

Classification: Official

Publication reference: PR637_i



AnalystX Observatory State of the Nation

Workforce survey key findings

24 October 2022

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Executive summary

This report gives an accurate, up-to-date picture of the work and career paths of data and analytic professionals across health and care in the public sector, possibly the first of its kind.

This AnalystX Observatory State of the Nation survey, undertaken in March 2022, was commissioned by NHS England. It collates the responses of 118 data professional team leads from across the care and health sector including the NHS and local authorities.

Its aim is to better understand the data professional landscape and help health and care, as a system, to:

- understand the workforce,
- retain and grow the expertise within the field,
- increase professionalisation within the world of data and analytics, and
- help the sector plan for the future.

This report of the survey analysis covers three areas:

- the current picture of data professionals within care and health,
- vacancies and recruitment challenges, and
- provide accurate benchmark data on how many data professionals there currently are working in this field.

The headlines from the report are:

- The latest estimate is that there are around 13,025 data professionals working in the health and care sector in the UK.
- The average size of data professional teams across the health and care sector is 11 employees, a range of 1 to 21 employee(s). Commissioning support units (CSUs) and national organisations had, on average, the largest team size.
- Most people who work in this profession are data analysts, making up 45% of the data and analytics profession.

- Pay bandings follow a similar distribution pattern across local, regional and national data and analytics teams. Band 7 is the height of this distribution. Though there is a greater proportion of band 8s at national level than local and regional.
- On average data professionals stayed between 2-4 years in a team.
- Recruitment is an issue. Over half of data and analytics teams have vacancies and are struggling to recruit, especially to band 6 and 7 where over half the vacancies are. Most of the band 7 gaps are in the national organisations, though recruitment issues in general cut across both rural and urban settings.
- Vacancies are distributed throughout organisation types and areas of England. The reasons given for vacancies vary with topics surrounding gaps in specific technical skills and banding restrictions.

In this report we will share who we heard from in the survey, what we asked them and what they said.

Introduction

A survey of the health and care workforce was undertaken in March 2022 by [AnalystX](#) to understand the data professional landscape. Data professionals are understood as the group of staff whose roles, responsibilities and skills fit into the definitions of [Data Engineer](#), [Performance Analyst](#), [Data Analyst](#), [Data Scientist](#) or a combination of these.¹

Data professionals sit within the ‘central functions’² in the [monthly statistical publication](#) of the NHS workforce statistics. This amalgamates personnel, finance, IT, legal services and library services functions. This umbrella term means it has been difficult to know how many data professionals there are in the NHS or, more broadly, in the health and care sector.

AnalystX is a community of practice for those involved in data and analytics across health and care. It is pan-organisational and includes members from academia, industry, voluntary sectors and the public. It is leading the movement for data driven, evidence-based decision making, by sharing learning across health and social care beyond typical organisational and geographic boundaries. AnalystX hosts the AnalystX Observatory which aims to understand the data and analytics workforce across health and care.

In 2018, the Department of Health and Social Care (DHSC) policy paper, [The future of healthcare: our vision for digital, data and technology in health and care](#), sets out the government’s vision for the use of data, digital and technology within health and care, to meet the needs of all users. Within that paper was a clear recommendation: we need to recruit and retain specialist non-clinical professions, such as a highly skilled and well-resourced data science and analytics workforce, to make the best use of data.

For data-driven healthcare transformation to truly succeed, recognition of and investment in the non-clinical data team is equally as important and essential as developing the clinical workforce. However, one of the starting blocks to investment in the data and analytics workforce is to understand what the workforce looks like

¹ See [Appendix D](#)

² Definition taken from monthly [NHS workforce statistics report](#)

and what are the current barriers experienced by that workforce in recruitment, innovation and development.

In 2016 health services researcher and analyst, [Martin Bardsley](#), asked the question “do we have more data than insights?”. In this thought paper called [Understanding analytical capability in health care](#) he aimed to find out how many data professionals there are working in healthcare in the UK.

He estimated that there were ~10,000 data professionals working in the health sector in the UK. This figure was calculated by scaling up known statistics, estimates and assumptions. Since the publication, this 10,000 figure has been quoted and used in multiple pieces of work, for example by the [Health Economic Unit](#) (2021), [Ben Goldacre](#) (2020), and [the Health Foundation](#) (2022).

The health and care landscape has changed since 2016; new mandates and increased use of data, digital and technology have meant the figure needs reviewing and revising. In addition, there has been continued structural reorganisation across the health and care sector and particularly the move towards greater integration at a local authority level.

The State of the Nation survey looks to understand the data professional landscape in the health and care sector. Evidence from this survey alongside figures from other sources eg internal audit, find that there are roughly 13,000 data professionals working in the health and care sector in the UK. Analysis of the survey covers three areas: the current data professional state of the nation, vacancies and recruitment challenges, and revising Martin Bardsley’s estimate on how many data professionals there are in the sector.

Approach

The requirement to undertake the workforce survey was included as a recommendation in the [Data Saves Lives 2022](#): “develop a workforce observatory, including an annual census, to inform how to better harness the professional skills of analysts and data managers, engineers and scientists, and support their professional learning and development.”

As the AnalystX community has 17,000+ members it was decided the best way to reach out into the data and analytics community was to leverage this membership reach. It also provides a platform by which to share the results from the survey.

As there is no existing list containing all data professionals within the health and care sector, the survey was published on the [NHS AnalystX website](#), sent to distribution lists that contained known data professionals team leads, and promoted via social media channels.³

Participation was voluntary and participants were self-selecting. The survey was open for responses from 8 March to 8 April 2022.⁴ People were encouraged to share the survey with other known data professional team leaders. The survey asked for details of the respondent, team structure, recruitment, retention, training, working environments and challenges.⁵

Who we heard from

118 data professionals team leaders responded to the survey, representing 120 data professional teams, as two of the team leads completed the survey for two separate teams.

90 unique organisations across the health and care sector⁶ were represented by the 120 teams that responded to the survey. The unique organisations (denominator of 90) equate to ~10% of organisations in the health and care sector represented in this survey. The majority of these organisations were trusts (46/90).

³ Via FuturesNHS, LinkedIn and Twitter

⁴ For further details on the response rate please see [Appendix F](#)

⁵ A copy of the survey is in [Appendix B](#)

⁶ See [Appendix G](#) for full list of organisations represented

This included 45 NHS trusts, which represents 20% of all NHS trusts across England (45/219), and one independent trust.

The next largest response was from local authorities (18/90). There was one response from a Welsh local health board, one response from the University of Bradford. There were four responses from CSUs. The 11 responses from national organisations included teams from NHS England, NHS Digital and DHSC.

79% of responses came from the health sector (71/90), while 20% of responses (18/90) were received from the care sector.⁷

All NHS regions in England were represented. 28% (25/90 unique responses) of respondents were from the Midlands, including one hospital where 10 out of the 39 total Midland responses were based. One response was outside of England, being from a local health board in Wales.

Respondents were asked to provide their [ODS code](#),⁸ from which location and organisation type could be analysed. The map below (figure 1) demonstrates the geographical spread of responses and location of organisations represented. The bubble size on the map depicts the number of responses from a location.

The table below (Table 1) summarises the number of responses, the data professional's location and organisation types represented.

⁷ See [Appendix H](#) for the organisation that are categorised into health, care and other.

⁸ Further detail on how ODS codes were utilised is in the [Appendix J](#)

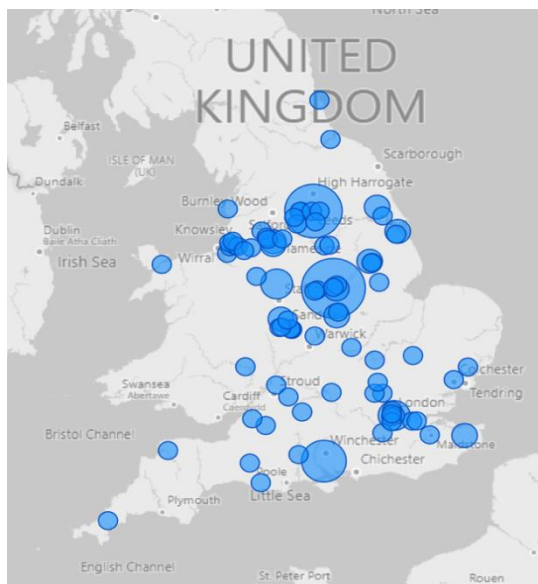
Table 1: Responses to survey by organisation type, health / care organisation and location

| | Number of responses | Percentage of total responses | Percentage of total organisations across England / Wales |
|--|---------------------|-------------------------------|--|
| Number of responses | | | |
| Total number of responses (individuals) | 118 | | |
| Total number of responses (teams within organisations) | 120 | | |
| Total number of unique organisations represented | 90 | | |
| Total number of unique trusts represented | 46 | | |
| Responses by organisation type | | | |
| NHS Trusts | 45 | 48% | 20% |
| Local authority | 18 | 20% | 5% |
| Clinical Commissioning Groups | 14 | 15% | 12% |
| Commissioning Support Unit | 4 | 4% | 18% |
| Prescribing cost centre | 3 | 3% | / |
| National Organisation | 3 | 3% | 100% ⁹ |
| Local health board | 1 | 1% | 14% |
| University | 1 | 1% | 1% |
| Independent Sector healthcare | 1 | 1% | 2% |
| Organisation by health / care sector division | | | |

⁹ At the time of the survey there were three national organisations: NHS England and NHS Improvement (now NHS England), NHS Digital and DHSC. All these organisations are represented; however, not all teams within the organisations are represented.

| | | | |
|--------------------------------|----|-----|--|
| Health | 71 | 79% | |
| Care | 18 | 20% | |
| Other | 1 | 1% | |
| Location of respondents | | | |
| Midlands (Y60) | 25 | 28% | |
| North West (Y62) | 17 | 19% | |
| North East and Yorkshire (Y63) | 15 | 17% | |
| South West (Y58) | 11 | 12% | |
| London (Y56) | 7 | 8% | |
| East of England (Y61) | 6 | 7% | |
| South East (Y59) | 5 | 6% | |
| National Organisation | 3 | 3% | |
| Wales | 1 | 1% | |

Figure 1: Map showing the geographical spread of teams (N=120)



Current landscape of data professionals in the health and care sector

The survey looked to understand the current landscape of data professionals. It asked data professional team leads questions about the average size of their team, pay band distribution, types of data professional roles within their team, and the average tenure of data professionals in their team. The following is a summary of the key findings from the survey.

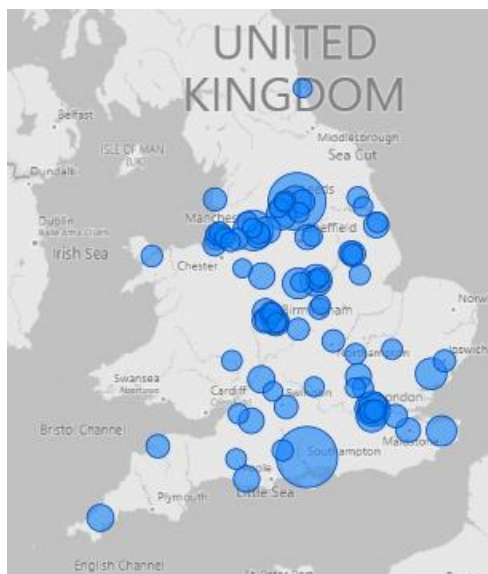
Average size of data professional teams

Based on the survey responses received, the average size of data professional teams across the health and care sector is 11 employees. CSUs and national organisations had, on average, the largest team sizes (21 and 20 respectively). See Table 2 and Figure 2 below for average sizes of data professional teams by organisation type and geographical distribution, based on responses to the survey.

Table 2: Average size of data professional teams (N=120)

| Organisation type | Average data professional team size |
|-------------------------------|-------------------------------------|
| CSU | 21 |
| National organisations | 20 |
| Trust | 17 |
| Local health board | 10 |
| CCG | 8 |
| Local authority | 8 |
| Independent sector healthcare | 4 |
| Prescribing cost centre | 2 |
| Other | 1 |

Figure 2: Map showing the distribution of data professional teams by postcode



Whole time equivalent analysis

The survey asked team leads to give a total whole time equivalent (WTE) for their team and then break this figure down into job role categories¹⁰ and pay bands¹¹. There was a disparity between the total number of WTE and subsequent breakdowns across three questions asked in the survey, shown in table 3.

This does impact the interpretation of the findings, meaning it was necessary to utilise a new denominator based on the summation of the pay bands and job role breakdowns. For example, for understanding the breakdown of pay bands WTE we totalled the respondent's breakdown (1631.22 WTE) and used this as the denominator. This was instead of the total given by each respondent (which totalled 1577.52 WTE). This method is chosen to create a more accurate representation of the current state of WTE across the profession.

¹⁰ See [Appendix D](#) for job role category breakdown

¹¹ See [Appendix K](#) for pay band category breakdown

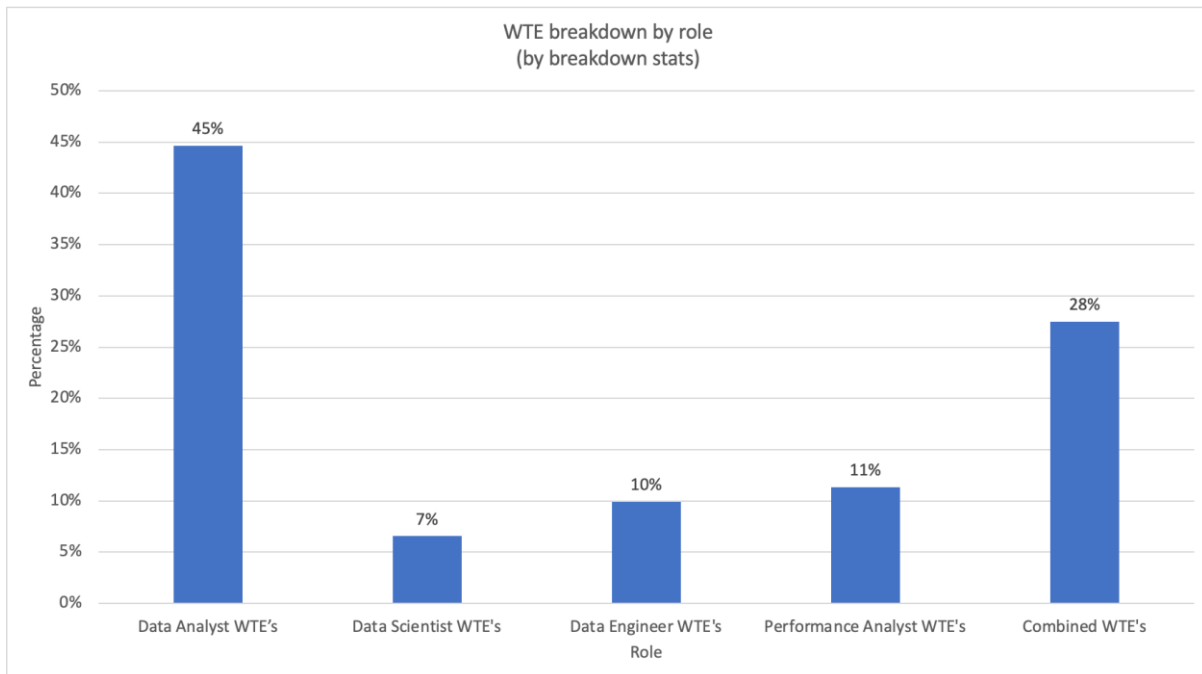
Table 3: Different totals of WTE from three survey questions

| Data professional's numbers | WTE |
|---|---------|
| Total WTE employed within your team | 1577.52 |
| Total WTE employed by pay bands breakdown | 1631.22 |
| Total WTE employed by job role breakdown | 1754.23 |

Whole time equivalent by job role

The survey produced a total of 1754.23 WTE across the four roles with data analysts making up the majority of these with 783.27 WTE, 45%.

Figure 3: Distribution of WTE by job role

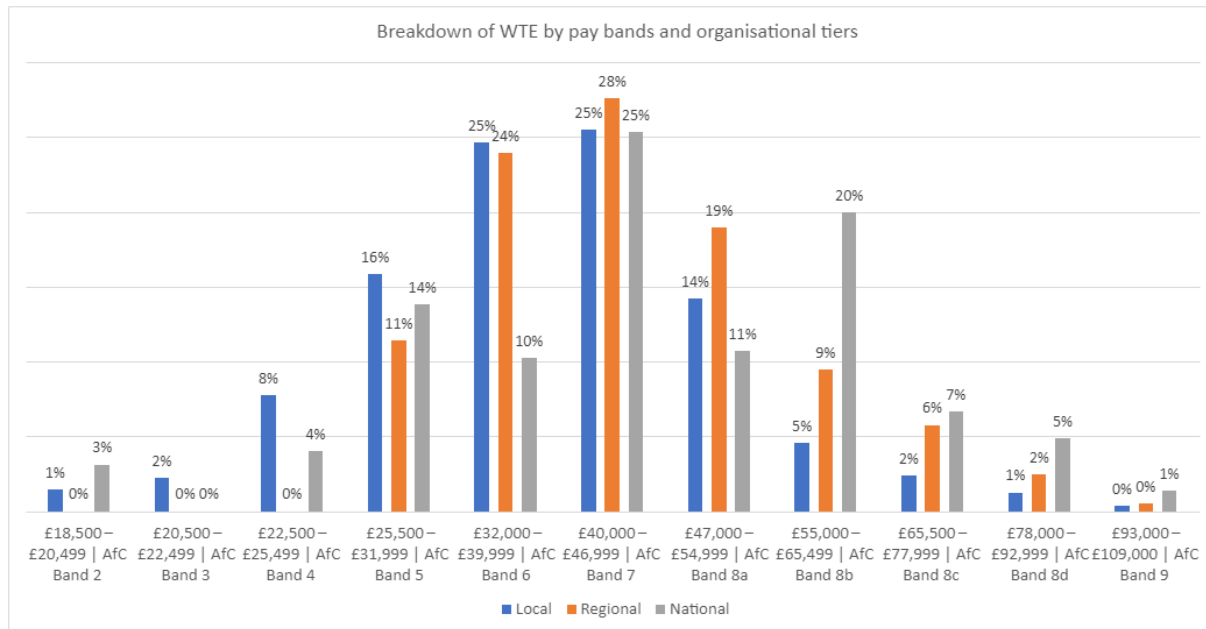


Whole time equivalent by pay bands

Respondents were asked to break down their team's WTE by pay bands. This resulted in a total of 1631.22 WTE across the 11 pay boundaries. Just over half (53%) of the WTEs working in teams are in pay bands higher than band 7 and only 3% of WTE in teams are in bands 2 and 3. Band 7 has the highest amount of WTE, 26% share of the survey responses.

National organisations had 69% of WTEs in band 7 roles and above. This is in comparison to 65% at a regional level and 48% at a local level. There is a higher proportion of 8b roles at the national level. The breakdown of WTE by pay bands and organisational tiers is below (fig 4).

Figure 4: Distribution of WTE by pay bands and organisational tiers



How long data professionals stay in post

Respondents were asked to give the average tenure of data professionals within their teams. The most frequent average tenure was 2-4 years (34%) and 41% of respondents said their team members' average tenure was over 6 years.

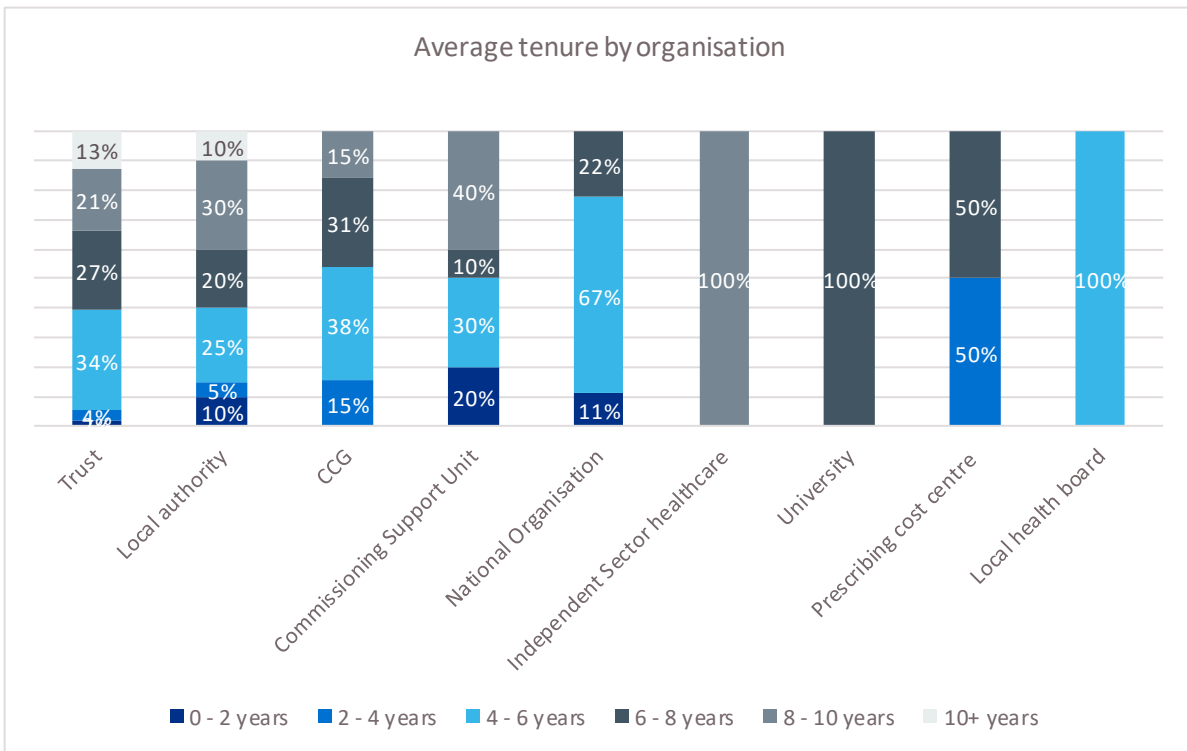
Table 4: Data professionals' average tenure by teams

| Average tenure | Count of data professional team members tenure | Percentage of data professional team members tenure |
|----------------|--|---|
| 0 - 2 years | 6 | 5% |
| 2 - 4 years | 39 | 34% |
| 4 - 6 years | 28 | 25% |
| 6 - 8 years | 26 | 23% |

| | | |
|--------------|---|----|
| 8 - 10 years | 9 | 8% |
| 10+ years | 6 | 5% |

The average tenure of the data professionals has been broken down by organisation type. Those in a national organisation reported that 67% (6/9 responses) of their data professionals stayed 4 - 6 years. In trusts and local authorities 61% (34/56 responses) and 60% (12/20 responses) respectively, found that data professionals were staying six years +.¹²

Figure 5: Average tenure by team in five different types of organisations.



¹² Tenure can only be calculated on how long the organisations have been in existence. NHS England, CCGs and CSUs were set up in 2013 retrospectively, and so there will not be any teams over 10 years old.

Vacancies in data professional roles

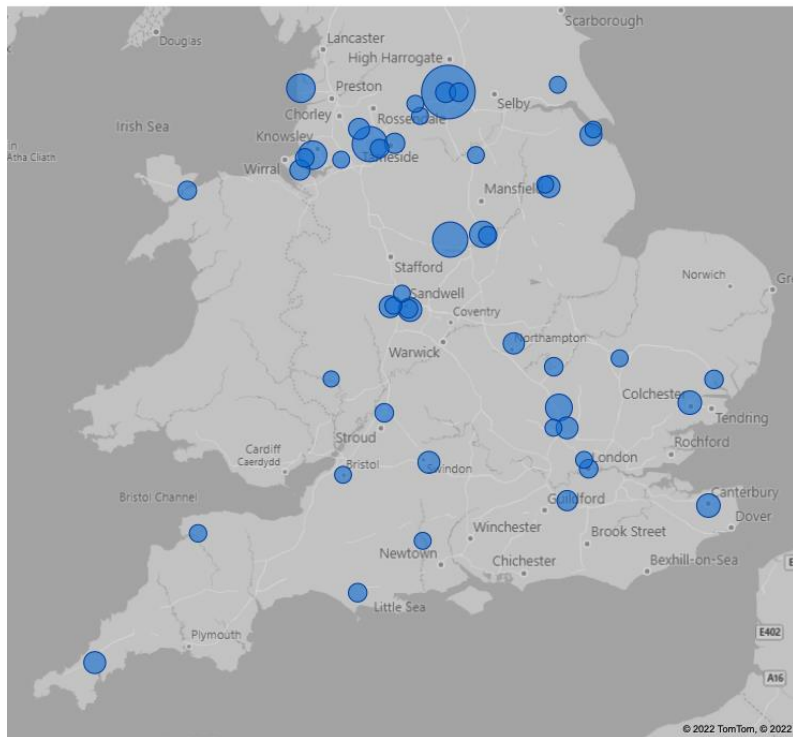
The survey asked about the data professional vacancies within the team. The respondents who said they had vacancies were asked about the location, pay bands, organisational tiers and barriers to recruitment. The following is a summary of the key vacancies findings from the survey.

68/118 respondents said there are data professional vacancies within their team(s). This totalled to 194.79 WTE in the survey, with 11% of all jobs recorded by the survey being vacancies.

Analysis of vacancies from the survey

The map below shows the geographical distribution of vacancies in the health and care sector by postcode. There are a large number of vacancies in Leeds, this is partly due to a national organisation being based in Leeds.

Figure 6: Map showing vacancies by organisation postcode



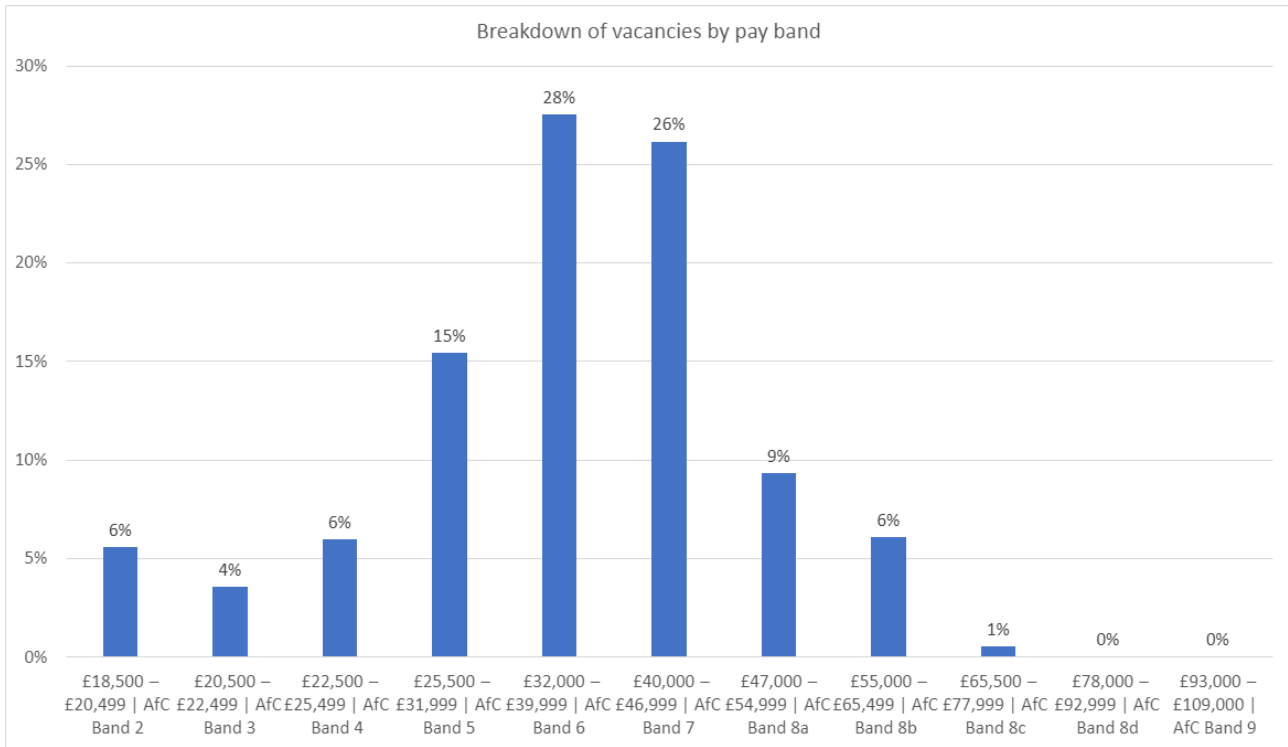
The table below splits the WTE vacancies by their organisations. 57% of the total vacancies from the survey were within trusts. National organisations appeared to have the highest average of vacancies within their teams of 10.7 WTE.

Table 5: WTE vacancies breakdown by organisation type

| Organisation type | Total WTE Vacancies from survey | Average WTE vacancies per organisation from survey |
|----------------------------|--|---|
| Trust | 112.99 | 2.5 |
| National Organisation | 32 | 10.7 |
| Local authority | 22.3 | 1.2 |
| Commissioning Support Unit | 13.2 | 3.3 |
| CCG | 11 | 0.8 |
| Local health board | 2 | 2 |
| Independent Sector Trust | 0.8 | 0.8 |
| Prescribing cost centre | 0.5 | 0.3 |
| Other | 0 | 0 |

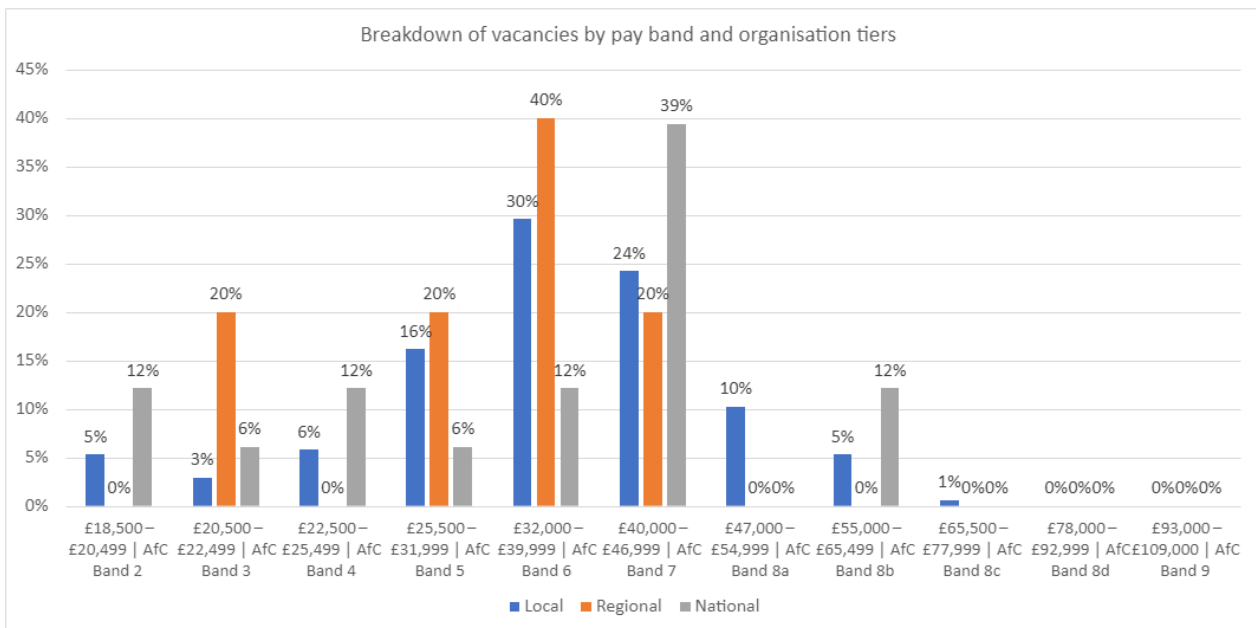
Respondents were asked to break down their vacancies by pay band. The majority of vacancies are in band 6 and 7 roles. Responding to the question, “Please indicate which job roles you have had difficulty in filling”, 20 respondents stated that it was particularly difficult to recruit band 6 and 7 jobs (20/65 responses).

Figure 7: Vacancies in survey by pay band distribution



The vacancies by pay bands were split into organisational tiers, this is shown in the graph below. A high proportion of the national level vacancies are in band 7 and above (52%) compared to local (40%) and regional (20%) organisations.

Figure 8: Vacancies in survey by pay bands and organisation tiers



Barriers to hiring

71 out of the total responses (118) did not respond to the question asking about barriers to hiring. This could be because they had no vacancies (3/71) and therefore no barriers or because while they had vacancies, they did not consider there were barriers to hiring, or simply chose not to answer this question (27/68).

41 respondents indicated that there was a barrier to recruitment. The distribution of barriers are listed below. Respondents were able to select more than one option.

Table 6: Responses to barriers to hiring

| Barrier to recruitment | Count |
|---------------------------|----------------------------|
| Specific technical skills | 34 |
| Pay scales | 26 |
| Banding restrictions | 24 |
| Other | 9 - Further analysis below |

The most common theme that emerged from qualitative analysis of free text responses to barriers to hiring related to the development of internal candidates to higher bands. From the comments, there seems to be high ongoing recruitment of lower banding roles. The roles that are band 7 and above are more difficult to recruit both internally and externally.

There were 3/68 responses from organisations classed as rural, 65/68 were based in urban locations. Rural organisations had an average of 29% of positions being vacant. Urban based organisations had an average of 16%.¹³

There is disparity between the quantitative figures of where vacancies exist and respondents' reasons as to why they believe recruitment for roles is difficult. Some respondents based in rural areas said that it was particularly difficult to recruit as suitable candidates are drawn to urban cities and towns. However, the data shows that there was a large number of vacancies in urban cities and towns for different reasons. This demonstrates that areas, regardless of urban/rural classification, are struggling with recruitment for a variety of reasons.

¹³ See [Appendix M](#) for more information.

66/118 respondents gave specific examples of job roles they have difficulty filling. There was a range of qualitative responses, citing a range of bands from 5-8b.

Qualitative responses to the question “Please indicate which job roles you have had difficulty in filling”:

“Typically, we see a high turnover of our more junior roles.”

“Development and analytical roles above an entry level. I'm finding the trust on the coast with limited other geographically close trusts very difficult to have a good throughput of staff.”

“We have advertised multiple times for a Band 7 principal information analyst role. A maximum of 8 applicants, all of which are based overseas, do not have the required experience or skills and have not tailored their application to the vacancy. A complete waste of time.”

“We have struggled in the past to find people with the required technical skills to join the NHS at the current AfC pay bands, and expect this to be a problem again when we start our planned recruitment drive”

“NHS pays too little for analyst roles, easy to get a project manager role at an 8a and even programme manager role at an 8b.... Try getting your HR department to recognise the pay grade for advanced technical skills ...”

“All of them”

Specific roles that appear difficult to hire included policy roles, data scientists and data analysts with specific skills such as SQL and BI (business intelligence).

[Appendix N](#) shows a thematic analysis of qualitative responses given to the question “Do you currently have vacancies within your team of data professionals?”. There were 6 topics highlighted by the responses. These included development of internal data professionals, geographical and organisational barriers, banding barriers, experience and fixed term contracts, specific roles / skills gap, specific pay bands. Responses focused on a lack of analytical skills being above entry level, confirmed in the difficulty to hire band 6 and 7 roles.

Estimated total of data professionals in the health and care sector

This report looks to create a new estimate for the number of data analysts working across health and care by using Martin Bardsley method (2016:39, Appendix B), the survey results (scaled up) and known workforce data for national organisations.

Bardsley estimated the number of analysts based on organisational types. He asked various people from different organisations to estimate the number of analysts in their organisations. This is based on his definition of analyst (Bardsley, 2016:3).¹⁴

For example, to calculate the number of analysts in NHS providers (Trusts), Bardsley took the average of 20 analysts per NHS provider for the North West¹⁵ and scaled it up by the 257 trusts in England in 2016. This equated to 5140 analysts working in NHS providers. For analysts working in public health (national) Bardsley scaled down the total PHE (Public Health England) payroll as over half were analysts (CFWI source). Indeed, this process involves a lot of guesswork, estimation and scaling up but this inexact process was accepted to give a ballpark approximation. We have mimicked this method utilising data from the survey, internal sources and Bardsley's work.

Bardsley analysed the health sector exclusively. There is mention of local authorities; however, he is referring to public health analysts that support health related tasks and therefore not the care sector. In this survey we include social care, and as a result the scope of this research is broader.

[Appendix A](#) shows the table and workings in more detail. The first column looks at organisations. The organisations were selected based on the organisations represented by the survey. The next column fits the estimated numbers that Bardsley found from his research into our categories. Indeed, there has been significant reorganisation since the Health Foundation's paper was published and the data found by Bardsley has been recategorised into areas that are now part of

¹⁴ Bardsley's data analyst definition is created by himself and follows a narrower scope. The data professional definition we use follows the DDAT framework and has a broader scope. See glossary for more information.

¹⁵ This average was found by the Informatics Skills group who Bardsley cites (2016:40)

the health sector. For example, NHS Improvement has merged into NHS England. The third column demonstrates the estimated total number of data professionals we found from our research. The fourth column is the total percentage of data professionals in the health and care sector that this makes up. The final column discusses methods and assumptions used for each of the organisation areas.

There are limitations with the current method. The survey was sent out to data professional teams and therefore there are certainly data professionals in non-data related teams. This method doesn't take into consideration geographical differences. There are some organisations that were not represented in the survey for example, independent service providers and the voluntary sector. In future years the scope of the survey and distribution list will be expanded to create a more accurate picture. In this instance Martin Bardsley's 2016 figures were used to fill in the gaps.

Accepting assumptions, there are an estimated 13,025 data professionals working in the health and care sector in the UK. This is scaled up from the estimated England figure of 10,887 data professionals working in the health and care sector.

Conclusion

This work is part of a wider research landscape to help identify and equip data professionals throughout the health and care sector.

The key findings from this survey are:

- The latest estimate is that there are around 13,025 data professionals working in the health and care sector in the UK.
- The average size of data professional teams across the health and care sector is 11 employees, a range of 1 to 21 employee(s). Commissioning Support Units and National Organisations had, on average, the largest team size.
- Most people who work in this profession are data analysts, making up 45% of the data and analytics profession.
- Pay band bandings follow a similar distribution pattern across local, regional and national data and analytics teams. Band 7 is the height of this distribution. Though there is a greater proportion of band 8s at national level than local and regional.
- On average data professionals stayed between 2-4 years in a team
- Recruitment is an issue. Over half of data and analytics teams have vacancies and are struggling to recruit, especially to bands 6 and 7 where over half the vacancies are. Most of the band 7 gaps are in the national organisations, though recruitment issues in general cut across both rural and urban settings.
- Vacancies are distributed throughout organisation types and areas of England. The reasons given for vacancies vary with topics surrounding gaps in specific technical skills and banding restrictions.

This survey will be an annual ongoing process. In the future the scope will be expanded to include qualitative analysis asking focus groups questions surrounding their experiences. This is in the ambition to refine knowledge in understanding data professionals within the health and care system.

Please contact [Sarah Blundell](#) to be included in the next year's distribution or future focus groups.

Glossary

National Organisations

The term “national organisations” includes NHS England and NHS Improvement as was prior to April 2023 (including NHSX, now integrated into the NHS England Transformation Directorate), NHS Digital and Department of Health and Social Care.

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Appendix

Appendix A: How many data professionals are there in the health and care sector?

| Organisation type | Estimated totals by Health Foundation paper | Estimated total number of Analysts | Total percentage | Method / Assumptions |
|-------------------------------|---|------------------------------------|------------------|---|
| NHS Trust | 5140 | 4483 | 41% | An average of 20.5 WTE per trust was calculated by the respondents' data (903.82 WTE / 44 organisations). Understanding that there are 218 trusts (found here) this would give an estimated total of 4478. |
| CCG | 1000 (incl. LA) | 786 | 7% | An average of 7.4 WTE per CCG with a total of 106 organisations (data found here). |
| Commissioning Support Unit | 240 | 1098 | 10% | 4 commission support units responded to the survey with an average of 49.9 per organisation. A total of 22 CSUs (found here) |
| Local authority | N/A (see CCG) | 2597 | 24% | An average of 7.8 WTE per local authority. Total number of local authorities (333) found here |
| Independent Sector healthcare | 300 | 435 | 4% | Total number of independent healthcare organisations (66) can be found here |

| | | | | |
|--------------------------|-------------------------------|---------------|----|---|
| NHS Digital | N/A | 296 | 3% | Source: Rupert Chaplin, skilled teams in data services |
| National Org (NHSE&I) | 550 | 642 | 6% | Source: Suki Panesar |
| Other | 550 | 550 | 5% | 2016 Health Foundation figure used including Private sector management, applied researchers, voluntary sector/think tanks |
| Total for England | 8625 | 10,887 | | |
| Total for UK | 10,415 (2016: 64m/53m) | 13,025 | | Scaling up by population (67m/56m) |

Appendix B: Copy of the survey

[Click here](#) to see a copy of the survey.

Appendix C: Central functions monthly stat publication comparison.

Monthly statistical publication of the NHS Workforce was found [here](#). The definition of central functions was found [here](#). “NHS infrastructure support includes central functions (eg personnel, finance, IT, legal services and library services); hotel, property and estates (eg laundry, catering, caretakers and domestic services, gardeners, builders, electricians); administrative managers and senior managers.”

Appendix D: What job roles are considered data professionals?

The survey was intended to be completed by data professional group managers/team leaders. Data professionals are understood as the group of staff whose roles, responsibilities and skills fit into the definitions of [Data Engineer](#), [Performance Analyst](#), [Data Analyst](#), [Data Scientist](#) or a combination of these. These high-level job specifications were included in the survey introduction to give some guidance about the details of the members of data professional teams wanted to be

included in survey responses. Respondents were asked to include within their responses data professionals where the characteristics of their job fit one or more of the four roles. Respondents were asked to omit members of their teams where at least 50% of the role does not fit the data professional profile.

The survey used definitions that related to four job roles (data analyst, data scientist, data engineer and performance analyst). Roles that did not directly relate to the options or included a mixture were placed in “combined”.

Appendix E: How was the state of nation survey sent out?

The AnalystX Observatory State of the Nation survey was published on the [NHS website](#), sent out to distribution lists that contained known data professionals, and promoted via social media channels (LinkedIn and Twitter). Please contact [Sarah Blundell](#) to be included in the next year's distribution.

Appendix F: What is the response rate?

It is not possible to calculate the response rate as it is unknown how many data professionals there are in the health and care sector. The survey was closed on the 8th April 2022.

Appendix G: The 90 unique organisations represented in the survey

| |
|---|
| 1. A West Midlands Council |
| 2. Alder Hey Children's NHS Foundation Trust |
| 3. Greater East Midland Commissioning Support Unit |
| 4. Arden and GEM Commissioning Support Unit |
| 5. Bath and North East Somerset Council |
| 6. Bedford Borough Council |
| 7. Betsi Cadwaladr University Health Board |
| 8. Birmingham & Solihull Mental Health Foundation Trust |
| 9. Black Country Healthcare NHS Foundation Trust |
| 10. Blackpool Teaching Hospitals NHS Foundation Trust |
| 11. Bolton Council |

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| 12. Bradford District & Craven CCG |
| 13. Calderdale CCG |
| 14. Care Plus Group Independent Sector Healthcare Provider |
| 15. Chelsea & Westminster NHS Foundation Trust |
| 16. Coventry City Council |
| 17. Dartford & Gravesham NHS Trust |
| 18. Department of Health and Social Care |
| 19. Dorset County Hospital / Dorset CCG |
| 20. Dudley Council |
| 21. East Kent NHS Trust Hospital |
| 22. East Midlands Academic Health Science Network |
| 23. East Riding of Yorkshire Council |
| 24. East Suffolk and North Essex Foundation Trust |
| 25. Gloucestershire Health and Care NHS Foundation Trust |
| 26. Great Western Hospitals NHS Foundation Trust |
| 27. Guy's and St Thomas' NHS Foundation Trust |
| 28. Halton Borough Council |
| 29. Health Innovation Manchester |
| 30. Herts Valleys CCG |
| 31. Hull City Council |
| 32. Imperial College Healthcare NHS Trust |
| 33. Ironopolis Medical Group |
| 34. Leeds & York Partnership NHS Foundation Trust |
| 35. Leicester City Council |
| 36. Leicestershire Partnership NHS Trust |
| 37. Lincolnshire Community Health Services NHS Trust |
| 38. Lincolnshire Partnership Foundation Trust |
| 39. LLR CCG |
| 40. London Borough of Barnet Council |
| 41. Luton Council |
| 42. Maidstone and Tunbridge Wells NHS Trust |

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| 43. NHS BNSSG CCG |
| 44. NHS Cheshire CCG |
| 45. NHS Digital |
| 46. NHS England and NHS Improvement |
| 47. NHS Knowsley CCG |
| 48. NHS Lincolnshire CCG |
| 49. NHS Liverpool CCG |
| 50. NHS South Sefton CCG and NHS Southport & Formby CCG |
| 51. NHS SOUTHPORT AND FORMBY CCG |
| 52. Northern Care Alliance NHS Foundation Trust |
| 53. Northern Devon Healthcare Trust |
| 54. Northern Lincolnshire and Goole NHS Foundation Trust |
| 55. Nottingham University Hospitals NHS Trust |
| 56. Nottingham university hospitals Trust |
| 57. Nottinghamshire County Council |
| 58. Nottinghamshire Healthcare NHS Trust |
| 59. Oxford University Hospitals NHS Foundation Trust |
| 60. OXLEAS NHS Mental Health Foundation Trust |
| 61. Public Health Suffolk, Suffolk County Council |
| 62. Rotherham CCG |
| 63. Royal Cornwall Hospital Trust |
| 64. Royal Free London NHS Trust |
| 65. Salford City Council |
| 66. Salisbury NHS Foundation Trust |
| 67. Sandwell & West Birmingham Hospitals NHS Trust |
| 68. South, Central and West Commissioning Support Unit |
| 69. South Tyneside Council |
| 70. St George's Hospital NHS Trust |
| 71. Strategy Unit, NHS Midlands and Lancashire Commissioning Support Unit |
| 72. Surrey & Borders Mental Health NHS Foundation Trust |

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| 73. Tameside & Glossop Integrated Care |
| 74. Taurus Healthcare |
| 75. The Christie NHS Foundation Trust |
| 76. The Clatterbridge Cancer Centre NHS Trust |
| 77. The Dudley Group NHS Foundation Trust |
| 78. The Endeavour practice |
| 79. The Health Informatics Service |
| 80. The Rotherham NHS Foundation Trust |
| 81. The Royal Wolverhampton NHS Trust |
| 82. The Walton Centre NHS Foundation Trust |
| 83. United Lincolnshire Hospitals NHS Trust |
| 84. University Hospitals of Derby and Burton NHS Foundation Trust |
| 85. University of Bradford |
| 86. WALSALL Council |
| 87. Walsall Healthcare NHS Trust |
| 88. Warrington and Halton Teaching Hospitals NHS Foundation Trust |
| 89. West Yorkshire ICS |
| 90. Yeovil District Hospital NHS Foundation Trust |

Appendix H: Health and care split of organisations

Organisations from the survey that are considered to be in the health sector include:

- Trusts
- CCGs
- National Organisations (NHSE&I and DHSC)
- Commissioning Support Units
- Sustainability and Transformation Partnerships
- Prescribing cost centres
- Local Health Board (Wales)

Organisations from the survey that are considered to be in the care sector include:

- Local authorities

Other organisations include:

- Universities

Appendix I: Organisation tiers split

Organisations were classed into different tiers. These categories are listed below.

- Local organisations include: Trusts, local authorities, CCGs, prescribing cost centres, independent sector healthcare, local health board and the university.
- Regional organisations include: Commissioning support units
- National Organisations include: NHSE&I, NHSD and DHSC

Appendix J: ODS methodology

Respondents were asked to provide their organisation's ODS code. Respondents who did not know their organisation's ODS code were found using their organisation name. This code was utilised to understand geographical split of responses, teams and vacancies. ODS codes can be found [here](#).

Appendix K: Pay band categories methodology

The pay categories used are encompassing all organisations in the health and care sector. The breakdown of pay bands is shown below.

| Pay Range (£) | AfC Bands |
|-----------------|-----------|
| 18,500 – 20,499 | 2 |
| 20,500 – 22,499 | 3 |
| 22,500 – 25,499 | 4 |
| 25,500 – 31,999 | 5 |
| 32,000 – 39,999 | 6 |
| 40,000 – 46,999 | 7 |
| 47,000 – 54,999 | 8a |

| | |
|-------------------------|-----------|
| 55,000 – 65,499 | 8b |
| 65,500 – 77,999 | 8c |
| 78,000 – 92,999 | 8d |
| 93,000 – 109,000 | 9 |

Appendix L: WTE methodology

Respondents were asked to give the total WTE data professionals within their team. They were then asked to split this number into pay bands and job roles. When adding up pay band and job role breakdown WTEs this did not equal the total WTE each respondent had given. Therefore, the three totals were utilised in analysis.

| Data professional's numbers | WTE |
|---|------------|
| Total WTE employed within your team | 1577.52 |
| Total WTE employed by pay bands breakdown | 1631.22 |
| Total WTE employed by job role breakdown | 1754.23 |

For vacancies analysis, the total of 194.79 WTE was used as the denominator when calculating percentages for analysis.

Appendix M: Rural / urban classification

The rural urban classification is based on the gov.uk definitions. The Ministry of Housing, communities & Local Government's [English indices of deprivation 2019](#) tool was used. The postcodes of each organisation were uploaded and the tool classified the postcodes into rural urban categories. The categories are:

- Mainly Rural (80% or more of the population resides in rural areas)
- Largely Rural (Between 50% and 79% of the population resides in rural areas)
- Urban with Significant Rural (Between 26% and 49% of the population resides in rural areas)
- Urban with Minor Conurbation
- Urban with Major Conurbation

- Urban City and Town

The Welsh organisation (Betsi Cadwaladr University Health Board) has been removed from this analysis as the parameters were limited to England and so did not include Wales.

Appendix N: Thematic analysis of qualitative answers to question 10.3

“If you responded yes, please indicate which job roles you have had difficulty filling”.

| Theme | Evidence |
|---|--|
| Development of internal data professionals | <ul style="list-style-type: none"> • Development of analytical roles above entry level • A lack of analytical skills • Multiple skill sets in data • High turnover of junior roles |
| Geographical and organisation barriers | <ul style="list-style-type: none"> • Location: geographically limiting to have a good throughput of staff, more attraction to London and Bristol |
| Banding barriers | <ul style="list-style-type: none"> • Local authority difference in pay grading therefore, harder to fill analyst roles • Heading towards interim positions on higher pay scales. |
| Experience / fixed term | <ul style="list-style-type: none"> • Not getting the experienced applicants • Lack of fixed term applicants and roles |
| Specific roles (skills) being hard to recruit for | <ul style="list-style-type: none"> • Public Health Intelligence for any band 2 • Policy-facing analysts • Data scientists - 2 • Data warehouse roles • Data analyst roles with SQL knowledge / experienced • Data relationship manager |

| | |
|----------------------------|---|
| | <ul style="list-style-type: none">● Health econometrics |
| Specific pay bands (bands) | <ul style="list-style-type: none">● Band 5 - 7 responses (mainly focusing on lack of career pathway)● Band 6 - 10 responses● Band 7 - 10 responses● Band 8 (a) - 6 responses |