

Data management

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Hypothesis

- Does socio-economic disadvantage increase the risk of developing heart disease and reduce the chances of receiving appropriate care?

“... we have been discussing the ischaemic heart disease (IHD) analysis and decided we would like to look in more detail at some diseases within the IHD grouping. We are particularly interested in acute myocardial infarction (AMI). I think this has specific icd9/10 codes, but i'm not sure...

Can you produce age/sex adjusted rates of AMIs for NSW by year from 96/97 to 01/02 and by postal area 2001 boundaries?”

Crude specifications

- acute myocardial infarction emergency department admissions of NSW residents, and their procedures
- acute myocardial infarction deaths of NSW residents
- geographic unit – postal area
- 6 year study period
- annual indirect standardised separation ratios
- annual indirect standardised mortality ratios

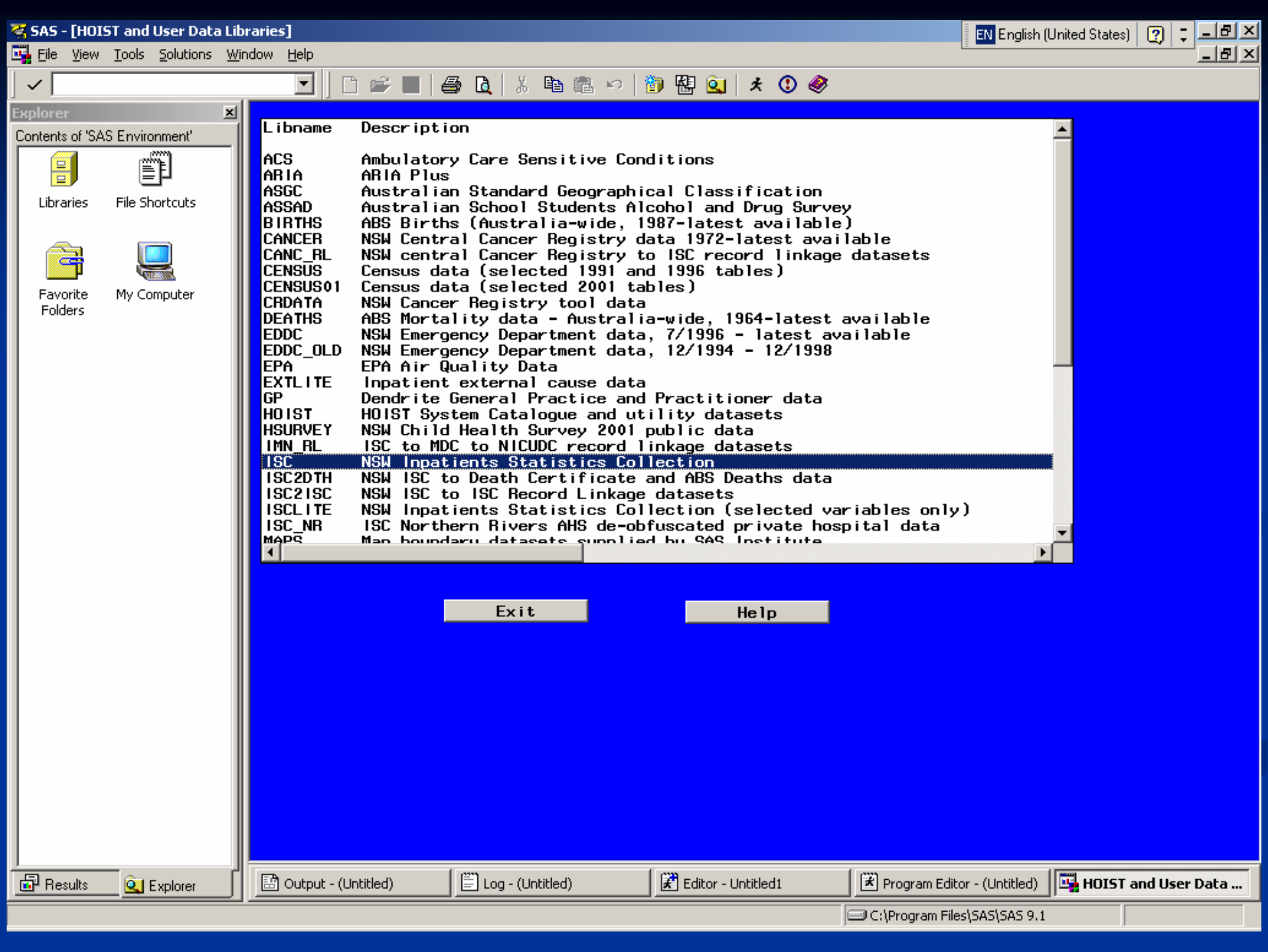
Data requirements

- Socio-Economic Disadvantage
 - Socio-Economic Indexes For Areas (SEIFA)
 - Index of Advantage\Disadvantage
 - Index of Disadvantage
 - Index of Economic Resources
 - Index of Education and Occupation
- Acute myocardial infarction
 - Inpatient Statistics Collection (ISC)
 - ABS Mortality Datasets
- Appropriate Care
 - procedures performed in treating the patient during their hospitalisation
- Population figures
 - Standard population
 - Special population

HOIST

(Health Outcomes Information Statistical Toolkit)

- HOIST is a SAS-based 'data warehouse' operated by the Centre for Epidemiology and Research of the NSW Department of Health.
- It brings together most of the data collections often used in population health surveillance in NSW, and contains all the available historical data for each collection.
- HOIST data are in one format - SAS datasets - and HOIST code values are, as far as possible, consistent across time and among datasets.
- HOIST provides a common data analysis environment across the public health network in NSW.



Libname	Description
ACS	Ambulatory Care Sensitive Conditions
ARIA	ARIA Plus
ASGC	Australian Standard Geographical Classification
ASSAD	Australian School Students Alcohol and Drug Survey
BIRTHS	ABS Births (Australia-wide, 1987-latest available)
CANCER	NSW Central Cancer Registry data 1972-latest available
CANC_RL	NSW central Cancer Registry to ISC record linkage datasets
CENSUS	Census data (selected 1991 and 1996 tables)
CENSUS01	Census data (selected 2001 tables)
CRDATA	NSW Cancer Registry tool data
DEATHS	ABS Mortality data - Australia-wide, 1964-latest available
EDDC	NSW Emergency Department data, 7/1996 - latest available
EDDC_OLD	NSW Emergency Department data, 12/1994 - 12/1998
EPA	EPA Air Quality Data
EXTLITE	Inpatient external cause data
GP	Dendrite General Practice and Practitioner data
HOIST	HOIST System Catalogue and utility datasets
HSURVEY	NSW Child Health Survey 2001 public data
IMN_RL	ISC to MDC to NICUDC record linkage datasets
ISC	NSW Inpatients Statistics Collection
ISC2DTH	NSW ISC to Death Certificate and ABS Deaths data
ISC2ISC	NSW ISC to ISC Record Linkage datasets
ISCLITE	NSW Inpatients Statistics Collection (selected variables only)
ISC_NR	ISC Northern Rivers AHS de-obfuscated private hospital data
MAPS	Map boundary datasets supplied by SAS Institute

Exit

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Contents of 'SAS Environment'

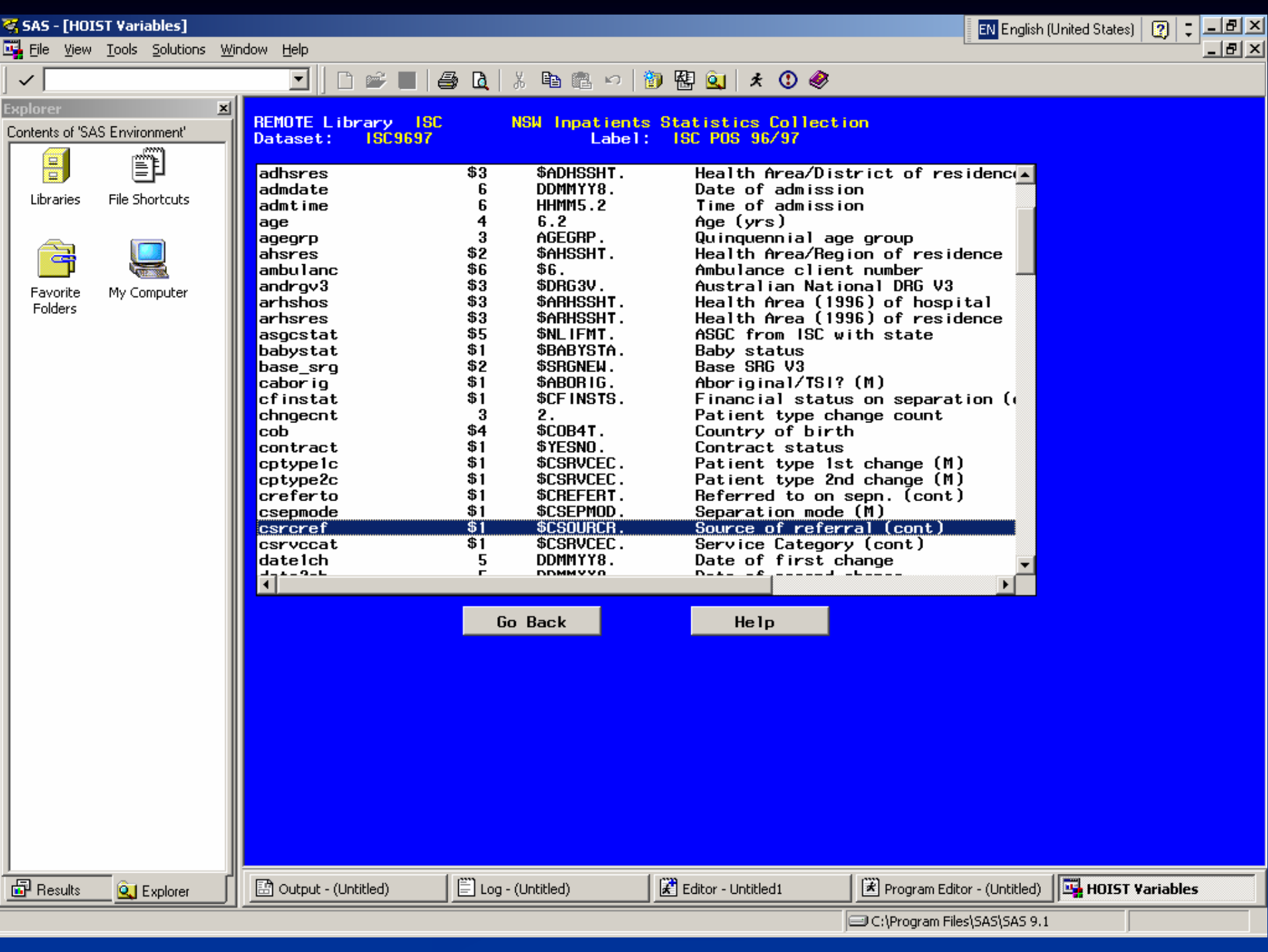
- Libraries
- File Shortcuts
- Favorite Folders
- My Computer

REMOTE Library: ISC NSW Inpatients Statistics Collection

Library	Dataset	Mentype	Obs	Vars	Indexed	Description
ISC	EOC0001	DATA	2012807	246	BOTH	ISC EOC 2000/01 pul
ISC	EOC0102	DATA	2071515	251	BOTH	ISC EOC 2001/02 pul
ISC	EOC0203	DATA	2120315	251	BOTH	ISC EOC 2002/03 pul
ISC	EOC0304	DATA	2160701	322	BOTH	ISC EOC 2003/04 pul
ISC	EOC0405	DATA	2176097	322	BOTH	ISC EOC 2004/05 pul
ISC	EOC0506	DATA	2273272	323	BOTH	ISC EOC 2005/06 pul
ISC	EOC9899	DATA	1959174	195	BOTH	ISC EOC 9899 public
ISC	EOC9900	DATA	1967604	195	BOTH	ISC EOC 9900 public
ISC	ISC8889	DATA	1046571	39	SIMPLE	ISC POS Strip File
ISC	ISC8990	DATA	1142691	48	BOTH	ISC POS 89/90
ISC	ISC9091	DATA	1241118	48	BOTH	ISC POS 90/91
ISC	ISC9192	DATA	1420753	67	BOTH	ISC POS 91/92
ISC	ISC9293	DATA	1525040	67	BOTH	ISC POS 92/93
ISC	ISC9394	DATA	1703557	118	BOTH	ISC POS 93/94 [20/
ISC	ISC9495	DATA	1745566	118	BOTH	ISC POS 94/95
ISC	ISC9596	DATA	1824688	118	BOTH	ISC POS 95/96
ISC	ISC9697	DATA	1859510	133	BOTH	ISC POS 96/97
ISC	ISC9798	DATA	1923146	189	BOTH	ISC POS 1997/98
ISC	ISC9899	DATA	1945991	201	BOTH	ISC POS 1998/99
ISC	ISC9900	DATA	1954124	294	BOTH	ISC POS 99/00
ISC	POS8889	DATA	966605	44	SIMPLE	ISC POS 8889

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REMOTE Library ISC
 Dataset: ISC9697
 NSM Inpatients Statistics Collection
 Label: ISC POS 96/97

adhsres	\$3	\$ADHSSHT.	Health Area/District of residence
admdate	6	DDMMYY8.	Date of admission
admtime	6	HMM5.2	Time of admission
age	4	6.2	Age (yrs)
agegrp	\$3	AGEGRP.	Quinquennial age group
ahsres	\$2	\$AHSSHT.	Health Area/Region of residence
ambulanc	\$6	\$6.	Ambulance client number
andrgv3	\$3	\$DRG3V.	Australian National DRG V3
arhshos	\$3	\$ARHSSHT.	Health Area (1996) of hospital
arhsres	\$3	\$ARHSSHT.	Health Area (1996) of residence
asgcstat	\$5	\$NLIFMT.	ASGC from ISC with state
babystat	\$1	\$BABYSTA.	Baby status
base_srg	\$2	\$SRGNEW.	Base SRG V3
caborig	\$1	\$ABORIG.	Aboriginal/TSI? (M)
cfinstat	\$1	\$CFINSTS.	Financial status on separation (M)
chngcnt	3	2.	Patient type change count
cob	\$4	\$COB4T.	Country of birth
contract	\$1	\$YESNO.	Contract status
cptype1c	\$1	\$CSRVICE.	Patient type 1st change (M)
cptype2c	\$1	\$CSRVICE.	Patient type 2nd change (M)
crefer to	\$1	\$CREFERT.	Referred to on sepn. (cont)
csepmode	\$1	\$CSEPMOD.	Separation mode (M)
csrcref	\$1	\$CSOURCE.	Source of referral (cont)
csrvccat	\$1	\$CSRVICE.	Service Category (cont)
date1ch	5	DDMMYY8.	Date of first change
date2ch	5	DDMMYY8.	Date of second change

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Format: \$CSOURCR. Continuous Referral Source

LOCAL Li SASFMTS.FORMATS

Value	Label
	Missing
OTHER	Invalid Data
A	Born in hospital
B	Casualty or A&E
C	Community health service
D	Outpatients department
E	Psych Hosp/Unit
F	Nursing home (any area)
G	Other hospital same area
H	Other hospital outside area
I	Medical practitioner
J	Self or relative
K	Law enforcement agency
L	Other agency
M	Type change admission
N	Psych. practice
O	Other medical practice
P	Other health estab.
Q	Private hospital
R	Other
S	Crisis team
T	Other Hosp/Nursing Home
U	Not known

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Libraries



File Shortcuts

Favorite
Folders

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Format: **AGEGRP.** **Quinquennial age groups to 85+** LOCAL Li **SASFMTS.FORMATS**

Value	Label
.	Missing
1	0-4 yrs
2	5-9 yrs
3	10-14 yrs
4	15-19 yrs
5	20-24 yrs
6	25-29 yrs
7	30-34 yrs
8	35-39 yrs
9	40-44 yrs
10	45-49 yrs
11	50-54 yrs
12	55-59 yrs
13	60-64 yrs
14	65-69 yrs
15	70-74 yrs
16	75-79 yrs
17	80-84 yrs
18	85+ yrs
19	Unknown
OTHER	Invalid Data

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Index of Disadvantage

- focuses on low income earners, relatively lower educational attainment and high unemployment.
- NSW average is 1000
- lower values indicate areas of disadvantage
- available for each Census year
 - 1986, 1991, 1996, 2001
- Census Collection District (CCD) is smallest geographical area available. All other geographical areas aggregated up

Acute myocardial infarction hospitalisations

- Inpatient Statistics Collection (ISC)
 - is a survey (or a census?) of all inpatients treated in NSW hospitals
 - the survey covers approximately 70 variables, and since 1 July 1993 both public and private hospitals
 - Interstate data contains records on NSW residents who are admitted to hospitals outside NSW. Datasets from 1995/96 onwards contain interstate data
 - financial year collection from beginning on 1 July through to 30 June of the following year
 - pre (and including) 1996/97 uses ICD9 codes, and 1997/98 onwards data has ICD10 codes for primary diagnosis

Acute myocardial infarction mortality

- ABS Mortality Datasets
 - one record for each death registered in Australia since 1st January, 1964 to 31st December 2004
 - pre 1997 uses ICD9 codes, and 1997 onwards data has ICD10 codes for cause of death
 - calendar year collection of records

Subsetting AMI records

Must have a diagnosis which is chiefly responsible for the admission as;

- ICD9 Codes

- 410 and 411

- ICD10 Codes

- I20.0 (Unstable angina), and I20 to I24.9

Creating annual AMI hospitalisation datasets

* Download ISC 1996/1997 hospital data *;

```
data work.isc9697;
```

```
set isc.isc9697(keep = ADMDATE SEPDATE PCODE SEX YEAR AHSRES CSRCREF AGE AGEGRP  
ICD1 PROC1 PROC2 PROC3 PROC4 PROC5 PROC6 PROC7 PROC8 PROC9 PROC10);
```

```
where CSRCREF='B'
```

```
and AHSRES in ("01", "02", "03", "04", "05", "06", "07", "08", "09", "10", "11", "12", "13", "14", "15", "16")  
and ((icd1 =: '410') or (icd1 =: '411'));
```

```
run;
```

* Download ISC 1997/1998 hospital data *;

```
data work.isc9798;
```

```
set isc.isc9798(keep = ADMDATE SEPDATE PCODE SEX YEAR AHSRES CSRCREF AGE AGEGRP ICD10D1  
PROCBL1 PROCBL2 PROCBL3 PROCBL4 PROCBL5  
PROCBL6 PROCBL7 PROCBL8 PROCBL9 PROCBL10);
```

```
where CSRCREF='B'
```

```
and AHSRES in ("01", "02", "03", "04", "05", "06", "07", "08", "09", "10", "11", "12", "13", "14", "15", "16")  
and ((icd10d1 = 'I20.0') or ((icd10d1 >= 'I21') and (icd10d1 <= 'I24.9')));
```

```
run;
```

* Download ISC 2000/2001 hospital data *;

```
data work.eoc0001;
```

```
set isc.eoc0001(keep= ADMDATE SEPDATE PCODE SEX YEAR AHSRES SRCREFC AGE AGEGRP ICD10d1  
PROCBL1 PROCBL2 PROCBL3 PROCBL4 PROCBL5  
PROCBL6 PROCBL7 PROCBL8 PROCBL9 PROCBL10);
```

```
where (SRCREFC='1' or SRCREFC = '01')
```

```
and AHSRES in ("01", "02", "03", "04", "05", "06", "07", "08", "09", "10", "11", "12", "13", "14", "15", "16")  
and ((icd10d1 = 'I20.0') or ((icd10d1 >= 'I21') and (icd10d1 <= 'I24.9')));
```

```
run;
```

Appropriate Care

Emergency department hospital admissions diagnosed with acute myocardial infarction and received an appropriate procedure ;

- Cardiac catheterisation
- Intervention angiography (stents)
- CABG (Coronary artery bypass grafts)

Procedure Codes defined

ICD9 Procedure Codes ;

- 37.2 - 37.23 : Cardiac catheterisation
- 36.0 - 36.09 : Intervention angiography (stents)
- 36.1 - 36.19 : CABG (Coronary artery bypass grafts)

ICD10 Procedure Codes ;

- 667-669 : Cardiac catheterisation
- 670-671 : Intervention angiography (stents)
- 672-680 : CABG (Coronary artery bypass grafts)

Sample code to extract Stent procedures 1996/97

```
data isc9697_AMI_STENT;
  set ami.isc9697_ami_ed(keep = ADMDATE SEPDATE PCODE SEX YEAR AHSRES
                        AGE AGEGRP PROC1 PROC2 PROC3 PROC4
                        PROC5 PROC6 PROC7 PROC8 PROC9 PROC10);
  where AHSRES in ("01", "02", "03", "04", "05", "06", "07", "08", "09", "10", "11", "12",
                  "13", "14", "15", "16")
        and ('36.0' <= proc1 <='36.09'
            or '36.0' <= proc2 <='36.09'
            or '36.0' <= proc3 <='36.09'
            or '36.0' <= proc4 <='36.09'
            or '36.0' <= proc5 <='36.09'
            or '36.0' <= proc6 <='36.09'
            or '36.0' <= proc7 <='36.09'
            or '36.0' <= proc8 <='36.09'
            or '36.0' <= proc9 <='36.09'
            or '36.0' <= proc10 <='36.09');
run;
```

INPUTS

ISC data



Population data



SEIFA data



Data manipulation

OUTPUTS

Indirect standardised
separation ratios



Export to dbf file
(for import into
WinBugs)

