Independent review of Methodology

A review of the methodology activity across the Office for National Statistics

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Introduction and Overview

Background to the Review

Transparent, professional and robust methods lie at the heart of trusted National Statistics. In March 2016 the National Statistician announced an independent review of methodology across the Office for National Statistics (ONS). The National Statistician asked the reviewer to:

- assess the methodology skills needed across ONS if the recommendations of the Bean and other relevant reviews, particularly on Statistical Quality, are to be implemented effectively and efficiently at an acceptable cost
- assess the existing skills, organisation and techniques in use in ONS Methodology against future needs
- identify any gaps against the above needs including, but not limited to, assessing the skills and competencies, technology tools, quantitative methods, data science and data engineering techniques which are currently in place
- recommend how these gaps should be filled, and how the resources should be organised in ONS and/or in partnership with other organisations, across the GSS, or academic or other third party organisations
- make clear recommendations as to the steps needed to render ONS methodology functions fit for the future including but not limited to the organisation, location (centrally and/or across the business for example) level of resourcing and range of skills
- determine where these skills and competencies should be based, whether in a central ONS Methodology function or in the respective business areas

The review was driven by the need to take advantage of the data revolution. National Statistics Institutes across the world are finding new opportunities to measure what matters in society and the economy, resulting in the requirement to develop new methodologies. The recommendations suggested in this review have been informed by thorough evidence gathering undertaken over 3 months and, if implemented, would unlock the potential held in new techniques and data sources for innovation to create better statistics.

Overview

In order to progress the recommendations of the Bean Review and to deliver the 'Better Statistics, Better Decisions' strategy, the National Statistician appointed Dr Andrew Garrett to lead an independent review of methodology in the Office for National Statistics (ONS). The review was conducted over the 3-month period May-July 2016, and was supported by an internal ONS support team and an external Expert Group.

The internal ONS support team held weekly planning meetings with Andrew and were responsible for:

- organising and facilitating all data collection activities (SurveyMonkey questionnaire, interviews, workshops)
- weekly internal ONS communications on the progress of the review
- stakeholder management

- cross-site liaison and communications with all staff in the existing two Methodology divisions (the "Methodology Function") in ONS

The internal ONS support team was jointly led by Gary Brown and John D Lewis, and comprised – Pete Brodie, Jennet Woolford, Owen Abbott, Louisa Blackwell and Douglas Cameron (Douglas also provided support to the Expert Group). Additional support was provided by: Laura Kirke (administration), Lisa Davies (communications), Kat Ralph and Pete Betts (questionnaire design), Karen Gask and Theodore Manassis (SurveyMonkey analysis), Byron Kalies and Daniel Lewis (workshop facilitators).

The Expert Group met three times by teleconference during June and July. A review of papers, notes of meetings, and informal discussions also took place in between meetings as needed and as requested by the Review Lead or any Member of the Expert Group. The Expert Group were responsible for:

- providing a review forum and source of best practice for the Review Lead
- reviewing and providing expert feedback on the progress of the review and its emerging findings
- challenging, where necessary, scope, direction and depth of the review team's enquiry, and any key issues within the Terms of Reference
- validating the draft recommendations and, on request, advising the National Statistician of issues or concerns or suggestions as to further work

The Expert Group members were:

- Chair – Mr. Roger Halliday, Chief Statistician and Head of Performance at Statistics Scotland
- Prof David Hand – Imperial College & UK Statistics Authority Board
- Dr Andrew Garrett – Statistical Consultant
- Mr Vince Galvin – Chief Methodologist at Statistics at New Zealand
- Ms Siobhan Carey – Chief Statistician and Head of Profession, Department for Business, Innovation and Skills (BIS)
- Mr Harry Powell – Head of Advanced Data Analytics at Barclays
- Mr Richard Pugh – Chief Data Scientist at Mango Solutions
- Ms Lilli Japec – Scientific Adviser for Statistics Sweden
- Mr Andrie de Vries – Senior Programme Manager, Data Science at Microsoft
- Dr David Best – Director of Digital, Technology Services and Methodology at ONS

Stages of Review

1. Status quo
   i. Understand structures and functions within ONS and the Methodology function
   ii. Identify both senior stakeholders and ONS stakeholders, including those who undertake methodology outside of the Methodology function
   iii. Expert Group and Review Team set-up

Andrew visited Newport, Titchfield and London offices took place during May and June to gather data and develop an understanding of the Methodology function. These early introductory sessions shaped the design of a series of questionnaires to collect information around the key issues from Methodology staff and a wide range of stakeholders. Annex I lists those individuals who provided background information during the introductory sessions.

Andrew identified 2 groups of stakeholders were identified: senior stakeholders at the executive level within ONS and outside across government, academia and internationally; and internal stakeholder groups who were "customers" of Methodology services.

2. Data collection
   i. Short survey of all Methodology staff
   ii. Interviews with a sample of Methodology staff
   iii. Interviews with senior stakeholders
   iv. Workshops with stakeholder groups, incl. GSS and those undertaking methodology outside of Methodology function (with particular focus around methodology for administrative data)

With input from specialists in questionnaire design, 3 sets of questions were created for data collection. These were tested and reviewed before the data gathering began. Approximately 50 questions were used as the basis for a semi-structured one to one interview with 41 Methodology staff. From this list a subset of questions were used for the SurveyMonkey questionnaire sent to all Methodology staff. The questionnaires were also used to inform the 'quick fire' binary questions used at the end of the senior stakeholder interviews.

Workshops with 10 stakeholder groups were held during July, with total attendance of 53. Each workshop was asked to identify 3 key messages to feed into the review.

3. Analysis
   i. Analyse findings from data collection
   ii. Test and revise findings through testing workshops
   iii. Write draft report with recommendations and next steps

Every response from the SurveyMonkey, one to one interviews, stakeholder interviews and output from the stakeholder workshops was reviewed by the lead reviewer. The ONS Big Data team used a variety of text analysis methods to identify the key response themes from the Survey Monkey questions and generated a number of word clouds and bar charts. The results of the senior stakeholder 'quick fire' questions were compared with the findings from the SurveyMonkey and Methodology staff interviews to explore areas of concordance and discordance.

To test out initial findings, 2 testing workshops were held at Newport and Titchfield with a selection of Methodology staff to test out initial findings. The output from these workshops was then used to refine the draft recommendations delivered to John Pullinger and the Expert Group at the end of July.

Strategic Recommendations

Following the process outlined above, these 12 strategic recommendations would enable ONS to take advantage of new collaborations, techniques and data sources to produce Official Statistics and Research.

i. Place innovation at the heart of a new Core Methodology identity.
ii. Broaden the areas of expertise and encourage innovative working by flattening the current branch structure.
iii. Appoint a forward-looking and outward-facing leader of Core Methodology
iv. Introduce a technical career ladder.
v. Move Address Registers, Geography and Classification out of the Core Methodology function.
vi. Group Harmonisation and the Quality Centre with the GSS Good Practice Team.
vii. ONS Methodology should co-ordinate, and provide leadership to, a broader methodology community that includes GSS – develop cross-cutting methodology alongside GSS colleagues.
viii. ONS Methodology should drive the research agenda and work with academia (and other research bodies) in a strategic way, with clear prioritisation. They should also work jointly with leading NSIs in a more strategic way.
ix. Methodologists should play an enabling role in multi-disciplinary teams, and not act as a gatekeeper.
x. Methodologists have a role to play as Subject Matter Experts (SME) in operational quality assurance (including RQRs) but not as SMEs assigned to the UKSA Regulatory function.
xi. A more flexible resource and recruitment model should be adopted that includes academic and GSS secondments, and joint appointments (ONS Fellows). All jobs should be advertised across Titchfield, Newport and London to attract the best candidates.
xii. There should be a UKSA Board-level Innovation Champion and an innovation evaluation framework.

Organisation

The recommendations in this chapter relate to the way in which Methodology is organised within ONS, to best affect the way that teams solve problems, innovate, and share best practice.

1. Place innovation at the heart of a new Methodology identity, together with a sharper definition of ONS methodology that can be easily articulated both internally and externally. Consider re-branding Methodology using a different name and aspire to be the best.

2. Methodology currently comprises over 20 'branches' for around 150 staff. This is unhelpful in terms of resourcing, narrowness of expertise and internal navigation. It also creates a large management overhead of variable standard. Many staff enjoy the technical aspects and enjoy management and administrative tasks much less. The number of branches within Core Methodology should be reduced to four new groups that combine branches across business, social and census to broaden the areas of expertise and that include a mandate to address administrative data. These four groups would comprise the following:
   - Design, Estimation, Imputation/Cleaning and Time-Series, together with Modelling of administrative data
   - Data Linkage and Disclosure Control (data and outputs)
   - Survey Questionnaire Design (including on-line)
   - Big Data and Statistical Computing (SC supporting prototype development as conduit with IT in DTM who scale-up prototypes). This grouping would also include programming solutions for administrative data.

3. The broader Methodology structure still remains organised by methods along the business process. As such end-to-end optimisation within business areas is an element of the matrix that will continue to require attention. The advantage of organising by method is that it facilitates the creation of production standards and best practices that can be adopted widely within ONS and beyond to ensure consistency. It is important that these benefits are realised. To address business area optimisation (including effective communication), consideration should be given to creating a limited number of business optimisation roles that understand the needs of key business areas (including from a user perspective) and have a specific responsibility to assess resource requirements and bring together methodologists to deliver a co-ordinated service across the assigned business area.

4. Re-assign functions that are not primarily methodology focussed and are more infrastructure orientated.
   a. Address Registers, Classification and Geography, should be kept together within a separate reporting structure outside of Methodology, either as a single combined group within DTM or within a key business division that they support, such as Administrative Data. There should be a Head of this combined group. These groups are aligned with the Bean review since they enable "deeper" investigation and production of statistics based on location and (sub)sector. These groups provide the basic building blocks for granularity and support users beyond ONS/GSS. In particular, the Address Registers and Geography groups have coherent, forward-looking agenda. Classification is more constrained by EU/UN review cycles but should work proactively with key stakeholders as well as other NSIs on agile solutions that meet current user needs.
   b. Harmonisation and the Quality Centre work across both ONS and GSS, and in addition to being enablers, have a gatekeeper/auditor role. There appears to be an overlap with the GSS Good Practice team which is part of GSS Professional Support. Consideration should be given to combining these three groups within Business Services and Development. Methodology staff should form a pool of SMEs that can be drawn upon to

support quality reviews (RQRs), in particular. There should be a role description for SMEs when working in this capacity, that is different from their primary role supporting output areas.

c. National Accounts is a small branch and the work is specialised. There is less of a cross-cutting aspect to this team's work and it would be better served by being part of National Accounts. Along similar lines, there is also a case for moving Price Indices to Prices.

5. Recruit a strong forward-looking and outward-facing leader of Methodology (to manage the remaining groups) who has technical credibility and influence, and is able to champion Methodology at the highest levels within ONS, across GSS, Internationally and with academia and other relevant bodies (e.g. Bank of England, IFS etc.). Such a role needs to map to the most appropriate Civil Service grade to attract the candidate with the right skills and competencies. The person appointed could also serve an *ex officio* role on committees or management boards as required and deemed appropriate by the National Statistician.

6. Flatten the management structure to make it is less hierarchical and less narrow. Fewer managers, but outward-facing managers who enjoy (and are capable of) managing technical people and who are aligned with a refreshed Methodology culture. These managers should also be tasked with building stakeholder relationships, undertaking horizon scanning and directing their team to develop generalizable solutions and standards.

7. Introduce a technical career ladder to retain top technical talent and to use their skills to the full. This should be based on the concept of T-shaped skills – that is, a depth of related skills/expertise in one area combined with the ability to collaborate across broad areas with experts leading to the application of knowledge in areas of expertise other than their own.

8. Other Core Methodology staff should be encouraged to broaden their skill base to a minimum standard within each of the 4 functions/branches and refer to technical experts as needed. Core Methodology staff should be encouraged (and have the technical skill set) to make decisions in multidisciplinary teams without the need to check their decision with their manager (in most situations).

9. There was a range of views as to the position of Methodology within the broader ONS organisation. Many Methodology staff would like to see Methodology as a separate Directorate and not combined with IT, although some senior members acknowledged the recent progress that had been made within DTM. Interestingly the view from academia ranged from describing being with IT as "a good fit", to "not great". Certainly with advances in Data Science, there are advantages to working closely with IT, particularly if IT is undertaking computational development rather than project based IT. There is consensus that Methodology should have a stronger voice in the future – through the impact of the work undertaken. The leadership of Methodology is more important than the position of Methodology in the broader ONS organisation, and therefore Methodology should remain in DTM, but there should be a more balanced relationship - taking the best IT practices but with a clear Methodology identity, influence and voice. In this respect, Methodology can increase its influence through the impact of its work whilst DTM can make a greater effort to understand, acknowledge and promote Methodology.

10. The Core Methodology group should build a 'hub-and-spoke' model to acknowledge and support methodology work undertaken elsewhere within ONS and GSS, viewing it as part of a natural and desirable continuum that is part of broader methodology community. If National Accounts

and Prices Indices methodology teams were to move to National Accounts and Prices respectively, per recommendation 4c, then these would form spokes in the 'hub-and-spoke' model. A working party should set up with representatives from the ONS and GSS to determine how this collaborative model would operate.

Culture and Modus Operandi

The recommendations in this chapter suggest how to create a culture of success within Methodology.

11. Role clarity is an important part of the cultural re-fresh of Methodology. Specifically, Methodology staff need explicitly to play the role of enablers. Although staff do see themselves as primarily enablers, it is clear that the dominant stakeholder view is that they act as gatekeepers. The role description should address the following:
    - Multi-disciplinary team players who are committed to team success
    - Proactive, problem solvers with a can-do attitude
    - Team members that understand the importance of fit for purpose quality and meeting timelines
    - Team members that air their concerns constructively, then commit to team goals

    Current Methodology staff that work effectively as enablers in successful multidisciplinary teams should be identified to understand more about team dynamics, including role competencies, skills and interdependencies.

12. A strong and influential leader of Methodology, within a flatter management structure, should provide a quick escalation path if team members have important concerns as to how Methodology is being implemented in output areas.

13. Role clarity is also required when Methodology staff undertake an SME role as part of a quality review (as described in 4b). Although this could be viewed a more akin to a gatekeeper/auditor role, feedback does point to the power of working as an enabler even in this capacity. A separate role description would, however, avoid any confusion and reduce the tension that exists when staff are asked to play different roles.

14. Methodology should play a wider role across GSS - in particular playing a leadership and co-ordination role. The GSS would welcome Methodology taking a broader role, bringing in new methods and driving the cross-cutting agenda. However, there is a clear message from GSS that Methodology should not look to solve everything on its own (working in isolation), rather it should create a *community of practice* that makes full use of the wider expertise available. With input from GSS, ONS should work on cross-cutting methods and avoid re-inventing the wheel. In particular, many government departments have experience and expertise in relation to administrative data that could be utilised and co-ordinated to better effect.

15. The current Methodology culture is a quality-first approach, and the Stakeholders are unanimous in agreeing the Methodology has a quality-first approach and not an innovation-first approach. When asked for the impact of not having a Methodology function, the Methodology staff mostly see quality being impacted (with little mention of lost innovation), particularly in the medium term with resulting ONS reputational risk. If the role of Methodology is to move to being an innovation-first function, then its role in controlling or assuring quality of outputs needs to be made clear. For instance, a responsibility assignment matrix / RACI (or variations thereof) could be developed in association with Output areas to make the distinctions between Responsible, Accountable, Consulted and Informed. SMEs are typically assigned to the Consulted role. (An innovation-first approach for Methodology does not imply an innovation-first approach for the ONS as a whole. ONS has a clear remit to produce statistics that others can rely upon and quality is therefore front and centre.)

Staffing and Resourcing

The recommendations in this chapter relate to the way that resources are managed, and how best to collaborate to share knowledge and intelligence.

16. There were mixed views from stakeholders as to whether Methodology was under- or over-resourced, although it is clear that Methodology's view is that they are under-resourced currently. From speaking with the large business areas such as Census and Administrative Data, it is apparent that new methodologies will need to be developed to meet challenges and there is growing demand over the medium term (5 years, say). Such demand relates to ongoing support and specific project needs. The movement to online surveys, and the use of alternative data sources, both point to a growing demand for Methodology resource and generally those stakeholders that are closer to the work undertaken by Methodology, or who were undertaking statistical work elsewhere, were more strongly of the view that more resource was required, not less. Whilst using current resource more effectively, linking into GSS expertise and commissioning more work from academia/research bodies would all increase the supply-side without increasing the size of core Methodology, further work will be needed to quantify both the supply and demand side for the next 5-year period (7-year for Census). In my view it is unlikely to point to the need for a smaller Methodology group than exists currently.

17. Methodology needs to be more actively engaged in the resource planning process by actively seeking out medium and long term resource requirements from large business areas such as Census. Resource models require, for example, short-term (next 12 months, reviewed monthly), medium-term (1-3 years, reviewed 6-monthly) and long-term components (4-10 years, reviewed annually) and should be linked to the strategic priorities of the ONS and cross-cutting work undertaken with the GSS. For the delivery of large time-bound projects, consideration should be given to the creation of a limited number of delivery manager roles.

18. ONS Methodology should acknowledge and use GSS knowledge and expertise much more so than it does currently, through a wider co-ordinating role that embraces the contributions of others. This is particularly relevant in terms of knowledge and expertise around administrative data. There are some pockets of collaboration within GSS (e.g. DfE, DWP and HMRC data sharing) but no formal co-ordination of research resource or strategic approach to co-ordinated problem-solving. Sharing resource would create efficiencies and support standardisation across both ONS and GSS and potentially produce better solutions, quicker.

19. Methodology was viewed as being the bridge between leading (academic) research and the producers of statistics (including GSS). In this respect the primary role of Methodology is to take research and apply it to real world problems (something that academics typically have less interest in) such that it becomes quickly embedded in the production of statistics. In this respect Methodology has an important commissioning role with academia and other research partners, including expanding PhDs sponsorships.

20. There was support for building long-term academic partnerships (similar to that undertaken with Southampton University) and it was acknowledged that long-term relationships lead to greater continuity and increased engagement of PhD supervisors and other senior faculty staff due to long-term funding commitments. ONS should work with the leading international academic researchers according to strategic research areas.

21. There was support for the creation of ONS Methodology fellows that can be seconded from Academia for periods of between 6m to 2 years (including sabbaticals) and also for ONS funded part-time positions (split between Methodology and academia/research groups) as a means of

building a stronger bridge with the research community. Fellows could also be seconded from other NSIs, research bodies, or the commercial sector (such as retail).

22. ONS Methodology should also look to work with other research bodies such as IFS, NatCen, ATI and other statistical consultancies, if they are able to deliver the research required in a timely and cost effective manner.

23. Other NSIs are facing similar methodology challenges and want to be more innovative. Methodology and ONS more generally should work more strategically with other NSIs – sharing the resource burden, using collective expertise and jointly commissioning cross-cutting research work. NSIs most commonly mentioned in terms of their forward looking work were the Netherlands and Canada, and to a lesser extent Australia, NZ, US, Italy and Sweden (Scandinavia). ONS Methodology staff do work with counterparts but it is mostly *ad hoc* and irregular. More work should be undertaken to explore closer strategic working relationships with leading NSIs.

24. There is a strong UK demand for quantitative sciences talent and Methodology should open up new positions across London, Newport and Titchfield to recruit the best staff and to blur the lines between Newport and Titchfield. There are advantages to having staff on all sites in terms of the talent pool, building relationships with GSS and data owners more generally, and for ease of attendance at professional meetings. London in particular has a vibrant, energetic and very active Data Science community which should be built upon.

25. Methodology would benefit from the recruitment of some bright early-career individuals and this should be done through targeted recruitment efforts rather than recruiting from the general pool, where Methodology often loses out to the Output areas.

26. A greater London presence would also facilitate increased secondments to ONS from GSS, and *vice-versa* which would build stronger relationships and break-down barriers. It would also facilitate secondments and relationship building with other bodies such as IFS, NatCen, ATI, Bank of England etc.

Innovation

The recommendations in this chapter suggest ways to place innovation at the heart of Methodology.

27. It is important to have a high profile champion for innovation within ONS given its importance and the requirement for a cultural shift. There should be UKSA Board-level Innovation Champion, that links to innovation strategy, planning and evaluation within ONS. This champion could also support horizon scanning by accessing external networks.

28. A more strategic view of innovation needs to be taken within Methodology, based on ONS business need, and GSS cross-cutting priorities. Methodology should also drive the agenda, and not simply respond to these business requests. An outward-looking Methodology group that is aware of developments in the broader research community, should join-the-dots, share ideas with ONS and GSS, and make clear recommendations.

29. Methodology staff consider themselves to be self-motivated in terms of innovation and that, in effect, innovation is business as usual. Stakeholders do not see Methodology as innovative, however. It is important therefore to have a clear definition of what innovation means within ONS and for Methodology to do more to communicate the value of the innovative work they are doing.

30. Standard definitions of innovation include two components, the idea (or invention), and the implementation of the idea to add value. Innovation can be big or it can be small, and it can be revolutionary or evolutionary – and includes process improvement. The current disconnect between stakeholders and Methodology staff is likely to be a result of three things - the desire from stakeholders for more revolutionary, transformative innovation, the desire of stakeholders to want to see the idea moved to a production environment in a timely manner, and low stakeholder visibility to the current work being undertaken. Clearly the outputs areas have a role in driving forward implementation in their own areas and this may be constrained by their own risk aversion.

31. Feedback suggests that innovation could be celebrated more and made more visible both internally and externally. There are excellence awards, but more could be done in this area particularly to acknowledge exploratory work done quickly and well.

32. “How is innovation evaluated?” was the question most Methodology staff struggled to answer during the interview process. If an evaluation framework does exist, then it is not widely known amongst staff. If innovation is the intended primary focus area for Methodology in the future, then an evaluation framework is vital to be able to measure success. Such a framework should ensure that if projects fail, that they fail early and that strategic innovation projects have clear plans, check-in points, and agreed measures of success. As an example, some Innovative work has been undertaken with regard to web-scraping to produce alternative CPI measures (more real-time), but frustration exits that such measures are still not routinely available – noting that post-Brexit, such measures would be very helpful in terms of understanding the ongoing impact. An innovation framework that tracks Innovation through to production is one way of managing expectations. To overcome the fear of failure, early failure needs to be an accepted part of the ONS culture.

33. Whilst recommending an evaluation framework, it is important to limit bureaucracy on lower level projects, where all staff should be encouraged to engage in process improvement activities and celebrate successes.

34. Innovation projects should be prioritised in terms of strategic impact and Methodology should work strategically with partners to deliver these, including with GSS, academia (incl. PhD sponsorship), other research bodies (e.g. IFS, NatCen, Bank of England, ATI) and other NSIs

35. While Methodology staff are viewed as risk averse by Stakeholders, feedback points to ONS as a whole being risk averse, although it is acknowledged that at the top levels of ONS, there is now a much less risk averse culture with a greater focus on innovation. Interestingly Methodology staff feel able to take risks. Methodology has an important role to play in the ONS becoming more innovative, but it remains one part of the jigsaw.

36. There appears to be overlap between the role of the Data Science Campus versus the current Big Data team. It is important that the different roles and priorities are clarified.

37. One NSI model of innovation is to think in terms of Research and Development. Research is defined as working on problems where you do not know if there will a solution, whereas development is defined as working on problems that you know you can solve. A longer term view is taken of research which is ring-fenced at 25% of the work-plan, whereas development is time-bounded and represents 75% of the work plan. This may be a helpful way for ONS to think about innovation, including how it is prioritised and evaluated. It was also noted that research projects can attract top talent. Although most Methodology staff regard their work plan as ambitious, one telling comment was that the work was not ambitious because ambitious projects fail. This points to the need to create a culture where it accepted that not all research projects will be successful.

Administrative Data

This chapter contains recommendations for how Methodology can best support the use of administrative data in the production of Official Statistics and Research.

38. The responsibility of Methodology to drive methodological development in the area of Administrative data needs to be made more explicit. This is apparent in the current branch structure where Administrative data is not referenced.

39. Over 60 of around 150 current Methodology staff have worked with administrative data, although it was often referred to in the context of providing a sampling frame. In early discussions, it became apparent that more emphasis was placed on using administrative data to support surveys, rather than *vice versa*. Administrative data are not uniformly useful and there may be cases where this may be the right approach, but a cultural change is required. The direction of travel from the Bean review is to move to greater use of administrative data with fewer and smaller surveys as a result. It is important that Methodology staff (and the wider ONS) understand that this is the strategic direction and that the associated work plan is fully aligned. Working with administrative data requires a different mind-set.

40. Methodology needs to build stronger relationship with the administrative data division.

41. Importance of relationships is a common theme for working successfully with administrative data. There needs to be more of a community of practice based model – acknowledging and using GSS knowledge, expertise their relationships (particularly in DWP/HMRC/DoE) to make stronger and more timely methodological progress. ONS Methodology will have an effective co-ordinating and driving role if it creates the right collegial environment.

42. Proposed legislation on data access should help to remove legal barriers to ONS accessing wider groups of data sets. However, access to administrative data continues to be a barrier for Methodology staff, even for data currently held by ONS. There is a need to create a trusted ONS researcher category to facilitate broader data access, that currently limits the ability of Methodology staff to get work done in an efficient and effective manner. Such barriers do not encourage the cultural change required.

43. It is important that ONS servers have a common toolkit, including SAS, R, Python, Matlab etc., that creates an efficient and effective working environment for staff that avoids delay and the re-writing of program code. Access to a common toolkit is also important to avoid the re-writing of code developed with academic partners. Again, the removal of such barriers is key to cultural change.

44. The importance of Meta data (and its documentation) was raised by many of those with experience of working with administrative data. In particular, the need to adopt a common set of standards, although it is clear that the creation of meta data sits with the data owners. In some cases, the government departments are not the primary collectors (source) of data and the GSS face similar challenges obtaining meta data. It is important to understand how the data were collected and its resultant impact on coverage and quality.

45. Administrative data sets are created for operational purposes and the secondary use of generating statistics appears to be a very low priority by comparison. Legacy systems are challenging to modify and are often operating at their limits (including storage) such that even GSS statisticians struggle to make a business case for modification. Even for new systems, the primary focus is on user requirements and operational effectiveness. Whilst this is

understandable, the use of administrative data for secondary purposes needs to move higher up the priority list. Although Data Science has a reputation for agile working, a can-do attitude and natural curiosity, it is a labour intensive process and more should be done to create administrative datasets by design that link together in a more efficient manner. The work of the administrative data division on frames supports this approach. It will be important to raise awareness of the resource implications of not placing greater emphasis on the design issues.

46. Representation and coverage were identified as key methodological issues, and the importance of focussing methodological development towards the investigation of bias, rather than sampling error, was emphasised. Future research plans should address these priorities.

Skills and Training

The recommendations below would provide learning and development opportunities to increase sills and change the culture within ONS.

47. With fewer groups and a flatter structure, more autonomy should be given to managers of the combined groups to plan annual training budgets, seek overall approval for the plan, and then implement according to the plan so long as they remain within budget.

48. Consideration should be given to creating a program that supports managers in Methodology to lead change in terms of creating an innovation-first culture

49. Key research areas where there is likely to be a growing need for technical skills development include:
    a. Estimation through Modelling (including multi-level)
    b. Missing data methods
    c. Linkage and probabilistic matching
    d. Disclosure control and anonymization techniques

50. Consideration should be given to developing a course on administrative data that can be used to train cohorts of Methodology staff. This would support cultural change and create a series of champions and change agents. Such courses are run elsewhere (e.g. US) and could be adapted for UK requirements.

51. The Big Data and Statistical Computing teams should lead efforts to increase the uptake of additional software skills across all groups, in particular a move towards open-source software such as R and Python, which were identified by staff as skills to acquire.

Quality Assurance

Methodology should continue to play an important quality assurance role, in the ways outlined below.

52. Methodology needs to ensure ONS work that moves the boundaries is correct. Methodology staff should be part of multi-disciplinary teams and Output areas should document the limitations of the methods that they employ (if a pragmatic approach is agreed). There should be a separate escalation route, through to the Head of Methodology, if methodologists have important concerns about the application of methods within Output areas that brings reputational risk to ONS. As with any service provided, the process and procedures for undertaking quality control of the input provided by the service should be clear and documented, and this should apply to Methodology input.

53. Operational Quality Assurance, that is QA activities directed by ONS such as RQRs is different from external regulation, such as NSQRs, and provides internal checks and balances. There is strong argument for Methodology staff undertaking a well-defined internal role here as SMEs on wider teams. The co-ordination of this activity should be undertaken outside of Methodology.

Annex A - Terms of Reference

TERMS OF REFERENCE

FOR

AN EXTERNAL REVIEW OF METHODOLOGY FOR ONS

Dr David Best

Director, DTM

March 2016

1. INTRODUCTION

The Bean review has made significant recommendations about the way that Quality is handled in ONS now and for the future. These recommendations also concern the wider and more innovative use of a far greater range of administrative and third party data in the production of statistical outputs, and the operation of the Regulator.

These recommendations, together with continued implementation of the Better Statistics, Better Decisions Strategy, will require significant changes in the ways in which current outputs are produced and maintained and the production of a range of new outputs.

These recommendations have major implications for the role of methodology for the UKSA, and for ONS as a whole, including specifically within the Methodology function of the Digital Services, Technology and Methodology Directorate (DTM), and how it should be organised in the future.

2. NEED FOR A REVIEW

The organisation and activities of the DTM Methodology and Data Science functions and across the office as a whole, are therefore central to our ability to make these changes: not only do we rely on methodology to ensure that the samples, populations and range of values in our data sets are valid and fit for purpose in our current products, but for the future we also need to be able to rely on methodology to ensure that the methods applied to the new sources and uses of data will produce valid, accurate, and timely outputs at the requisite level of quality, either alone, or in combination with survey data. Methodology is essential for innovation in these areas, both in developing the new approaches and in applying these to the production of statistics.

This is equally true for the methodology functions across the business as a whole, whether in the areas of geographical and small area statistics, the harmonisation of survey questions, the sampling approaches we use, or our role across the GSS and our participation in European and wider international statistical forums.As collection of data moves to be progressively on-line and multi channel, methodology needs to provide appropriate levels of quality assurance and to compensate for, or explain, any modal differences from existing outputs. These needs necessitate a step change in the capability of our methodologists and an increase in data science capability. The agreement of funding for the new Data Campus also demands that we assess how the current ONS capability and the new establishment will work effectively in these areas. The skills requirements of the Data Campus are not the subject of this review, but will be affected by it.

It is therefore timely to conduct an in depth review of the methodology activity across the organisation to ensure that we are prepared for these new or changing demands, and to assess whether the organisation, skill base and tools to enable these demands to be met are either in place or should be enhanced as necessary.

This document sets out the proposed Terms of Reference for this review.

3. OBJECTIVES OF THE REVIEW.

The objective of the Review will be produce recommendations on:

- the scope and scale of the methodology skills, tools and organisation necessary to meet the findings of the Bean and other recent reviews on the work of ONS
- how the quality of ONS outputs should be assured using methodology
- what the relationship should be between the central methodology function in DTM and methodology skills in the other business areas
- what the future work programme of the central methodology team should be
- the consequent development and recruitment needs in the area of methodology over the period of the Spending Review

4. TERMS OF REFERENCE

The terms of reference are proposed to be, to:

- assess the methodology skills needed across ONS if the recommendations of the Bean and other relevant reviews, particularly on Statistical Quality, are to be implemented effectively and efficiently at an acceptable cost
- assess the existing skills, organisation and techniques in use in ONS Methodology against future needs
- identify any gaps against the above needs including, but not limited to, assessing the skills and competencies, technology tools, quantitative methods, data science and data engineering techniques which are currently in place
- recommend how these gaps should be filled, and how the resources should be organised in ONS and/or in partnership with other organisations, across the GSS, or academic or other third party organisations
- make clear recommendations as to the steps needed to render ONS methodology functions fit for the future including but not limited to the organisation, location (centrally and/or across the business for example) level of resourcing and range of skills
- determine where these skills and competencies should be based, whether in a central ONS Methodology function or in the respective business areas

5. ASSUMPTIONS

The following assumptions are implicit in these terms of reference but should be tested in the initial phase of the review:

- the provision of methodological services in the constituent organisations of the GSS other than in ONS is excluded from the review. All the statistical methodology needs of other

Governments Departments are not therefore included in this work, but ONS support to them, as part of its leadership role of the GSS, is

- the needs for methodological resources in response to the recommendations of the Bean Review about the regulatory function are not to be included in this review given the need for independence of the regulatory function
- internal assurance of the quality of ONS outputs is essential and the review is to assess the skills and other resource and the organisation of these which are needed to ensure effective quality assurance of ONS outputs

6. CONDUCT OF THE REVIEW

The review will be led by Dr Andrew Garrett. He will be supported by a secretariat and resources drawn from the Directorate of Digital Services, Technology and Methodology, supplemented as required. It is anticipated that the Review will work closely with the Director, DTM for resources and access.

The review is expected to be carried out over a period of three months. The review lead will have a small expert group at his disposal which will meet as required but no less than monthly for the period of the review. The review lead will present findings to the National Statistician by 31 July 2016.

As well as producing an interim and final report the review is expected to result in a series of practical and implementable, recommendations.

Annex B - Data Collection

SurveyMonkey

All staff (approx 155) in the two Methodology divisions – Survey Methods & Statistical Computing, and Population Methodology & Statistical Infrastructure were sent invitations to answer 8 questions via the online SurveyMonkey tool.

Overall 125 people responded to the survey, which corresponded to an 80% response rate. It is worth noting that this is a higher than the 69% response rate for the ONS People Survey for 2015.

Number of responses and response rate per question (as percentage of those that responded to the survey)

Question	Number of responses	Response rate (%)
1. Which of the following best describes your primary role?	118	94
2. If you could learn one new skill to help you deliver your work in your primary role, what would it be?	88	70
3. What single change would have the most positive impact on your ability to deliver your work in your primary role?	82	66
4. Have you worked with administrative data whilst in Methodology?	115	92
5. Which administrative data source have you worked most with?	51	41
6. What do you like most about working in Methodology?	88	70
7. What frustrates you most about working in Methodology?	82	66
8. Is there anything else you would like to say about the Methodology divisions or your work in Methodology?	51	41

One To One Interviews of Methodology Staff

41 members of staff from the Methodology Division were selected at random to take part in a confidential semi structured interview; of these 41, 2 declined to take part. The interviews took place across 3 sites; Titchfield 19, Newport 16, London 4. Those selected were asked around 50 questions covering the following themes

- Methodology
- Customer focus
- Innovation
- Quality
- Leadership, influence & skills
- Culture

Refer to the methods section for detail on the sample selection.

Senior Stakeholder Interviews

Interviews were held with senior stakeholders across the ONS, Government, Academia and Internationally. These stakeholders were identified through discussion within the review team with input from the Expert Group and through a presentation made to the GSS Heads of Profession where volunteer interviewees were sought. Most individuals identified were available within the review window and were able to participate. An unstructured interview format was used whereby individuals could raise the topics that they viewed as being the most relevant. If requested by the interviewee, specific topic prompts were provided including: the use of administrative data and online surveys; organizational structure; whether current expertise was broad or narrow; technical ladders; enabler versus gatekeeper roles; interaction with, and support provided for, GSS; International and academic links; and customer relationship management. Stakeholders (excluding academic and International ones) were asked the same series of 'quick fire' binary questions to explore their views on ONS Methodology. If a stakeholder felt unable to select an answer from the two provided, then the data were recorded as missing. The full list of those interviewed can be found at annex H. The results of the quick fire round are presented below and were used to compare the stakeholders' views with those of the Methodology staff.

Stakeholder Workshops

Workshops were held with 10 stakeholder groups between 11 & 15 July, with total attendance of 53.

Each workshop was asked to identify 3 key messages – based on discussion of the meaning of methodology, experience of working with MD, methodology going on outside of MD, and how methodology work should be organised in the future.

Refer to methods section for detail on stakeholder identification.

Annex C - Methods

Sampling for semi-structured interviews

The sample design for the semi-structured interviews was a stratified random sample of staff in Methodology with constraints in two dimensions – Grade and Role. The sampling frame was all Methodology staff in post (and contactable) on 19 May 2016. The total number of staff (N) was 155.

- **Grade constraints**

Probability of selection decreased by grade (grade is a proxy for experience and influence) with all staff at SCS and G6 given the opportunity to be interviewed. The sample design in Table 1 equated to a maximum of 37 interviews – with the following maximum constraints: 8 SCS & G6, 10 G7, 7 SEO, 7 HEO and 5 EO & AO.

Table A2.1 Maximum sample sizes by grade

Grade	SCS & G6	G7	SEO (~ SRO)	HEO (~ RO)	EO & AO
Sample (n)	$N_{SCS\ \&\ G6}$	$2 * \sqrt{N_{G7}}$	$\sqrt{N_{SEO}}$	$\sqrt{N_{HEO}}$	$\sqrt{N_{EO\&AO}}$

- **Role constraints**

Teams in Methodology are organised as "Centres of Expertise". Each Centre concentrates on a single aspect of survey methodology – for example, questionnaire design. So it is relatively easy to assign a primary "role" to each Centre – for example, social researcher for questionnaire design. The counts of staff by Centre can then be used to provide a breakdown of staff in Methodology by role. Table 2 gives minimum sample sizes by role.

Table A2.2 Minimum sample sizes by role (*there is only 1 Economist role in Methodology)

Role	Statisticians	Geographers	Social researchers	Programmers	Help Desk	Operational Delivery	Economist
Sample (n)	7	5	4	4	4	3	1*

The sample selection process was as follows.

1. Set the selection probability for each Grade based on the proportions in Table 1.
2. Randomly generate 0 (non-selection) or 1 (selection) for each member of staff according to their selection probability.
3. Sum the total number of staff selected by grade and compare to the maxima in Table 1.
4. Sum the total number of staff selection by role and compare to the minima in Table 2.
5. Re-run the allocation until both sets of constraints in steps 3 and 4 are met.

The allocation process ran about 30 times until all constraints were satisfied. In addition to the 37 selected staff, 2 additional staff were interviewed. These were experts in Data Collection Methodology (viz questionnaire design) who helped design and test the questionnaire. Rather than discard their responses, it was decided to include them in the overall analysis.

Identification of stakeholder groups for workshops

The data underpinning an interactive mapping of Centre of Expertise in Methodology to their stakeholders – see http://bl.ocks.org/AlessandraSozzi/raw/96929793d23e805e2ca3/ - was used to count how many Centres each stakeholder area interacted with. Ranking these counts in decreasing ordering identified a priority order in stakeholder – and it was quickly established that all the stakeholders interacting with fewer than 3 Centres were non-statistical areas. Another non-statistical area – the Service Centre – only had 3 interactions in which they managed the contractual arrangements for Southampton University to provide consultancy services. All remaining stakeholders interacted with 3 or more Centres that were recognizable statistical areas, and so were deemed key stakeholders.

However, not all these key stakeholders were distinct. For example Structural & International Statistics Division, Expenditure, Household & Economic Indicators Division and Labour Market Division were all survey output areas working in the Economic Surveys part of the National Accounts and Economic Surveys Directorate – so Economic Surveys was defined as a key stakeholder group, distinct from National Accounts which was another. Through this 2-stage process – prioritisation followed by clustering – 10 distinct key stakeholder groups were identified. Workshops were held with each area individually, to identify whether these different types of stakeholders had different:

- views on the experience of working with Methodology staff
- knowledge of methodology in ONS not being performed by Methodology staff
- ideas of how methodology should be organised in ONS in the future

Annex D - SurveyMonkey analysis

Introduction

All staff in the two Methodology divisions, Survey Methods & Statistical Computing, and Population Methodology & Statistical Infrastructure, were sent the following 8 questions via the online SurveyMonkey tool.

1. Which of the following best describes your primary role?
    a. Enabler (providing solutions to problems, helping others to deliver what they want, on time)
    b. Gatekeeper (signing-off solutions to problems, reviewing the work of others to ensure it is correct)
    c. Auditor (evaluating work completed by others and recommending future improvements)
2. If you could learn one new skill to help you deliver your work in your primary role, what would it be?
3. What single change would have the most positive impact on your ability to deliver your work in your primary role?
4. Have you worked with administrative data whilst in Methodology? (Yes / No)
5. Which administrative data source have you worked most with?
6. What do you like most about working in Methodology?
7. What frustrates you most about working in Methodology?
8. Is there anything else you would like to say about the Methodology divisions or your work in Methodology?

Methods

- **Sentiment analysis**

After parsing blocks of text into sentences automatically, sentiment analysis using the National Research Council of Canada word-emotion association lexicon (also called NRC emotion lexicon) associated the responses to 3 questions (2, 3 and 7) with positive polarity or negative polarity, and 8 emotions (joy, sadness, anger, fear, trust, disgust, surprise and anticipation). These emotions were proposed by Plutchik (1980) as the 8 primary bipolar emotions; joy vs sadness, anger vs fear, trust vs disgust, and surprise vs anticipation. Additionally, Plutchik's wheel of emotions theory proposed that emotions can be expressed at different intensities and can mix to form different emotions, as in the colour wheel in .

Figure A3.1 Plutchik's[1] wheel of emotions

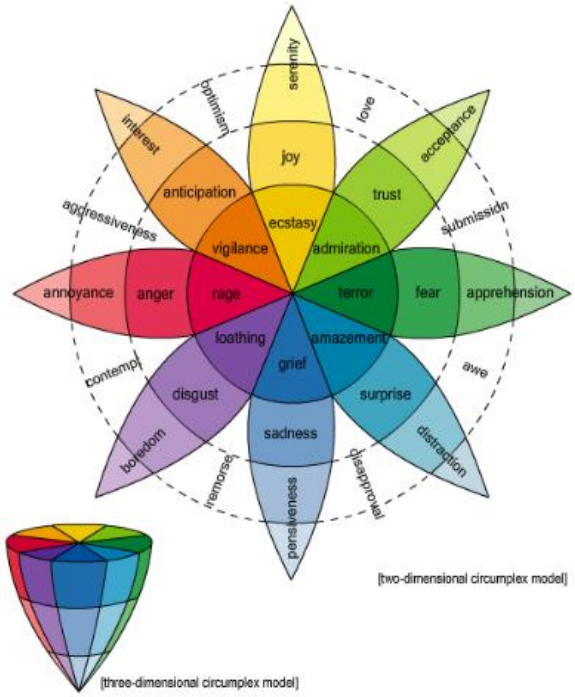


FIGURE 1. Plutchik's wheel of emotions. Similar emotions are placed next to each other. Contrasting emotions are placed diametrically opposite to each other. Radius indicates intensity. White spaces in between the basic emotions represent primary dyads—complex emotions that are combinations of adjacent basic emotions. (The image file is taken from Wikimedia Commons.)

- **Word clouds**

Word clouds were created for 2 questions (3 and 7) by removing punctuation and stop words (common words such as 'and' or 'the') and converting the text to lower case. The most common words in the text are visualised as larger than the uncommon words.

- **Bar charts**

For 3 questions (6, 7 and 8) the ONS Big Data team manually classified responses into shorter descriptions summarising the theme of the response. For example, a respondent answered the question about what they liked most about working in Methodology with "I enjoy getting involved with many other parts of the Office. In other divisions the opportunity to engage with other areas is much lower." This was manually summarised as "collaboration". In many cases, multiple themes emerged. If a respondent noted n themes in their answer, each theme for that respondent was given a weight of 1/n to ensure that all respondents were given equal weight in the analysis.

[1] Plutchik, Robert (1980), Emotion: Theory, research, and experience: Vol. 1. Theories of emotion 1, New York: Academic

Results

- **1. Which of the following best describes your primary role?**

Most staff in Methodology self-define as “Enablers” (Table). Even if all non-respondents to the survey self-defined as other than as Enabler, this would only equate to 1 in 3 not seeing themselves as Enablers.

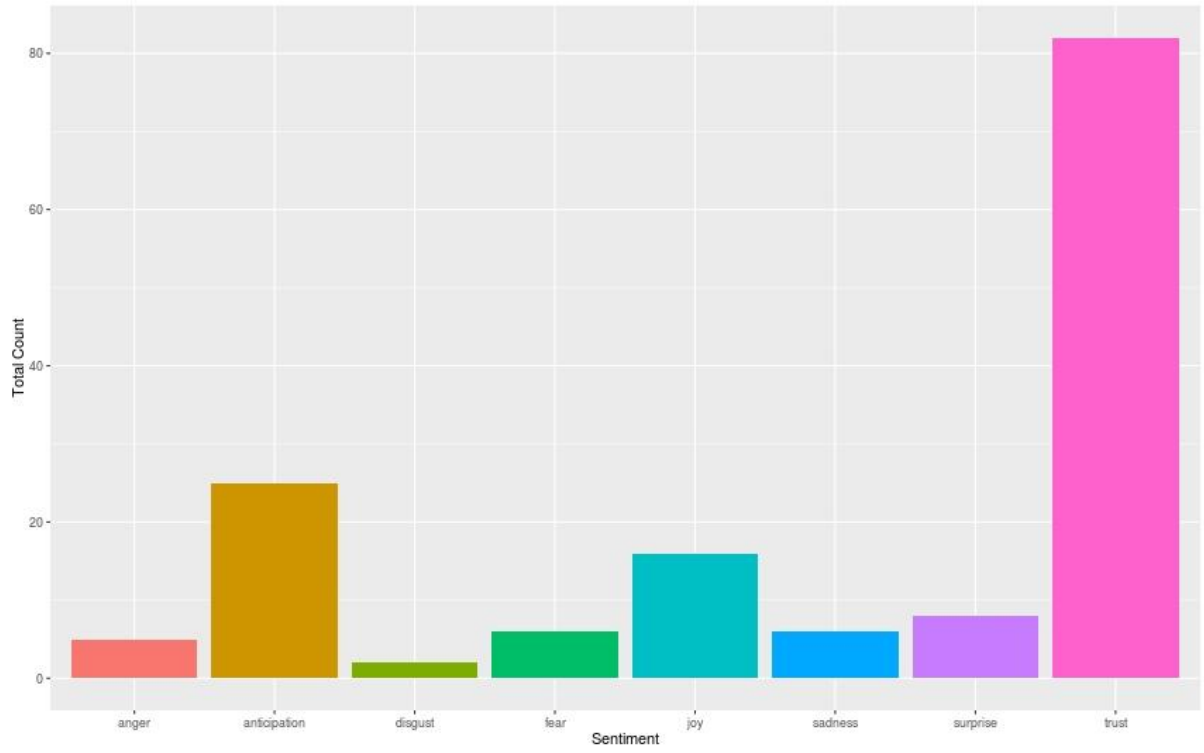
Table A3.1 Responses to question 1

	Enabler	Gatekeeper	Auditor
Responses	103	7	8

- **2. If you could learn one new skill to help you deliver your work in your primary role, what would it be?**

Sentiment analysis (see Figure A3.2) showed that the words used in the responses denoted trust in Methodology. Anticipation also featured, indicating expectation and hope about learning a new skill.

Figure A3.2 If you could learn one new skill to help you deliver your work in your primary role, what would it be?



- **3. What single change would have the most positive impact on your ability to deliver your work in your primary role?**

Sentiment analysis (see Figure A3.) showed that gaining trust was again the key driver to make change – scanning the individual responses, the theme is ONS showing increased trust in Methodology by allocating more resources and increasing their influence. Unsurprisingly for a question on change, words expressing anticipation also feature strongly.

To identify the key themes in the response, a word cloud was formed (see Figure A3.4) – the importance of improving access to staff resources and data is clear. The word "work" is probably just a consequence of it being in the question, and hence being included by design in answers.

Figure A3.3 What single change would have the most positive impact on your ability to deliver your work in your primary role?

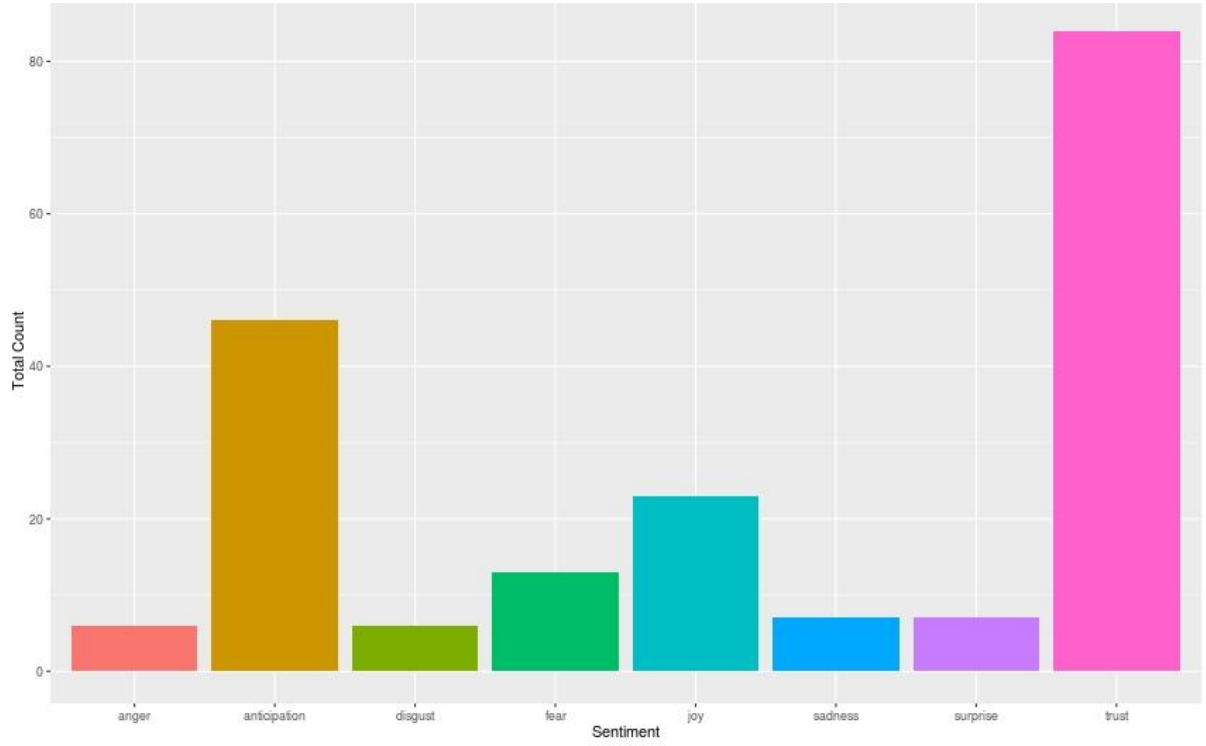


Figure A3.4 What single change would have the most positive impact on your ability to deliver your work in your primary role?

- **4. Have you worked with administrative data whilst in Methodology?**

The majority of staff in Methodology have worked with administrative data (Table A1.2). However, it would only take a small majority of the non-responding staff not to have worked with administrative data to switch the overall picture.

Table A1.2 Responses to question 4

	Yes	No
Responses	63	52

- **5. Which administrative data source have you worked most with?**

The most commonly used administrative sources are VAT and PAYE from HMRC, which form the backbone of the Inter-Departmental Business Register (IBDR), used for sampling business surveys. Of the 13 other sources quoted in Table A3.3, only the Patient Register was used by more than 5 people. 5 people said they used “numerous” (but undefined) sources.

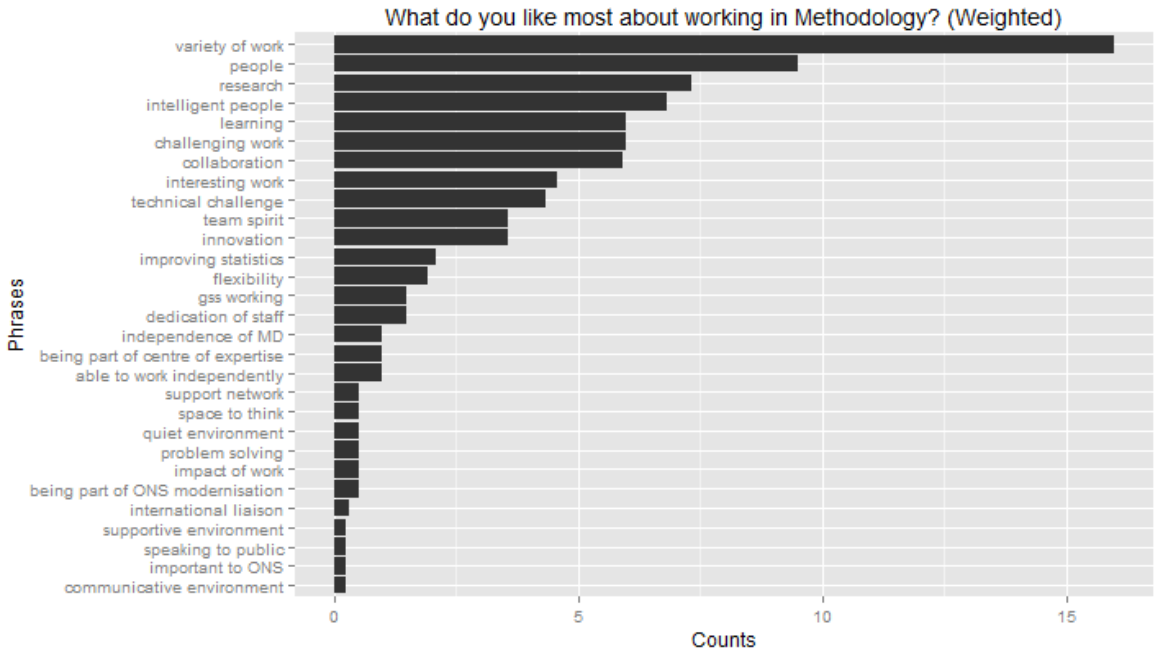
Table A3.3: Responses to question 5

	HMRC (VAT/PAYE)	Patient Register	Numerous
Responses	19	7	5

- **6. What do you like most about working in Methodology?**

The aspect people most liked about working in Methodology was the variety of research (Figure A3.1), which was related to many other top 10 likes: Research, learning and technically challenging/interesting work. The other theme in the top 10 was around the second top like: the people. This had the related likes: intelligent people, collaboration and team spirit.

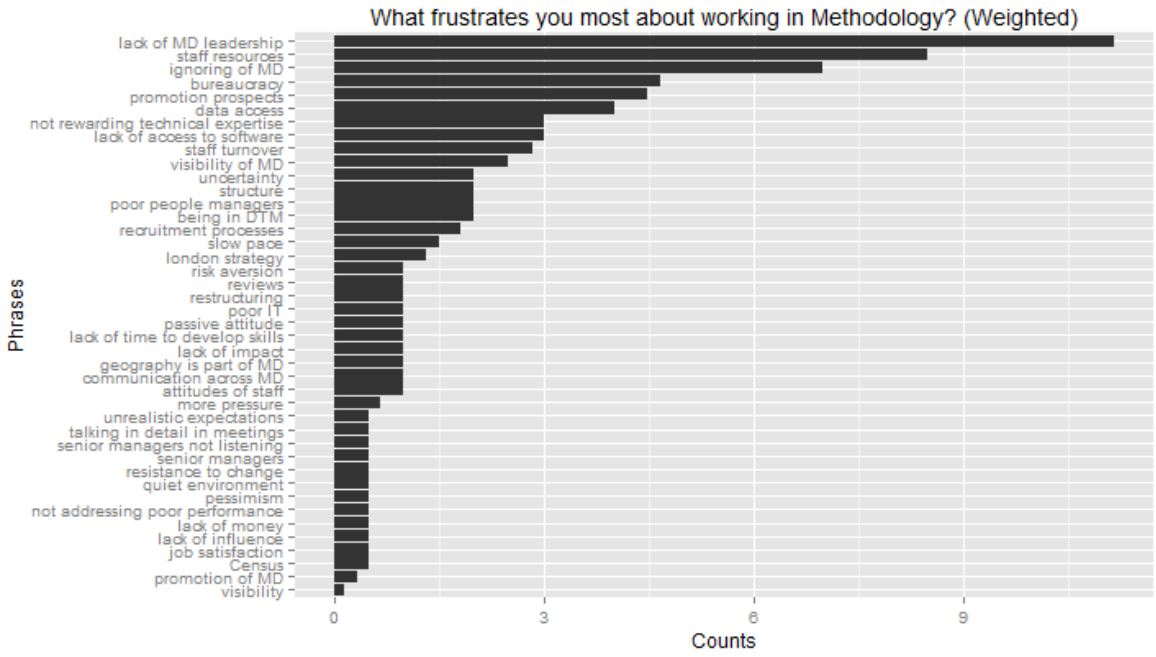
Figure A3.1 What do you like most about working in Methodology?



- **7. What frustrates you most about working in Methodology?**

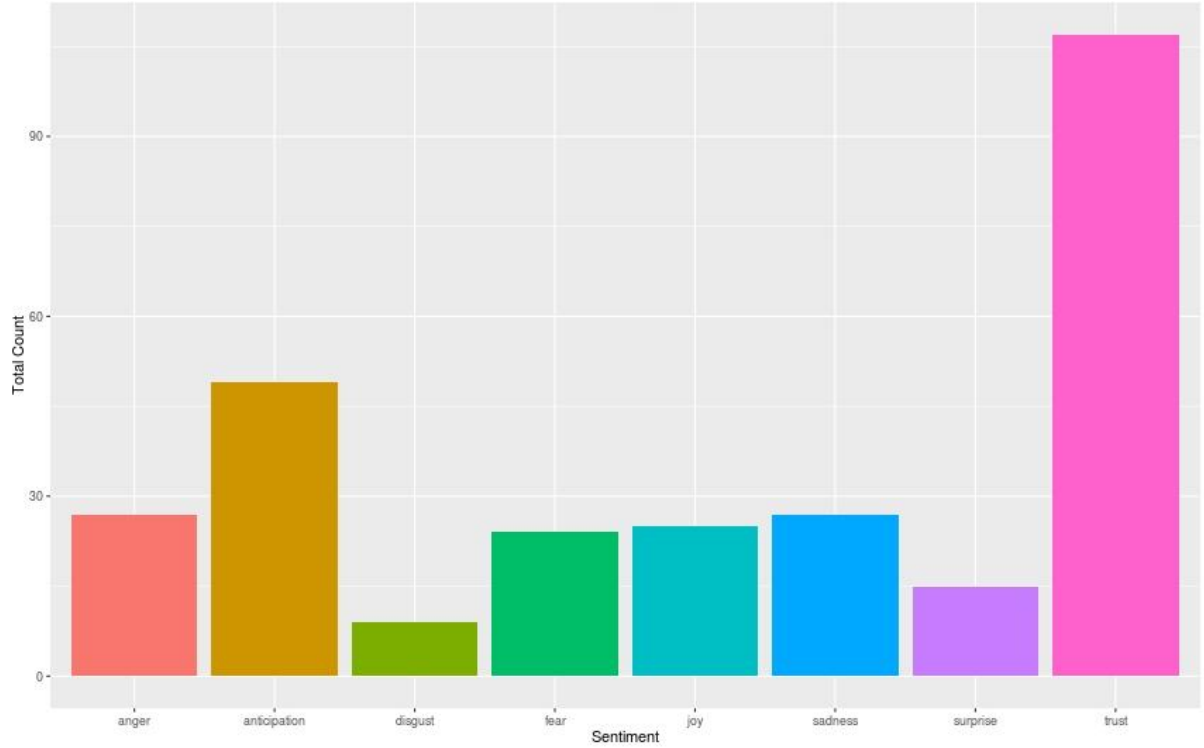
The top frustration for Methodology staff was lack of MD leadership, which is directly connected with the third item in the list: Ignoring of MD, as a strong leader would not be ignored. Lack of MD leadership is also indirectly related to the second item on the list: staff resources, as strong leader would raise the profile and hence the resource level. Another related frustration in the top 10 is visibility of MD. The only other theme in the top 10 is around careers - fifth is promotion prospects and seventh is not rewarding technical expertise.

Figure A3.2 What frustrates you most about working in Methodology?



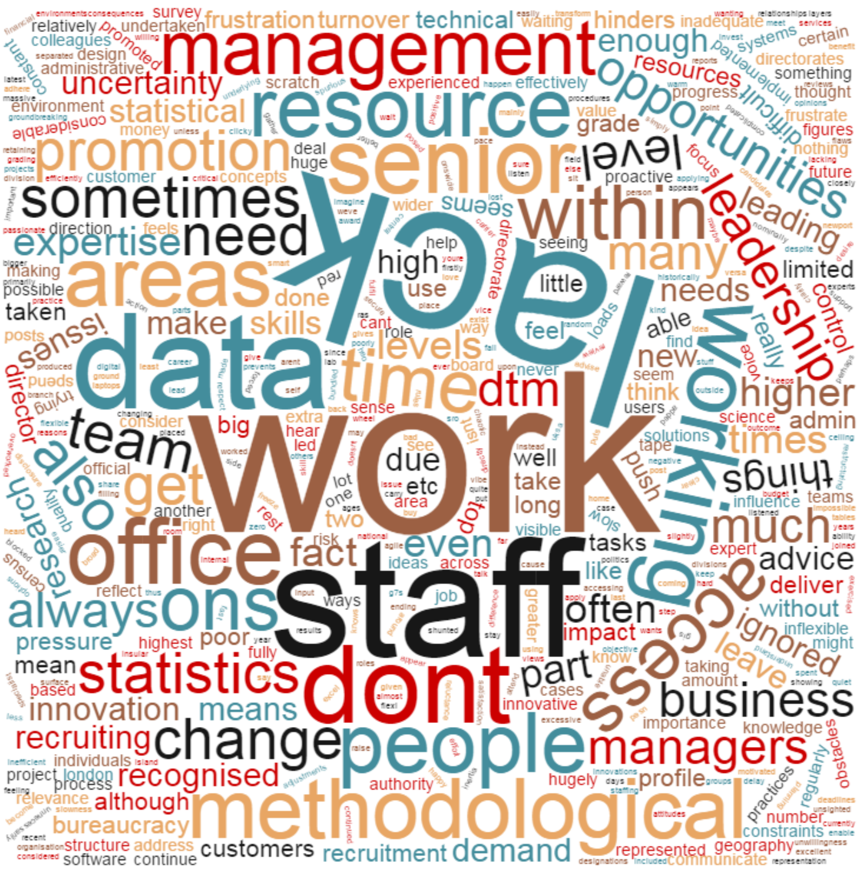
As frustration is such a key emotion, sentiment analysis was also applied to the responses (Figure A3. 3). As in the previous sentiment analyses, trust is the key driver. This means that although people have niggles, sentiment is mostly positive. Given the nature of the question it is not surprising that anger, anticipation and fear also come out.

Figure A3. 3: What frustrates you most about working in Methodology?



To further explore the key themes in the response, a word cloud was formed (see Figure A3.4). The clear message is a lack of staff/resource and of senior management, so all 3 approaches to analysing responses to this question have reached the same conclusion. Again, the word "work" is just a consequence of it being in the question, and hence being included by design in answers.

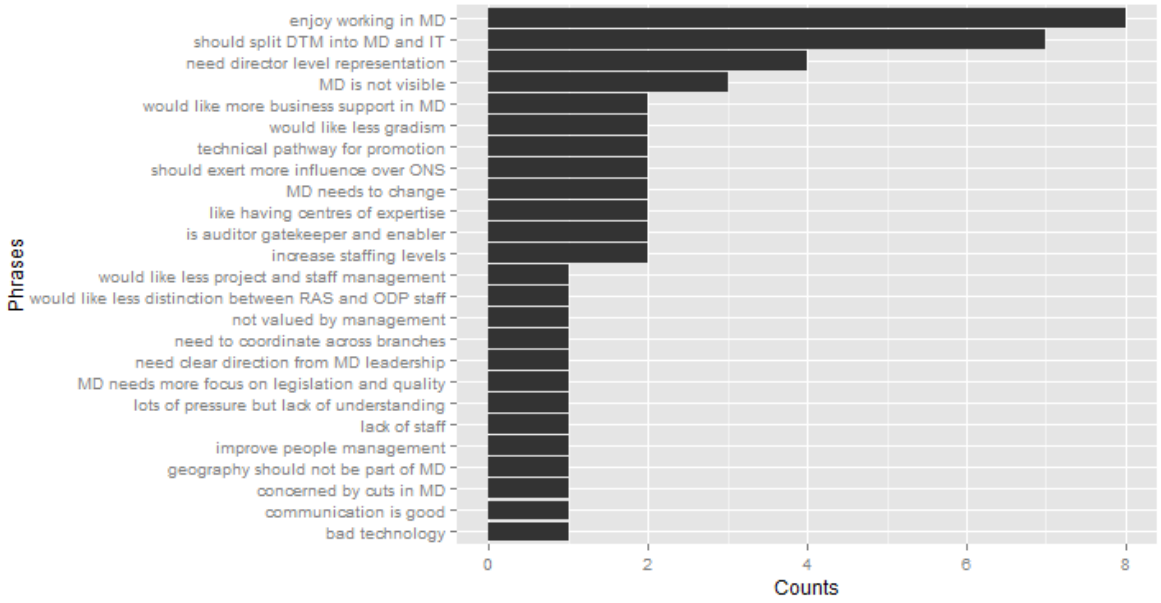
Figure A3.4 What frustrates you most about working in Methodology?



- **8. Is there anything else you would like to say about the Methodology divisions or your work in Methodology?**

Notwithstanding the responses to the other 7 questions, the top message in Figure A3.9 is that staff enjoy working in Methodology. The next 3 top messages revert to the common theme of making Methodology more visible by creating an independent Methodology Directorate.

Figure A3.5 Is there anything else you would like to say about the Methodology divisions or your work in Methodology?



Annex E - Semi-structured interview questionnaire

Introductory paragraph

The purpose of this interview is to gather information that will feed into the methodology review alongside the short survey you have already been sent.

I will ask you a series of around 50 short questions – there are no right or wrong answers, please just answer honestly and to the best of your ability. I am looking for your first response, so please don't over-think the answers and just tell me the first thing that comes to mind.

I can assure you your answers will be kept confidential and when the results are analysed and reported you will not be mentioned personally. The interview will last no longer than an hour.

Do you have any questions before we begin? Many thanks for taking part.

Methodology (10 minutes)

I will start by asking you some questions about you, your role and the concept of methodology (10 minutes)

1. Name / Grade / Date of Interview DDMMYY
2. How do you self-define (for instance, if you were asked for your occupation – I am a …..)
3. In one sentence, what is your primary role?
4. Which of the following best describes your primary role? (show a card with these definitions below)
    - Enabler (providing solutions to problems, helping others to deliver what they want, on time).
    - Gatekeeper (signing-off solutions to problems, reviewing the work of others to ensure it is correct).
    - Auditor (evaluating work completed by others and recommending future improvements).
5. In one sentence, what is your team's primary role? (may be the same as Q3)
6. Do you manage a team of people?
7. How long have you been in your current role?
8. What attracted you to your current role?
9. Could you tell me what the term methodology means to you?
10. Does your team do methodology?
11. Apart from DTM, which other teams do methodology in ONS? Please tell me a maximum of three teams.
12. Thinking about the teams you just mentioned who do methodology, could you tell me what they do?
13. In your opinion, do you think they do methodology well?

Customer focus (10 minutes)

I am now going to ask you some questions about customers.

14. Who are your customers?
15. Who is your primary customer?

16. Please tell me three words that you think your primary customer would use to describe your team?
17. Who do you interact with most to deliver your work?
18. Where are they based?
19. Why are you based in your location?

Innovation (10 minutes)

I am now going to ask you some questions about innovation.

20. Thinking about your work at ONS, please could you explain what you feel the term innovation means?
21. Does your team's work involve innovation?
22. If Yes:
23. Please give your best example from the last twelve months – describe what it was, and the impact
24. Who else knows about it?
25. Thinking about those people who know about your example of innovation, what do you think they would say about it?
26. Do you feel innovation is celebrated within methodology?
27. How, if at all, is innovation evaluated in methodology?
28. Who, if anyone, encourages you to innovate?
29. To what extent is your program of work ambitious?
30. In your opinion, which National Statistical Institute (NSI) is the most forward looking in your area?
31. What do you feel they do well?
32. How do you interact with them?
33. What are the benefits and limitations of using admin data in your team?

Quality (10 minutes)

I am now going to ask you some questions about quality

34. Thinking about your work at ONS, please could you explain what you feel the term 'quality' means?
35. Does your team deliver quality?
36. How do you know?
37. What happens when you fail to deliver quality?
38. Thinking about the work you do in methodology, do you feel able to take risks by suggesting new ways of working?

Leadership, influence and skills (10 minutes)

I am now going to ask you some questions about leadership and skills

39. To what extent does your team have influence within ONS? Please explain your answer.
40. If methodology skills were lost, what would be the impact?

41. If there were a technical career ladder rather than a managerial career ladder, would you select it?
42. Which academic group is the leader in your area?
43. Do you feel academic groups add value? If Yes: How do they add value?

Culture (10 minutes)

I am now going to ask you some questions about culture.

44. What frustrates you the most about working in methodology?
45. To what extent do you feel empowered to make decisions in your role in methodology?
46. To what extent are you able to implement change in your role in methodology?
47. Please tell me three words that describe the culture within methodology at ONS? [Expand if needed]
48. If you could only make one point in this interview, what would it be?

<Interview end>

Annex F - Stakeholder workshops

Overview

Workshops, run by the review team, were held with 10 distinct groups of stakeholders between 11 & 15 July, with total attendance of 53. One member of the Expert Group (Richard Pugh) attended two workshops.

Each workshop was asked to identify 3 key messages – based on discussion of the meaning of methodology, experience of working with MD, methodology going on outside of MD, and how methodology work should be organised in the future.

These messages fall into the following themes.

- **Methodology (MD) culture needs to change**

Wider non-technical skills, increased pace, agile communication, proactive, pragmatic regards quality, focussed on problem solving & innovation, engagement in/ownership of problems, focus on generic methods, outward looking

- **Methodology (MD) operating model needs to change**

Agile collaboration in multi-skilled teams, upskilling of business areas, embedded staff in business areas, secondments in/out, hub & spoke model supplying support networks across ONS & GSS

- **An ONS-wide vision for methodology is needed**

Set by NSEG aligned with the UKSA strategy, led by executive director for MD, MD responsible and accountable for monitoring & policing, clarification of which functions do innovation/BAU/data architecture, strategic prioritisation of resources

Key messages from stakeholder workshops

1. Change is needed in MD - wider skills, more agile collaboration within MD and between MD & ONS, early & continuous personal (face-to-face) communication.
2. ONS-wide methodological vision for ONS, driven by MD, not academic research into silo problems - with corresponding innovation/methodological workplan properly planned, prioritised, managed monitored and assured.
3. Refocus of MD on methods - development, QA, governance, architecture - and less on statistical infrastructure, geography and building production systems - which requires key decision on whether data architecture/governance sits within MD.
4. MD need to lead more - across ONS or GSS needs to be decided - do more monitoring & policing, and be more proactive/innovative/forward-looking - less reactive.
5. MD needs a flexible support model (central/roaming/local) and more collaboration with business area/NSI experts in stand-up teams with wide breadth of knowledge - and not to be hamstrung by IT service model.
6. MD needs to say "No" less - this might require more funding - take ownership of timetables/solutions, spend less time doing BAU, and spend more time doing development/QA/audit of methods.
7. Investment is needed in MD to increase it's influence, and stronger leadership is needed within MD to make it more pragmatic and less perfectionist.
8. ONS needs rigour in estimation/techniques, and methodologists are the key resource to providing this so should be cherished & recognised - but they also need to prove their value.
9. MD needs space for innovation and continuous improvement - this requires a balance between in-house and targeted outsourced research, which the hub and spoke model would deliver (for the GSS too).
10. ONS needs a more strategic approach to methodology - top down prioritisation, an executive director (ED) for MD, more resources for MD.
11. MD needs to work more collaboratively - being part of multi-skilled teams, embedding staff in business areas, operating a hub & spoke model.
12. MD needs to lead the methodological upskilling of ONS - this will require more resources for MD.
13. Have a chief methodologist at director level to define the strategic role of methodology and include a governance function / capability.
14. Business areas should continue to undertake methodology work and explore the scope for further work to be decentralised (but resourced)
15. There is a need to address the balance between Pace, Quality and Flexibility - haven't got it right at the moment.
16. MD needs to be aligned with the UKSA strategy "Better Statistics, Better Decisions" - not just at workplanning stage, but all members of staff - and have a culture of engagement, not one where barriers to communication are put on (eg Front Door process).
17. MD need to go to where work is, not expect work to come to them - be proactive, forward looking, and think strategically.
18. MD needs to change structure and culture and adopt the developer model: taking part in multi-disciplinary teams; being problem focussed (not siloed); having wider 'softer' skills (not just narrow technical experts).
19. NSEG should set an ONS vision for methodology - clearly defining who undertakes BAU & innovation roles, with MD operating a hub & spoke model - with embedded staff in business areas, secondments in and out of MD, and methodology-specific networks across ONS supporting this model. MD should be responsible & accountable for leading this vision, and demonstrate involvement & engagement.
20. There should be a strategic prioritisation of resources for methodology.
21. MD should focus more on innovation than pure academic research/developments, but still do both. MD expertise should be retained, but MD should become more part of ONS - sharing expertise, and helping business areas improve.
22. MD needs to be pro-actively involved in output areas to resolve issues and assist with regular quality assurance - collaborative rather than commissioned.
23. MD needs to be pro-active in developing broad principles for methods.
24. MD should be guiding the journey from surveys to admin data.
25. Improve leadership - Methods Director
26. Increase collaboration (possibly co-location) and pace of delivery - Maintain independence and rigour
27. Communicate the appropriate messages at the right time
28. MD needs strong statistical leadership as it is crucial for achieving TQV statistics.
29. There should be a vision for methodology/data science etc in ONS & especially GSS - with a clear distinction between BAU & innovation functions - and MD operating a hub & two spokes model.
30. MD culture needs to change - they need to be relevant, real-world, progressive, outward & forward looking, innovative, collaborative, flexible, at forefront - and "good enough", not perfect.

Annex G - Testing workshops

Aim

The aim of the workshops was to discuss the preliminary draft of the main recommendations from the review with a selection of Methodology staff.

Structure

Both workshops were led by Andy Garrett. The first workshop was face-to-face with Methodology staff based in Titchfield, the second was via video conference with Methodology staff in Newport. The workshop was positioned as an opportunity to comment on the preliminary findings rather than an additional opportunity to input into the review.

Representation

The staff at the workshops were purposively selected by Jane Naylor for Population Methodology and Statistical Infrastructure (PMSI) and by Pete Brodie, Gareth James, Jeff Ralph, and Ria Sanderson for Survey Methodology and Statistical Computing (SMSC). The specific attendees will not be named in this report. The total number for each workshop was intended to be 6 – but 1 from Titchfield attended the Newport workshop due to a calendar clash.

Feedback

The feedback from the workshops was overall positive in terms of the recommendations. The reasons behind specific recommendations were questioned, and good discussion on the nature of some of the recommendations was voiced.

Impact

As a result of the workshops, more detail and explanation was added to the draft recommendations, and wording was tightened up on some specific recommendations. Andy found the workshops extremely constructive, as they helped shape the draft recommendations, and thanked all staff involved for their time and comments.

Annex H - List of key stakeholders interviewed and attendees at stakeholder workshops

Stakeholder interviews

ONS

John Pullinger, Jonathan Athow, Heather Savory, Ian Cope, Pete Benton, Ed Humpherson, Frankie Kay, Neil Wooding, Rob Bumpstead, David Best, Martin Ralphs, Charles Lound

GSS

Siobhan Carey, Sean Whellams, Scott Heald, Neil McIvor, Iain Bell

Academia and Research

Harvey Goldstein, Chris Skinner, Denise Lievesley, Guy Goodwin

International

Peter Miller, Julia Lane, Kees Zeelenberg, John Eltinge

Individuals who provided background information during the introductory sessions

Pete Benton, Jason Bradbury, Laura Dewis, Tricia Dodd, Bill Oates, Glen Watson, Jennet Woodford, Neil Wooding

Group presentations were made by representatives from each ONS Methodology branch

Stakeholder workshop attendees

Jan Jones, Colin Bowler, Stephen Ball, Claire Bell, Joni Kranka, Ray Collins, Robert Fry, Craig McLaren, Kevin Moore, Steven Dunstan, Craig Orchard, Philip A Lewis, Laura , Hollie Palmer, Jason Bradbury, Ed Dunn, Ian , Amanda Bowen-Downes, Steve Drew, Eric Crane, Louisa Nolan, Jennet Woolford, Paul Vickers, Richard Pereira, Roma Chappell, John Flatley, Emma Wright, Abigail Self, Myer Glickman, Lynsey Brown, Owen Abbott, Daniel Lewis, Pam Davies, Gareth Clancy, Martin Ralphs, Ceri Regan, Charles Lound, Mike Prestwood, David Freeman, Jayne Olney, Hannah Finselbach, Clive Holliday, Claire Evans, Fiona Dawe, Richard Heys, Andy Banks, Ciaren Taylor, Louisa Blackwell, Cal Ghee, Garnett Compton, Teague Andy, Colin Lloyd, Mark Pont