

Comparison of Methods for Census Analysis

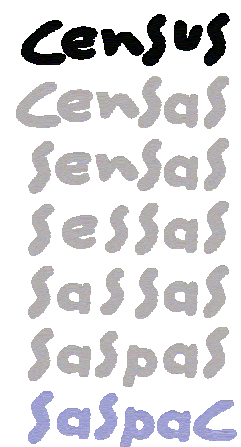
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Introduction

There are various groups that wish to make use of the rich resource of the Population Census and a variety of methods to obtain access to the data. This note, prepared by the SASPAC team, considers the types of user and matches them to available facilities. It begins with an examination of the best known **public sector** software and Web tools for access to the data and then considers additional service options.

Widely Available Census Tools

The public sector produces five sets of facilities that are evaluated in some detail in this note. These are:

- Census Access Service (using SuperTable)
- Neighbourhood Statistics (NeSS) from ONS
- Scotland's Census Results Online (SCROL)
- National Online Manpower Information Service (NOMIS)
- Small Area Statistical Package (SASPAC)

Comparison of SuperTable, NeSS, SCROL, NOMIS and SASPAC

SuperTable is a limited census data viewing/exporting tool distributed by ONS on CD with the 2001 data, or through the developers, Space Time Research (<http://www.str.com.au/>), and is designed to allow users to print, view or export *individual* tables/variables for types of specific areas. Its main advantages are:

- Free access
- Simple and straightforward to use
- Quick and easy to export data for multiple areas into a number of alternative formats with the appropriate metadata

However, its limited functionality makes it unsuitable as an all-round Census access tool. Its individual table structure (i.e. one table per file) and limited variable/area searching tool are significant limitations considering the large quantity of Census data available.

GROS offers a separate service, SCROL, on its Website. SCROL has greater functionality than SuperTable, including thematic mapping and a data warehouse for downloading all of the available Census tables for a selection of areas.

NeSS, SCROL and NOMIS all provide a valuable census access service to a very large number of users through the Internet. These have a number of advantages:

NeSS:

- Free access over the Web
- Quick and easy 'Neighbourhood' profiles
- Built around easy to use wizards that require no training
- SVG thematic maps

NeSS is aimed at the relatively casual census user who only requires access to a relatively small amount of the complete 2001 dataset. It does, however, include a range of statistics from government departments and administrative sources beyond the Census. NeSS have recently (December'08) released their NeSS Data Exchange (NDE), which allows users to incorporate the datasets into their systems via a published Application Programming Interface (API).

SCROL:

- Free access over the Web
- Easy to use means of selecting tables and areas. There is a 'Browser' for simple queries and an 'Analyser' for the more demanding user
- Thematic mapping where the user can construct variables for display
- Data warehouse for downloading all the available Census tables for a selection of areas
- Data for all main Census Geographies

NOMIS, in terms of the census, is principally a tool for downloading data. It provides access to more data than NeSS and includes a more sophisticated user specification/selection option.

- Free access over the web
- Easy to use wizards
- A lot more data than NeSS – Standard Tables, Census Area Statistics, 2001 Travel to work flows and 1981/91 data
- Quick and easy to download large quantities of data in a user friendly format

It should also be noted that the Northern Ireland Statistical and Research Agency (NISRA) provide access to their Census data through the Northern Ireland Neighbourhood Information Services (NINIS) and Northern Ireland Census Access (NICA). These are Web-based access to tools but will not be included as part of this analysis.

However, all these tools provide a service aimed at a different type of user than SASPAC. Supertable, NeSS and NOMIS are designed for the more casual census user and do not accommodate the demands of the more intensive analyst.

SASPAC provides the following:

- A single point of access to a *UK wide* dataset
- Access to all the 2001 Census Statistics
- Access to and analysis of the Double Geography (origin/destination) datasets from 1991 and 2001
- Access to all the Specially Commissioned Tables
- Can carry out complex data queries, i.e. criteria 'Select IF' statements and map-based radial searches
- Can integrate supporting files (gazetteer files, zone lists) created in other software to allow selections/re-aggregations of a very large number of areas.
- Create a customised user environment with complex user defined areas, new table layouts and integrating other local datasets
- An integrated desktop GIS package
- Web publishing of tables and interactive Flash maps in customised web pages

SASPAC, unlike the others, does have a licence fee and annual update/support charge, but these are relatively modest.

The Annex (at the end of this document) gives more details of comparison between the four products. The comparison has been verified with those responsible for the products.

Other Census Data Access Methods

In addition to the main methods of obtaining Census information, outlined above, users can also consider:

- CASWEB/WICID – extensive capabilities, but limited to academic users
- Data brokers – selling convenient packages of data, sometimes with accompanying software tools, such as GIS
- Mapping software companies – bundling selected Census data into their software offerings
- Market analysis companies – providing derived information, such as area classifications
- Consultancies – bringing Census data into client projects

User Types and Choices

It is suggested that there are distinct user groups that will want access to the Census, although their interests and use of tools can be overlapping. The user types considered are:

- The public
- Professional users with casual enquiries
- Professional users with in depth analysis requirements
 - Those with skilled staff wishing to undertake analysis
 - Those that commission analysis from others
 - Consultant intermediaries
- Academic researchers

The table below shows these users and the types of services that are most likely to be suitable.

Census Tools and Services for Types of Use

User Type	Super Table	NeSS	SCROL	NOMIS	SAS-PAC	CAS-WEB	Data Brokers	GIS Kits	Market Analysis	Consultants
Public	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>							
Professional										
--Casual use	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
--In depth use			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	
--Use others									<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
--Consultants		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					
Academic				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				

Annex: A comparison of the Census Services provided by NeSS, SCROL, Nomis, Supertable and SASPAC³

	NeSS	SCROL	Nomis	SUPERTABLE	SASPAC	Key points
Introduction	Neighbourhood Statistics is a cross-government initiative, led by the Office for National Statistics (ONS) and the Neighbourhood Renewal Unit of the Department for Communities and Local Government.	Developed by the General Register Office for Scotland (GROS) to encourage the use of, and widen access to, the 2001 Census.	Nomis is run by the University of Durham on behalf of the Office for National Statistics (ONS).	Software distributed with CD/DVDs by the Office for National Statistics (ONS) to facilitate access to the Census data.	Software owned by the Improvement and Development Agency (IDeA) and managed/developed by the Greater London Authority (GLA) on behalf of its users.	
Access/cost	Free access to all users via web.	Free access to all users via web.	Free access to all users via web - although there is a charge for some non-Census data.	Free with data.	Typically an organisation will pay £1350 in the 1st year and then a £600 annual support fee for any subsequent years. This is an organisation-wide licence.	SASPAC requires an annual licence fee whereas NeSS, SCROL Nomis and Supertable are all free. A few problems accessing some of the online services - slow at times and some tasks failed. Require Supertable CD/DVDs to be distributed by the ONS.
Census Data Available						
2001	Key Statistics/Univariate Tables.	All tables in Area Statistics except those dealing with ethnicity and religion.	ST/TT/CAS/CAST/SWS/TVS ^{1,4}	ST/TT/UV/KS/CS/CT ¹	All Census datasets - ST/TT/CS/CT/KS/UV/AF/SWS/SMS/TVS ¹	SASPAC provides a single point of access for all the 2001 Census datasets including SWS/SMS/TVS ¹ Origin/destination data.
1991	not available	not available	LBS/SAS/SWS ² (Single Geography only)	not available	SAS/LBS ² and SWS/SMS ² Origin /Destination data	Nomis and SASPAC both provide access to 1991 Census data, SASPAC also provides access to the 1991 Origin/Destination datasets.

	NeSS	SCROL	Nomis	SUPERTABLE	SASPAC	Key points
1981	not available	not available	SAS/SWS ² (single Geography only)	not available	SAS/SWS ² (single Geography only)	Only Nomis and SASPAC provide access to the 1981 Census.
Time period of data	2001 data only.	2001 data only.	1981 - 2001	2001 and subsequent boundary changes post 2001 e.g. Census tables for ward changes.	1981 - 2001 and subsequent boundary changes post 2001 e.g. Census tables for ward changes.	NeSS and SCROL contain only 2001 Census data.
Geographical Areas						
2001 (areas existing in 2001)	National to OA for 2001 Census areas in E&W only. In addition SOA, Health Areas, NDC's, Parishes and Parliamentary Cons.	Scotland to OA -15 different area types.	National to OA for 2001 Census areas in E&W. In addition CAS for Urban areas and Parliamentary Constituencies 2001 CAS for 1995 Parliamentary Cons.	National to OA for all 2001 Census areas, includes data for alternative geographies e.g. 2004 wards, Urban Areas, Parliamentary Cons...etc	National to OA for all 2001 Census areas in UK. In addition Health Areas, National Parks, Parishes, Parliamentary Cons., Postcodes, Settlements. Rural and Urban Areas, SOA (Lower and Middle Layer) , revised ward boundaries and Specially Commissioned Tables.	SASPAC provides users with one point of access to all the 2001 Census data for the UK. SASPAC also allows users to access all published Census data for alternative geographies e.g. urban areas, health areas, settlements....etc.

	NeSS	SCROL	Nomis	SUPERTABLE	SASPAC	Key points
1991 (areas existing in 1991)	not available	not available	National to Enumeration District level in Great Britain, Parliamentary Cons., Scottish Postcode Sectors and Travel to work areas. Also, Northern Ireland data for National to ward level, Parliamentary Cons. and historic areas pre 1991.	not available	National to Enumeration District level in Great Britain, Scottish Postcode Sectors	
1981 (areas existing in 1981)	not available	not available	National to ward level in Great Britain, Parliamentary Cons., Scottish Postcodes and a number of revised areas post 1981.	not available	National to ward level in Great Britain.	
Data export/download functionality	Download KS/UV tables one table at a time in xls/csv format. Also, possible to select individual areas and variables (with metadata) to download.	Possible to view, copy and download all tables, for single or multiple areas, in a csv format complete with metadata.	ST/CS tables can be downloaded in xls, csv or a web browser format (html). Single or multiple tables/variables/areas can be selected for downloaded. When exporting a large amount of data output is as a single worksheet, with selected tables and areas placed below each other.	Possible to view, copy and export one table at a time. Data can be exported with or without metadata as csv/xls/html/txt files. In some instances (i.e. exporting data for a large number of areas) there is a limit on the number of areas that data can be exported for.	Export data as text files, wks, csv, html, xls, delimited and a number of other historical file formats. Individual or multiple tables, variables and areas can be selected for exporting.	NeSS, SCROL and Supertable provide a basic download service without as much user control as Nomis or SASPAC i.e. only one table at a time. SASPAC and Nomis provide a similar more sophisticated download/export functionality. In addition SASPAC will allow users to select and export variables from different Census datasets at the same time.

	NeSS	SCROL	Nomis	SUPERTABLE	SASPAC	Key points
Functionality						
Data selection	Individual tables and variables are identified and 'ticked' by the table title or variable description.	Individual tables are selected either: within Themes, by keyword or table number.	Whole tables can be viewed and selected by table title or individual variable.	Multiple individual tables can be viewed with metadata. Individual variables or whole tables can be selected but only one table accessed at a time.	Whole table layouts, with metadata, can be are viewed and selected.	NeSS only contains small tables (KS/UV) so a text string to describe the variable is possible. Selecting tables and variables are similar in both SASPAC and Nomis. Identifying variables in Nomis can be difficult with very large tables due to the window/screen size - SASPAC allows users to view the row/column text when out of sight.
Data searching	User can search for a keyword from table title.	User can search by a keyword from a table title, table number or Topic.	User can search tables by choosing up to two keywords, via a drop down list, from the table title.	"Find value" tool can search a table for a specific text string.	All datasets can be searched by keyword (word in the table title) or by searching for any words that appear in the table itself.	SASPAC contains a more sophisticated searching tool. This is required due to the large quantity of data available.
Area selection	Check box selection via a text listing or OAs can be selected using a map when creating user defined zones.	First select the area type of interest and then one or more areas using a check box. Cannot select areas from different types of geographies.	Check box selection via a text listing or OAs can be selected using a map.	Generally, only possible to view one area (area code/name) at a time via selection from a drop down list. However, single or multiple areas can be selected and then exported.	Check box selection via a text listing or via a map using Mapshore. Also possible to use an external file of pre-defined zones, radial searching and Select IF statements.	SASPAC allows users to select areas through a variety of more sophisticated methods.

	NeSS	SCROL	Nomis	SUPERTABLE	SASPAC	Key points
Area Searching	Areas can be searched by name, postcode, text listing or retrieved via a map.	Areas searched by postcode, Census code, area name or retrieved via a map.	Areas can be searched by name, Census code, postcode or text listing and viewed on a map.	Areas are listed alphabetically and there is a limited area searching facility available with 1-dimensional tables only.	Areas can be searched by area name, Census code or map.	Unlike SASPAC, NeSS, SCROL and Nomis all allow users to search by postcode. NeSS does not allow users to search by Census code.
Data analysis	Produces statistical profiles for a postcode or area based mainly on Census data, these is designed to be viewed online and printed. User can build/view/download their own data mixing different areas and variables. Also possible to produce basic charts and thematic SVG maps designed to be viewed online or printed.	Produces Census profiles/tables for a postcode/area, which are designed to be viewed online, printed or downloaded. Also possible for the users to create thematic SVG maps designed to be viewed online or printed.	No analytical capabilities, designed for users to download data into another software package for further analysis.	Possible to sort data in ascending/descending order but mainly designed for users to export data into another software package for further analysis.	Allows users to define/build their own tables, add their own data to supplement the Census, rename/describe existing variables, Select IF statements sort and customise output, analyse OD data and has an integrated GIS system.	SASPAC strong points are its powerful analytical and output options, these allow users to customise/tailor the Census to meet there own requirements. The thematic maps in NeSS and SCROL use SVG to produce basic interactive maps, SASPAC's Web Publishing application provides users with a more powerful tool.
Customising Census data	User can build and save their own areas by selecting OAs to aggregate on a map. Individual variables (not tables) can then be viewed/downloaded for these new areas.	User can construct new variables when constructing Thematic maps only.	User can build and save their own areas by selecting OAs for aggregation on a map. Individual variables or tables can then be viewed/downloaded for these new areas.	New variables can be created and inserted within in existing tables.	New areas can be created and saved through a map or gazetteer file, possible to add/subtract proportions of areas. New variables can also be created and saved.	Very basic new zone creation and in NeSS and Nomis. SASPAC's New zone creation is more sophisticated and powerful through the use of gazetteer files..

	NeSS	SCROL	Nomis	SUPERTABLE	SASPAC	Key points
Ease of Use	Built on a series of wizards that are very easy and straight forward to use.	Based on a series of easy to use query tools.	Functionality is through a basic or advanced wizard query - both very user friendly.	Straight forward to use due to the limited functionality.	Not straight forward without training.	NeSS, SCROL and Nomis control what variables and areas the user can select once a dataset has been specified, SASPAC does not, which can cause confusion.
Support	Free email/phone/online tutorials and helpdesk support.	Free email/phone/online tutorials and helpdesk support.	Free email/phone helpdesk support and training sessions available.	Email support and tutorials available online and with DVD/CDs.	Email/phone helpdesk support and training sessions available.	SASPAC's helpdesk service is included in the annual support fee.

¹ ST - Standard Tables, TT - Standard Theme Tables, CS - Census Area Statistics Tables, CT - Census Area Theme Tables, KS - Key Statistics Tables, UV - Univariate Tables, AF - Armed Forces Tables, SWS - Special Workplace Statistics, SMS - Special Migration Statistics, TVS - Travel to work or study Statistics (Scotland only).

² LBS - Local Base Statistics, SAS - Small Area Statistics, SWS - Special Workplace Statistics, SMS - Special Migration Statistics

³ Comparison was undertaken in late 2006 and was verified by those responsible for the services as an accurate reflection at the products at that time.

⁴ NOMIS added Local Authority and ward level travel flows to the site in 2007/08.