Office for
Statistics Regulation

UK Statistics
Authority

Assessment of compliance with the Code of
Practice for Statistics

Scottish prison population statistics

(produced by Scottish Government)

Assessment Report 375   January 2023

Office for Statistics Regulation

We provide independent regulation of all official statistics produced in the UK. Statistics are an essential public asset. We aim to enhance public confidence in the trustworthiness, quality and value of statistics produced by government.

We do this by setting the standards they must meet in the [Code of Practice for Statistics.](#) We ensure that producers of government statistics uphold these standards by conducting assessments against the Code. Those which meet the standards are given National Statistics status, indicating that they meet the highest standards of trustworthiness, quality and value. We also report publicly on system-wide issues and on the way statistics are being used, celebrating when the standards are upheld and challenging publicly when they are not.

Executive Summary

Why we carried out this assessment

ES.1 The Scottish prison population statistics provide granular, accessible, and insightful information about the Scottish prison population. The statistics have been published in their current form since 2020. They were developed to fill a long-standing gap left by the discontinuation of the previous National Statistics (in 2014). It is essential that they continue to be published to allow Scottish Government and the public to monitor trends in the Scottish prison population.

ES.2 Scottish Government asked the Office for Statistics Regulation (OSR) to assess the Scottish prison population statistics. This assessment follows a compliance check carried out in February 2021. In requesting this assessment, the statistics team at Scottish Government is demonstrating its commitment to produce statistics that meet the standards required of National Statistics and the Code of Practice for Statistics.

ES.3 Our assessment found widespread good practice in the production of these statistics. We have identified four actions for Scottish Government to fulfil in order for the Scottish prison population statistics to be designated as National Statistics. Once the statistics team demonstrates that these steps have been undertaken, OSR will recommend that the UK Statistics Authority designate the statistics as National Statistics.

Key findings

ES.4 The statistics team has an open dialogue with users and engages with them through a variety of means, including surveys, presentations, and workshops. These proactive user engagement activities have enabled the team to identify key users and stakeholders of the statistics, understand their needs, and develop the statistics. The team can build on this successful engagement by broadening the types of users it engages with.

ES.5 Scottish Government and the Scottish Prison Service (SPS) have formed an effective partnership to produce the statistics. Two recent developments are expected to support more coordinated and collaborative working. Scottish Government and SPS are currently reviewing the memorandum of understanding between the two organisations, and SPS recently recruited a new Head of Data and Analysis. The Head of Data and Analysis provides a much-needed boost to SPS's analytical capacity and capability and will help facilitate knowledge sharing between SPS and Scottish Government.

ES.6 Granularity is one the key strengths of these statistics. Data are broken down by a range of demographic and other characteristics, including prison establishment and legal status, which is helpful for understanding changes in the prison population over time.

ES.7 The statistical bulletin is informative and engaging, with detailed and impartial commentary and visualisations that aid interpretation of the statistics. The team has developed an excellent interactive analytical tool. It promotes reuse of data and supports interpretation of the statistics by allowing users to explore the data themselves.

ES.8 At present, the Scottish prison statistics and data landscape is somewhat uncoordinated. In addition to the official statistics produced by Scottish Government, SPS produces its own quarterly performance report which covers similar areas to the official statistics. To enhance coherence and insight, and minimise the risk of undermining the official statistics, Scottish Government should work collaboratively with SPS to explore if they can produce more joined-up statistics about the prison population in Scotland.

ES.9 The team has successfully linked prisoner home address information with 2016 Scottish Index of Multiple Deprivation (SIMD) data to add insight on arrivals by deprivation. The team's plans to link prison population data with data on a range of other topic areas, including education, health and drug use show ambition to maximise the value of the statistics. It supports our vision of a statistical system that makes data linkage the norm.

ES.10 The statistics are based on administrative data from SPS's prisoner records system (PR2). Several users told us that the quality of the official statistics meets their needs. However, some users queried with us aspects of the PR2 system, such as outdated IT infrastructure and the level of quality assurance of data. Scottish Government is confident in the quality of the data used to produce the statistics. It told us that PR2 serves the functions it was designed for – understanding and managing the prison population – and that it accurately records information.

ES.11 The bulletin and technical manual are clear about the nature and limitations of PR2. To reassure users about data quality and demonstrate transparency about its quality assurance (QA) approach, Scottish Government should explain the strengths of the PR2 system and why it is confident in the quality of the data. It should also review its QA process and publish more-detailed information about data collection, checking and validation.

ES.12 Longitudinal analysis is essential for understanding the prison population. It allows the measurement of flows into and out of prison, changes in prisoner demographics, and changes in prisoners' custodial 'journeys'. The Cellwise method used to construct the statistics creates a longitudinal 'spine' from historic PR2 prison cell occupancy data and then adds a range of other information to this spine. The method is sound and well-explained; the technical manual gives a step-by-step account of the construction of the statistics. The bulletin outlines the differences between the Cellwise data and other sources of information about the Scottish prison population, which helps users understand the comparability and coherence of the statistics.

ES.13 Due to the way information is recorded on PR2 and the way the Cellwise dataset is constructed, there is uncertainty in the estimates. To help users interpret the statistics, the information about uncertainty should be expanded, by explaining the nature of the prison population estimates and the confidence intervals around the general population estimates.

ES.14 The team applies Reproducible Analytical Pipeline (RAP) principles to the production of the statistics, which supports robust quality management. Our main concern about the current setup is that there is only one statistician in the team with access to the data and sufficient knowledge to run the code. To improve the team's resilience and ensure the process can be understood and used by multiple team members, the team should prioritise the development of documentation and coding skills.

Introduction

1.1 [Scottish prison population statistics](#) have been published in their current form since 2020. The annual statistical bulletin contains information about the demographics of people in prison, the time they spend there, their sentences and offences, and flows into and out of prison. The statistics are based on administrative data from the Scottish Prison Service (SPS) prisoner records system (PR2).

1.2 Until 2015, Scottish Government published National Statistics based on daily snapshots of data from PR2. Due to a technical issue and a need to use resource in more effective ways, the data transfer of snapshots between SPS and Scottish Government broke down and the statistics were discontinued. This created a large information gap. Scottish Government started work on a new statistical series in 2018, leading to the development of the current method. The new statistics were first released in July 2020 as experimental statistics, to involve users and stakeholders in their development.

1.3 The Cellwise method used to construct the statistics takes historic prison cell occupancy data from PR2 to create a longitudinal spine. Additional information – about warrants, sentences, offences, and liberations (departures from prison) – is then joined to this spine. Several different methods were developed and tested, but Cellwise estimates produced the closest match to previous official statistics and SPS management information.

1.4 The official statistics are not the only source of information about the prison population in Scotland. SPS also publishes a range of datasets and reports, including [weekly and annual aggregate management information about the number of prisoners](#) (introduced after the official statistics were discontinued); [annual management information about deaths in custody](#); and a [quarterly performance management report](#) with statistics and commentary about trends in the prison population, demographics of prisoners, the impact of the coronavirus pandemic on isolation, absence of prison staff and the prison estate.

User engagement

1.5 The statistics team has an open dialogue with users and engages with them through a variety of means. When it first published the new statistics (as experimental statistics), it used both quantitative and qualitative methods to gather user feedback. A user survey helped the team collect basic information about users, their satisfaction with the content and format of the statistical bulletin, and ideas for future development of the statistics. The survey was followed up with a series of workshops with known users and users identified through the survey, to discuss how the statistics might be developed to better meet user needs and to identify user priorities. The results led to some immediate changes to the content of the statistical bulletin and the team is currently planning what further changes may be needed to meet additional users' needs. The team also engages directly with some academic and charity users by attending and presenting at workshops.

1.6 This proactive and well-structured set of user engagement activities has enabled the team to identify key users and stakeholders of the statistics, understand their needs, and develop the statistics. This level of engagement has been well-received by users: users told us they are happy with the team's openness, visibility, and responsiveness. It is good that the team intends to publish the findings and actions

from the user survey and workshops. This demonstrates transparency about user engagement activities and how user feedback is being acted on. The team told us that certain user needs that were identified are outside the scope of official statistics and may be better met through different means or outputs. The team is working with other analysts in Scottish Government's Justice Analytical Services (JAS) and SPS to explore how such unmet needs may be addressed.

1.7   The statistics team has a strong working relationship with Scottish Government policy teams. Policy teams were very positive about the analytical support they receive from the statistics team and the relevance and importance of the statistics for their work. Policy teams consult the statistics team on all data-related matters and handle the data with honesty and integrity.

1.8   The team can build on this successful engagement by broadening the types of users it engages with. A wider range of users brings a wider range of perspectives, which may provide additional ideas for developing the statistics. The team may also like to consider setting up a forum for more regular engagement; several users told us they would welcome such an opportunity.

1.9   The team is currently reviewing oversight arrangements for the statistics. To date, the production of the statistics has been overseen by a working group comprising Scottish Government statisticians and analytical leadership, and representatives from the SPS. The aim is to develop a wider advisory board to help steer the ongoing and future development of the prison population statistics, with a focus on outputs. The team told us it would like to set up the group in advance of the next annual publication in November 2023 and is looking for external stakeholder representation beyond SPS. We support the creation of an advisory board, which sounds like a good forum for engaging with users and other stakeholders to drive continued improvement of the statistics.

1.10   The team also intends to develop and implement a formal user engagement plan, which will be published on the Scottish Government website. In the meantime, the team said it will continue to work closely with various user groups. It is good that Scottish Government is being transparent about its user engagement plans.

1.11   The statistics are promoted in a range of ways, including an email alert via Scottish Government's ScotStat mailing list, a news release, and posts on the Scottish Government Justice Analysts Twitter feed, all of which are authored by the statistics team. The news release for the 2019-20 statistical bulletin was clear, accurate and impartial, highlighting the impact of Covid-19 on prisons. Several users told us they like the use of Twitter to publicise the statistics.

Collaboration

1.12   The team collaborates regularly with other analytical teams in Scottish Government. Within JAS, the team worked with crime statisticians to implement the new offence categories and is currently working with operational researchers to develop a prison microsimulation model. It also contributes to the JAS Safer Communities and Justice Statistics Monthly Report, which brings together summary statistics across a range of justice areas, including crime, criminal and civil proceedings, and prisons, to provide a coherent narrative on the justice system in Scotland. The team works with other divisions and directorates across Scottish Government, including health and education, to explore how prison data can be combined with other data sources to build a more complete picture of prisons in Scotland (see 1.24). As an opportunity

for further collaboration, we suggest the team establish links with the prison statistics teams in the Ministry of Justice and Department of Justice (Northern Ireland), to share best practice and learning.

1.13 Scottish Government and SPS have formed an effective partnership to produce the statistics. The statistics team has regular high-level discussions with SPS analysts about the data. We are pleased to hear about two recent developments that are expected to further strengthen this partnership. Scottish Government and SPS are currently reviewing the memorandum of understanding between the two organisations. This is expected to lead to a closer working relationship by setting out the scope of the relationship, who is responsible for what, and how they will work together to analyse the data and produce the statistics. In addition, SPS recently recruited a Head of Data and Analysis. This role provides a key analytical link between the two organisations, supporting more coordinated and collaborative working. The new head is already having an impact, for example, through more-regular, in-depth discussions about the data and changes to PR2.

Clarity and insight

1.14 The statistics provide vital information on a key policy area and fill a long-standing gap in Scottish official statistics. Discontinuation of the previous National Statistics had a significant impact on users, so it is essential that they continue to be published, to allow Scottish Government and the public to monitor trends in the Scottish prison population.

1.15 The statistical bulletin is informative and engaging, with detailed and impartial commentary and visualisations that aid interpretation of the statistics. The 2020-21 bulletin is clear on the impact of the coronavirus pandemic on the prison population. For example, monthly and quarterly summary data are used to illustrate in-year changes in the population and the criminal justice system response to public health measures is explained. Background information about legislative and policy changes across the criminal justice system allows users to contextualise short- and longer-term changes in the prison population.

1.16 Granularity is one the key strengths of these statistics. Data are broken down by a range of demographic and other characteristics including age, gender, ethnicity, disability, sexual orientation, and prison establishment and legal status. Age, gender and ethnicity, and the interactions between them, are particularly helpful for understanding changes in the demographics of the prison population over time. Some users told us they would like to see more intersectional analysis. The team is working with colleagues to provide as many breakdowns as possible. For example, for the 2021-22 statistics (released in November 2022) it added further breakdowns of young people to interactive analytical tool (see 1.21).

1.17 The bulletin contains some helpful guidance for users, particularly on interpreting trends in the context of the pandemic, but Scottish Government could go further with its advice. For instance, to support appropriate use of the statistics and data by all users, we recommend that the team develops guidance on what questions can and cannot be answered using the statistics. Additionally, in places, the commentary or guidance could be improved or simplified to enhance clarity, for instance, by being clear about relative versus absolute changes in the prison population and using plain English for advice on interpreting the statistics.

1.18   The users we spoke to identified several gaps in the statistics, such as the lack of information about sentence progression and history of care experience. Some of these gaps may be filled by linking prisoner data with other data sources (see 1.24). There is a wealth of information on PR2 that currently is not included in the official statistics, and we encourage Scottish Government to work with SPS to explore other aspects of the prison population on which it might be able to add insight (see also 1.20). It is good that the team is considering producing of a series of one-off articles, to examine certain subsets of the prison population or aspects of the data in greater depth, such as longer-term and life sentence prisoners.

1.19   The bulletin signposts users to other related statistics and sources of information about the prison population, including SPS weekly population snapshots, SPS research reports from the Scottish Prisoner Survey, and other Scottish Government criminal justice statistics. The technical manual contains a link to SPS statistics on deaths in prisons, an important dimension of the prison population. The team added further information about other sources to the 2021-22 statistical bulletin, including information on the comparability of JAS's monthly reports and the Council of Europe's SPACE-I reports (which provide international comparisons), and SPS's quarterly Public Information Pages.

1.20   At present, the Scottish prison statistics and data landscape is somewhat uncoordinated. In addition to the official statistics produced by Scottish Government, SPS produces its own quarterly performance report which covers similar areas to the official statistics. This means that there are multiple narratives about the prison population in Scotland, and an associated risk that the management information undermines the official statistics.

Requirement 1: To enhance coherence and insight, and minimise the risk of undermining the official statistics, Scottish Government should:

a) **work collaboratively with SPS to explore if they can produce more joined-up statistics about the prison population in Scotland.**

b) **add links to other related statistics, such as homelessness statistics and equivalent prison population statistics for England and Wales, and Northern Ireland.**

Accessibility

1.21   The team has developed an excellent interactive analytical tool (an RShiny app). It promotes reuse of data and supports interpretation of the statistics by allowing users to explore the data themselves – helpful for such a granular dataset. For example, we heard that Scottish Government policy teams have used the tool to get information on the remand population to inform their development of the Bail and Release from Custody (Scotland) Bill currently progressing through the Scottish Parliament, and academics are using it for both research and teaching purposes. Users told us they find the tool user-friendly and engaging. To further support use, we suggest the team increase the number of chart types available.

1.22   To raise awareness and encourage use of the tool, the team is promoting it widely. For instance, it ran a demo for academics and added a worked example to the September 2022 edition of the Justice Analytical Services Safer Communities and Justice Statistics Monthly Report. The worked example is signposted in the 2021-22 prison population statistical bulletin. It is good that the team is considering other ways in which to promote the tool and gather user feedback, such as roadshows.

Data linkage

1.23   The team has successfully linked prisoner home address information with 2016 Scottish Index of Multiple Deprivation (SIMD) data to add insight on arrivals by deprivation. This analysis shows that people from more deprived areas are more likely to end up in prison than those from less-deprived areas. There are known quality issues with home address data, such as changes to address not being reported or recorded, or incomplete or incorrect postcode information, but the team accounts for this by excluding records with partial information and prisoners of no fixed abode. The technical manual is clear about the approach used, but it could explain what percentage of records cannot be matched, to give an indication of confidence in statistics produced from the linked data.

1.24   The team's plans to link prison population data with data on a range of other topic areas, including education, health and drug use, show ambition to maximise the value of the statistics. It supports our vision of a statistical system that makes data linkage the norm. JAS is working with the Scottish Government Data Sharing and Linkage team on this. The statistics team is approaching this work in a methodical and rigorous way, by mapping out which data sources are available and which questions are being asked. The datasets are expected to be linked and made available through a safe haven, managed by [Research Data Scotland](). These datasets will help academics and researchers explore issues related to the prison population that can only be answered through sharing and linking data, for example, on prisoners' educational background, health background, and drug use history. To demonstrate transparency around data linkage, it might be helpful to publish a summary of data linkage plans and update users on progress.

Data quality

1.25   Several users told us that the quality of the official statistics meets their needs and that they trust Scottish Government analysts to produce high quality statistics. However, some users queried with us aspects of the PR2 system. They had concerns about outdated IT infrastructure, the system's inability to measure certain features of the prison population (for example, due to the way information is recorded it cannot be used to track prisoners' journeys at an aggregate level), and the level of, and lack of information about, quality assurance of data.

1.26   Scottish Government is confident in the quality of the data used to produce the statistics. It told us that PR2 serves the functions it was designed for – understanding and managing the prison population – and that it accurately records information. The system was not designed for analytical purposes, which presents challenges for extracting and analysing data. In particular, PR2 does not easily allow longitudinal population analysis (because information on the system is overwritten) or the interrogation of data for certain purposes, such as producing a collective measure of time spent of remand. To overcome these limitations, Scottish Government built a new dataset based on PR2 but constructed in a different way (the Cellwise method). The Cellwise dataset is longitudinal, which allows the measurement of flows into and out of prison, changes in prisoner demographics, and changes in prisoners' custodial 'journeys'.

1.27   The bulletin and technical manual are clear about the nature and limitations of PR2. They cover general limitations of the system, such as instability of data, as well as limitations relating to specific aspects of the data, such as missing information about

warrants or sentences. Most users we spoke to appreciate the transparency about limitations and think it provides helpful advice for interpreting the statistics. We consider that Scottish Government should go further in assuring users about the suitability of PR2 for producing statistics by explaining the strengths of the system and why it is confident in the quality of the data.

1.28   The technical manual contains a brief overview of Scottish Government's quality assurance (QA) arrangements, describing the types of errors that arise and how they are resolved. However, it does not explain SPS's role in processing and quality assuring data, for example, how it checks the accuracy and reliability of information recorded by prison officers. Given users' concerns about quality assurance, it is important to reassure them about the level of quality assurance applied at all stages of data collection and statistics production.

Requirement 2. To reassure users about data quality and demonstrate transparency about its QA approach, Scottish Government should:

a) **explain the strengths of the PR2 system and why it is confident in the quality of the data.**

b) **review its QA process and publish more-detailed information about data collection, checking and validation**. Our [Quality Assurance of Administrative Data (QAAD) framework](#) will be helpful for this.

1.29   To ensure the statistics continue to deliver the insight that users need, Scottish Government and SPS should continue to invest resources in PR2. This applies to the people using the system: skilled analysts are vital for producing trustworthy, high-quality statistics. The new SPS Head of Data and Analysis provides a much-needed boost to SPS's analytical capacity and capability and plays an important role in coordinating and facilitating knowledge sharing between SPS and Scottish Government. This should lead to a better understanding of data quality across both organisations and support more detailed and insightful analysis. We encourage Scottish Government to make the most of this relationship, and where possible, to share any knowledge with users by updating the quality information.

1.30   The technical manual outlines quality issues for demographic characteristics data and explains why certain characteristics (such as prisoner religion) are excluded from analysis. It explains how information is recorded for most demographic characteristics apart from gender. Currently, it states that "the collection of prisoner gender is determined by [SPS recording policy](#)", with a link to the policy. To support understanding of the nature of the data, it is essential for Scottish Government to add a description of the approach to recording gender in prisons. This should clarify whether sex or gender identity is being recorded, how it is being recorded (for example, if responses are recorded after the prisoner has been asked or if it is assumed by the data collector), and the extent to which recording practice varies between prison establishments. It is important that the terms sex and gender are not conflated. The team may want to consult our [draft guidance on collecting and reporting data about sex in official statistics](#). It would also be helpful to signpost [SPS's quarterly performance reports](#) as these provide more information on the gender of prisoners. If relevant, the technical manual should highlight any impact on the statistics of the ongoing [SPS review of the policy](#).

1.31   The Cellwise method used to construct the statistics is sound. The team worked with a colleague with operational expertise to ensure that the method replicates the picture of the custodial cell experience of each person. It engaged with policy

colleagues and other stakeholders as it developed the method, to assure them of its robustness.

1.32 The technical manual gives a step-by-step account of the construction of the Cellwise dataset. It covers the assumptions made and the analytical factors and measurements, with illustrated examples to aid understanding. While we welcome this level of detail and transparency, less technical users told us the information can be difficult to follow. To enhance the accessibility of quality and methods information for all users, Scottish Government could add a high-level summary of the key strengths and limitations of the methods and data source.

1.33 The bulletin outlines the differences between the Cellwise dataset and other sources of information about the prison population, including the earlier official statistics published by Scottish Government and the aggregate figures published by SPS. This helps users understand the comparability and coherence of the statistics. Despite these differences, the Cellwise method produces an estimate of the overall prison population which is very closely aligned to the other sources, giving Scottish Government and the public confidence in the statistics.

1.34 Due to the way information is recorded on PR2 and the way the Cellwise dataset is constructed, there is uncertainty in the estimates. The language in the 2020-21 bulletin gives some indication of this uncertainty (for example, a figure being "around X"), but it should be more explicit about the fact that the statistics are estimates, and the language used throughout the bulletin should be consistent. It is good that the team has added a clear statement to the introduction of the 2021-22 bulletin about the figures representing estimates. There is also uncertainty in the population estimates and rates used to make comparisons with the prison population, as these are derived from household surveys. Although the technical manual mentions that ethnic group sizes from the Scottish Survey Core Questions (SSCQ) have a margin of error, it does not explain how this is calculated or how users should interpret the intervals.

Requirement 3. **To help users interpret the statistics, the information about uncertainty should be expanded, by explaining the nature of the prison population estimates and the confidence intervals around the general population estimates**.

1.35 The team applies Reproducible Analytical Pipeline (RAP) principles to the production of the statistics, which supports robust quality management. Data extraction from SPS systems is automated and an open-source programming language (R) is used to process data. It is good that the team is exploring further opportunities to embed RAP principles, including the use of version control software. The team may also like to consider publishing code online, to demonstrate public transparency.

1.36 Our main concern about to the current setup is that there is only one statistician in the team with access to the data and sufficient knowledge to run the code.

Requirement 4. To improve the team's resilience and ensure the process can be understood and used by multiple team members, the team should prioritise the development of documentation and coding skills.