ROYAL STATISTICAL SOCIETY
DATA | EVIDENCE | DECISIONS

Report Summary: Fit for Purpose?

An Exploration of Non-degree Pathways into Data Analysis Careers

GATSBY

CONTENTS

BACKGROUND AND CONTEXT

WHY THIS REPORT

- Access to data analysis and statistics skills at all levels is central to the productivity, growth, and success of most organisations. However, difficulty accessing these skills has been identified as a significant constraint for many employers
- Much of the 'skills gap' public narrative focusses on advanced data science skills such as those needed for AI or machine learning. However, with the generation and collection of data more ubiquitous than ever before, the skills needed to ethically and effectively manage and use data is increasingly important for people working in 'non-data' roles
- Non-degree pathways like apprenticeships are a key pathway for training these skills, not only for school leavers, but also for people already in the workforce and changing careers, or people looking to upskill for their existing role.

RELEVANCE TO THE OBJECTIVES OF THE RSS

- Improving statistical literacy is one of the key strategic goals of the RSS
- To achieve this, pathways for learning new data analysis and statistics skills need to be suitable for people from a range of backgrounds and with different levels of expertise

WHO WE WORKED WITH

- This project was funded by the Gatsby Foundation
- The project benefited from the insights of a steering group: Eugenie Hunsicker, Ernest Edifor, Victoria Brunsdon, Sayma Chowdhury, Mike Deevy, Ben Jordan, Alison Adams, and Daniel Sandford-Smith

RESEARCH APPROACH

RESEARCH OBJECTIVES

Apprenticeships are well-researched in the UK. Their role in training entry-level data analysis skills less so, as such our objectives were:

- Explore the skills and accreditation needs of junior data analysts
- Assess the suitability of the current Level 3 Data Technician apprenticeship to the needs of employers and recommend improvements
- Explore what influences on decisions to pursue a data apprenticeship or other alternative routes into a data career

POPULATION OF INTEREST

To consider the experiences of junior analysts and their employers within the context of broader public perspectives, we had 3 groups of interest:

- The general public
- Junior data analysts
- Employers and managers

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STAGE 1: SCOPING REVIEW

- A scoping review of existing literature using systematic key term search
- Emphasised post-2018 publications to account for recent changes and COVID's impact on the broader education context

STAGE 2: NATIONAL PUBLIC SURVEY

- 2,155 responses from people aged 16+
- 7 multichoice questions looking at different themes (training completed, opinions on apprenticeships, views on statistics and data analysis, confidence performing key tasks, importance of key tasks, barriers to learning, incentives to learn)

STAGE 3: INTERVIEWS AND DETAILED QUESTIONNAIRES

- 17 semi-structured interviews (9 employers; 8 analysts)
- 53 detailed questionnaire responses (22 employers; 20 analysts; 11 others)

THE CURRENT SYSTEM

THE APPRENTICESHIP SYSTEM

Apprenticeships involve a triangular relationship between:

- Employers, who provide the position, pay wages, and pay up to 5% of the providers fees (the remainder is government funded)
- Providers who provide the classroom learning, and can support the employer with recruitment
- Apprentices who work most of the week and complete training and assessments for the remainder

Apprentices wages, including when in off-the-job training, are paid by the employer. Minimum wages vary depending on an apprentices age and time in their apprenticeship

Apprentice hourly wages
(as at August 2023)

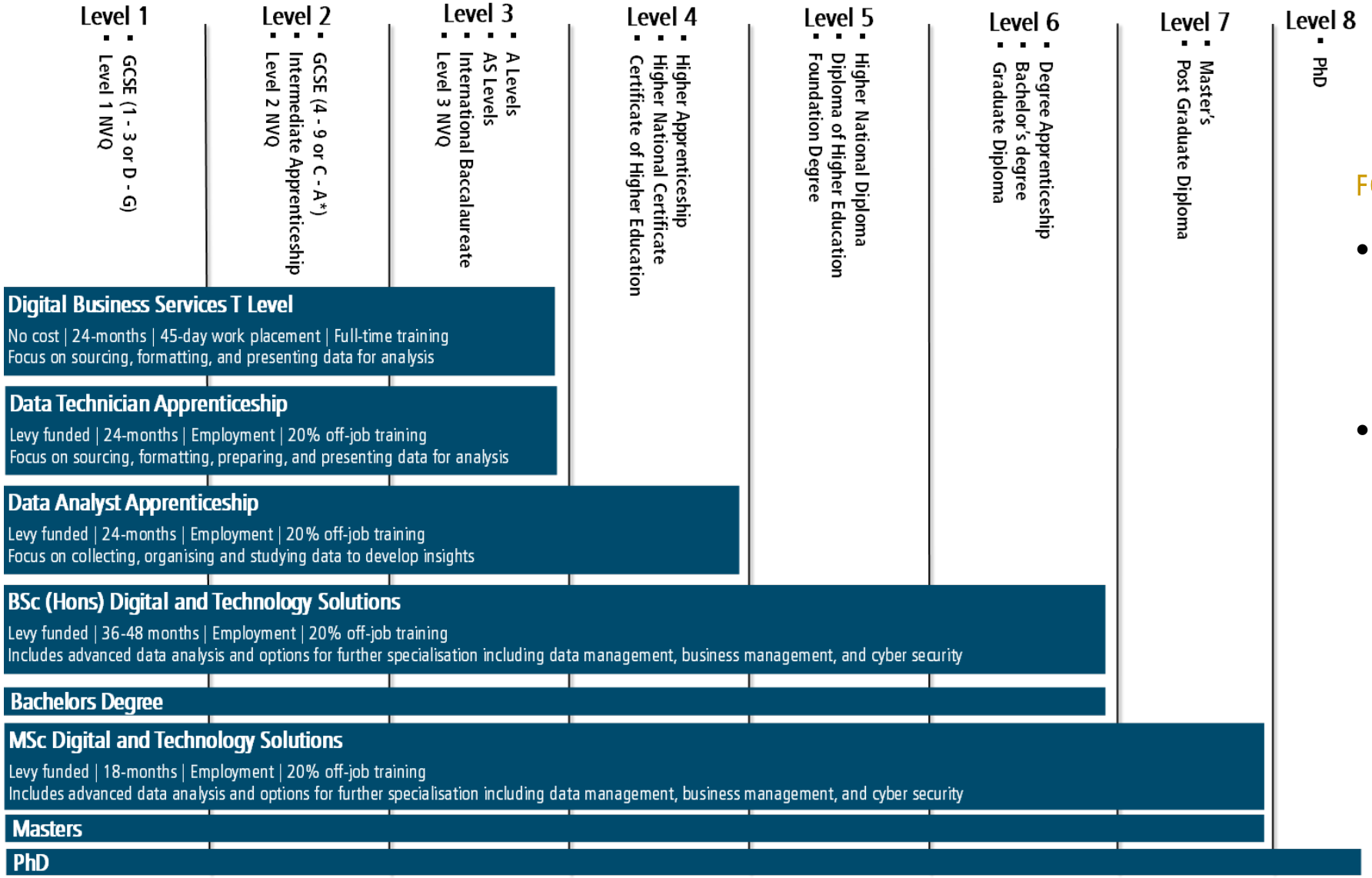
	16-18	19-20	21-22	23+
1st year	£5.28	£5.28	£5.28	£5.28
2nd year +	£5.28	£7.49	£10.18	£10.42

STATISTICS AND DATA ANALYSIS TRAINING OPTIONS

There are a wide range of reasons why someone may wish to undertake training in data analysis, including up skilling for their current job, changing careers, or as a prerequisite for higher education. The pathways below are the main structured courses. More detail is on the diagram over page.

- **Digital Business Services T-Level:** An 18-month, classroom-based course with a 45-day placement with an employer
- **Data Technician apprenticeship:** A two-year employment-based programme with six hours of weekly training
- **Data Analyst apprenticeship:** A two-year employment-based programme with six hours of weekly training. More advanced than a Data Technician Apprenticeship
- **Digital & Technology Solutions Professional (Integrated BSc):** A 3-4 year employment-based bachelors degree with six hours of weekly training. Allows learners to specialise
- **Digital & Technology Solutions Specialist (Integrated MSc):** An 18-month employment-based masters degree with six hours of weekly training. Allows learners to specialise

FORMAL TRAINING OPTIONS FOR LEARNING STATISTICS AND DATA ANALYSIS



FORMAL TRAINING OPTIONS

- There are a range of formal training options for statistics and data analysis across the UK Qualifications Framework (UKQF)
- It's not always clear how the different options compare and contrast, or when one is more appropriate than another

WHO ARE DOING DATA APPRENTICESHIPS

Looking at new starts (which are the number of *apprenticeships* started, not necessarily *people*):

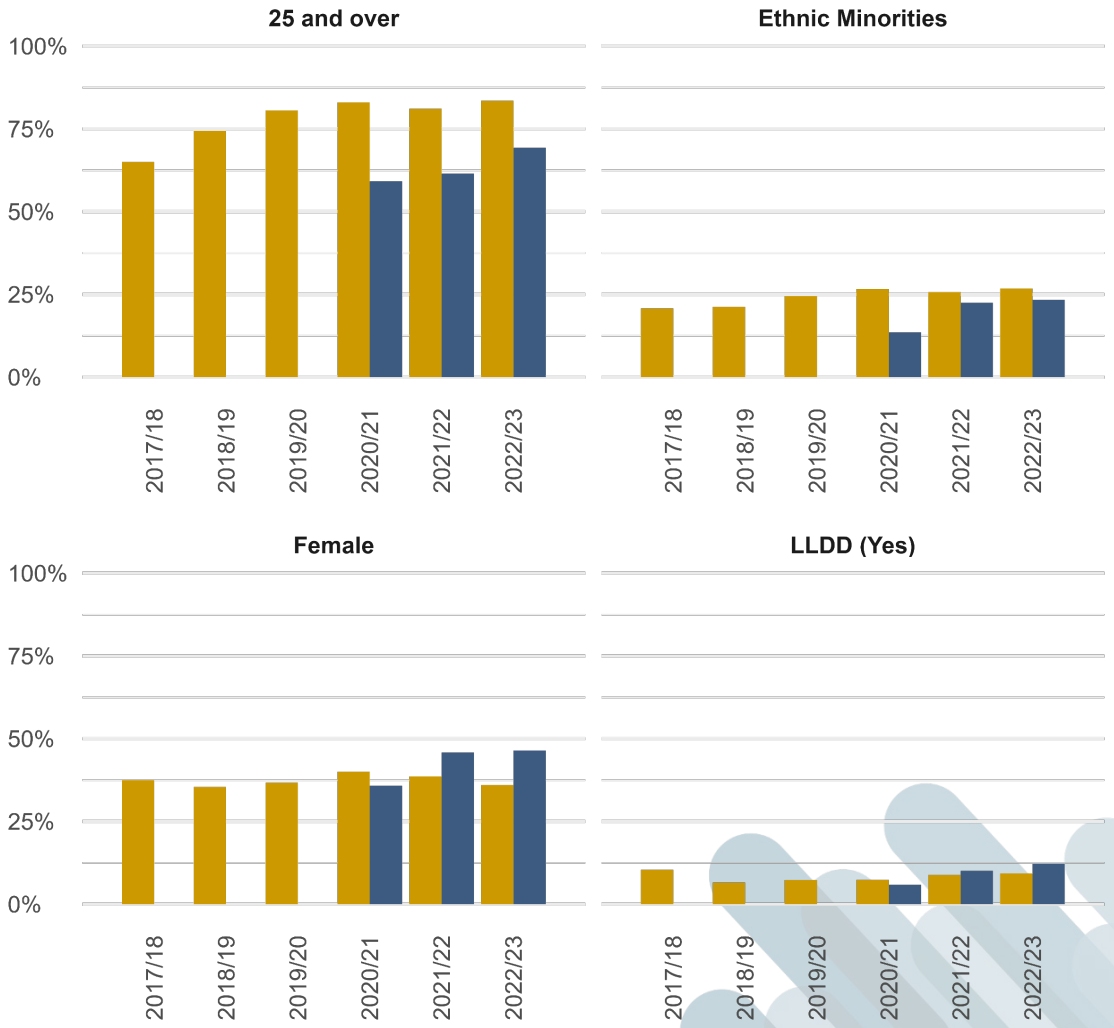
- Both the Level 3 Data Technician and Level 4 Data Analyst apprenticeships are seeing year on year increases
- In absolute terms these increases are modest (about 4,000 Level 4 Data Analyst starts in 2021/22 academic year compared to 288,800 starts across all apprenticeships for the same period

Of those 4,000 we see:

- Greater ethnic diversity than apprenticeships overall
- Most are older (24+)
- Similar numbers of people with learning difficulties or disabilities (LLDD) as apprenticeships overall
- Fewer than 50% are female

LEVEL 3 DATA TECH AND LEVEL 4 DATA ANALYST STARTS

Department for Education data on the diversity of new starts in **Level 3 Data Technician** and **Level 4 Data Analyst** starts. 2022/23 was a partial year.



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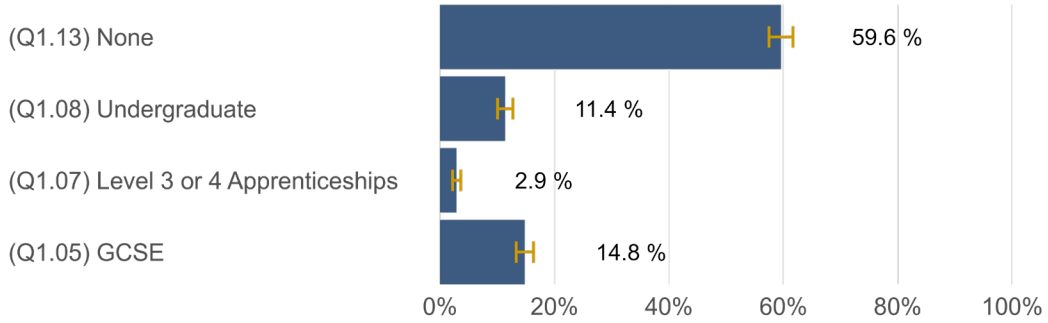
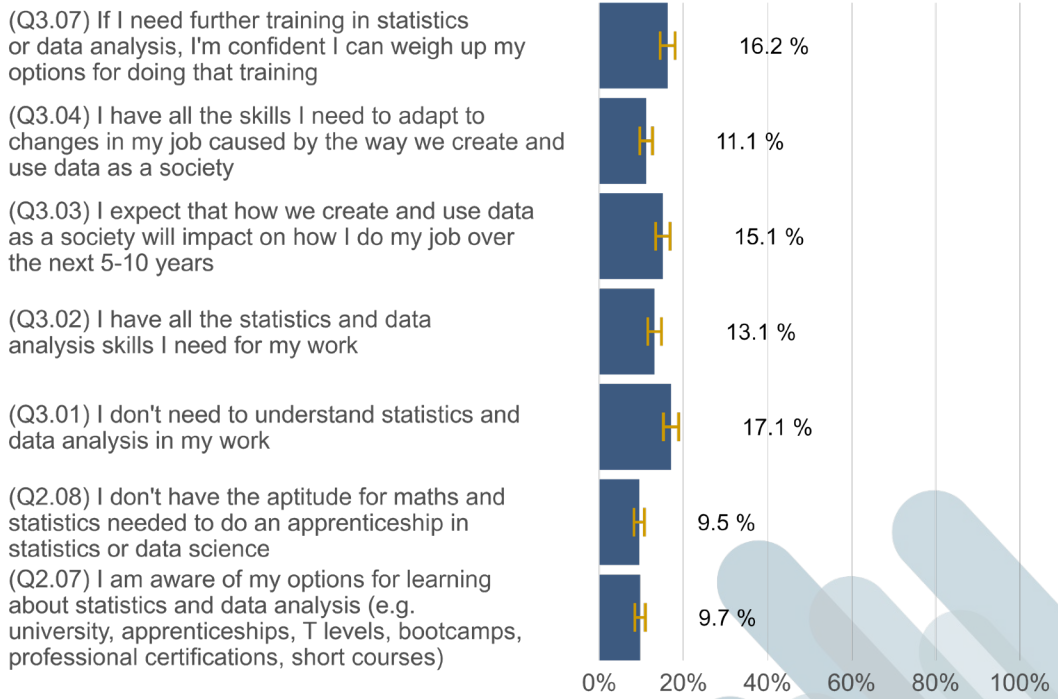
WHAT WE LEARNED FROM THE PUBLIC

- Nearly 60% of respondents had not received any level of training in statistics and data analysis
- 13% of respondents thought they had all the statistical analysis skills they needed for their work
- Only 10% of respondents indicated they were aware of their options for learning data analysis
- 34% of respondents weren't confident carrying out any basic statistics and data analysis tasks
- Only 16% of respondents were confident reviewing their own skill needs
- The factors that respondents most commonly indicated would be important in encouraging them to undertake further training were: encouragement from their employer at 23%, training options that were flexible at 21% or online at 20%, and skills being applicable to their current job 19%

WHAT TRAINING, IF ANY, HAVE YOU COMPLETED IN STATISTICS AND DATA ANALYSIS



WHICH, IF ANY, OF THE FOLLOWING STATEMENTS DO YOU AGREE WITH



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WHAT WE LEARNED FROM ANALYSTS

- Participants generally felt supported by their employers and positive about their decision to do an apprenticeship
- Apprentices indicated that the skills being taught generally match with the reality of their job
- Apprentices particularly valued the workplace context and soft skills they gained as part of an apprenticeship – e.g. dealing with imperfect data, giving presentations, talking to stakeholders
- The apprentice experience with providers was mixed, with some very happy with their tutors but frustrated by provider communication, and others dissatisfied across the board. Very few apprentices were positive about the communication and organisation of their provider overall
- School leavers tended to be attracted to apprenticeships by the practical learning approach or dissatisfaction with university
- People shifting careers were commonly encouraged by their employer to do an apprenticeship or considered it impractical to leave paid employment to return to study

"At the start, I wouldn't have valued multi-functional teams, but now it's really important. And being a data person, knowing how to talk to someone that isn't a data person is so useful."

"One of the challenges was the lack of responsiveness, if I had an upcoming project where a particular skill would be useful, the curriculum wasn't able to adjust so that I could learn things that would be useful of that project."

"I'd rather go and find out something interesting with [data analysis tools] than trying to prove the fact that this thing that you've told me works, actually works."

"After an apprenticeship, I'm a much better candidate than I would be after three years of Uni."

WHAT WE LEARNED FROM EMPLOYERS

- Apprenticeship experiences varied, with most employers positive about the apprentices themselves, but less so about the apprenticeship providers and their communication
- The skills framework that apprenticeships are based on was broadly right, but delivery within that framework was inconsistent across providers
- Eagerness to leap to more advanced tools often overshadowed the development of more fundamental skills for apprentices
- Junior roles were highly valued as they free up senior analysts for other activities
- Apprenticeships take up time and support, so selecting a good apprenticeship provider is important, but there is insufficient information to compare training providers and make an informed decision
- Employers often found they had limited access to information about course content in advance, and it was difficult to adjust the training schedule to align with work projects

"Data science has kind-of stolen the thunder a little bit. It feels like that's what everybody wants to be doing; It's what a lot of organizations are saying that they're doing. But a lot of them are actually doing very basic statistics, but kind of dressing it up as data science because it sounds cool, because that's what people want to be doing."

"As a manager I don't have a lot of visibility of what my person is supposed to be doing, and I don't always have confidence that even they [the apprentice] know what they are supposed to be doing. Which makes it difficult to know where I stand. So overall, a poor relationship with the provider."

"Data analysis has a marketing problem, in that people seem to think you need to have maths skills, at degree level and people think they're terrible at maths because they struggle with calculus or algebra.

You don't need to fully understand how every equation works and how to prove it. You need to understand what the tests are, and how, and when to apply them, which is different."

"We've had data technician roles in the past and they have been so useful in handling the basics, and then freeing up more senior analysts for detailed, specific tasks or relationship management."

"Overall, I'd say still probably a net benefit, but would definitely be more beneficial if we'd had more of an efficient product."

RECOMMENDATIONS

BROADER RECOMMENDATIONS

- Improve communication and transparency around the specific skills, platforms and techniques that will be taught in an apprenticeship (DfE and Providers)
- Identify areas of flexibility so that training can be aligned with actual projects in an apprentice's work (Providers)
- Improve the current online rating system for apprenticeship providers to support more informed comparisons of provider quality (DfE)
- Improve the public guidance for apprenticeship standards so that different data analysis apprenticeships can more easily be compared to each other (iFATE)
- Investigate including learning outcomes on the safe and effective use of AI included in future versions of apprenticeships (iFATE)

AREAS OF FURTHER WORK FOR THE RSS

Subject to funding, there are opportunities for the RSS do further work to support lifting skills by:

- Developing resources to support people in different career stages and at different levels of capability in navigating what to learn, and when
- Developing resources to support employers to understand the types of training pathways that may be useful for them, depending on what they are trying to achieve
- Reviewing the RSS Quality Mark accreditation scheme with the aim of lifting participation in the scheme from apprenticeship providers

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