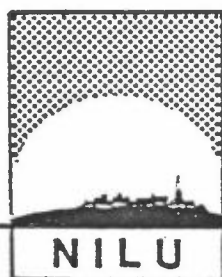


NILU OR : 44/84
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**BLOOD LEAD- A FUNCTION
OF VEHICULAR EMISSIONS
AND SMOKING**

PART II



NORWEGIAN INSTITUTE FOR AIR RESEARCH

ROYAL NORWEGIAN COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH

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*BLOOD LEAD- A FUNCTION
OF VEHICULAR EMISSIONS
AND SMOKING*

PART II

by

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BLOOD LEAD - A FUNCTION OF VEHICULAR EMISSIONS AND SMOKING.

Foreword

This is Part II of a report on an investigation, done in May 1983, of blood lead and air lead levels in two towns Holmestrand (moderately exposed to lead via vehicular emissions) and Sørumsand (control low exposure area). Part I summarizes the principle findings of the study.

Part II of this report contains the results of a series of analyses that were considered peripheral to the main body of the report. Therefore Part II is merely a collection of Appendices.

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Appendix II	Comparison of findings using hematocrit corrected and uncorrected blood lead.
Appendix III	Comparison of air lead exposure estimates corrected and uncorrected for respiratory ventilation.
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Appendix V	Results of the analysis of hematocrit.
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APPENDIX I

Means, standard deviations and samples size (N) of parameters that were not included in further analysis because of insignificance.

Values expressed as $\mu\text{g/dl}$.

$$\text{Pb-B } (\mu\text{g/dl}) = \text{Pb-B } (\mu\text{moles/l}) \times 20.72$$

Since Pb-B is log-normally distributed, it is incorrect to use means and standard deviations.

The more correct form is to use the median with the standard deviation of the natural logarithm. However, it is doubtful how many individuals would find this understandable. Therefore, it was decided to present the data as means and standard deviations. None of these findings were used in the final statistical analyses. For further discussion of this problem and comparison of findings, see Part I - pages 36 and 39.

Table I-1: Blood lead ($\mu\text{g}/\text{dl}$) in men and women in the two towns by age group.

		Age Group (yrs)									
		0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	> 90
Holmestrand	Mean	16.617 ¹	10.336	7.973	9.034	9.922	11.114	8.703	7.703	5.868	-
	St.dev. (N)	7.017 2	3.987 11	3.365 4	3.236 6	2.890 7	4.123 3	2.279 16	1.854 6	1.228 3	-
Sørumsand	Mean	13.318	7.694	13.062	6.958	6.670	6.990	6.391	7.410	6.789	5.979
	St.dev. (N)	3.033 3	1.827 11	7.661 9	3.412 14	2.390 17	2.159 9	2.494 17	4.897 7	2.527 16	0.431 2
Sørumsand	Mean	5.510	4.926	6.513	6.691	6.454	4.951	4.445	7.069	6.036	-
	St.dev. (N)	2.324 7	2.142 8	0.821 2	2.021 14	0.131 2	3.487 2	2.300 2	4.722 2	3.486 2	-
Sørumsand	Mean	5.437	4.175	3.723	4.419	4.380	4.969	4.881	3.833	6.040	4.512
	St.dev. (N)	2.675 7	0.890 8	1.808 5	1.642 24	1.532 18	3.460 6	1.759 3	1.025 2	4.298 2	0.000 1

¹ Blood lead is hematocrit adjusted
Occupationally exposed individuals not included.

Table I-2: Blood lead (µg/dl) in individuals living in the two towns by social class

		Social Class ¹					
		A	B	C	D	F	G
<u>Holmestrand:</u>	Adult Males	8.737 ² 3.445 8	9.645 3.280 13	7.703 2.124 3	9.738 2.556 5	8.715 1.577 10	7.030 2.147 7
	Adult Females	6.114 3.302 12	7.755 2.656 27	10.164 7.604 11	7.033 4.584 7	7.751 3.303 11	6.054 2.612 21
	Children	7.710 1.896 5	10.017 4.701 3	10.733 5.428 8	9.662 2.120 5	15.258 1.617 3	- - -
<u>Sørumsand:</u>	Adult Males	6.755 1.874 19	3.253 0.000 1	6.216 0.206 2	- - -	3.274 0.644 2	7.493 3.528 3
	Adult Females	4.313 2.379 22	4.536 1.430 17	4.195 1.459 13	4.896 1.626 4	3.051 0.054 3	5.799 2.200 4
	Children	4.938 1.904 18	4.117 0.000 1	5.221 2.383 8	- - -	- - -	- - -

¹ Social class defined in Table 2 and Appendix 1, Part 1.
² Blood lead is hematocrit adjusted.
³ Occasionally exposed individuals not included for analysis.

Table I-3: Blood lead ($\mu\text{g}/\text{dl}$) in adults who have quit smoking by time since quitting.

		Time since quitting			
		<3Mnths	3M-1Yr	1-5Yrs	>5Yrs
Holmestrand-	Mean		10.021	7.466	7.632
	St.dev		1.145	5.064	3.020
	N		3	6	2
Sørumsand-	Mean	3.571	3.885	4.332	4.552
	St.dev	0.000	0.000	1.154	1.901
	N	1	1	12	17

1. Blood leads are hematocrit adjusted.
2. Occupationally exposed individuals not included for analysis.

Table I-4: The effect of an open window on blood lead ($\mu\text{g}/\text{dl}$) levels.

		Simplified Air Index				
		1	2	3	4	5
Never	Mean	5.143	3.794	7.510	4.508	7.376
	St.dev	2.175	1.228	5.053	0.000	2.845
	N	24	2	7	1	30
Sometimes	Mean	5.028	9.350	8.435	7.522	7.122
	St.dev	1.695	2.985	2.786	1.698	2.491
	N	11	2	11	4	12
Always	Mean	4.868	7.605	8.100	6.079	8.472
	St.dev	2.162	5.236	2.574	1.883	5.271
	N	52	2	28	4	35

1. Air Index categories go from lowest (1) to highest (5) and represents a simplified combination of home and workplace. Sørumsand inhabitants for the most part are in category 1 whereas people working and living near the highway in Holmestrand are in category 5.
2. Blood lead is hematocrit adjusted, all individuals occupationally exposed removed from data set.

Table I-5 : Blood lead ($\mu\text{g}/\text{dl}$) in individuals of the two towns by number of hobbies that can be considered as lead exposure.

			Number of lead exposed hobbies		
			1	2	3
Holmestrand	Males	Mean St.dev N	9.015 ¹ 3.039 12	8.804 2.402 8	5.538 1.627 2
	Females	Mean St.dev N	7.059 4.503 3	2.442 0.000 1	- - -
Sørumsand	Males	Mean St.dev N	6.797 0.667 6	6.654 2.055 3	- - -
	Females	Mean St.dev N	4.970 1.747 7	1.865 0.000 1	- - -

¹ Blood lead is hematocrit adjusted.
Occupationally exposed individuals are removed from data set.

Table I-6: Blood lead ($\mu\text{g}/\text{dl}$) levels as a function of smoking habits and social class.

			Social Class ¹					
			A	B	C	D	F	G
S	Never smoked	Mean	5.684 ²	6.772	5.203	6.030	5.765	6.133
		St.dev (N)	2.704 22	3.341 20	1.728 9	0.365 2	1.693 9	2.643 22
M	Former smoker	Mean	5.220	7.035	5.370	7.636	7.629	6.230
		St.dev (N)	2.151 13	1.806 9	2.948 8	5.510 7	3.860 10	2.057 8
O	Occasional smoker	Mean	4.277	4.827	4.465	-	-	5.518
		St.dev (N)	1.183 5	2.280 5	2.636 3	- -	- -	0.000 1
K	1 - 9 cigarettes	Mean	5.441	8.633	12.826	-	5.894	8.501
		St.dev (N)	2.194 6	3.711 8	12.300 4	- -	3.060 2	0.000 1
E	10 - 29 cigarettes	Mean	7.619	7.731	9.478	7.444	9.630	7.748
		St.dev (N)	4.050 12	3.326 14	3.141 5	2.326 6	2.284 5	3.540 3
R	>30 + cigarettes	Mean	-	10.275	-	-	-	-
		St.dev (N)	- -	0.000 1	- -	- -	- -	- -
Passive smokers	NO	Mean	5.436	6.241	5.605	6.181	-	-
		St.dev (N)	2.146 20	1.840 3	2.420 10	0.000 1	- -	- -
Passive smokers	YES	Mean	6.238	15.446	11.930	10.532	-	15.258
		St.dev (N)	2.909 3	0.000 1	5.742 6	0.971 4	- -	1.617 3

- ¹ Social class defined in Table 2 and Appendix I, Part I.
² Blood lead is hematocrit adjusted
Occupationally exposed individuals removed from data set.

Table I-7: Effect of smoke inhalation on blood lead ($\mu\text{g}/\text{dl}$).

		Inhalation	
		No	Yes
Holmestrand	Mean	9.548 ¹	9.210
	St.dev	4.103	4.050
	N	4	54
Sørumsand	Mean	2.767	6.227
	St.dev	0.782	2.623
	N	3	18

¹ Blood lead is hematocrit adjusted.
Occupationally exposed individuals removed from data set.

Table I-8: Effect of hours of exposure to passive smoking on blood lead ($\mu\text{g}/\text{dl}$) in children living in Holmestrand and Sørumsand.

		Hours passive smoke exposure		
		0.5-2.5	3.0-4.5	>5+
Holmestrand	Mean	11.282 ¹	13.737	13.554
	St.dev	1.210	5.675	9.961
	N	3	4	6
Sørumsand	Mean	4.601	4.303	7.308
	St.dev	0.000	0.000	3.509
	N	1	1	2

¹ Blood lead is hematocrit adjusted.

APPENDIX II

Comparison of findings using standardized and unstandardized blood lead concentrations. Blood lead levels are standardized by:

$$CPbB = \frac{PbB \times 45.0}{Ht}$$

- CPbB = standardized blood lead concentrations
- PbB = unstandardized blood lead concentrations
- Ht = Hematocrit

Table II-1: Output of multiple regression analysis using DDPP (Jakobsen, 1982) for children (upper) and adults (lower) where blood lead uncorrected for hematocrit (not logarithmic) is the dependent variable, and the independent variables include smoking (passive smoking with children), exposure to air lead, social class and sex. The highly significant F values for passive smoking and air lead in children and sex and air lead in adults is evident.

MULTIPLE REGRESSION ANALYSIS ADULTS															
ANALYSIS USING BLOOD LEAD UNCORRECTED FOR HEMATOCRIT															
		REGRESSION			RESIDUAL										
DEGREES OF FREEDOM:		3			163										
SUM OF SQUARES :		915.0			1205.6										
MEAN SQUARE :		305.0			7.4										
F-RATIO :		61.2			PROB= 0.000										
=====															
VARIABLES IN EQUATION : (CONSTANT= 7.9101) I VARIABLES NOT IN EQUATION :															
B -		F TO			P-VALUES			STANDARDIZED BETA			95% CONF. INT. I		PARTIAL		F TO
ID	COEFFICIENT	STD.ERROR	REMOVE	FOR B	B (R.PART)	UPPER	LOWER	I	ID	CORR.	TOLERANCE	ENTER			
35	44.265	4.789	85.452	0.000	0.5459	53.7206	34.8101	I	SOCIAL	0.0671	0.9572	0.7325			
129	0.204	0.080	6.446	0.012	0.1500	0.3620	0.0453		CLASS						
90	-2.547	0.457	31.062	0.000	-0.3292	1.6448	-3.4497								
=====															
SUMMARY TABLE :															
STEP NR.	MULT.R	MULT.RSQ	INCREASE IN RSQ	RESIDUAL EFFECT	F-VALUE FOR E/I	VAR. NR ENTER	NR REMOVED	VAR. NAME							
1	0.5463	0.2984	0.2984	0.8376	70.187	35		AIR LEAD INDEX							
2	0.6395	0.4090	0.1106	0.7688	30.681	90		SEX							
3	0.6569	0.4315	0.0225	0.7540	6.446	129		SMOKING							

MULTIPLE REGRESSION ANALYSIS CHILDREN															
ANALYSIS USING BLOOD LEAD UNCORRECTED FOR HEMATOCRIT															
		REGRESSION			RESIDUAL										
DEGREES OF FREEDOM:		3			47										
SUM OF SQUARES :		396.5			216.5										
MEAN SQUARE :		132.2			4.6										
F-RATIO :		28.7			PROB= 0.000										
=====															
VARIABLES IN EQUATION : (CONSTANT= 1.7576) I VARIABLES NOT IN EQUATION :															
B -		F TO			P-VALUES			STANDARDIZED BETA			95% CONF. INT. I		PARTIAL		F TO
ID	COEFFICIENT	STD.ERROR	REMOVE	FOR B	B (R.PART)	UPPER	LOWER	I	ID	CORR.	TOLERANCE	ENTER			
35	39.308	10.464	14.110	0.000	0.3479	60.3585	18.2567	I	SEX	-0.2110	0.9624	2.1439			
111	0.539	0.260	4.301	0.044	0.2203	1.0610	0.0162								
114	3.565	0.752	22.490	0.000	0.4847	5.0769	2.0526								
=====															
SUMMARY TABLE :															
STEP NR.	MULT.R	MULT.RSQ	INCREASE IN RSQ	RESIDUAL EFFECT	F-VALUE FOR E/I	VAR. NR ENTER	NR REMOVED	VAR. NAME							
1	0.6795	0.4617	0.4617	0.7337	42.026	114		PASSIVE SMOKING							
2	0.7839	0.6144	0.1528	0.6209	19.018	35		AIR LEAD INDEX							
3	0.8042	0.6468	0.0323	0.5943	4.301	111		SOCIAL CLASS							

Table II-2: Summary statistics of blood lead ($\mu\text{g}/\text{dl}$) corrected and uncorrected for hematocrit in different population groups with smoking.

	Children and pass. smoking			Women and smoking						Men and smoking					
	NOT EXP	EXP		Never	Former	Occas.	1 - 9	10 +	All smoke	Never	Former	Occas.	1 - 9	10 +	All smoke
Hematocrit unadjusted	Mean	4.180	5.232	3.953	3.925	3.756	2.970	3.039	3.016	6.630	4.766	4.973	6.050	8.330	7.190
	St.dev (N)	1.492 23	2.340 4	1.571 25	1.286 18	1.770 8	1.555 3	0.701 6	0.956 9	2.039 6	1.951 7	1.435 3	1.924 5	1.272 5	1.951 10
Blood lead ($\mu\text{g}/\text{dl}$)	Mean	6.216	11.253	5.662	6.975	5.664	9.600	8.081	8.537	9.158	8.249	-	9.573	9.283	9.355
	St.dev (N)	1.539 11	2.674 13	2.038 43	4.053 15	1.380 3	6.806 9	2.991 21	4.410 30	4.123 10	2.547 16	-	4.220 5	2.676 15	3.007 20
Hematocrit adjusted	Mean	4.837	5.880	4.453	4.449	4.086	3.209	3.532	3.425	6.591	4.954	4.903	6.543	8.594	7.569
	St.dev (N)	1.888 23	2.615 4	1.723 25	1.431 18	1.974 8	1.548 3	1.235 6	1.256 9	1.800 6	2.286 7	1.153 3	1.792 5	1.663 5	1.956 10
Blood lead ($\mu\text{g}/\text{dl}$)	Mean	7.130	13.086	6.205	7.330	5.678	10.629	8.603	9.211	8.850	8.301	-	9.014	9.137	9.106
	St.dev (N)	1.775 11	3.607 13	2.380 43	4.267 15	1.753 3	7.923 9	3.347 21	5.093 30	3.492 10	2.256 16	-	4.029 5	2.387 15	2.760 20

APPENDIX III

- 1) Multiple regressions using air pollution exposure estimates not corrected for respiratory ventilation and respiratory ventilation corrected exposure estimates.
- 2) Standard statistics of both estimates. See discussion on page 7.

Table III-1: Multiple regression analysis using DDPP (Jakobsen, 1982) where blood lead (non-logarithmic) is the dependent variable and the independent variables include:

- 1) for children (upper) social class, passive smoking and air lead (uncorrected for respiratory ventilation).
- 2) for adults (lower) social class, air lead (uncorrected for respiratory ventilation) sex, and smoking.

F-values are very similar to those on the following page.

MULTIPLE REGRESSION ANALYSIS
ADULTS

ANALYSIS DONE WITH INDIVIDUAL AIR LEAD EXPOSURE ESTIMATE UNADJUSTED FOR RESPIRATORY VENTILATION

	REGRESSION	RESIDUAL
DEGREES OF FREEDOM:	3	163
SUM OF SQUARES :	955.8	1242.2
MEAN SQUARE :	318.6	7.6
F-RATIO :	41.8	PROB= 0.000

VARIABLES IN EQUATION:		(CONSTANT= 6.9295)		I		VARIABLES NOT IN EQUATION :					
B -	F TO	P-VALUES	STANDARDIZED	BETA	95% CONF. INT.	I	PARTIAL	F TO			
ID	COEFFICIENT	STD.ERROR	REMOVE FOR B	B (R.PART)	UPPER	LOWER	ID	CORR.	TOLERANCE	ENTER	
40	49.695	4.953	100.665	0.000	0.5908	59.4748	39.9148	I SOCIAL	0.0653	0.9622	0.6943
129	0.222	0.081	7.443	0.007	0.1607	0.3829	0.0614	CLASS			
90	-1.925	0.464	17.221	0.000	-0.2444	-1.0092	-2.8414				

SUMMARY TABLE :

STEP NR.	MULT.R	MULT.RSQ	INCREASE IN RSQ	RESIDUAL EFFECT	F-VALUE FOR E/I	VAR. NR ENTER REMOVED	VAR. NAME
1	0.5895	0.3476	0.3476	0.8077	87.899	40	AIR LEAD INDEX (UNCORR. FOR VENTILATION)
2	0.6396	0.4090	0.0615	0.7687	17.058	90	SEX
3	0.6594	0.4348	0.0258	0.7518	7.443	129	SMOKING

MULTIPLE REGRESSION ANALYSIS
CHILDREN

ANALYSIS DONE WITH INDIVIDUAL AIR LEAD EXPOSURE ESTIMATE UNADJUSTED FOR RESPIRATORY VENTILATION

	REGRESSION	RESIDUAL
DEGREES OF FREEDOM:	2	48
SUM OF SQUARES :	547.8	319.6
MEAN SQUARE :	273.9	6.7
F-RATIO :	41.1	PROB= 0.000

VARIABLES IN EQUATION :		(CONSTANT= 2.2273)		I		VARIABLES NOT IN EQUATION :					
B -	F TO	P-VALUES	STANDARDIZED	BETA	95% CONF. INT.	I	PARTIAL	F TO			
ID	COEFFICIENT	STD.ERROR	REMOVE FOR B	B (R.PART)	UPEPR	LOWER	ID	CORR.	TOLERANCE	ENTER	
40	7.468	15.564	24.776	0.000	0.4451	108.7594	46.1764	I SOCIAL	0.2461	0.6822	3.0294
114	5.035	0.782	41.428	0.000	0.5755	6.6074	3.4620	CLASS			

SUMMARY TABLE :

STEP NR.	MULT.R	MULT.RSQ	INCREASE IN RSQ	RESIDUAL EFFECT	F-VALUE FOR E/I	VAR. NR ENTER REMOVED	VAR. NAME
1	0.6643	0.4413	0.4413	0.7474	38.708	114	PASSIVE SMOKING
2	0.7947	0.6315	0.1902	0.6070	24.776	40	AIR LEAD INDEX (UNCORRECTED VENTILATION)

Table III-2: This table is similar to the preceding page except that the air lead exposure index is now corrected for respiratory ventilation. The effect of correcting for ventilation is to in fact decrease significance.

MULTIPLE REGRESSION ANALYSIS
ADULTS

ANALYSIS DONE WITH INDIVIDUAL AIR LEAD EXPOSURE ESTIMATE CORRECTED FOR VENTILATION

		REGRESSION	RESIDUAL	
DEGREES OF FREEDOM:		3	224	
SUM OF SQUARES	:	921.2	1743.1	
MEAN SQUARE	:	307.1	7.8	
F-RATIO	:	39.5	PROB= 0.000	

VARIABLES IN EQUATION :		(CONSTANT= 6.6749)			I		VARIABLES NOT IN EQUATION :				
B -	F TO	P-VALUES	STANDARDIZED	BETA	95% CONF. INT.	I	PARTIAL			F TO	
ID	COEFFICIENT	STD.ERROR	REMOVE FOR B	B (R.PART)	UPPER	LOWER	I	ID	CORR.	TOLERANCE	ENTER
90	-1.700	0.397	18.292	0.000	-0.2320	-0.9168	-2.4833	I	SOCIAL-0.0605	0.9189	0.8206
113	0.281	0.074	14.486	0.000	0.2067	0.4261	0.1354		CLASS		
35	38.947	4.145	88.280	0.000	0.5086	47.1149	30.7786				

SUMMARY TABLE :

STEP NR.	MULT.R	MULT.RSQ	INCREASE IN RSQ	RESIDUAL EFFECT	F-VALUE FOR E/I	VAR. NR ENTER	VAR. NR REMOVED	VAR. NAME
1	0.4914	0.2415	0.2415	0.8709	71.938	35		AIR LEAD INDEX (CORRECTED FOR VENTILATION)
2	0.5509	0.3034	0.0620	0.8346	20.023	90		SEX
3	0.5880	0.3458	0.0423	0.8089	14.486	113		SMOKING

MULTIPLE REGRESSION ANALYSIS
CHILDREN

ANALYSIS DONE WITH INDIVIDUAL AIR LEAD EXPOSURE ESTIMATE CORRECTED FOR VENTILATION

		REGRESSION	RESIDUAL	
DEGREES OF FREEDOM:		2	48	
SUM OF SQUARES	:	527.5	339.9	
MEAN SQUARE	:	263.7	7.1	
F-RATIO	:	37.2	PROB= 0.000	

VARIABLES IN EQUATION :		(CONSTANT= 2.5246)			I		VARIABLES NOT IN EQUATION :				
B -	F TO	P-VALUES	STANDARDIZED	BETA	95% CONF. INT.	I	PARTIAL			F TO	
ID	COEFFICIENT	STD.ERROR	REMOVE FOR B	B (R.PART)	UPPER	LOWER	I	ID	CORR.	TOLERANCE	ENTER
114	4.985	0.811	37.749	0.000	0.5698	6.6159	3.3535	I	SEX -0.2323	0.9673	2.6810
35	56.346	12.464	20.435	0.000	0.4192	81.6060	31.2853	I	SOCIAL 0.2221	0.6658	2.4399
									CLASS		

SUMMARY TABLE :

STEP NR.	MULT.R	MULT.RSQ	INCREASE IN RSQ	RESIDUAL EFFECT	F-VALUE FOR E/I	VAR. NR ENTER	VAR. NR REMOVED	VAR. NAME
1	0.6643	0.4413	0.4413	0.7474	38.708	114		PASSIVE SMOKING
2	0.7798	0.6082	0.1668	0.6260	20.435	35		AIR LEAD INDEX (CORRECTED FOR VENTILATION)

Table III-3: Comparison of individual air lead exposure estimates corrected and uncorrected for respiratory ventilation in the population subgroups in Holmestrand and Sørumsand.

		Children	Adults	Pensionists
A {	Mean	0.081	0.080	0.098
	Holmestrand St.dev	0.024	0.048	0.041
	N	25	169	44
	Mean	0.036	0.027	0.030
	Sørumsand St.dev	0.016	0.009	0.013
	N	27	87	11
B {	Mean	0.065	0.077	0.093
	Holmestrand St.dev	0.018	0.048	0.041
	N	27	110	44
	Mean	0.028	0.026	0.029
	Sørumsand St.dev	0.009	0.008	0.012
	N	28	87	11

A- Individual Air lead exposure estimated with an extra factor for activity.

B- Individual air lead exposure estimated with no extra factor to account for activity level.

Table III-4: Summary statistics of two individual air pollution exposure estimates (adjusted and unadjusted for respiratory ventilation) in different population groups with smoking exposure.

	Children and passive smoking			Women and smoking						Men and smoking					
	NOT X		X	NEVER	FORMER	OCCAS.	1 - 9	10 +	ALL SMOKE	NEVER	FORMER	OCCAS.	1 - 9	10 +	ALL SMOKE
	MEAN	ST.DEV	N												
Ventilation corrected air lead exposure estimate.	0.038	0.027	4	0.028	0.026	0.026	0.035	0.031	0.032	0.026	0.032	0.029	0.026	0.024	0.025
	0.017	0.003	24	0.009	0.008	0.005	0.022	0.010	0.014	0.005	0.014	0.006	0.010	0.002	0.007
				25	18	8	3	6	9	6	7	3	5	5	10
Not ventilation corrected air lead exposure estimate.	0.085	0.079	4	0.089	0.088	0.065	0.105	0.076	0.085	0.067	0.082	-	0.077	0.084	0.082
	0.024	0.026	14	0.037	0.051	0.032	0.087	0.059	0.068	0.026	0.025	-	0.050	0.026	0.032
				44	15	3	9	21	30	10	16	0	5	15	20
Not ventilation corrected air lead exposure estimate.	0.029	0.022	4	0.027	0.025	0.025	0.032	0.031	0.031	0.025	0.030	0.027	0.026	0.023	0.024
	0.010	0.000	24	0.009	0.007	0.004	0.017	0.010	0.011	0.004	0.014	0.007	0.010	0.002	0.007
				25	18	8	3	6	9	6	7	3	5	5	10
Not ventilation corrected air lead exposure estimate.	0.070	0.061	14	0.085	0.086	0.065	0.099	0.075	0.082	0.061	0.076	-	0.076	0.077	0.077
	0.021	0.017	12	0.038	0.052	0.032	0.090	0.058	0.068	0.024	0.020	-	0.049	0.023	0.030
				44	15	3	9	21	30	10	16	0	5	15	20

APPENDIX IV

Comparison of logarithmic treated data to non logarithmic treated data. Frequency distributions.

Table IV-1: Frequency distributions of air lead exposure estimates (API) for the entire populations of both Holmestrand and Sørumsand.

The upper figure represents the data without logarithmic transformations. The lower figure represents the data with natural logarithmic transformations.

Additional statistics accompany each set.

```
VARIABLE-FIELD: 83- 86 API
LOWER RANGE LIMIT : 0.018
UPPER RANGE LIMIT : 0.329
NUMBER OF CUTS : 10
=====
VALUE INTERVAL      FREQ.  PROS.  ONE X REPRESENTS  4 SUBJECTS
=====
0.018 - 0.046      135   44.0%  XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
0.047 - 0.075       72   23.5%  XXXXXXXXXXXXXXXXXXXXXXXX
0.076 - 0.103       65   21.2%  XXXXXXXXXXXXXXXXXXXXXXXX
0.104 - 0.131       25    8.1%  XXXXXXXX
0.132 - 0.159        3    1.0%  X
0.160 - 0.188        1    0.3%  X
0.189 - 0.216        1    0.3%  X
0.217 - 0.244        1    0.3%  X
0.245 - 0.272        1    0.3%  X
0.273 - 0.301        1    0.3%  X
0.302 - 0.329        1    0.3%  X
=====
NO. OF S:          307.000      SUMX:              18.953      MEDIAN <=         0.051
MINIMUM:           0.018      MAXIMUM:           0.329      VALUESPAN:       0.311
MODE:              0.021      FREQUENCY:         23.000     NO. OF VALUES:   97
MEAN:              0.062      ST. DEV.:          0.044      ST. ERR. MEAN:    0.003
SKEWNESS:          2.333      KURTOSIS:          9.181      GINI-INDEX:       0.350
=====
```

```
VARIABLE-FIELD: 88- 93 LOGPB-AIR
LOWER RANGE LIMIT : -4.017
UPPER RANGE LIMIT : -1.111
NUMBER OF CUTS : 10
=====
VALUE INTERVAL      FREQ.  PROS.  ONE X REPRESENTS  2 SUBJECTS
=====
-4.017 - -3.753     54   17.6%  XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
-3.752 - -3.489     41   13.4%  XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
-3.488 - -3.224     27    8.8%  XXXXXXXXXXXXXXXXXXXXXXXX
-3.223 - -2.960     32   10.4%  XXXXXXXXXXXXXXXXXXXXXXXX
-2.959 - -2.696     43   14.0%  XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
-2.695 - -2.432     31   10.1%  XXXXXXXXXXXXXXXXXXXXXXXX
-2.431 - -2.168     59   19.2%  XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
-2.167 - -1.904     13    4.2%  XXXXXXXX
-1.903 - -1.639      1    0.3%  X
-1.638 - -1.375      3    1.0%  XX
-1.374 - -1.111      2    0.7%  X
=====
VALUES SUBJECTS
BELOW RANGE :      0      0
BEYOND RANGE:      0      0
WITHIN RANGE:     97     307
NO. OF S:          307.000      SUMX:             -918.109     MEDIAN <=         -2.975
MINIMUM:           -4.017      MAXIMUM:          -1.111     VALUESPAN:       2.906
MODE:              -3.863      FREQUENCY:        23.000     NO. OF VALUES:   97
MEAN:              -2.991      ST. DEV.:         0.635     ST. ERR. MEAN:    0.036
SKEWNESS:          0.230      KURTOSIS:         -0.799     GINI-INDEX:       -0.121
=====
```

Table IV-2: Frequency distribution of air lead exposure estimates (API) for the Sørumsand population.

The upper figure represents the data without logarithmic transformation. The lower figure represents the data with natural logarithmic transformation.

Additional statistics accompany each set.

VARIABLE-FIELD: 83- 86 API
 LOWER RANGE LIMIT : 0.018
 UPPER RANGE LIMIT : 0.078
 NUMBER OF CUTS : 10

VALUE INTERVAL	FREQ.	PROS.	ONE X REPRESENTS	2 SUBJECTS
0.018 - 0.023	53	42.1%	XXXXXXXXXXXXXXXXXXXXXXXXXXXX	
0.024 - 0.029	33	26.2%	XXXXXXXXXXXXXXXXXXXXXXXXXXXX	
0.030 - 0.034	12	9.5%	XXXXXX	
0.035 - 0.040	8	6.3%	XXXX	
0.041 - 0.045	9	7.1%	XXXXX	
0.046 - 0.051	3	2.4%	XX	
0.052 - 0.056	3	2.4%	XX	
0.057 - 0.062	1	0.8%	X	
0.063 - 0.067	1	0.8%	X	
0.068 - 0.073	2	1.6%	X	
0.074 - 0.078	0	0.0%	X	

=====

VALUES	SUBJECTS
BELOW RANGE :	0
BEYOND RANGE:	0
WITHIN RANGE:	32
NO.OF S:	126.000
MINIMUM:	0.018
MODE:	0.021
MEAN:	0.029
SKWEVNESS:	2.074
SUMX:	3.703
MAXIMUM:	0.078
FREQUENCY:	22.000
ST.DEV.:	0.011
KURTOSIS:	4.345
MEDIAN <=	0.025
VALUESPAN:	0.060
NO.OF VALUES:	32
ST.ERR.MEAN:	0.001
GINI-INDEX:	0.182

VARIABLE-FIELD: 88- 93 LOGPB-AIR
 LOWER RANGE LIMIT : -4.017
 UPPER RANGE LIMIT : -2.551
 NUMBER OF CUTS : 10

VALUE INTERVAL	FREQ.	PROS.	ONE X REPRESENTS	2 SUBJECTS
-4.017 - -3.884	1	0.8%	X	
-3.883 - -3.750	52	41.3%	XXXXXXXXXXXXXXXXXXXXXXXXXXXX	
-3.749 - -3.617	26	20.6%	XXXXXXXXXXXXXXXXXXXX	
-3.616 - -3.484	12	9.5%	XXXXXX	
-3.483 - -3.351	9	7.1%	XXXXX	
-3.350 - -3.217	6	4.8%	XXX	
-3.216 - -3.084	9	7.1%	XXXXX	
-3.083 - -2.951	5	4.0%	XXX	
-2.950 - -2.818	1	0.8%	X	
-2.817 - -2.684	2	1.6%	X	
-2.683 - -2.551	2	1.6%	X	

=====

VALUES	SUBJECTS
BELOW RANGE :	0
BEYOND RANGE:	0
WITHIN RANGE:	32
NO.OF S:	126.000
MINIMUM:	-4.017
MODE:	-3.863
MEAN:	-3.582
SKWEVNESS:	1.349
SUMX:	-451.359
MAXIMUM:	-2.551
FREQUENCY:	22.000
ST.DEV.:	0.312
KURTOSIS:	1.143
MEDIAN <=	-3.688
VALUESPAN:	1.466
NO.OF VALUES:	32
ST.ERR.MEAN:	0.028
GINI-INDEX:	-0.045

Table IV-3: Frequency distribution of air lead exposure estimates (API)
for the Holmestrand population.

The upper figure represents the data without logarithmic transformations. The lower figure represents the data with natural logarithmic transformations.

Additional statistics accompany each set.

VARIABLE-FIELD: 83- 86 API
LOWER RANGE LIMIT : 0.021
UPPER RANGE LIMIT : 0.329
NUMBER OF CUTS : 10

VALUE INTERVAL	FREQ.	PROS.	ONE X REPRESENTS	2 SUBJECTS
0.021 - 0.049	29	16.0%	XXXXXXXXXXXXXXXXXX	
0.050 - 0.077	55	30.4%	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
0.078 - 0.105	66	36.5%	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
0.106 - 0.133	21	11.6%	XXXXXXXXXXXX	
0.134 - 0.161	3	1.7%	XX	
0.162 - 0.189	1	0.6%	X	
0.190 - 0.217	1	0.6%	X	
0.218 - 0.245	2	1.1%	X	
0.246 - 0.273	0	0.0%		
0.274 - 0.301	1	0.6%	X	
0.302 - 0.329	1	0.6%	X	

=====

VALUES	SUBJECTS
BELOW RANGE :	0
BEYOND RANGE:	0
WITHIN RANGE:	84
NO.OF S :	181.000
MINIMUM:	0.021
MODE:	0.096
MEAN:	0.084
SKEWNESS:	2.592
SUMX:	15.250
MAXIMUM:	0.329
FREQUENCY:	21.000
ST.DEV.:	0.044
KURTOSIS:	10.074
MEDIAN <=	0.084
VALUESPAN:	0.308
NO.OF VALUES:	84
ST.ERR.MEAN:	0.003
GINI-INDEX:	0.247

VARIABLE-FIELD: 80- 93 LOGPB-AIR
LOWER RANGE LIMIT : -3.863
UPPER RANGE LIMIT : -1.111
NUMBER OF CUTS : 10

VALUE INTERVAL	FREQ.	PROS.	ONE X REPRESENTS	2 SUBJECTS
-3.863 - -3.613	1	0.6%	X	
-3.612 - -3.363	8	4.4%	XXXX	
-3.362 - -3.112	10	5.5%	XXXXX	
-3.111 - -2.862	30	16.6%	XXXXXXXXXXXXXXXXXX	
-2.861 - -2.612	33	18.2%	XXXXXXXXXXXXXXXXXXXX	
-2.611 - -2.362	27	14.9%	XXXXXXXXXXXXXXXXXX	
-2.361 - -2.112	57	31.5%	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
-2.111 - -1.862	8	4.4%	XXXX	
-1.861 - -1.611	1	0.6%	X	
-1.610 - -1.361	3	1.7%	XX	
-1.360 - -1.111	2	1.1%	X	

=====

VALUES	SUBJECTS
BELOW RANGE :	0
BEYOND RANGE:	0
WITHIN RANGE:	84
NO.OF S :	181.000
MINIMUM:	-3.863
MODE:	-2.343
MEAN:	-2.579
SKEWNESS:	0.175
SUMX:	-466.750
MAXIMUM:	-1.111
FREQUENCY:	21.000
ST.DEV.:	0.451
KURTOSIS:	0.855
MEDIAN <=	-2.476
VALUESPAN:	2.752
NO.OF VALUES:	84
ST.ERR.MEAN:	0.033
GINI-INDEX:	-0.095

Table IV-4: Frequency distributions of blood lead (in µg/100 ml)*, standardized for hematocrit for the entire populations of Holmestrand and Sørumsand.

The upper figure represents the data without logarithmic transformations. The lower figure represents the data with natural logarithmic transformations.

Additional statistics accompany each set.

*Pb-B (µg/dl) = Pb-B (µmoles/l) x 20.72.

VARIABLE-FIELD: 62- 66 CPB2
 4 SUBJECTS EXCLUDED DUE TO UNPERMITTED VALUES
 LOWER RANGE LIMIT : 0.860
 UPPER RANGE LIMIT : 31.080
 NUMBER OF CUTS : 10

VALUE INTERVAL	FREQ.	PROS.	ONE X REPRESENTS	3 SUBJECTS
0.860 - 3.607	45	14.9%	XXXXXXXXXXXXXXXXXX	
3.608 - 6.355	104	34.3%	XX	
6.356 - 9.102	89	29.4%	XX	
9.103 - 11.849	39	12.9%	XXXXXXXXXXXXXXXXXX	
11.850 - 14.596	18	5.9%	XXXXXXX	
14.597 - 17.344	6	2.0%	XX	
17.345 - 20.091	0	0.0%		
20.092 - 22.838	1	0.3%	X	
22.839 - 25.585	0	0.0%		
25.586 - 28.333	0	0.0%		
28.334 - 31.080	0	0.0%	X	

VALUES SUBJECTS

BELOW RANGE :	0	0		
BEYOND RANGE:	0	0		
WITHIN RANGE:	240	303		
NO.OF S:	303.000	SUMX:	2122.560	MEDIAN <= 6.420
MINIMUM:	0.860	MAXIMUM:	31.080	VALUESPAN: 30.220
MODE:	4.660	FREQUENCY:	4.000	NO.OF VALUES: 240
MEAN:	7.005	ST.DEV.:	3.569	ST.ERR.MEAN: 0.205
SKEWNESS:	1.688	KURTOSIS:	6.731	GINI-INDEX: 0.268

VARIABLE-FIELD: 75- 79 LOG B-PB
 4 SUBJECTS EXCLUDED DUE TO UNPERMITTED VALUES
 LOWER RANGE LIMIT : -0.140
 UPPER RANGE LIMIT : 3.430
 NUMBER OF CUTS : 10

VALUE INTERVAL	FREQ.	PROS.	ONE X REPRESENTS	2 SUBJECTS
-0.140 - 0.185	1	0.3%	X	
0.186 - 0.509	1	0.3%	X	
0.510 - 0.834	6	2.0%	XXX	
0.835 - 1.158	20	6.6%	XXXXXXXXXXXX	
1.159 - 1.483	49	16.2%	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
1.484 - 1.807	62	20.5%	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
1.808 - 2.132	82	27.1%	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
2.133 - 2.456	55	18.2%	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
2.457 - 2.781	23	7.6%	XXXXXXXXXXXX	
2.782 - 3.105	3	1.0%	XX	
3.106 - 3.430	0	0.0%	X	

VALUES SUBJECTS

BELOW RANGE :	0	0		
BEYOND RANGE:	0	0		
WITHIN RANGE:	148	303		
NO.OF S:	303.000	SUMX:	551.840	MEDIAN <= 1.850
MINIMUM:	-0.140	MAXIMUM:	3.430	VALUESPAN: 3.570
MODE:	1.970	FREQUENCY:	8.000	NO.OF VALUES: 148
MEAN:	1.821	ST.DEV.:	0.503	ST.ERR.MEAN: 0.029
SKEWNESS:	-0.296	KURTOSIS:	0.475	GINI-INDEX: 0.154

Table IV-5: Frequency distributions of blood lead (in µg/100 ml)*, standardized for hematocrit for Sørumsand.

The upper figure represents the data without logarithmic transformations. The lower figure represents the data with natural logarithmic transformations.

Additional statistics accompany each set.

$$*Pb-B (\mu\text{g/dl}) = Pb-B (\mu\text{moles/l}) \times 20.72.$$

VARIABLE-FIELD: 62- 66 CPB2
 1 SUBJECTS EXCLUDED DUE TO UNPERMITTED VALUES
 LOWER RANGE LIMIT : 0.860
 UPPER RANGE LIMIT : 14.820
 NUMBER OF CUTS : 10

VALUE INTERVAL	FREQ.	PROS.	ONE X REPRESENTS	1 SUBJECTS
0.860 - 2.129	5	4.0%	XXXXX	
2.130 - 3.398	24	19.2%	XXXXXXXXXXXXXXXXXXXXXXXXXXXX	
3.399 - 4.667	36	28.8%	XXXXXXXXXXXXXXXXXXXXXXXXXXXX	
4.668 - 5.936	21	16.8%	XXXXXXXXXXXXXXXXXXXXXXXXXXXX	
5.937 - 7.205	14	11.2%	XXXXXXXXXXXXXXXXXXXX	
7.206 - 8.475	12	9.6%	XXXXXXXXXXXX	
8.476 - 9.744	6	4.8%	XXXXXX	
9.745 - 11.013	3	2.4%	XXX	
11.014 - 12.282	3	2.4%	XXX	
12.283 - 13.551	0	0.0%		
13.552 - 14.820	0	0.0%	X	

=====

VALUES SUBJECTS	
BELOW RANGE :	0 0
BEYOND RANGE:	0 0
WITHIN RANGE:	112 125
NO.OF S:	125.000 SUMX: 656.170 MEDIAN <= 4.550
MINIMUM:	0.860 MAXIMUM: 14.820 VALUESPAN: 13.960
MODE:	4.440 FREQUENCY: 3.000 NO.OF VALUES: 112
MEAN:	5.249 ST.DEV.: 2.412 ST.ERR.MEAN: 0.216
SKEWNESS:	1.099 KURTOSIS: 1.389 GINI-INDEX: 0.247

VARIABLE-FIELD: 75- 79 LOG B-PB
 1 SUBJECTS EXCLUDED DUE TO UNPERMITTED VALUES
 LOWER RANGE LIMIT : -0.140
 UPPER RANGE LIMIT : 2.690
 NUMBER OF CUTS : 10

VALUE INTERVAL	FREQ.	PROS.	ONE X REPRESENTS	1 SUBJECTS
-0.140 - 0.117	1	0.8%	X	
0.118 - 0.375	0	0.0%	X	
0.376 - 0.632	3	2.4%	XXX	
0.633 - 0.889	3	2.4%	XXX	
0.890 - 1.146	12	9.6%	XXXXXXXXXXXX	
1.147 - 1.404	28	22.4%	XXXXXXXXXXXXXXXXXXXXXXXXXXXX	
1.405 - 1.661	29	23.2%	XXXXXXXXXXXXXXXXXXXXXXXXXXXX	
1.662 - 1.918	19	15.2%	XXXXXXXXXXXXXXXXXXXX	
1.919 - 2.175	21	16.8%	XXXXXXXXXXXXXXXXXXXX	
2.176 - 2.433	6	4.8%	XXXXXX	
2.434 - 2.690	2	1.6%	XX	

=====

VALUES SUBJECTS	
BELOW RANGE :	0 0
BEYOND RANGE:	0 0
WITHIN RANGE:	85 125
NO.OF S:	125.000 SUMX: 194.170 MEDIAN <= 1.510
MINIMUM:	-0.140 MAXIMUM: 2.690 VALUESPAN: 2.830
MODE:	1.490 FREQUENCY: 4.000 NO.OF VALUES: 85
MEAN:	1.553 ST.DEV.: 0.458 ST.ERR.MEAN: 0.041
SKEWNESS:	-0.263 KURTOSIS: 0.661 GINI-INDEX: 0.164

Table IV-6: Frequency distributions of blood lead (in $\mu\text{g}/100\text{ ml}$)*, standardized for hematocrit for Holmestrand.

The upper figure represents the data without logarithmic transformations. The lower figure represents the data with natural logarithmic transformations.

Additional statistics accompany each set.

*Pb-B ($\mu\text{g}/\text{dl}$) = Pb-B ($\mu\text{moles}/\text{l}$) \times 20.72.

VARIABLE-FIELD: 62- 66 CPB2					
3 SUBJECTS EXCLUDED DUE TO UNPERMITTED VALUES					
LOWER RANGE LIMIT :		1.260			
UPPER RANGE LIMIT :		31.080			
NUMBER OF CUTS :		10			
VALUE INTERVAL	FREQ.	PROS.	ONE X REPRESENTS	2 SUBJECTS	
1.260 - 3.971	13	7.3%	XXXXXXX		
3.972 - 6.682	50	28.1%	XXXXXXXXXXXXXXXXXXXXXXXXXXXX		
6.683 - 9.393	61	34.3%	XXXXXXXXXXXXXXXXXXXXXXXXXXXX		
9.394 - 12.104	30	16.9%	XXXXXXXXXXXXXXXXXX		
12.105 - 14.815	17	9.6%	XXXXXXXXXX		
14.816 - 17.525	5	2.8%	XXX		
17.526 - 20.236	0	0.0%			
20.237 - 22.947	1	0.6%	X		
22.948 - 25.658	0	0.0%			
25.659 - 28.369	0	0.0%			
28.370 - 31.080	0	0.0%	X		
=====					
VALUES SUBJECTS					
BELOW RANGE :	0	0			
BEYOND RANGE:	0	0			
WITHIN RANGE:	149	178			
NO. OF S:	178.000	SUMX:	1466.390	MEDIAN <=	7.540
MINIMUM:	1.260	MAXIMUM:	31.080	VALUESPAN:	29.820
MODE:	4.660	FREQUENCY:	3.000	NO. OF VALUES:	149
MEAN:	8.238	ST. DEV.:	3.735	ST. ERR. MEAN:	0.280
SKWNESS:	1.765	KURTOSIS:	7.300	GINI-INDEX:	0.235
=====					
VARIABLE-FIELD: 75- 79 LOG B-PB					
3 SUBJECTS EXCLUDED DUE TO UNPERMITTED VALUES					
LOWER RANGE LIMIT :		0.230			
UPPER RANGE LIMIT :		3.430			
NUMBER OF CUTS :		10			
VALUE INTERVAL	FREQ.	PROS.	ONE X REPRESENTS	2 SUBJECTS	
0.230 - 0.521	1	0.6%	X		
0.522 - 0.812	0	0.0%			
0.813 - 1.103	4	2.2%	XX		
1.104 - 1.394	9	5.1%	XXXXX		
1.395 - 1.685	23	12.9%	XXXXXXXXXXXX		
1.686 - 1.975	43	24.2%	XXXXXXXXXXXXXXXXXXXX		
1.976 - 2.266	47	26.4%	XXXXXXXXXXXXXXXXXXXX		
2.267 - 2.557	33	18.5%	XXXXXXXXXXXXXXXXXXXX		
2.558 - 2.848	16	9.0%	XXXXXXXXXX		
2.849 - 3.139	1	0.6%	X		
3.140 - 3.430	0	0.0%	X		
=====					
VALUES SUBJECTS					
BELOW RANGE :	0	0			
BEYOND RANGE:	0	0			
WITHIN RANGE:	103	178			
NO. OF S:	178.000	SUMX:	357.670	MEDIAN <=	2.020
MINIMUM:	0.230	MAXIMUM:	3.430	VALUESPAN:	3.200
MODE:	1.970	FREQUENCY:	7.000	NO. OF VALUES:	103
MEAN:	2.009	ST. DEV.:	0.446	ST. ERR. MEAN:	0.033
SKWNESS:	-0.383	KURTOSIS:	1.152	GINI-INDEX:	0.122

APPENDIX V

Results of the analyses of hematocrit

Table V-1: Frequency distributions of hematocrit with relevant statistics:

a) both towns; b) Sørumsand; c) Holmestrand.

a)

VALUE INTERVAL	FREQ.	PROS.	ONE X REPRESENTS	2 SUBJECTS
28.000 - 30.273	1	0.3%	X	
30.274 - 32.545	3	1.0%	XX	
32.546 - 34.818	5	1.6%	XXX	
34.819 - 37.091	32	10.4%	XXXXXXXXXXXXXXXXXXXX	
37.092 - 39.364	45	14.7%	XXXXXXXXXXXXXXXXXXXXXXXXXXXX	
39.365 - 41.636	55	17.9%	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
41.637 - 43.909	61	19.9%	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
43.910 - 46.182	61	19.9%	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
46.183 - 48.455	26	8.5%	XXXXXXXXXXXXXXXXXXXX	
48.456 - 50.727	14	4.6%	XXXXXXXXXX	
50.728 - 53.000	3	1.0%	XX	

VALUES SUBJECTS					
BELOW RANGE :	0	0			
BEYOND RANGE:	0	0			
WITHIN RANGE:	46	307			
NO. OF S:	307.000	SUMX:	12884.500	MEDIAN <=	42.000
MINIMUM:	28.000	MAXIMUM:	53.000	VALUESPAN:	25.000
MODE:	43.000	FREQUENCY:	26.000	NO. OF VALUES:	46
MEAN:	41.969	ST. DEV.:	4.157	ST. ERR. MEAN:	0.237
SKEWNESS:	-0.103	KURTOSIS:	-0.106	GINI-INDEX:	0.056

b)

VALUE INTERVAL	FREQ.	PROS.	ONE X REPRESENTS	1 SUBJECTS
28.000 - 30.000	1	0.8%	X	
30.001 - 32.000	1	0.8%	X	
32.001 - 34.000	3	2.4%	XXX	
34.001 - 36.000	8	6.3%	XXXXXXXXXX	
36.001 - 38.000	11	8.7%	XXXXXXXXXXXX	
38.001 - 40.000	24	19.0%	XXXXXXXXXXXXXXXXXXXXXXXXXXXX	
40.001 - 42.000	21	16.7%	XXXXXXXXXXXXXXXXXXXXXXXXXXXX	
42.001 - 44.000	26	20.6%	XXXXXXXXXXXXXXXXXXXXXXXXXXXX	
44.001 - 46.000	11	8.7%	XXXXXXXXXXXX	
46.001 - 48.000	15	11.9%	XXXXXXXXXXXXXXXXXXXX	
48.001 - 50.000	3	2.4%	XXX	

VALUES SUBJECTS					
BELOW RANGE :	0	0			
BEYOND RANGE:	0	0			
WITHIN RANGE:	34	126			
NO. OF S:	126.000	SUMX:	5161.300	MEDIAN <=	41.000
MINIMUM:	28.000	MAXIMUM:	50.000	VALUESPAN:	22.000
MODE:	38.000	FREQUENCY:	10.000	NO. OF VALUES:	34
MEAN:	40.963	ST. DEV.:	4.121	ST. ERR. MEAN:	0.367
SKEWNESS:	-0.227	KURTOSIS:	0.013	GINI-INDEX:	0.056

c)

VALUE INTERVAL	FREQ.	PROS.	ONE X REPRESENTS	1 SUBJECTS
32.000 - 33.909	1	0.6%	X	
33.910 - 35.818	8	4.4%	XXXXXXXXXX	
35.819 - 37.727	10	5.5%	XXXXXXXXXXXX	
37.728 - 39.636	21	11.6%	XXXXXXXXXXXXXXXXXXXXXXXXXXXX	
39.637 - 41.545	32	17.7%	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
41.546 - 43.455	30	16.6%	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
43.456 - 45.364	34	18.8%	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
45.365 - 47.273	22	12.2%	XXXXXXXXXXXXXXXXXXXXXXXXXXXX	
47.274 - 49.182	15	8.3%	XXXXXXXXXXXXXXXXXXXX	
49.183 - 51.091	6	3.3%	XXXXXXX	
51.092 - 53.000	1	0.6%	X	

VALUES SUBJECTS					
BELOW RANGE :	0	0			
BEYOND RANGE:	0	0			
WITHIN RANGE:	39	181			
NO. OF S:	181.000	SUMX:	7723.200	MEDIAN <=	43.000
MINIMUM:	32.000	MAXIMUM:	53.000	VALUESPAN:	21.000
MODE:	40.000	FREQUENCY:	17.000	NO. OF VALUES:	39
MEAN:	42.670	ST. DEV.:	4.047	ST. ERR. MEAN:	0.301
SKEWNESS:	-0.000	KURTOSIS:	-0.374	GINI-INDEX:	0.054

Table V-2: Means and standard deviations of hematocrit by age group
(0 = 0-9 yrs, 1 = 10-19 yrs, 2 = 20-29 yrs etc.) in:

a) Sørumsand-males; b) Sørumsand-females;
c) Holmestrand-males; d) Holmestrand-females.

		NUMBER OF SUBJECTS				MEAN-VALUE	STANDARD-DEVIATION	STANDARD-ERROR OF THE MEAN	
		COUNTED	LEFTOUT	SUM	MINIMUM	MAXIMUM			
a)	0	8.	0.	301.500	33.000	41.500	37.687	2.698	0.954
	1	9.	0.	370.000	37.500	46.000	41.111	2.815	0.938
	2	3.	0.	131.000	41.000	46.000	43.667	2.517	1.453
	3	16.	0.	720.000	39.000	50.000	45.000	3.157	0.789
	4	4.	0.	179.500	42.500	47.000	44.875	2.016	1.008
	5	3.	0.	122.000	33.000	45.000	40.667	6.658	3.844
	6	3.	0.	127.500	41.500	43.000	42.500	0.866	0.500
	7	2.	0.	78.000	35.000	43.000	39.000	5.657	4.000
	8	2.	0.	81.000	34.000	47.000	40.500	9.192	6.500
TOTAL		50.	0.	2110.500	33.000	50.000	42.210	4.197	0.594
ANALYSIS OF VARIANCE FOR 9 GROUPS									
BETWEEN SUM OF SQUARES =				367.6665	VARIANCE =		45.9583	NDF =	8
WITHIN SUM OF SQUARES =				495.3785	VARIANCE =		12.0824	NDF =	41
TOTAL SUM OF SQUARES =				863.0450	VARIANCE =		17.6132	NDF =	49
F-VALUE =				3.804	PROBABILITY = 0.00203 **				

		NUMBER OF SUBJECTS				MEAN-VALUE	STANDARD-DEVIATION	STANDARD-ERROR OF THE MEAN	
		COUNTED	LEFTOUT	SUM	MINIMUM	MAXIMUM			
b)	0	7.	0.	270.000	35.000	41.000	38.571	2.353	0.889
	1	8.	0.	330.300	38.500	47.800	41.287	3.388	1.198
	2	5.	0.	195.500	28.000	43.000	39.100	6.329	2.830
	3	24.	0.	937.000	32.000	46.500	39.042	3.572	0.729
	4	18.	0.	736.500	35.500	46.000	40.917	2.675	0.630
	5	6.	0.	256.500	37.000	47.500	42.750	4.688	1.914
	6	3.	0.	128.500	37.000	49.000	42.833	6.007	3.468
	7	2.	0.	84.000	39.000	45.000	42.000	4.243	3.000
	8	2.	0.	81.500	38.000	43.500	40.750	3.889	2.750
	9	1.	0.	31.000	31.000	31.000	31.000	0.000	0.000
TOTAL		76.	0.	3050.800	28.000	49.000	40.142	3.883	0.445
ANALYSIS OF VARIANCE FOR 10 GROUPS									
BETWEEN SUM OF SQUARES =				226.8123	VARIANCE =		25.2014	NDF =	9
WITHIN SUM OF SQUARES =				903.9930	VARIANCE =		13.6969	NDF =	66
TOTAL SUM OF SQUARES =				1130.8053	VARIANCE =		15.0774	NDF =	75
F-VALUE =				1.840	PROBABILITY = 0.07728				

Table V-2 cont.

Mean values \pm standard deviations for the four groups are thus:

Sørumsand : Males : 42.210 \pm 4.197
 Females : 40.142 \pm 3.883

Holmestrand : Males : 44.283 \pm 4.186
 Females : 41.676 \pm 3.634

c)

	NUMBER OF SUBJECTS		SUM	MINIMUM	MAXIMUM	MEAN-VALUE	STANDARD-DEVIATION	STANDARD ERROR OF THE MEAN
	COUNTED	LEFTOUT						
0	2.	0.	71.000	35.000	36.000	35.500	0.707	0.500
1	11.	0.	449.500	34.000	48.000	40.864	3.829	1.154
2	6.	0.	282.500	40.000	51.000	47.083	4.271	1.744
3	10.	0.	450.000	43.000	50.500	45.000	2.134	0.675
4	9.	0.	409.500	40.000	49.000	45.500	3.544	1.181
5	4.	0.	190.000	43.500	53.000	47.500	4.223	2.111
6	18.	0.	817.000	39.000	52.000	45.389	2.968	0.700
7	6.	0.	272.000	40.000	49.000	45.333	3.559	1.453
8	3.	0.	114.000	36.000	40.000	38.000	2.000	1.155
TOTAL	69.	0.	3055.500	34.000	53.000	44.283	4.186	0.504

ANALYSIS OF VARIANCE FOR 9 GROUPS

BETWEEN SUM OF SQUARES =	536.8741	VARIANCE =	67.1093	NDF =	8
WITHIN SUM OF SQUARES =	654.4049	VARIANCE =	10.9067	NDF =	60
TOTAL SUM OF SQUARES =	1191.2791	VARIANCE =	17.5188	NDF =	68
F-VALUE =	6.153	PROBABILITY =	0.00001	***	

d)

	NUMBER OF SUBJECTS		SUM	MINIMUM	MAXIMUM	MEAN-VALUE	STANDARD-DEVIATION	STANDARD ERROR OF THE MEAN
	COUNTED	LEFTOUT						
0	4.	0.	150.000	36.000	39.000	37.500	1.472	0.736
1	12.	0.	476.200	37.000	43.000	39.683	1.951	0.563
2	10.	0.	412.000	38.000	46.000	41.200	2.497	0.790
3	15.	0.	632.000	37.500	50.000	42.133	3.425	0.884
4	17.	0.	713.500	35.000	47.000	41.971	3.262	0.791
5	10.	0.	428.500	37.000	48.000	42.850	3.198	1.011
6	19.	0.	822.000	35.500	51.000	43.263	3.758	0.862
7	7.	0.	293.500	37.000	45.000	41.929	2.978	1.126
8	16.	0.	648.000	32.000	49.000	40.500	5.046	1.262
9	2.	0.	92.000	46.000	46.000	46.000	0.000	0.000
TOTAL	112.	0.	4667.700	32.000	51.000	41.676	3.634	0.343

ANALYSIS OF VARIANCE FOR 10 GROUPS

BETWEEN SUM OF SQUARES =	245.8965	VARIANCE =	27.3218	NDF =	9
WITHIN SUM OF SQUARES =	1220.3486	VARIANCE =	11.9642	NDF =	102
TOTAL SUM OF SQUARES =	1466.2451	VARIANCE =	13.2094	NDF =	111
F-VALUE =	2.284	PROBABILITY =	0.02237	*	

Table V-3: Means and standard deviations of hematocrits in children exposed to passive smoking and unexposed children:

a) Holmestrand; b) Sørumsand.

		NUMBER OF SUBJECTS					MEAN-	STANDARD-	ERROR OF
		COUNTED	LEFTOUT	SUM	MINIMUM	MAXIMUM	VALUE	DEVIATION	THE MEAN
0	NO	12.	0.	468.500	34.000	42.500	39.042	2.583	0.746
1	YES	14.	0.	544.200	35.000	43.000	38.871	2.451	0.655
		1.	0.	45.000	45.000	45.000	45.000	0.000	0.000
TOTAL		27.	0.	1057.700	34.000	45.000	39.174	2.681	0.516
ANALYSIS OF VARIANCE FOR 3 GROUPS									
BETWEEN SUM OF SQUARES =				35.4341	VARIANCE =		17.7171	NDF =	2
WITHIN SUM OF SQUARES =				151.4977	VARIANCE =		6.3124	NDF =	24
TOTAL SUM OF SQUARES =				186.9319	VARIANCE =		7.1897	NDF =	26
F-VALUE =				2.807	PROBABILITY =		0.08029		

		NUMBER OF SUBJECTS					MEAN-	STANDARD-	ERROR OF
		COUNTED	LEFTOUT	SUM	MINIMUM	MAXIMUM	VALUE	DEVIATION	THE MEAN
0	NO	24.	0.	936.500	33.000	45.000	39.021	2.764	0.564
1	YES	4.	0.	160.000	38.500	42.500	40.000	1.780	0.890
TOTAL		28.	0.	1096.500	33.000	45.000	39.161	2.642	0.499
ANALYSIS OF VARIANCE FOR 2 GROUPS									
BETWEEN SUM OF SQUARES =				3.2872	VARIANCE =		3.2872	NDF =	1
WITHIN SUM OF SQUARES =				185.2396	VARIANCE =		7.1246	NDF =	26
TOTAL SUM OF SQUARES =				188.5268	VARIANCE =		6.9825	NDF =	27
F-VALUE =				0.461	PROBABILITY =		0.50287		

Table V-4: Means and standard deviations of hematocrit as a function of smoking in:

a) Holmestrand-males; b) Holmestrand-females;
c) Sørumsand-males; d) Sørumsand-females.

		NUMBER OF SUBJECTS		SUM	MINIMUM	MAXIMUM	MEAN-VALUE	STANDARD-DEVIATION	STANDARD ERROR OF THE MEAN
		COUNTED	LEFTOUT						
d)	0 NEVER	12.	0.	543.500	40.000	53.000	45.292	3.805	1.098
	1 PREV	18.	0.	803.500	36.000	52.000	44.639	4.126	0.973
	3 SMOKE	27.	0.	1236.000	39.000	51.000	45.778	3.111	0.599
	TOTAL	57.	0.	2583.000	36.000	53.000	45.316	3.572	0.473
	ANALYSIS OF VARIANCE FOR 3 GROUPS								
BETWEEN SUM OF SQUARES =				14.0172	VARIANCE =		7.0086	NDF =	2
WITHIN SUM OF SQUARES =				700.2986	VARIANCE =		12.9685	NDF =	54
TOTAL SUM OF SQUARES =				714.3158	VARIANCE =		12.7556	NDF =	56
F-VALUE =				0.540	PROBABILITY =		0.58561		
=====									
		NUMBER OF SUBJECTS		SUM	MINIMUM	MAXIMUM	MEAN-VALUE	STANDARD-DEVIATION	STANDARD ERROR OF THE MEAN
		COUNTED	LEFTOUT						
b)	0 NEVER	46.	0.	1902.500	32.000	47.000	41.359	3.722	0.549
	1 PREV	15.	0.	647.500	38.000	51.000	43.167	3.534	0.912
	2 OCCAS	3.	0.	136.500	41.000	49.000	45.500	4.093	2.363
	3 SMOKE	32.	0.	1348.000	35.000	50.000	42.125	3.317	0.586
			1.	0.	48.000	48.000	48.000	48.000	0.000
TOTAL	97.	0.	4082.500	32.000	51.000	42.088	3.658	0.371	
ANALYSIS OF VARIANCE FOR 5 GROUPS									
BETWEEN SUM OF SQUARES =				111.8401	VARIANCE =		27.9600	NDF =	4
WITHIN SUM OF SQUARES =				1172.6649	VARIANCE =		12.7464	NDF =	92
TOTAL SUM OF SQUARES =				1284.5050	VARIANCE =		13.3803	NDF =	96
F-VALUE =				2.194	PROBABILITY =		0.07578		
=====									
		NUMBER OF SUBJECTS		SUM	MINIMUM	MAXIMUM	MEAN-VALUE	STANDARD-DEVIATION	STANDARD ERROR OF THE MEAN
		COUNTED	LEFTOUT						
c)	0 NEVER	8.	0.	348.500	33.000	50.000	43.562	4.880	1.725
	1 PREV	8.	0.	349.500	39.000	47.000	43.687	2.604	0.921
	2 OCCAS	4.	0.	180.000	42.000	48.000	45.000	2.582	1.291
	3 SMOKE	13.	0.	566.000	34.000	50.000	43.538	4.715	1.308
			2.	0.	83.000	41.000	42.000	41.500	0.707
TOTAL	35.	0.	1527.000	33.000	50.000	43.629	3.904	0.660	
ANALYSIS OF VARIANCE FOR 5 GROUPS									
BETWEEN SUM OF SQUARES =				16.7531	VARIANCE =		4.1883	NDF =	4
WITHIN SUM OF SQUARES =				501.4183	VARIANCE =		16.7139	NDF =	30
TOTAL SUM OF SQUARES =				518.1714	VARIANCE =		15.2403	NDF =	34
F-VALUE =				0.251	PROBABILITY =		0.90702		
=====									
		NUMBER OF SUBJECTS		SUM	MINIMUM	MAXIMUM	MEAN-VALUE	STANDARD-DEVIATION	STANDARD ERROR OF THE MEAN
		COUNTED	LEFTOUT						
d)	0 NEVER	25.	0.	1002.800	31.000	47.800	40.112	4.146	0.829
	1 PREV	18.	0.	717.000	34.500	49.000	39.833	3.769	0.888
	2 OCCAS	8.	0.	336.000	35.500	47.500	42.000	3.505	1.239
	3 SMOKE	9.	0.	364.000	28.000	47.000	40.444	5.763	1.921
			3.	0.	118.000	38.000	42.000	39.333	2.309
TOTAL	63.	0.	2537.800	28.000	49.000	40.283	4.110	0.518	
ANALYSIS OF VARIANCE FOR 5 GROUPS									
BETWEEN SUM OF SQUARES =				30.8955	VARIANCE =		7.7239	NDF =	4
WITHIN SUM OF SQUARES =				1016.4153	VARIANCE =		17.5244	NDF =	58
TOTAL SUM OF SQUARES =				1047.3109	VARIANCE =		16.8921	NDF =	62
F-VALUE =				0.441	PROBABILITY =		0.77863		

Table V-5: Multiple regression of:

Hematocrit versus logarithm of blood lead, smoking, sex and social class in adults living in Holmestrand and Sørumsand.

Results: 1) There is a significant correlation of sex with hematocrit with females having the lower value.

2) There is no significant correlation of any of the other variables.

Further similar multiple regressions on each subject - males and females - led to no significant results.

F-EXCL : 3.90000 F-INCL : 4.00000 TOL : 0.01000 N-STEPS: 10
NUMBER OF SUBJECTS INCLUDED IN THE ANALYSIS 251

VAR NR.	MEAN	STANDARD DEVIATION	VARIABLE NAME
9 - 12	42.5709	4.1855	HEMATOCRIT
75 - 79	1.8109	0.4992	LOG B-PB
94 - 94	1.6813	2.4401	SMOKING HABITS
8 - 8	1.6335	0.4828	SEX
35 - 35	3.3267	2.4813	SOCIAL CLASS

DETERMINANT VALUE : 0.7198

THE STEPWISE REGRESSION

STEP NUMBER : 1

VARIABLE ENTERED : 8 SEX

MULTIPLE R : 0.3830

RESIDUAL STD.ERROR: 3.8742

VARIANCE TABLE

	REGRESSION	RESIDUAL
DEGREES OF FREEDOM:	1	249
SUM OF SQUARES :	642.3	3737.3
MEAN SQUARE :	642.3	15.0
F-RATIO :	42.8	PROB= 0.000

VARIABLES IN EQUATION :			(CONSTANT= 47.9937)				I				VARIABLES NOT IN EQUATION :		
ID	B - COEFFICIENT	STD.ERROR	F TO REMOVE	P-VALUES FOR B	STANDARDIZED B (R.PART)	BETA UPPER	95% CONF. LOWER	INT. I	ID	PARTIAL CORR.	TOLERANCE	F TO ENTER	
8	-3.320	0.507	42.794	0.000	-0.3830	-2.3204	-4.3193	I	75	-0.0071	0.9053	0.0125	
								I	94	0.0159	0.9901	0.0624	
								I	35	-0.0350	0.9930	0.3048	

* * * * F-LEVELS (4.000 , 3.900) OR TOLERANCE INSUFFICIENT FOR FURTHER STEPPING

SUMMARY TABLE :

STEP NR.	MULT.R	MULT.RSQ	INCREASE IN RSQ	RESIDUAL EFFECT	F-VALUE FOR E/I	VAR. NR ENTER	VAR. NR REMOVED	VAR. NAME
1	0.3830	0.1467	0.1467	0.9238	42.794	8		SEX

APPENDIX VI

Results of the analyses of standardized zinc protoporphyrin.
Zinc protoporphyrin was standardized by:

$$\text{CZPP} = \frac{\text{ZPP} \times 45.0}{\text{Ht}}$$

CZPP = standardized zinc protoporphyrin

ZPP = unstandardized zinc protoporphyrin

Ht = hematocrit

See page 7 for a commentary on the use of means and standard deviations.

Table VI-1: Frequency distributions of zinc protoporphyrin, standardized for hematocrit with relevant statistics:

a) both towns; b) Sørumsand; c) Holmestrand.

	VALUE INTERVAL	FREQ.	PROS.	ONE X REPRESENTS	3 SUBJECTS	
a)	0.093 - 0.221	24	7.8%	XXXXXXXX		
	0.222 - 0.349	108	35.3%	XX		
	0.350 - 0.477	87	28.4%	XX		
	0.478 - 0.605	49	16.0%	XXXXXXXXXXXXXXXXXXXXXXXXXXXX		
	0.606 - 0.733	21	6.9%	XXXXXXXX		
	0.734 - 0.860	7	2.3%	XXX		
	0.861 - 0.988	3	1.0%	X		
	0.989 - 1.116	2	0.7%	X		
	1.117 - 1.244	1	0.3%	X		
	1.245 - 1.372	0	0.0%			
	1.373 - 1.500	3	1.0%	X		
=====						
	VALUES	SUBJECTS				
	BELOW RANGE :	0	0			
	BEYOND RANGE:	0	0			
	WITHIN RANGE:	209	306			
	NO.OF S :	306.000	SUMX:	127.741	MEDIAN <=	0.369
	MINIMUM:	0.093	MAXIMUM:	1.500	VALUESPAN:	1.407
	MODE:	0.450	FREQUENCY:	8.000	NO.OF VALUES:	209
	MEAN:	0.417	ST.DEV.:	0.205	ST.ERR.MEAN:	0.012
	SKEWNESS:	2.200	KURTOSIS:	7.508	GINI-INDEX:	0.242
=====						
	VALUE INTERVAL	FREQ.	PROS.	ONE X REPRESENTS	2 SUBJECTS	
b)	0.133 - 0.253	23	18.4%	XXXXXXXXXXXX		
	0.254 - 0.373	56	44.8%	XX		
	0.374 - 0.493	25	20.0%	XXXXXXXXXXXX		
	0.494 - 0.613	12	9.6%	XXXXXX		
	0.614 - 0.733	5	4.0%	XXX		
	0.734 - 0.852	0	0.0%	X		
	0.853 - 0.972	1	0.8%	X		
	0.973 - 1.092	0	0.0%	X		
	1.093 - 1.212	1	0.8%	X		
	1.213 - 1.332	0	0.0%			
	1.333 - 1.452	1	0.8%	X		
=====						
	VALUES	SUBJECTS				
	BELOW RANGE :	0	0			
	BEYOND RANGE:	0	0			
	WITHIN RANGE:	106	125			
	NO.OF S :	125.000	SUMX:	47.547	MEDIAN <=	0.341
	MINIMUM:	0.133	MAXIMUM:	1.452	VALUESPAN:	1.319
	MODE:	0.450	FREQUENCY:	6.000	NO.OF VALUES:	106
	MEAN:	0.380	ST.DEV.:	0.199	ST.ERR.MEAN:	0.018
	SKEWNESS:	2.994	KURTOSIS:	12.217	GINI-INDEX:	0.236
=====						
	VALUE INTERVAL	FREQ.	PROS.	ONE X REPRESENTS	2 SUBJECTS	
c)	0.093 - 0.221	11	6.1%	XXXXXX		
	0.222 - 0.349	54	29.8%	XX		
	0.350 - 0.477	52	28.7%	XX		
	0.478 - 0.605	35	19.3%	XXXXXXXXXXXXXXXXXXXXXXXXXXXX		
	0.606 - 0.733	16	8.8%	XXXXXXXX		
	0.734 - 0.860	7	3.9%	XXXX		
	0.861 - 0.988	2	1.1%	X		
	0.989 - 1.116	2	1.1%	X		
	1.117 - 1.244	0	0.0%			
	1.245 - 1.372	0	0.0%			
	1.373 - 1.500	1	0.6%	X		
=====						
	NO.OF S :	181.000	SUMX:	80.194	MEDIAN <=	0.394
	MINIMUM:	0.093	MAXIMUM:	1.500	VALUESPAN:	1.407
	MODE:	0.345	FREQUENCY:	4.000	NO.OF VALUES:	146
	MEAN:	0.443	ST.DEV.:	0.206	ST.ERR.MEAN:	0.015
	SKEWNESS:	1.806	KURTOSIS:	5.678	GINI-INDEX:	0.237

Table VI-2: Frequency distribution of the logarithm of zinc protoporphyrin standardized for hematocrit with relevant statistics for both towns combined.

```

VARIABLE-FIELD: 100- 104 LOGCZPP
      1 SUBJECTS EXCLUDED DUE TO UNPERMITTED VALUES
LOWER RANGE LIMIT : -2.370
UPPER RANGE LIMIT :  0.400
NUMBER OF CUTS    :    10
      VALUE INTERVAL      FREQ.  PROS.  ONE X REPRESENTS  2 SUBJECTS
=====
-2.370 - -2.118         1   0.3%  X
-2.117 - -1.866         2   0.7%  X
-1.865 - -1.615        13   4.2%  XXXXXXXX
-1.614 - -1.363        34  11.1%  XXXXXXXXXXXXXXXXXXXX
-1.362 - -1.111        61  19.9%  XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
-1.110 - -0.859        76  24.8%  XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
-0.858 - -0.607        63  20.6%  XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
-0.606 - -0.355        37  12.1%  XXXXXXXXXXXXXXXXXXXXXXXX
-0.354 - -0.104         9   2.9%  XXXXX
-0.103 -  0.148         6   2.0%  XXX
 0.149 -  0.400         3   1.0%  XX
=====
VALUES SUBJECTS
BELOW RANGE :      0      0
BEYOND RANGE:      0      0
WITHIN RANGE:    134    306
NO. OF S:      306.000    SUMX:      -294.940    MEDIAN <=      -0.990
MINIMUM:      -2.370    MAXIMUM:      0.400    VALUESPAN:      2.770
MODE:         -0.790    FREQUENCY:      8.000    NO. OF VALUES:      134
MEAN:         -0.964    ST.DEV.:      0.426    ST.ERR.MEAN:      0.024
SKEWNESS:      0.280    KURTOSIS:      0.629    GINI-INDEX:      -0.245

```

Table VI-3: Means and standard deviation of zinc protoporphyrin standardized for hematocrit by age group (0 = 0-9 yrs; 1 = 10-19 yrs; 2 = 20-29 yrs, etc.) in:

a) Sørumsand-males; b) Sørumsand-females;
c) Holmestrand-males; d) Holmestrand-females.

a)

NUMBER OF SUBJECTS		COUNTED	LEFTOUT	SUM	MINIMUM	MAXIMUM	MEAN-VALUE	STANDARD-DEVIATION	STANDARD ERROR OF THE MEAN
0	7.	1.		2.382	0.197	0.450	0.340	0.088	0.033
1	9.	0.		3.156	0.209	0.480	0.351	0.103	0.034
2	3.	0.		0.876	0.187	0.372	0.292	0.095	0.055
3	16.	0.		4.005	0.133	0.369	0.250	0.066	0.016
4	4.	0.		1.260	0.264	0.389	0.315	0.060	0.030
5	3.	0.		0.937	0.194	0.470	0.312	0.142	0.082
6	3.	0.		1.211	0.251	0.510	0.404	0.136	0.078
7	2.	0.		0.733	0.283	0.450	0.367	0.118	0.083
8	2.	0.		0.928	0.306	0.622	0.464	0.223	0.158
TOTAL	49.	1.		15.488	0.133	0.622	0.316	0.105	0.015

ANALYSIS OF VARIANCE FOR 9 GROUPS

BETWEEN SUM OF SQUARES =	0.1577	VARIANCE =	0.0197	NDF =	.8
WITHIN SUM OF SQUARES =	0.3665	VARIANCE =	0.0092	NDF =	40
TOTAL SUM OF SQUARES =	0.5242	VARIANCE =	0.0109	NDF =	48
F-VALUE =	2.152	PROBABILITY =	0.05290		

b)

NUMBER OF SUBJECTS		COUNTED	LEFTOUT	SUM	MINIMUM	MAXIMUM	MEAN-VALUE	STANDARD-DEVIATION	STANDARD ERROR OF THE MEAN
0	7.	0.		2.866	0.230	0.604	0.409	0.123	0.047
1	8.	0.		3.014	0.207	0.561	0.377	0.132	0.047
2	5.	0.		1.922	0.163	0.675	0.384	0.190	0.085
3	24.	0.		11.635	0.242	1.414	0.485	0.290	0.059
4	18.	0.		6.667	0.209	0.664	0.370	0.142	0.033
5	6.	0.		2.011	0.254	0.523	0.335	0.098	0.040
6	3.	0.		1.173	0.266	0.547	0.391	0.143	0.083
7	2.	0.		0.615	0.265	0.350	0.308	0.060	0.042
8	2.	0.		0.704	0.332	0.372	0.352	0.028	0.020
9	1.	0.		1.452	1.452	1.452	1.452	0.000	0.000
TOTAL	76.	0.		32.059	0.163	1.452	0.422	0.232	0.027

ANALYSIS OF VARIANCE FOR 10 GROUPS

BETWEEN SUM OF SQUARES =	1.3122	VARIANCE =	0.1458	NDF =	9
WITHIN SUM OF SQUARES =	2.7224	VARIANCE =	0.0412	NDF =	66
TOTAL SUM OF SQUARES =	4.0345	VARIANCE =	0.0538	NDF =	75
F-VALUE =	3.535	PROBABILITY =	0.00126	**	

Table VI-3: Cont.

Mean values \pm standard deviations for the four groups are thus:

Sørumsand : Males = 0.316 ± 0.105
 Females = 0.422 ± 0.232

Holmestrand: Males = 0.352 ± 0.135
 Females = 0.499 ± 0.221

	NUMBER OF SUBJECTS		SUM	MINIMUM	MAXIMUM	MEAN-VALUE	STANDARD-DEVIATION	STANDARD-ERROR OF THE MEAN
	COUNTED	LEFTOUT						
0	2.	0.	1.219	0.512	0.707	0.609	0.138	0.098
1	11.	0.	4.202	0.178	0.596	0.382	0.120	0.036
2	6.	0.	1.839	0.185	0.394	0.306	0.079	0.032
3	10.	0.	2.893	0.198	0.430	0.289	0.081	0.026
4	9.	0.	2.617	0.093	0.450	0.291	0.111	0.037
5	4.	0.	1.330	0.289	0.380	0.333	0.050	0.025
6	18.	0.	6.297	0.164	0.804	0.350	0.160	0.038
7	6.	0.	2.465	0.230	0.664	0.411	0.170	0.069
8	3.	0.	1.412	0.394	0.568	0.471	0.089	0.051
TOTAL	69.	0.	24.274	0.093	0.804	0.352	0.135	0.016
=====								
ANALYSIS OF VARIANCE FOR 9 GROUPS								
BETWEEN SUM OF SQUARES =			0.2926			VARIANCE =	0.0366	NDF = 8
WITHIN SUM OF SQUARES =			0.9520			VARIANCE =	0.0159	NDF = 60
TOTAL SUM OF SQUARES =			1.2446			VARIANCE =	0.0183	NDF = 68
F-VALUE =			2.305			PROBABILITY =	0.03164 *	

	NUMBER OF SUBJECTS		SUM	MINIMUM	MAXIMUM	MEAN-VALUE	STANDARD-DEVIATION	STANDARD-ERROR OF THE MEAN
	COUNTED	LEFTOUT						
0	4.	0.	1.979	0.381	0.617	0.495	0.104	0.052
1	12.	0.	5.752	0.257	0.676	0.479	0.146	0.042
2	10.	0.	4.276	0.137	0.571	0.428	0.137	0.043
3	15.	0.	6.917	0.160	0.984	0.461	0.201	0.052
4	17.	0.	8.707	0.266	1.414	0.512	0.267	0.065
5	10.	0.	4.513	0.202	0.824	0.451	0.189	0.060
6	19.	0.	8.065	0.168	0.990	0.424	0.199	0.046
7	7.	0.	5.435	0.419	1.500	0.776	0.368	0.139
8	16.	0.	9.542	0.354	0.969	0.596	0.186	0.046
9	2.	0.	0.734	0.362	0.372	0.367	0.007	0.005
TOTAL	112.	0.	55.920	0.137	1.500	0.499	0.221	0.021
=====								
ANALYSIS OF VARIANCE FOR 10 GROUPS								
BETWEEN SUM OF SQUARES =			0.9338			VARIANCE =	0.1038	NDF = 9
WITHIN SUM OF SQUARES =			4.5028			VARIANCE =	0.0441	NDF = 102
TOTAL SUM OF SQUARES =			5.4365			VARIANCE =	0.0490	NDF = 111
F-VALUE =			2.350			PROBABILITY =	0.01876 *	

Table VI-5: Means and standard deviation of zinc protoporphyrin standardized for hematocrit as a function of smoking in:

a) Sørumsand-males; b) Sørumsand-females;
c) Holmestrand-males; d) Holmestrand-females.

	NUMBER OF SUBJECTS		SUM	MINIMUM	MAXIMUM	MEAN-VALUE	STANDARD-DEVIATION	STANDARD ERROR OF THE MEAN
	COUNTED	LEFTOUT						
0 NEVER	8.	0.	2.107	0.194	0.352	0.263	0.054	0.019
1 PREV	8.	0.	2.900	0.251	0.510	0.362	0.102	0.036
2 OCCAS	4.	0.	1.142	0.178	0.389	0.285	0.090	0.045
3 SMOKE	13.	0.	3.907	0.133	0.622	0.301	0.128	0.036
	2.	0.	0.637	0.187	0.450	0.318	0.186	0.132
TOTAL	35.	0.	10.693	0.133	0.622	0.306	0.107	0.018
ANALYSIS OF VARIANCE FOR 5 GROUPS								
BETWEEN SUM OF SQUARES =			0.0424		VARIANCE =	0.0106	NDF =	4
WITHIN SUM OF SQUARES =			0.3499		VARIANCE =	0.0117	NDF =	30
TOTAL SUM OF SQUARES =			0.3923		VARIANCE =	0.0115	NDF =	34
F-VALUE =			0.910		PROBABILITY =	0.47078		

	NUMBER OF SUBJECTS		SUM	MINIMUM	MAXIMUM	MEAN-VALUE	STANDARD-DEVIATION	STANDARD ERROR OF THE MEAN
	COUNTED	LEFTOUT						
0 NEVER	25.	0.	11.262	0.163	1.452	0.450	0.323	0.065
1 PREV	18.	0.	6.978	0.214	0.913	0.388	0.168	0.039
2 OCCAS	8.	0.	3.081	0.265	0.664	0.385	0.124	0.044
3 SMOKE	9.	0.	4.114	0.209	1.125	0.457	0.287	0.096
	3.	0.	1.464	0.343	0.628	0.488	0.143	0.082
TOTAL	63.	0.	26.899	0.163	1.452	0.427	0.249	0.031
ANALYSIS OF VARIANCE FOR 5 GROUPS								
BETWEEN SUM OF SQUARES =			0.0750		VARIANCE =	0.0187	NDF =	4
WITHIN SUM OF SQUARES =			3.7808		VARIANCE =	0.0652	NDF =	58
TOTAL SUM OF SQUARES =			3.8558		VARIANCE =	0.0622	NDF =	62
F-VALUE =			0.288		PROBABILITY =	0.88489		

Table VI-5: Cont.

		N U M B E R O F S U B J E C T S C O U N T E D L E F T O U T		S U M	M I N I M U M	M A X I M U M	M E A N - V A L U E	S T A N D A R D - D E V I A T I O N	S T A N D A R D E R R O R O F T H E M E A N
c)	0 NEVER	12.	0.	3.571	0.178	0.394	0.298	0.060	0.017
	1 PREV	18.	0.	6.372	0.093	0.664	0.354	0.164	0.039
	3 SMOKE	27.	0.	9.088	0.169	0.804	0.337	0.129	0.025
TOTAL		57.	0.	19.031	0.093	0.804	0.334	0.130	0.017
ANALYSIS OF VARIANCE FOR 3 GROUPS									
	BETWEEN SUM OF SQUARES =			0.0233		VARIANCE =	0.0116	NDF =	2
	WITHIN SUM OF SQUARES =			0.9282		VARIANCE =	0.0172	NDF =	54
	TOTAL SUM OF SQUARES =			0.9515		VARIANCE =	0.0170	NDF =	56
	F-VALUE =			0.678		PROBABILITY =	0.51208		

		N U M B E R O F S U B J E C T S C O U N T E D L E F T O U T		S U M	M I N I M U M	M A X I M U M	M E A N - V A L U E	S T A N D A R D - D E V I A T I O N	S T A N D A R D E R R O R O F T H E M E A N
d)	0 NEVER	46.	0.	25.389	0.263	1.500	0.552	0.238	0.035
	1 PREV	15.	0.	7.067	0.168	0.990	0.471	0.235	0.061
	2 OCCAS	3.	0.	1.294	0.310	0.571	0.431	0.131	0.076
	3 SMOKE	32.	0.	14.526	0.137	1.414	0.454	0.225	0.040
		1.	0.	0.319	0.319	0.319	0.319	0.000	0.000
TOTAL		97.	0.	48.595	0.137	1.500	0.501	0.232	0.024
ANALYSIS OF VARIANCE FOR 5 GROUPS									
	BETWEEN SUM OF SQUARES =			0.2513		VARIANCE =	0.0628	NDF =	4
	WITHIN SUM OF SQUARES =			4.9231		VARIANCE =	0.0535	NDF =	92
	TOTAL SUM OF SQUARES =			5.1744		VARIANCE =	0.0539	NDF =	96
	F-VALUE =			1.174		PROBABILITY =	0.32751		

Table VI-6: Multiple regression of:

the logarithm of standardized zinc protoporphyrin versus logarithm of blood lead, passive smoking, and hematocrit in children living in Holmestrand and Sørumsand.

Results: 1) There is a significant negative correlation of hematocrit with zinc protoporphyrin.

2) No other variables have a significant correlation.

```

IF-EXCL : 3.90000 F-INCL : 4.00000 TOL : 0.01000 N-STEPS: 10
NUMBER OF SUBJECTS INCLUDED IN THE ANALYSIS 51
DETERMINANT VALUE : 0.4697
THE STEPWISE REGRESSION
STEP NUMBER : 1
VARIABLE ENTERED : 9 HEMATOCRIT
MULTIPLE R : 0.3211
RESIDUAL STD.ERROR: 0.3043
VARIANCE TABLE
      REGRESSION   RESIDUAL
DEGREES OF FREEDOM:      1       49
SUM OF SQUARES :      0.5       4.5
MEAN SQUARE :      0.5       0.1
F-RATIO :      5.6   PROB= 0.022
-----
VARIABLES IN EQUATION :      (CONSTANT= 0.7122)      I   VARIABLES NOT IN EQUATION :
      B -
      ID COEFFICIENT STD.ERROR   F TO   P-VALUES STANDARDIZED BETA 95% CONF.INT. I   PARTIAL   F TO
      ID COEFFICIENT STD.ERROR   REMOVE FOR B   B (R.PART)   UPPER   LOWER   I   ID CORR.   TOLERANCE   ENTER
      9   -0.042   0.018   5.634   0.022   -0.3211   -0.0064   -0.0776   I   75   0.2511   0.9542   3.2309
      I   32   0.2427   0.9994   3.0042
-----
* * * * F-LEVELS ( 4.000 , 3.900) OR TOLERANCE INSUFFICIENT FOR FURTHER STEPPING

SUMMARY TABLE :
STEP   INCREASE RESIDUAL   F-VALUE   VAR. NR
NR.   MULT.R MULT.RSQ   -IN RSQ EFFECT   FOR E/I   ENTER REMOVED VAR. NAME
      1,   0.3211   0.1031   0.1031   0.9470   5.634   9   HEMATOCRIT
-----

```

Table VI-7: Multiple regression of:

the logarithm of standardized zinc protoporphyrin versus logarithm of blood lead, smoking, sex and hematocrit in adults living in Holmestrand and Sørumsand.

Results: 1) Hematocrit had a significant negative correlation with zinc protoporphyrin.

2) Sex had a significant correlation with zinc protoporphyrin with males having the higher value.

```

F-EXCL : 3.90000  F-INCL : 4.00000  TOL : 0.01000  N-STEPS: 8
NUMBER OF SUBJECTS INCLUDED IN THE ANALYSIS 251
VAR      MEAN      STANDARD      VARIABLE NAME
NR.      DEVIATION
100 - 104  -0.9733    0.4458    LOGCZPP
75 - 79   1.8109    0.4992    LOG B-PB
94 - 94   1.6813    2.4401    SMOKING HABITS
8 - 8     1.8335    0.4828    SEX
9 - 12   42.5709    4.1855    HEMATOcrit
=====
DETERMINANT VALUE : 0.5443
=====
REGRESSION      RESIDUAL
DEGREES OF FREEDOM: 2          248
SUM OF SQUARES : 13.3        36.4
MEAN SQUARE : 6.6           0.1
F-RATIO : 45.2  PROB= 0.000
=====
VARIABLES IN EQUATION :          (CONSTANT= 0.4621)  I  VARIABLES NOT IN EQUATION :
B -          F TO  P-VALUES STANDARDIZED BETA 95% CONF.INT. I  PARTIAL
ID COEFFICIENT STD.ERROR REMOVE FOR B  B (R.PART)  UPPER  LOWER  I  ID CORR.  TOLERANCE  F TO
ENTER
8  0.204  0.054  14.142  0.000  0.2213  0.3113  0.0973  I  75  0.0621  0.9052  0.9562
9  -0.042  0.006  43.979  0.000  -0.3902 -0.0292 -0.0539  I  94  -0.0356  0.9898  0.3133
=====
* * * * * F-LEVELS ( 4.000 , 3.900) OR TOLERANCE INSUFFICIENT FOR FURTHER STEPPING
=====
SUMMARY TABLE :
STEP  INCREASE RESIDUAL  F-VALUE  VAR. NR
NR.   MULT.R  MULT.RSQ  IN RSQ  EFFECT  FOR E/I  ENTER  REMOVED  VAR. NAME
1  0.4749  0.2256  0.2256  0.8800  72.525  9  HEMATOcrit
2  0.5171  0.2673  0.0418  0.8560  14.142  8  SEX
=====

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**NORSK INSTITUTT FOR LUFTFORSKNING (NILU)
NORWEGIAN INSTITUTE FOR AIR RESEARCH**

(NORGES TEKNISK-NATURVITENSKAPELIGE FORSKNINGSRÅD)

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3 STIKKORD (å maks. 20 anslag) Lead Traffic Pollution Smoking			
REFERAT (maks. 300 anslag, 7 linjer) This is Part II of a report of the same title that examined blood lead in children and adults as a function of exposure to lead stemming from car pollution. Part II contains only appendices.			

TITLE
ABSTRACT (max. 300 characters, 7 lines)

*Kategorier: Åpen - kan bestilles fra NILU A
Må bestilles gjennom oppdragsgiver B
Kan ikke utleveres C