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**SLS Outputs Guidance Document**

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| 3.1 | 10/03/21 | Intermediate output form in annex B updated | LF |
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| 3.4 | 13/07/21 | Guidance on synthetic data added as Annex D | LF |

SLS Outputs Guidance Document

# The SLS-DSU operates a 2-stage approach to cleared outputs: Pre-publication Output (ie non-disclosive outputs) and Publication Output (ie anything to be shared beyond the immediate team) - please familiarise yourself with both types.

# General Guidelines for Pre-publication Outputs Clearance

Pre-publication Outputs (ie non-disclosive outputs) are those which once cleared can be shared with ***only those who have signed the SLS Undertaking Form.*** You should have read the Scottish Longitudinal Study Disclosure Control Protocol for general guidance, available in Annex A.

## Pre-publication outputs - overview

While at the SLS-DSU we understand that it may be useful to report back to your team members who have signed the SLS Undertaking Form. However, as much as possible, we expect that you will keep your Pre-publication Outputs to a minimum.

***2020/21 update***

All researchers are now offered synthesised versions of prepared/main data files and all data management through to preliminary statistical analysis can be done on the synthetic extract (see Annex D for guidance on preparing a data extract for synthesis). Meaning there should only really be one set of pre-publication outputs requested per SLS project.

***For older SLS projects***

As noted, we expect that you will keep your Pre-publication Outputs to a minimum. Given at the preliminary stages of projects the sample can change and many variables will be recoded/derived making it hard to keep track of possible disclosure risks through differencing between tables.

The SLS-DSU operates as a service to provide research access to the SLS data. We endeavour to facilitate the process as much as we can but it is important to bear in mind that, in normal circumstances, researchers ***should not expect*** SLS-DSU support staff to provide substantive input into the analysis, research design and interpretation of the results of SLS projects unless they are formally recognised as part of the research project team. As such SLS-DSU support staff time cannot be allocated to clearing multiple revisions of Pre-publication Output, especially as checking for disclosure risk between revised versions takes many times longer than a simple clearance.

If you are working through output for presentation to your team (e.g. PhD supervisor or project collaborators) which could lead to discussion points or questions as to how to proceed etc, where possible you should request your colleague(s) be present with you in the SLS-DSU Safe Setting (booked into the other PC) to address these directly while looking at the data - in order to produce only the pre-publication outputs that are required.

It is expected that exact numbers and percentages should not be required before requesting Publication Outputs – therefore either rounding can be used which will retain the key message(s) from the analysis whilst avoiding disclosure risk or results can be summarised without using numbers/percentages. Examples of more narrative styles of results reporting might include:

* There was a significantly increasing trend in unemployment as deprivation increased
* The table shows how the SLS variables have been re-coded, the smallest group listed here accounted for >20% of the sample i.e. all the re-coded groups are sufficiently large.

Other ways of reporting frequency information or modelling results include producing simple colour coded table cells indicating high, medium and low counts/coefficients/odds ratios should be considered.

***Please bear in mind that time spent carefully preparing pre-publication output in this way is likely to save time in the long-run because it will reduce the time spent by SLS-DSU support staff on statistical disclosure control (SDC) checking. In the interests of efficiency, support staff may well prioritise output that makes a clear attempt to assist with the SDC process.***

## Pre-publication Output clearing – the process

Clearing any Pre-publication Output *may* take **up to** 10 working days during busy periods, especially for more complex and/or lengthy output. When asking for Pre-publication Outputs to be cleared please complete the SLS Pre-publication Outputs Clearance form (see Annex B), ensure that the outputs comply with all items on the Pre-publication Outputs checklist and save them in a numbered subfolder within the *Reports*/*To\_Be\_Cleared* folder.

You may have to undertake statistical disclosure control (SDC) measures and save a cut down or supressed version to be cleared. For example, in a cross-tabulation with small cells you can either remove the categories with the small counts from the table (ensuring that row and column totals do not reveal the removed categories) or can combine the small counts into larger groups. It is permissible to make a note (ie for information purposes) below the table that there were small counts in certain categories, but you cannot reveal what the small counts were. SLS-DSU support staff can advise on how best to present information/output for clearing if need be. Please note that if we cannot clear the output as it stands (eg disclosive output needs to be re-worked or output not clearly labelled) then the whole process can take longer than 10 days.

As outlined each pre-publication output should be saved as a separate folder To\_Be\_Cleared within your ‘Reports’ folder. SLS-DSU support staff will talk through the file naming system for outputs which should include the project number, successive numbering of outputs (1=first output etc. within its own subfolder) and date. Please do not delete this folder after the files have been cleared as they can be useful to refer back to at a later point (especially if substantial SDC was applied). Once SDC is performed and cleared the output is saved in a subfolder within *Reports/Cleared* by Support staff (this version is emailed encrypted).

Most outputs are tabular or model based, and all of these Pre-publication Outputs should be recorded in the table within the *Pre-publication Outputs Clearance form*. Details of the output are to be provided along with the overall table N (sample count). For model output, details of the sample size (model N) should be provided for all models run that are to be cleared.

Please remember the output needs to be understandable in terms of what variables (or derived variables) are being presented and, as outlined above, always allow some time to go over it all with support staff (at a safe distance) ahead of leaving the SLS-DSU Safe Settings, as if they can understand it fully then it will take less time to clear it.

Finally, you are required to complete the Pre-publication Outputs Disclosure Control checklist (see Annex B) for each separate output requested for clearance. Again, please also make sure there is sufficient time to discuss these outputs to be cleared with support staff before leaving the SLS-DSU Safe Setting. This ensures that SLS-DSU support staff can understand what recoding of variables may have occurred and the output which they may not be familiar with. Then support staff should be emailed with a request to clear Pre-publication Outputs including the folder name and the checklist (see appendix 1) – there is some flexibility the form can be completed when in the SLS-DSU Safe Settings, then an email request done afterwards to put in the request. Normally they will send you an Outlook calendar invite so to have a record of the (latest) date by which you should expect to receive your cleared output.

## Pre-publication Outputs – applying your own SDC checks

In general, please take great care when presenting output to be cleared. It is vitally important that you do not present output to be cleared which you know is not permitted. If the outputs cannot be cleared by SLS-DSU support staff because it contains material that presents a disclosure risk, further time and work will be required from the researcher until the output is suitably formatted for clearing. This is particularly important to remember when working to a deadline or in situations where it will be difficult to re-visit the SLS-DSU Safe Settings easily.

Users must also adhere to and be aware of the restriction level of certain variables noted below. Of particular note is level 3; these variables can be used to create derived variables but the raw variables cannot be reported in any analysis. Details given in the data dictionary.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **RESTRICTION LEVEL** | **EXAMPLE**  **VARIABLES** | **Permissions** | | |
| **SLS**  **ADMINISTRATORS** | **SLS support staff** | **SLS EXTERNAL RESEARCHERS(SAFE SETTING ENVIRONMENT)** |
| 1 | DOBDY  JTITLEO  INDDES9 | Access | No access | No access |
| 2 | POSTCODE  EASTINGS  GRNORTH  MIGPCPO  CATT | Access | **With permission from the SLS Manager, can:**  -View fields  -Create new derived variables based on these fields  -Provide data to External Researchers based on these fields | No access |
| 3 | DATAZONE  SIMDSCORE4  CARSCO9  PERSNUM9  DOBMT  DOBYR | Access | **Can:**  -View fields  -Create new derived variables based on these fields  -Provide data to External Researchers based on these fields  -Link to approved lookup tables via these fields | **Can:**  -View fields  -Create new derived variables based on these fields  -Link to approved lookup tables via these fields  **Cannot:**  -Remove from the SLS (i.e. report findings on these variables) |

# Pre-publication and Publication Outputs Clearance Criteria

## Analysis and Results

### Sub-group sizes and statistics

Many outputs contain frequency counts or cross-tabulations (N values). The guideline is that if N is 10 or above, it can be reported but if N is between 0 and 9, it cannot be reported. In general N-values of zero cannot be reported, however, in certain cases zeros are allowed if this is to be expected (structural zeroes). For example, in a cross-tabulation of age-group and marriage we would not expect anyone aged under 16 to be married, so it would be permissible to denote the zero in this case.

### Suppression within tables

We advise users to group categories or adapt output to avoid the need for suppression in tables however, in certain circumstances, suppression may have to be used.

It is assumed that row and column totals are reported as part of the table or, alternatively, that they can be calculated from outputs published elsewhere from the same data set.[[1]](#footnote-2)  Not displaying the row and column totals **cannot** be used as a method of SDC. If your results are being presented as percentages you must supply the numbers as additional material to assist clearing – we would prefer tables with counts, and percentages can be created later away from the Safe Setting.

If a single cell is suppressed, it will be necessary to either (i) suppress one or more cells in the same row **and** in the same column until the totals of the suppressed cells in both the row and the column are at least 10 or (ii) to merge the cell with an adjacent one in the same row or column until the merged cell frequency is at least 10. This latter option of combing categories would be preferred, depending on what is being displayed this need not involve merging the entire row/column with its neighbour. The “merge cells” option on Excel or Word can be used to minimise the number of cells to be merged. The symbol ‘.’ should not be used – suppression should be indicated by \*\*\*.

For the toy example below, 4 cells must be suppressed here to avoid disclosure that only 1 case is contained in cell “BX”[[2]](#footnote-3):

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Table as received** | | | |  | **Table with suppressed cells** | | | |
|  | X | Y | Total |  |  | X | Y | *Total* |
| A | 17 | 17 | **34** |  | A | 17 | 17 | ***34*** |
| B | 1 | 16 | **17** |  | B | \*\*\* | \*\*\* | ***17*** |
| C | 15 | 15 | **30** |  | C | \*\*\* | \*\*\* | ***30*** |
| ***Total*** | ***33*** | ***48*** | ***81*** |  |  | ***33*** | ***48*** | ***81*** |

### Disclosure between tables

Codings of variables should wherever possible be kept consistent. If age is to be coded in bands of k years, different pre-publication output tables should not have different codings as this may allow a disclosive frequency to be calculated by subtracting one table from another. For example, if one table used an age band of 5-9 years and another table used an age band of 5-10 years, then subtracting the two tables would show the data for those of age 10 years.

In the unusual situation that there is a good research reason that multiple codings are to be used, you must ensure that any cell count which can be derived from the differencing between tables is over 10. This applies to all tables produced throughout the entirety of the project.

***To avoid this please delay, wherever possible, pre-publication output of numbers until you have determined what your final sample/groupings are.***

Further, if a statistic is suppressed in one table it must not be derivable from data released in any other table. As an SLS user it is your responsibility to ensure that this does not occur. If this does occur and there have been no Publication Outputs produced, to have the later table cleared you will be asked to confirm deletion of the earlier pre-publication output table before you are permitted to receive the later table. If the first table has been presented as a (final) Publication Output then the later table cannot be cleared.

## Summary statistics

Maximum or minimum values should only be reported where at least 10 cases share that value. The range should be reported only where both the maximum and the minimum can be reported. When reporting maximum and minimum values in the pre-publication output to be cleared, users should in a separate output file provide a frequency count to demonstrate that there are at least 10 cases in the maximum and minimum.

It is possible to report percentiles if they are shared by a total of 10 observations. Similarly the mode should only be reported if there are at least 10 observations at the modal value.

For numerical data with many unique values it may be better to report the percentage of values in certain fixed ranges: e.g. income levels in certain bands. The mean, variance and higher order parametric statistics can be reported if N is 10 or above.

## Graphical output

If possible we would prefer that tables are requested and charts produced at a later stage away from the SLS-DSU Safe Settings. If charts are produced the corresponding tables of the underlying data should also be produce (to show as part of the clearing process) to ensure no small cell sizes.

Specifically, histograms and bar charts (whether simple or stacked) can be reported if, and only if, the same data in frequency table form could be reported. The frequency table used to produce these chart must be provided for clearing.

In general, graphical output can be used only to make tabular or other formats more accessible to the user. The use of scatterplots is discouraged, however if the data plotted are derived from models then this may be permissible and should be discussed with . If these are both true then the graph should then meet the following conditions:

* data points cannot be identified with units (when the graph consists of transformed or fitted data this is not usually a problem)
* there are no outliers that might lead to the identification of a unit
* the graph is submitted as a fixed picture, with no data attached. This means graphs should be image files (either .jpg, .jpeg, .bmp or .wmf).

Kaplan-Meier survival plots should be smoothed, SLS-DSU support staff can help advise – rules are slightly different on presenting deaths.

Residual plots should not be requested, please discuss with SLS-DSU support staff.

# General Guidelines for Publication Outputs Clearance

When you want to disseminate your SLS results beyond your project team and named associates in the SLS Undertaking Form you **must obtain Publications outputs clearance** from the SLS Data Custodian using the SLS Clearance Form (Available from the [SLS website](https://sls.lscs.ac.uk/guides-resources/step-bystep-guide-to-accessing-sls-data-1/)). If a member of your research team produces a Publication Output (previously referred to as Final Outputs), it is the responsibility of the approved researcher to ensure that the publication output goes through the complete Publication Outputs Clearance process.

Typical Publication Outputs include conference abstracts, presentations for dept. seminars through to conference talks, working papers, reports or journal articles intended for publication. The SLS Data Custodian must clear all types of Publication Output and you should **allow 15 working days** for publication outputs clearance (though keep in mind it may take up to 20 days during busy periods). Although most Publication Outputs are cleared more quickly than this, larger outputs such as PhD theses will take longer and you should build into your PhD submission timetable enough time for the possibility of the SLS Data Custodian asking for changes before giving approval. The process for clearing Publication Outputs reduces the risk of disclosure, ensures that the study and data are properly described and that the data have been used appropriately.

Key criteria that will be considered are:

* The results displayed and the discussion concerning them do not raise confidentiality or disclosure issues;
* The SLS is described correctly;
* 'Source: Scottish Longitudinal Study' is added to tables and figures, where appropriate;
* There is no reputational damage to the Scottish Government, The National Records of Scotland and the Scottish Longitudinal Study
* You have acknowledged the support of the LSCS using this disclaimer:

*"The help provided by staff of the Longitudinal Studies Centre - Scotland (LSCS) is acknowledged. The LSCS is supported by the ESRC, National Records of Scotland and the Scottish Government. The authors alone are responsible for the interpretation of the data. Census output is Crown copyright and is reproduced with the permission of the Controller of HMSO and the Queen's Printer for Scotland."*

Please keep in mind that the Publication Outputs Clearance checks should not be considered a peer review process as the NRS Data Custodian will only check the key criteria as described above. ***Errors in the Interpretation of the data or in the analysis are entirely the responsibility of the researcher.***

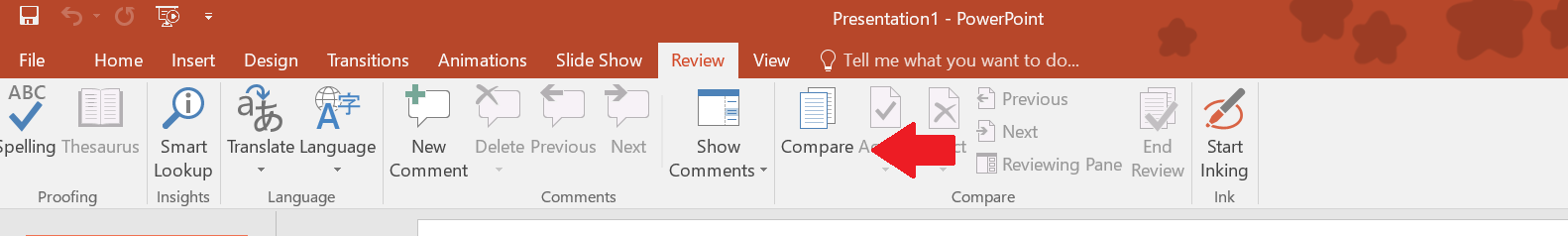
When you submit a Publication Output Clearance Form to SLS-DSU support staff you should also submit a completed check list (see Annex C). Similar to the Pre-publication Output process SLS-DSU support staff will normally send you an Outlook calendar invite so you have a record of the (latest) date by which you should expect to receive your clearance.

We cannot emphasise enough the importance of ensuring your output meets the criteria set out in Annex A. If your output does not meet this criteria you will be required to attend the SLS-DSU Safe Setting in person to discuss with SLS-DSU support staff and rectify the output before the output can be released to you[[3]](#footnote-4). It is therefore essential that you plan to allow enough time at the end of the day to thoroughly check your output to avoid potential delays and to allow enough time for the SLS-DSU support staff and the NRS Data Custodian to clear the output. If in doubt, please discuss with SLS-DSU support staff.

*Reuse of Publication Output – primarily for talks:*

1. ***If the output remains unchanged*** and there is no new discussion of SLS processes, once your Publication Output has been cleared for public release you may disseminate it a number of times without resubmitting it for clearance. However, if the output text or results changes at all then it will be required to be re-cleared. We would kindly remind you that we do require for ESRC reporting purposes information on where and when your research using the SLS is presented. This extends to future presentations which have not needing clearing.
2. ***Any changes in tables, figures, text or content*** requires the submission of another Publication Outputs Clearance Form. For example, if you need to submit to a different journal then you should submit a Publication Outputs Clearance Form for each submission.

***For speed of clearance, you can use ‘track changes’ if your output is in ‘Word’ format or ‘compare and combine’ for outputs in ‘Powerpoint’ (see image below) to ensure SLS-DSU support staff can quickly see the changes.***



If you do not do this, clearance will inevitably be delayed as the NRS Data Custodian will need to check for changes manually.

As you have gained either SLS Approved Researcher status or Provisionally Approved Researcher status, the SLS trust that you will inform us of any changes and not release/present/publish any output which has not been officially cleared especially that which may inadvertently cause reputational damage to the SLS-DSU/NRS/Scottish Government. Releasing uncleared data would be a breach of the terms and conditions of your Undertaking with the SLS.

Again to kindly stress you **MUST** notify support staff (or the SLS-DSU on [sls@lscs.ac.uk](mailto:sls@lscs.ac.uk)) when any publication which draws on the SLS is published. We maintain a database of all published research outputs that use the SLS and it is vital for us to keep this record up-to-date (<https://sls.lscs.ac.uk/outputs/>)

***In all cases, the Registrar General reserves the right to withhold clearance of any output if such an output would inhibit the Registrar General’s ability to carry out their statutory duties.***

## Publication Outputs Clearance Criteria

**Describing the SLS (see** [**LSCS Working Paper 1.0**](http://calls.ac.uk/wp-content/uploads/2013/05/LSCS-WP-1.0.pdf) **for further details)[[4]](#footnote-5):**

The SLS must be described correctly ensuring accuracy of the text and of substantive points about the SLS and its functions, for example:

* the SLS should not be described as being used to “track people”;
* the SLS should be referred to as a database: data provided for researchers to use in analysis should normally be referred to as “datasets”;
* the SLS linkage method, sample size and content (i.e. that it includes data for Scotland only) and study methodology (see below) should be described accurately;

Researchers must make clear that SLS linked datasets have no identifiable individual level data and are derived from linkages that are anonymised prior to handover to the research team. For example, if your support staff linked your datasets using the postcode (deleting the postcode before providing you with the data) then you must state that SLS-DSU staff carried out the linkage and not say that ‘we’ linked the data.

## Methodology

‐ The SLS sample is made up of 5.3% of the Scottish population

‐ The SLS sample is selected using 20 dates of birth.

‐ Values cannot be described as “missing”, it is more appropriate to refer to them as “non‐response (missing/edited)”.

Please note that 2011 data have imputed values and no missing values. Imputed values occur when the original data was either missing or has been edited. 2011 data before imputation are not available so this difference between 2011 and 2001/1991 census data should be considered when interpreting results. For example, it is not true to say that the proportion missing has decreased in the 2011 census. We have some imputation flags for primary census variables such as age, sex i.e. responses to single census questions (see the data dictionary) however some SLS variables are derived from several primary or secondary etc. variables and the degree of imputation becomes very difficult to work out. If you have requested any imputation flags as part of your project variables you are **not** allowed to publish any tables or report any specific statistics based on analysis using the imputation flags. The imputation flags are for informational purposes only. You can use them to refine samples etc.

## Analysis and Results

***The same rules that apply to the level of output control for the named researchers are also applied to information that is to be released publicly using SLS data.*** In general if N is between 0 and 10, it cannot be reported, although in certain cases (e.g. reporting on rare diseases, deaths) it may be permissible to report on N-values between 5 and 10, however this will be at the discretion of SLS support staff.

Thus, the minimum N of 10 also applies to tables and summary statistics (ie if reporting max and min frequency tables of these variable should also be provided).

Annex A

Scottish Longitudinal Study Disclosure Control Protocol

**This document must be read by all persons wishing to use SLS data**

The SLS is a linked database containing individual confidential data, managed by the Longitudinal Studies Centre – Scotland (LSCS). Any person using that data, whether in the role of a SLS-DSU support staff providing data to a user, or as an end user receiving results of data for research, must comply with the confidentiality requirements stated in the undertaking.

Further to this, certain disclosure controls must be applied to the data to ensure that no individual can be identified within them. These controls will be applied to any data released to users by support personnel. If data are to be released in tabular form then the SLS-DSU support staff must ensure that any variables that alone, or in conjunction with others, may identify individuals are aggregated to the point where no identification is possible.

* No data on the birth dates of SLS members may be released, with the exception of year of birth. Where full date of birth is required for use in derivations (i.e. in such procedures as person years at risk analysis) only those SLS staff based at NRS with full database permissions will be allowed access to the data.
* Exposure times (e.g. person years at risk) may be included in aggregated datasets provided ***either*** there is more than 10 events in each cell ***or*** else the data has been subject to adjustment to prevent disclosure.

When releasing tabular data SLS support staff must ensure that cell counts are 10 or over for Pre-publication and Publication Outputs. If associated data allows the cell to be split then the support person must aggregate the data to the highest level consistent with the need to explain the results.

* Sample uniques are never allowed.
* Reporting residual values that identify individual cases will not be allowed when releasing data from statistical models.
* Particular care should be exercised with plots especially where there are outliers or extreme values. These should not be released.
* Histograms and bar charts can be reported if, and only if, the same data in frequency table form could be reported.

Restrictions will also be placed on the release of any variable deemed to be sensitive. These include variables which relate to small numbers of people in Scotland (i.e. local-area geographic identifiers, detailed ethnicity, rare causes of death etc.). Other variables, such as religion, may also be treated as sensitive, depending on the context of the research. It should be noted that selection criteria used in extracting data such as sex and age may be disclosive when used in conjunction with other variables.

If a SLS-DSU support staff believes that data may be disclosive they must bring this to the attention of the NRS SLS Data Custodian who will decide on the procedure to follow. In most cases this will require further aggregation of the data.

**Annex to the SLS Undertaking Form**

**Immediate sanctions to be applied in the case of breach**

**of the conditions of the undertaking**

All users of the Scottish Longitudinal Study (SLS) who have signed the SLS Undertaking Form must report any breach of the conditions of the Undertaking promptly to the NRS SLS Project Manager. Failure to do so is a fundamental breach of the terms and conditions of the Undertaking. It should be noted that in signing the Undertaking individuals (and their institutions) are agreeing to the terms of the Census Act (1920), the Statistics Act (1938) and current Data Protection and Freedom of Information legislation.

The following sanctions may be applied:

For a first offence, depending on the seriousness, the penalty should be a minimum 1 month discretionary suspension from access to any SLS or NRS data applicable to the individual(s) in question. For more a serious breach a minimum of 12 months would be applied and subsequent offences directly to step 3. This would also be applicable to other researchers named on that individual’s SLS project(s). It would generate a written warning to that individual’s institution of employment.

For a second offence, the penalty should be a minimum 12 month discretionary suspension from access to any SLS or NRS data applicable to the individual(s) in question. This would also be applicable to other researchers named on the SLS project. Again, it would generate a written warning to that individual’s institution of employment.

An individual’s further breach would, as a minimum, result in a suspension of access of 2 to 5 years, or permanently, on the individual and would generate a written warning from the Responsible Statistician (the Registrar General for Scotland).

Or where the breach is the result of an institution’s willful or negligent action, then a minimum penalty of a 12 month non-discretionary suspension shall apply to the relevant department within the institution. Repeated breaches will result in a letter from the Responsible Statistician with discretionary penalties to the institution as a whole including suspension of all SLS and NRS data access facilities for all the institutions staff.

Please also refer to the NRS 2022 census confidentiality undertaking (CCU) signed and emailed.

Further information on how NRS protects the confidentiality of census data from: [www.scotlandscensus.gov.uk/confidentiality](http://www.scotlandscensus.gov.uk/confidentiality) and [www.scotlandscensus.gov.uk/Privacy-2021](http://www.scotlandscensus.gov.uk/Privacy-2021)

**Annex B Pre-publication Outputs Clearance Criteria**

**SLS Pre-publication Outputs Clearance Form[[5]](#footnote-6)**

Project Number: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Researcher Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date of request: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Folder location and name: **Reports\To\_be\_cleared\**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(eg \*Reports\To\_be\_cleared\2018\_tbc(n)\_yymmdd*) (where n=output number, yymmdd=date)

Date of SLS approval (SLS use only) \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Approved by (Staff initials - SLS use only) \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**I have read the SDC guidance v3.4 document ☐I have read the Pre-publication Output Clearance Guidance and completed the Statistical Disclosure Control Checklist (below) ☐I confirm that the requested outputs fall within the scope of the project’s aims and objectives ☐**

Please complete the table below for each file to be released (insert additional rows if required)

|  |  |  |
| --- | --- | --- |
| File name | Description of file contents | Is this an update to a previously released file? If so, please provide details of changes |
|  |  |  |
|  |  |  |
|  |  |  |

**Pre-publication Output Clearance GUIDANCE**

As far as possible, limit pre-publication output requests to one of the following scenarios:

1. Pre-publication i.e. necessary to produce your (final) publication outputs
2. Discussions with team members, without which the analysis would be delayed. Team members should attend the safe setting where possible and researchers should make the majority of analysis decisions themselves

Check the following prior to requesting a file to be released from the SLS (see also the more detailed disclosure control checklists on p. 3-4):

* Titles and descriptions are clear and self-explanatory. Tables, charts[[6]](#footnote-7), variables and variable codes should be labelled in a meaningful way and have been formatted to a standard suitable for a final presentation i.e. not cut and pasted from log/output windows
* Outputs do not contain embedded data which could be made available after release
* There are no small, potentially-disclosive numbers - no tables should have a cell count of less than 10
* The sample used in each table/chart/model is shown i.e. description including exclusions and sample size (N). Any statistics should be based on a sample size of at least 10
* Differencing from previously released outputs: Have you produced similar analysis before that, combined with this output, could be used to identify someone?
* Every effort has been made to convert data results to descriptive text to avoid release of actual results. For example, a table of age in 1991 by age in 2001 would not be released due to small numbers but text could be written ‘*although in most cases age in 2001 is a corresponding number of years older than age in 1991, there are instances where this is not the case so a decision needs to be made to either exclude these cases or accept the 1991 age is being ‘correct’. Excluding such cases would reduce the sample size by <5%*’. This approach of summarising results also makes team discussions quicker and easier
* Any graph/chart/percentage must also include the data behind the graph/ chart/ percentage, have no outliers and be in a suitable format. Scatter plots are not released.

**Save this completed Pre-publication Outputs checklist form with the outputs and email your SO to request clearance together with the location of the output**

**If output does not comply with the above, SLS support staff will cease output checking and you will need to return to the SLS Safe Setting to amend the output**

**SDC CHECKLIST for SLS Pre-publication Outputs[[7]](#footnote-8)**

Complete the following SDC checks: (Please answer all questions)

**Frequency tables/charts**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Yes | No | N/A |
| Are there any cells in the table with a value >0 and <10? | ☐ | ☐ |  |
| Are there any columns or rows dominated by zeros or 100% of observations? | ☐ | ☐ |  |
| Are there any cells with suppressed values/hidden columns or rows? | ☐ | ☐ |  |
| Has the table used a different population base from previous similar tables? | ☐ | ☐ |  |
| Has the table used a different variable breakdown from a previous similar table? | ☐ | ☐ |  |
| Has the table used a different definition or source for a variable previously tabulated? | ☐ | ☐ |  |
| Are there any minima/maxima present?  (for max/min separate frequency counts/univariate distribution table must be provided – ie for age could be disclosive for top age or certain ‘events’) | ☐ | ☐ |  |
| *For health data linkage projects* |  |  |  |
| If using health data does the count of ‘10’ (events/admissions etc) relate to more than 10 SLS members (rather than a rare event to 1 SLS member) | ☐ | ☐ | ☐ |

**Models**

|  |  |  |
| --- | --- | --- |
|  | Yes | No |
| Does the model have fewer than 10 residual degrees of freedom? | ☐ | ☐ |
| Does the model description quote or plot any individual values, such as minimum or maximum values or outliers? Again, plots are discouraged and tables to be produced to produce away from the Safe Settings | ☐ | ☐ |
| Does the model description include a residual plot or residual values? | ☐ | ☐ |
| Has the model used a different population base (ie cohort) from a previously described (or cleared) model (or sets of models)? | ☐ | ☐ |
| Is the regression undertaken on a single unit? | ☐ | ☐ |
| Does the regression solely consist of categorical variables? | ☐ | ☐ |

**Syntax files**

|  |  |  |
| --- | --- | --- |
|  | Yes | No |
| Is the code clearly annotated with comments to assist the reviewer? | ☐ | ☐ |
| Are there any references or figures in the comments or code that could lead to potential identification of individuals? | ☐ | ☐ |
| Are there any SLS numbers included in the code or the comments? | ☐ | ☐ |
| Are there any counts from the data present in the comments or code? | ☐ | ☐ |

* **Any white** boxes ticked, your output will fail SDC. If you think your output should still pass, please discuss this with your SLS support officer before leaving the safe setting
* **Any light grey** boxes ticked, your output may fail SDC. If your output fails, your support officer can also provide advice about how to re-design your outputs so they will pass
* **All dark grey** boxes ticked, your output is likely to pass SDC, but it still needs to be checked

The SLS support officer will compare your outputs to all outputs previously released from the same dataset to make sure it is not possible to identify any individuals or small cells by comparing outputs.

**Annex C Publication Outputs Clearance Criteria**

|  |  |
| --- | --- |
| **CHECKLIST Publication Outputs Clearance Criteria** |  |
| * The SLS is described correctly |  |
| * 'Source: Scottish Longitudinal Study' is added to tables and figures, where appropriate |  |
| * The support of the LSCS is acknowledged using the specified disclaimer |  |
| * No tables have a cell count of less than 10 (unless previously agreed with SLS-DSU support staff) |  |
| * There is no disclosure between tables |  |
| * Any statistics should be based on a sample size of at least 10 and when reported should include confidence intervals and/or statistical significance |  |
| * Any graphs should be based on cleared output, have no outliers and be in a suitable format |  |
| * There is no reputational damage to the National Records of Scotland, The Scottish Government and the Scottish Longitudinal Study. |  |
|  |  |
|  |  |

* **I have read and understood the Statistical Disclosure Protocol (Annex A)**

|  |  |
| --- | --- |
| **Process chart for Pre**-**publication output clearance** |  |

**Annex D: Guidance for researchers on synthetic data**

Macintosh HD:Users:fionabolik:Desktop:Work:Hub:LOGOS:Final Versions:Print logos:SLS 2.eps

**This document is to provide guidance for researchers who wish to have a Synthetic version of their main SLS dataset to take away from the SLS Safe Setting during the COVID-19 period**

Using the R software package ‘synthpop’ the SLS-DSU team have the ability to produce non-disclosive versions of your main SLS analysis dataset that you can then take away to work on outside the safe haven (however, this data must **never** be passed onto another party). A SLS Synthetic Data Undertaking form must be signed to confirm this – this also means passing on to project team members, unless they have also signed the SLS Synthetic Data Undertaking form.

Because this synthetic data is model based, it retains some of the statistical structure of the ‘real’ data and therefore you will often find that models run on the two datasets are very similar. You can use your synthetic data to develop your methods, but you should ***always*** base your research on the actual data. As detailed in the SLS synthetic data SLS Synthetic Data Undertaking form you must **never** present or publish results based on the synthetic data.

In order to produce synthetic data we need you to pre-process your data. This should not be extra work because in most cases the restructured dataset will be the same or close to the one you would want to carry out a ‘final analysis’ on.

***Preparation of your data for synthesis:***

1. It must be in **wide format** i.e. a simple flat file with a single case in a row of data. At an initial stage of your project you could have more than one of these and you can get each one synthesised, but it will not be possible to link the synthesised files.
2. Remove all identification numbers (usually **sls number**).
3. Replace any date variables by numeric or categorical variables, e.g. use age at death and/or follow up time instead of date of death.
4. Identify the following to your support officer:
   1. Any continuous variables with missing values that are indicated by something other than the system missing value (e.g. -9 or 999). System missing values are fine if you have only one missing value code (e.g. in STATA).
   2. Optionally, one grouping variable of major interest that divides your data into large groups of at least 500 records each (e.g. Local Authority, or Health Board). This will be used for stratification.
   3. If possible, a list of at most 5 variables that are your major focus of interest (e.g. your outcome variable and those you expect to be the most important predictors).
5. All categorical or ordinal variables (except the stratification variable) should have a **maximum of 15 categories**. Here are some strategies to deal with this:
   1. Group categories with small numbers of records together
   2. If you have a variable with lots of categories (e.g. detailed cause of death), please provide an additional variable that groups it into fewer categories. We will use this second variable in the synthesis. A synthesised version of your detailed variable will appear in the synthetic data but its relationship with other variables will only be via its grouping variable.
6. Ideally you would provide this data as an R data file (.Rdata or .RDS extension). All variables should be numeric, factor, character or logical (**no other types**) and stored in a data frame. Alternatively, you can provide a CSV file with the first row including your variable names. If your data are in STATA or SPSS you should speak to your support officer about supplying it in this format, as there may be issues with variable label codes being changed in the synthetic version. As such it may be worth asking your support officer for the original syntax used to produce your SLS extract, this would be in STATA or SPSS format. Plus, to clear any data management syntax/code you have created. As from these 2 sets of code the categories can be identified.
7. Outliers, on a continuous variable, must be top and bottom coded. For your ease please simply top code at the 95th percentile and bottom code at the 5th (eg if the 95th percentile for an income variable is £60,000 all incomes above £60,000 should be given the value £60,000). This is most likely to apply to age, hours worked, hours caring etc.

Please read these instructions very carefully and follow them precisely, otherwise valuable support officer time might be wasted. Given that during this period of social distancing and low density working we cannot afford any waste of time in more vulnerable work situations.

**We therefore reserve the right not to produce synthetic data for anyone who fails to meet these instructions**.

1. Not to make this assumption would involve keeping a record of the marginal totals in question and ensuring that they are never published. As this would in time become unmanageable, the assumption that marginal totals will be published should be made from the start. [↑](#footnote-ref-2)
2. In practice we would prefer combining categories rather than cell suppression as in this simple toy example using the marginal total and iterative proportional fitting these supressed cells could be reidentified. [↑](#footnote-ref-3)
3. For overseas researchers you will be required to skype/call with SLS-DSU support staff at a time convenient for them. [↑](#footnote-ref-4)
4. <http://calls.ac.uk/wp-content/uploads/2013/05/LSCS-WP-1.0.pdf> [↑](#footnote-ref-5)
5. Please note this SLS form was adapted from the eDRIS doc: “*National Safe Haven Statistical Disclosure V3*” [↑](#footnote-ref-6)
6. Where possible please produce charts from tables away from the Safe Setting as charts should only be produced if the counts can be released [↑](#footnote-ref-7)
7. Please note this SLS form was adapted from the eDRIS doc: “*National Safe Haven Statistical Disclosure V3*” [↑](#footnote-ref-8)