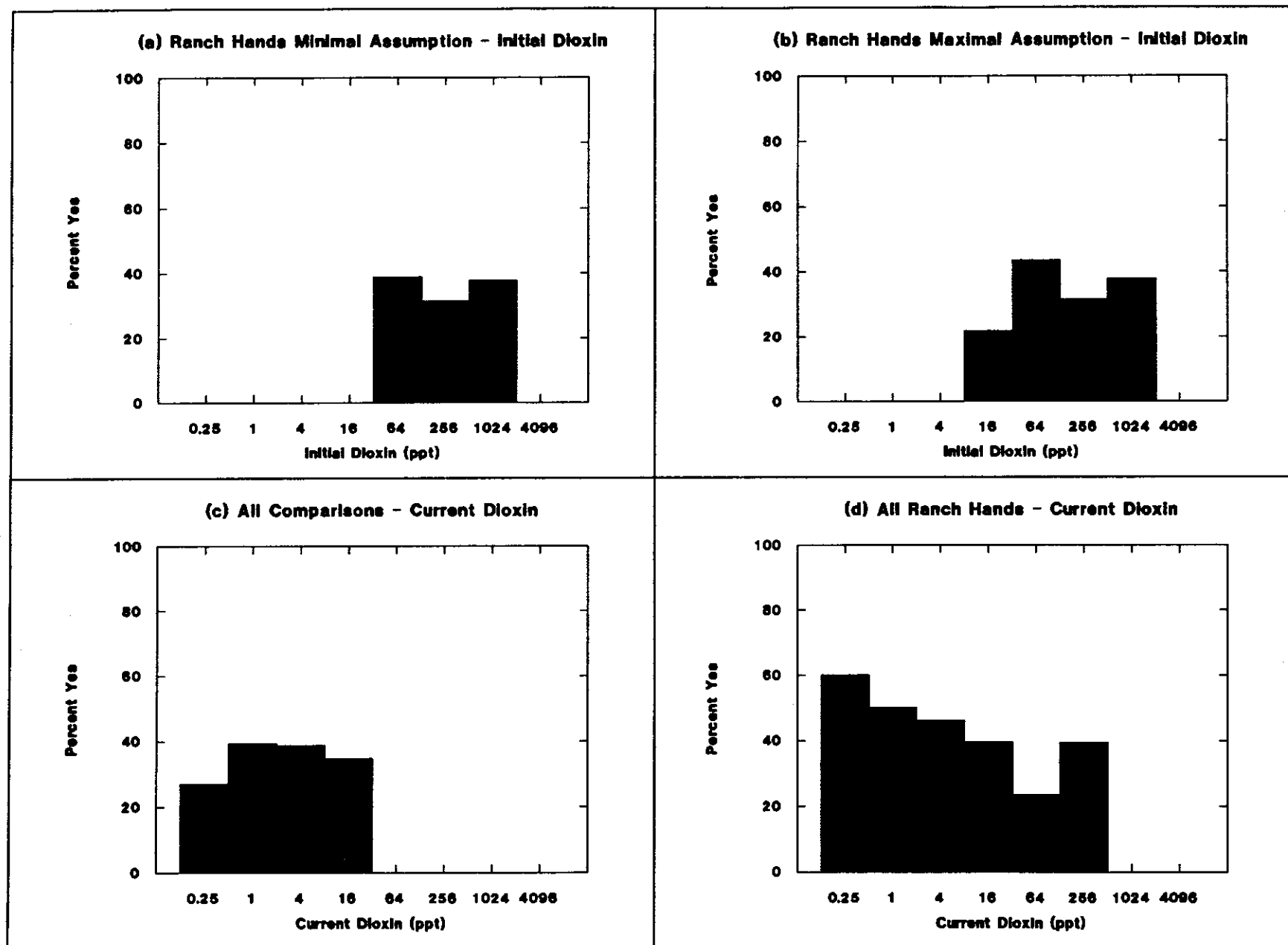


FIGURE K-1-3. Verified Heart Disease (excluding Essential Hypertension) versus Dioxin

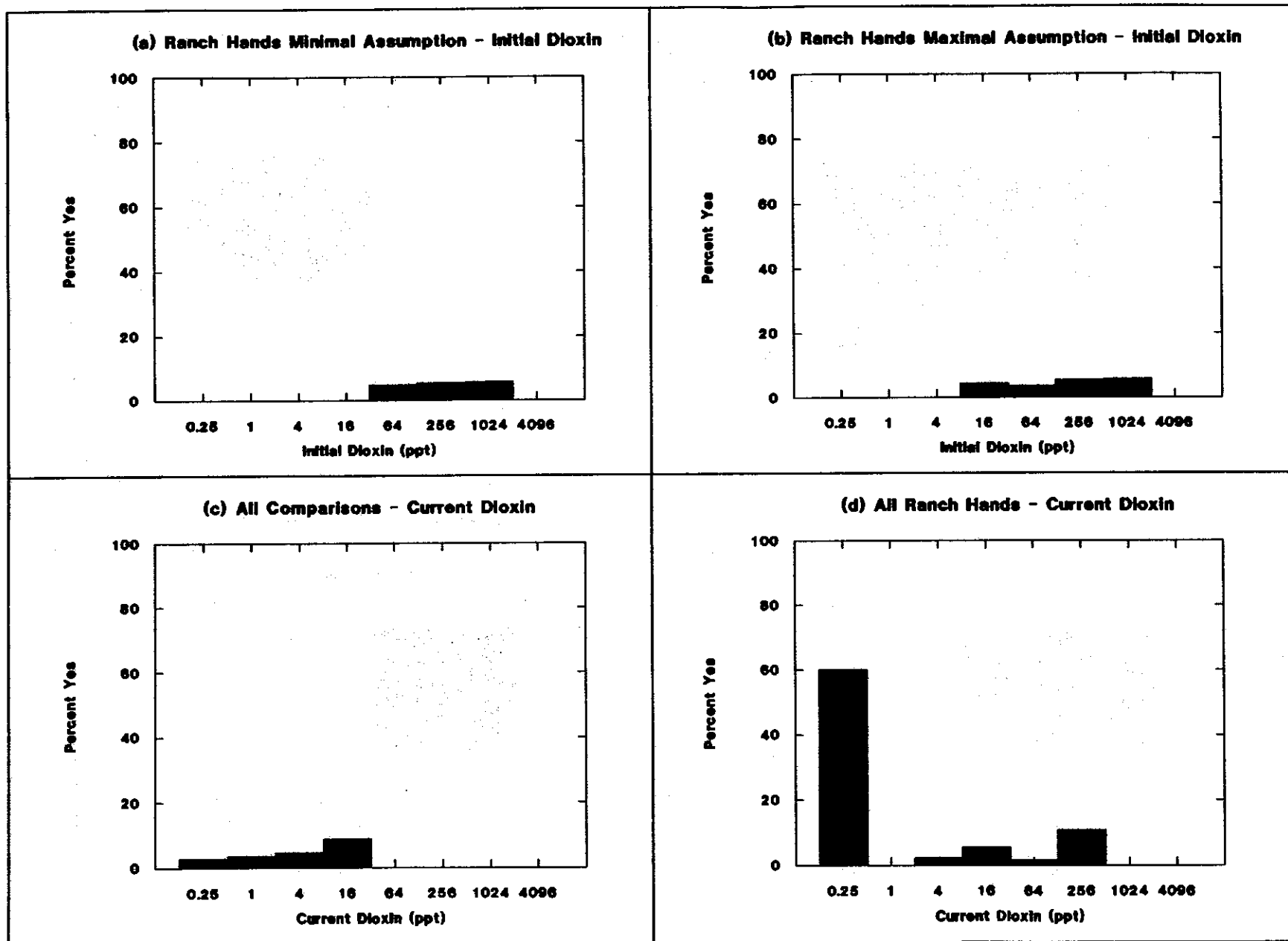


FIGURE K-1-4. Reported/Verified Myocardial Infarction versus Dioxin

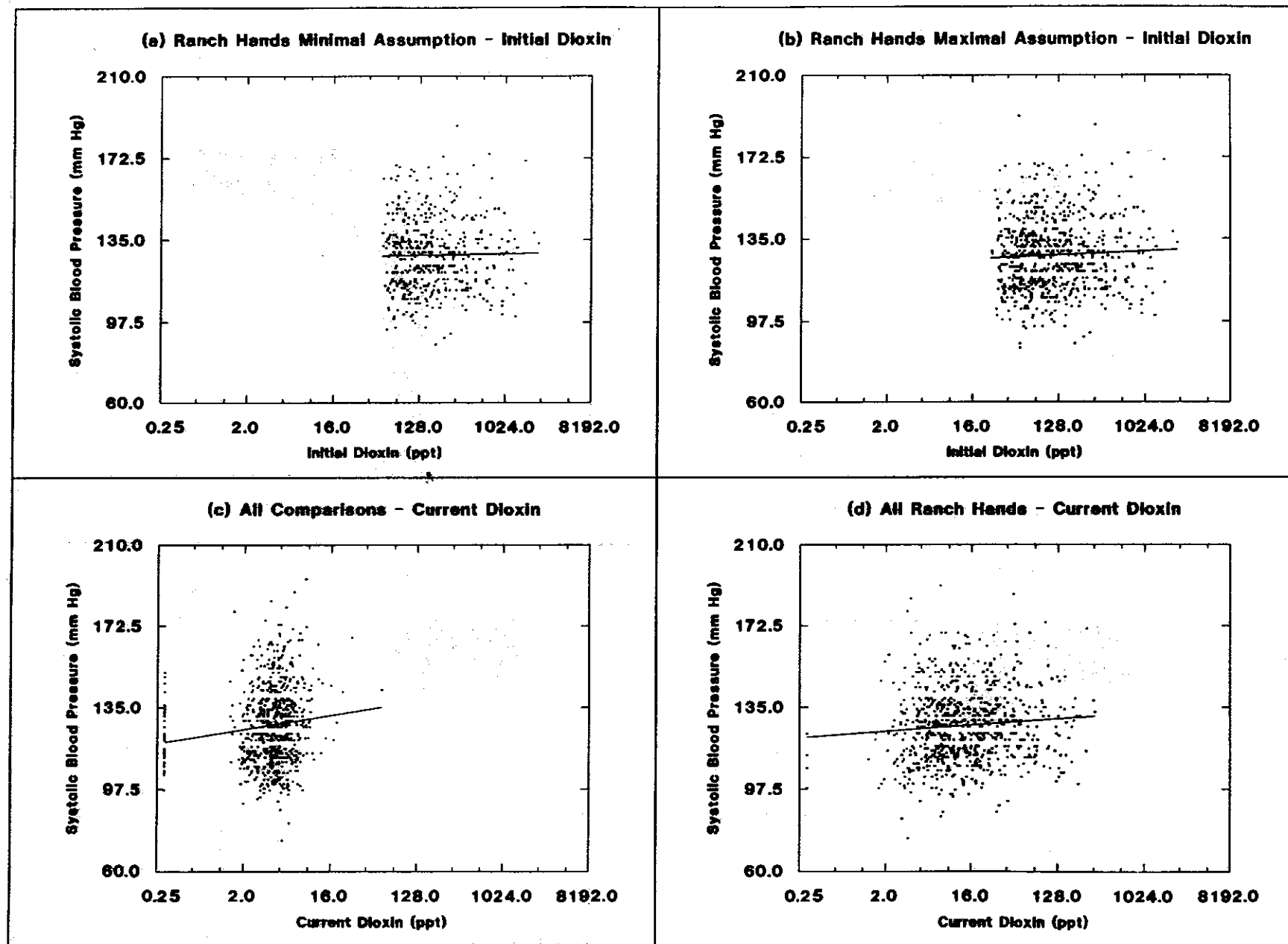


FIGURE K-1-5. Systolic Blood Pressure (Continuous) versus Dioxin

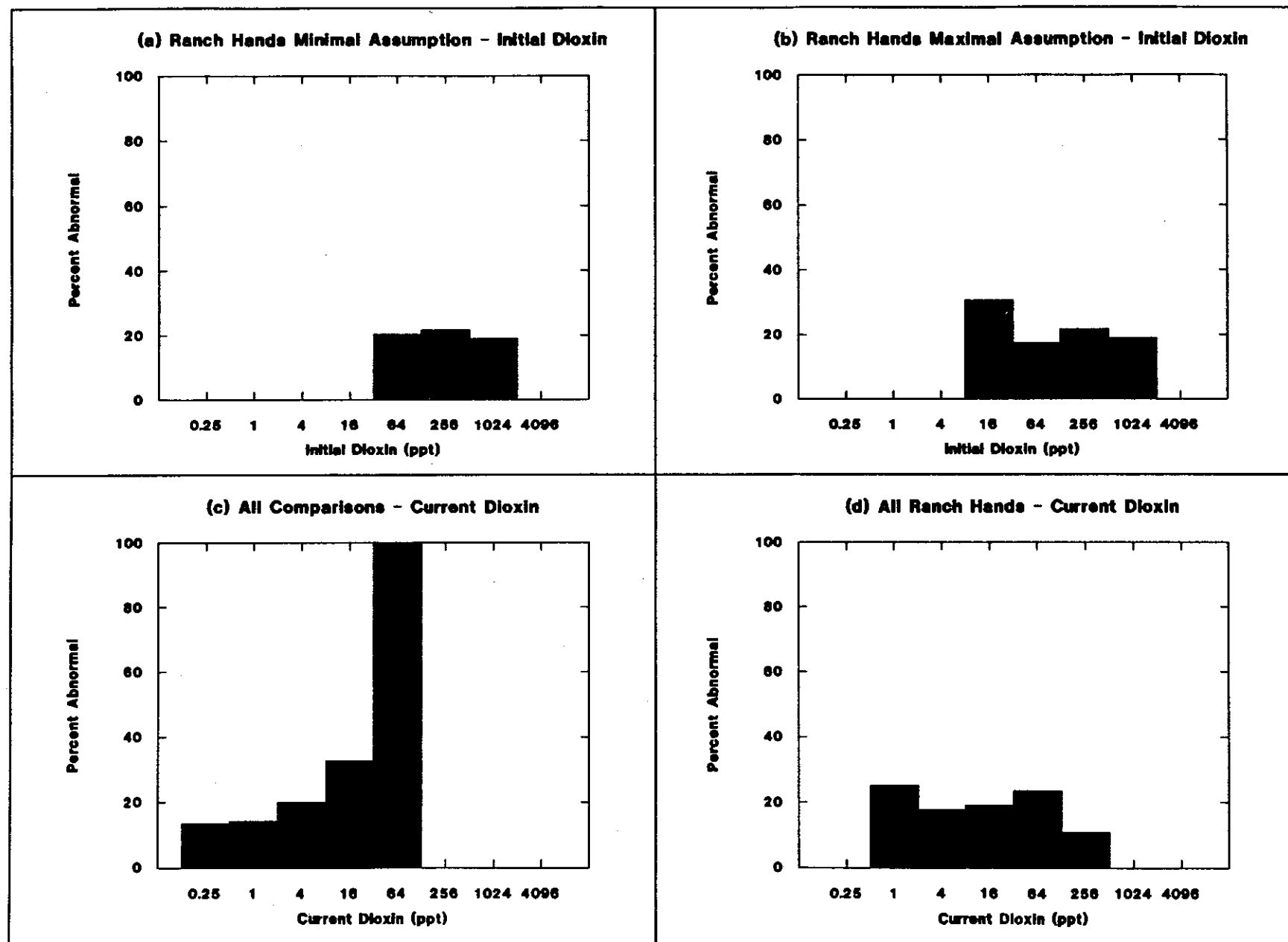


FIGURE K-1-6. Systolic Blood Pressure (Discrete) versus Dioxin

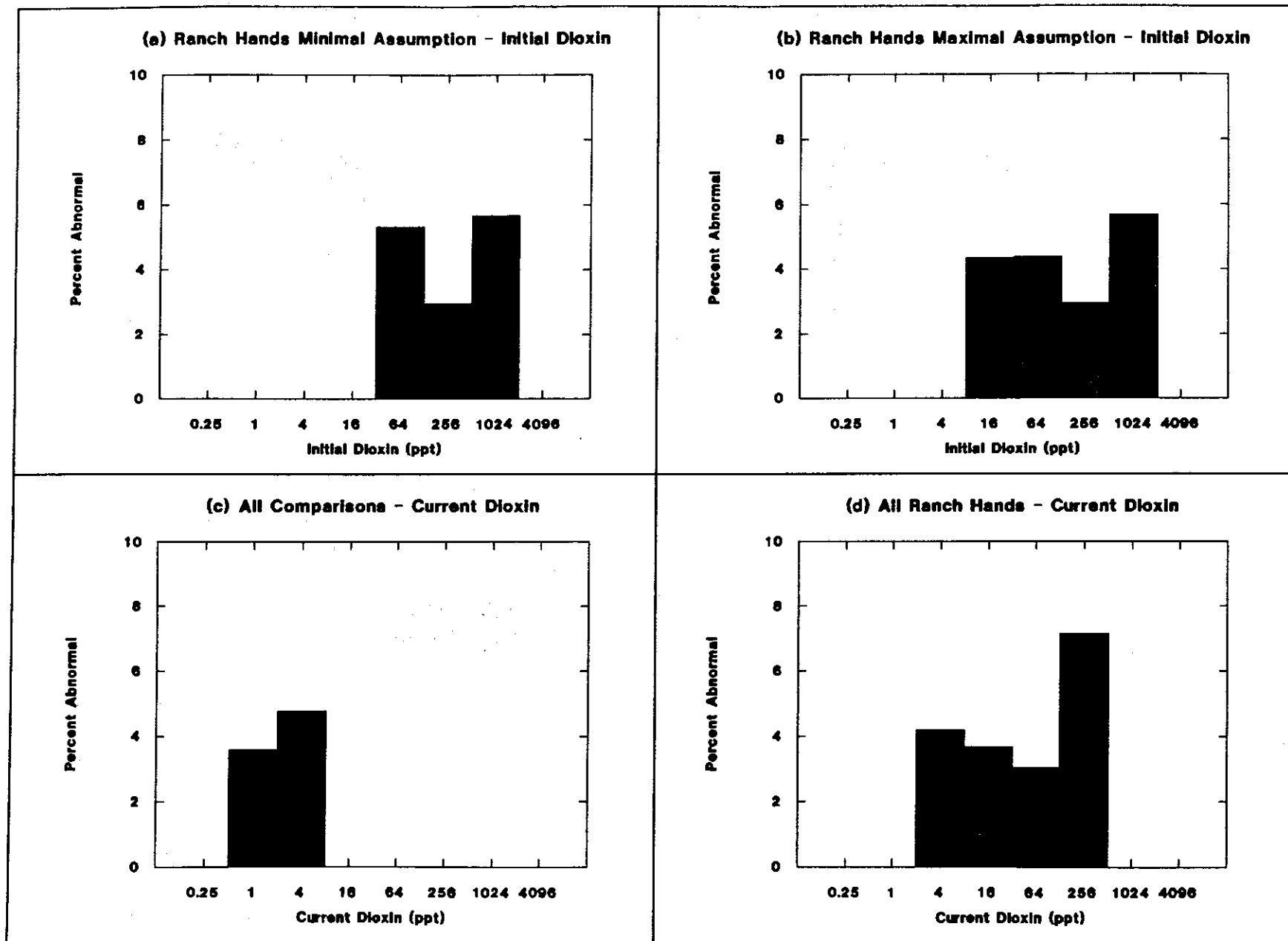


FIGURE K-1-7. Heart Sounds versus Dioxin

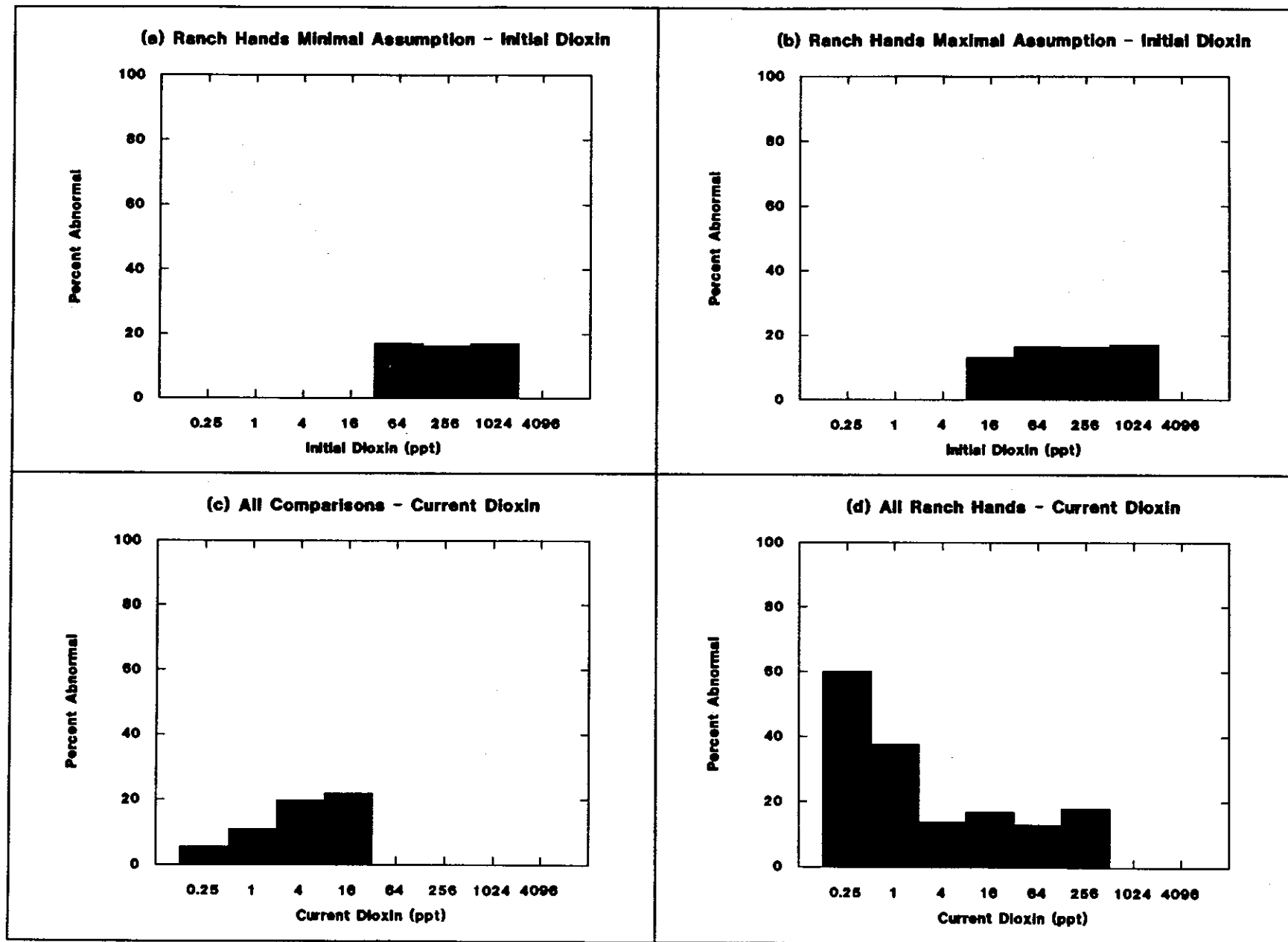


FIGURE K-1-8. Overall Electrocardiograph (ECG) versus Dioxin

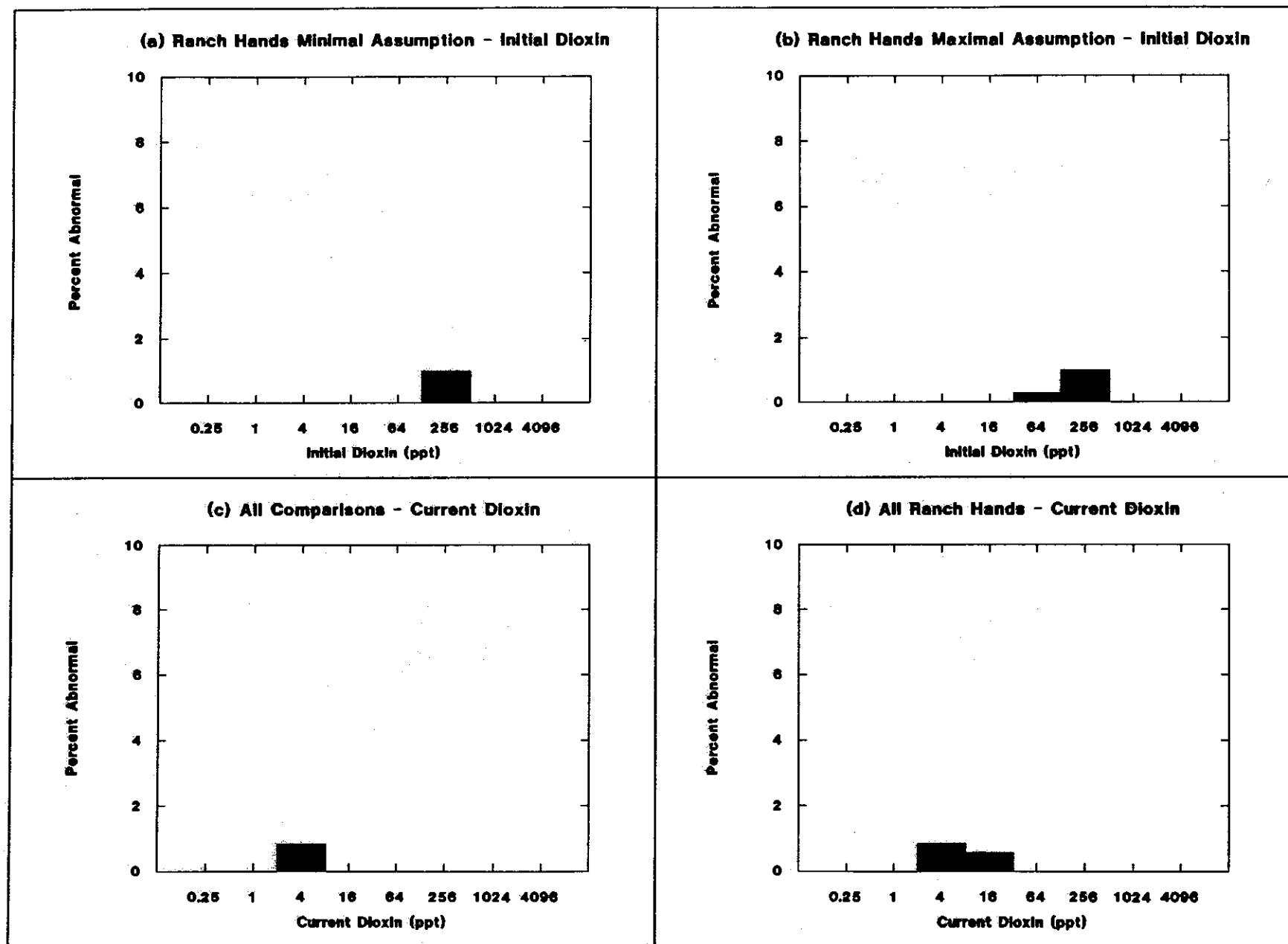
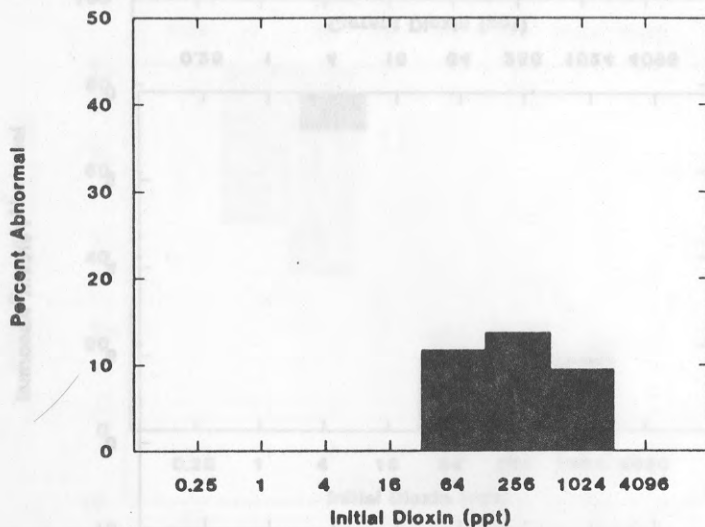
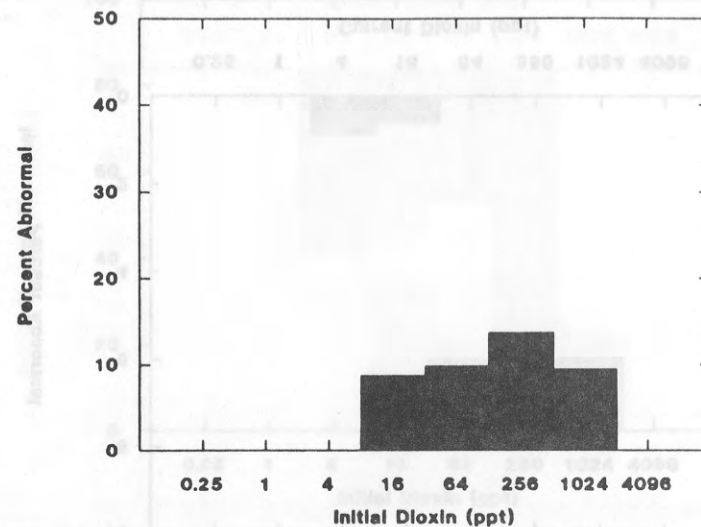


FIGURE K-1-9. ECG: Right Bundle Branch Block versus Dioxin

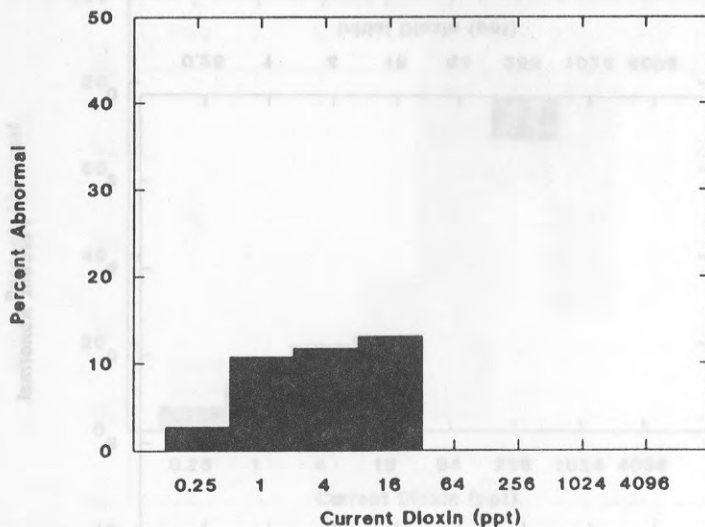
(a) Ranch Hands Minimal Assumption - Initial Dioxin



(b) Ranch Hands Maximal Assumption - Initial Dioxin



(c) All Comparisons - Current Dioxin



(d) All Ranch Hands - Current Dioxin

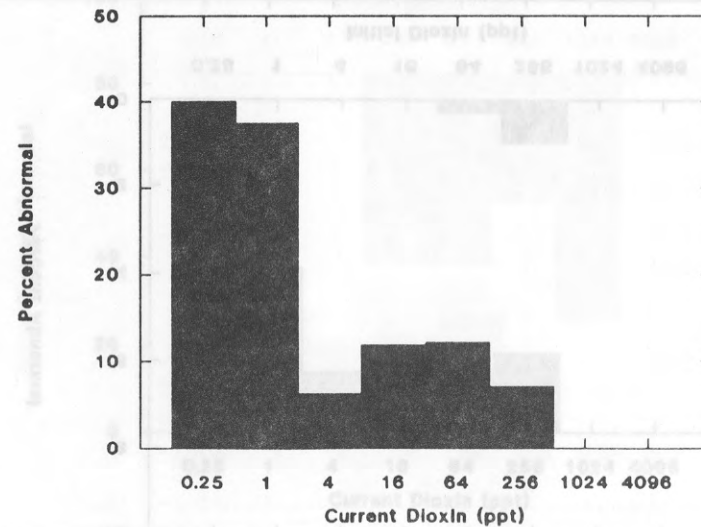


FIGURE K-1-10. ECG: Nonspecific ST- and T-Wave Changes versus Dioxin

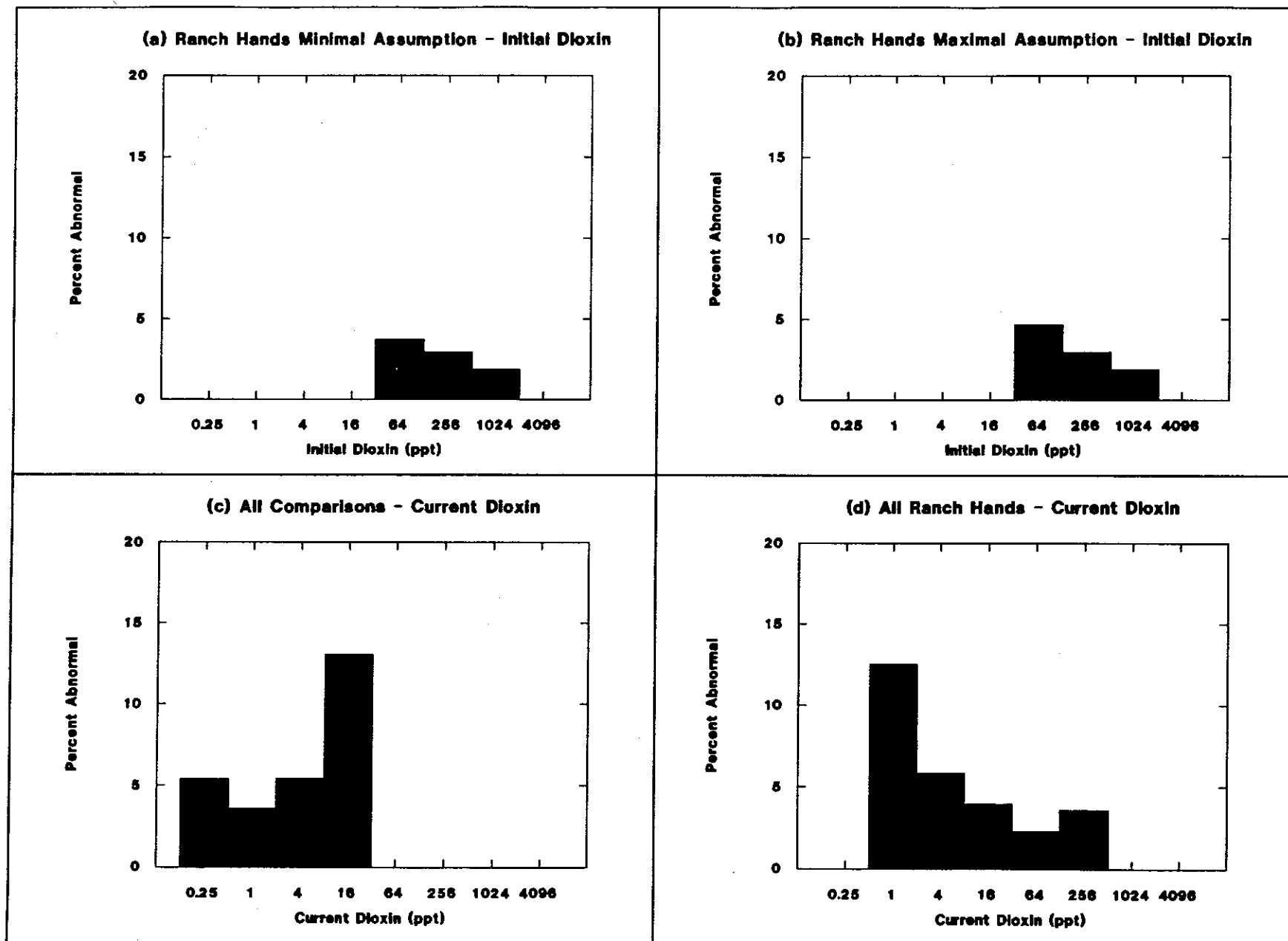


FIGURE K-1-11. ECG: Bradycardia versus Dioxin

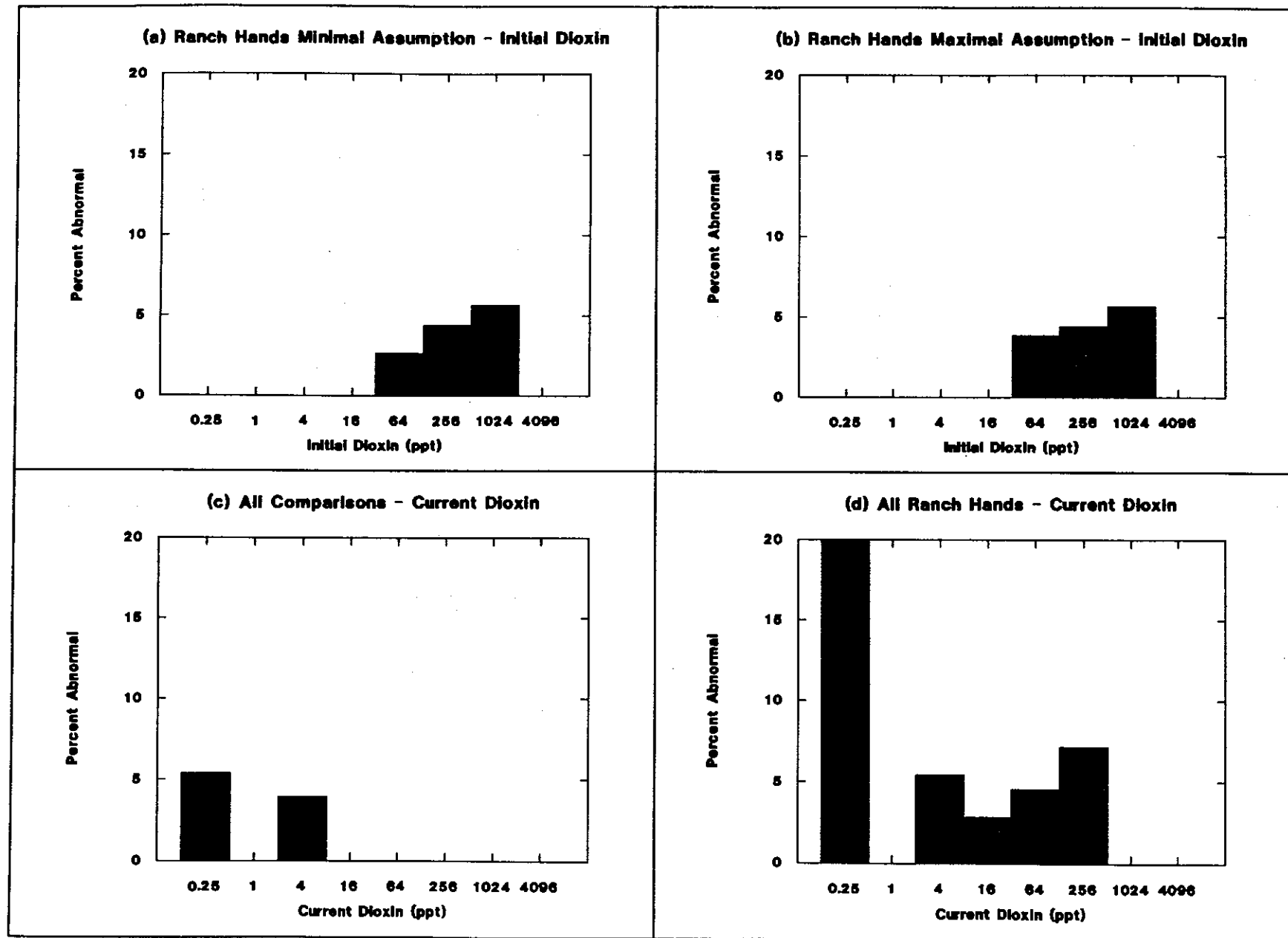


FIGURE K-1-12. ECG: Arrhythmia versus Dioxin

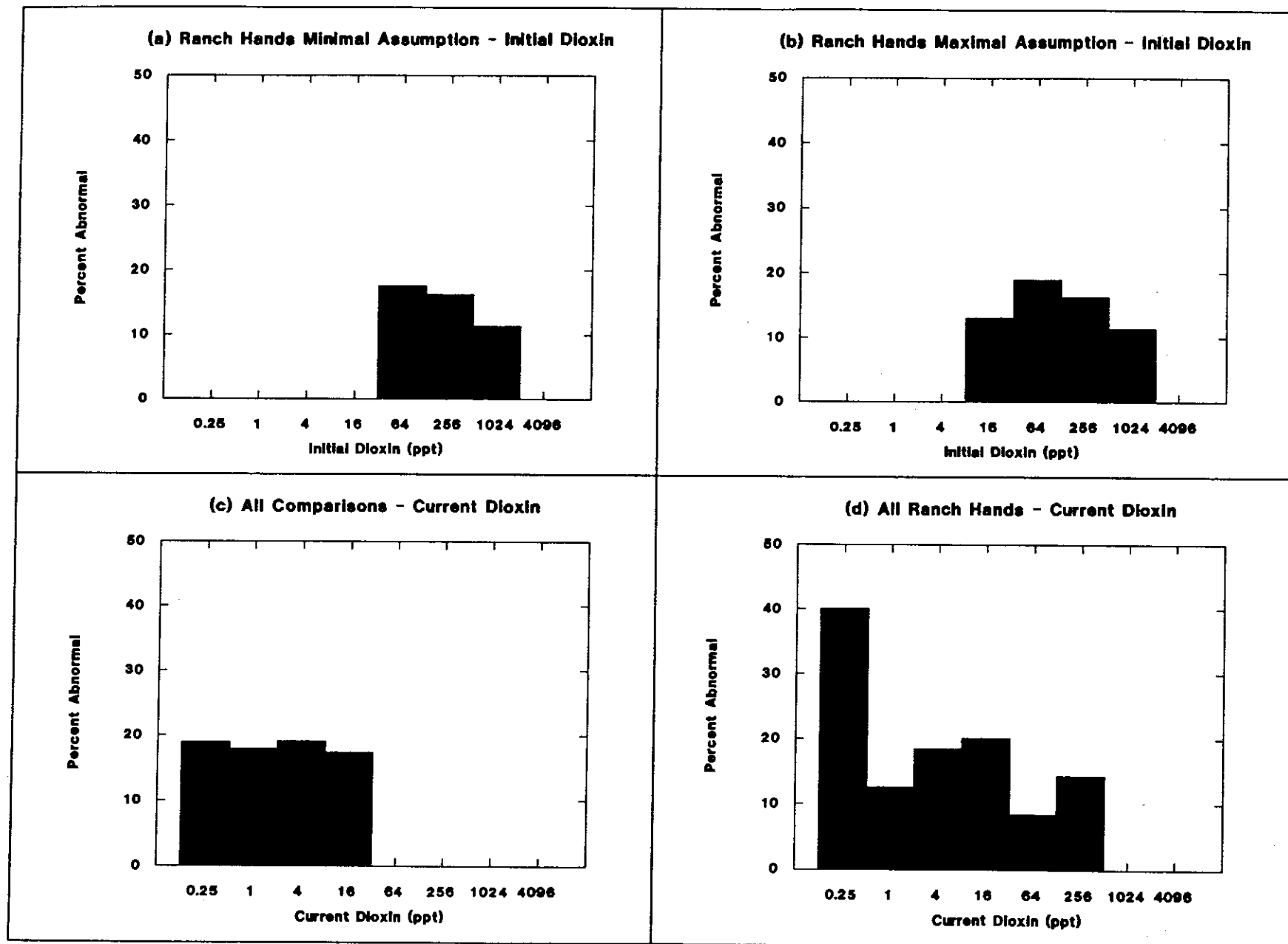


FIGURE K-1-13. ECG: Other Diagnoses versus Dioxin

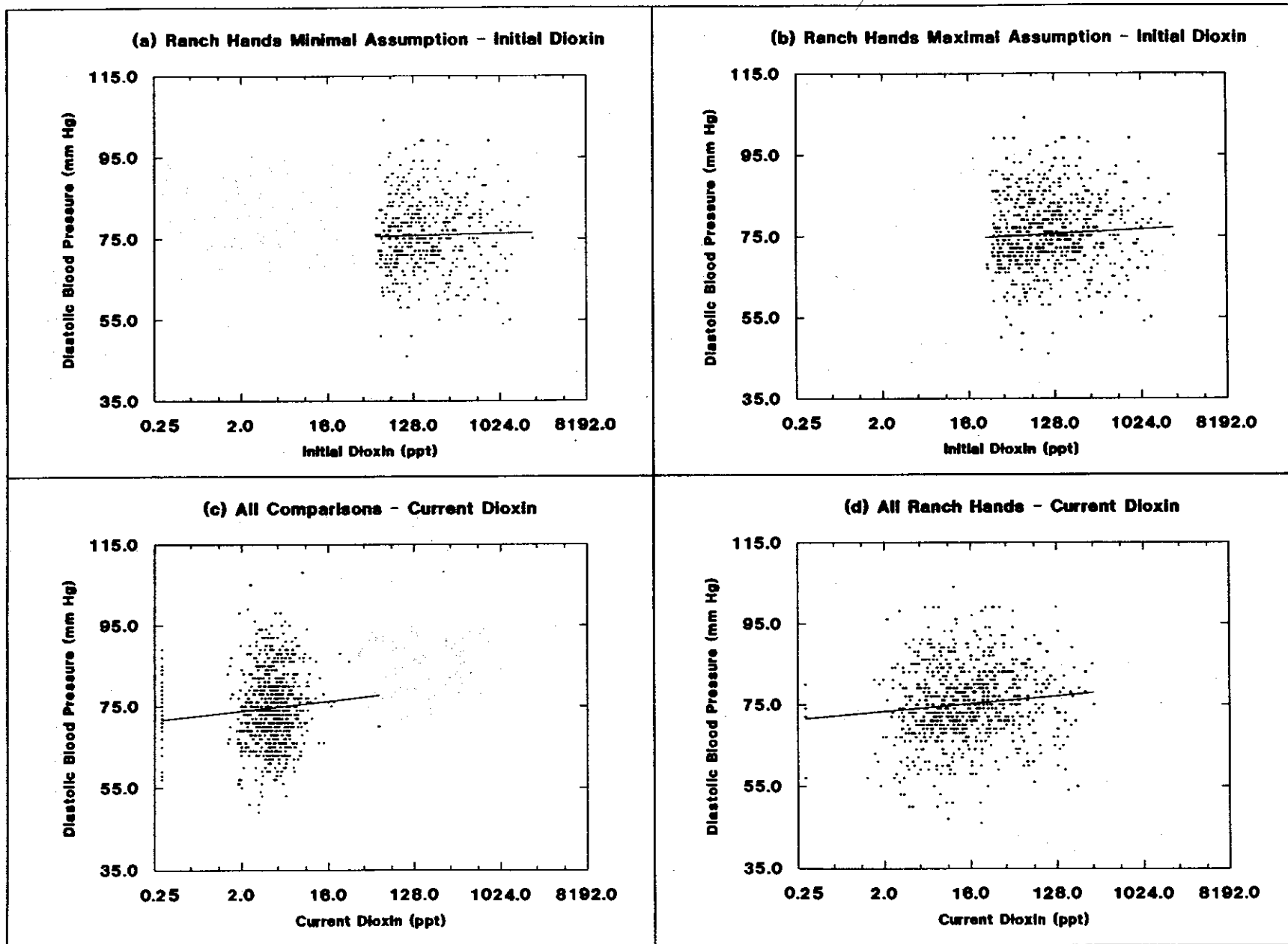


FIGURE K-1-14. Diastolic Blood Pressure (Continuous) versus Dioxin

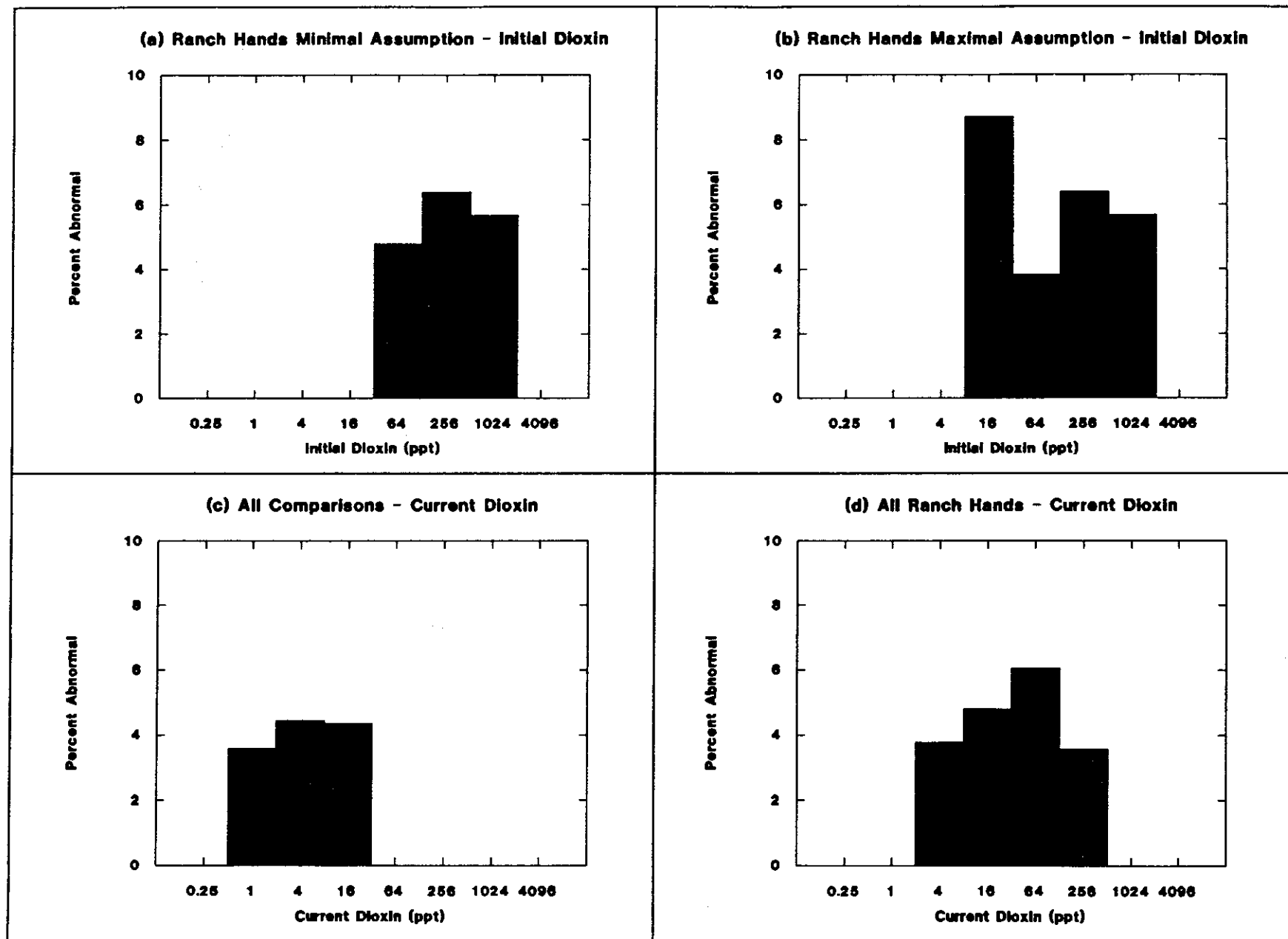


FIGURE K-1-15. Diastolic Blood Pressure (Discrete) versus Dioxin

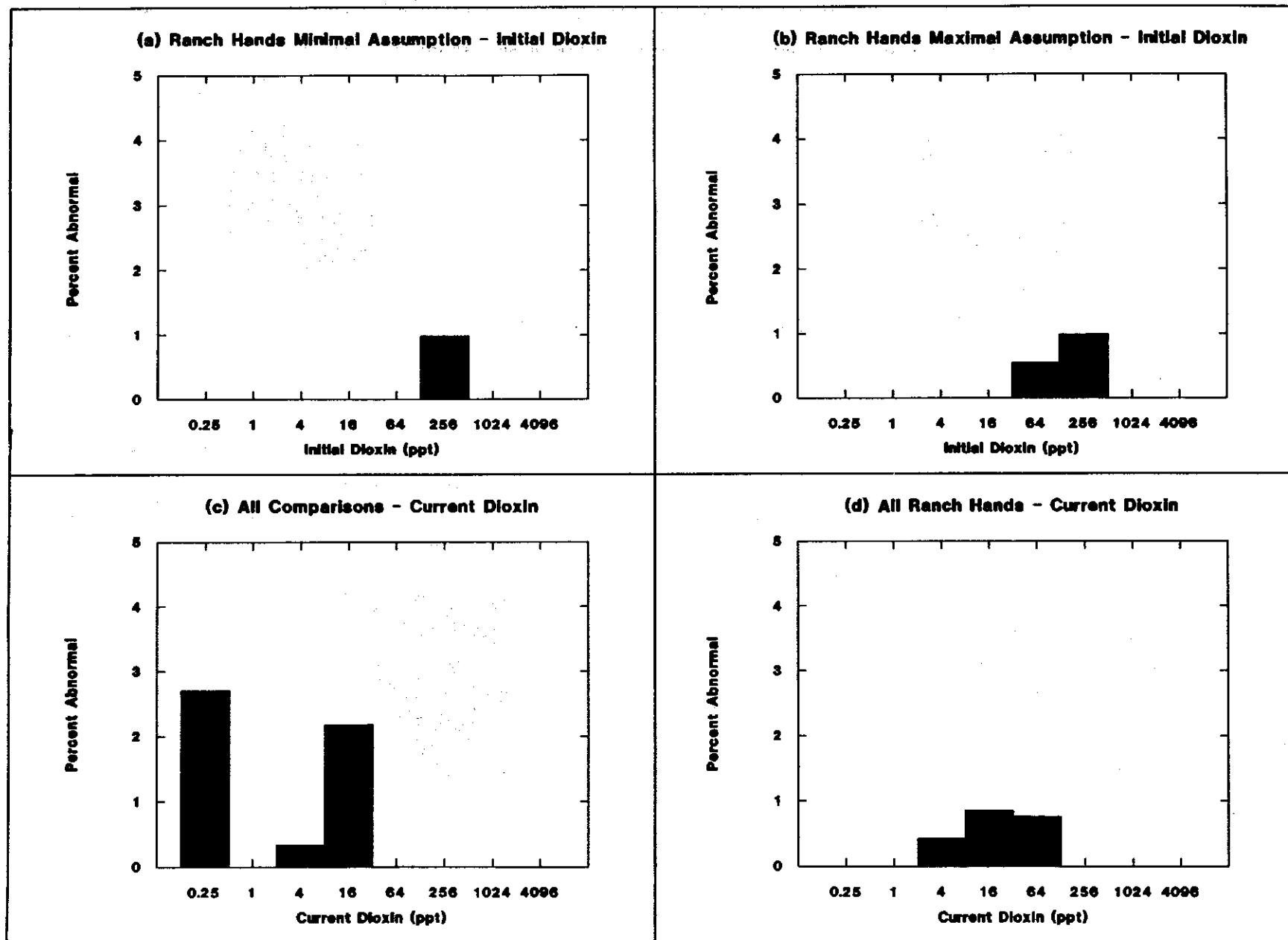


FIGURE K-1-16. Funduscopy Examination versus Dioxin

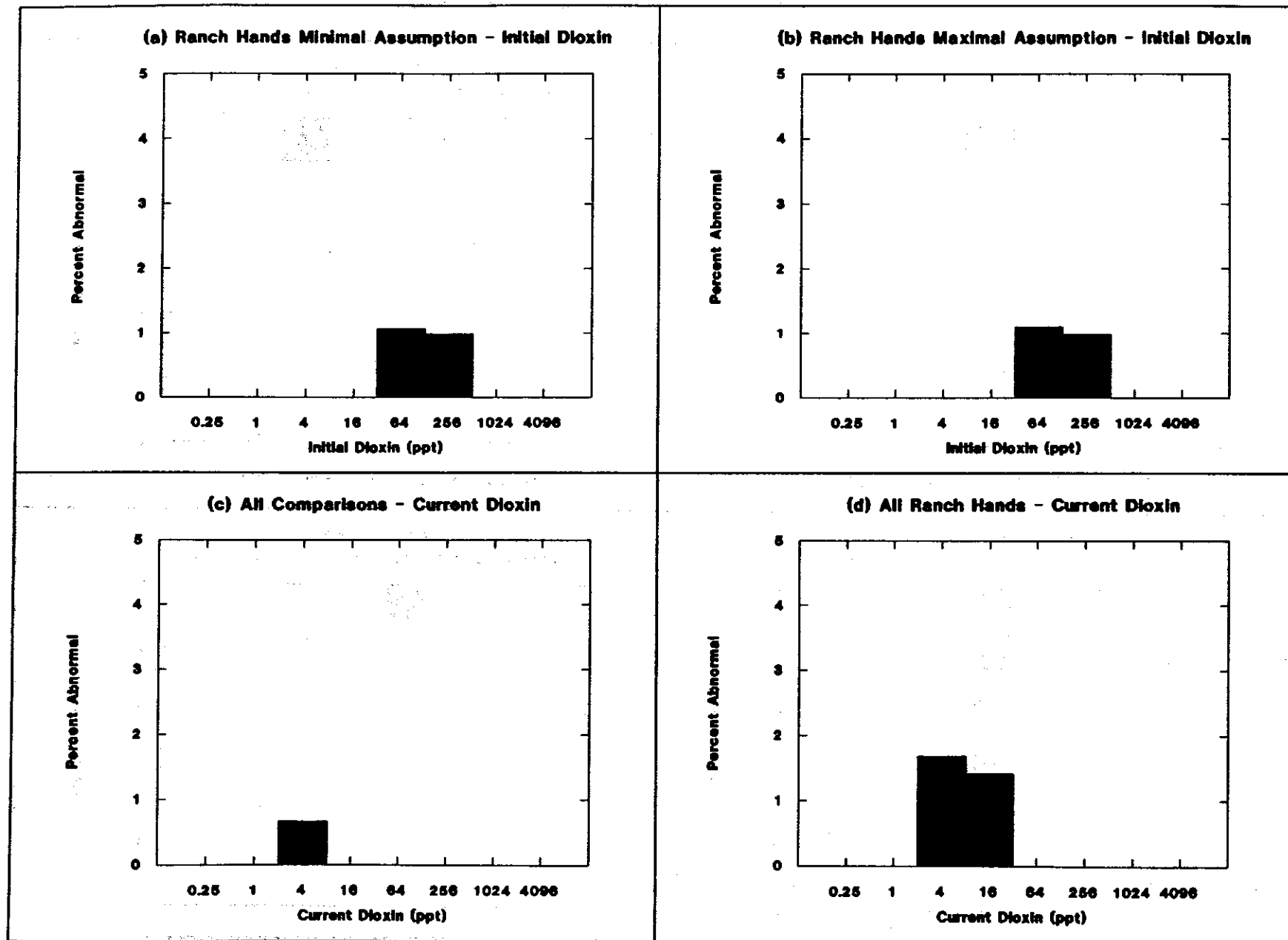


FIGURE K-1-17. Carotid Bruits versus Dioxin

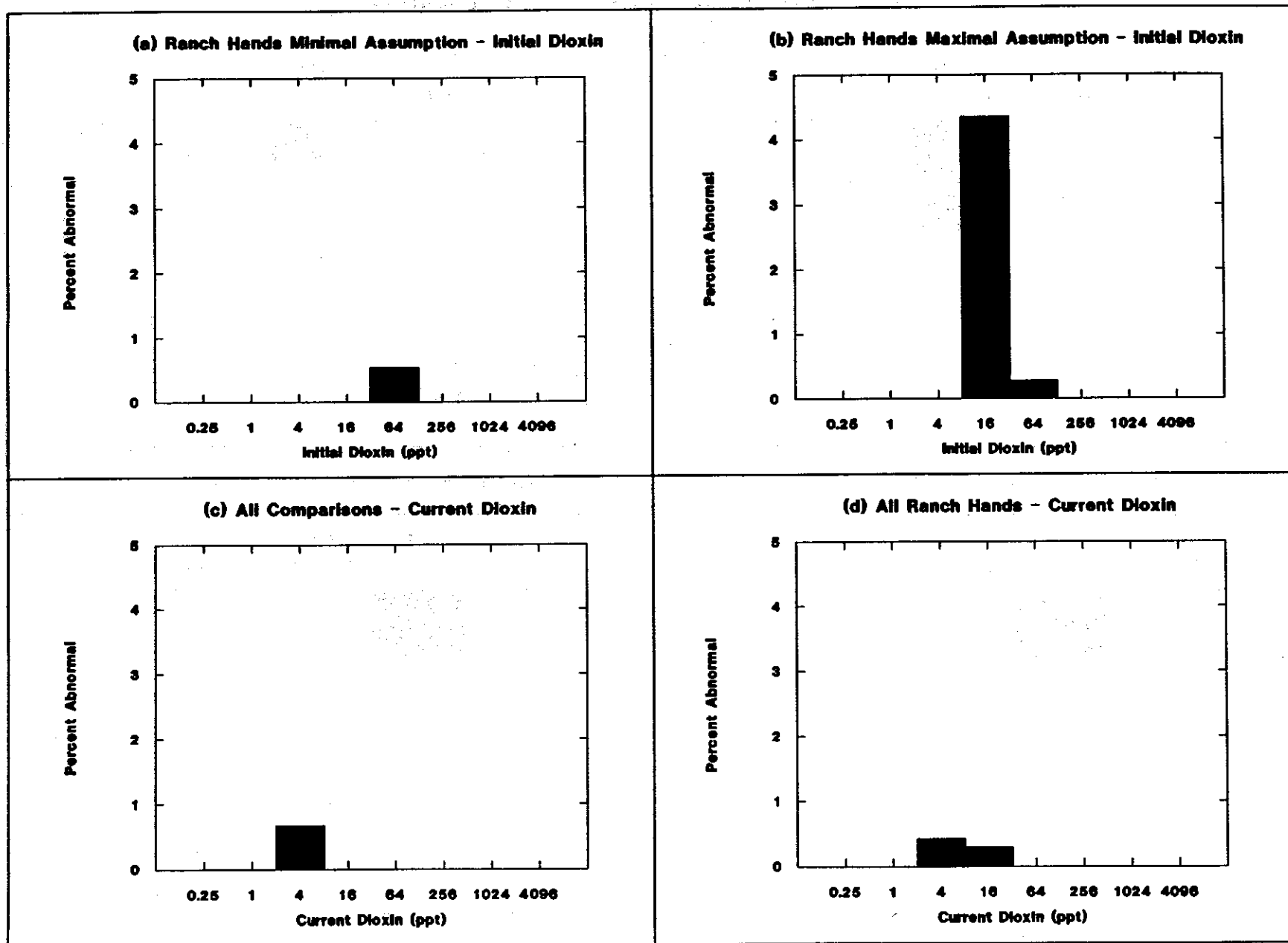


FIGURE K-1-18. Radial Pulses versus Dioxin

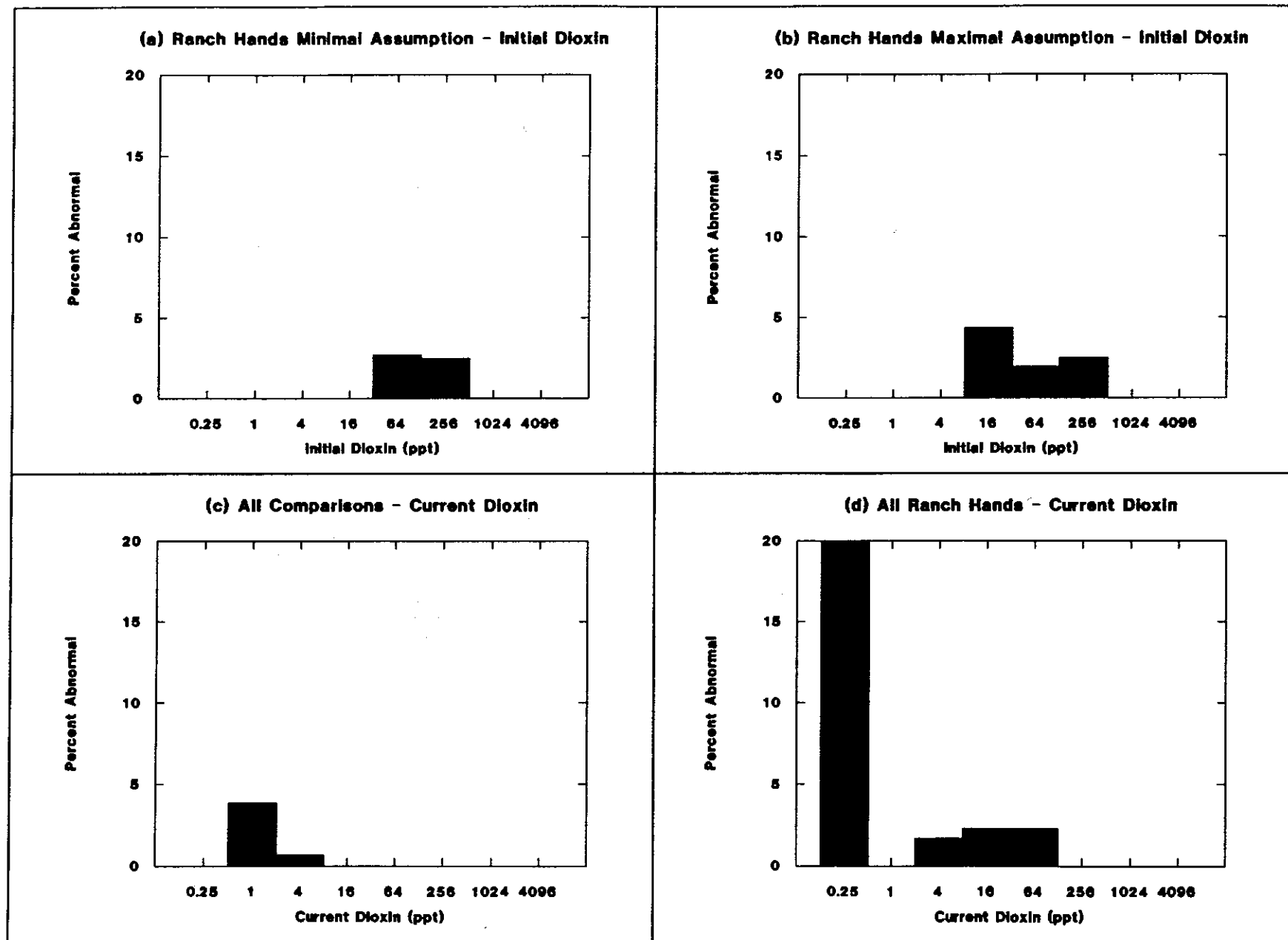


FIGURE K-1-19. Femoral Pulses versus Dioxin

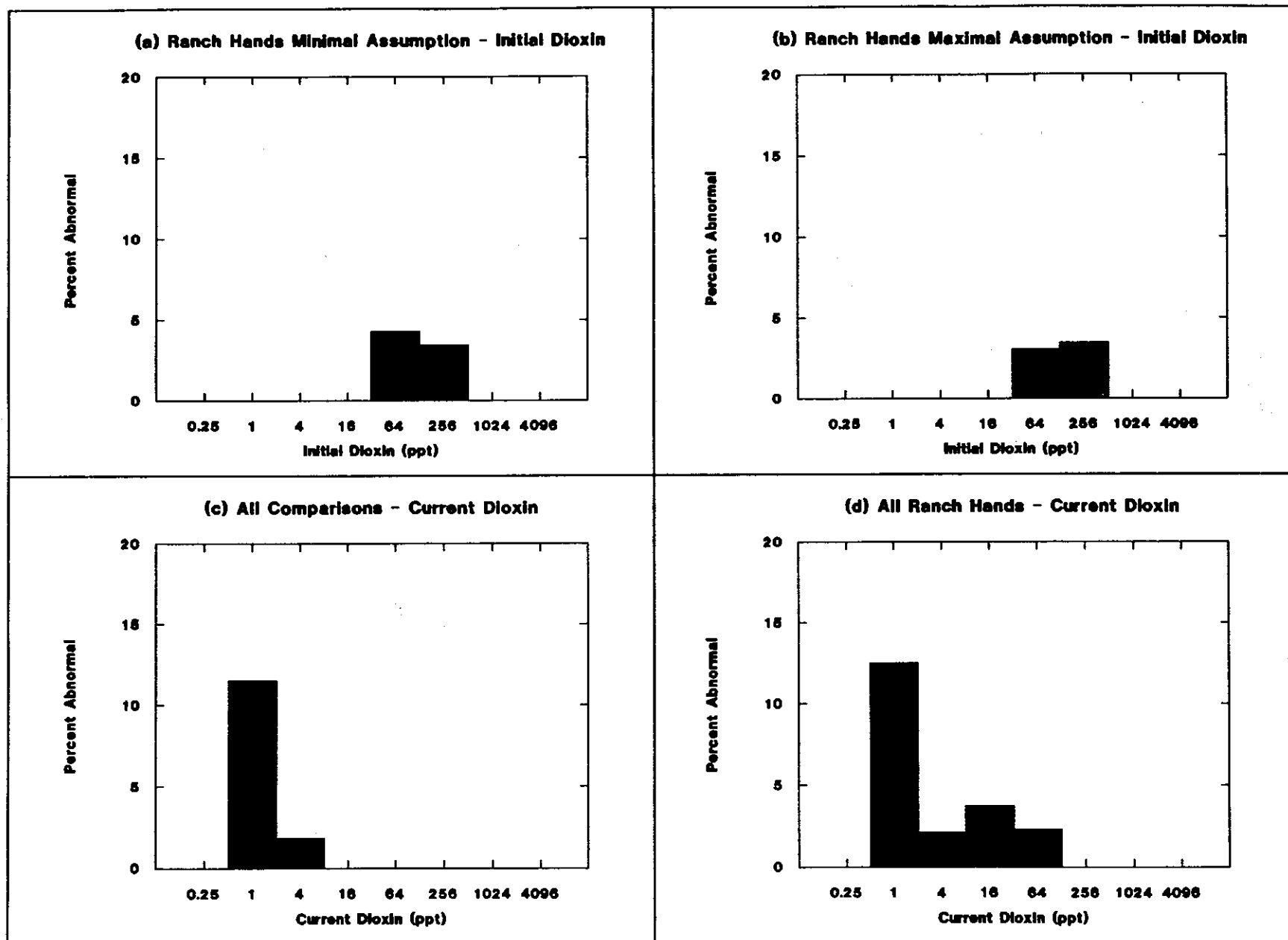


FIGURE K-1-20. Popliteal Pulses versus Dioxin

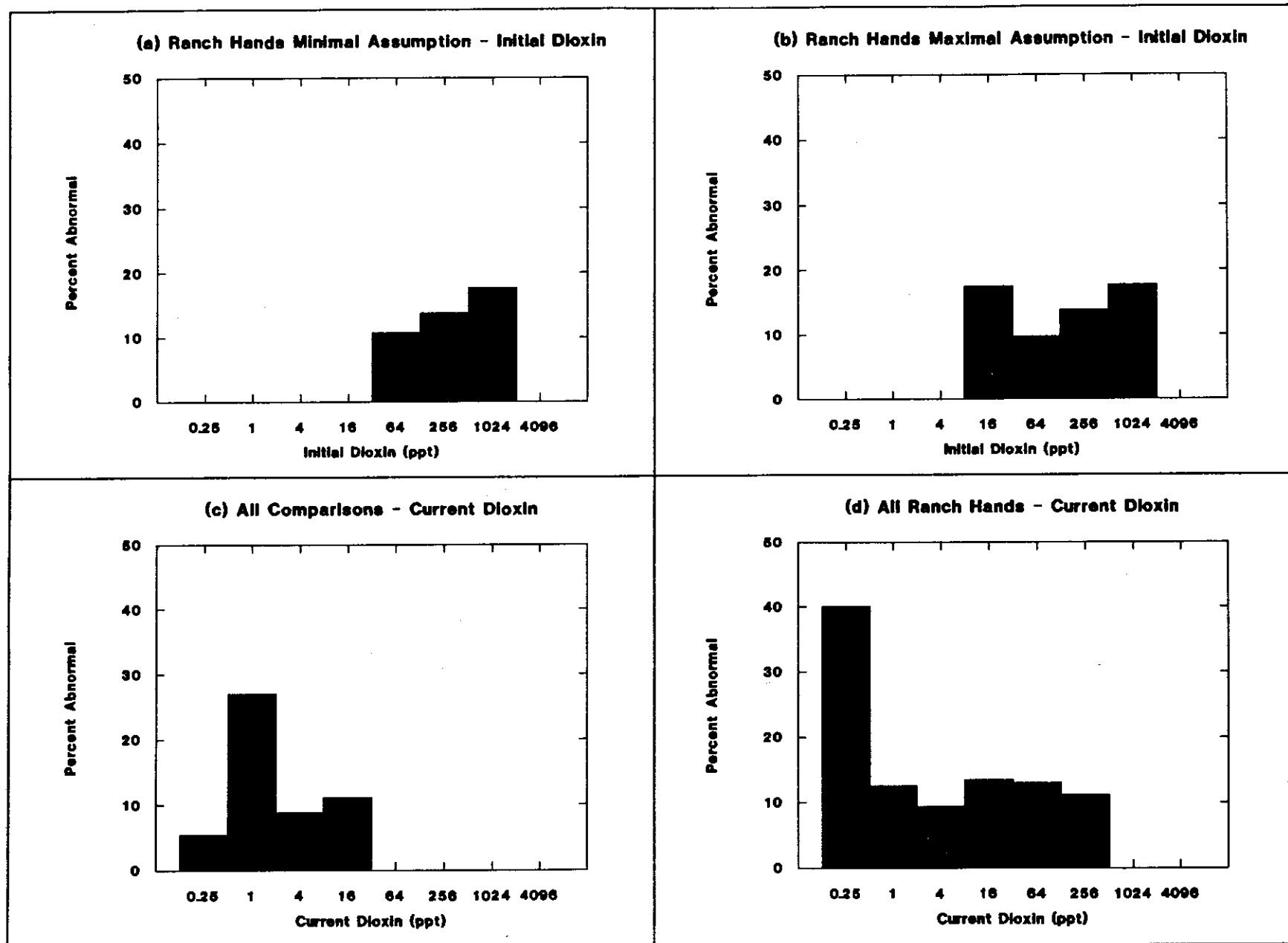


FIGURE K-1-21. Dorsalis Pedis Pulses versus Dioxin

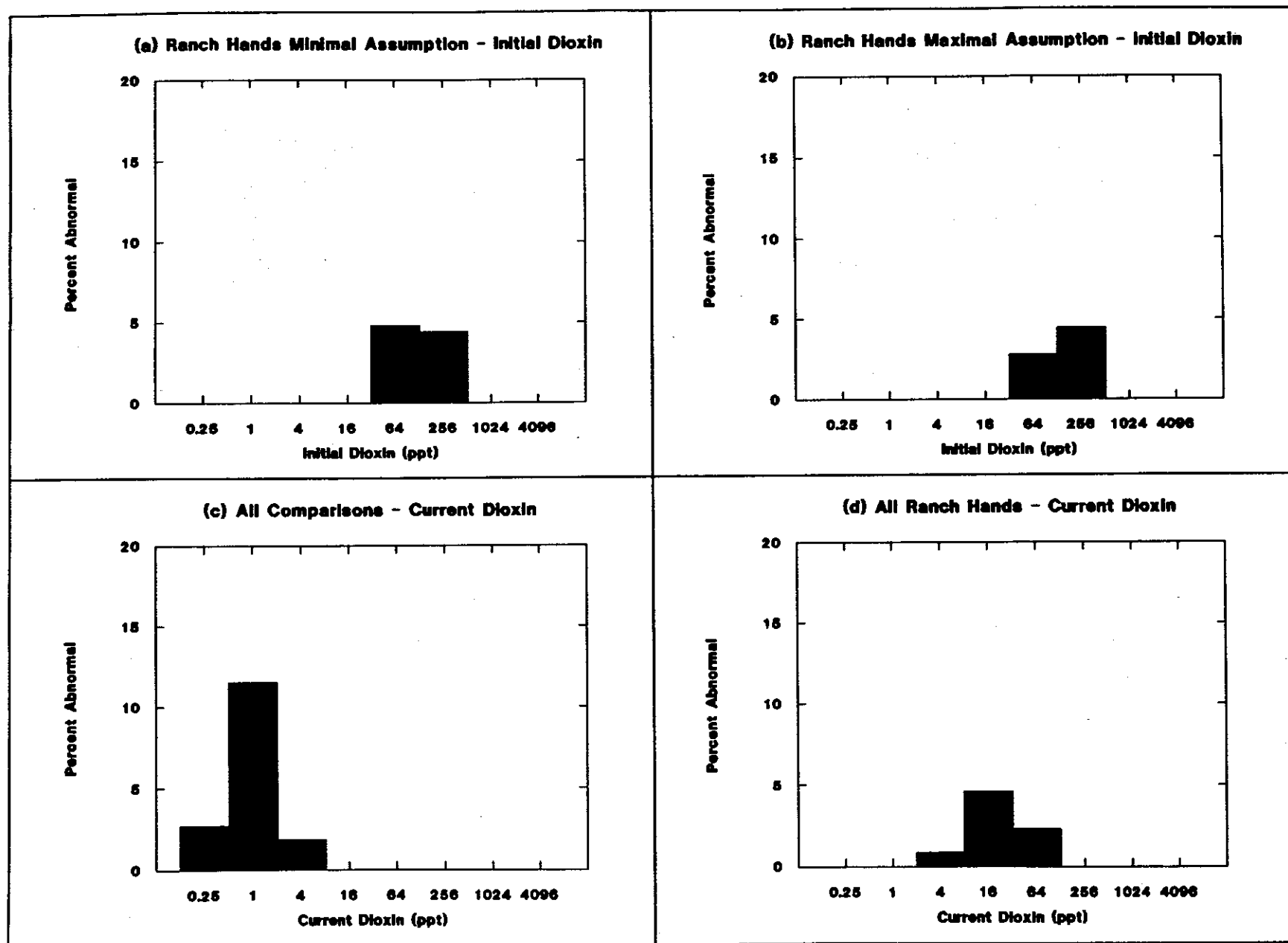


FIGURE K-1-22. Posterior Tibial Pulses versus Dioxin

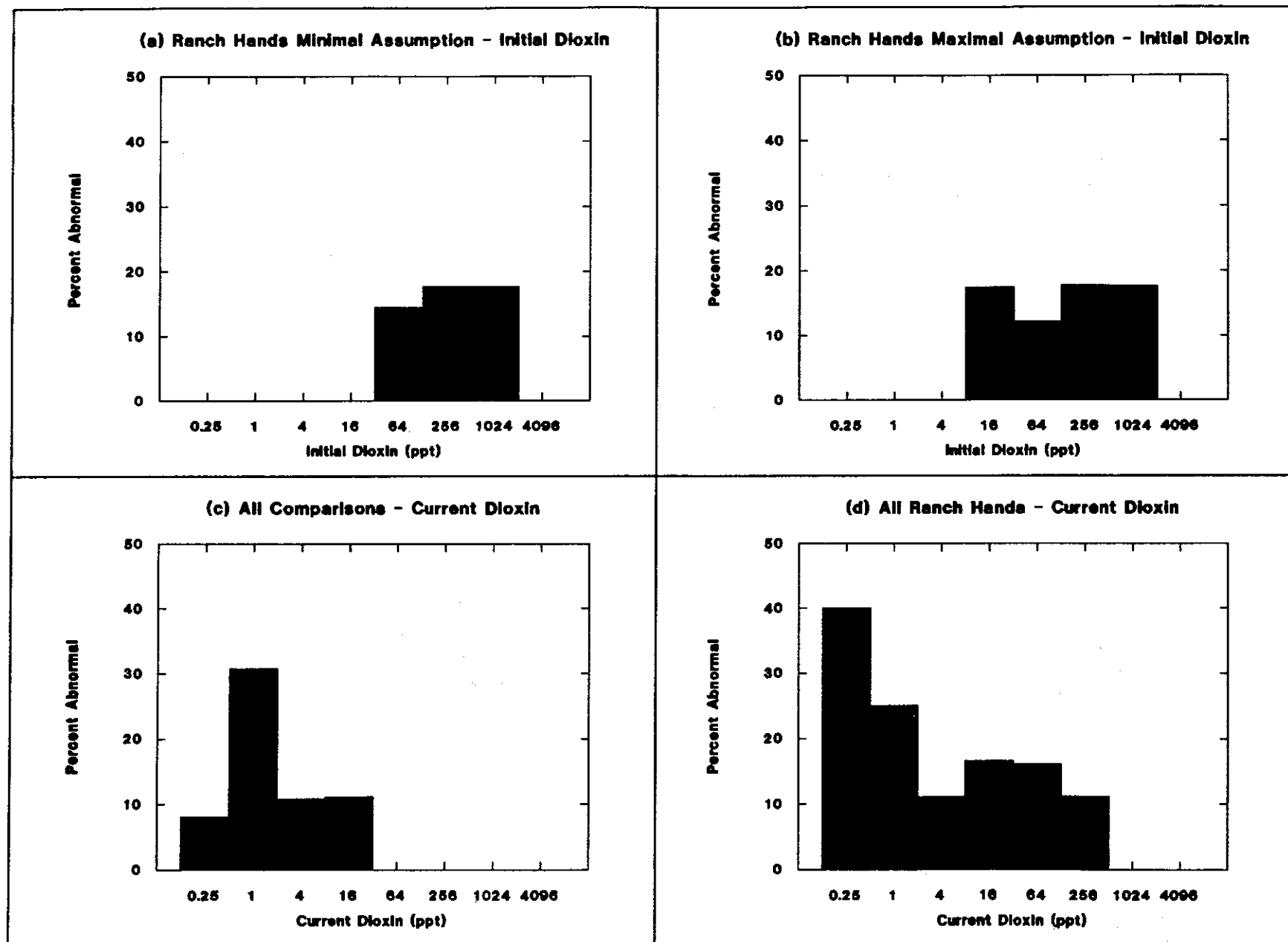


FIGURE K-1-23. Log Pulses versus Dioxin

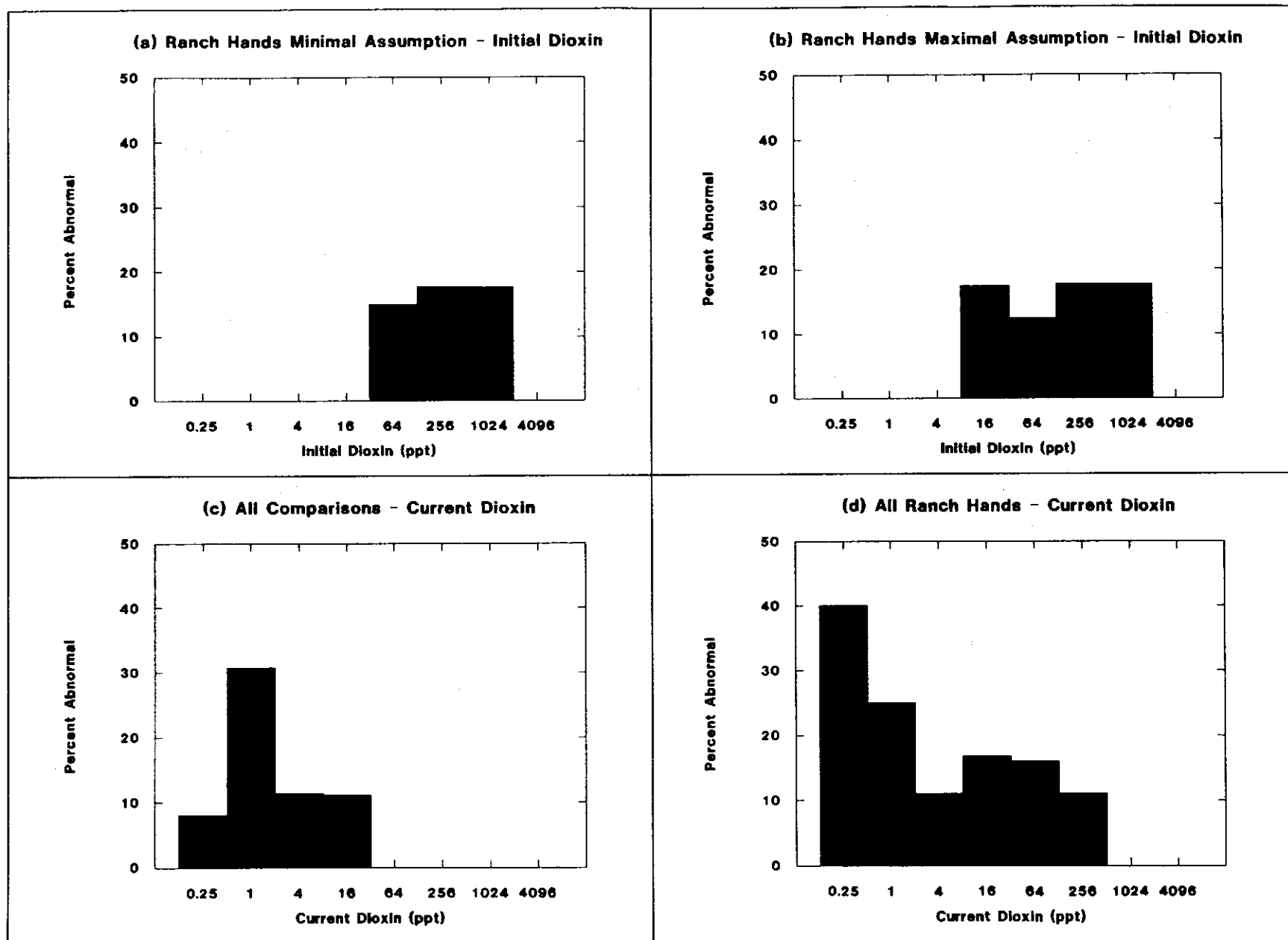


FIGURE K-1-24. Peripheral Pulses versus Dioxin

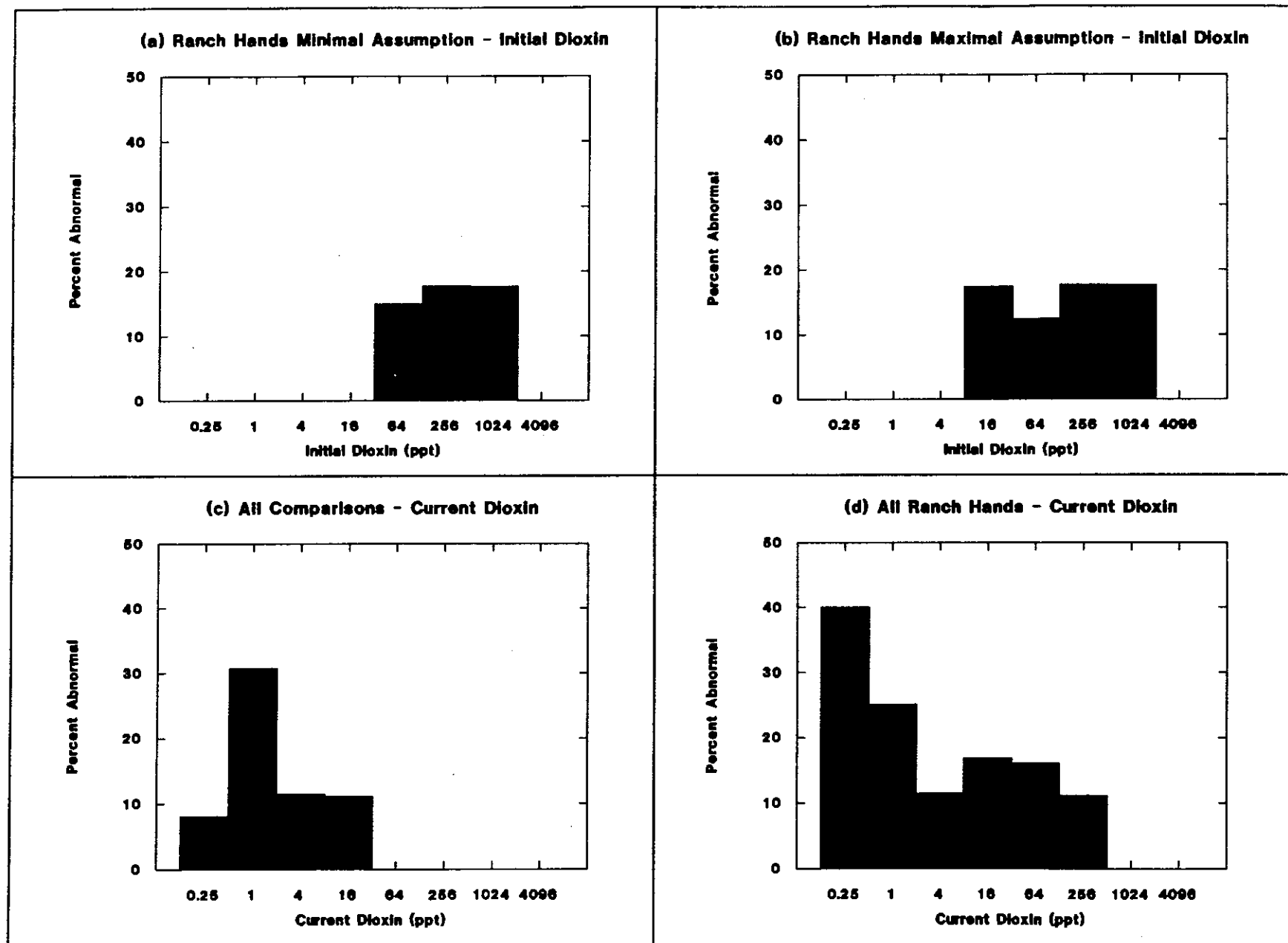


FIGURE K-1-25. All Pulses versus Dioxin

APPENDIX K-2.

Interaction Displays for the Cardiovascular Assessment

The following figures graphically display dioxin-by-covariate interactions found in the statistical analyses of the dependent variables in the cardiovascular assessment. For interactions with initial dioxin in the Ranch Hands involving continuous dependent variables, bivariate plots are presented with observations in each stratum represented by different symbols. Initial dioxin is shown in original units (ppt) but spacing of intervals is based on the logarithm (base 2) scale. The dependent variable is also displayed in original units but spacing is based on the scale used for analysis, as described in the chapter. The reference lines indicate the general relationship, unadjusted for any covariates, between the (transform of the) dependent variable and $\log_2$ (initial dioxin). For each stratum, the lines span the range of initial dioxin. For interactions with initial dioxin in the Ranch Hands involving discrete variables, the stratum-specific percentage of participants that exhibited an abnormal condition is displayed for low, medium, and high initial dioxin categories (as defined in Appendix K, Table K-1), and each stratum is represented by a different design. Appendix Table K-1 also displays the sample sizes for each bar on the graph.

In the Ranch Hands, for current dioxin-by-time-by-covariate interactions with continuous dependent variables, separate bivariate plots (dependent variable versus current dioxin) are presented for each stratum of the covariate. Different symbols represent late tours (time since tour ≤ 18.6 years) and early tours (time since tour > 18.6 years) within each plot. The spacing for current dioxin and the dependent variable follows the same conventions as described above, as do the reference lines. For current dioxin-by-time-by-covariate interactions in the Ranch Hands with discrete dependent variables, a stratum-specific percentage of participants that exhibited an abnormal condition is displayed for low, medium, and high current dioxin. Different designs represent separate time since tour categories, and covariate strata are given on separate panels. Appendix Table K-1 provides the sample sizes for each bar on the graph.

For covariate interactions with current dioxin categorized within the Ranch Hand and Comparison groups involving continuous dependent variables, adjusted means for the background category in the Comparisons, and the unknown, low, and high categories in the Ranch Hands, are shown. Appendix Table K-1 presents the definition of these categories and the sample sizes for each mean. Different symbols distinguish the covariate categories and solid line segments connect the means to display a profile of the adjusted means. For covariate interactions with current dioxin categorized within the Ranch Hand and Comparison groups involving discrete dependent variables, bars representing the percentage of participants that exhibited an abnormal condition are displayed for each of the four current dioxin exposure categories. Different designs represent covariate categories.

Figure		Page
K-2-1	Interaction of Initial Dioxin and Differential Cortisol Response for Reported/Verified Essential Hypertension (Ranch Hands, Maximal Assumption).....	K-2-4
K-2-2	Interaction of Categorized Current Dioxin and Age for Reported/Verified Essential Hypertension.....	K-2-5
K-2-3	Interaction of Initial Dioxin and Race for Reported Heart Disease (Excluding Essential Hypertension - Ranch Hands, Minimal Assumption).....	K-2-6
K-2-4	Interaction of Initial Dioxin and Race for Verified Heart Disease (Excluding Essential Hypertension - Ranch Hands, Minimal Assumption).....	K-2-7
K-2-5	Interaction of Categorized Current Dioxin and Differential Cortisol Response for Reported/Verified Myocardial Infarction	K-2-8
K-2-6	Interaction of Initial Dioxin, Age, and Lifetime Cigarette Smoking History for Systolic Blood Pressure (Continuous - Ranch Hands, Minimal Assumption).....	K-2-9
K-2-7	Interaction of Initial Dioxin and Lifetime Cigarette Smoking History for Systolic Blood Pressure (Continuous - Ranch Hands, Maximal Assumption)	K-2-10
K-2-8	Interaction of Current Dioxin, Time, and Family History of Heart Disease for Systolic Blood Pressure (Continuous - Ranch Hands, Minimal Assumption).....	K-2-11
K-2-9	Interaction of Current Dioxin, Time, and Age for Systolic Blood Pressure (Continuous - Ranch Hands, Maximal Assumption)....	K-2-12
K-2-10	Interaction of Categorized Current Dioxin and Age for Systolic Blood Pressure (Continuous)	K-2-13
K-2-11	Interaction of Initial Dioxin and Personality Type for Systolic Blood Pressure (Discrete - Ranch Hands, Minimal Assumption).....	K-2-14
K-2-12	Interaction of Current Dioxin, Time, and Personality Type for Systolic Blood Pressure (Discrete - Ranch Hands, Minimal Assumption).....	K-2-15
K-2-13	Interaction of Current Dioxin, Time, and Personality Type for Systolic Blood Pressure (Discrete - Ranch Hands, Maximal Assumption).....	K-2-16
K-2-14	Interaction of Categorized Current Dioxin, Age, and Differential Cortisol Response for Systolic Blood Pressure (Discrete).....	K-2-17
K-2-15	Interaction of Initial Dioxin, Time, Family History of Heart Disease, and Lifetime Cigarette Smoking History for Heart Sounds (Ranch Hands, Minimal Assumption).....	K-2-18
K-2-16	Interaction of Current Dioxin, Time, Family History of Heart Disease, and Lifetime Cigarette Smoking History for Heart Sounds (Ranch Hands, Maximal Assumption)	K-2-19
K-2-17	Interaction of Current Dioxin, Time, and Age for ECG: Nonspecific ST- and T-Wave Changes (Ranch Hands, Maximal Assumption).....	K-2-20
K-2-18	Interaction of Categorized Current Dioxin and Race for ECG: Bradycardia.....	K-2-21
K-2-19	Interaction of Initial Dioxin and Personality Type for ECG: Arrhythmia (Ranch Hands, Minimal Assumption)	K-2-22

Figure		Page
K-2-20	Interaction of Current Dioxin, Time, and Differential Cortisol Response for ECG: Arrhythmia (Ranch Hands, Maximal Assumption).....	K-2-23
K-2-21	Interaction of Initial Dioxin and Personality Type for Diastolic Blood Pressure (Continuous - Ranch Hands, Maximal Assumption).....	K-2-24
K-2-22	Interaction of Categorized Current Dioxin, Personality Type, and Family History of Heart Disease for Diastolic Blood Pressure (Continuous)	K-2-25
K-2-23	Interaction of Categorized Current Dioxin and Differential Cortisol Response for Fundoscopic Examination	K-2-26
K-2-24	Interaction of Initial Dioxin and Personality Type for Femoral Pulses (Ranch Hands, Minimal Assumption)	K-2-27
K-2-25	Interaction of Initial Dioxin and Personality Type for Femoral Pulses (Ranch Hands, Maximal Assumption).....	K-2-28
K-2-26	Interaction of Current Dioxin, Time, Percent Body Fat, and Differential Cortisol Response for Femoral Pulses (Ranch Hands, Maximal Assumption)	K-2-29
K-2-27	Interaction of Categorized Current Dioxin and Differential Cortisol Response for Femoral Pulses	K-2-30
K-2-28	Interaction of Current Dioxin, Time, and Family History of Heart Disease for Popliteal Pulses (Ranch Hands, Minimal Assumption).....	K-2-31
K-2-29	Interaction of Current Dioxin, Time, and Lifetime Cigarette Smoking History for Popliteal Pulses (Ranch Hands, Maximal Assumption).....	K-2-32
K-2-30	Interaction of Initial Dioxin and Differential Cortisol Response for Dorsalis Pedis Pulses (Ranch Hands, Minimal Assumption).....	K-2-33
K-2-31	Interaction of Initial Dioxin and Age for Leg Pulses (Ranch Hands, Minimal Assumption)	K-2-34
K-2-32	Interaction of Current Dioxin, Time, and Lifetime Cigarette Smoking History for Leg Pulses (Ranch Hands, Minimal Assumption).....	K-2-35
K-2-33	Interaction of Initial Dioxin and Age for Peripheral and All Pulses (Ranch Hands, Minimal Assumption).....	K-2-36
K-2-34	Interaction of Current Dioxin, Time, and Lifetime Cigarette Smoking History for Peripheral and All Pulses (Ranch Hands, Minimal Assumption)	K-2-37

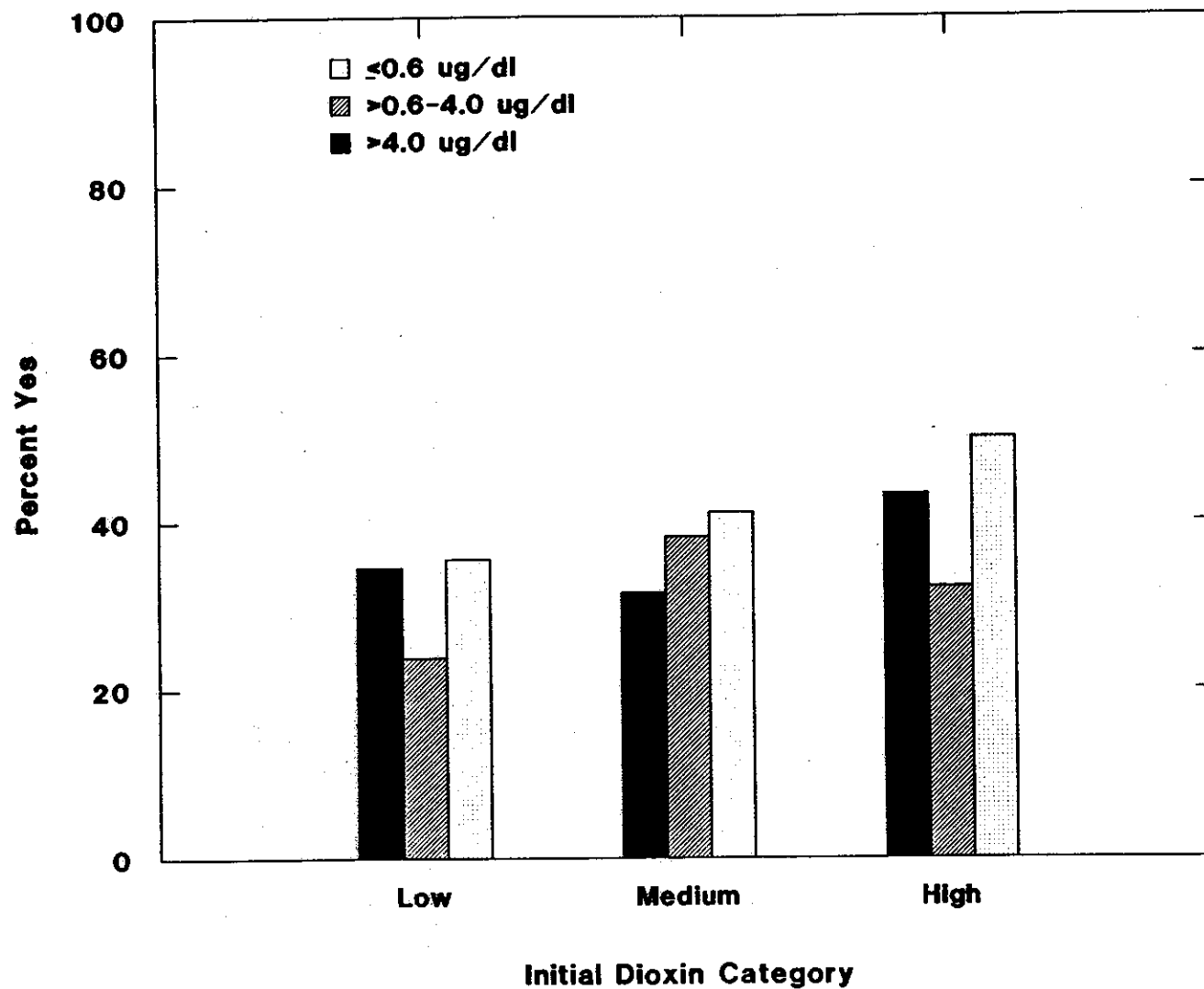


FIGURE K-2-1. Interaction of Initial Dioxin and Differential Cortisol Response for Reported/Verified Essential Hypertension (Ranch Hands, Maximal Assumption)

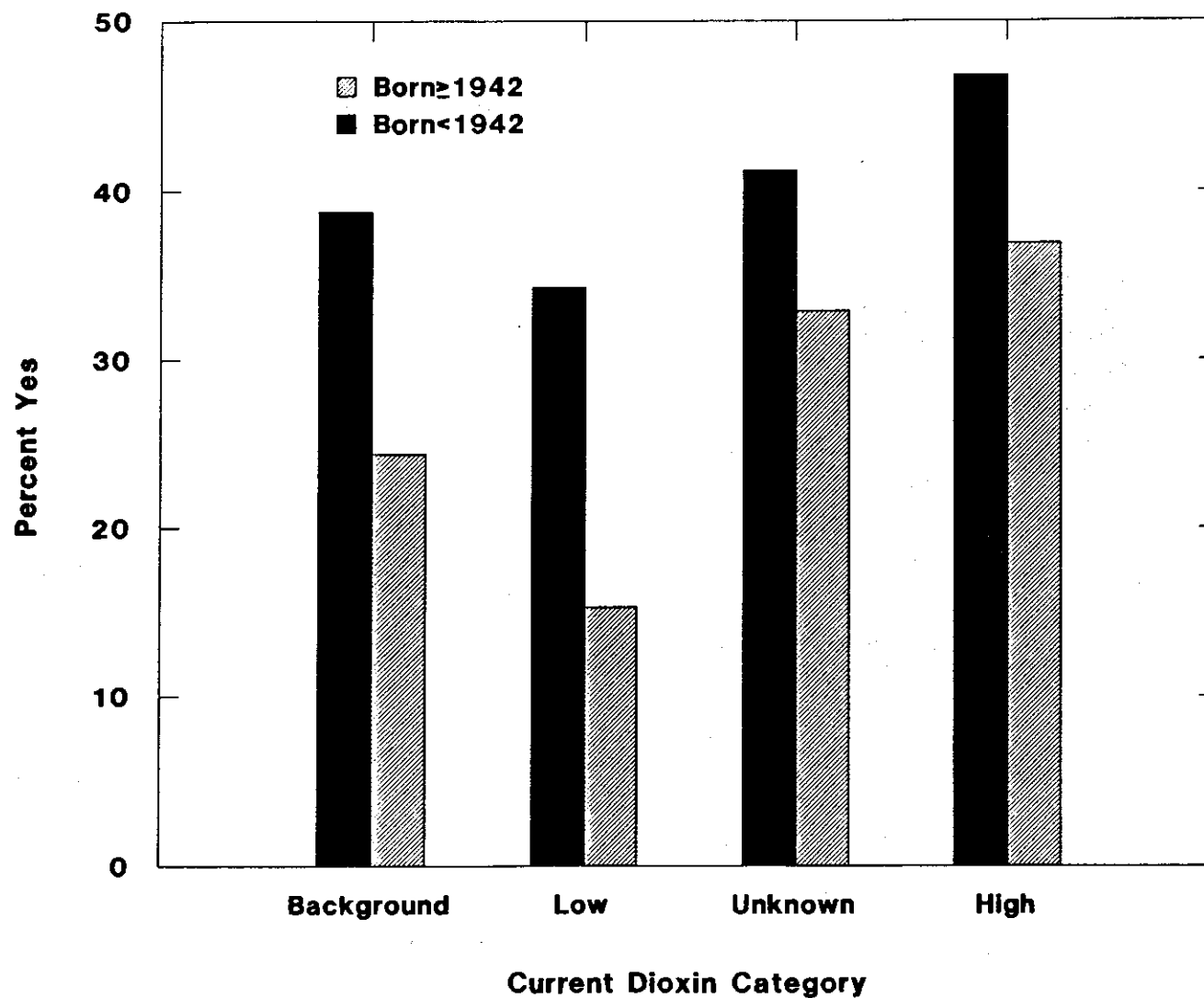


FIGURE K-2-2. Interaction of Categorized Current Dioxin and Age for Reported/Verified Essential Hypertension

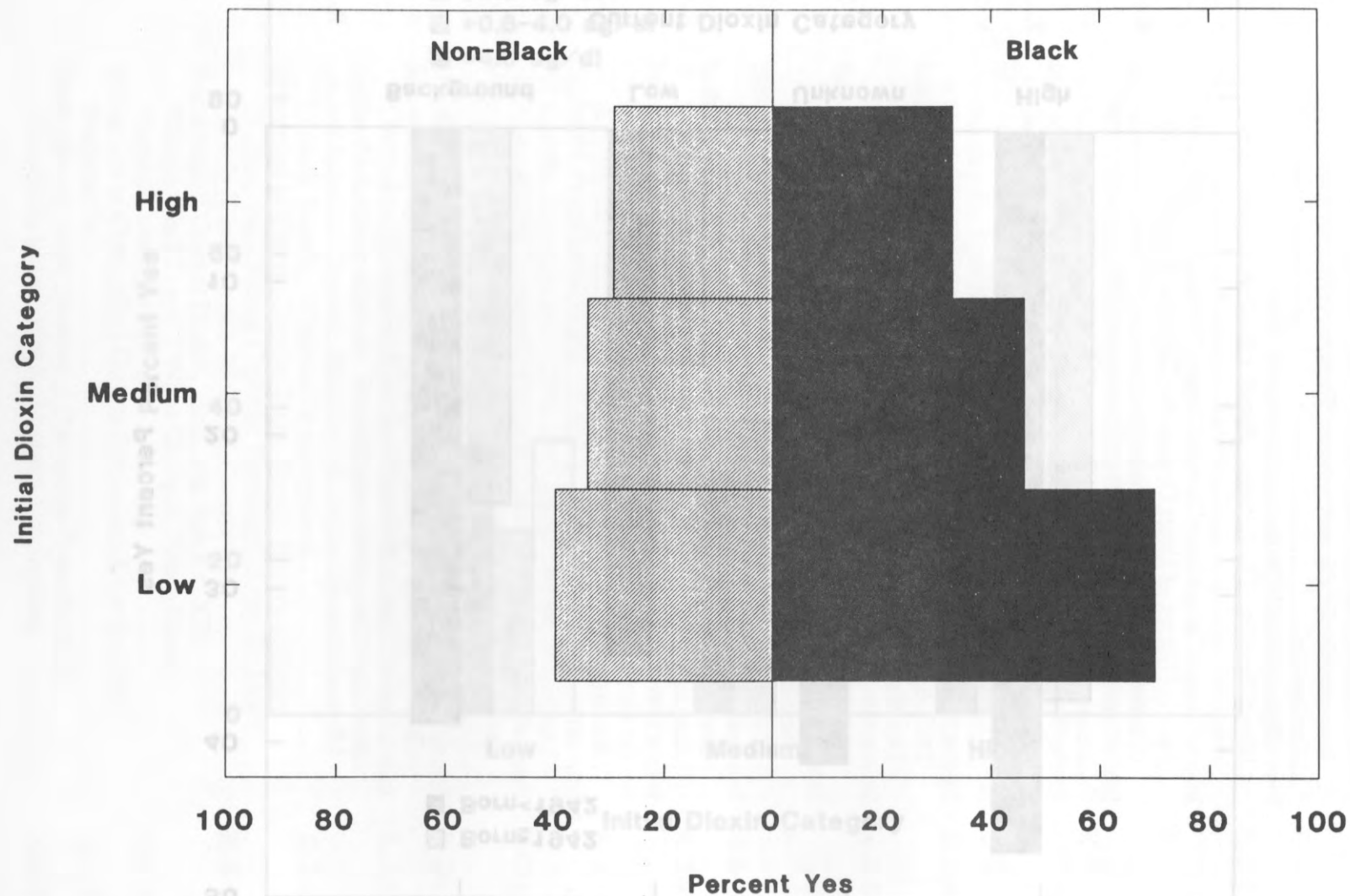


FIGURE K-2-3. Interaction of Initial Dioxin and Race for Reported Heart Disease (Excluding Essential Hypertension) (Ranch Hands, Minimal Assumption)

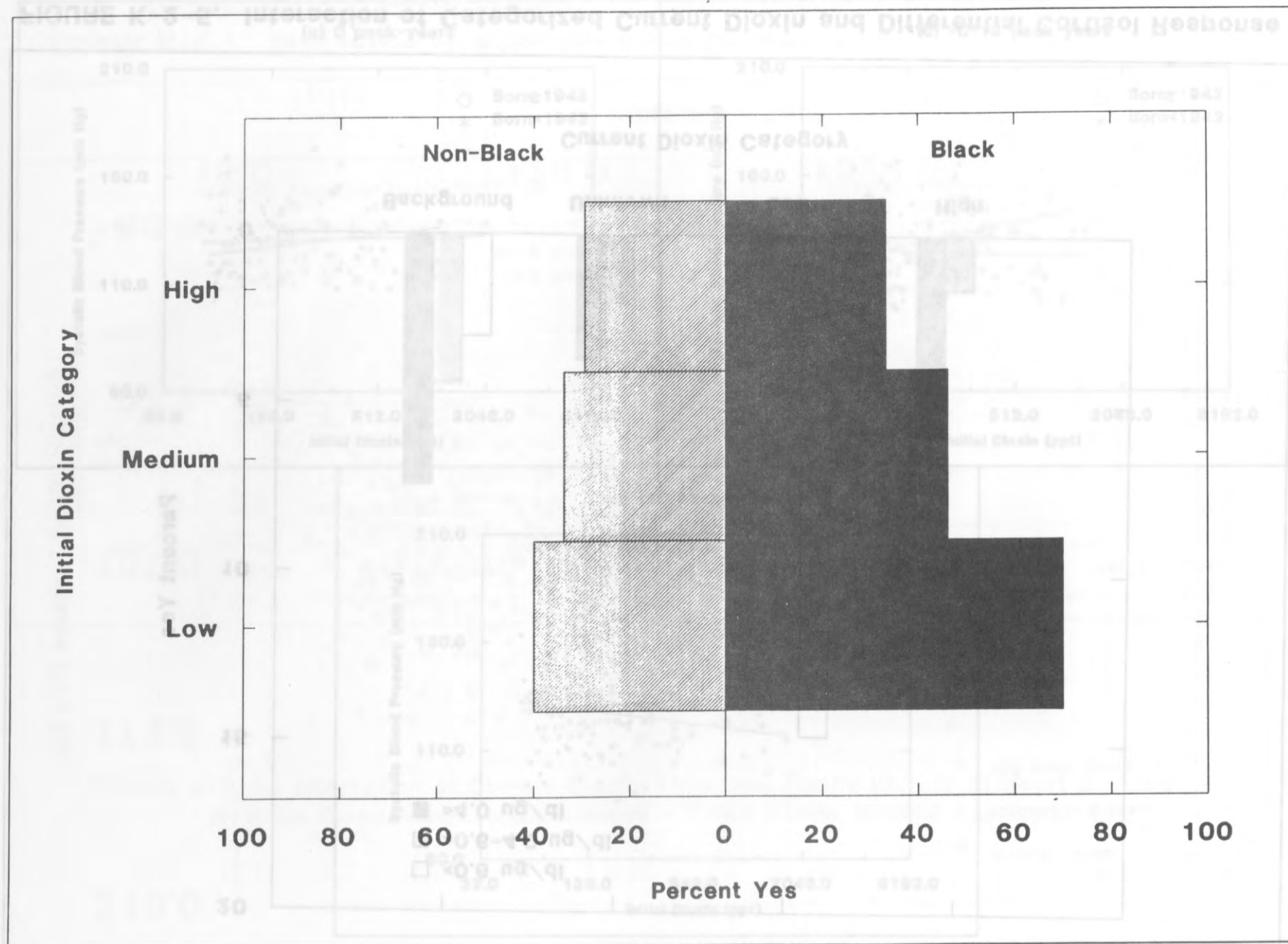


FIGURE K-2-4. Interaction of Initial Dioxin and Race for Verified Heart Disease (Excluding Essential Hypertension) (Ranch Hands, Minimal Assumption)

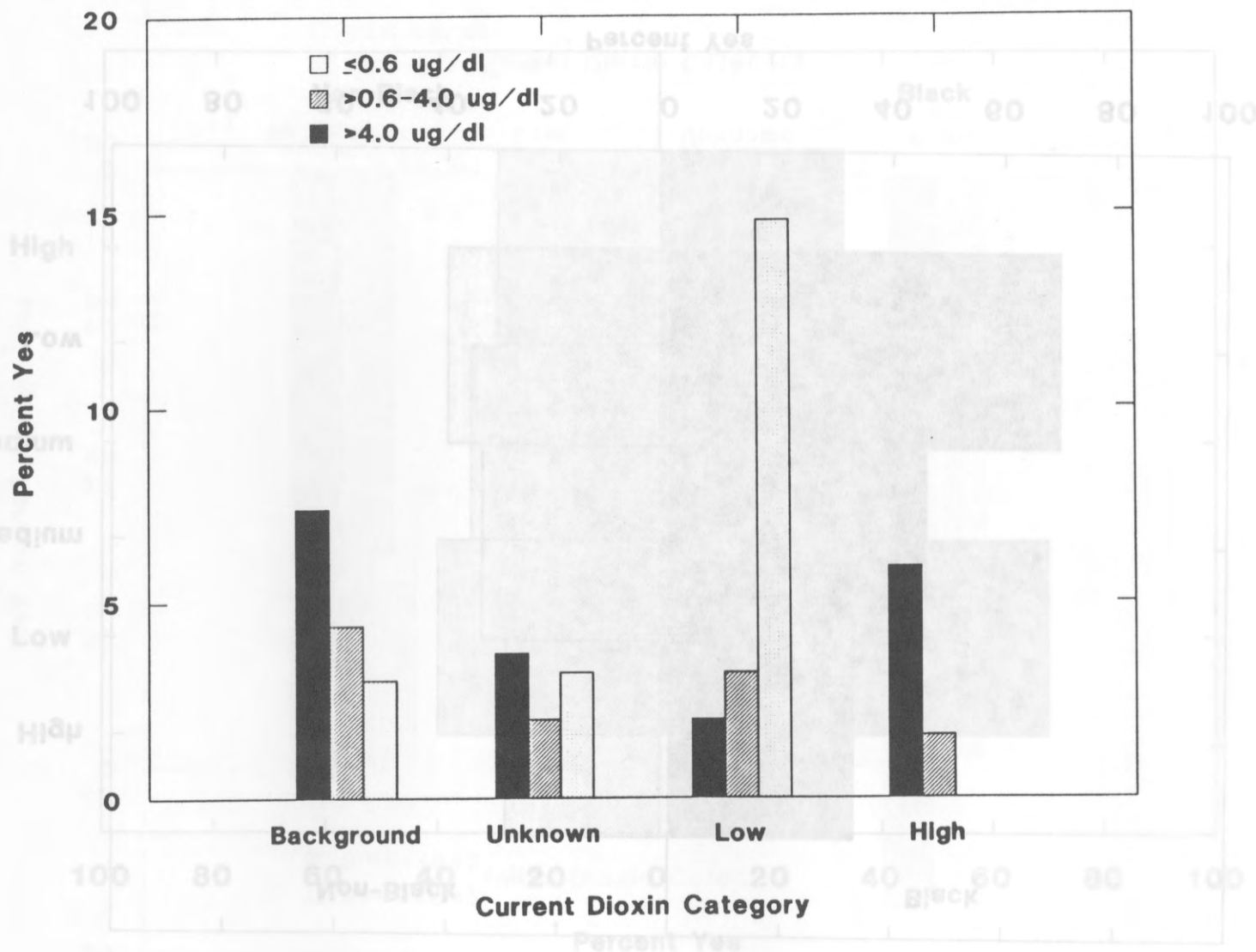


FIGURE K-2-5. Interaction of Categorized Current Dioxin and Differential Cortisol Response
 (Excluding Response for Reported/Verified Myocardial Infarction Assumption)

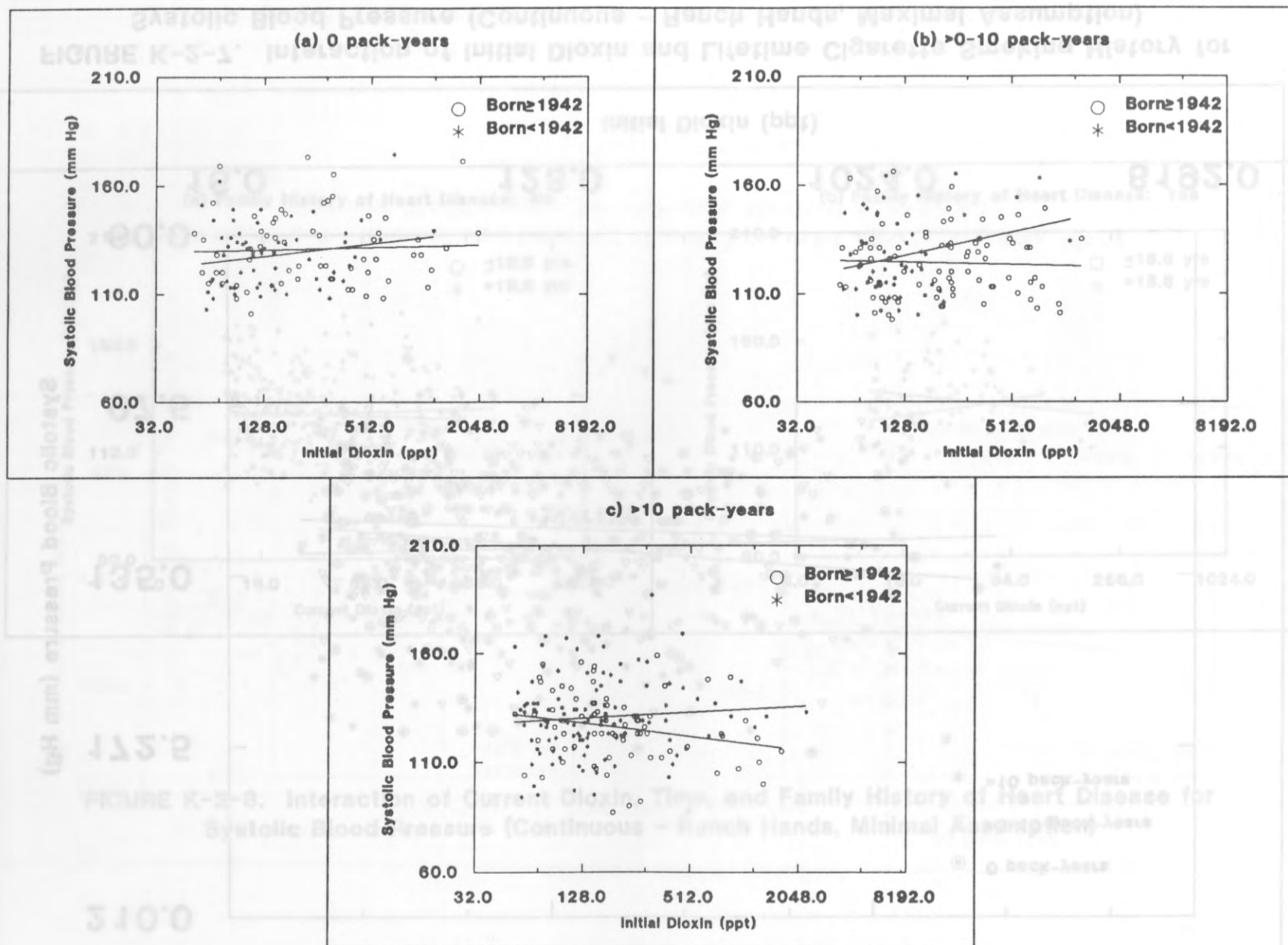


FIGURE K-2-6. Interaction of Initial Dioxin, Age, and Lifetime Cigarette Smoking History for Systolic Blood Pressure (Continuous - Ranch Hands, Minimal Assumption)

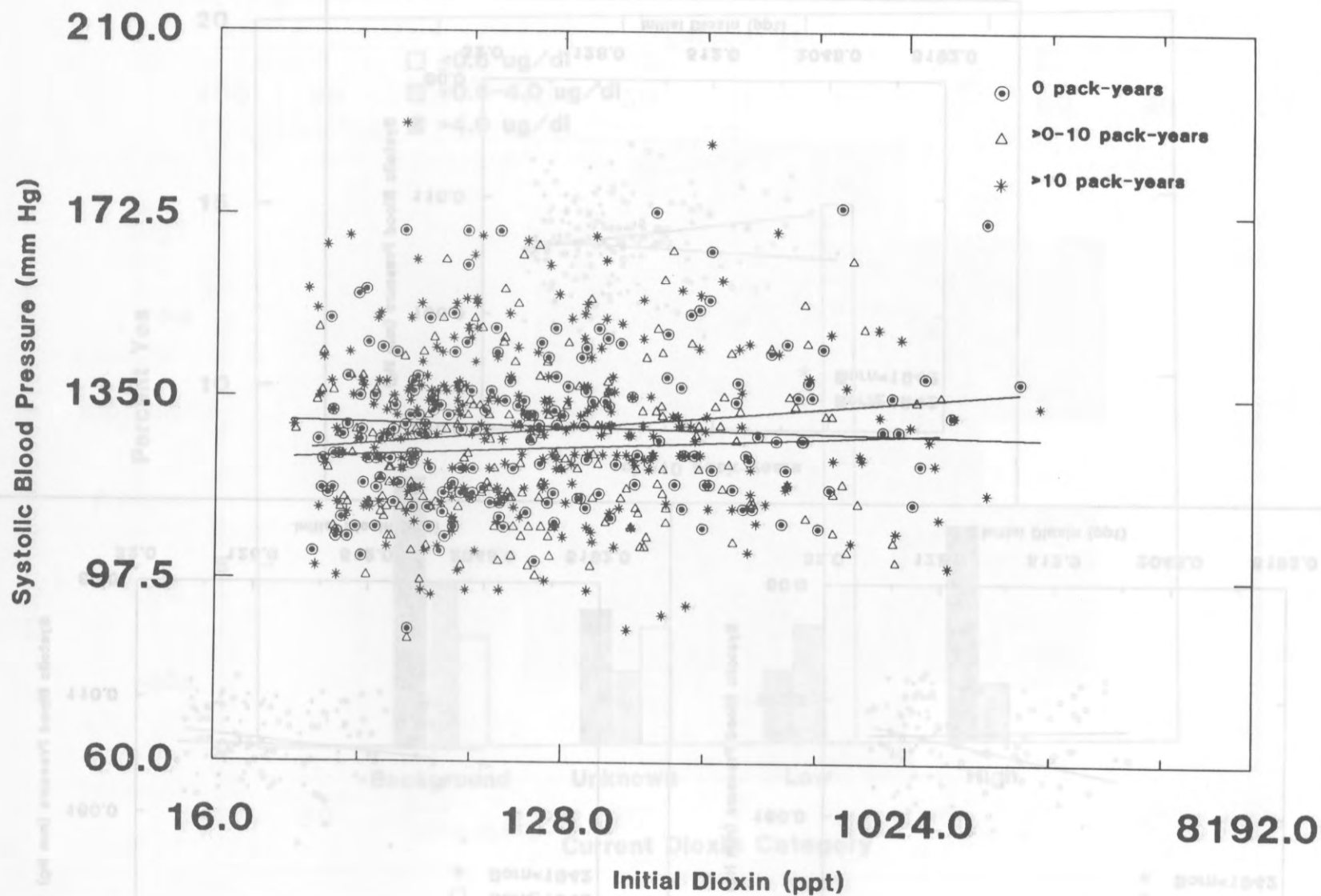


FIGURE K-2-7. Interaction of Initial Dioxin and Lifetime Cigarette Smoking History for Systolic Blood Pressure (Continuous - Ranch Hands, Maximal Assumption)

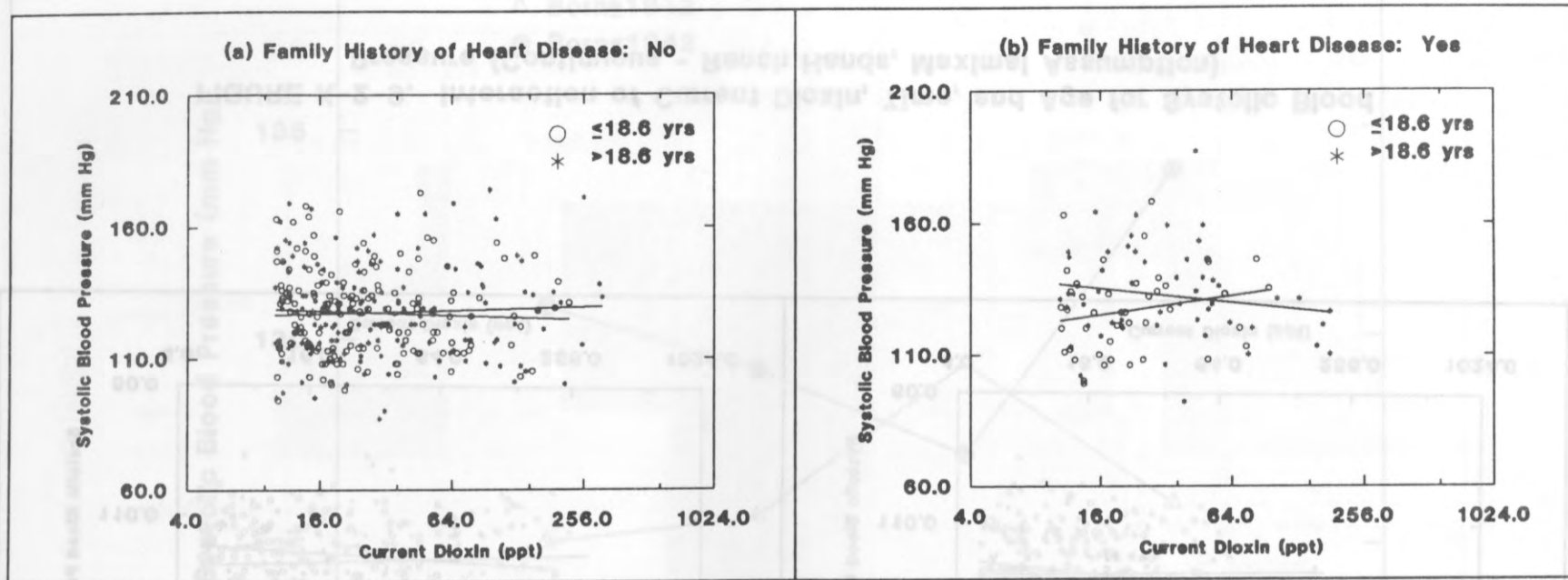


FIGURE K-2-8. Interaction of Current Dioxin, Time, and Family History of Heart Disease for Systolic Blood Pressure (Continuous - Ranch Hands, Minimal Assumption)

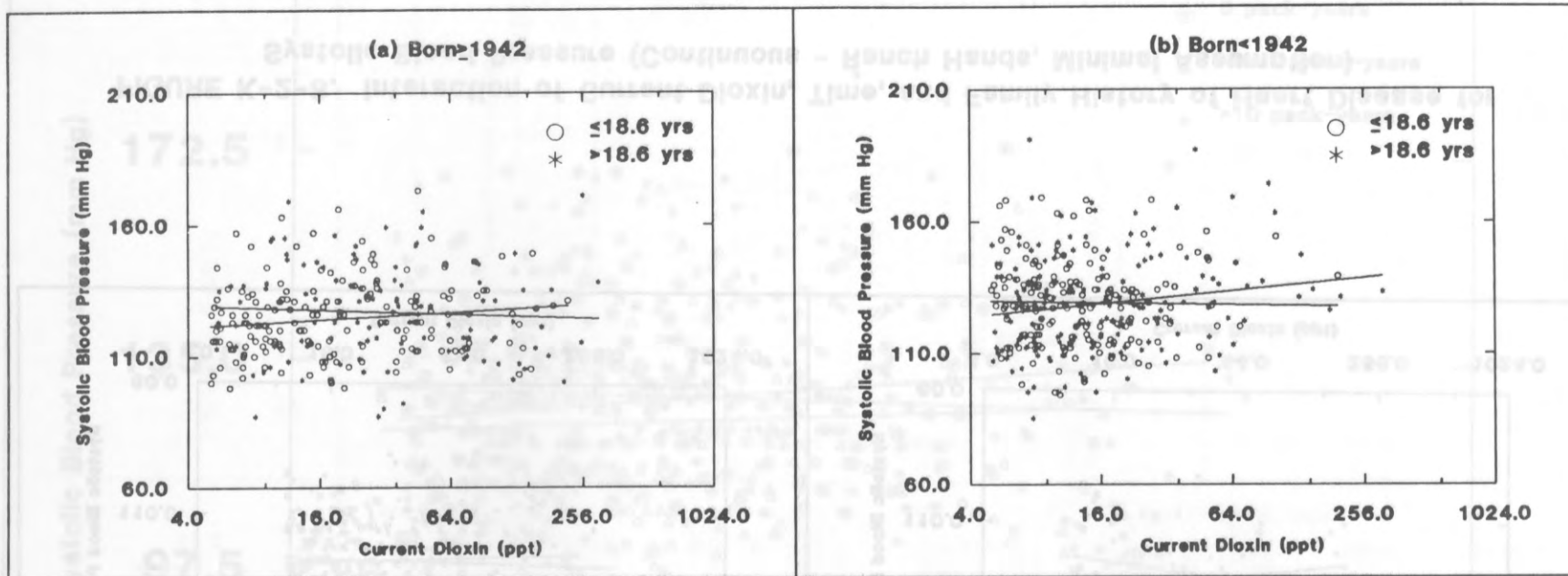


FIGURE K-2-9. Interaction of Current Dioxin, Time, and Age for Systolic Blood Pressure (Continuous - Ranch Hands, Maximal Assumption)

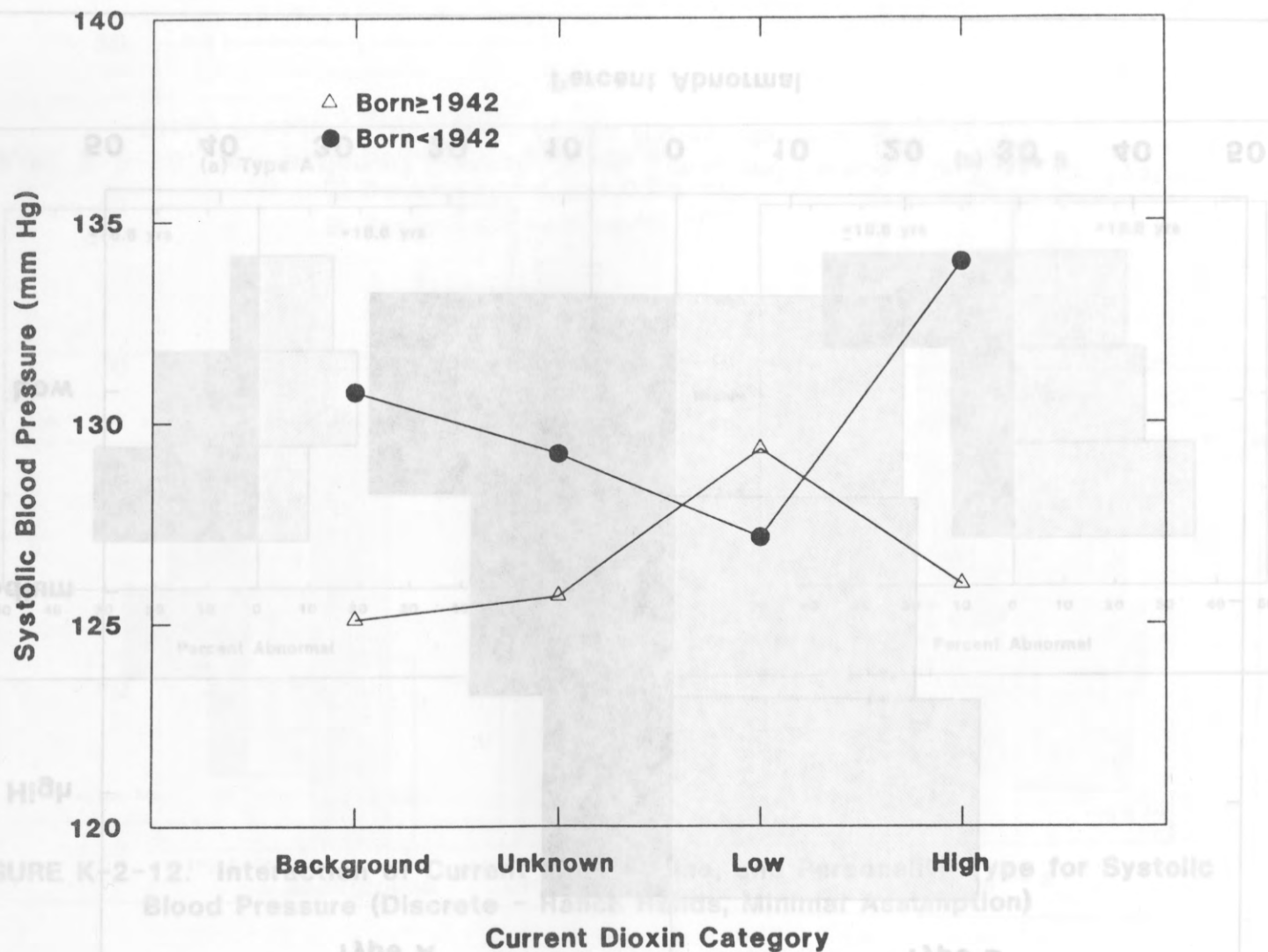


FIGURE K-2-10. Interaction of Categorized Current Dioxin and Age for Systolic Blood Pressure (Continuous)

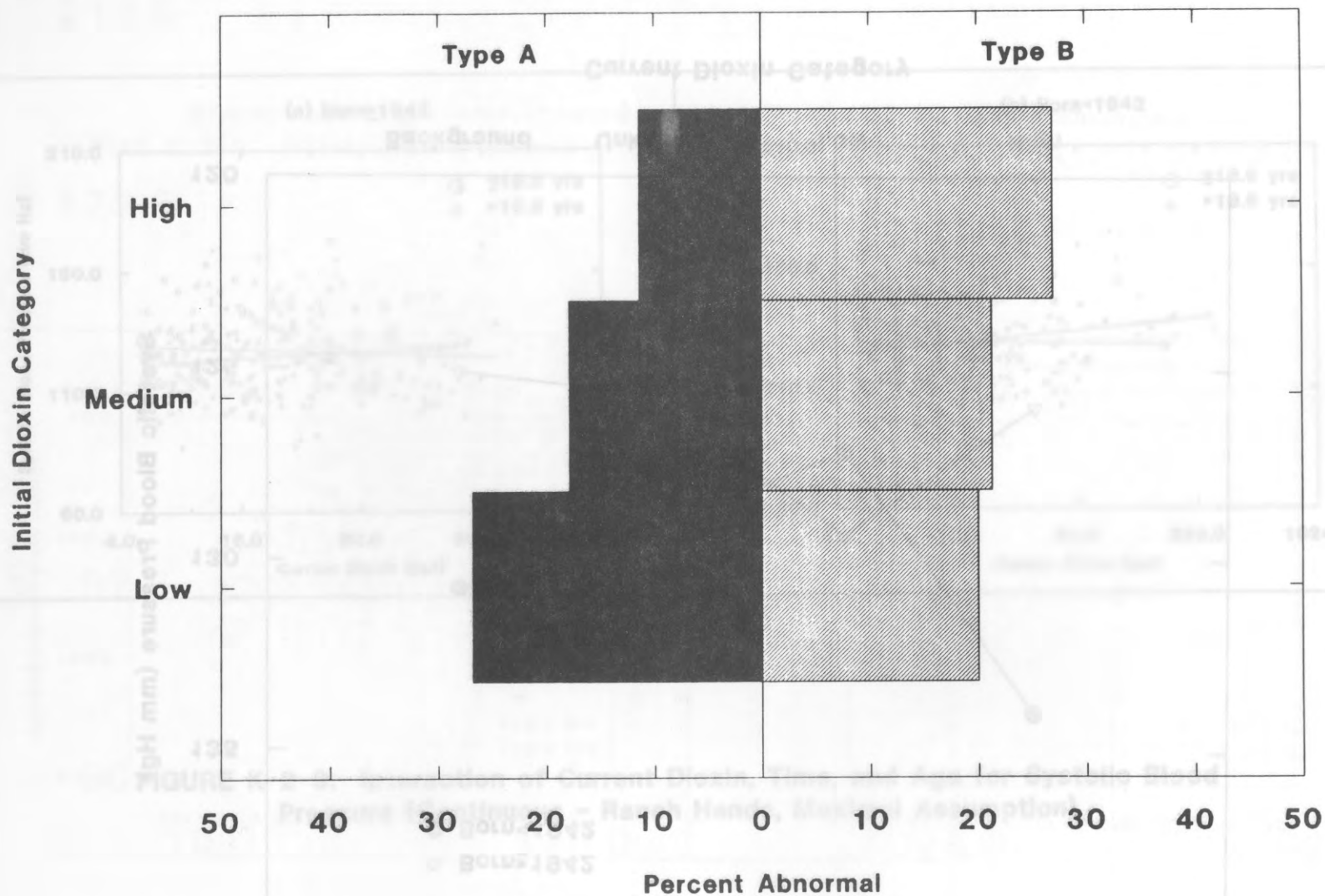


FIGURE K-2-11. Interaction of Initial Dioxin and Personality Type for Systolic Blood Pressure (Discrete - Ranch Hands, Minimal Assumption)

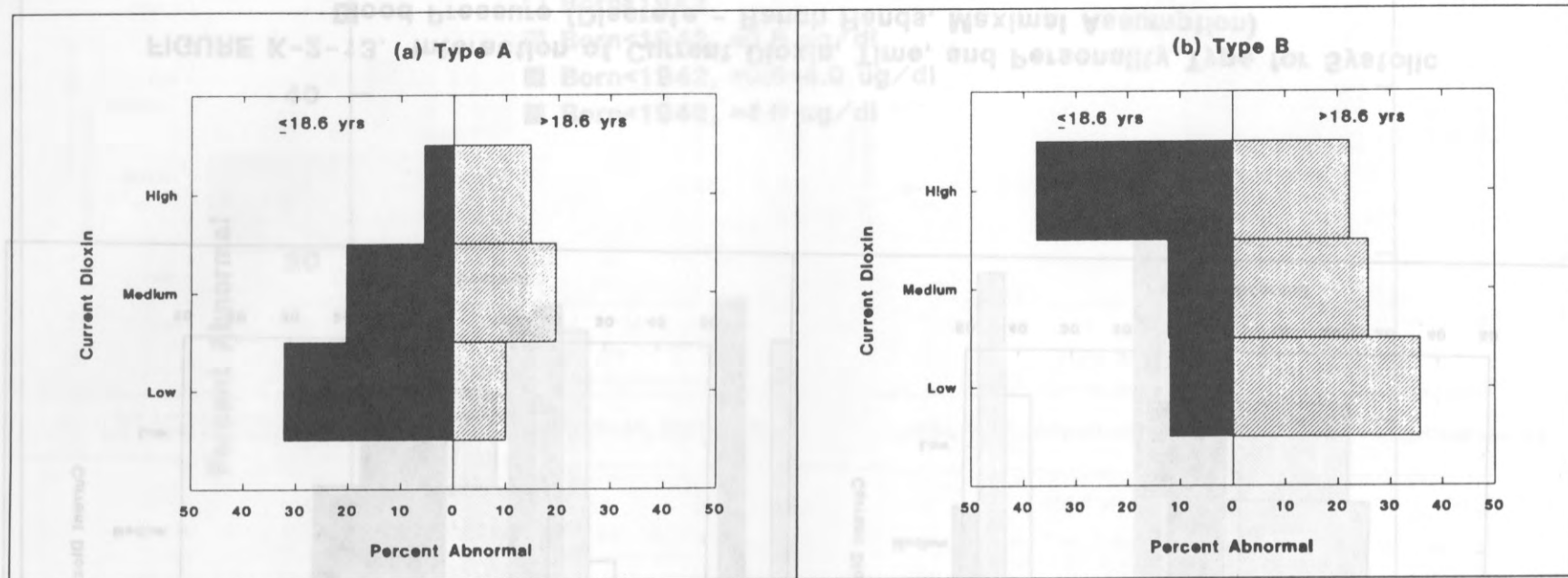


FIGURE K-2-12. Interaction of Current Dioxin, Time, and Personality Type for Systolic Blood Pressure (Discrete - Ranch Hands, Minimal Assumption)

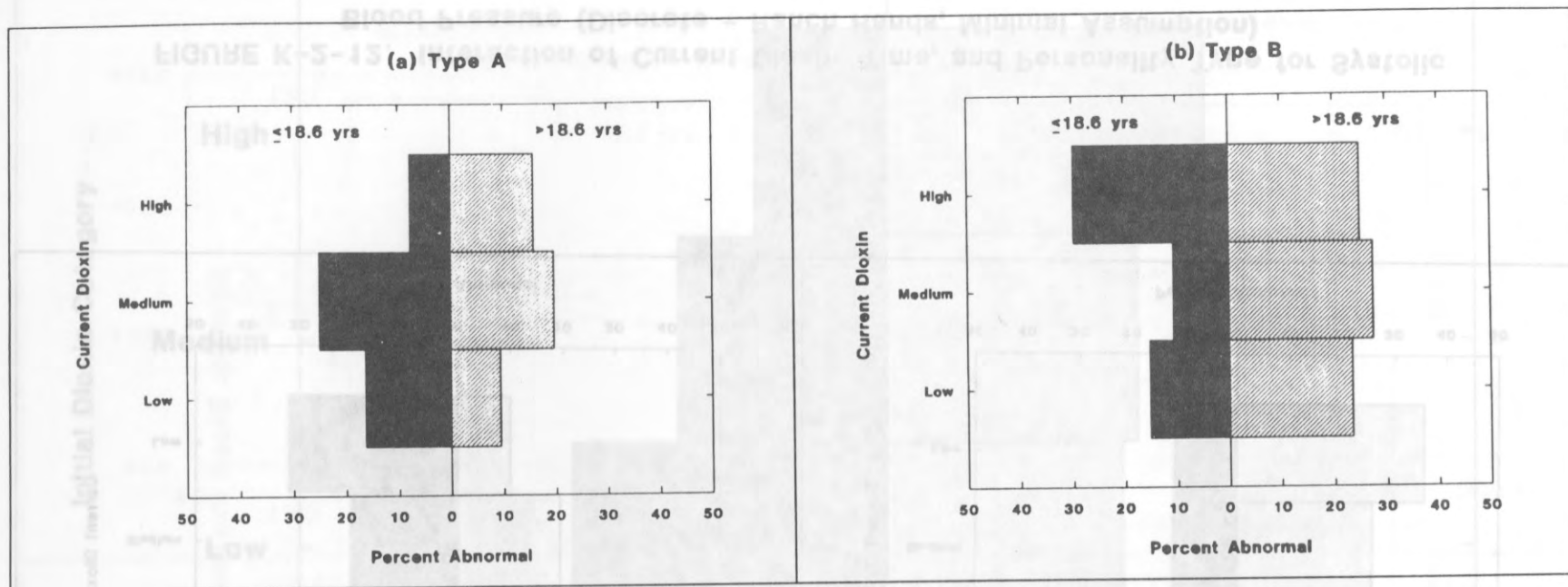


FIGURE K-2-13. Interaction of Current Dioxin, Time, and Personality Type for Systolic Blood Pressure (Discrete - Ranch Hands, Maximal Assumption)

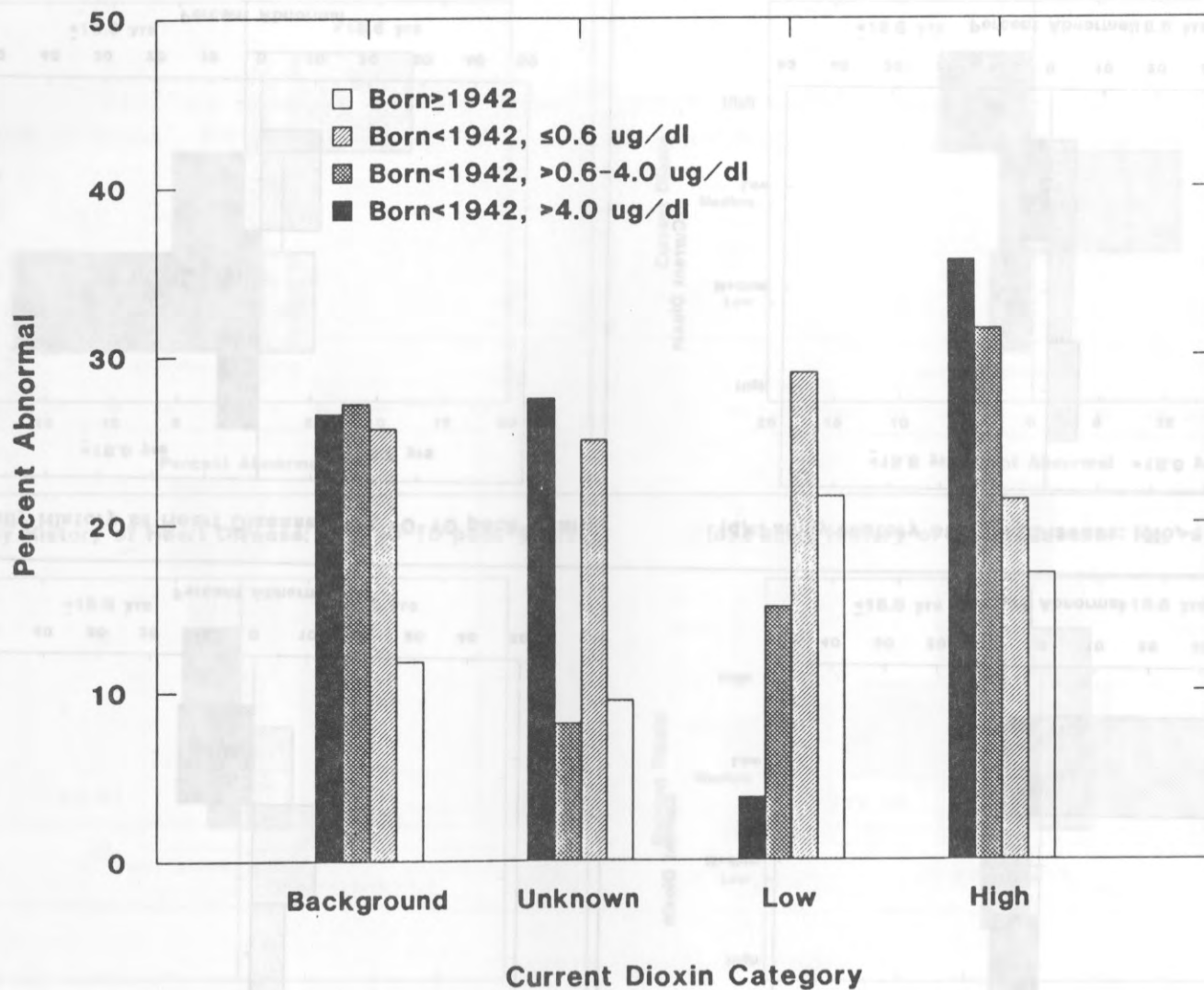


FIGURE K-2-14. Interaction of Categorized Current Dioxin, Age, and Differential Cortisol Response for Systolic Blood Pressure (Discrete)

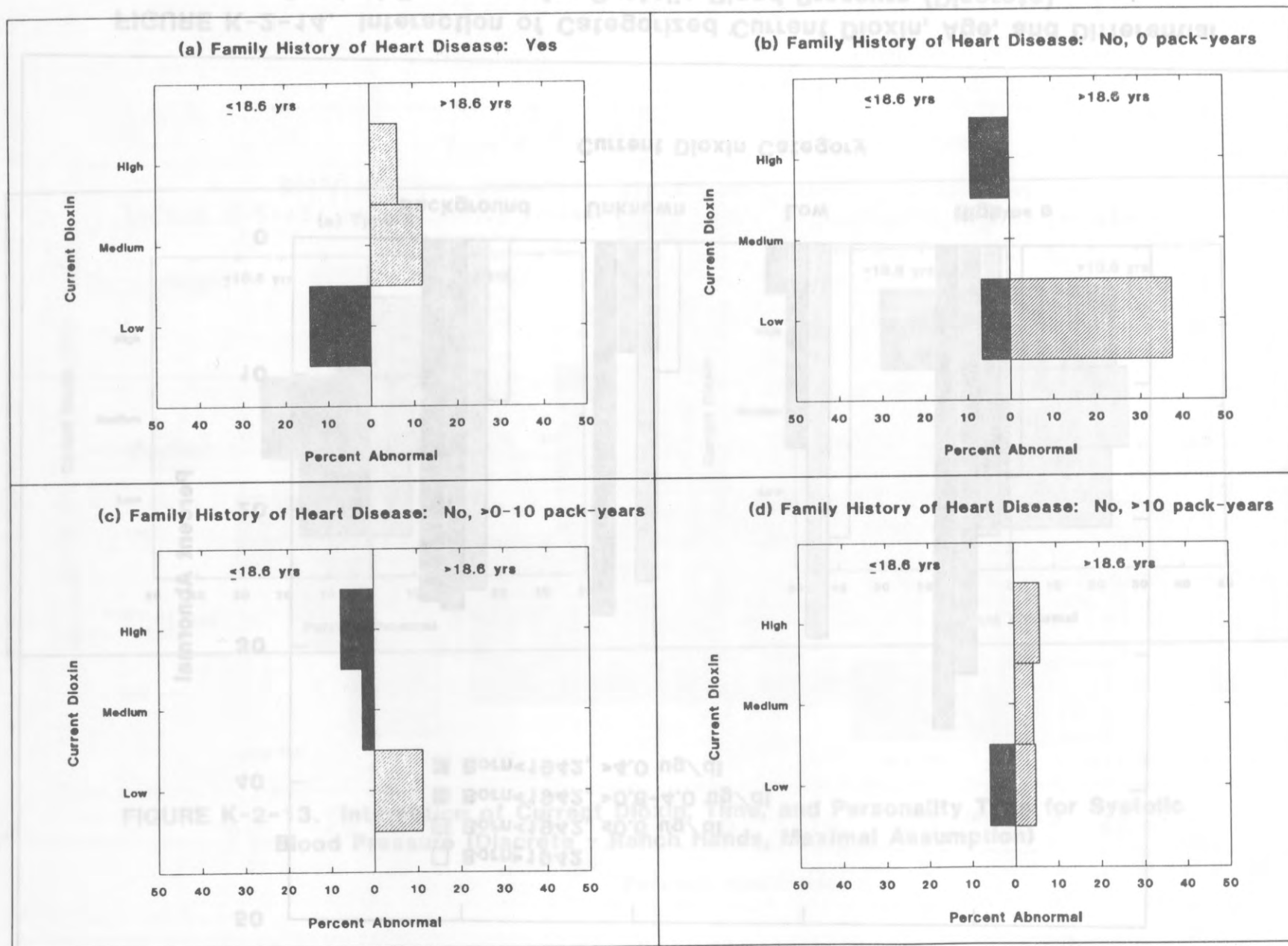


FIGURE K-2-15. Interaction of Current Dioxin, Time, Family History of Heart Disease, and Lifetime Cigarette Smoking History for Heart Sounds (Ranch Hands, Minimal Assumption)

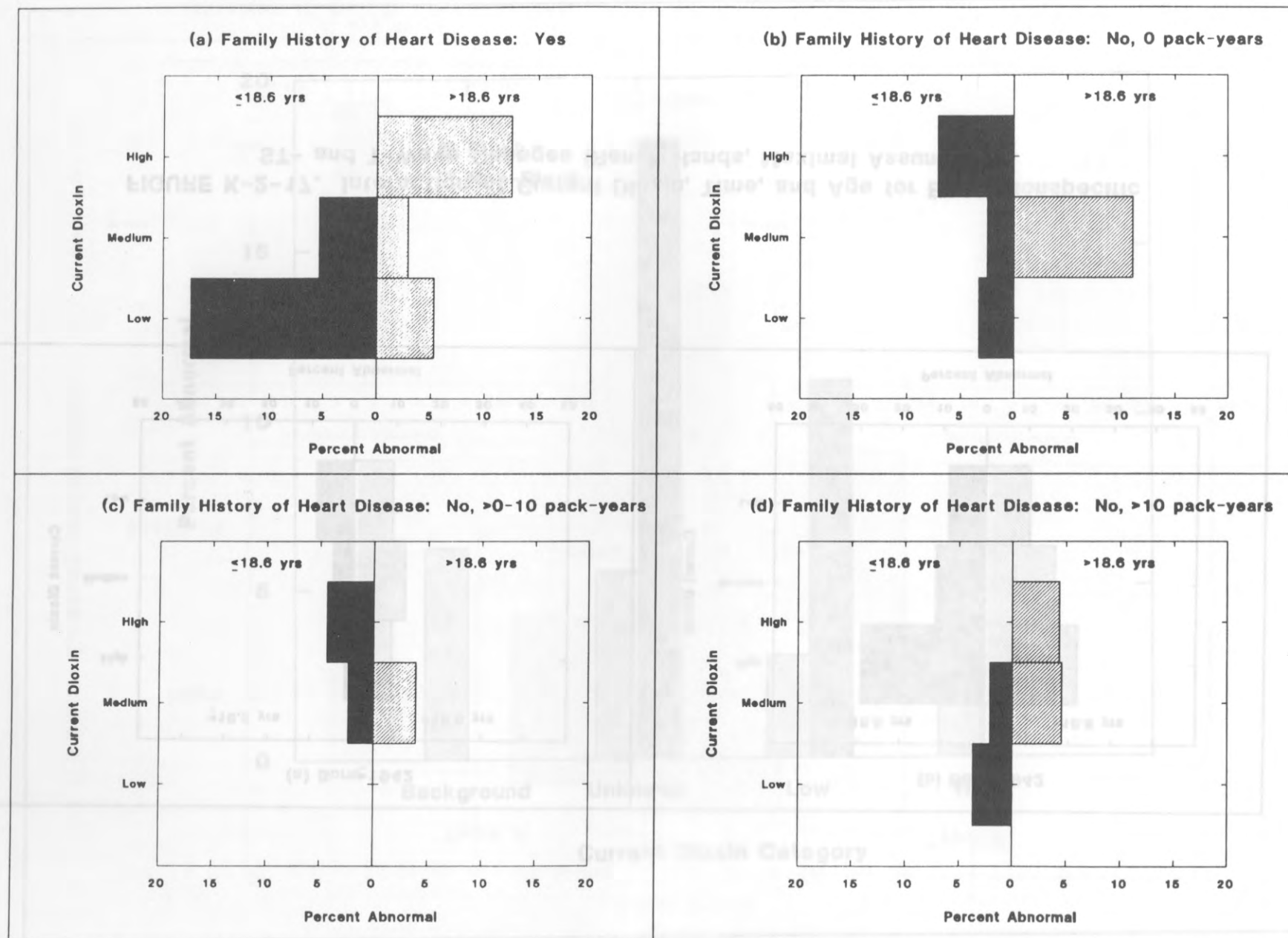


FIGURE K-2-16. Interaction of Current Dioxin, Time, Family History of Heart Disease, and Lifetime Cigarette Smoking History for Heart Sounds (Ranch Hands, Maximal Assumption)

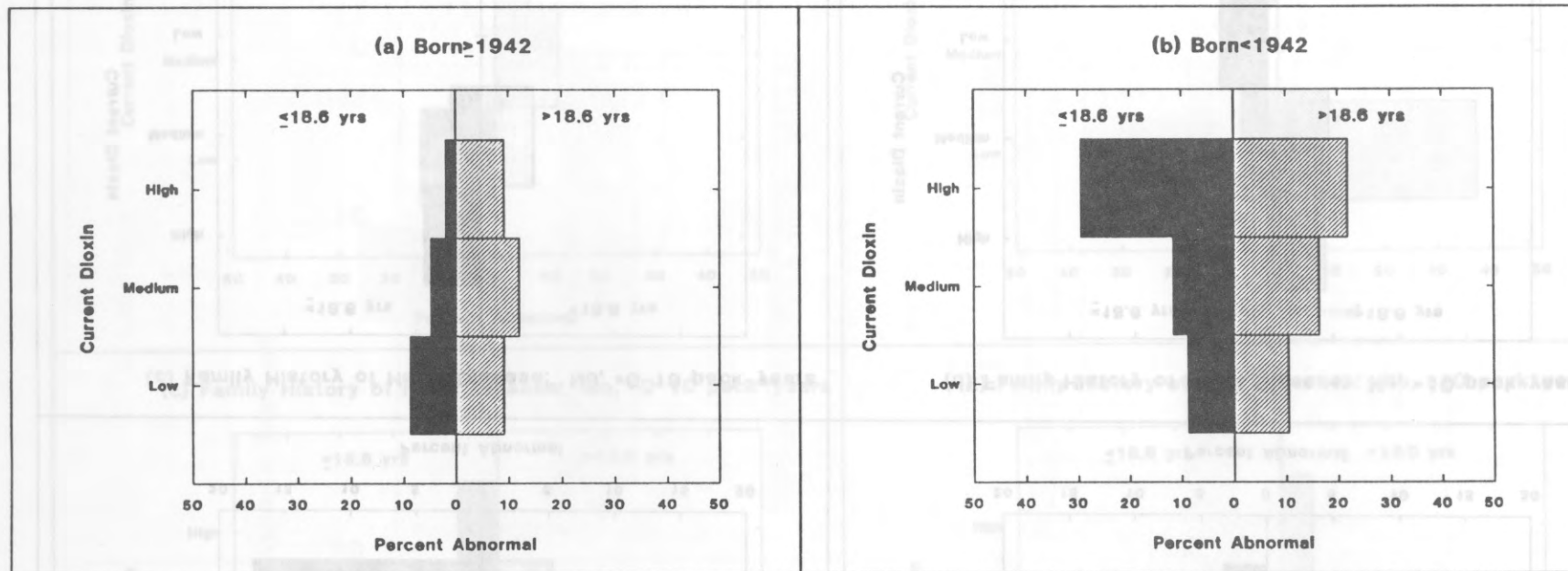


FIGURE K-2-17. Interaction of Current Dioxin, Time, and Age for ECG: Nonspecific ST- and T-Wave Changes (Ranch Hands, Maximal Assumption)

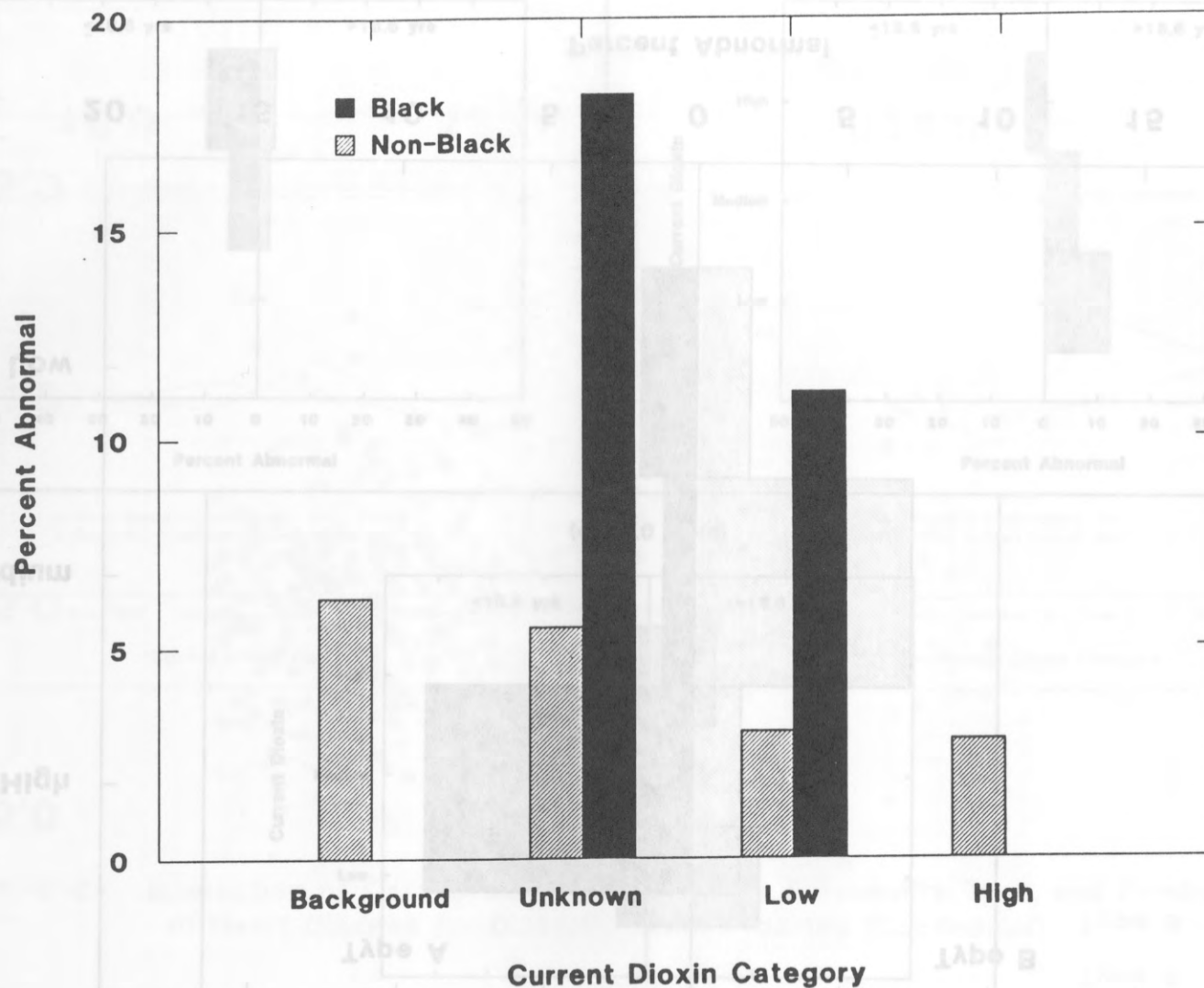


FIGURE K-2-18. Interaction of Categorized Current Dioxin and Race for ECG: Bradycardia

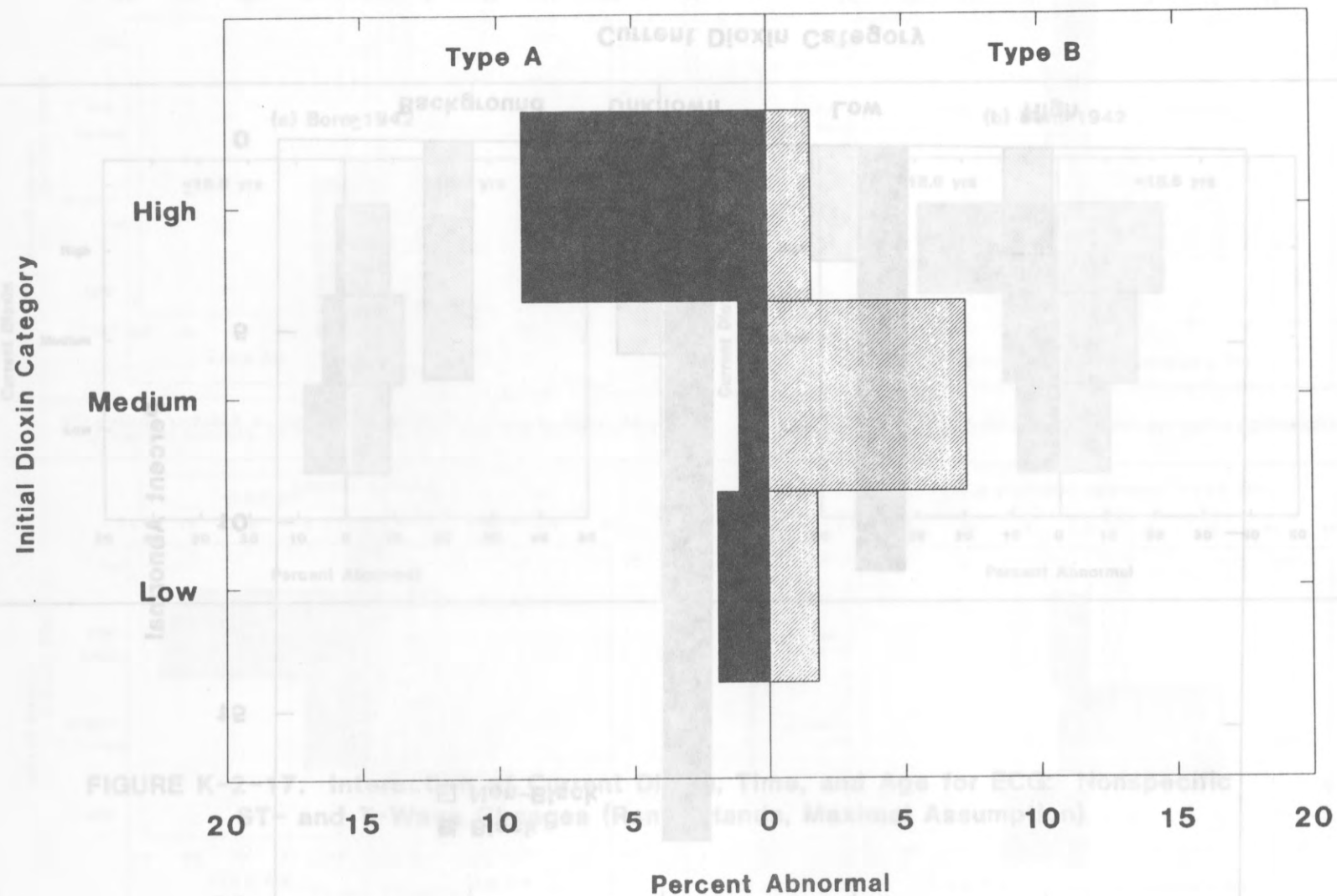


FIGURE K-2-19. Interaction of Initial Dioxin and Personality Type for ECG: Arrhythmia (Ranch Hands, Minimal Assumption)

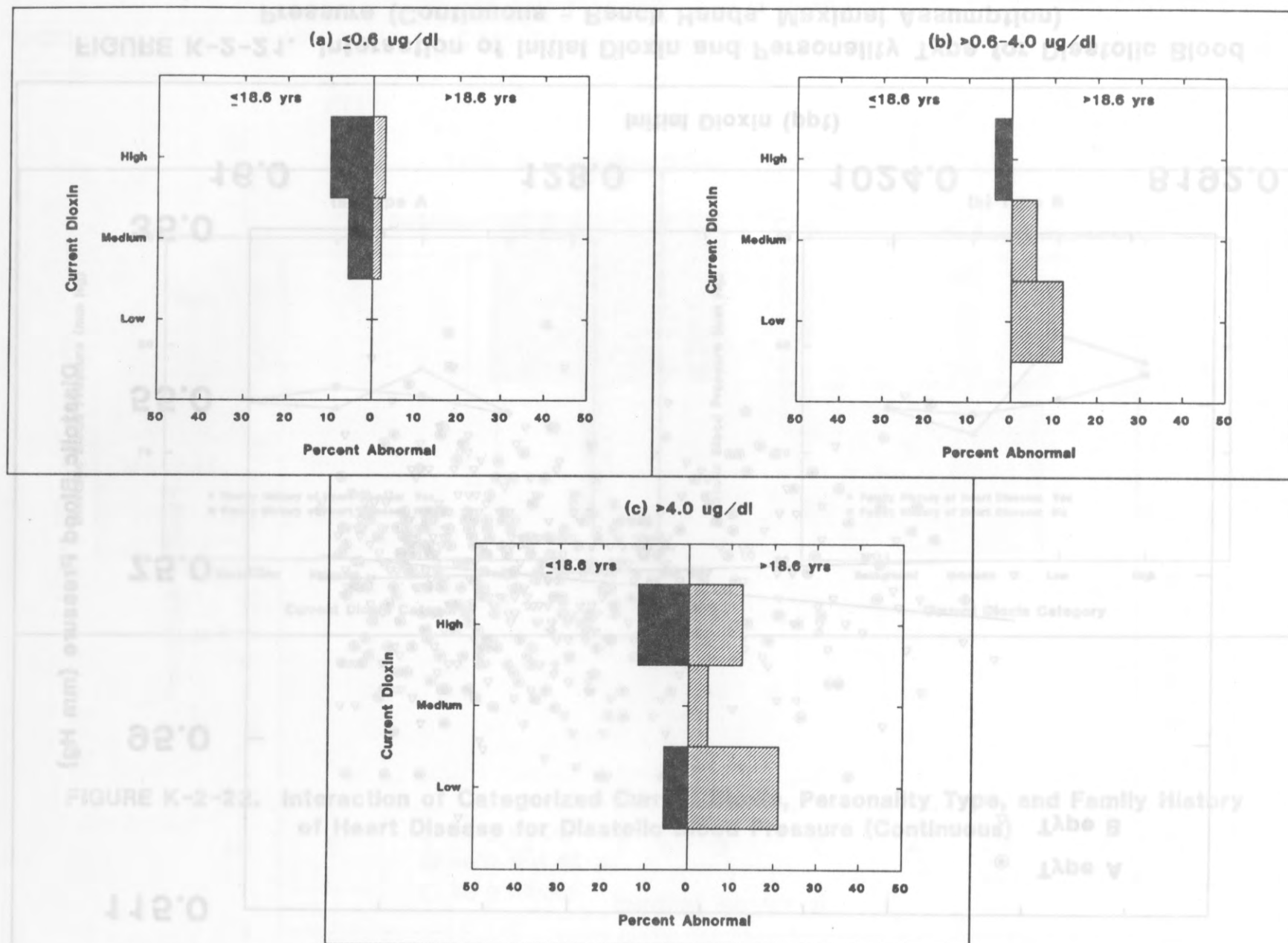


FIGURE K-2-20. Interaction of Current Dioxin, Time, and Differential Cortisol Response for ECG: Arrhythmia (Ranch Hands, Maximal Assumption)