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MANITOBA POPULATION HEALTH PROJECT

Technical Characteristics
of Public Use Census Data

Units of Observation and Measures of Socio-Economic Status

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This short paper documents a set of group-level socio-economic indicators for the population of Manitoba. There is an extensive literature examining the relationship between social and economic factors and health status or health service utilization. The magnitude and consistency of these relationships provides compelling evidence for the inclusion of socio-economic status measures in all research designs, either as explanatory factors, or as a control for factors which may potentially confound the relationship under direct investigation.

Group-level socio-economic data may be applied in three distinct research designs: 1) true ecological analyses, where the dependent variable is a rate for a specified population, and independent variable are rates of exposure for the same population ^{1,2}, 2) mixed designs where the outcome is observed at the individual level, and among the explanatory variables are measures descriptive of group characteristics, such as region of residence ³, and 3) studies which combine individual and group level measures of the same explanatory measure, such as individual income and mean neighbourhood income ⁴⁻⁹.

Public Use Data Statistics Canada releases public use tapes over the three year period following the census. One census product, called Basic User Summary Tables (BUST), provides public use data aggregated to small geographic areas. The minimum unit of observation for the BUST data is the Enumeration Area, defined as the area usually canvassed by one census representative.

The boundaries of Enumeration Areas generally reflect the physical and human landscape; typically using references such as residential blocks, streets, rivers, or railway lines. The number of households varies from approximately 375 in urban areas to a minimum of 125 in rural settings. Enumeration areas are units of Federal Electoral Districts, the geographic area entitled to be represented by a member of the House of Commons. In Manitoba, there are 15 Federal Electoral Districts, and 2,097 Enumeration Areas, of which 1,841 were found to have resident households in the 1986 census.

The full library of 1986 Basic User Summary Tables is in the Government Documents collection of Dafoe, and the thirteen tapes are located in the tape library at Computer Services. Tape labels, bin numbers and lists of tape contents are attached. Each data set is supplied with a SAS and an SPSS command file, in a French and an English version, defining variable location, variable name and variable labels. Summary codebooks for 2A data (short-form) and 2B data (long-form) are also provided on the tape set. Hard copy output for the codebooks is available from C. Mustard. The 1988 version of the postal code conversion file is also installed on this tape set.

Unit of Observation and Sampling The operational sampling unit of the census is the household. For an operational definition, refer to the appropriate census edition of the Statistics Canada dictionary. All household inhabitants are enumerated, and are distinguished between members of a household and members of families. The census fields two data collection instruments: a short form, which is applied to 100% of households, and a long form, which is applied to a random sample of 20% of households. The short form

collects information on household members' age, marital status and kinship structure. The long form collects information on attained education and occupation of household members over the age of fifteen, household and family income, labour force activity and characteristics of the dwelling.

Data Quality The sources of error in information collected by survey can be attributed to random and systematic effects. Sources of this error can be attributed to 1) coverage errors, 2) respondent error, 3) processing error and 4) sampling error. In the census, sampling errors are confined to data collected on the 2B form, which is applied to a 20% sample of households.

Additional loss of precision is introduced by two procedures performed on the public use small area data to prevent the identification of single households. One procedure, random rounding, converts values for specific cells to a multiple of 5. A second procedure, cell suppression, replaces cell values representing a small number of observations at the smallest geographic unit of observation with zeros. Typically, this rule is applied if the population of an Enumeration Area is less than 40. However, the cutpoint is adjusted depending upon the nature of the data. True cell values are returned when data is aggregated to the next largest geographic unit.

During the 1986 census, a number of native organizations and status reserves boycotted participation in the enumeration. An estimated 8,000 Manitoba natives were not enumerated in the 1986 census.

Linkage to Individual-Level Health Data Statistics Canada provides a data and command file resource, the Postal Code Conversion File, which performs a link between postal code and a range of standard geographic census units. An edition of this file is released annually, incorporating revisions in the postal code inventory. As of the 1988 edition, there were 22,190 postal codes in Manitoba.

The census and postal code geographic structures are non concordant. As a result, where a postal code area straddles the boundaries of two enumeration areas, the conversion procedure will produce a postal code link to both enumeration areas. Approximately 10% of postal codes link to multiple enumeration areas. This problem is dominant in rural postal codes, where fully 95% of postal areas intersect multiple enumeration areas. Statistics Canada provides a computer-based decision method for assigning a best single link in cases of multiple links. This system is based on the concordance of geographic center points in postal code and enumeration area geographies. An alternate approach, to be adopted by the low birthweight study, computes a mean score from all enumeration areas linked to a postal code. Table 4 reports the distribution of postal codes by the number of intersected enumeration areas. The 234 enumeration areas which were not found to contain resident private households in 1986 are associated with 225 postal codes, over 95% of which were located in urban settings.

Socio-Economic Measures

Developed for the Low Birthweight Study

Three measures of enumeration area SES have been derived from the BUST census data for application in the low birthweight study: 1) attained education, 2) household income and 3) the market value of owner-occupied dwellings. Work is in progress to develop a meaningful measure of the occupational status composition of enumeration areas, and to test the validity of a composite SES indicator. Detailed definition of the individual variables follows.

Education The file contains counts of the number of enumeration area residents, aged fifteen and over, in each cell of the three way classification of level of education, sex and age. Age is classified in ten year groups. Level of education is stratified by seven levels. For the LBW study, two variables, derived from a binomial distribution, have been constructed: 1) the proportion of women, aged 25-54, who have not completed high school and 2) the proportion of men, aged 25-54, who have not completed high school.

Given the levels of educational attainment in the province, high school completion was judged the level of attainment which provided the greatest variation across enumeration areas while approximating a gaussian distribution.

The decision to combine three age strata (25-34, 35-44, 45-54) was predicated on two factors: first, to define the educational attainment of the reproductive aged population, and second, to accumulate sufficient numbers of observations to avoid large numbers of enumeration areas with zero observations in the numerator. A more appropriate age composition would have combined age groups 15-24, 25-34 and 35-44, however the youngest strata, 15-24 years, is awkward. It combines women who could not have completed high school (15-16 years of age), women who are still of high school age (15-18) and women who older than high school age. An educational attainment measure is available for all populated enumeration areas.

See Table 1 for the distribution of attained education by age, and Figures 1 and 2 for the frequency distribution of high school completion for all populated provincial enumeration areas. Table 1 provides evidence of strong differences in educational attainment by urban/rural status. The urban classification is based on a Statistics Canada definition of a population density of 400 or more people per sq km. Also note in Table 1 the weak correlation of gender-specific educational attainment, especially within rural enumeration areas.

Source File: SC86B01
Population 15 years and over by highest level of schooling (7), sex (3) and age groups (7)

Average Household Income Average household income is the mean total 1985 income of all household residents fifteen years of age and older in private households in an enumeration area. Private households are equivalent to occupied private dwellings, which is the census sampling unit. Income data comes from the 20% 2B sample, and as such there is a sample error associated with the supplied enumeration area estimate. Average income (in dollars) is calculated from unrounded data by dividing the aggregate household income from all sources in an enumeration area by the number of households in that groups, whether or not they reported income. An income measure is available for all populated enumeration areas.

Table 2 reports the mean income and standard deviation for enumeration areas by rural or urban setting. Figures 3 and 4 provide the frequency distribution of enumeration area average household income.

Source File IN86B04
 Number, aggregate and average income of private households

Average Dwelling Value Average dwelling value records the owner's expectation of the market value of owner-occupied homes. Dwelling value is stratified into 9 levels. The type of dwelling is classified into four groups: single detached, apartments with five or more stories, movable dwellings and other dwellings. Dwelling value data derives from the 20% 2B sample.

The census does not collect data on the value of owner-occupied dwellings on status reserves and farms. Additionally, in the low birthweight study, the calculation of dwelling value is restricted to single detached dwellings. These exclusions, as well as the exclusion of enumeration areas which have insufficient numbers of owner-occupied dwellings to calculate a mean value result in a number of populated enumeration areas with a zero recorded for average dwelling value: 95 of 979 urban areas (9.7%) and 82 of 849 rural areas (9.6%). These zero scores are best treated as missing values, rather than true zeros. On an additional validity issue, it should be recognized that only non-farm dwellings contribute to the calculation of average dwelling value in rural enumeration areas, which may bias the estimate of true housing worth for these settings.

Work is in progress to calculate a ratio measure of the proportion of households which inhabit non-farm, non-reserve owner-occupied dwellings. Additional restrictions on the use of this variable may be indicated where only a small proportion of households live in owner-occupied dwellings. Table 2 reports the mean dwelling value by urban or rural setting, and Figures 5 and 6 report the frequency distribution of dwelling values by enumeration area.

Source File: DW86B03
 Owner-occupied non-farm, non-reserve private dwellings by
 value of dwelling (11) and structural type (5)

Table 3 and Figures 7-12 provide information on the correlation of these three measures of socio-economic status, separating urban and rural enumeration areas. It should be evident from both the table and the plots that the three measures have stronger covariation in urban settings than in rural regions.

Work is in progress to define a classification which will stratify occupation by either status, income or a composite of the two. This will be a custom product from Statistics Canada.

Linking Socio-Economic Information on Enumeration Area to Individual-Level Health Care Utilization Data

The BUST tape series contains a useful utility, the Postal Code Conversion File, which relates postal codes to enumeration areas. As noted earlier, the two geographies are non concordant. As enumeration areas tend to be larger than postal code areas, most enumeration areas contain more than one postal code. Additionally, approximately 10% of postal codes intersect more than one enumeration area.

Using the Postal Code Conversion File, we have prepared a SAS dataset which assigns the three socio-economic measures derived from enumeration area data to each of the 21,965 unique postal codes which are contained within or intersect the 1,841 enumeration areas found to contain private households in the 1986 census. Users of this dataset (current DSN=.CMUSTRD.SESDATA,USER21) may link individual-level administrative claims records with the area SES measures via a simple merge operation, joining records on the basis of the common postal code.

The dataset presently contains 14 variables:

PC	Postal Code
EALINK	Number of Enumeration Areas linked to Postal Code
POPMEAN	Population of Enumeration Area, aged 15 and over (Value has been attributed to Postal Code area: it is not a true measure of postal code population)
DWELMEAN	Mean value of single detached private dwellings (Value has been derived from Enumeration Area)
EDMEAN	Proportion of women 25-54, without high school diploma (Value has been derived from Enumeration Area)
INCMEAN	Mean household income, all sources (Value has been derived from Enumeration Area)
POPSTD	Standard deviation of POPMEAN, if EALINK > 1
DWELSTD	Standard deviation of DWELMEAN, if EALINK > 1
EDSTD	Standard deviation of EDMEAN, if EALINK > 1
INCSTD	Standard deviation of INCMEAN, if EALINK > 1

POPTOTAL	Sum of population, if EALINK > 1
DWELTOT	Sum of dwelling values, if EALINK > 1
EDTOT	Sum of education, if EALINK > 1
INCTOT	Sum of incomes, if EALINK > 1

Observations in this file are postal codes. Note, however, that the variable POPMEAN records the enumerated, rounded, population of the enumeration area, not the postal code area. The variable EALINK reports the number of enumeration areas which intersect the postal code. If EALINK is greater than 1, the three SES measures (INCMEAN, DWELMEAN, EDMEAN) are calculated from the sum of values for the intersecting enumeration areas, divided by the number of enumeration areas. For these postal codes, a standard deviation and a sum of values over all enumeration areas is reported.

Note that 225 postal codes were within the bounds of 235 enumeration areas which were found to have no private households. These enumeration areas were either truly without resident population, or contained only institutionalized populations such as nursing home or prison residents which were not enumerated in the census.

The variable URBAN, derived from the BUST data, categorizes enumeration areas into either urban or rural settings. An urban area is defined by Statistics Canada as having a population density of greater than 400 people per square kilometre. A postal code value for URBAN greater than 0 and less than 1 indicates the postal code intersects multiple enumeration areas (EALINK > 1) and that the intersected enumeration areas are not homogenous.

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2A DATA FILES

Numbers in brackets indicated number of strata

- CF86A01 Census families in private households by number of persons in census families (10), showing family structure (5)
- CF86A02 Census families in private households by number of children at home (14), showing family structure (5).
- CF86A03 Census families in private households by age groups of children at home (13), showing family structure (5).
- CF86A04 Census families in private households by census family status: age (24), and sex (3).
- DM86A01 Population by five-year age groups and sex
- DM86A02 Population by age groups (8) and sex (3) showing marital status (6)
- DW86A01 Occupied private dwellings by structural type (5) and tenure (4), showing age of household maintainer (6).
- DW86A02 Occupied private dwellings by structural type (5), showing number of persons per dwelling (13).
- HH86A01 Private households by type (23), showing tenure of household (4).
- HH86A02 Private households by type of household (12) showing number of persons per household (13)
- MT86A01 Population by selected mother tongue (25) and sex (3)

2B DATA FILES

Numbers in brackets indicated number of strata

DW86B01	Occupied private dwellings by structural type (5) and principal heating fuel (9)
DW86B02	Occupied private dwellings by structural type and period of construction (9)
DW86B03	Owner-occupied non-farm, non-reserve private dwellings by value of dwelling (11) and structural type (5)
DW86B04	Occupied private dwellings by structural type (5) and number of persons per room (7)
DW86B05	Occupied private dwellings by main type of heating equipment showing principal heating fuel
EC86B01	Population by ethnic origin (21) and sex (3)
EC86B02	Population by place of birth (20) and sex (3)
EC86B03	Immigrant population by period of immigration (7), sex (3) and age at immigration (4)
EC86B04	Population by citizenship (11) and sex (3)
HH86B01	Private households in owner-occupied non-farm non-reserve dwellings by type of household (12) and owners major payments (6)
HH86B02	Private households in tenant-occupied non-farm non-reserve dwellings by type of household (12) and gross rent (6)
HH86B03A	Private households in owner-occupied non-farm non-reserve dwellings by owner's major payment as a percentage of 1985 household income (8) and age of household maintainer (6)
HH86B03B	Private households in tenant-occupied non-farm non-reserve dwellings by gross rent as a percentage of 1985 household income (8) and age of household maintainer (6)
IN86B01	Number, aggregate and average income of population 15 years of age and over in private households by sex and 1985 income groups (2)
IN86B02	Number, aggregate and average income of census families in private households
IN86B03	Number, aggregate and average income of unattached individuals 15 years and over in private households by sex (3)
IN86B04	Number, aggregate and average income of private households
IN86B05	Number, aggregate and average employment income of population 15 years and over who worked in 1985 and reported income by sex (3)
IN86B06	Number, aggregate and average income of non-family persons 15 years of age and over in private households by sex (3)
IN86B07	Number, aggregate and average income of economic families in households

2B DATA FILES / Continued

Numbers in brackets indicated number of strata

LA86B01	Population by official language (5), age groups (8) and sex (3)
LA86B02	Population by home language (25) and sex (3)
LF86B01	Population 15 years and over by labour force activity (7) age groups (7) and sex (3)
LF86B02	Population 15 years and over by labour force activity (7) sex (3) and marital status (6)
LF86B03	Population 15 years and over by labour force activity (7) highest level of schooling and sex (3)
LF86B04	Population 15 years and over by occupation major groups (25) and sex (3)
LF86B05	Population 15 years and over by industry divisions (21) and sex (3)
LF86B06	Labour force 15 years and over by class of worker (5) and sex (3)
LF86B07	Labour force 15 years and over by work activity in 1985 and sex (3)
LF86B08	Labour force activity of females 15 years and over in occupied private households by presence of children (6)
LF86B09	Labour force 15 years and over by industry divisions and sex
MB86B01	Population 15 years and over by age groups (8) sex and mobility status (8) (province level mobility)
SC86B01	Population 15 years and over by highest level of schooling (7), sex (3) and age groups (7)
SC86B02	Population 15 years and over by major field of study (13) and sex (3)

Table 1
 Proportion of Population
 with less than Grade 12 Education

N = 1841 Enumeration Areas

Age	Urban			Rural		
	Male	Female	r	Male	Female	r
15 - 24	52.1	46.3	.303	69.4	64.4	.230
25 - 34	30.6	30.2	.394	48.8	44.4	.241
35 - 44	34.0	36.8	.428	53.7	53.0	.302
45 - 54	45.9	52.2	.314	68.1	66.1	.182
55 - 64	56.2	62.1	.314	78.1	73.1	.152
> 65	68.5	70.7	.442	82.4	79.3	.125

Table 2
 Socio-Economic Indicators
 Aggregated by Enumeration Area

N = 1841 Enumeration Areas

	URBAN		RURAL	
	Mean	SD	Mean	SD
Income	\$32,506	(13,327)	\$26,072	(8,997)
Dwelling	\$71,042	(30,794)	\$50,858	(26,977)
Male Education (1)	35.26	(17.35)	57.12	(22.44)
Female Education (1)	37.56	(17.96)	53.54	(22.85)

(1) Proportion with less than Grade 12

April 2, 1991

Table 3
Correlation of Socio-Economic Indicators

N = 1841 Enumeration Areas

URBAN	Average Income	Average Dwelling Value	Males Aged 25-54 < Grade 12	Females Aged 25-54 < Grade 12
Income	1.000 (979)	.695 (884)	-.497 (972)	-.423 (971)
Dwelling		1.000 (884)	-.531 (976)	-.476 (971)
Male Education			1.000 (976)	.630 (971)
Female Education				1.000 (976)
RURAL				
Income	1.000 (849)	.520 (767)	-.354 (849)	-.317 (847)
Dwelling		1.000 (767)	-.260 (767)	-.263 (765)
Male Education			1.000 (854)	.413 (851)
Female Education				1.000 (851)

April 2, 1991

Table 4
 Distribution of Postal Codes and Enumeration Areas
 By Urban/Rural Region

	Rural	Both	Urban	Total
Enumeration Areas	1,014		1,083	2,097
Postal Codes	615	55	21,520	22,190
Population > 15 Years	214,175		598,825	813,000
Number of Enumeration Areas Linked to Postal Code				
1	281	0	20637	20918
2	95	16	775	886
3	80	4	62	146
4	56	1	33	90
5	36	4	5	45
6-10	61	12	8	81
11-20	6	15	0	21
>20	0	3	0	3
TOTAL	615	55	21570	22190

Figure 1
 Frequency Distribution of Proportion of Men, aged 25-54,
 with less than Grade 12 Education

N = 1830 Enumeration Areas

Enumeration Area	FREQ	CUM FREQ	PERCENT	CUM PERCENT
00000	26	26	1.42	1.42
00001	4	30	0.22	1.64
00002	17	47	0.93	2.57
00003	17	64	0.93	3.50
00004	20	84	1.14	4.64
00005	25	109	1.37	6.01
00006	48	157	2.62	8.63
00007	35	192	1.95	10.58
00008	24	216	1.31	11.89
00009	25	241	1.36	13.25
00010	62	303	3.33	16.58
00011	75	378	4.15	20.73
00012	57	435	2.39	23.12
00013	102	537	5.61	28.73
00014	82	619	4.37	33.10
00015	89	708	4.86	37.96
00016	92	800	5.03	43.00
00017	86	886	4.70	47.70
00018	59	945	3.22	50.92
00019	117	1062	5.85	56.77
00020	40	1102	2.19	58.96
00021	52	1154	2.84	61.80
00022	52	1206	2.84	64.64
00023	49	1255	2.68	67.32
00024	17	1272	0.93	68.25
00025	64	1336	3.50	71.75
00026	17	1353	0.93	72.68
00027	20	1373	1.09	73.77
00028	40	1413	2.19	75.96
00029	21	1434	1.15	77.11
00030	26	1460	1.42	78.53
00031	22	1482	1.20	79.73
00032	22	1504	1.20	80.93
00033	24	1528	1.31	82.24
00034	24	1552	1.31	83.55
00035	48	1600	2.62	86.17
00036	22	1622	1.20	87.37
00037	22	1644	1.20	88.57
00038	24	1668	1.31	89.88
00039	24	1692	1.31	91.19
00040	24	1716	1.31	92.50
00041	24	1740	1.31	93.81
00042	24	1764	1.31	95.12
00043	24	1788	1.31	96.43
00044	24	1812	1.31	97.74
00045	24	1836	1.31	99.05
00046	24	1860	1.31	100.36
00047	24	1884	1.31	101.67
00048	24	1908	1.31	102.98
00049	24	1932	1.31	104.29
00050	24	1956	1.31	105.60
00051	24	1980	1.31	106.91
00052	24	2004	1.31	108.22
00053	24	2028	1.31	109.53
00054	24	2052	1.31	110.84
00055	24	2076	1.31	112.15
00056	24	2100	1.31	113.46
00057	24	2124	1.31	114.77
00058	24	2148	1.31	116.08
00059	24	2172	1.31	117.39
00060	24	2196	1.31	118.70
00061	24	2220	1.31	120.01
00062	24	2244	1.31	121.32
00063	24	2268	1.31	122.63
00064	24	2292	1.31	123.94
00065	24	2316	1.31	125.25
00066	24	2340	1.31	126.56
00067	24	2364	1.31	127.87
00068	24	2388	1.31	129.18
00069	24	2412	1.31	130.49
00070	24	2436	1.31	131.80
00071	24	2460	1.31	133.11
00072	24	2484	1.31	134.42
00073	24	2508	1.31	135.73
00074	24	2532	1.31	137.04
00075	24	2556	1.31	138.35
00076	24	2580	1.31	139.66
00077	24	2604	1.31	140.97
00078	24	2628	1.31	142.28
00079	24	2652	1.31	143.59
00080	24	2676	1.31	144.90
00081	24	2700	1.31	146.21
00082	24	2724	1.31	147.52
00083	24	2748	1.31	148.83
00084	24	2772	1.31	150.14
00085	24	2796	1.31	151.45
00086	24	2820	1.31	152.76
00087	24	2844	1.31	154.07
00088	24	2868	1.31	155.38
00089	24	2892	1.31	156.69
00090	24	2916	1.31	158.00
00091	24	2940	1.31	159.31
00092	24	2964	1.31	160.62
00093	24	2988	1.31	161.93
00094	24	3012	1.31	163.24
00095	24	3036	1.31	164.55
00096	24	3060	1.31	165.86
00097	24	3084	1.31	167.17
00098	24	3108	1.31	168.48
00099	24	3132	1.31	169.79
00100	24	3156	1.31	171.10
00101	24	3180	1.31	172.41
00102	24	3204	1.31	173.72
00103	24	3228	1.31	175.03
00104	24	3252	1.31	176.34
00105	24	3276	1.31	177.65
00106	24	3300	1.31	178.96
00107	24	3324	1.31	180.27
00108	24	3348	1.31	181.58
00109	24	3372	1.31	182.89
00110	24	3396	1.31	184.20
00111	24	3420	1.31	185.51
00112	24	3444	1.31	186.82
00113	24	3468	1.31	188.13
00114	24	3492	1.31	189.44
00115	24	3516	1.31	190.75
00116	24	3540	1.31	192.06
00117	24	3564	1.31	193.37
00118	24	3588	1.31	194.68
00119	24	3612	1.31	195.99
00120	24	3636	1.31	197.30
00121	24	3660	1.31	198.61
00122	24	3684	1.31	199.92
00123	24	3708	1.31	201.23
00124	24	3732	1.31	202.54
00125	24	3756	1.31	203.85
00126	24	3780	1.31	205.16
00127	24	3804	1.31	206.47
00128	24	3828	1.31	207.78
00129	24	3852	1.31	209.09
00130	24	3876	1.31	210.40
00131	24	3900	1.31	211.71
00132	24	3924	1.31	213.02
00133	24	3948	1.31	214.33
00134	24	3972	1.31	215.64
00135	24	3996	1.31	216.95
00136	24	4020	1.31	218.26
00137	24	4044	1.31	219.57
00138	24	4068	1.31	220.88
00139	24	4092	1.31	222.19
00140	24	4116	1.31	223.50
00141	24	4140	1.31	224.81
00142	24	4164	1.31	226.12
00143	24	4188	1.31	227.43
00144	24	4212	1.31	228.74
00145	24	4236	1.31	230.05
00146	24	4260	1.31	231.36
00147	24	4284	1.31	232.67
00148	24	4308	1.31	233.98
00149	24	4332	1.31	235.29
00150	24	4356	1.31	236.60
00151	24	4380	1.31	237.91
00152	24	4404	1.31	239.22
00153	24	4428	1.31	240.53
00154	24	4452	1.31	241.84
00155	24	4476	1.31	243.15
00156	24	4500	1.31	244.46
00157	24	4524	1.31	245.77
00158	24	4548	1.31	247.08
00159	24	4572	1.31	248.39
00160	24	4596	1.31	249.70
00161	24	4620	1.31	251.01
00162	24	4644	1.31	252.32
00163	24	4668	1.31	253.63
00164	24	4692	1.31	254.94
00165	24	4716	1.31	256.25
00166	24	4740	1.31	257.56
00167	24	4764	1.31	258.87
00168	24	4788	1.31	260.18
00169	24	4812	1.31	261.49
00170	24	4836	1.31	262.80
00171	24	4860	1.31	264.11
00172	24	4884	1.31	265.42
00173	24	4908	1.31	266.73
00174	24	4932	1.31	268.04
00175	24	4956	1.31	269.35
00176	24	4980	1.31	270.66
00177	24	5004	1.31	271.97
00178	24	5028	1.31	273.28
00179	24	5052	1.31	274.59
00180	24	5076	1.31	275.90
00181	24	5100	1.31	277.21
00182	24	5124	1.31	278.52
00183	24	5148	1.31	279.83
00184	24	5172	1.31	281.14
00185	24	5196	1.31	282.45
00186	24	5220	1.31	283.76
00187	24	5244	1.31	285.07
00188	24	5268	1.31	286.38
00189	24	5292	1.31	287.69
00190	24	5316	1.31	289.00
00191	24	5340	1.31	290.31
00192	24	5364	1.31	291.62
00193	24	5388	1.31	292.93
00194	24	5412	1.31	294.24
00195	24	5436	1.31	295.55
00196	24	5460	1.31	296.86
00197	24	5484	1.31	298.17
00198	24	5508	1.31	299.48
00199	24	5532	1.31	300.79
00200	24	5556	1.31	302.10

Figure 2
 Frequency Distribution of Proportion of Women, aged 25-54,
 with less than Grade 12 Education

N = 1830 Enumeration Areas

PERCENT	FREQ	CUM FREQ	PERCENT	CUM PERCENT
0.00	36	36	1.97	4.97
0.05	9	45	0.47	5.44
0.075	8	53	0.44	5.88
0.10	14	67	0.77	6.65
0.125	42	109	2.35	9.00
0.15	37	146	2.08	11.08
0.175	51	197	2.84	13.92
0.20	58	255	3.22	17.14
0.225	64	319	3.50	20.64
0.25	78	397	4.32	24.96
0.275	64	461	3.50	28.46
0.30	107	568	5.89	34.35
0.325	97	665	5.36	39.71
0.35	92	757	5.08	44.79
0.375	97	854	5.36	50.15
0.40	96	950	5.30	55.45
0.425	97	1047	5.36	60.81
0.45	97	1144	5.36	66.17
0.475	97	1241	5.36	71.53
0.50	52	1293	2.84	74.37
0.525	59	1352	3.22	77.59
0.55	57	1409	3.12	80.71
0.575	53	1462	2.90	83.61
0.60	42	1504	2.35	85.96
0.625	79	1583	4.32	90.28
0.65	71	1654	3.89	94.17
0.675	34	1688	1.86	96.03
0.70	31	1719	1.70	97.73
0.725	25	1744	1.37	99.10
0.75	14	1758	0.77	99.87
0.775	6	1764	0.33	100.20
0.80	1	1765	0.05	100.25
0.825	1	1771	0.05	100.30
0.85	1	1777	0.05	100.35
0.875	1	1784	0.05	100.40
0.90	1	1791	0.05	100.45
0.925	1	1800	0.05	100.50
0.95	1	1810	0.05	100.55
0.975	1	1821	0.05	100.60
1.00	1	1832	0.05	100.65

FREQUENCY

Figure 3
 Frequency Distribution of Average Household Income
 in Rural Areas

N = 849 Enumeration Areas

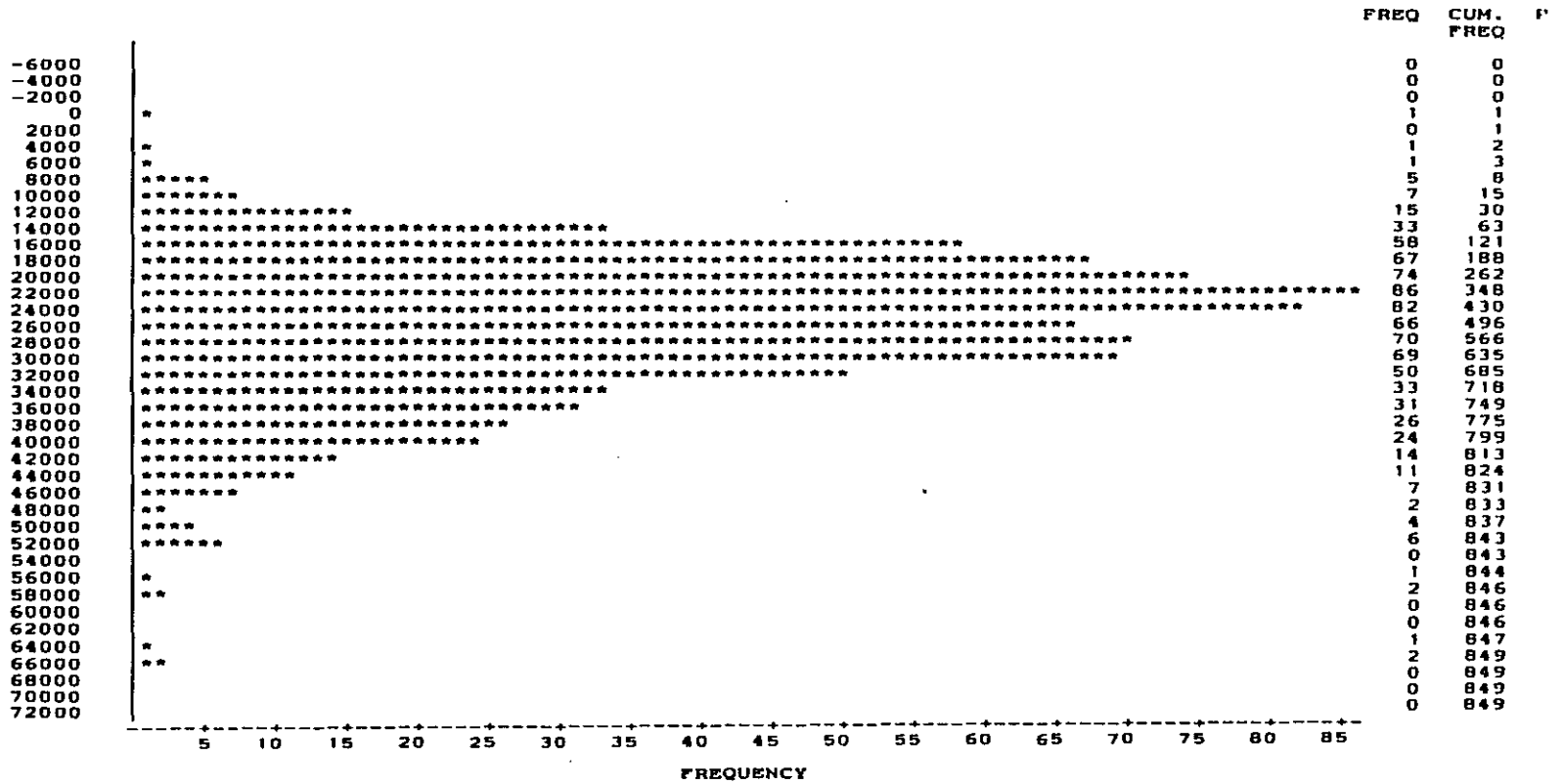


Figure 4
 Frequency Distribution of Average Household Income
 in Urban Areas

N = 979 Enumeration Areas

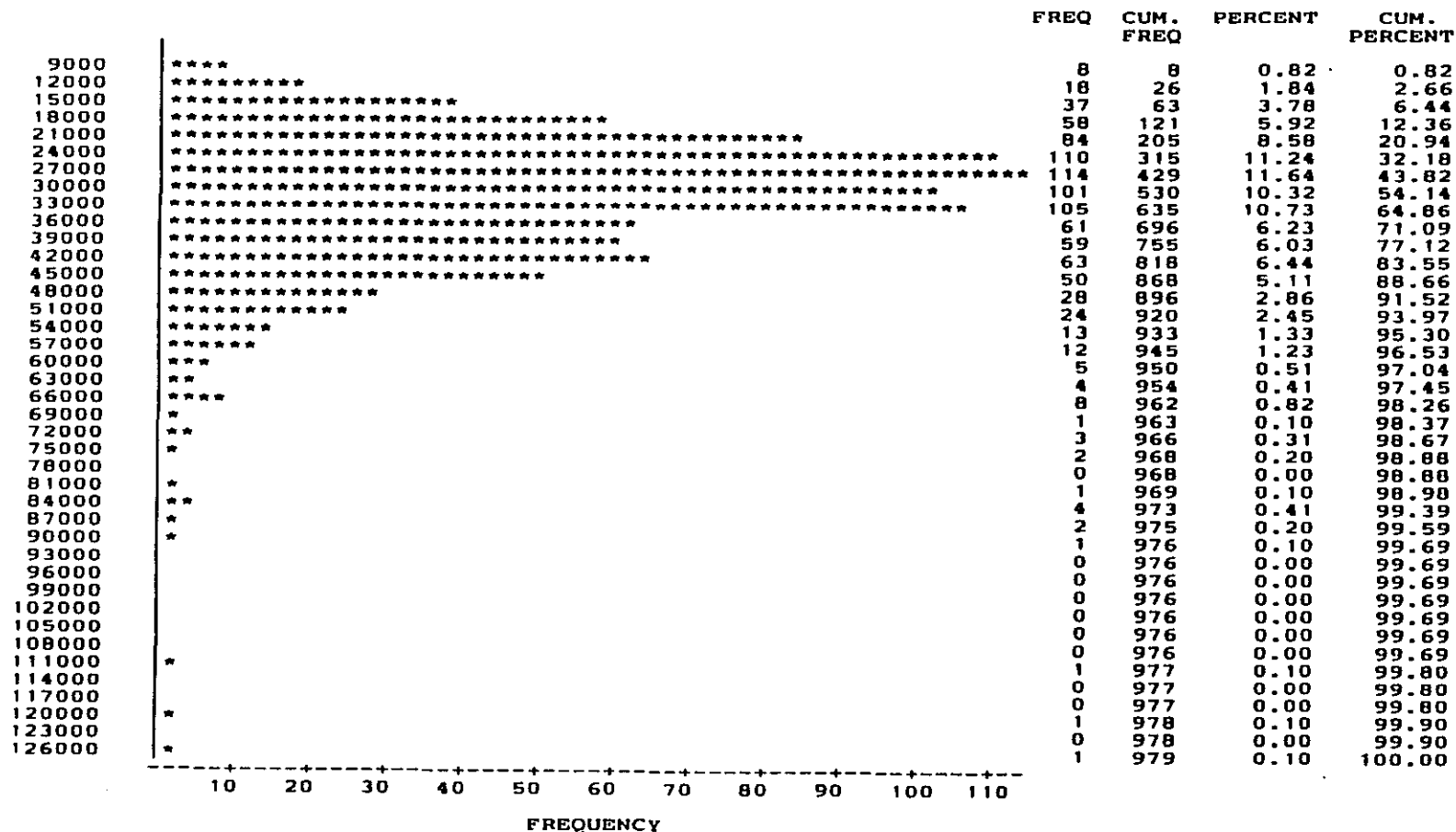


Figure 5
 Frequency Distribution of Average Value
 of Owner-Occupied Dwelling in Rural Areas

N = 767 Enumeration Areas

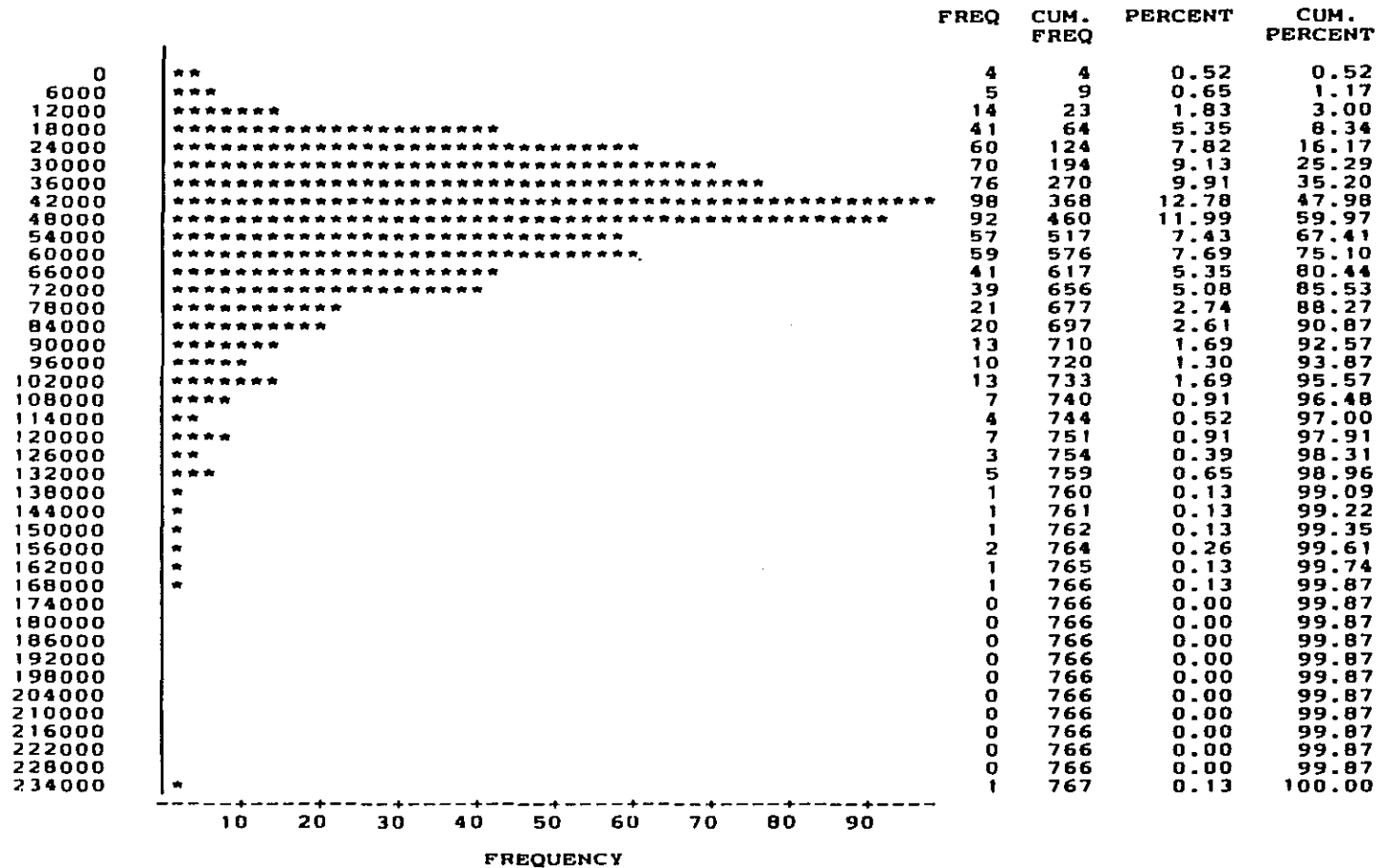


Figure 6
 Frequency Distribution of Average Value
 of Owner-Occupied Dwelling in Urban Areas

N = 884 Enumeration Areas

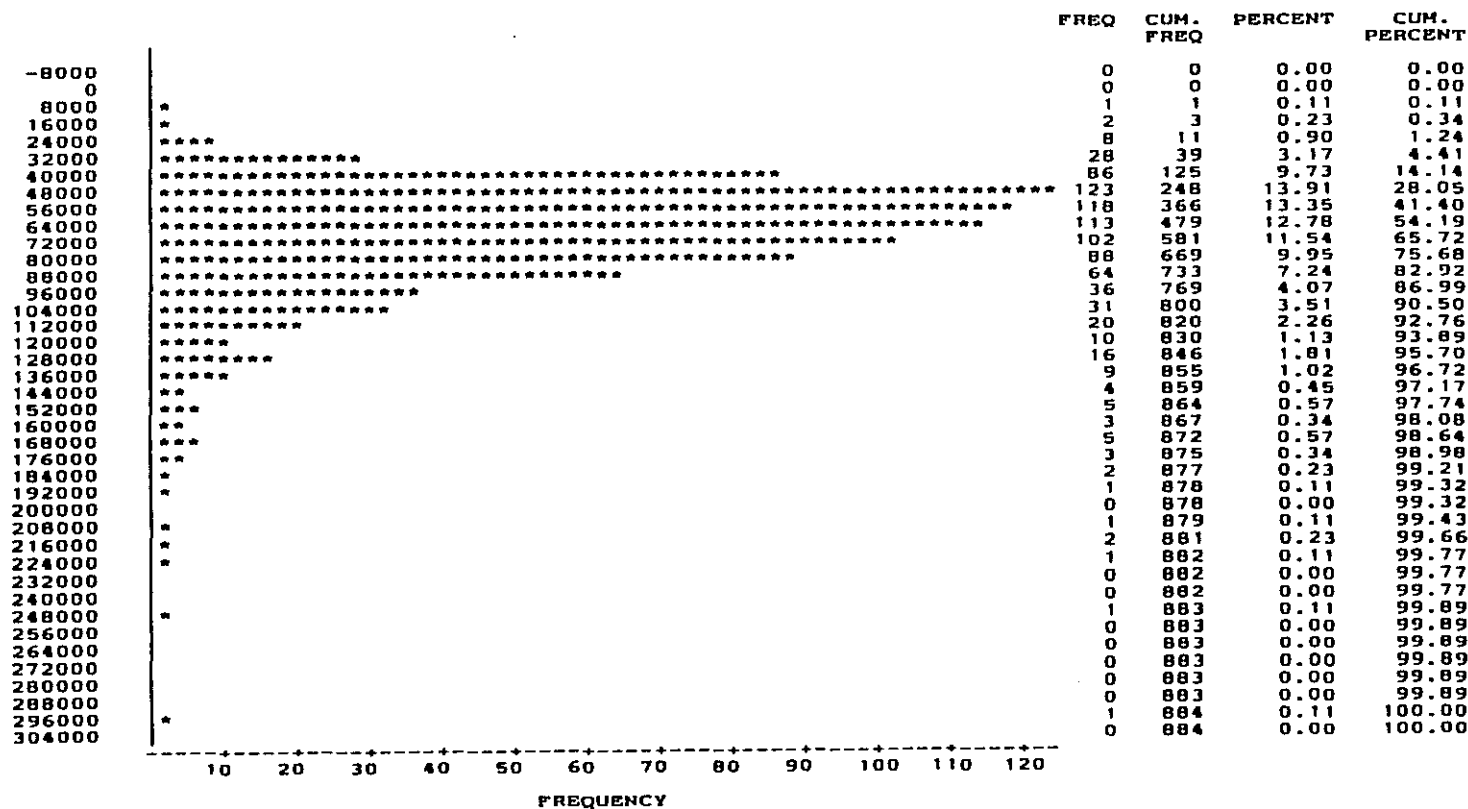
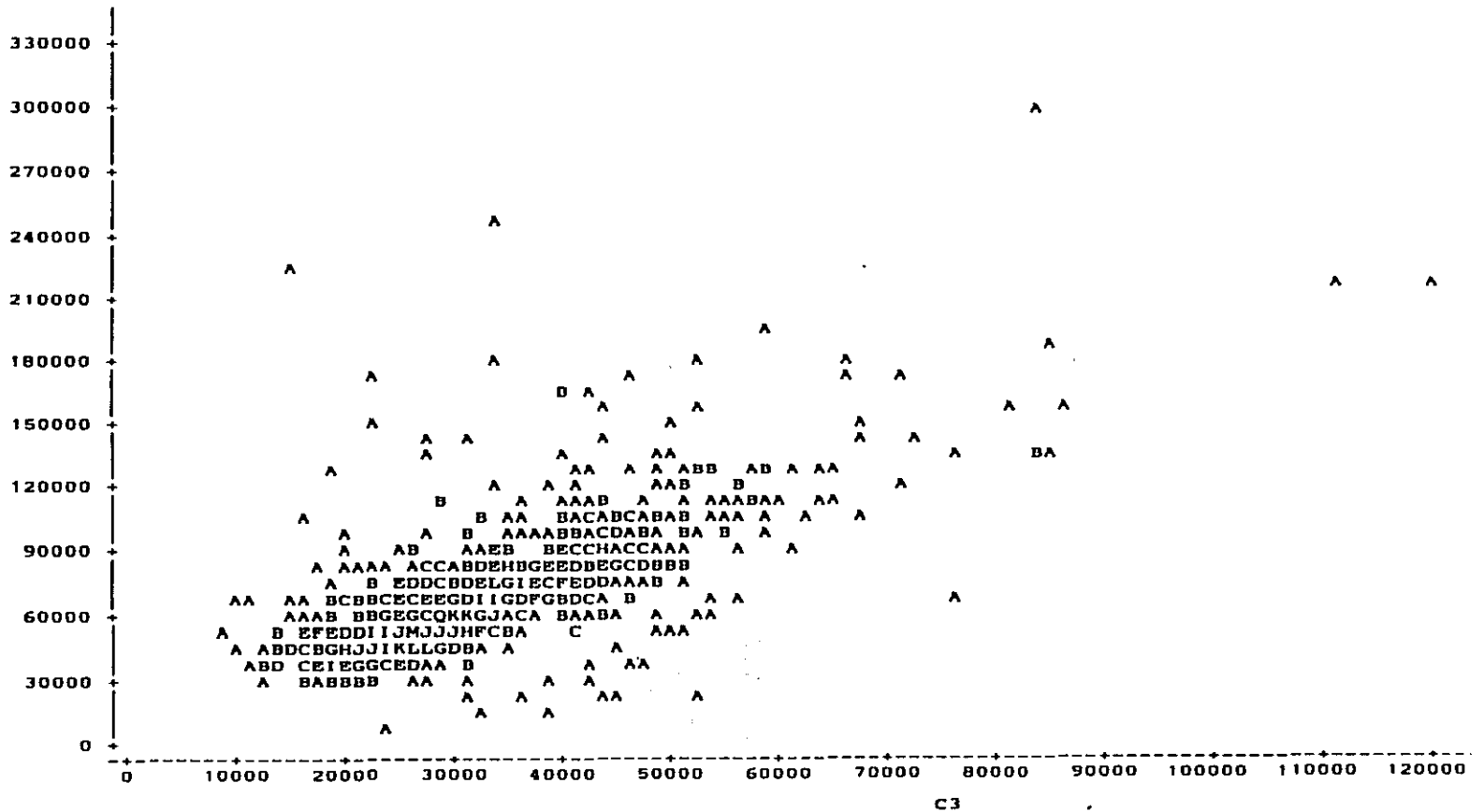


Figure 7
 Plot of Average Income by Average Dwelling Value
 for Urban Areas

N = 884 Enumeration Areas, r = .695



NOTE: 103 OBS HAD MISSING VALUES

Figure 10
 Plot of Proportion of Women, aged 25-54, with Less than Grade 12 Education
 by Average Dwelling Value in Rural Areas

N = 767 Enumeration Areas, r = -.263

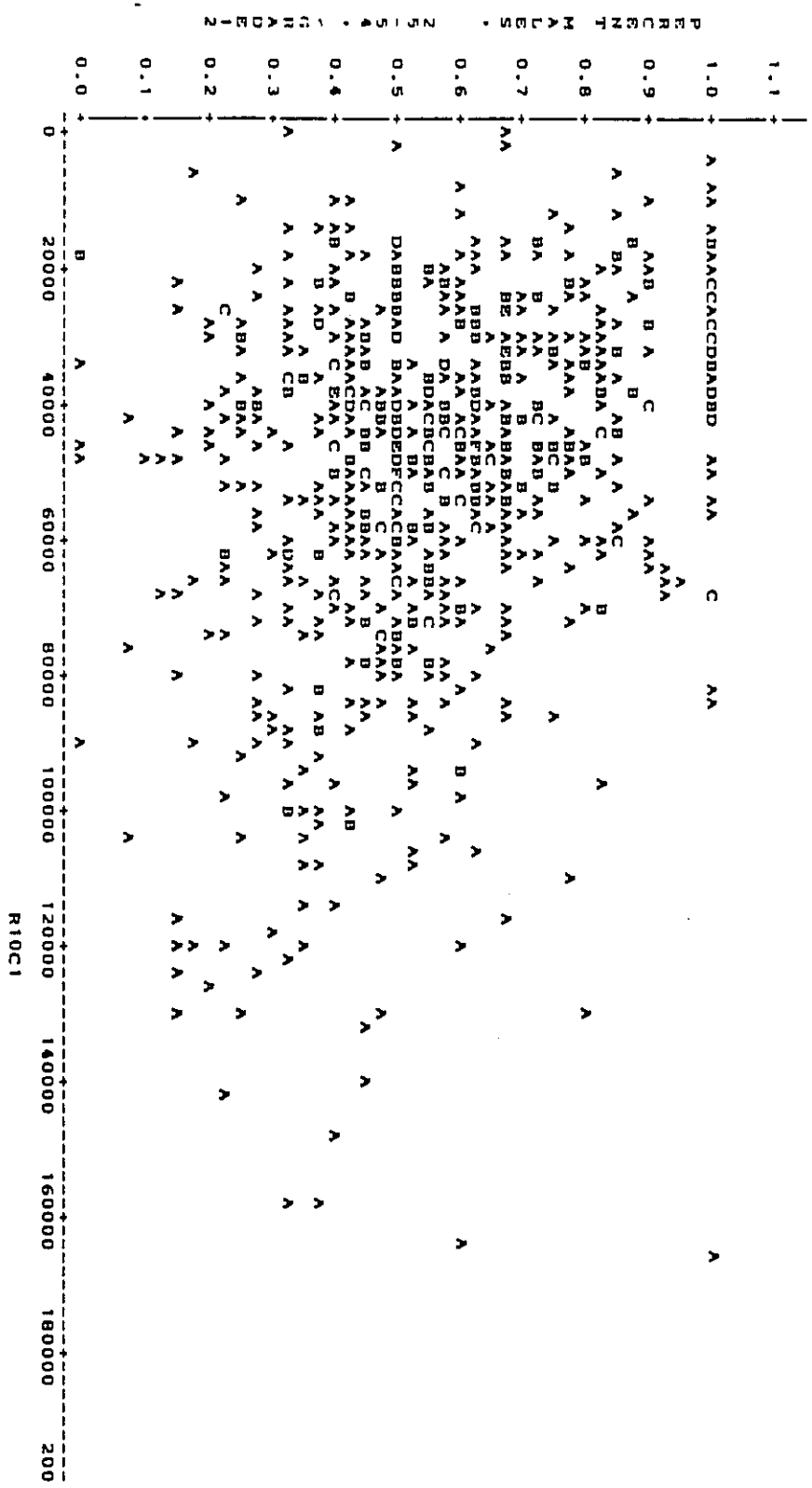
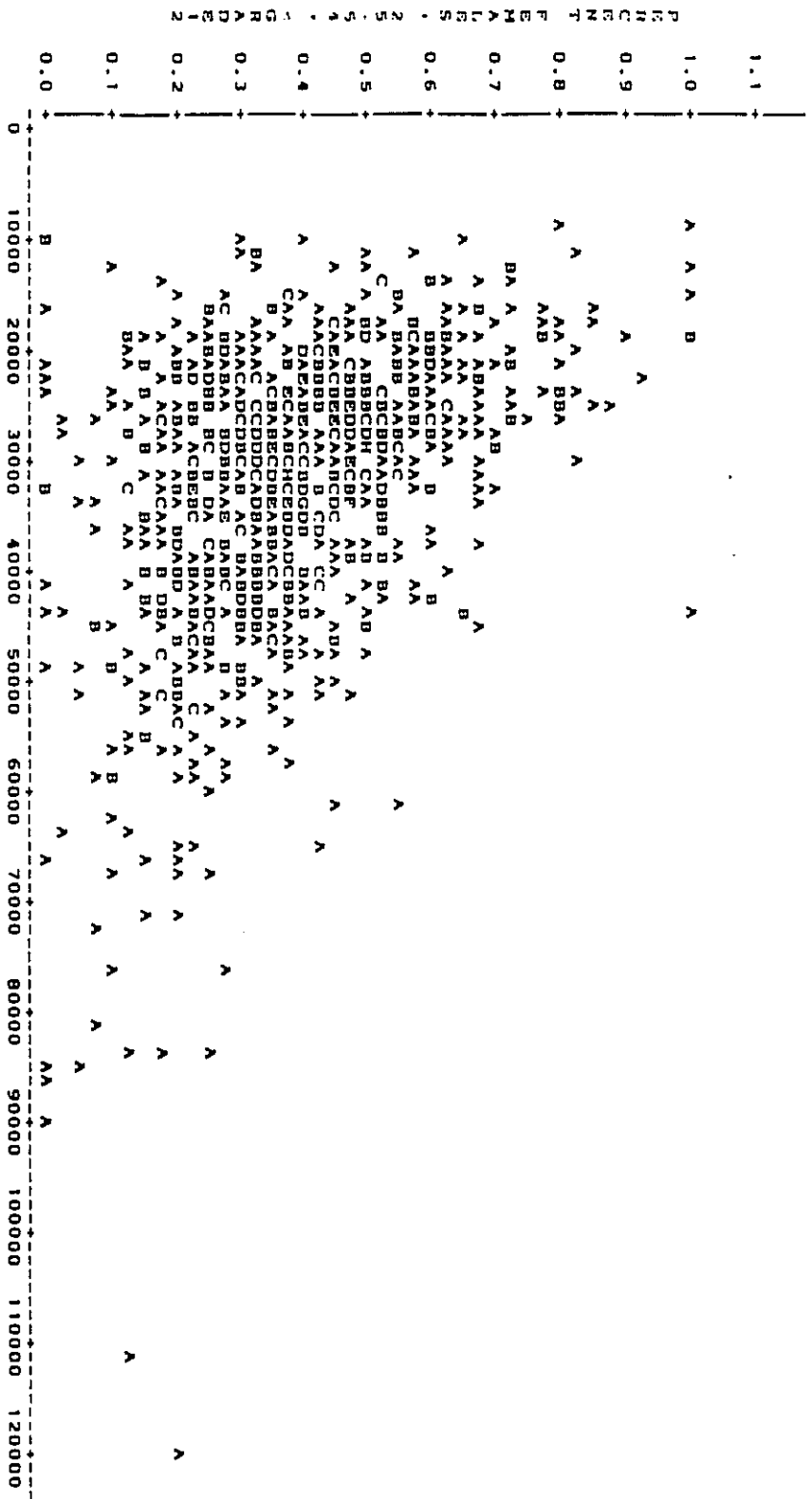


Figure 11
 Plot of Proportion of Women, aged 25-54, with less than Grade 12 Education
 by Average Income in Urban Areas

N = 979 Enumeration Areas, r = -.423



NOTE: 16 OBS HAD MISSING VALUES

Figure 12
 Plot of Proportion of Women, aged 25-54, with less than Grade 12 Education
 by Average Income in Rural Areas

N = 849 Enumeration Areas, $r = -.317$

