



Scottish Employer Skills Survey 2020

Technical report

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Introduction	5
Sampling	6
Sampling population and survey sampling unit	6
Sampling approach and setting quotas	7
Sizeband quotas	7
Sector quotas.....	9
Regional targets.....	10
Sample sources	12
Questionnaire design	13
Questionnaire development and changes from the 2017 survey	13
Piloting the 2020 survey	17
Questionnaire timings	18
Fieldwork	19
Data collection and methodology	19
Response rate	20
Data preparation	23
Data edits.....	23
Coding	23
Weighting	24
Using the survey for analysis	26
Reporting	26
Sampling error and statistical confidence	26
Explaining variation between sub-groups in the report.....	28
Appendix A: Industry coding	30
Appendix B: Occupational coding	34
Appendix C: ROA regions (and their constituent Local Authorities)	36
Appendix D: Scottish ESS 2020 questionnaire deletions	37
Appendix E: Reassurance email	39
Appendix F: Response rates by subgroups for the survey	40
Appendix G: Edit specification	41

List of tables

Table 1: Interview quotas by sizeband	8
Table 2: Expected (and actual) interview distribution by ROA region	11
Table 3: New codes added to existing survey questions	14
Table 4: Average interview length by size of establishment.....	18
Table 5: Sample outcomes and response rate.....	21
Table 6: Sampling error (at the 95% confidence level) associated with findings of 50%.....	27
Table 7: Interviews achieved across key measures and by size band.....	29
Table 8: SIC 2007 definitions of industry sectors	30
Table 9: Examples of occupations that were included within each occupational group.....	34
Table 10: ROA regions (and their constituent Local Authorities)	36
Table 11: Scottish ESS 2020 questionnaire deletions	37
Table 12: Interviews achieved and response rate by size and sector.....	40
Table 13: Specification of edits applied to the data.....	41

Introduction

The Scottish Employer Skills Survey (ESS) 2020 gathered labour market intelligence (LMI) on employer skills needs and training activity among employers in Scotland.

The publication of the Scottish ESS follows a longstanding UK-wide ESS series (including Scotland) which was conducted biennially from 2011 to 2017. The 2020 survey was undertaken within the context of the COVID-19 global pandemic. Fieldwork was conducted between 20th October and 22nd December 2020, during which period the level of restrictions in different areas of Scotland were under constant review and changing frequently. At the start of fieldwork, after a summer of the economy gradually re-opening, the Scottish 'Central Belt' was back under tighter restrictions and all bars and restaurants were closed. A COVID-19 protection level system came into effect on 2nd November, with the worst-hit areas at that point in Level 3. A week later many were moved to Level 4, with the system regularly reviewed, and restrictions tightened or relaxed in different areas throughout fieldwork.¹

This technical report provides background information on the methodology used for carrying out the Scottish ESS. It is divided into six chapters, each considering a different area of survey design and methodology in detail:

- Sample design: detailing the method by which employers were selected to take part in the research, including the setting of quota targets and sample volumes;
- Questionnaire design: detailing the considerations taken into account in the design of the questionnaire, including comparability with previous UK-wide surveys, new question areas, and the methods by which the survey was tested and refined to ensure high quality data collection;
- Fieldwork: providing a detailed overview of how the interviews were carried out, quality control procedures, and the levels of response achieved;
- Data preparation: outlining the process for editing data and coding verbatim responses collected in the survey;
- Weighting: detailing how the survey responses were processed to ensure that the resulting dataset was representative of the population of businesses in Scotland; and
- Using the data: considering the reliability and margins of statistical error of figures produced from the dataset.

¹ More information on the COVID-19 protection levels can be found here.

Sampling

Sampling population and survey sampling unit

The sampling unit was at an establishment level, rather than at an organisation level. This is in recognition of the influence that local labour markets have on skills issues and the fact that skills issues are felt most acutely at the site level. This mirrored the establishment-based approach adopted in previous UK-wide Employer Skills Surveys and the Scottish Employer Perspectives Survey, as well as the legacy skills surveys in Scotland.

The respondent sought at each establishment was the person who had most responsibility for staff issues such as training, recruitment or resourcing. For smaller establishments this was most often the general manager or owner, and for larger establishments this was most often the HR manager.²

In line with the approach adopted in the 2013, 2015, 2017 UK ESS and the 2019 survey undertaken in England, Northern Ireland and Wales, the survey population for Scottish ESS 2020 was establishments with 2 or more employees: establishments were eligible if they had two or more people on the payroll at the site, regardless of whether or not these individuals were working proprietors or not, and excluding the self-employed, outside contractors and agency staff.

The 2011 survey was the first year of transitioning to a UK-wide Employer Skills Survey and so it had 1+ employment coverage to allow comparisons with the preceding national skills surveys. Note that in the current Scottish ESS report and all ESS reports going back to 2013, where comparisons are made with 2011, this is based on 2011 data that has been re-weighted on a 2+ employment population. This means that results from the 2011 survey that are presented in the Scottish ESS 2020 report will not necessarily match those published in the 2011 report. The rationale for the change in survey population and the 2011 re-weighting process is detailed in the UK ESS 2013 technical report.³

² Note that the terms 'establishment', 'employer' and 'business' are used interchangeably throughout the report.

³ The UK Employer Skills Survey 2013, published by the UK Commission for Employment and Skills: <https://www.gov.uk/government/publications/ukces-employer-skills-survey-2013>

Sampling approach and setting quotas

Matching the previous iterations of the survey, the Scottish ESS 2020 adopted a disproportionate stratified random sampling strategy such that the quota targets set intentionally oversampled some groups and undersampled others, rather than setting targets in direct proportion to the business population. In practice this means that some smaller sub-groups of employers (such as large establishments) are oversampled to ensure that a sufficiently large number of interviews are achieved to allow for robust sub-group analyses. Oversampling of larger establishments also meant that a larger proportion of the workforce were covered by the survey. Some of the initial quota targets were adjusted towards the end of fieldwork due to the available sample being exhausted, but sample 'substitutions' (i.e. the introduction of new sample outside of the initial sample drawn) were not made.

Quota targets were set by size and sector using interlocked size and sector targets within Scotland.

The first step in setting quotas involved establishing employer size targets, which needed to strike a balance between over-sampling larger employers (relative to the population), whilst not skewing the size profile too far away from smaller establishments. After setting targets by employer size, targets were set by sector within each size band, in proportion to the establishment population within each size band.

Population statistics used to stratify the business population were established through the March 2019 Inter-Departmental Business Register (IDBR), which was the latest available at the time. The IDBR is administered by the Office for National Statistics (ONS), it holds records of all businesses registered for VAT and all businesses operating a pay as you earn (PAYE) income tax scheme. The IDBR is widely regarded as being the most accurate and comprehensive 'official' source of business population data available, and was used for sampling and weighting in all previous editions of the Employer Skills Surveys.

Sizeband quotas

In line with the approach utilised in the Scottish EPS 2019 survey, quota targets based on establishment size were set within each region by distributing interviews in each sector into seven sizebands (see Table 1). Interviews were distributed across sizebands utilising a set of selected ratios that struck a balance between over-sampling larger employers (relative to the unit population) whilst not skewing the size profile too far away from smaller establishments.

Larger establishments were oversampled in order to maximise the proportion of the workforce covered by the survey and because interviews in the largest sizebands have historically proven more difficult to complete. This oversampling of larger establishments was corrected when weighting the survey results (as detailed later in this technical report).

When setting quotas by employer size (for each sector within each region), the sample-to-target ratios were set at an average sample-to-target ratio of 8:1 for each sizeband. Due to the availability of sample (i.e. in certain sizebands it was not possible to order at the desired ratio) this resulted in sample being ordered at a ratio of 8:1 for the 2-4, 5-9, 10-24, 25-49 and 100-249 sizebands, 11:1 for the 50-99 sizeband and 7:1 for the 250+ sizeband.

Table 1: Interview quotas by sizeband

Sizeband (employees)	Quota	Sample drawn	Ratio	Proportion of the overall target
2 to 4	930	7,647	8:1	27%
5 to 9	795	6,470	8:1	23%
10 to 24	760	6,144	8:1	22%
25 to 49	447	3,606	8:1	13%
50 to 99	211	2,356	11:1	6%
100 to 249	240	2,038	8:1	7%
250 or more	117	821	7:1	3%

Sector quotas

Sector quotas were defined after setting interview targets by sizeband. Interview targets within each sizeband were allocated by sector according to the proportion of the employer population within each sizeband.

In terms of the definition of sector categories, the quota approach in Scottish ESS 2020 matched that of the UK-wide ESS 2017, with sector definitions utilising 13 categories (as opposed to the 12 sectors used in Scottish EPS 2019). These sectors, defined using Standard Industrial Classifications (SIC), were:

- Primary Sector and Utilities (SIC 01-03, 05-09, 35-39)
- Manufacturing (SIC 10-33)
- Construction (SIC 41-43)
- Wholesale and Retail (SIC 45-47)
- Hotels and Restaurants (SIC 55-56)
- Transport and Storage (SIC 49-53)
- Information and Communications (SIC 58-63)
- Financial Services (SIC 64-66)
- Business Services (68-82)
- Public Administration (SIC 84)
- Education (SIC 85)
- Health and Social Work (SIC 86-88)
- Arts and other service activities (SIC 90-96)

Further information on the SIC definitions for these sectors can be found in Appendix A.

Adopting such an approach ensured the maximum Standard Error associated with findings by sector were minimised, in order to report with a greater level of confidence in the results. Critically, this also helped to ensure that within each broad sizeband and sector, key cuts of the data (such as the nature of skills gaps relating to individual occupations or the causes and implications of specific types of skill-shortage vacancies) were associated with sufficiently robust base sizes.

In some sectors (particularly Public Administration), using this approach produced a regional and sizeband sector target that was greater than the number of interviews realistically achievable given the population in that sector and region. In these cases, targets were revised down to the maximum possible, with the difference redistributed as evenly as possible across the remaining sectors.

Regional targets

Mirroring the approach of previous ESS surveys, interviews were allowed to fall out 'naturally' by geography within Scotland. For the analysis and reporting Regional Outcome Agreement (ROA) areas have been used (how the ROAs are defined in terms of Local Authority is presented in Appendix C). The expected distribution by ROA is shown in Table 2. The 'expected 'fall out' of interviews' column is calculated by multiplying the ROA distribution within the population by the target overall sample size. This expected distribution was felt to provide relatively robust base sizes for regional analyses. The final column shows the actual (unweighted) distribution of interviews by ROA region, which is reasonably close to the expected distribution.

Table 2: Expected (and actual) interview distribution by ROA region⁴

Region	Population	Proportional Distribution	Expected 'fall out' of interviews	Actual achieved interviews (unweighted)
Aberdeen and Aberdeenshire	17,200	11%	396	410
Ayrshire	9,100	6%	211	230
Borders	4,300	3%	99	109
Dumfries and Galloway	5,900	4%	137	178
Edinburgh and Lothians	20,200	13%	465	474
Fife	8,600	6%	198	201
Forth Valley	7,500	5%	173	166
Glasgow	21,200	14%	489	375
Highlands and Islands	19,300	13%	444	500
Lanarkshire	16,800	11%	387	328
Tayside	12,100	8%	279	314
West	9,400	6%	217	197
West Lothian	4,100	3%	95	87

Population data is taken from the 2019 Inter-Department Business Register (IDBR) - the latest available business population statistics published by ONS at the time of sampling. Population figures are rounded to the nearest 100.

⁴ Note that the number of interviews sums to greater than 3,497 as ROAs are defined by Local Authorities (LA), and some LAs are in more than one ROA. Also note that the population data are rounded to the nearest 100.

Sample sources

As in 2017, Market Location was used as the principal sample source of the Scottish ESS 2020. The IDBR was not used as the sample source for the Scottish ESS 2020 (nor any of the previous iterations of the survey) as the majority of records in the IDBR do not come with a telephone number.

Sample was ordered from Market Location at an average ratio of around 7:1 against target interviews required.

A total of 28,884 records were ordered from Market Location for fieldwork. This supplemented 200 records which were initially drawn for piloting purposes from the Scottish EPS 2019 survey (a sample of respondents that had given permission to be re-contacted). In total, 29,082 records were loaded for fieldwork. All sample records were postcode-validated to ensure that geographical regions had been correctly assigned. Checks were also undertaken in instances where duplicate telephone numbers existed within the sample. In certain sectors, such as Retail and Finance, it is common for different establishments to appear under the same centralised telephone number. Such establishments were marked up on the sample – with the address of the sampled establishment displayed on-screen – so that interviewers would be aware that the telephone number they were calling was a centralised switchboard and thus they would need to request to be transferred to a particular site.

Questionnaire design

Questionnaire development and changes from the 2017 survey

Where possible the questionnaire for 2020 was aligned with the questionnaire used for the 2017 survey to allow for time-series comparisons on key measures. However, some of the 2017 ESS questions were removed to help reduce length to account for: (i) removal of modularisation of questions (as done for the UK survey in 2017); and (ii) to make space for additional COVID-19-related questions. To minimise the number of questions that had to be removed, it was agreed to increase the interview length from 21 minutes in ESS17 to a target interview length of 25 minutes.

The ESS 2017 questions that were not included in the 2020 survey are shown in Appendix D.

The approach taken to incorporate questions on COVID-19 was three-fold: (i) Some longstanding ESS questions had additional codes added to the read-out and non-read out codes (this also included some Brexit-related codes); (ii) The training section of the questionnaire had a series of new Covid-related questions added; and (iii) A new Covid-related section of the questionnaire was added.

New codes added to the existing questionnaire (including those related to Brexit and COVID-19) are summarised in Table 3 below.

The new COVID-related training questions explored:

- Whether those who had received online training or e-learning had done this as a replacement for training they would have done face-to-face had the pandemic not occurred (F7C);
- Whether training levels were expected to increase, decrease or stay the same over the next 12 months (F17-F18) and the extent to which COVID-19 was a factor in these plans (F19-F20);
- Training undertaken in the previous six months in response to COVID-19 (F21); and,
- Whether establishments planned to arrange or fund any training related to COVID-19 in the next 6 months (F22nw).

Table 3: New codes added to existing survey questions

Question reference	Question text	Codes added
C11A	What are the main causes of having a hard to fill vacancy for [OCCUPATION]	<ul style="list-style-type: none">• COVID-19 has limited the availability of candidates• COVID-19 has hindered the recruitment process• Brexit has made it more difficult to recruit EU nationals
C13NW	Have you found any of the following skills difficult to obtain from applicants for [OCCUPATION WITH SKILL-SHORTAGE VACANCY]	<ul style="list-style-type: none">• Creative and innovative thinking
C14	Thinking now about all occupations in which you have hard-to-fill vacancies, are hard-to-fill vacancies causing this establishment to ...	<ul style="list-style-type: none">• Be unable to react effectively to the impacts of COVID-19• Be unable to prepare for the impact of Brexit on our business
C15	What if anything, is this establishment doing to overcome the difficulties that you are having finding candidates to fill these hard-to-fill vacancies?	<ul style="list-style-type: none">• Offering new or enhanced benefit packages to new recruits (e.g. health insurance, company car, etc.)• Increasing / expanding trainees programmes (other than apprenticeships)• Increasing/expanding apprenticeship programmes (including Foundation Apprenticeships, Modern Apprenticeships and Graduate Apprenticeships)

Question reference	Question text	Codes added
D10	What are the main causes of staff in [OCCUPATION] not being fully proficient in their jobs...?	<ul style="list-style-type: none"> Difficulties adapting to workplace changes during COVID-19
D11NW	Thinking about your [OCCUPATION] who are not fully proficient, which, if any, of the following skills need improving?	<ul style="list-style-type: none"> Creative and innovative thinking
D13	Is the fact that some of your staff are not fully proficient causing this establishment to...?	<ul style="list-style-type: none"> Be less able to respond or adapt to workplace changes as a result of COVID-19
D14	Which if any of the following steps is this establishment taking to overcome the fact that some of its staff are not fully proficient in their job?	<ul style="list-style-type: none"> Increasing or expanding apprenticeship programmes, including Foundation Apprenticeships, Modern Apprenticeships and Graduate Apprenticeships Increasing other training activity or spend or increasing or expanding other trainee programmes
E1	Over the next 12 months do you expect that any of your employees will need to acquire new skills or knowledge as a result of the following?	<ul style="list-style-type: none"> Changing workplace practices as a result of COVID-19

Question reference	Question text	Codes added
E4	Which, if any, of the following skills do you feel will need improving among your [OCCUPATION FROM E2] over the next 12 months?	<ul style="list-style-type: none"> • Creative and innovative thinking
F5	You mentioned that you have not arranged or funded training for any of this establishment's employees over the past 12 months. What are the reasons for this?	<ul style="list-style-type: none"> • COVID-19 meant that planned training courses were suspended / unavailable • COVID-19 reduced time available to managers to organise training • COVID-19 reduced time available for employers to give training • COVID-19 reduced time available for staff to undertake training and development • COVID-19 financial impacts meant no money was available for training • COVID-19 has led to staff being furloughed who would have received training • COVID-19 has made staff reluctant to travel to or attend training courses • COVID-19 social distancing guidelines have prevented the running of training

Question reference	Question text	Codes added
F15B	<p>What barriers, if any, have there been preventing your organisation providing more training over the last 12 months for staff at this location?</p> <p>PROBE: what other barriers have you faced?</p>	<ul style="list-style-type: none"> • COVID-19 meant that planned training courses were suspended / unavailable • COVID-19 financial impacts has meant we've lacked funds for training • COVID-19 has meant we can't spare more staff time (having them away on training) • COVID-19 has made it hard to find the time to organise training • COVID-19 has led to staff being furloughed who would have received training • COVID-19 has made staff reluctant to travel to training courses

As noted above, a new section of the questionnaire was also added to the 2020 questionnaire to explore the impacts of COVID-19, including:

- The number of staff furloughed by employers via the Coronavirus Job Retention Scheme (J1 and J1RAN);
- How the furlough scheme was used in terms of use of flexible furlough options and rotating staff between periods of work and furlough (J2 and J7);
- Whether staff had been made redundant due to the pandemic (J3) and whether this included staff previously on the furlough scheme (J4);
- Whether establishments accessed government-backed financial support and whether this influenced furlough decisions (J5 and J6);
- Activities undertaken by furloughed staff (J8);
- The impact of COVID-19 on homeworking and productivity (J9 and J10); and,
- The impact of COVID-19 on working practices (J11).

Piloting the 2020 survey

A pilot of the questionnaire was conducted between the 6th October and 8th October 2020 to test the suitability of changes made to the questionnaire, and to ensure the questionnaire flowed well and was of an appropriate length and nature for CATI-based interviewing. A total of 25 pilot interviews were completed among employers across a range of size bands and sectors. Sample for the pilot phase was drawn from the 2019 Scottish Employer Perspectives Survey (EPS), where respondents had given permission to be re-contacted for future research.

The pilot found that the survey questionnaire was running around 2 minutes over the target average length. Three further questions were deleted from the questionnaire, as shown in Appendix D. The pilot also helped to identify some further changes that were needed to help refine the new COVID-19 questions.

Questionnaire timings

The average overall interview length was around 26 minutes. This varied between different employers depending on their recruitment activities, experience of skill-shortage vacancies, internal skills gaps and training activities. (The length of the shortest interview was 7 minutes and the longest was 56 minutes).⁵

As shown in Table 4, interviews with larger establishments took longer on average given that they were more likely to have trained their staff and to have experienced skill-shortage vacancies and/or skills gaps given their greater number of employees.

Table 4: Average interview length by size of establishment

Sizeband (employees)	Average length of interview
2 to 4	22 minutes
5 to 9	24 minutes
10 to 24	27 minutes
25 to 49	30 minutes
50 to 99	31 minutes
100 to 249	33 minutes
250 or more	32 minutes
Overall	26 minutes

⁵ The top and bottom 1% of interview lengths were removed from the average interview length calculations to reduce the influence of large outliers on the average interview length.

Fieldwork

Data collection and methodology

A total of 3,497 interviews were conducted by telephone using computer-assisted telephone interviewing (CATI) systems by IFF Research.

Establishments were not pre-notified that they would be called for the survey, partly due to financial considerations and partly because it was felt that this could lead to a reduction in response rates if head offices potentially opted all the establishments in their organisation out of the survey.

Large multisite organisations and banks were pre-identified during sample processing. This enabled contacts for multisite organisations to be split across a number sample batches and released sequentially over the course of fieldwork to ensure that the various sites were not contacted within too short a time window.

Interviews were conducted with the most senior person at the site with responsibility for recruitment, human resources and workplace skills. Reassurances were provided to respondents prior to the survey, including confirmation that data would be reported in a way that would not allow them or their organisation to be identifiable. If after the first contact the respondent or gatekeeper wanted more information about the survey a reassurance email was sent (see Appendix E for a copy of the reassurance email). This reassurance email included a link to the dedicated survey website which was created and hosted by IFF Research. This website provided further background information on the research, links to the 2017 results, and a list of frequently asked questions.

All interviewers received around a two-hour briefing via video conference. Prior to the briefing, interviewers were provided with a set of briefing notes, advising them on the background and objectives of the study, how sample information had been sourced and guidance on specific questions. The briefings included a detailed run-through of all survey questions by a senior researcher at IFF Research, to help guide interviewers through more complex questions.

Fieldwork took place from 20th October 2020 to 22nd December 2020. Weekly progress updates and feedback ensured the quotas progressed as evenly as possible. However, conducting fieldwork during the COVID-19 pandemic created various challenges in terms of administering the survey. Survey fieldwork coincided with a second spike in COVID-19 cases in Autumn 2020 and the development regional restrictions. This included closure of bars and restaurants in Scotland's central belt from 9th October 2020 until the 2nd November 2020, prior to the introduction of the protection levels. Furthermore, from 20th November 2020, eleven local authorities entered Level 4 restrictions, covering the remainder of the fieldwork period.⁶ Under these restrictions, hospitality businesses and close contact services, such as hairdressers and beauty salons, visitor attractions, leisure and entertainment setting and indoor gyms, were forced to close.

IFF Research worked closely with Scottish Government and Skills Development Scotland to monitor and anticipate where restrictions may be introduced and took mitigating actions where possible. Some sectors such as Hotels and Restaurants, Wholesale and Retail, and Arts and Other Services were prioritised early on during the fieldwork period to try and maximise the response rate in these challenging circumstances.

As a result of the COVID-19 pandemic, many employers also moved their employees to homeworking, creating further practical challenges around administering the survey. With many switchboards unable to transfer interviewers to the correct respondents, processes were introduced by IFF Research to collect email addresses for homeworking respondents and email invites were sent offering respondents the opportunity to book an appointment online.

Response rate

High response rates are central to the success of the Employer Skills Survey. Maximising coverage is especially important in some of the harder to reach sectors and regions that may run the risk of being underrepresented (this was even more of a challenge in the context of COVID-19, as noted above).

The overall response rate for the survey was 40%, calculated as 'achieved interviews' as a proportion of all 'complete contacts'. This compares to a 43% response rate in ESS 2017 and 44% in Scottish EPS 2019. Table 5 provides a detailed breakdown of survey outcomes. Appendix F shows how response rate varied by size and sector.

⁶ East Ayrshire, East Dunbartonshire, East Renfrewshire, Glasgow, North Lanarkshire, Renfrewshire, South Ayrshire, South Lanarkshire, Stirling, West Dunbartonshire, West Lothian.

Table 5: Sample outcomes and response rate

Outcome	Number of contacts	% of all sample	% of complete contacts
Total sample	28,625	100%	-
Ineligible establishments (e.g. just 1 working proprietor at site)	1,145	4%	-
'Live' / out of quota	15,163	53%	-
Unobtainable / invalid numbers	3,656	13%	-
Total complete contacts	8,661	30%	100%
Achieved interviews	3,497	12%	40%
Respondent refusal	5,000	17%	58%
Quits during interview	164	1%	2%

The response rate is defined as the number of achieved interviews as a proportion of the total complete contacts.

Regular adjustments were made to the balance of establishments contacted to ensure an even distribution of interviews with employers from different sectors and size bands throughout the fieldwork period. Sample was loaded into fieldwork in proportion to quota targets so that quota progression was as even as possible, and to ensure employers were called and re-called at suitable points without being over-contacted.

During fieldwork, when it became evident that a target quota within a particular cell had become unachievable (i.e. when the number of interviews required to reach the quota target was more than the remaining sample), targets were increased in other cells to compensate, using the following approach:

- In the first instance, fieldwork contractors were to increase the target within the same sector in an adjacent size band.
- If adjacent size bands had also become unachievable then any remaining achievable size bands within the sector were used to compensate.

- In some cases it was preferable to make up the shortfall in a cell within the same sizeband from a different sector. This would be the case when there was a desire to maximise the number of interviews in that sizeband irrespective of other characteristics. This was most common in the larger size bands.

Data preparation

Data edits

It was recognised at the outset that the ESS questionnaire involved the collection of some complex data that respondents would possibly struggle to answer. There was also, despite stringent quality control, the chance that interviewers may enter typing errors, for example accidentally entering extra zeros on the end of numerical variables.

Data checks were built into the Computer-Assisted Telephone Interviewing (CATI) script to ensure, for example, that questions breaking down the workforce into by occupation equalled the number of people working at the site, and that the number of staff in each job role who were not proficient could not exceed the number of staff they had in each job role. However, some data validation needed to occur after fieldwork had finished to ensure no errors were present in the final data. Guidelines for editing the survey data can be found in Appendix G.

Coding

Open ended responses to the survey were coded by IFF Research's internal coding team. To ensure consistency, a formal codeframe was developed and regularly reviewed during development by the research team. In addition, the application of the codeframe in practice was monitored through quality control checks, to ensure a high level of accuracy of codes assigned to verbatim responses.

Standard Industrial Classifications (SIC) were coded using 2007 standards, and Standard Occupational Classifications were coded using 2010 standards. More information about these classifications can be found in Appendix A and Appendix B.

Weighting

Survey data were weighted and grossed up to the total population of establishments and total population of employees, according to the 2020 Inter-Departmental Business Register (IDBR) – the latest available business population statistics published by ONS at the time that weighting was carried out.

Weights were created in pairs: a ‘unit-based’ weight and an ‘employment-based’ weight. The unit-based weight was designed for analyses by the number or proportion of establishments; the employment-based weight was designed for use when analysing by number or proportion of employees (including volume measures of vacancies, skills gaps and numbers trained). Data dictionary files were created listing each variable with notes and guidance on the correct weight to use.

The following weighting strategy was used:

- Grossing weights were applied on a 13 broad Standard Industrial Classification (SIC) sector and six sizeband grid (i.e. 78 cells). The employment sizebands used were: 2-4, 5-9, 10-24, 25-49, 50-99, 100+.⁷
- Overlaying these grids, RIM (random iterative method) weights were imposed for according to a combination of Regional Outcome Agreement (ROA) region and local authority (LA) in Scotland. It was not possible to group solely by ROA region for weighting purposes due to overlapping ROAs for some postcodes (i.e. it was possible for a sample record to have more than one ROA):
 - ‘Glasgow’ ROA was disaggregated into its component local authorities of East Dunbartonshire, East Renfrewshire and Glasgow City.
 - ‘Lanarkshire’ ROA was disaggregated into its component local authorities of East Dunbartonshire, North Lanarkshire and South Lanarkshire.
 - ‘West’ ROA was disaggregated into its component local authorities of East Renfrewshire, Inverclyde, Renfrewshire and West Dunbartonshire.
- The regional RIM weights ensured the survey population of each local geography matched the employer population without further correction for size and sector at this level. The RIM weights were calculated by the data processing software which used this method to find a ‘best fit’ between the data and the local level targets.

⁷ The sample was structured to separate businesses with 100 to 249 employees from large businesses with 250 employees or more. However, weighting on a size by sector basis meant that for some cells within the 250+ group there were either zero interviews or a very small number of interviews achieved. To overcome this issue, the 100 to 249 and 250+ groups were merged for weighting purposes.

- Cell merging was applied in instances where no interviews had been conducted in cells where the IDBR indicated that establishments existed, and, conversely, ones where interviews had been carried out in cells with a reported 'zero population' according to the IDBR. Cell merging was also conducted in instances where a very small number of interviews had been conducted in that cell (typically in the 250+ employment band). In each of these instances, cells were merged within broad SIC sector (i.e. merging sizebands).⁸

⁸ A total of 10 cells (out of 78) were merged as a result of the process outline above. The cell merging were consistent across both the unit and employment weights.

Using the survey for analysis

Reporting

The headline results from the survey are available in an Official Statistics Publication on the Scottish Government website. Supplementary data accompanying the Official Statistics Publication can also be found on the Scottish Government website. Accompanying 'Background Tables' include underlying data used in the report and the 'Additional Tables' provide a more extensive set of data collected in the survey.

Sampling error and statistical confidence

Sampling errors for the survey results overall and for key sub-groups are presented in Table 6. Figures have been based on a survey result of 50% (the 'worst' case in terms of statistical reliability) and have used a 95% confidence level. Where the table indicates that a survey result based on all respondents has a sampling error of $\pm 1.64\%$, this should be interpreted as follows: 'for a question asked of all respondents where the survey result is 50%, we are 95% confident that the true figure lies within the range 48.36% to 51.64%'. Significance testing on employer measures use the unweighted respondent base, while employment measures, and density measures such as the proportion of the workforce with skills gaps and skills-shortage vacancy density, have been calculated on the basis of the unweighted employment (or vacancy) base.

As a note, the calculation of sampling error has taken into account the finite population correction factor to account for cases where we are measuring a significant portion of the population universe (i.e. even if two sample sizes are the same, the sampling error will be lower if in one case a far higher proportion of the population was covered).

These confidence intervals are based on the assumptions of random probability sampling and a normal distribution of responses.

Table 6: Sampling error (at the 95% confidence level) associated with findings of 50%

Survey group	Population	Number of interviews	(Maximum) Sampling Error
Overall	151,600	3,497	± 1.64
2 to 4	76,200	873	± 3.30
5 to 24	58,900	1,707	± 2.34
25 to 49	8,600	452	± 4.49
50 to 99	4,400	244	± 6.10
100+	3,400	221	± 6.38
Primary Sector and Utilities	13,300	233	± 6.36
Manufacturing	7,100	256	± 6.01
Construction	13,400	214	± 6.65
Wholesale and Retail	28,400	692	± 3.68
Hotels and Restaurants	16,400	408	± 4.79
Transport and Storage	4,800	123	± 8.72
Information and Communications	4,500	67	± 11.89
Financial Services	2,700	54	± 13.20
Business Services	30,400	608	± 3.93
Public Administration	2,800	65	± 12.01
Education	4,400	167	± 7.44
Health and Social Work	10,700	363	± 5.06
Arts and Other Services	12,700	247	± 6.17

Survey group	Population	Number of interviews	(Maximum) Sampling Error
Aberdeen and Aberdeenshire	17,100	410	± 4.78
Ayrshire	9,100	230	± 6.38
Borders	4,300	109	± 9.27
Dumfries and Galloway	5,900	178	± 7.23
Edinburgh and Lothians	20,300	474	± 4.45
Fife	8,600	201	± 6.83
Forth Valley	7,500	166	± 7.52
Glasgow	21,300	375	± 5.02
Highlands and Islands	19,200	500	± 4.33
Lanarkshire	16,700	328	± 5.36
Tayside	12,100	314	± 5.46
West	9,500	197	± 6.91
West Lothian	4,100	87	± 10.40

Note: due to overlap between some ROAs, the sum of the number of interviews across the ROAs will exceed the total number of interviews. Population data is taken from the 2020 Inter-Departmental Business Register (IDBR) – the latest available business population statistics published by ONS at the time of reporting.

Explaining variation between sub-groups in the report

Table 6 shows the total number of interviews achieved across the entire sample. However, a number of measures are based only on a subsection of the sample. For example, questions on the provision of training were only asked of establishments that had arranged or funded training for their staff in the last 12 months (2,396 unweighted establishments). Table 7 shows common subsample bases used in reporting and their respective base sizes, both at an overall level and split by sizeband. Lower sample sizes achieved, increase the maximum sampling error, as shown in Table 6.

Table 7: Interviews achieved across key measures and by size band

Base measure	Total	2 to 4	5 to 24	25 to 49	50-99	100+
All establishments	3,497	873	1,707	452	244	221
All establishments with vacancies	637	36	250	125	96	130
All establishments with skill-shortage vacancies	153	10	57	41	14	31
All establishments with skills gaps	638	39	309	125	78	87
All establishments with a need for upskilling	2,399	524	1,194	333	175	173
All establishments funding / arranging training in the past 12 months	2,396	400	1,186	394	215	201
All establishments who furloughed staff since March 2020	2,380	510	1,255	317	164	134

Appendix A: Industry coding

Each establishment was allocated to one of 13 sectors, based on their Standard Industrial Classification (SIC). SIC 2007 was used to classify establishments using the following method: using the four-digit Standard Industrial Classification (SIC) supplied for each record from the Market Location database, a description of business activity was read out to each respondent. If they agreed that this description matched the main activity undertaken at the establishment, then the SIC on Market Location's database was assumed to be correct. If, however, the respondent felt the description did not correspond to their main business activity at the site (27% of cases), a verbatim response was collected of their main activity. At the analysis stage this was coded to a four-digit SIC which was then used as the basis for their classification into one of the 13 sectors.

Table 8 below shows the 13 sectors and their corresponding SIC 2007 definitions.⁹

Table 8: SIC 2007 definitions of industry sectors

Sector	SIC 2007
	A - Agriculture, forestry and fishing (01-03) Including farming, hunting and other related service activities, forestry and logging, fishing and aquaculture
	B - Mining and quarrying (05-09) Including mining of coal, metals, sand/stone/clay, and extraction of crude petroleum and natural gas
Primary Sector and Utilities	D - Electricity, gas, steam and air conditioning supply (35)
	E - Water supply, sewerage, waste management and remediation activities (36-39) Including electric power generation, transmission and distribution, manufacture of gas and distribution of gaseous fuels, steam and air conditioning supply, water collection, treatment and supply, sewerage and waste collection

⁹ UK Standard Industrial Classification of Economic Activities 2007 (SIC 2007)

<https://www.gov.uk/government/publications/standard-industrial-classification-of-economic-activities-sic>

Sector	SIC 2007
Manufacturing	<p>C - Manufacturing (10-33)</p> <p>Including manufacture of food and beverage, textiles, chemicals and chemical products, basic pharmaceutical products, other mineral products, manufacture of metals and metal products, machinery, computer and electronic products and equipment, motor vehicles and other transport equipment, furniture, and repair and installation of machinery and equipment</p>
Construction	<p>F - Construction (41-43)</p> <p>Including the construction of buildings, civil engineering (constructing roads, railways and other utility projects), demolition, and specialised activities such as electrical installation, roofing and scaffold erection</p>
Wholesale and Retail	<p>G - Wholesale and retail trade; repair of motor vehicles and motor cycles (45-47)</p> <p>Including sale, maintenance and repair of motor vehicles, parts and accessories, non-vehicle wholesale (for example agriculture, food, household goods), and the retail trade of all products whether in stores, stalls, markets, mail order or online</p>
Hotels and Restaurants	<p>I - Accommodation and food service activities (55-56)</p> <p>Including hotels, campsites, youth hostels, holiday centres, villages and other short stay accommodation, restaurants and takeaways, event catering and licensed clubs, pubs and bars</p>
Transport and Storage	<p>H - Transport and storage (49-53)</p> <p>Including land, water and air transport (passenger and freight), warehousing and support activities for transportation, postal and courier activities,</p>
Information and Communications	<p>J - Information and communication (58-63)</p> <p>Including publishing (books, journals, newspapers etc. and software/computer games), television, film and music production, broadcasting, telecommunications, computer programming and consultancy, information service activities (e.g. data processing and hosting)</p>
Financial Services	<p>K - Financial and insurance activities (64-66)</p> <p>Including banks and building societies, activities of holding companies, trusts, funds and similar financial entities, credit granting, pensions, insurance and reinsurance</p>

Sector	SIC 2007
	L - Real estate activities (68)
	M - Professional, scientific and technical activities (69-75)
Business services	N - Administrative and support service activities (77-82) Including the buying, selling and renting of real estate, legal activities, accounting, bookkeeping and auditing, management consultancy, architectural and engineering activities, scientific research and development, advertising and market research, specialist design, photographic activities, translation and interpretation, veterinary activities, renting and leasing of tangible goods (motors, household, machinery), employment agencies, travel agencies and tour operations, security and investigation activities, office administration and business support
Public Administration	O - Public administration and defence; compulsory social security (84) Including administration of the State and economic and social policy of the community, provision of services to the community such as defence activities, foreign affairs, justice and judicial activities, fire service and compulsory social security activities
Education	P - Education (85) Including pre-primary, primary, secondary and higher education, other education (such as sports, driving schools, cultural education), educational support activities
Health and Social Work	Q - Human health and social work activities (86-88) Including Hospitals, medical and dental practices, residential care, social work activities
Arts, entertainment, recreation and other service activities	R - Arts, entertainment and recreation (90-93)
	S - Other service activities (94-96) Including performing arts, libraries and museums, gambling and betting, sports facilities, amusement and recreation activities, activities of membership organisations (religious, political, trade union, professional), personal services (hairdressing, beauty, textile cleaning, well-being activities, funeral activities)

Sector	SIC 2007
<i>NOT COVERED IN SURVEY</i>	<p>T - Activities of households as employers; undifferentiated goods and services producing activities of households for own use (97-98)</p> <p>U - Activities of extraterritorial organisations and bodies (99) Including households as employers of domestic personnel, private households producing goods for own use</p>

Appendix B: Occupational coding

The occupational data collected in the survey were collected both pre-coded and verbatim. The former included the occupational breakdown of employment (question D5c to D8) where respondents were asked how many of their workforce fell into each of the nine major (one-digit) Standard Occupation Classification (SOC) 2010 categories (Managers, Directors and Senior Officials through to Elementary Occupations). However, on vacancy measures (for example the occupations in which vacancies existed at the time of the interview – question C7), this information was collected verbatim and then coded at the analysis stage, where possible to a four-digit level SOC. Table 9 below gives examples of the types of occupations included within occupational bandings.

Table 9: Examples of occupations that were included within each occupational group

Occupational group	Primary sectors (Agriculture, Manufacturing, Construction, etc.)	Service sectors (retail, business, finance, transport, etc.)	Public sectors (Public Admin, Health, Education, etc.)
Managers, Directors and Senior Officials	Site managers, Department Heads, Shift Managers (not supervisors)	Directors, Managers / Branch/site managers, shift managers (not supervisors)	Police inspectors and above, department heads, Head teachers, Senior Officials
Professionals	Professional engineers, software and IT professionals, accountants, chemists, scientific researchers	Solicitors, lawyers, accountants, IT professionals, economists, architects, actuaries	Doctors, nurses, midwives, teachers, social workers, librarians
Associate Professionals	Science and engineering technicians, lab technicians, IT technicians, accounting technicians	Insurance underwriters, finance/investment analysts and advisers, writers/journalists, buyers, estate agents	Junior police/fire/prison officers, therapists, paramedics, community workers, health and safety officers, housing officers

Occupational group	Primary sectors (Agriculture, Manufacturing, Construction, etc.)	Service sectors (retail, business, finance, transport, etc.)	Public sectors (Public Admin, Health, Education, etc.)
Administrative staff	Secretaries, receptionists, PAs, telephonists, bookkeepers	Secretaries, receptionists, PAs, communication operators, market research interviewers, clerks	Secretaries, receptionists, PAs, local government officers and assistants, office assistants, library and database assistants
Skilled Trades	Farmers, electricians, machine setters / tool makers, carpenters, plasterers	Motor mechanics, chefs, printers, TV engineers, butchers	Chefs, cooks
Caring, Leisure and Other Service Occupations	Care assistants, nursery nurses	Travel agents, travel assistants, hairdressers, housekeepers	Care assistants, home carers, nursery nurses, ambulance staff, pest control, dental nurses, caretakers
Sales and customer service occupations	Customer facing roles: sales staff and call centre agents	Sales assistants and retail cashiers, telesales, call centre agents	Customer care operations
Process, plant and machine operatives	Routine operatives, drivers, machine operators, sorters and assemblers	HGV, van, fork-lift, bus and taxi drivers	Drivers, vehicle inspectors
Elementary occupations	Labourers, packers, goods handling and storage staff	Bar staff, shelf fillers, catering assistants, waiters/waitresses, cleaners	Labourers, cleaners, road sweepers, traffic wardens, security guards

Appendix C: ROA regions (and their constituent Local Authorities)

Table 10: ROA regions (and their constituent Local Authorities)

ROA Region	Local Authority (note some overlap)
Aberdeen and Aberdeenshire	Aberdeen City; Aberdeenshire
Ayrshire	East Ayrshire; North Ayrshire; South Ayrshire
Borders	Scottish Borders
Dumfries and Galloway	Dumfries and Galloway
Edinburgh and Lothians	East Lothian; Edinburgh; Midlothian
Fife	Fife
Forth Valley	Clackmannanshire; Falkirk; Stirling
Glasgow	East Dunbartonshire; East Renfrewshire; Glasgow
Highlands and Islands	Argyll and Bute; Eilean Siar; Highland; Moray; Orkney Islands; Shetland Islands
Lanarkshire	East Dunbartonshire; North Lanarkshire; South Lanarkshire
Tayside	Angus; Dundee; Perth and Kinross
West	East Renfrewshire; Inverclyde; Renfrewshire; West Dunbartonshire
West Lothian	West Lothian

Appendix D: Scottish ESS 2020 questionnaire deletions

Table 11: Scottish ESS 2020 questionnaire deletions

Question reference	Stage removed	Question text
D1	Pre-pilot	Thinking now about your <NUMBER OF STAFF FROM A1> current staff, roughly how many of them are qualified to SCQF Level 7 or above - by Level 7 I mean a degree level qualification or higher, or HNCs, Advanced Highers or SVQ level 3?
F1	Post-pilot	Does your establishment have any of the following...? <ul style="list-style-type: none"> • A business plan that specifies the objectives for the coming year • A training plan that specifies in advance the level and type of training your employees will need in the coming year • A budget for training expenditure
F3	Post-pilot	And approximately what proportion of your staff have an annual performance review?
F9	Post-pilot	Over the last 12 months which occupations have you arranged or funded training for [whether on- or off-the-job]?
F10	Pre-pilot	You said you had arranged or funded training for <F8 FIGURE OR F8RAN RANGE> staff in the last 12 months, including any who have since left. How many of these were <READ OUT IN TURN EACH ANSWER FROM F9> ...
F10chk	Pre-pilot	You said that in the last 12 months that you trained <F8> staff, but the sum of the occupations that you have trained total <SUM OF F10>. Do you wish to amend the overall figure or the number within each occupation?

Question reference	Stage removed	Question text
F11	Pre-pilot	Over the last 12 months, on average, how many days training and development [whether on- or off-the-job] have you arranged for EACH MEMBER OF STAFF receiving training?
F11chk	Pre-pilot	Can I just check that, on average, EACH MEMBER OF STAFF receiving training and development has received [INSERT ANSWER FROM F11 IF GAVE ABSOLUTE FIGURE OR “more than 20” IF CODE 13 ON DON’T KNOW RANGE] days training over the last 12 months?
F15	Pre-pilot	Does your establishment formally assess whether the training and development received by an employee has an impact on their performance?
F16	Pre-pilot	Is your establishment currently accredited with the Investors in People Standard?
G1A	Pre-pilot	And does your establishment have any of the following pay and incentive schemes for your employees?
G2	Pre-pilot	Do you have processes in place to allow you to identify “high potential” or talented individuals within your establishment?
I3	Pre-pilot	Investment in Training survey re-contact permissions (not conducted in the 2020 survey)

Appendix E: Reassurance email

SURVEY REFERENCE: [KEY NUMBER]

Scottish Employer Skills Survey 2020

Thank you for considering participating in this important research.

The Scottish Employer Skills Survey 2020 is being conducted on behalf of Scottish Government and Skills Development Scotland. The project is being conducted by IFF Research, an independent market research organisation.

The aim of this project is to help the Government and other institutions meet the skills, employment and business support needs of organisations like yours. Your co-operation will ensure that the views expressed are representative of all employers in your sector.

Your organisation has been selected at random from Market Location's Business Database (which combines 118 and Thomson data) and we hope very much that you are able to take part. Participation will involve a telephone interview with an IFF interviewer lasting around 25 minutes at a time that is convenient for you.

More information about the survey (including FAQs) can be found at <http://www.scottishskillssurvey.co.uk>. Furthermore, you can confirm the authenticity of the survey at <https://www.gov.scot/publications/scottish-employer-skills-survey-2020/>

For results from the previous 2017 UK-wide survey please see the Gov.UK website: <https://www.gov.uk/government/publications/employer-skills-survey-2017-uk-report>

If you have any queries concerning the format or content of the interview, please contact us at ScottishSkillsSurvey2020@iffresearch.com.

Your replies will be treated in the strictest confidence under the Code of Conduct of the Market Research Society and in accordance with the Data Protection Act (2018) and General Data Protection Regulations (GDPR). You can view Scottish Government's personal information charter [here](#). Responses will not be linked to individual companies or respondents without their prior consent.

Thank you for your assistance.

Yours sincerely,

IFF Research

Appendix F: Response rates by subgroups for the survey

Table 12: Interviews achieved and response rate by size and sector

Survey group	Interviews achieved	Response rates
Overall	3,497	40%
2 to 4	822	35%
5 to 24	1,605	43%
25 to 49	516	46%
50 to 99	257	39%
100+	297	37%
Primary Sector and Utilities	230	39%
Manufacturing	205	37%
Construction	237	30%
Wholesale and Retail	674	36%
Hotels and Restaurants	411	49%
Transport and Storage	128	37%
Information and Communications	69	29%
Financial Services	56	27%
Business Services	621	39%
Public Administration	71	36%
Education	182	63%
Health and Social Work	350	53%
Arts and Other Services	263	51%

Response rate is calculated as 'achieved interviews' as a proportion of all 'complete contacts', as explained in the Response Rate section of the main body of the technical report.

Appendix G: Edit specification

Table 13: Specification of edits applied to the data

Edit number	Objective of edit	Condition	Force/actions
1	Check that all SICs given at A7 are valid SIC07 codes	If A6 = 2	Any records where A6=2 will need to have the SIC at A7 validated. Recode where possible, recontact if necessary.
2	To ensure that all SOC codes are valid at C7 (4 DIGITS)	If SOC at C7 is not in full SOC file provided	Recode where possible, recontact if necessary. Coding to 1 or 2 digit SOC is acceptable if there is not sufficient information, although this should only be the case for a small minority of records (i.e. less than 1%). For any records that are entirely uncodable, use four zeros "0000."
3	To check that public sector ('local or central government financed body') definition given at SA8 is consistent with SIC code	If SA8 is '3' or '4' and first two digits of SIC are not '84', '85' or '86'	Each record to be judged on an individual basis by company name and activity.
4	To check legitimacy of high numbers of employment	If A1 is greater than 1500	Each record to be judged on an individual basis. Call-backs may be necessary if number of employees seems excessively high for business activity.

Edit number	Objective of edit	Condition	Force/actions
5	To check legitimacy of high numbers of vacancies in relation to size of establishment	If C6 is more than 5 times greater than A1 if A1 < 5 OR if C6 is more than 3 times greater than A1 if A1 IS BETWEEN 5 AND 49 OR if C6 is more than 1.5 times greater than A1 if A1 ≥ 50	Call-backs usually necessary to confirm high numbers of vacancies.
6	To investigate establishments where all employees have been allocated to one occupational group	If only one of D5, D6, D8_1-7 / D5C_1-9 is greater than 0 and A1 is more than 10	Each record to be judged on an individual basis. Call-backs may be necessary.
7	To check high values of individual occupational groups	If D5 / D5C_1 (managers) is greater than 50 OR If D8_7 / D5C_9 (professionals) is greater than 100 OR If D8_6 / D5C_8 (associate prof/technical) is greater than 100 OR OR If D6 / D5C_2 (admin/clerical) is greater than 100 OR If D8_5 / D5C_7 (skilled trades) is greater than 100 OR If D8_4 / D5C_6 (caring/leisure) is greater than 100 OR If D8_3 / D5C_5 (sales/customer service) is greater than 100 OR If D8_2 / D5C_4 (machine operatives) is greater than 100 OR If D8_1 / D5C_3 (elementary) is greater than 100	Each record to be judged on an individual basis. Call-backs may be necessary.
8	To check high values of underemployed (both qualifications and skills) staff	If D15a is greater than half of the sum of D9 (number of proficient employees) and SA1>5	Each record to be judged on an individual basis. Call-backs may be necessary.

Edit number	Objective of edit	Condition	Force/actions
9	To ensure all postcodes given by respondents are valid	If POSTCODE=2	Check that postcode is valid and given in full. Invalid postcodes will need to be investigated as each record must have a full valid postcode in the final data file.
10	To sense check establishments with a high proportion of EU, non-UK staff	If A1 > 10 and (D1b = A1) [i.e., all staff are EU, non-UK citizens] Or if A1 > 10 and D1bran=6 ("all of them")	Each record to be judged on an individual basis. Consider whether it seems plausible that no staff would be UK citizens. Call-backs may be necessary.

An Official Statistics publication for Scotland

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e-mail: statistics.enquiries@scotland.gsi.gov.uk

How to access background or source data

The data collected for this statistical publication:

are available in more detail through <https://statistics.gov.scot>

are available via the official statistics results report, background tables and additional tables published on the Scottish Government website.

may be made available on request, subject to consideration of legal and ethical factors. The Scottish ESS 2020 questionnaire is available on request. Please contact FHEstatistics@gov.scot for further information.

cannot be made available by Scottish Government for further analysis as Scottish Government is not the data controller.

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