

## 11. Correlation analysis

A correlation analysis has been undertaken to illustrate the extent of association at the SLA level between socioeconomic status and the other indicators mapped: see box. Socioeconomic status is measured here using the Index of Relative Socioeconomic Disadvantage (IRSD – covers both males and females), full-time education participation at age 16 and unemployment (these latter two are based on data for men only). Note that as the IRSD is calculated such that low scores (below 1000) reflect relative disadvantage, and high scores (above 1000) reflect relative advantage, negative (or inverse) correlations between the IRSD and other variables indicate a positive association with socioeconomic disadvantage.

In the following tables, the correlations are based on data for men, unless noted.

### Metropolitan Adelaide

There are very strong correlations between men living in socioeconomically disadvantaged areas (as indicated by the IRSD) and their use of the following health services: community health and community mental health services, Child and Adolescent Mental Health Services clinics, SA Dental Service and GPs.

Strong correlations were recorded between socioeconomic disadvantage and men attending public hospital Emergency Departments, or admitted to a hospital for circulatory system diseases or respiratory system diseases. Avoidable hospitalisations of men had a strong correlation with socioeconomic disadvantage, and those for diabetes complications had a very strong correlation.

Both of the chronic diseases for which prevalence estimates were available for men were very strongly correlated with socioeconomic disadvantage – they were the prevalence of mental and behavioural disorders and of mood (affective) disorders.

Of the health risk factor for which data were available, smoking and obesity were both very strongly correlated with socioeconomic disadvantage, while the proportion of the male population who were overweight showed a very weak correlation with areas of high socioeconomic status.

The incidence of lung cancer among the male population is also strongly correlated with socioeconomic disadvantage.

Many of the correlations noted above with the IRSD are similarly strong with the variables for full-time education participation at age 16 (high rates of service use and poor outcomes inversely correlated

**Correlation** is the degree to which one variable is statistically associated with another. The correlation coefficient is a measure of the strength of this association. When high values for one variable are matched by high values for the other (or when low values are matched by low values), then they are positively correlated. Where the interdependence is inverse (i.e. high values for one are matched by low values for the other), the two variables are negatively correlated.

The Pearson product-moment correlation ( $r$ ) has been used in this analysis to indicate the degree of correlation between pairs of variables. Pearson correlation coefficients range from +1 (complete positive correlation) through 0 (complete lack of correlation) to -1 (complete negative correlation). As a general rule, correlations of plus or minus 0.50 or above are considered to be of meaningful statistical significance (referred to in the text as 'strong'). Correlations of plus or minus 0.71 or above are of substantial statistical significance, because this higher value represents at least 50% shared variation ( $r^2$  greater than or equal to 0.5): these are referred to as being 'very strong' correlations. Correlations just below plus or minus 0.50 are referred to in the text as being 'moderate'; and those below plus or minus 0.30 are referred to as 'weak'.

Correlation coefficients were calculated by comparing the value (expressed as a percentage or as a standardised ratio) for each variable in each SLA with the value of each of the other variables. Correlation coefficients are generally referred to as being, for example, 'a correlation of low income families with the paired variable of hospital admissions of females'. However, to promote ease of reading where many correlation coefficients are quoted in the text, the word 'paired' has been omitted. For similar reasons, the symbol used to indicate a correlation coefficient ( $r$ ) has been omitted.

The results of the correlation analysis, which was undertaken separately for Metropolitan Adelaide and country South Australia, are shown in the following table: coefficients from 0.5 to 0.7 and from 0.71 to 1 (both positive and negative) are highlighted in the table.

with high rates of education participation) and unemployment (high rates of service use and poor outcomes correlated with high rates of unemployment).

### Country SA

There are fewer indicators in country South Australia with sufficient data to undertake the correlation analysis, and many of the correlations

are quite weak, in part because of the relatively small number of cases in these low-population areas.

There are strong correlations between socioeconomic disadvantage and high death rates from premature causes (all cause deaths and deaths from circulatory system diseases) and avoidable causes (each of these categories includes deaths before 75 years of age). A similar relationship exists between areas with high unemployment rates high rates of attendance of adults at SADS clinics; as well as admissions for mental and behavioural problems.

There is also a strong correlation between high rates of participation in full-time education at age 16 and socioeconomic advantage.



Table 11.1: Correlation coefficients for SLAs in Metro Adelaide ... cont.

	V36	V37	V38	V39	V40	V41	V42	V43	
V1	0.41	0.61	0.55	0.57	0.17	0.51	0.47	0.61	V1
V2	0.54	0.87	0.66	0.81	0.41	0.63	0.83	0.88	V2
V3	0.61	0.59	0.53	0.52	0.10	0.50	0.55	0.60	V3
V4	0.62	0.70	0.68	0.67	0.29	0.31	0.65	0.70	V4
V5	0.09	0.47	0.22	0.44	0.14	0.51	0.48	0.48	V5
V6	0.32	0.18	0.25	0.21	-0.17	0.20	0.06	0.20	V6
V7	0.54	0.77	0.66	0.69	0.36	0.58	0.67	0.78	V7
V8	0.21	0.16	0.30	0.15	0.09	0.03	0.01	0.19	V8
V9	0.54	0.74	0.67	0.73	0.29	0.45	0.65	0.73	V9
V10	0.03	0.00	0.10	-0.01	-0.24	0.02	0.00	0.03	V10
V11	0.27	0.42	0.29	0.42	-0.02	0.48	0.38	0.46	V11
V12	-0.24	0.10	0.09	0.11	0.04	0.24	-0.09	0.12	V12
V13	-0.33	-0.27	-0.18	-0.24	-0.31	-0.14	-0.30	-0.24	V13
V14	0.37	0.61	0.36	0.58	0.15	0.53	0.64	0.64	V14
V15	0.20	0.33	0.32	0.37	0.01	0.29	0.17	0.37	V15
V16	0.15	0.39	0.35	0.40	0.21	0.27	0.26	0.42	V16
V17	-0.54	-0.35	-0.23	-0.34	-0.15	-0.07	-0.53	-0.35	V17
V18	-0.13	0.23	0.12	0.19	0.14	0.44	0.08	0.23	V18
V19	-0.15	-0.17	0.07	-0.25	0.00	-0.11	-0.30	-0.18	V19
V20	0.19	0.41	0.24	0.31	0.19	0.51	0.39	0.42	V20
V21	0.15	0.45	0.33	0.47	0.19	0.41	0.32	0.47	V21
V22	0.37	0.58	0.57	0.56	0.21	0.39	0.42	0.57	V22
V23	0.58	0.81	0.66	0.79	0.25	0.59	0.76	0.83	V23
V24	0.66	0.87	0.72	0.82	0.39	0.57	0.80	0.85	V24
V25	0.65	0.77	0.70	0.75	0.23	0.50	0.67	0.78	V25
V26	-0.10	-0.14	-0.11	-0.10	-0.17	-0.30	0.02	-0.15	V26
V27	0.62	0.66	0.66	0.63	0.18	0.41	0.56	0.66	V27
V28	0.23	0.24	0.35	0.22	-0.02	0.05	0.23	0.27	V28
V29	0.35	0.12	0.20	0.19	-0.16	-0.18	0.21	0.18	V29
V30	0.38	0.60	0.59	0.57	0.21	0.34	0.54	0.64	V30
V31	-0.21	-0.17	-0.10	-0.14	-0.18	-0.18	-0.11	-0.16	V31
V32	-0.50	-0.74	-0.63	-0.68	-0.28	-0.60	-0.64	-0.76	V32
V33	0.41	0.72	0.47	0.70	0.29	0.55	0.74	0.72	V33
V34	0.51	0.78	0.54	0.73	0.30	0.62	0.77	0.78	V34
V35	-0.70	-0.83	-0.72	-0.78	-0.32	-0.55	-0.75	-0.83	V35
V36	1.00	0.62	0.64	0.58	0.17	0.20	0.65	0.61	V36
V37	0.62	1.00	0.82	0.94	0.56	0.66	0.89	0.98	V37
V38	0.64	0.82	1.00	0.74	0.35	0.33	0.62	0.80	V38
V39	0.58	0.94	0.74	1.00	0.45	0.54	0.80	0.93	V39
V40	0.17	0.56	0.35	0.45	1.00	0.28	0.45	0.48	V40
V41	0.20	0.66	0.33	0.54	0.28	1.00	0.54	0.67	V41
V42	0.65	0.89	0.62	0.80	0.45	0.54	1.00	0.86	V42
V43	0.61	0.98	0.80	0.93	0.48	0.67	0.86	1.00	V43

Disability	Males with a profound or severe disability, living in the community	V36
Deaths	Total deaths	V37
	Cancer	V38
	Circulatory disease	V39
	Respiratory disease	V40
	External causes	V41
	Other causes	V42
Avoidable mortality	Total avoidable mortality	V43



Table 11.2: Correlations coefficients for SLAs in Country SA ... cont.

	V28	V29	V30	V31	V32	V33	V34	
V1	0.07	0.16	0.21	0.15	0.02	0.16	0.12	V1
V2	-0.10	0.13	0.14	0.14	-0.10	0.15	0.07	V2
V3	0.00	-0.24	-0.02	-0.13	-0.20	-0.32	-0.24	V3
V4	-0.27	0.38	0.40	0.26	0.27	0.14	0.40	V4
V5	0.11	-0.36	-0.20	-0.12	-0.27	-0.32	-0.29	V5
V6	0.03	-0.10	-0.14	0.21	-0.19	-0.09	-0.04	V6
V7	-0.25	0.21	0.06	0.32	0.18	0.02	0.34	V7
V8	-0.10	-0.11	0.30	-0.22	-0.10	-0.20	-0.07	V8
V9	-0.36	0.34	0.12	0.49	0.32	0.10	0.54	V9
V10	-0.19	0.32	0.11	0.28	0.27	0.15	0.38	V10
V11	-0.17	0.34	0.09	0.34	0.29	0.13	0.38	V11
V12	-0.27	-0.03	-0.06	0.07	-0.01	-0.07	0.04	V12
V13	-0.03	0.24	0.04	0.24	0.30	0.07	0.29	V13
V14	-0.26	0.44	0.17	0.33	0.46	0.16	0.51	V14
V15	-0.35	0.35	0.03	0.44	0.38	0.02	0.45	V15
V16	-0.17	-0.39	-0.12	0.12	-0.44	-0.39	-0.31	V16
V17	-0.11	-0.31	-0.05	0.14	-0.40	-0.30	-0.25	V17
V18	-0.10	-0.42	-0.05	-0.01	-0.49	-0.36	-0.37	V18
V19	-0.10	-0.56	-0.17	-0.18	-0.58	-0.42	-0.53	V19
V20	-0.06	-0.48	-0.16	-0.05	-0.48	-0.42	-0.44	V20
V21	-0.17	-0.10	0.46	-0.31	-0.14	-0.17	-0.12	V21
V22	-0.23	-0.25	0.18	-0.21	-0.30	-0.28	-0.25	V22
V23	-0.19	0.51	0.31	0.29	0.38	0.36	0.58	V23
V24	-0.18	-0.22	0.12	-0.16	-0.14	-0.29	-0.28	V24
V25	0.26	-0.41	-0.14	-0.44	-0.44	-0.07	-0.53	V25
V26	-0.18	0.33	0.08	0.59	0.20	0.10	0.40	V26
V27	-0.22	-0.62	-0.07	-0.70	-0.42	-0.44	-0.65	V27
V28	1.00	0.22	0.04	0.07	0.09	0.41	0.10	V28
V29	0.22	1.00	0.43	0.66	0.73	0.78	0.92	V29
V30	0.04	0.43	1.00	0.00	0.17	0.18	0.29	V30
V31	0.07	0.66	0.00	1.00	0.39	0.41	0.72	V31
V32	0.09	0.73	0.17	0.39	1.00	0.37	0.77	V32
V33	0.41	0.78	0.18	0.41	0.37	1.00	0.63	V33
V34	0.10	0.92	0.29	0.72	0.77	0.63	1.00	V34
	V28	V29	V30	V31	V32	V33	V34	

Disability	Males with a profound or severe disability, living in the community	V28
Deaths	Total deaths	V29
	Cancer	V30
	Circulatory disease	V31
	External causes	V32
	Other causes	V33
Avoidable mortality	Total avoidable mortality	V34