Introduction to the SCOTTISH LONGITUDINAL STUDY (SLS)

Susan Carsley, SLS Project Manager
What is the SLS?

What data is available?

How the SLS can be used

Future Developments
What is the SLS?

- The SLS is a large-scale, anonymised linkage study designed to capture 5.5% of the Scottish population.
- The sample is based on 20 semi-random birthdays.
- It's a joint project between University of Edinburgh and National Records of Scotland (NRS).
- It is built using data available from:
  - Census
  - Vital Events
  - NHSCR (migration into or out of Scotland)
  - Education (School Census, Absences and SQA qualifications)
## Tracing and linkage rates

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>New entries</td>
<td>265,321</td>
<td>96.8%</td>
<td>30,934</td>
<td>11.5%</td>
<td>14,294</td>
<td>5.2%</td>
</tr>
<tr>
<td>Existing SLS members found</td>
<td>-</td>
<td></td>
<td>225,445</td>
<td>84.0%</td>
<td>255,200</td>
<td>93.0%</td>
</tr>
<tr>
<td>Total traced cases</td>
<td>265,321</td>
<td>96.8%</td>
<td>256,379</td>
<td>95.5%</td>
<td>269,494</td>
<td>98.2%</td>
</tr>
<tr>
<td>Total no traces cases</td>
<td>5,064</td>
<td>1.8%</td>
<td>8,725</td>
<td>3.3%</td>
<td>1,483</td>
<td>0.5%</td>
</tr>
<tr>
<td>Total dummies and duplicates</td>
<td>3,670</td>
<td>1.3%</td>
<td>3,324</td>
<td>1.2%</td>
<td>3,327</td>
<td>1.2%</td>
</tr>
<tr>
<td>Total</td>
<td>274,055</td>
<td>100.0%</td>
<td>268,428</td>
<td>100.0%</td>
<td>274,304</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

*Note 2011 results are preliminary*
What data is available?
2011 Census – New Questions

5 new questions were included in 2011 Census:

- national identity
- ability in spoken English
- languages other than English used at home
- long term health conditions
- Month/year of arrival into the UK (for people not born in the UK)
Vital Events

- Births of SLS members
- Births to SLS members
- Stillbirths to SLS members
- Infant mortality of children of SLS members
- Marriages of SLS members
- Deaths of SLS members
- Widow(er)hoods of SLS members
NHSCR data

- Immigrants into the sample
- Emigration out of Scotland of SLS members (if available)
- Re-entries into Scotland after previous emigrations of SLS members
Education data

1. School Census data
2. SQA attainment data
3. Attendance/absence & exclusions data

- Data for 2007-2010 are currently linked to the SLS.
- Names not available so linkage carried out on DOB, sex and postcode only. Good linkage rates.
- Data to be provided annually, and successive linkages will increase proportion of linked pupils (since each has up to 13 chances of being linked).
Health data

Not held within the SLS database but can be linked on a project by project basis

- SMR00 – Outpatient Attendance dataset
- SMR01 – General / Acute Inpatient and Day Case dataset
- SMR02 – Maternity Inpatient and Day Case dataset
- SMR04 – Mental Health Inpatient and Day Case dataset
- SMR06 – Scottish Cancer Registry
- SMR11 – Neonatal Inpatient dataset
- Accident and Emergency dataset
- Child Health Surveillance (CHSP-PS/ CHSP-S/SIRS)
- Outpatient dataset
- Maternity and Neonatal Linked Database
- Prescribing Information System (PIS)
- Scottish Birth Record
- Scottish Drug Misuse Database
- Scottish Morbidity Database
Pollution data

- Modelled annual concentrations for 1x1 km grids in Scotland:
  - 1994-2008: NO₂, PM₁₀, SO₂
  - 2001-2008: CO
  - 1994-2005: O₃
  - 2002-2008: PM₂.₅

- Map shows modelled concentrations of NO₂ in 2000
Weather data

- Gridded data sets
- Regression and interpolation are used to generate values:
  - latitude and longitude
  - altitude and terrain shape
  - coastal influence
  - urban land use.

- Map shows distribution of total rainfall (mm) in Scotland
<table>
<thead>
<tr>
<th>Climate Variable</th>
<th>Daily</th>
<th>Monthly</th>
<th>Annual</th>
<th>1961-1990 Averages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum air temperature</td>
<td>1960-2006</td>
<td>1914-2006</td>
<td>-</td>
<td>5km, 25km, Region</td>
</tr>
<tr>
<td>Minimum air temperature</td>
<td>1960-2006</td>
<td>1914-2006</td>
<td>-</td>
<td>5km, 25km, Region</td>
</tr>
<tr>
<td>Mean air temperature</td>
<td>1960-2006</td>
<td>1914-2006</td>
<td>-</td>
<td>5km, 25km, Region</td>
</tr>
<tr>
<td>Days of air frost</td>
<td>-</td>
<td>1961-2006</td>
<td>-</td>
<td>5km, 25km, Region</td>
</tr>
<tr>
<td>Days of ground frost</td>
<td>-</td>
<td>1961-2006</td>
<td>-</td>
<td>5km, 25km, Region</td>
</tr>
<tr>
<td>Sunshine duration</td>
<td>-</td>
<td>1929-2006</td>
<td>-</td>
<td>5km, 25km, Region</td>
</tr>
<tr>
<td>Total precipitation</td>
<td>Note 1</td>
<td>1914-2006</td>
<td>-</td>
<td>5km, 25km, Region</td>
</tr>
<tr>
<td>Days of rain &gt;= 1mm</td>
<td>-</td>
<td>1961-2006</td>
<td>-</td>
<td>5km, 25km, Region</td>
</tr>
<tr>
<td>Days of rain &gt;= 10mm</td>
<td>-</td>
<td>1961-2006</td>
<td>-</td>
<td>5km, 25km, Region</td>
</tr>
<tr>
<td>Days of sleet or snow falling</td>
<td>-</td>
<td>1971-2000</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Days of snow lying</td>
<td>-</td>
<td>1971-2006</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Mean wind speed</td>
<td>-</td>
<td>1969-2006</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Mean sea-level pressure</td>
<td>-</td>
<td>1961-2006</td>
<td>-</td>
<td>5km, 25km, Region</td>
</tr>
<tr>
<td>Mean relative humidity</td>
<td>-</td>
<td>1961-2006</td>
<td>-</td>
<td>5km, 25km, Region</td>
</tr>
<tr>
<td>Mean vapour pressure</td>
<td>-</td>
<td>1961-2005</td>
<td>-</td>
<td>5km, 25km, Region</td>
</tr>
<tr>
<td>Mean cloud cover</td>
<td>-</td>
<td>1961-2004</td>
<td>-</td>
<td>5km, 25km, Region</td>
</tr>
<tr>
<td>Heating degree days</td>
<td>-</td>
<td>-</td>
<td>1961-2006</td>
<td>5km, Region</td>
</tr>
<tr>
<td>Cooling degree days</td>
<td>-</td>
<td>-</td>
<td>1961-2006</td>
<td>5km, Region</td>
</tr>
<tr>
<td>Growing degree days</td>
<td>-</td>
<td>-</td>
<td>1961-2006</td>
<td>5km, Region</td>
</tr>
<tr>
<td>Extreme temperature range</td>
<td>-</td>
<td>-</td>
<td>1961-2003</td>
<td>5km, Region</td>
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<tr>
<td>Growing season length</td>
<td>-</td>
<td>-</td>
<td>1961-2003</td>
<td>5km, Region</td>
</tr>
<tr>
<td>Summer heat wave duration</td>
<td>-</td>
<td>-</td>
<td>1961-2003</td>
<td>5km, Region</td>
</tr>
<tr>
<td>Winter heat wave duration</td>
<td>-</td>
<td>-</td>
<td>1961-2003</td>
<td>5km, Region</td>
</tr>
<tr>
<td>Summer cold wave duration</td>
<td>-</td>
<td>-</td>
<td>1961-2003</td>
<td>5km, Region</td>
</tr>
<tr>
<td>Winter cold wave duration</td>
<td>-</td>
<td>-</td>
<td>1961-2003</td>
<td>5km, Region</td>
</tr>
<tr>
<td>Consecutive dry days</td>
<td>-</td>
<td>-</td>
<td>1961-2004</td>
<td>5km, Region</td>
</tr>
<tr>
<td>Greatest 5-day precipitation</td>
<td>-</td>
<td>-</td>
<td>1961-2004</td>
<td>5km, Region</td>
</tr>
<tr>
<td>Rainfall intensity</td>
<td>-</td>
<td>-</td>
<td>1961-2004</td>
<td>5km, Region</td>
</tr>
</tbody>
</table>
How the SLS can be used

- Wide ranging topic areas, though main focus on health and mortality
- Over 70 projects approved since launch
- The academic partner provide research support for the use of the data
- Topics include:
  - Sectarianism
  - NEET: Not in Education, Employment or Training
  - Impact of air pollution on adult health and birth outcomes
  - Housing tenure change
  - Birth parity
  - Impact of aging on health care expenditure
  - Educational and social outcomes for teenage mothers
  - And many more – see http://sls.lscs.ac.uk/projects/

See SLS Beta Test Poster for more projects
Future Developments

Scottish Mental Study (SMS) 1947
- A valuable new life-course research resource

Historic Postcodes
- GP registered address changes available from 2001

Children of the SLS (COTS)
- Will enable researchers to investigate inter-generational effects
Questions?

http://sls.lscs.ac.uk/