

Our Time to Shine: Empowering the Data,  
Information and Knowledge Workforce as a  
Driving Force for Digital Health and Care

**Appendix 4:**

Baseline workforce survey

August 2019





*a collaboration between*

**INNOVATION  
SCHOOL  
THE GLASGOW  
SCHOOL OF ART**



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**Main report:** [Our Time to Shine : Empowering the Data, Information and Knowledge Workforce as a Driving Force for Digital Health and Care](#)

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# Appendix 4: Baseline workforce survey

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## 1 Introduction

This baseline survey of the specialist data, information and knowledge (SDIK) workforce in health and care in Scotland was designed to:

- Provide an initial indicative description of that workforce as a baseline foundation for the next stages.
- Seek confirmation (or otherwise) of the initial statement of scope of the Specialist Data, Information and Knowledge workforce in health and care (see appendix A)
- Explore the future needs of SDIK staff in relation to:
  - Skills development
  - New ways of working

Strategic stakeholder engagement and a scoping literature review undertaken to inform the development of the initial statement of scope of the SDIK workforce showed that this workforce is currently ill-defined, and relatively ‘invisible’ in terms of workforce planning and development. As such, it was anticipated that survey would be very much a baseline exploration.

As such, the dissemination of the survey was through extensive use of known networks and communication channels. The survey was live from 7<sup>th</sup> December 2018 to 8<sup>th</sup> February 2019. See Appendix B for survey questionnaire.

## 2 Response

There were 617 respondents to the survey. However, most questions were poorly answered, with an average response rate of 66.5% across all questions following question 1 (job role), see table 1. This may indicate that respondents found some of the questions difficult to understand and to answer. See appendix for survey questionnaire.

*Table 1: Response to questions*

QUESTIONS		Response			
		#	%		
Job role	Data/information analysis/management	435	70.5%		
	Knowledge management, research & development, libraries	99	16.0%		
	Records	23	3.7%		
	Other	60	9.7%		
	<b>TOTAL RESPONSE TO SURVEY</b>	<b>617</b>	<b>100.0%</b>		
Main purpose of SDIK role		494	80.1%		
Main users of SDIK services		496	80.4%		
		Response		Average Response	
		#	%		
Job activities/skills	Do you identify user needs?	492	79.7%	Job activities/skills	78.1%
	Do you organise, manage, quality assure and/or validate DIK?	483	78.3%		

	Do you source, collect and/or select DIK?	481	78.0%		
	Do you analyse and/or interpret DIK incl synthesising knowledge e.g. through systematic reviews?	481	78.0%		
	Do you transfer, share, present and/or communicate DIK?	473	76.7%		
Time spent in SDIK				401	65.0%
Impacts & influences	Impacts	397	64.3%	Impacts & Influences	63.9%
	Influences	389	63.0%		
	What would help SDIK responding to needs	396	64.2%		
Learning & development	What would you welcome?	395	64.0%	Learning & development	44.1%
	Preferred approaches	395	64.0%		
	Main barriers to learning & development	395	64.0%		
	Current learning	69	11.2%		
	Involvement in professional networks	105	17.0%		
Demographics	Work context	396	64.2%	Demographics	54.4%
	Main employer organisation	389	63.0%		
	Lone/team working	397	64.3%		
	Name of service/department/directorate	285	46.2%		
	Job title of line manager	275	44.6%		
	Salary range	313	50.7%		
	Time in current job	347	56.2%		
	Age	327	53.0%		
	Job title	290	47.0%		



## 2.1 Nature of respondents

### 2.1.1 Work context

396 (64.2%) respondents provided their 'work context'. The majority (81.1%) worked in an NHS Board (national or territorial), with only 9.8% respondents working in a Local Authority – very slightly more than the 7.1% respondents who worked in higher education. There was a greater response from people working in primary care (16.2%) than in secondary care (10.4%). See tables 2 and 3

*Table 2: Work context*

<b>Work context</b>	<b>#</b>	<b>%</b>
Health and Social Care Partnership	80	20.2%
Local Authority social work/social care	27	6.8%
Local Authority (not social work/social care)	12	3.0%
Territorial NHS Board	76	19.2%
National NHS Board	245	61.9%
Government	24	6.1%
Public Health	67	16.9%
Primary Care	64	16.2%
Secondary care	41	10.4%
Third/voluntary sector	11	2.8%
Private sector	4	1.0%
University/Higher Education	28	7.1%
Other (please specify)	9	2.3%

Total number of responses is greater than the number respondents to the question because respondents were invited to 'tick all that apply'

*Table 3: 'Other' work context*

<b>Other work context</b>	<b>#</b>
Non-departmental Public Body	2
Corporate Services - Practice Development	1
eHealth within health and social care partnerships.	1
government funded organisation	1
Intermediary social services organisation	1
Professional body	1
Social care and services	1
Partnerships - Locality Improvement Plans / Wellbeing PSP for Mental Health Digital Group	1

## 2.1.2 Main employer organisation

63.0% (389) respondents provided their main employer organisation. More than half (51.4%) respondents were employed by NHS National Services Scotland. See tables 4 and 5.

*Table 4: Main employer organisation*

<b>Main employer organisation</b>	<b>#</b>	<b>%</b>
NHS Ayrshire and Arran	4	1.0%
NHS Borders	2	0.5%
NHS Dumfries and Galloway	6	1.5%
NHS Fife	7	1.8%
NHS Forth Valley	1	0.3%
NHS Grampian	4	1.0%
NHS Greater Glasgow and Clyde	33	8.5%
NHS Highland	8	2.1%
NHS Lanarkshire	14	3.6%
NHS Lothian	12	3.1%
NHS Orkney	0	0.0%
NHS Shetland	2	0.5%
NHS Tayside	0	0.0%
NHS Western Isles	5	1.3%
NHS Education for Scotland	8	2.1%
NHS Health Scotland	10	2.6%
Golden Jubilee Foundation	3	0.8%
NHS24	4	1.0%
Scottish Ambulance Service	0	0.0%
The State Hospitals Board for Scotland	5	1.3%
NHS National Services Scotland	200	51.4%
Healthcare Improvement Scotland	19	4.9%
Aberdeen City Council	0	0.0%
Aberdeenshire Council	0	0.0%
Angus Council	0	0.0%
Argyll and Bute Council	1	0.3%
Clackmannanshire Council	0	0.0%
Dumfries and Galloway Council	2	0.5%
Dundee City Council	3	0.8%
East Ayrshire Council	2	0.5%
East Dunbartonshire Council	1	0.3%
East Lothian Council	1	0.3%
East Renfrewshire Council	2	0.5%
Edinburgh City Council	2	0.5%
Falkirk Council	0	0.0%
Fife Council	2	0.5%
Glasgow City Council	0	0.0%
Highland Council	0	0.0%

Inverclyde Council	1	0.3%
Midlothian Council	0	0.0%
Moray Council	0	0.0%
North Ayrshire Council	0	0.0%
North Lanarkshire Council	0	0.0%
Orkney Islands Council	0	0.0%
Perth and Kinross Council	0	0.0%
Renfrewshire Council	1	0.3%
Scottish Borders Council	0	0.0%
Shetland Islands Council	0	0.0%
South Ayrshire Council	1	0.3%
South Lanarkshire Council	0	0.0%
Stirling Council	0	0.0%
West Dunbartonshire Council	0	0.0%
Western Isles Council (Comhairle nan Eilean Siar)	0	0.0%
West Lothian Council	1	0.3%
University/Higher Education	15	3.9%
Third/voluntary sector	2	0.5%
Private sector	1	0.3%
Other (please specify)	10	2.6%

Total number of responses is greater than the number respondents to the question because respondents were invited to 'tick all that apply'

*Table 5: 'Other' employer organisation*

<b>Other</b>	<b>#</b>
GP practice	2
IRISS	2
Care inspectorate	1
CELCIS	1
Chartered Society of Physiotherapy	1
NHS England	1
Non-departmental public body	1
Scottish Government	1

### 2.1.3 Team/lone working

The majority (95.5%) of respondents worked as part of a team, with only 4.5% working alone, see table 6

Table 6: Team/lone working

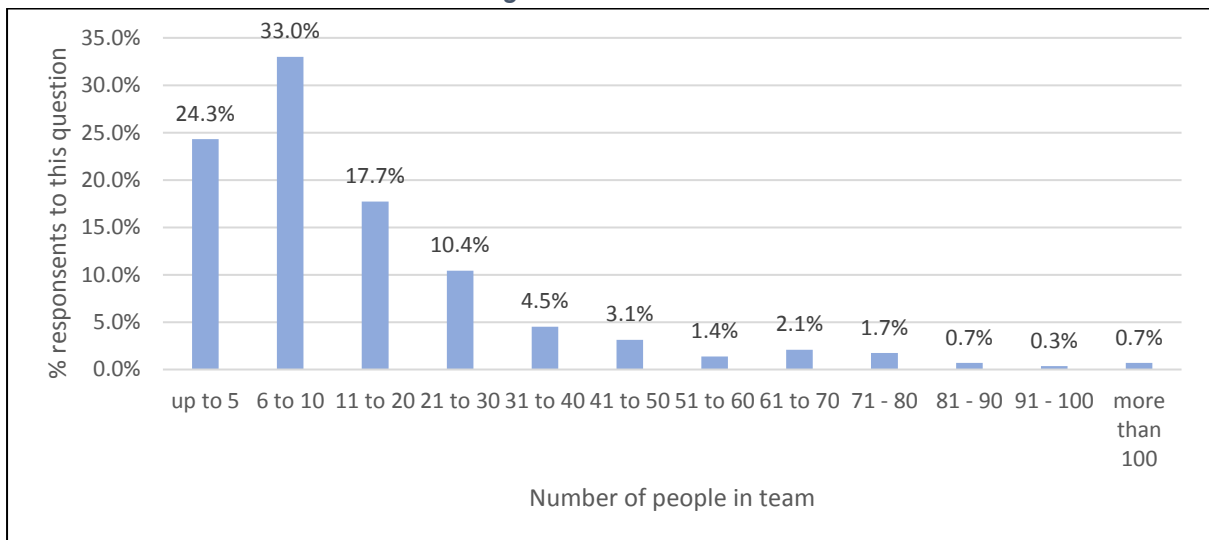
	#	%
Work alone	18	4.5%
Work as part of a team	379	95.5%
Total respondents to this question	397	= 64.3% all respondents

### 2.1.4 Team size

Most respondents who worked in teams, worked in teams of up to ten people (57.3%), see figure 1 and table 7. It must be noted that this analysis is very indicative as some respondents provided WTEs, and some provided national rather than local team size. Two comments are illustrative:

- 15 (but I am the only researcher)
- About 60 overall but being locally placed there is only myself and one other

Figure 1: Team size



Where both national and local team sizes were provided, analysis has included local team size only

Table 7: Team size

Team size	#	%
up to 5	70	24.3%
6 to 10	95	33.0%
11 to 20	51	17.7%
21 to 30	30	10.4%
31 to 40	13	4.5%
41 to 50	9	3.1%
51 to 60	4	1.4%



BBV/STI	1
Business Intelligence	6
CAIR team	1
Cancer Data Services	1
Cancer Statistics	1
CELCIS Edges of Care and Neglect Team	1
CHI linkage	1
Clinical Coding	1
Communications and Events team	1
Community Health & Indexing Team	1
Community Justice Scotland Learning, Development & Innovation Team	1
Consultancy Services	4
Consultancy, Knowledge and Research Services	1
Corporate Services, Business Intelligence	1
Data & Measurement Team	1
Data management and strategic development	1
Data Management Secondary Care	1
Data Quality	3
Data Science Team	1
Data, Measurement and Business Intelligence	5
Dental and Ophthalmic	1
Development and Innovation Hub	1
Digital Health and Social Care (Information Assurance)	1
Eden Villa	1
Edinburgh Young People's Service (YPS)	1
Education	1
eHealth	3
Evaluation Support Scotland	1
Evidence for Action	1
Evidence Search and Summary Service	2
Excellence in Care	1
Gastro-intestinal Zoonosis and travel team	1
Genetics Genealogy	1
HAI Data Managers Group	1
Health & Community Care	1
Health Records	2
HPS HAI and IC team	1
I manage 4 teams: Consultancy Services, Scottish Clinical Trials Research Unit, Health Management Library, Scottish Healthcare Audits	1
Immunization and Respiratory Team	1
Infection Control Team	1
Information Department	2
Information Management	2
Information Services	6
Intelligence team	1

ISD	1
ISD Cancer, Heart Disease and Stroke Statistics	2
ISD Electronic Data Research and Innovation Service (eDRIS)	6
ISD Health & Social Care	4
ISD LIST	26
Knowledge Management and Discovery Business Unit	2
Knowledge Management Team	5
Knowledge Services	7
Learning and Development	1
Learning and Research Services	1
Libraries Team (Public Health & Intelligence)	1
Library	2
Library and Knowledge Service	3
Library and Theatre (two separate teams)	1
Library Network	1
Library Services	2
Living Well in Communities	1
Lothian Analytical Services	2
Management Information - SW	1
Mental Health	2
Mental Health Access Improvement Support Team (MHAIST)	2
Mental Health Information Station	1
Mental Health Workforce	3
National Planning Team	1
NES Digital, Knowledge Management & Discovery Unit	1
NES Knowledge Services Group	1
NHS Borders Knowledge Services - Library	1
NHS Fife	1
NHS Health Scotland Evaluation Team	1
NHS National Services Scotland	1
NHSGGC Library Network	2
NRS: Census Admin Data Team	1
Nursing and Midwifery Workload and Workforce Planning	1
Organisational Development	1
Participation Network	1
Performance & Information	1
Performance and Business Intelligence	1
Performance and Intelligence	2
Permanence and Care Excellence Team - Centre for Excellence for Looked after Children in Scotland	2
PHI	2
PHI - CKRS	2
PHI clinical team	1
PHI Digital Services	1
PHI Information Governance Team	1

PHI Pharmacists	1
PHI Primary Care Team	1
PHI Service Access - Waiting Times	1
PHI Strategic Development	1
PHI/ISD Clinical Leads and PHI Information Governance Team	1
PHIIS	1
PHO	1
Planning & Performance Team	2
Planning and Information	1
Policy and Planning Children Services	1
Population Health	3
Practice Admin Staff Collaborative	1
Practice and Development Team	1
Practice Education	1
Prescribing	3
Primary care GP practice	8
Primary Care Improvement Team	2
Primary Care Management Team	1
Primary, Community & Social Care programme management office	1
Public Health	1
Public Health Intelligence and Information Services	1
Public Health Science	1
Quality Assurance	1
Quality Indicators	5
RDT	1
ScotPHO	1
Scottish Burden of Disease Study team	1
Scottish Cancer Trials Research Unit	3
Scottish Healthcare Audits	2
Scottish Intensive Care Society Audit Group	1
Scottish Medicines Consortium	1
Senior Information Analysts	1
Service Access	5
SG-based workforce analysis	1
SPARRA	2
SSHAIP - Health Protection Scotland	1
Statistical & Information Governance	1
Strategic Development	3
Strategic Planning	1
Strategy and Performance Team	1
Subject Specialist Team within NHSGGC Library Network	1
Substance Misuse Team	1
Surveys Team	1



Sxholarky Comms	1
System Watch	2
Terminology Services	6
Transforming Publications Team	1
Women, Children and Sexual Health Directorate Senior Management Team	1
Workforce	2
Workforce Development	1
Workforce in Resources area	1
Workforce Planning and Development	1
Total respondents to this question	268

### 2.1.6 Service/department/directorate name

Respondents found it difficult to distinguish name of team from name of 'service/department /directorate', with many simply providing the same answer to both questions. Word cloud analysis of responses to 'service/department/directorate' name indicates that many/most specialist data information and knowledge staff worked in NHS National Services Scotland Public Health and Intelligence (PHI) and Information Services Division (ISD) teams. Ehealth, performance, strategic development and business intelligence and development were also key areas. See figure 3, and table 9 for all 'service/department/directorate' names provided.

Figure 3: Service/department/directorate name



Table 9: Service/department/directorate name

NAME	#
Administration	1
Alcohol and Drugs Partnership	1
Analytical Services	1
Analytics & Intelligence	5

Antimicrobial Resistance, Healthcare Associated Infections, Infection Prevention and Control	1
Business Development	1
Business Development and Improvement	1
Business Intelligence	4
CELCIS	5
Children, Young People and Lifelong Learning	1
Children's Services	2
Chronic Disease Management	2
Clinical	2
Clinical & Professional Development	1
Communities and Families	1
Community Justice Scotland	1
Community Mental Health Team	1
Corporate services	4
Data management	4
Data Management & Strategic Development	3
Digital	5
eHealth	22
Employee & Customer Services	1
Evidence	6
Finance	1
Finance and Performance	2
GP Practice	8
Health & Community Care	1
Health & Social Care Integration	1
Health and Performance	1
Health and Social Care Partnership	3
Health Improvement	1
Health Intelligence	1
Health Protection Scotland	8
Health Records	1
Human Resources	3
Improvement Hub	3
Information and Technology	1
Information Management & Technology	1
Information Services	4
Information Services Division (ISD)	25
Information, Data & Knowledge	1
Intelligence	1
Knowledge Services	1
Library	5
Library & Knowledge Services	2
Management	1
Medical Directorate	5

Medical Records Department	1
NHS Board	1
Nursing directorate	1
Organisational Development	1
Pharmacists	1
Planning & Performance	2
Policy and Performance	1
Population health	1
Practice and Development	1
Primary Care	3
Public Health	1
Public Health & Information	1
Public Health & Intelligence	82
Public Health Intelligence	1
Public Health Science	6
Public Health Scotland	1
Quality Directorate	1
Quality Improvement and Governance Team	1
Resources	2
Scottish Health Council	1
Scottish Medicines Consortium	1
Service Access	1
Social Work	1
Strategic and Support Services	1
Strategic Development	3
Strategic Planning	2
Strategic Planning and Commissioning and Performance	1
Strategic Services	1
Support	1
Surgical	1
Waiting Times	1
Waiting Times Governance	1
Women, Children and Sexual Health Directorate	1
Workflow optimisation	1
Workforce Directorate	1
	285 (46.2% all responses)

### 2.1.7 Manager job title

45% (275) respondents provided their manager's job title. Word cloud analysis indicates that most respondents were managed within information and/or analysis services. See figure 4 for word cloud and table 10 for all manager job titles provided.



Finance & Performance Management Director	1
Finance and Information Manager	1
General Manager	2
GP Partners	7
Head eHealth	1
Head of Business Development	1
Head of Data, Measurement & Business Intelligence	1
Head of Department	1
Head of eHealth	4
Head of Health & Community Care	1
Head of Health Records	1
Head of Information & Knowledge Management	1
Head of Information and Technical Assurance	1
Head of Information Management	2
Head of Information Management & Technology	1
Head of Information Services	1
Head of Intelligence and Risk	1
Head of Knowledge and Research Services	1
Head of Learning	1
Head of Service	11
Head of Strategic Planning	1
HR Manager	1
Improvement Advisor	3
Information Consultant	4
Information Manager	13
Information Services Manager	1
Information System and Data Quality Manager	1
Information Systems Manager	1
Knowledge Management Co-ordinator	1
Knowledge Services Manager	5
Lead Healthcare Scientist	1
Library & Knowledge Services Manager	1
Library Services Manager	1
Library Services Manager	1
Library Team Leader	1
Manager	2
Mental Health and Substance Misuse Manager	1
PACT Team Lead	1
Performance and Intelligence Manager	1
Permanence and Care Team Lead	1
Policy and Research Lead	1
Practice Manager	6
Primary Care Manager	1
Principal Analyst	3
Principal Information Analyst	39
Principal Information Development Manager	3

Principal Lead	2
Principal Pharmaceutical Analyst	1
Principal Information Analyst	7
Programme Lead	1
Programme Manager	1
Programme Team Lead	1
Public Health Intelligence Adviser	1
Public Health Intelligence Principal	2
Quality Improvement Lead	2
Senior Analyst	2
Senior Assistant Statistician	1
Senior Epidemiologist	1
Senior Health Information Scientist	4
Senior Healthcare Scientist	1
Senior Improvement Manager	1
Senior Infection Control Nurse	2
Senior Information Analyst	17
Senior Information Performance Analyst	1
Senior Manager, Planning & Performance	1
Senior Manager, Strategy and Performance	1
Senior Nurse	1
Senior MI Analyst	1
Service Lead	1
Service Manager	35
Social Researcher	1
Strategic Lead and Implementation Manager	1
Subject Specialist	1
Support Services Manager	1
Team Leader	2
Team Manager	1
Terminology Services Manager	3
Web and Graphics Manager	1
Workforce Development Team Manager	1
Total responses to this question	275

### 2.1.8 Job title

47% (290) respondents provided their job title. Word cloud analysis indicates that most respondents were information analysts, although there was a wide variety of different job titles. See figure 5 for word cloud and table 11 for all job titles provided.

*Figure 5: Job titles*

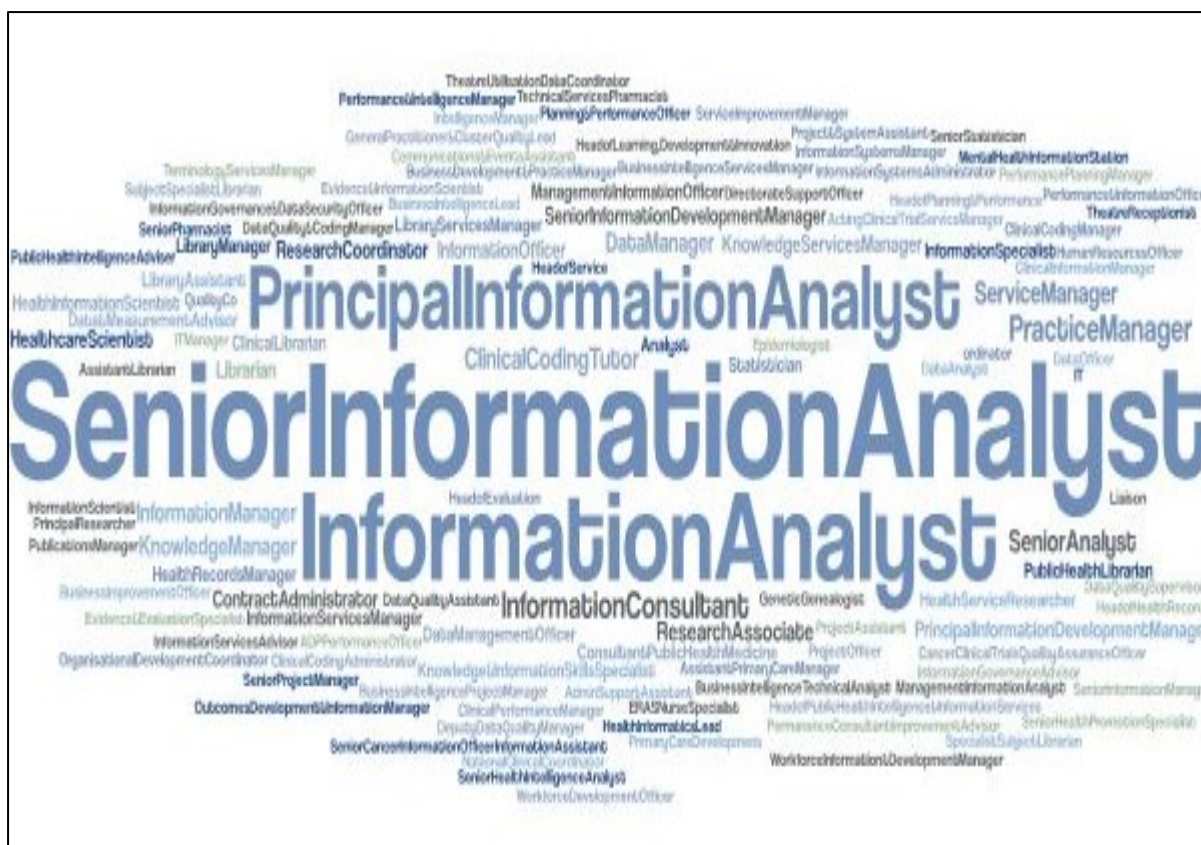


Table 11: Job titles

Job Title	#
Acting Clinical Trial Service Manager	1
Admin Support Assistant	1
ADP Performance Officer	1
Analyst / Statistician	1
Analyst Business Partner	1
Assistant Librarian	1
Assistant Primary Care Manager - Intelligence & Performance	1
Business Development and Practice Manager	1
Business Improvement Officer	1
Business Intelligence Lead	1
Business Intelligence Project Manager	1
Business Intelligence Services Manager	1
Business Intelligence Technical Analyst	1
Cancer Clinical Trials Quality Assurance Officer	1
Cynical Information Manager	1
Clinical Coding Administrator	1
Clinical Coding Manager	1
Clinical Coding Tutor	5
Clinical Librarian	1
Clinical Performance Manager	1
Communications and Events Assistant	1
Consultant in Public Health Medicine	2

Contract Administrator	3
Data & Measurement Advisor	2
Data Analyst	1
Data Management Officer	2
Data Manager	4
Data Quality & Coding Manager	1
Data Quality Assistant	1
Data Quality Supervisor	1
Deputy Data Quality Manager	1
Directorate Support Officer	1
Enhanced Recovery After Surgery (ERAS) Nurse Specialist	1
Epidemiologist	1
Evidence and Evaluation Specialist	1
Evidence and Information Scientist	1
General Practitioner and Cluster Quality Lead	1
Genetic Genealogist	1
Head of Evaluation	1
Head of Health Records	1
Head of Learning, Development & Innovation	1
Head of Planning and Performance	1
Head of Public Health Intelligence and Information Services	1
Head of Service	1
Health Informatics Lead	1
Health Information Scientist	2
Health Records Manager	2
Health Service Researcher	2
Healthcare Scientist	3
Human Resources Officer	1
Information Analyst	34
Information Assistant	1
Information Consultant	7
Information Governance Advisor	1
Information Governance and Data Security Officer	1
Information Manager	4
Information Officer	3
Information Scientist	1
Information Services Advisor	1
Information Services Manager	2
Information Specialist	2
Information Systems Administrator	1
Information Systems Manager	1
Intelligence Manager	1
IT Manager	1
IT/Data Officer	1
Knowledge and Information Skills Specialist	2
Knowledge Manager	4



Knowledge Services Manager	3
Liaison/Clinical Librarian	1
Librarian	3
Library Assistant	1
Library Assistant/ Theatre Receptionist	1
Library Manager	2
Library Services Manager	2
Management Information Analyst	1
Management Information Officer	2
National Clinical Coordinator	1
Organisational Development Coordinator	1
Outcomes Development and Information Manager	1
Performance & Information Officer	1
Performance and Intelligence Manager	1
Performance Planning Manager	1
Permanence Consultant Improvement Advisor	1
Planning & Performance Officer	1
Practice Manager	7
Primary Care Development	1
Principal Information Analyst	23
Principal Information Development Manager	3
Principal Information Development Manager	1
Principal Researcher	1
Project and System Assistant	1
Project Assistant - Mental Health Information Station	1
Project Officer	1
Public Health Librarian	2
Public Health Librarian	1
Publications Manager	1
Research Associate	4
Research Coordinator	3
Senior Analyst	6
Senior Cancer Information Officer	1
Senior Health Intelligence Analyst	1
Senior Health Promotion Specialist	1
Senior Information Analyst	51
Senior Information Development Manager	3
Senior Information Manager	1
Senior Pharmacist	1
Senior Project Manager	1
Senior Statistician	1
Service Improvement Manager	1
Service Manager	5
Specialist Subject Librarian	1
Statistician	1
Subject Specialist Librarian	1

Technical Services Pharmacist	1
Terminology Services Manager	1
Theatre Utilisation Data Coordinator	1
Workforce Development Officer	1
Workforce Information and Development Manager	1
Total responses to this question	290

### 2.1.9 Salary range

Half of all respondents (50.7%) provided their salary range. Of these respondents, the majority (65.8%) earned between £20,000 and £40,000, with only 3.5% earning more than £60,000. See figure 6 and table 12.

Figure 6: Salary range

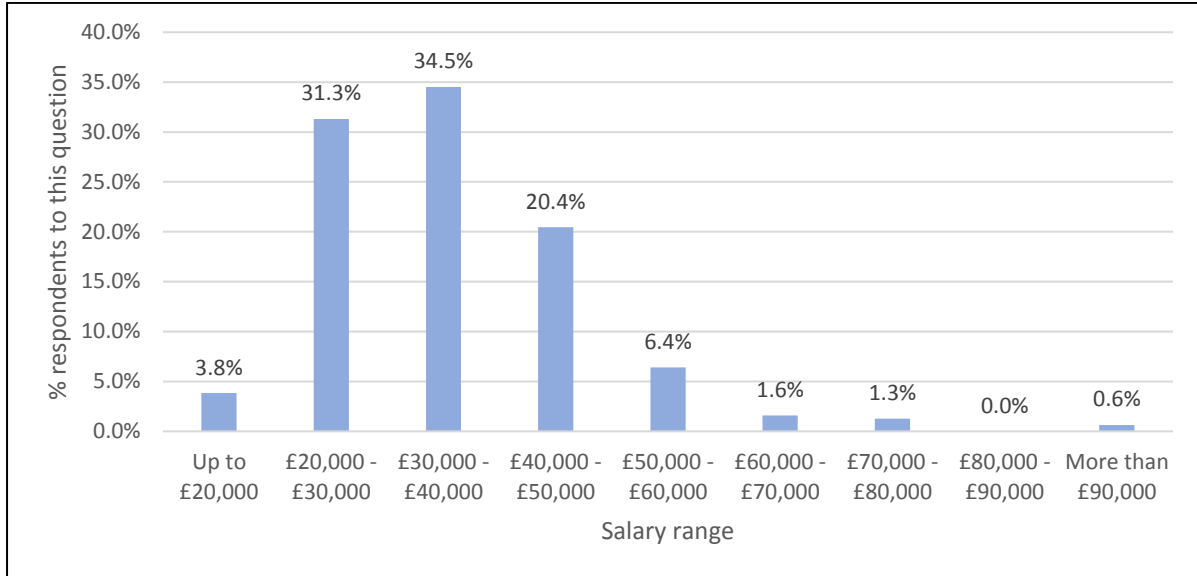


Table 12: Salary range

Salary range	#	%
Up to £20,000	12	3.8%
£20,000 - £30,000	98	31.3%
£30,000 - £40,000	108	34.5%
£40,000 - £50,000	64	20.4%
£50,000 - £60,000	20	6.4%
£60,000 - £70,000	5	1.6%
£70,000 - £80,000	4	1.3%
£80,000 - £90,000	0	0.0%
More than £90,000	2	0.6%
Total responses to this question	313	= 50.7% all respondents

#### 2.1.10 Length of time in current job

Slightly more than half of all respondents (56.2%) provided length of time they had been in their current job. Of these, a quarter (25.6%) had been in their current job for more than 10 years; and 16.4% had been in their current job for less than a year. See figure 7 and table 13.

Figure 7: Length of time in current job

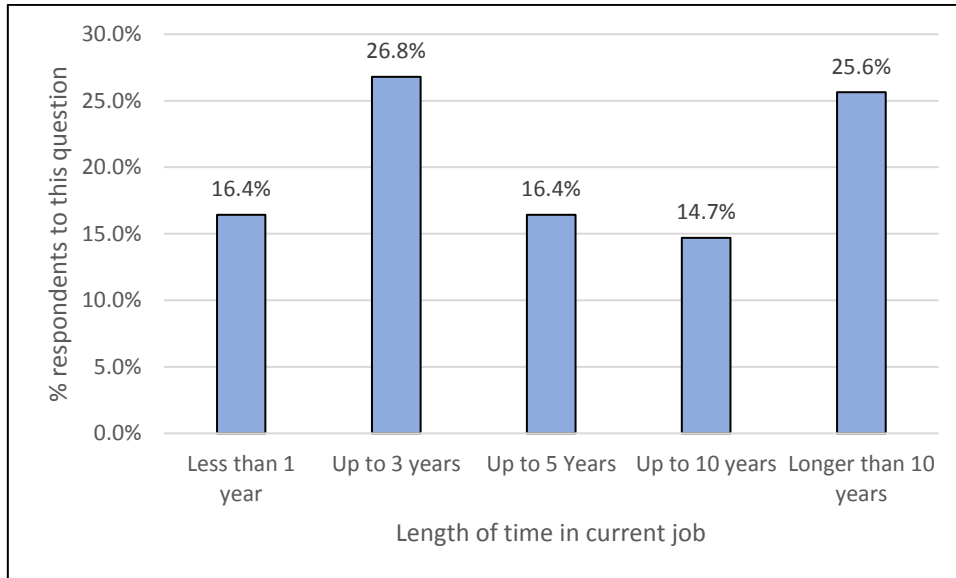


Table 13: Length of time in current job

Length of time in current job	#	%
Less than 1 year	57	16.4%
Up to 3 years	93	26.8%
Up to 5 Years	57	16.4%
Up to 10 years	51	14.7%
Longer than 10 years	89	25.6%
Total responses to this question	347	= 56.2% total respondents

### 2.1.11 Age range

Just over a half (53%) of all respondents provided their age range. Of these, 29.5% were older than 50 years old; with only 12.5% being 30 years old or younger. See figure 8 and table 14.

Figure 8: Age range

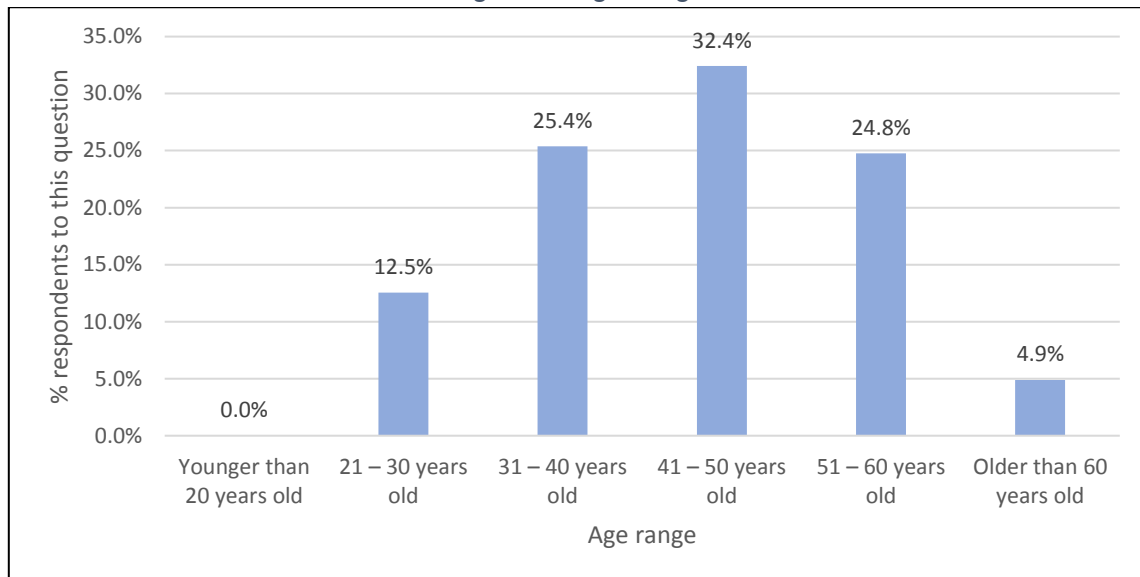


Table 14: Age range

Age range	#	%
Younger than 20 years old	0	0.0%
21 – 30 years old	41	12.5%
31 – 40 years old	83	25.4%
41 – 50 years old	106	32.4%
51 – 60 years old	81	24.8%
Older than 60 years old	16	4.9%
	327	= 53.0% all respondents

### 3 Job role

Almost three quarters (72%) of respondents said that their 'day-to-day work' was in 'data/information analysis/management'; with 17.2% working in 'knowledge management, research & development, libraries'; and only 3.9% working in 'records'. See table 15, table 16 for analysis and recategorisation of 'other' responses, and table 17 for remaining 'other' responses.

Table 15: Day-to-day work summary

	Response		after analysis of 'other' responses	Total	
	#	%		#	%
Data/information analysis/management	435	70.5%	9	444	72.0%
Knowledge management, research & development, libraries	99	16.0%	7	106	17.2%
Records	23	3.7%	1	24	3.9%
Other (please specify)	60	9.7%			
	617	100.0%			

Table 16: Day-to-day work: analysis of 'other' responses

'Other' responses	Recategorisation
Data for Improvement	Data
Data Management	Data
Data/information analysis/management, surveillance of imported infections, risk assessment of emerging infectious hazards, risk assessment of overseas outbreaks.	Data
Information officer	Data
not sure what you mean by knowledge management. We run a specialist clinical classification service providing knowledge of clinical classification systems and rules and data collection to analysts, clinicians etc as well as training and support	Data
PH leadership/ advice to state/ information analysis / management	Data
Project manager for information / data science projects	Data
Quality improvement	Data
Scottish Clinical Trials Research Unit (SCTRU)	Data
Communications	KM
Development and launch of new digital healthcare services	KM
Development of training material, answering complex coding queries, tutoring	KM
Digital services	KM
Graphic design and website management.	KM
Information Development	KM
Online learning and knowledge exchange	KM

Total	16
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Table 17: Day-to-day work: remaining 'other' responses

'Other' responses remaining after recategorisation	# Responses	
	#	% total response
GP Practice Admin	7	1.1%
Information governance	7	1.1%
Clinical (incl GPs, midwives)	5	0.8%
Administration	4	0.6%
L&D and OD	4	0.6%
Data/information analysis/management AND Knowledge management, research & development, libraries	2	0.3%
All	2	0.3%
Clinical informatics	2	0.3%
Primary Care development	2	0.3%
Public Health Intelligence	2	0.3%
Project management/support	2	0.3%
Clinical coding	1	0.2%
Communications	1	0.2%
Epidemiology	1	0.2%
Assistant manager	1	0.2%
Social Worker (Team Leader) whose work is aided by access to consistent, quality and reliable data.	1	0.2%
	45	

### 3.1 Respondents who work in data/information analysis/management

92.9% (404) of the respondents who said that they work in 'data/information analysis/management' provided further details of their work. Of these, the vast majority (85.7%) said that 'data/information analysis' or 'data/information management' 'best described' their work. See table 18, and table 19 for 'other' responses.

Table 18: Data/information analysis/management: best descriptions

Best description of work	#	% respondents to this question
Data/information analyst	260	64.4%
Data/information manager	86	21.3%
Statistician	66	16.3%
Coding	65	16.1%
Public health analyst	61	15.1%
Service management/senior manager	53	13.1%
Business intelligence	52	12.9%
Information governance	52	12.9%
Data scientist	51	12.6%
Planning and performance manager	32	7.9%

Other (please specify)	32	7.9%
Business analyst	25	6.2%
Researcher	19	4.7%
Audit facilitator	12	3.0%
Data warehousing	10	2.5%
Other (please specify)	32	7.9%
Total is more than 404 because respondents were invited to 'tick all that apply'	908	

Table 19: Data/information analysis/management: best descriptions: 'other' responses

<b>'Other' responses remaining after recategorisation</b>	<b>Number of responses</b>
Clinician	5
Epidemiologist	3
Data & measurement advisor	2
Data management officer	2
GP Practice Manager	2
Project Manager	2
Cancer information	1
Contract administrator (chronic disease management)	1
data monitoring and reporting and queries about these	1
Data support- data entry.	1
Data visualisation (although it's usually included under data science, the task of data visualisation also crosses over into other domains, like graphic design and web development)	1
Developer	1
Evaluator	1
Genetics Genealogy - doesn't really fit into any category	1
I work within the LA remit for LIST and I had to do the transition from NSS background in to LA terminology and cultural change.	1
Improvement Adviser	1
Intelligence analysis	1
Personnel Officer	1
Principal Information Development Manager	1
records summarising	1
Training and advice	1
User Research	1



### 3.2 Respondents who work in knowledge management, research & development, libraries

94.9% (94) of the respondents who said that they work in ‘knowledge management, research & development, libraries’ provided further details of their work. Of these, a third (34%) said that ‘knowledge manager/specialist’ best described their work; with just over a quarter (27%) saying that ‘librarian’ was the best description; and just over a fifth (21%) saying that ‘researcher’ best described their work. See table 20, and table 21 for ‘other’ responses.

*Table 20: Knowledge management, research & development, libraries: best descriptions*

<b>Best description of work</b>	<b>#</b>	<b>% respondents to this question</b>
Knowledge manager/specialist	32	34%
Librarian	25	27%
Researcher	20	21%
Library and knowledge services manager	17	18%
Service management/senior manager	12	13%
Library assistant	3	3%
Other (please specify)	7	7%
Total is more than 94 because respondents were invited to ‘tick all that apply’	116	

*Table 21: Knowledge management, research & development, libraries: best descriptions: ‘other’ responses*

<b>‘Other’ responses remaining after recategorisation</b>	<b>Number of responses</b>
Information Scientist	2
Research coordination	2
Also information governance, records management, database management (jack of all trades!)	1
Digital services	1
Editor - Community Mental Health Intranet site, Project Assistant for Mental Health Information Station	1
Data Linkage Specialist	1

### 3.3 Respondents who work in records

20 out of the 23 people who said that they work in records (87%) provided further details of their work. Of these, 45% said that ‘records summariser’ best described their work. See table 22 and table 23 for ‘other’ responses.

Table 22: Records: best descriptions

Best description of work	#	% respondents to this question
Records summariser	9	45.0%
Records assistant	5	25.0%
Records manager	3	15.0%
Outpatient clerk	2	10.0%
Service management/senior manager	2	10.0%
Researcher	0	0.0%
Waiting list coordinator	0	0.0%
Ward/inpatient clerk	0	0.0%
Other (please specify)	4	20.0%
Total is more than 20 because respondents were invited to 'tick all that apply'	25	

Table 23: Records: best description: 'other' responses

'Other' responses remaining after recategorisation	Number of responses
clinical coding	1
Data management, filing clerk, minute-taker, network management	1
GP Practice manager	1
Rota manager and receptionist	1

## 4 Main purpose of data/information/knowledge role

The vast majority of respondents (80.1%: 494) provided details of the main purpose of their data/information/ knowledge role. Of these, the main purpose of the vast majority (81.8%) of respondents was in service improvement/development and/or service planning. The main job purpose of more than a third (34%) respondents was in public health. Only 15% respondents said that their main job purpose was in 'frontline care'. See table 24, and table 25 for 'other' responses.

Table 24: Main purpose of data/information/knowledge role

Main purpose of role	#	% respondents to this question
Service improvement /service development	252	51.0%
Public health	168	34.0%
Official statistics	161	32.6%
Service planning	152	30.8%
Performance management	142	28.7%
Policy/planning support	126	25.5%
Freedom of Information and/or similar requests	121	24.5%
Operational management	114	23.1%
Health/Social policy	113	22.9%
Research	110	22.3%

Epidemiology/health protection	85	17.2%
Workforce planning	77	15.6%
Information governance	75	15.2%
Frontline care	74	15.0%
Innovation	57	11.5%
Economic/financial planning	46	9.3%
Other (please specify)	32	6.5%
Total is more than 494 because respondents were invited to 'tick all that apply'	190 5	

Table 25: Main purpose of data/information/knowledge role: 'other' responses

<b>'Other' responses reaming after recategorisation</b>	<b>Number of responses</b>
Evaluation	4
Education	3
Consultancy	2
Quality improvement	2
Advice on which ICD10 and OPCS codes to apply	1
Also production of non-official stats, reports, data requests, data entry, database development and management	1
Clinical guidance	1
Clinical Trials for both IMP and Non-IMP trials and Epidemiological studies	1
Data Management of NHS data	1
Data Quality	1
Evidence into action	1
genetics genealogy - research and analyse data on inherited conditions for patients' families	1
Graphic design and website management.	1
Health professional education	1
I Manage a centralised Data, Performance & Business Planning team for the Council	1
Information management, Information standards	1
Intelligence-led working/prioritisation	1
linkage	1
Running of GP practice, recall, data collection	1
scrutinising applications for access to NHS National data by the research community	1
sharing information gathered by our researchers and external organisations with stakeholders	1
Supporting researchers	1
To help improve and develop skills and understanding in clinical coding across NHS Scotland	1
Use of health data in bespoke projects	1
We support a national NHS Board and therefore the team role covers a broad range of areas	1

working with disparate data to build citizen profiles based on household profiling for poverty indicators within the local authorities.	1
---	---

## 5 Main users of data/information/knowledge services

The vast majority of respondents (80.4%: 496) provided details of the main users of their data/ information/ knowledge services. Of these, the main users were service managers or team leaders (58%) and clinical or frontline teams (51%); with national government being the main users of 44% respondents. Service users/patients and the general population were the main users of more than a fifth (23%) of all respondent. See table 26, and table 27 for 'other' responses

*Table 26: Main users of data/information/knowledge services*

Main users of data/information/knowledge services	#	% respondents to this question
Service managers or team leaders	288	58.1%
Clinical or frontline care teams	251	50.6%
National government	216	43.5%
National/whole system level e.g. across the whole of health and/or care	184	37.1%
Public bodies such as SSSC, Care Inspectorate, NHS National Services	182	36.7%
Managers running whole organisations	179	36.1%
Commissioning and planning groups	174	35.1%
Local government	147	29.6%
Service users/patients	115	23.2%
General population (e.g. about available services)	112	22.6%
Other (please specify)	27	5.4%
Total is more than 469 because respondents were invited to 'tick all that apply'	1875	

*Table 27: Main users of data/information/knowledge services: 'other' responses*

'Other' responses remaining after recategorisation	Number of responses
Academic researchers	7
Researchers	6
Third sector	5
Charities	4
Journalists	2
All staff dealing with personal information	1
Clinical Coders in Health Boards	1
Educators	1
Royal Colleges and Societies	1
work in planning and performance and cover roles from front line services to SG	1

## 6 Nature of specialist data/information/knowledge work

Almost two thirds (60.4%) of all respondents said that their work involved all of the activities suggested in the survey questionnaire i.e.

- Transferring, sharing, presenting and/or communicating data/information/knowledge
- Organising, managing, quality assuring and/or validating data/information/knowledge
- Sourcing, collecting and/or selecting data/ information/knowledge
- Analysing and/or interpreting data/information /knowledge including synthesising knowledge e.g. through systematic reviews
- Identifying user needs for data/information/ knowledge

Slightly more respondents (69.5%) were involved in ‘transferring, sharing, presenting and/or communicating data/information/knowledge’, and slightly fewer were involved in ‘identifying user needs for data/information/ knowledge’. See figure 9 and table 28.

Figure 9: Nature of specialist data/information/knowledge work

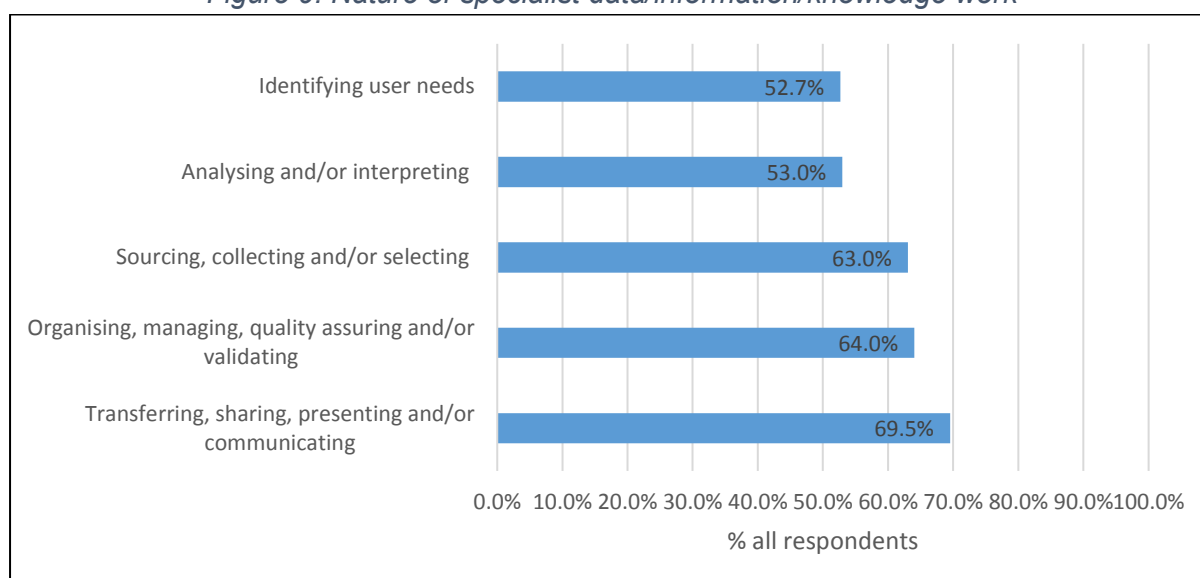


Table 28: Nature of specialist data/information/knowledge work

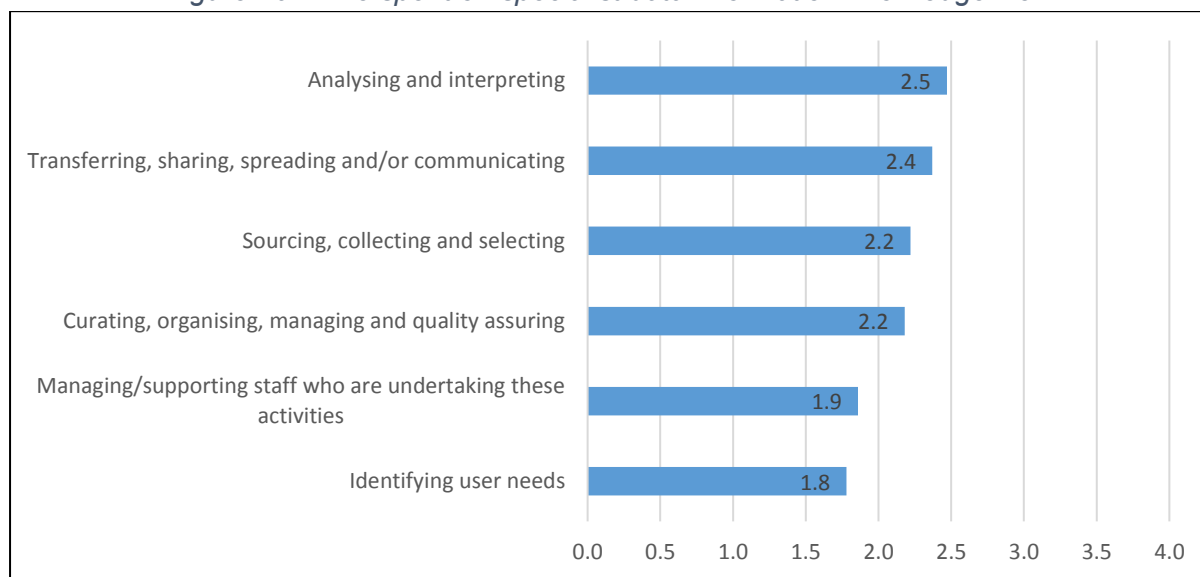
	#	% all respondents
Transferring, sharing, presenting and/or communicating data/information/knowledge	429	69.5%
Organising, managing, quality assuring and/or validating data/information/knowledge	395	64.0%
Sourcing, collecting and/or selecting data/information/knowledge	389	63.0%
Analysing and/or interpreting data/information /knowledge including synthesising knowledge e.g. through systematic reviews	327	53.0%
Identifying user needs for data/information/ knowledge	325	52.7%

## 6.1 Time spent on specialist data/information/knowledge work

More than two thirds (65%: 401) respondents provided details of the time the spent on different aspects of their specialist data/information/knowledge work.

They spend most time on analysing and interpreting data/information/knowledge, and transferring, sharing, spreading and/or communicating data/information/knowledge to relevant users; and least time on identifying user needs for data/information/knowledge. See figure 10 and table 29.

Figure 10: Time spent on specialist data/information/knowledge work



On a scale of 0 – 4, where 0 = no time, and 4 = all my time

Table 29: Time spent on specialist data/information/knowledge work

	Weighted Average
Analysing and interpreting data/information/knowledge	2.5
Transferring, sharing, spreading and/or communicating data/information/knowledge to relevant users	2.4
Sourcing, collecting and selecting data/information/knowledge	2.2
Curating, organising, managing and quality assuring data/information/knowledge	2.2
Managing/supporting staff who are undertaking these activities	1.9
Identifying user needs for data/information/knowledge	1.8

On a scale of 0 – 4, where 0 = no time, and 4 = all my time

## 6.2 Work relating to identifying user needs for data/information/ knowledge

More than three quarters (79.7%: 492) respondents provided details of their work related to identifying user needs for data/information/knowledge. Only 66.1% of these respondents said that they did any work relating to identifying user needs for data/information/knowledge.

Respondents were least involved and spent the least amount of time (see figure 9 and section 5.1) in identifying user needs for data/information/knowledge: 52.7% time and 1.8 on a scale of 0 to 6, where 0 = no time at all and 6 = 'all my job time'.

Of those respondents who did work to identify user needs for data/information/knowledge, most identified user needs through face-to face engagement (87.7%), with 41.5% using workshops. Only 9.2% user needs were identified through phone/on-line/email enquiry. See tables 30, 31 and 32 below.

*Table 30: Work to identify user needs*

<b>Do you do any work in relation to identifying user needs for data/information/knowledge?</b>	<b>#</b>	<b>%</b>
yes	325	66.1%
no	167	33.9%
Total responses to this question	492	= 79.7% of all responses

*Table 31: How user needs are identified*

<b>How do you identify user needs?</b>	<b>#</b>	<b>% respondents who said yes</b>
Face-to-face engagement	285	87.7%
Phone/on-line/email enquiry	30	9.2%
Workshops	135	41.5%
Surveys	117	36.0%
Focus groups	96	29.5%
Other (please specify)	11	3.4%
Total is more than 325 because respondents were invited to 'tick all that apply'	674	

*Table 32: How user needs are identified: 'other' responses*

<b>'Other' responses remaining after recategorisation</b>	<b>Number of responses</b>
Asset Mapping	1
Combination of above depending on circumstances	1
comment on draft papers	1
consultation	1
direct onsite support	1
Email conversations, study protocols	1
I have a management responsibility for ensuring that engagement with users is undertaken as part of the process	1
I work with those who do user assessment work, so indirectly.	1
Informal picking up through day to day work	1
Need is determined by proxy from combination of data types, e.g. acute, prescribing, social care, delayed discharges, wait lists, long term conditions, SIMD, repeat activity, failed discharge, etc.	1
Service requirement	1

### 6.3 Work relating to organising, managing, quality assuring and/or validating data/information/knowledge

More than three quarters (78.4%: 483) respondents provided details of their work relating to organising, managing, quality assuring and/or validating data/information/knowledge. Of these, 81.6% said that they did this work. Most of this work involved quality assuring/validating (79.7%), processing/handling (75.7%) and organising (70.9%) data/information and knowledge. Relatively fewer respondents were involved in evaluating evidence (40.8%), see tables 33 and 34.

*Table 33: Work relating to organising, managing, quality assuring and/or validating data/information/knowledge*

<b>Do you do any work relating to organising, managing, quality assuring and/or validating data/information/knowledge</b>	<b>#</b>	<b>%</b>
Yes	395	81.6%
No	88	18.2%
Total responses to this question	483	= 78.4% of all responses

*Table 34: What work relating to organising, managing, quality assuring and/or validating data/information/knowledge involves*

<b>What does this involve?</b>	<b>#</b>	<b>% respondents who said yes</b>
Quality assuring and/or validating data/information /knowledge	315	79.7%
Processing/handling data/information/knowledge	299	75.7%
Organising data/information/knowledge resources	280	70.9%
Evaluating evidence	161	40.8%
Clinical coding, indexing	79	20.0%
Other (please specify)	7	1.8%
Total is more than 395 because respondents were invited to 'tick all that apply'	1141	

### 6.4 Work relating to sourcing, collecting and/or selecting data/information/knowledge

More than three-quarters (78%:481) respondents provided details of their work relating to sourcing, collecting and/or selecting data/ information/knowledge. Of these, 80.9% said that they did this work. Most of this work involved sourcing and extracting data from existing system (82.3%) and data collection (59.9%). Relatively fewer respondents were involved in developing data collection tools (40.1%), sourcing published and grey literature (35.7%) and data warehouse/platform development (20.8%). See tables 35 and 36.



Table 35: Work relating to sourcing, collecting and/or selecting data/ information/knowledge

Do you do any work relating to sourcing, collecting and/or selecting data/ information/knowledge	#	%
Yes	389	80.9%
No	92	19.1%
Total response to this question	481	= 78.0% of all responses

Table 36: What work relating to sourcing, collecting and/or selecting data/ information/knowledge involves

What does this involve?	#	% respondents who said yes
Sourcing and extracting data from existing systems	320	82.3%
Data collection	233	59.9%
Developing data collection tools	156	40.1%
Sourcing published and grey literature	139	35.7%
Data warehouse/platform development	81	20.8%
Other (please specify)	7	1.8%
Total is more than 389 because respondents were invited to 'tick all that apply'	936	

## 6.5 Work relating to analysing and/or interpreting data/information /knowledge including synthesising knowledge e.g. through systematic reviews

More than three-quarters (78%: 481) respondents provided details of their work relating to analysing and/or interpreting data/information /knowledge including synthesising knowledge e.g. through systematic reviews. Of these, 68% said that they did this work. Most of this work involved using numerical data/information (72.2%); with only 23.5% using qualitative research. See tables 37 and 38.

Table 37: Work relating to analysing and/or interpreting data/information /knowledge including synthesising knowledge e.g. through systematic reviews

Do you do any work relating to analysing and/or interpreting data/information /knowledge including synthesising knowledge e.g. through systematic reviews	#	%
Yes	327	68.0%
No	154	32.0%
Total response to this question	481	= 78.0% of all responses

Table 38: What work relating to analysing and/or interpreting data/information /knowledge including synthesising knowledge e.g. through systematic reviews involves

What does this involve?	#	% respondents who said yes
Using numerical data/information	236	72.2%
Interpreting information to extract insights	216	66.1%
Manipulating data sets	214	65.4%
Linking data sets	182	55.7%
Statistical methods	166	50.8%
Descriptive analytics	164	50.2%
Using textual data/information	135	41.3%
Modelling	101	30.9%
Qualitative research	77	23.5%
Community/local area profile development	75	22.9%
Predictive/preventative analytics	73	22.3%
Artificial Intelligence e.g. machine learning, neural networks	16	4.9%
Other (please specify)	9	2.8%
Total is more than 327 because respondents were invited to 'tick all that apply'	1664	

## 6.6 Work relating to transferring, sharing, presenting and/or communicating data/information/knowledge

More than three-quarters (76.7%: 437) provided details of their work transferring, sharing, presenting and/or communicating data/information/knowledge. Of these, 90.7% said that they did this work. The majority (91.6%) of this work involved producing reports and summaries. See tables 39 and 40.

Table 39: Work relating to transferring, sharing, presenting and/or communicating data/information/knowledge

Do you do any work relating to transferring, sharing, presenting and/or communicating data/information/knowledge	#	%
Yes	429	90.7%
No	44	9.3%
Total response to this question	473	= 76.7% of all respondents

Table 40: What work relating to transferring, sharing, presenting and/or communicating data/information/knowledge involves

<b>What does this involve?</b>	<b>#</b>	<b>% respondents who said yes</b>
Producing reports and summaries	393	91.6%
Visualising data/information/knowledge e.g. infographics, dashboards	261	60.8%
Training others in using data, information and knowledge	243	56.6%
Publishing information online	212	49.4%
Facilitating knowledge sharing online and/or in person	207	48.3%
Making recommendations for action	169	39.4%
Social media	62	14.5%
Copyright and Intellectual Property Rights	42	9.8%
Social networking	41	9.6%
Other (please specify)	9	2.1%
	1639	

## 7 Impacts and influences

### 7.1 Positive impacts of specialist data/information/knowledge work on health and social care

The vast majority (91.7%: 364) respondents considered that their specialist data/information/knowledge work had had a positive impact on health and social care; however, it is notable that 8.3% (33) respondents did not think that their work had had a positive impact. See table 41.

*Table 41: Positive impact of specialist data/information/knowledge work on health and social care*

<b>Do you think that your specialist data/information/knowledge work has had a positive impact on health and social care?</b>	<b>#</b>	<b>%</b>
Yes	364	91.7%
No	33	8.3%
Total responses to this question	397	= 64.3% all respondents

More than a quarter of all respondents (29.7%) and almost one half (49.7%) people considering that their specialist data/information/knowledge work had a positive impact on health and social care provided examples that 'demonstrate the value of specialist data/information/knowledge staff in health and social care. 177 (28.7%) respondents provided examples which demonstrated the value of specialist data/information/knowledge staff in health and care.

#### 7.1.1 Examples which demonstrate the value of specialist data/information/knowledge staff in health and care

More than a quarter (28.7%: 177) provided examples which they considered demonstrated the value of the specialist data/information/knowledge workforce in health and care – indicating that they are proud of the work that they do.

The majority of examples were in relation to service planning and efficiency (23.3%), in particular service planning at a local level (7.2%); examples relating to wider strategic planning were also plentiful (13.1%), with value relating to performance management, and to patient/service user outcomes both comprising 9.7% of examples provided. See table 42.

Table 42: Examples demonstrating value of SDIK staff in health and care

Examples demonstrating value of SDIK staff in health and care		Examples	
		#	%
Workforce planning		15	6.4%
Workforce development and training		5	2.1%
Performance management	Generally	10	4.2%
	Audit	2	0.8%
	Data QA	6	2.5%
	Compliance	5	2.1%
	<b>Total performance management</b>	<b>23</b>	<b>9.7%</b>
Public Trust		7	3.0%
Strategic planning	Generally	15	6.4%
	Integration	5	2.1%
	Specific issues	3	1.3%
	Service planning/improvement at national level	8	3.4%
	<b>Total strategic planning</b>	<b>31</b>	<b>13.1%</b>
Public Health		12	5.1%
Service planning & efficiency	Efficiency and costs	7	3.0%
	Supplies	3	1.3%
	Service planning at local level	17	7.2%
	Service redesign at local level	3	1.3%
	Improvement at local level	14	5.9%
	Patient/service user pathways	11	4.7%
	<b>Total service planning &amp; efficiency</b>	<b>55</b>	<b>23.3%</b>
Patient/service user safety & outcomes	Generally	11	4.7%
	Clinical trials/research	10	4.2%
	Direct value to patient/service user	2	0.8%
	<b>Total patient/service user safety &amp; outcomes</b>	<b>23</b>	<b>9.7%</b>
Making data/information/knowledge accessible and usable		16	6.8%
People using specialist data/information/knowledge services		3	1.3%
Generic comments		12	5.1%
Reference to published evidence		2	0.8%
Not useful		32	13.6%
Total examples		236	

Respondents made some helpful overarching comments/examples relating to the value of the specialist data/information/knowledge workforce in health and care: the following are particularly illustrative:

- *In organisations which seek to be evidence-informed in everything they do, having staff with the skills to quickly search for, collate, and summarise existing research evidence can help to ensure that relevant and timely information is available to aid thinking,*

*advice-giving and decision-making. Where new evidence is required, staff with research skills can offer perspectives on how this might be achieved in an appropriate way for the needs and context.*

- *In general terms, service planners and managers should be making informed decisions. That information should be robust, which means accurately recorded at source, complete, analysed correctly, and interpreted in the context of local knowledge. The more accurate and complete the source data, and the better the analytical skills, the more useful the information will be to service planners and managers. And decisions can be made with confidence, backed by genuine evidence.*
- *Clinical classifications and clinical terminology information standards form the building blocks for information analysis and interpretation and ultimately informs decision making and policy. Without standards you can't benchmark for performance improvement, gain epidemiological knowledge of disease processes, evaluation outcomes of new treatments etc . My own team has developed new coding solutions to provide clinicians and researchers with more detailed information and knowledge on cardiac conditions such as myocardial infarctions and heart failure and cancer reoccurrence as well as providing coding requirements for health questions raised at parliament, for routine health publications and elsewhere. Standards adoption can also support interoperability of healthcare data between systems and between different healthcare areas and professionals.*
- *Effectively visualising large datasets helps identify variation and drive improvement by exposing trends. Although it's now easier than ever to quickly put together a few graphs to illustrate a point, having specialist staff to advise on the best visualisation practice and tools as well as datasets suitable for exploratory analysis via visualisations definitely adds value to the analytics function.*
- *We have set up an interactive map of work themes being undertaken by analytical staff working with GP Clusters in different areas across Scotland. This is assisting Clusters to share work that is on-going or being done, facilitating knowledge transfer.*
- *Enquirers have used the specialist information provided by our service to:*
  - *Support funding applications*
  - *Improve practice/interventions/outcomes*
  - *Increase awareness and understanding of issues*
  - *Scope needs of service users*
  - *Support service development*
  - *Produce training materials*
  - *Helping to inform policy and actions*
- *Recent activities I have been involved in include:*
  - *providing evidence to support development of a tool to support blood loss management in pregnant women*
  - *providing evidence to support development of local guidance on safe use of weighted blankets with people with learning difficulties*
  - *providing evidence to support 'regional review of adult upper gastrointestinal surgical services for both malignant and benign disease in the West of Scotland'*
  - *providing evidence to support treatment planning for a child post-stroke*
  - *provided multiple knowledge skills training sessions for clinical staff to support their practice and learning*

- *Clinical teams make decisions on the quality improvement actions they should undertake based on the information we explain to them. Funding decisions are based on the evaluations we write of how programmes are performing. At a strategic level, Board members are directed to ask the right scrutiny questions about services' performance based on their understanding of our analysis. We communicate with the public about the challenges and successes their much-valued services are experiencing. We show where service changes are having an impact and we give people early warning when capacity is a challenge and targets are not being met. Probably the most important thing we do is support decision makers to have confidence in the decisions they are making, because they feel they know what is going on. There is no evidence-based decision making without specialist information.*

Additionally the case studies collated by the LIST team were identified as being helpful in demonstrating positive impacts and the value of specialist data/information/knowledge staff: <https://www.isdscotland.org/Health-Topics/Health-and-Social-Community-Care/Local-Intelligence-Support-Team/docs/LIST-Our-Stories-V1-1.pdf?2>

Two respondents were pessimistic about the possibility of evidencing the positive impacts of specialist data/information/knowledge work on health and social care:

- *Unable to do so! We struggle to obtain interest in and ability to utilise effectively information in local decision-making process. Despite variety of visualisation techniques and distribution methods service managers/Executives continue to operate largely by other motivating factors. There is a real dearth of skills in interpreting and utilising intelligence within the care system management and leadership despite advocacy for its key role by both local and national Information specialists.*
- *No. My local experience is one of managers and clinicians who basically don't care about data and what it tells them until 'the shit hits the fan'. Then they blame the data.*

However, other respondents provided many examples of the positive impact of specialist data/information/knowledge staff.

#### *7.1.1.1 Workforce planning*

Indicative comments about the positive impact of specialist data/information/knowledge staff included:

- *By way of workforce planning it allows us to scenario plan particular workforce/demographic issues which will help advise managers/operational management to make decisions/identify potential risks before they happen.*
- *GP Cluster workload audit to inform decisions about use of other practitioners e.g. ANP, MH Nurse, Physiotherapist within the Cluster.*
- *Developing the HR/Pay system to hold specific information for Social Care Roles to help develop online tools for HR Processes.*

#### *7.1.1.2 Workforce development and training*

Indicative comments about the positive impact of specialist data/information/knowledge staff included:

- *Literature searches conducted by knowledge services staff feed directly into national educational materials for health and care staff in areas such as trauma.*
- *Working with partners developing learning products to enhance practice*
- *I regularly support our staff who are developing their careers and are working on further courses.*

#### 7.1.1.3 Performance management

Indicative comments about the positive impact of specialist data/information/knowledge staff included:

- Performance management
  - *Provision of performance reports which facilitate performance management and support the aims of continuous improvement and best value.*
  - *Regular performance management reporting providing a transparent, albeit high-level, overview of the organisational performance. This in turn may have an impact on, for example, funding.*
  - *Development of locality profiles, using a range of health and care performance measures, being used to develop locality specific policy initiatives.*
- Audit
  - *My work involves audits of services in Lothian so anytime an audit is conducted the results are shared with the relevant teams and any errors are worked on so that the next time the audit is conducted these errors hopefully don't show up again.*
- Data Quality Assurance
  - *Quality assurance requires a number of cross-checks across complex linked data. Whilst this can be semi-automated at the moment it still requires a human to sense check the data for errors before it can be released as e.g. national statistic*
- Governance
  - *Assurance and compliance with legislation (mitigating information risks)*

#### 7.1.1.4 Public trust

Indicative comments about the positive impact of specialist data/information/knowledge staff included:

- *The greatest benefit for all parties (organisations, health care professionals and the public) is increased trust (re-assurance).*
- *Responses made along with information releases via the Freedom of Information Scotland Act 2002, have resulted in evidence for campaign work, special interest groups, and members of the public. 'Held information' becomes useful intelligence. For example, where it can be used to focus attention on health service equity for all.*

#### 7.1.1.5 Strategic planning



Indicative general comments about the positive impact of specialist data/information/knowledge staff included:

- *The data collected by my team are used in the production of National and Official statistics, used for service planning and audit, and for public health policy. This is only achievable through high-quality training and specialised knowledge of clinical information.*
- *Specialist information can support strategic development of services to aid service delivery and offer local knowledge and historic trends along with potential future trends and demographic information to aid planning and redesign of services for future proofing.*
- *Using specialist information, knowledge and evidence to inform (and change) national strategy*

Indicative comments relating to the value of specialist data/information/knowledge staff to more specific strategic planning work included:

- Service planning/improvement at national level
  - *Helping to evaluate and improve quality of services - e.g. National Patient experience surveys, maternity and infant feeding survey.*
  - *Literature search and summary undertaken to inform the Organisational Development Commission work in developing culture and values for the new Public Health Scotland.*
  - *Activity, workforce and cost data are all essential to inform planners of current demand and can be used to forecast future demand to inform planners at all levels on identifying future service redesign*
- Health and social care integration
  - *Integrating health and social care records to improve planning across the system.*
  - *Data used in all 4 our health and social care partnership of the Interagency Children Services Plans (statutory requirement by SG)*
  - *Predictive analysis has helped the partnerships set realistic targets for the upcoming year(s).*
- Specific issues
  - *Heads of Services across the LA have now commissioned further work to build household profiles showing poverty to help provide evidence basis for action against which to measure changes over time within their own remit.*
  - *Collecting data for on vulnerabilities for the implementation of Best Start (government strategy):*
    - *Define what women would be included.*
    - *Assess how many women and therefore staffing numbers for the midwifery team.*
    - *Assess where the women are within the region.*
    - *Identify staff who would want to work in the team and where they are in relation to the women.*
    - *Engagement with staff and women regarding care models.*
  - *Recent work on predicting the future prevalence of long-term conditions commissioned by NHS 24 to aid planning of demand for telehealth and telecare services been welcomed and has generated a lot of interest among staff planning and delivering these services at local level and requests for further work on more conditions/updated information/different time periods/comparisons of predicted vs actual increases.*

#### 7.1.1.6 Public health

Indicative general comments about the positive impact of specialist data/information/knowledge staff included:

- *We have created algorithms which extract coded information from free text to standardise calculation of patient's drug exposure. The potential for creating a population-based set of research ready images is huge. e.g. the exemplar project will lay the foundations for a lung cancer screening programme for Scotland*
- *Collection, analysis and reporting of healthcare associated infection surveillance data allowing management teams to direct resources to high risk areas and focus on targeting prevention and control of these infections using evidence-based guidance.*
- *My focus is on mental health information including suicide information. This is of value to national and local bodies in planning policy, services and prevention responses. Specialist data, information and knowledge is key to ensuring new services such as distress brief interventions are properly evaluated, especially before national roll out. Routine data informs research, for example in examining physical health needs and outcomes amongst people with severe mental health problems. Specialist interpretation of data enables national and local bodies to identify key areas for action and local needs.*

#### 7.1.1.7 Service planning and efficiency

Indicative general comments about the positive impact of specialist data/information/knowledge staff included:

- Efficiency and costs
  - *Information helps with accessing bed occupancy.*
  - *Analysis to determine if introduction of specialist nursing staff in a care home reduces unscheduled care for care home residents.*
  - *Optimising workflow to General Practitioners*
  - *Cost saving of £143k through literature search for a nurse for one patient (avoiding stoma surgery and associated costs whilst improving patient's quality of life*
- Supplies
  - *My work is in relation to the supply chain for pharmaceuticals in primary care. This includes taking action to facilitate continuing supply of medicines and ensuring that pharmacy contractors are reimbursed properly. This can include collecting evidence and evaluating the worth of such evidence.*
  - *Looking at patient data and identifying the groups who should receive flu vaccination this year. Taking this information and from this identifying the groups who fall into the 4 main vaccination age groups. This information allows us to correctly order the amount of vaccination required and also allows us to contact the patient and offer this very important vaccination.*
- Service planning
  - *Presentation of routine data in an alternative way (looking at long-term trends) to identify where a change may have occurred has been helpful in understanding*

- how mental health services operate (for example, has demand really gone up?) and to identify where to focus efforts to improve processes or to provide additional support (more staff or different options).*
- *Bespoke reports which enable team leaders/managers to adapt processes and develop a more streamlined operating model yielding benefits to both staff and patients.*
  - *Analysis of data which challenges/supports clinicians' suspicions about how services are delivered and utilised. These analyses are of particular benefit when trying to obtain stakeholder engagement in develop projects.*
  - *Mainly provided Customer Insight by linking multiple datasets. Producing findings and managing projects. Outputs consists of:*
    - *Identify households in-receipt of benefits and childcare*
    - *Look at frequent attenders, online and in face to face interactions across the LA, including housing, benefits and Council Tax users*
    - *Identifying low income housing to offer help via Scottish Welfare Fund*
  - *Service redesign*
    - *The data we have extracted, analysed and shared with our customers is being used to inform local service redesign/reconfiguration.*
  - *Improvement*
    - *I work on clinical profiles that are used by clinicians to identify areas for improvement - we have received feedback from users that they have been able to address problem areas and through the use of dashboards they have been able to see the difference that they are making.*
    - *CAIR dashboard - gives nurses access to their own data pulled together from various sources and allows them to compare with other wards/teams; this is starting to spark off conversations about improvement (early days though)*
    - *Sending reports directly to practice managers regarding their practice's antibiotic prescribing, leading to reflection on antibiotic prescribing, and safeguarding of antibiotics for the future.*
    - *Signposting planners, policy makers and operational managers to relevant data that underpins their decision making*
  - *Patient/service user pathways*
    - *Identifying clients for follow up to pass on to the community-based teams, to help them keep track of patients.*
    - *Linking data sets to produce patient pathway analysis which provides insight into resource use and focus for intervention and prevention.*
    - *Use of a series of different data both local and national to help create pathways to allow service providers to identify demand and capacity, in order to plan more appropriate local services.*
    - *I help to interpret and make available (on PCI dashboard and via BOXI), hospital and community prescribing data to customers (including GPs, and researchers eg The Alan Turing Institute) together with risk prediction scores for SPARRA (likelihood of patient having an emergency admission to hospital in the next 12 months), and a High Health Gain (HHG) risk score (likelihood of patient being in the top 2% of NHS service users, in terms of cost). These risk scores help GPs select patients for Anticipatory Care Planning ie to put in place preventative care earlier, before the patient becomes dependant on emergency care (reactive)*

services, which are expensive to the NHS. SPARRA have already been proven to save NHS Lothian £millions in terms of reduced emergency admissions. It is hoped that HHG will do the same, nationally, but is yet to be evaluated.

#### 7.1.1.8 Patient/service user safety and well being

Indicative general comments about the positive impact of specialist data/information/knowledge staff included:

- Safety and outcomes
  - *Advising primary care clinical staff how to apply coded terminologies to aid patient safety.*
  - *Managers (e.g. service managers service improvement managers), consultants, doctors, nurses and other health professionals have medical skills and knowledge that enable them to (usually) make request for more information that will aid them in treating patients and monitoring patient outcomes but do not have the technical knowledge and / or time to extract and analyse the information.*
  - *Primary care staff have free access to clinical decision support tools to make sure their day to day decisions are based on up to date research and guidance.*
  - *Images sourced for national guidance on piercing placements for tattoos*
  - *Analysis of hospital discharges shows that of all those discharged with a diagnosis of AKI (which has a mortality rate of 25%) 30% were preventable via the cessation of DAMN drugs for those who have co-morbidities, are on the at-risk register and are in the frail/elderly demographic. This assertion was arrived at by looking individually at each discharge and reviewing the events leading up to admission. As a result, we have developed a protocol for prevention of undetected development of AKI, in the form of Sick Day Rule Cards. Data helps us understand patient's activation levels for treatment and adherence. Acts as a safety measure for ensuring patients are given the appropriate treatment and care. Data is used for quality assurance purposes e.g. audit to drive forward quality improvement measures.*
  - *Reports we send back to referring clinician enables accurate risk of particular inherited condition to be determined for patient and their family, leading to discharge from service/increased monitoring/screening/further genetic testing etc, leading to prevention or early diagnosis of that condition.*
- Clinical trials/research
  - *Specialist data is used in the appraisal, analysis, and evaluation of new medicines and interventions. Depending on the outcome of these assessments new medicines may be recommended for use across NHS Scotland.*
  - *Supporting research studies which have high potential for improving decisions on health care / personalising medicine / developing population-based screening programme for lung cancer*
  - *We have provisioned data for a number of research studies looking at areas such as:*
    - *impact of the smoking ban*
    - *burden of respiratory conditions in neonates*
    - *mental health and military veterans*
    - *Auto delivery of test results links etc. to clinician/gp.*
    - *Highlight trends where necessary, eg increased wait times.*

- Investigate and find underlying reasons for change/variation.
  - The outcomes from clinical research can lead to new/improved treatments for the patients in Scotland. The outcomes from clinical research can lead to process/service improvements in the NHS, benefitting the health of patients in Scotland as well as improving efficiencies in NHS. For example
  - The ATAC trial of which NSS were involved in led to the licencing of Arimidex a new treatment for Breast Cancer (2003/4)
  - The SPRING trial currently developed by NSS will inform prescribing practices for NHS.
  - Innovating coding solutions to support clinical requirements for specific data at national level, otherwise unavailable - e.g. i) cardiologist community's requests for specific data on STEMI/NSTEMI and on heart failure with reduced LV ejection fraction ii) SG's request for specific national data on female genital mutilation - these requests were met by creating novel, specific Scottish coding solutions, not available in the standard national classification of diagnoses (ICD10).
  - Literature searches have been used:
    - In formulating Health Board policies, e.g. breastfeeding peer support, self-management, tracheostomy, bronchoscopy.
    - To support case reports published by clinical staff
    - To produce major systematic reviews, e.g. paediatric pharmacovigilance, readmission modelling, surgical volumes
- Direct patient/service user value
  - We produce information leaflets based on current scientific literature that are available on our website for the public/healthcare professionals etc. This is a valuable resource and is translated into different languages etc. Also presenting information in graphical form enables a wide range of people to use the data collected.
  - We collate information about GP practices in Scotland which facilitate service user involvement through a Patient Participation Group (PPG) and make this freely available on our website via an interactive map. Comparable information for NHS England is hidden behind a paywall.

#### 7.1.1.9 Making DIK accessible and usable

Indicative general comments about the positive impact of specialist data/information/knowledge staff included:

- Data visualisations we have created for use on the NHSNSS Twitter feed and on ISD and HPS websites help users understand quickly the importance and relevance of key facts included within them.
- Most of our database systems in Social care are very poor at showing staff relevant data about their clients in a useful way. The inbuilt reporting tools are not adequate for this purpose, so I find that my skills are required in the areas of data-mining, transformation, manipulation and reporting in a user-friendly way.
- Use of infographics to illustrate knowledge data to speed up knowledge transfer
- Creation of Evidence Summaries to save clinician time
- Efficient access to information by decision makers and users of healthcare

- *A large amount of data is still recorded in systems as free text fields. This makes it more complex to analyse. Specialist knowledge and skill (and time) is then needed to be able extract relevant data from these free text field and recode it appropriately and analyse it.*
- *Presenting evidence in an accessible way helps service managers to ensure that their services are evidence-informed.*
- *Reorganisation and classification of reports online to ensure they are easier to find.*
- *Implementing a Business Classification Scheme across team shared spaces, including file naming conventions and document management guidance.*
- *Good quality audit data, in both clinical and non-clinical areas of our work, can be impactful but sometimes requires supportive explanation in dissemination.*

#### 7.1.1.10 People using SDIK services

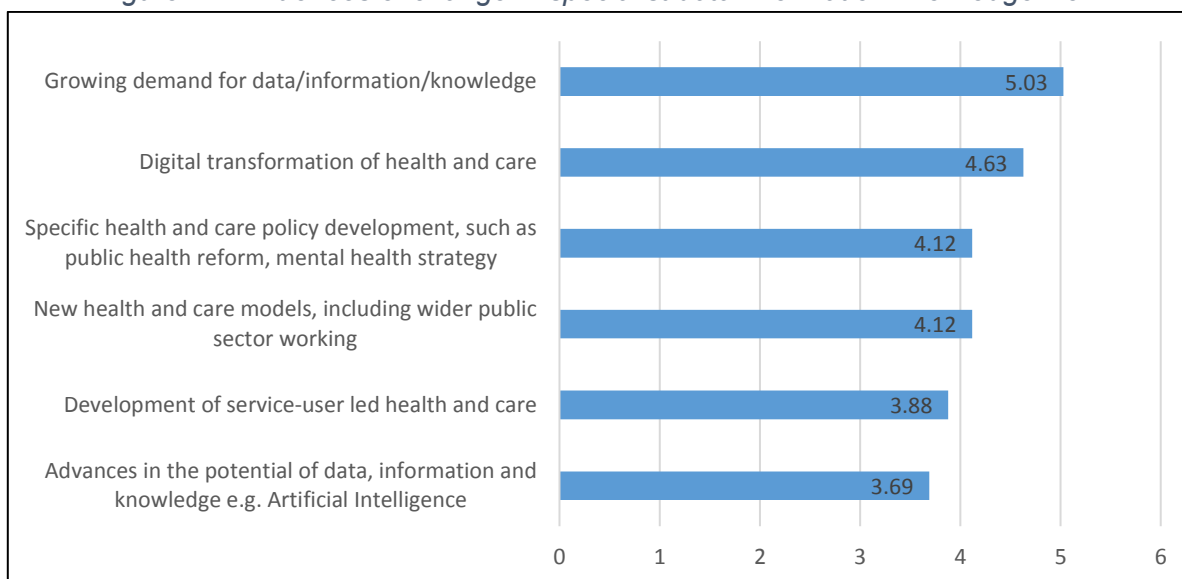
Indicative general comments about the positive impact of specialist data/information/knowledge staff included:

- *Positive engagement by clinicians in the development of datasets and collection/analysis of national data for large scale pilots as well as smaller scale local service improvement programs.*
- *Providing evidence to support local, regional and national clinical strategies - and the fact that we continue to be asked for our input over the last 8 years says that this is of value.*

## 7.2 Influences of change in specialist data/information/knowledge work

Respondents considered that the “most important influence of change” in specialist data/information/knowledge work was growing demand for data/information/knowledge; with digital transformation of health and care being identified as the second most important driver. Service focused developments (specific health and care policy development, new health and care models, and the development of service-user led health and care) are seen as important, but less so. Advances in the potential of data, information and knowledge, such as Artificial Intelligence were seen as important, but the least significant driver. See figure 11.

Figure 11: Influences of change in specialist data/information/knowledge work



On a scale of 0 – 6, where 0 = no influence and 6 = major influence  
389 responses; 63.0% all responses

Respondents identified the following 'other' influences of change in specialist data/information/ knowledge work:

- Culture and awareness
  - *Staff culture has been a major influence with more staff aware of and keen to explore digital tech and data*
  - *Growing awareness from management & clinical staff for the need for data to provide the evidence to make informed decisions*
  - *Increased pressure to undertake evidence informed practice*
- Better information governance and sharing
  - *Information Governance is also a major influence we have huge quantities of data currently held in an enormous number of different systems we need to get better at using this information across different areas of health & social care to really understand what is happening to service users.*
  - *Better processes for information governance, data sharing*
  - *The resolution of the tension between information sharing across disciplines, regions and sectors (and with citizens) and effective information governance is the single thing that would transform our sector.*
  - *Breaking down bureaucratic barriers to linking and sharing data between boards, and within other non-territorial NHS organisations.*
- Timescales
  - *AI has a big influence, the reason I scored it as "partial" is because although it will become more relevant in the next 5-10 years, it is something to consider when looking at the horizon, but it can only have a partial actual impact in health and social care due to the limited levels of current adoption.*
  - *It is important the models, policy development don't just last a few years. Changing policies must be extremely robust and not just a trial and error approach which to be fair is what is happening, and staff do not benefit from this*

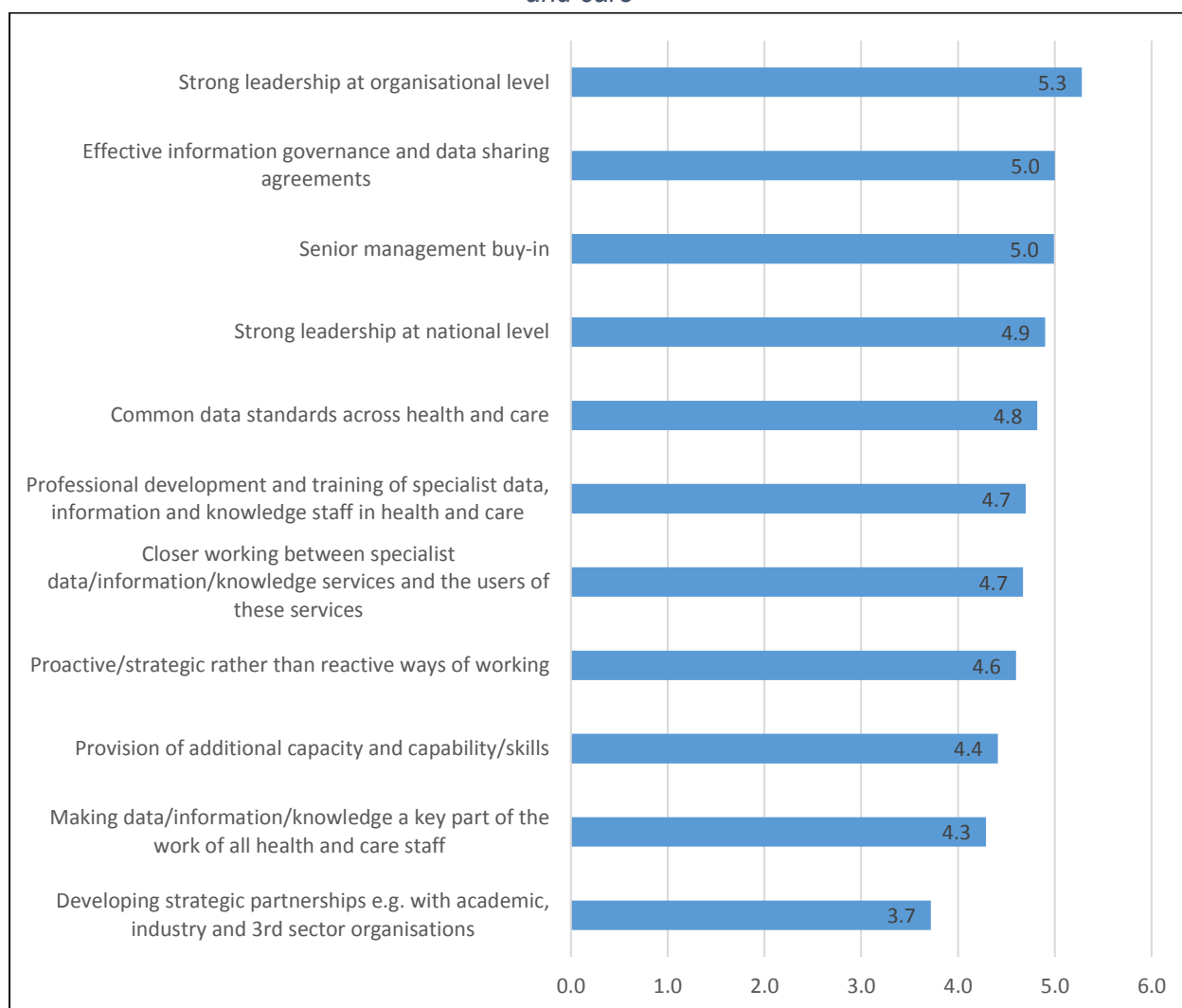
- *Regional working in NHS Scotland and recognition of national bodies needing to work with Regional and Local colleagues. Difficulty is that transformation of services is happening at a speed faster than national definitions for data fields can respond.*

### 7.3 Helping the specialist data/information/knowledge services respond to changing demands/needs for specialist data, information and knowledge services in health and care

Respondents welcomed all suggestions for enabling specialist data/information/knowledge services “respond to changing needs for specialist data, information and knowledge services in health and care”. In particular, they considered that strong leadership at organisational level would best help. Senior management buy-in and effective information governance and data sharing agreements were also seen as very important facilitators. The development of common data standards, professional development and training and closer working between specialist data/information/knowledge staff – together with proactive/strategic rather than reactive ways of working were also seen as very helpful. See figure 12.



Figure 12: What would help specialist data/information/knowledge services respond to changing demands/needs for specialist data, information and knowledge services in health and care



On a scale of 0 – 6, where 0 = not helpful and 6 = essential  
396 responses; 64.2% all respondents

Respondents identified the following 'other' ways of enabling specialist data/information/knowledge services respond to changing needs for specialist data, information and knowledge services in health and care

- Organisational culture change
  - *This question 'hits the nail on the head'. It can be summarised by a requirement for a change in 'culture' towards the value of these services and how best of to develop and make use of them. Investment is clearly a challenge give competing priorities and financial constraints.*
  - *I would also add that there needs to a greater interest at senior level in ensuring good quality data is available from administrative/clinical systems for these services to utilise. Too often those seeking Business Intelligence seem to think 'data grows on trees' and just needs to be picked?*
- More shared understanding

- *Re: information sharing and data governance agreements - the advent of GDPR has made people over-cautious. There needs to be a common sense and shared understanding and agreement around what can be shared, especially between organisations/agencies.*
- *Common data standards - these would overwrite localised practice which is important to understand - risk that the dominant 'common' narrative shuts down important details. 'Strong leadership' should just be 'Leadership' - 'strong' implies the 'hero' leader which is out of kilter current best practice on leadership.*
- *Less red tape around information governance. Online data collection systems not reliant on IT colleagues for set up which can be easily adapted would significantly reduce costs and timescales. Some specialist information can evolve rapidly as indicated by the title of this question and having to wait for change control boards and IT availability is a major barrier.*
- **Better IT**
  - *Not constantly being held back by restrictive information technology support services*
  - *Higher computational power. Our pcs are not fast enough to cope with national level datasets. And space available on drives is always too tight. We need management to purchase more disc space so we can do analytical work efficiently.*
  - *Technological investment! Our kit is old and our software sadly out of date!*
  - *IT support at local level and nationally agreed direction vis-a-vis data science.*
- **Better data quality**
  - *More mandatory coding and storing of key health data. Too often data is stored as free text and /or it is not mandatory that a coded version of the data is stored. For example, in Emergency Department data use of free text presenting complains fields for patient information and no mandatory field storing an ICD 10 diagnosis code can limit what information can be analysed about patient health for patients attending an ED.*
- **Learning from other sectors**
  - *Looking at other industries and other countries for inspiration rather than always trying to do everything in-house*
- **Growing capacity and career development from within**
  - *Encourage managers to build on and highlight staff's existent knowledge and experience as an evolving asset to the organisation. Opportunities to build capacity from existing employees is often overlooked. Staff need to strategically assisted by managers - to have pathways to gain experience and greater knowledge more routinely given time for. Rather than just recruit externally - focus on mechanisms to expand and use / leverage people who know the organisation.*
  - *Better career prospects for specialist informatics staff to retain essential skills. The skills of my own team take years to develop but staff have no means of progressing other than to generic management roles and their knowledge can then become lost as they move to other areas of the organisation. Need a technical route for progression and the recognition that expertise is a valuable and essential asset for any organisation. This expertise is not restricted to analytical staff. Career pathways for data management staff and other specialist*

*experts have been overlooked and their expertise has not so far been valued in the NHS. An expert understanding of health data and information, how it is collected, structured, how standards are applied and the assumptions you can make from the outputs are all essential to providing good healthcare knowledge. Many people can apply statistical tests to data, but real knowledge comes from understanding the whole data journey and being able to understand what the customer really needs rather than what they are asking for.*

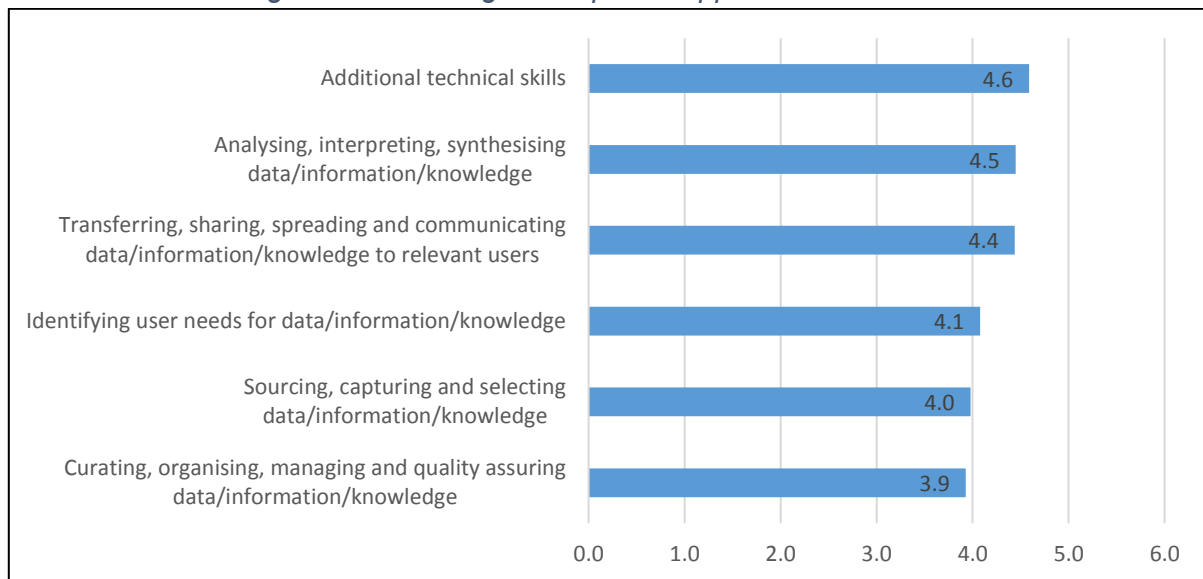
- *Organisational support, securing time for learning and development*

## 8 Learning and development

### 8.1 Learning and development opportunities welcomed

Respondents welcomed all suggested learning and development opportunities, with opportunities for developing additional technical skills; analysing, interpreting and synthesising; and transferring, sharing spreading and communicating data/information/knowledge being particularly welcome. See figure 13.

Figure 13: Learning/development opportunities welcome



On a scale of 0 – 6, where 0 = not welcome and 6 = definitely welcome  
395 responses; 64.0% of all responses

Respondents identified the following 'other' learning/development opportunities which would be welcome:

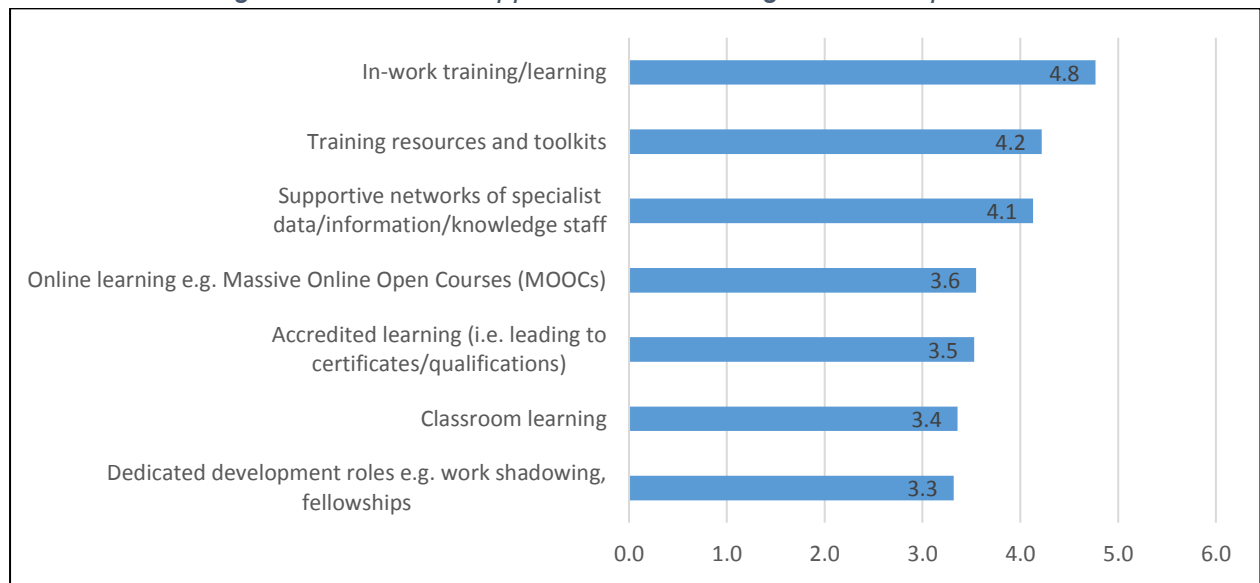
- Technical skills
  - *A.I. and I.T support is essential to help build outputs and provide predictive analytics*
  - *R software training*
  - *R to analyse data where traditionally I have used SPSS*
  - *Training in Python and appropriate use of machine learning techniques - i.e. not attempting to use full AI systems but rather more currently practical applications like Random Forests. Also moving beyond descriptive statistics and towards Bayesian Inference methods as this is what the wider community use and are (post analysis) much better in terms of communicating findings to the public.*
  - *Up to date regular training on informatics, BI etc and the availability of software as it becomes available.*
  - *Use of STATA and R*
  - *Regular development opportunities in new technologies and techniques*
  - *Critical appraisal*
  - *Digital ethics*
  - *Governance, technology and innovation - getting the correct balance*

- *Pragmatic data protection and privacy.*
- *New technical skills across data science spectrum and, opportunities to share and learn about what others are doing/can do.*
- *Support in adopting free and more powerful analytical tools.*
- *Text mining for data analyses in systematic reviewing*
- **Advanced skills**
  - *Most of the skills listed above are basic and are currently part of the day to day work of our profession - what we need is more advanced level skills, or looking at the future of the profession, how to cross the boundaries between information and knowledge management for example, or the relationship between quality and knowledge management.*
  - *In my current role, I would be expected to have the above expertise.*
- **New products**
  - *Management of IP and identifying and quantifying the value of using NHS data in developing algorithms / new products.*
  - *Working in partnership with commercial companies to deliver innovations in healthcare which ensure IP and benefits are realised effectively across organisations with appropriate governance*
- **Organisational skills**
  - *All informatics staff should have knowledge of public health basics - essential for being part of a new public health body. They should also have knowledge about the functions of other departments within their organisation (new and existing) in order to operate effectively. Too many silos right now.*
  - *You are missing out a whole range of other skills that are relevant including those relevant to leadership. E.g. services often involve teams that need to led and managed. Staff often need strong interpersonal and customer engagement skills to ensure intelligence needs are understood and met.*
- **SDIK User engagement skills**
  - *As a manager I no longer analyse data myself, so my personal needs would be more around discussing data requirements, data sources etc. with colleagues and customers.*
  - *Relevance of data science to non-analysts*
- *Project management and time management skills would be welcome to ensure analysts can properly manage their workload - especially at Senior/Principal analyst level.*
- *Train the trainer techniques*
- *We are still using Excel 2007 in the NHS. How are we supposed to keep up with the latest thinking in the field? There is no investment in us or our tools. New graduates find our set-up laughable; they are being trained to use technology that no one in the NHS will be using for 10 years or more.*

## 8.2 Preferred approaches to learning and development

In-work training/learning was the preferred approach of most respondents, with dedicated development roles, such as work shadowing or fellowships, and classroom learning being welcome, but not most preferred. Accredited learning opportunities were not as preferred as less formal, more self-directed learning approaches such as training resources and toolkits, and supportive networks of colleagues. See figure 14.

Figure 14: Preferred approaches to learning and development



On a scale of 0 – 6, where 0 = not preferred and 6 = definitely preferred  
395 responses; 64.0% total response

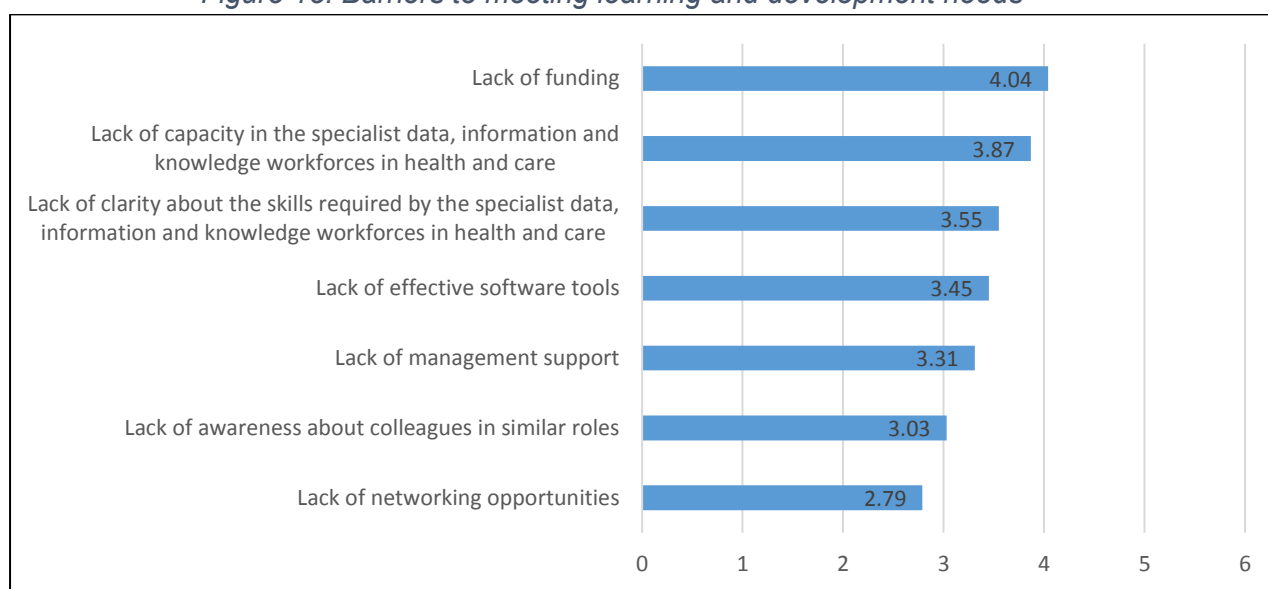
Respondents' comments stressed the importance of learning and development being linked with day-to-day work practice, with the following comments being indicative:

- *Any sort of training in isolation is pretty useless as anything learnt is not developed and/or remembered unless it is used. I would ideally be trained in-house by a colleague who was ahead of me in terms of the particular learning need. Joint working on a particular project would be beneficial in terms of increasing knowledge about datasets involved and the necessary analysis methods (both software and presentation).*
- *All of the above are good approaches. However, learning has to meld with practice. Learning new skills without concrete opportunities/projects to apply them is a waste of time and money. So any learning has to be outcome-focused and come with a pre-planned follow-up from the day-to-day practice.*
- *Open learning online is a massive commitment and an isolated one. No interaction from colleagues or tutors and is not for everyone.*

### 8.3 Barriers to meeting learning and development needs

Lack of funding was perceived as the biggest barrier to learning and development needs, with lack of capacity in the specialist data/information/knowledge workforce, and lack of clarity about the skills required by that workforce seen as a bit of a barrier. Respondents did not consider that the lack of networking opportunities, lack of awareness about colleagues in similar roles, or lack of management support as major barriers. See figure 15.

Figure 15: Barriers to meeting learning and development needs



On a scale of 0 – 6, where 0 = not a barrier and 6 = a major barrier  
395 respondents; 64.0% of all respondents

Respondents identified the following 'other' barriers to meeting learning and development needs of people working in specialist data/information/knowledge roles:

- Time (20 respondents), with the following comments being illustrative:
  - *Time is a major barrier for me - lack of high-quality staff mean that my personal development time is sacrificed to make up staffing shortfall*
  - *Lack of time/capacity to undertake learning opportunities with current workload.*
  - *With work pressures it is very hard to carve out enough time to dedicate to learning new skills or even build on those already obtained, without having to try and fit these in during non-work time.*
  - *Finding the time to develop analytical skills, e.g. learning how to use new software, or code in a different language, while still delivering on work priorities.*
  - *Time to gain the skills, but also support in embedding those skills into practice.*
  - *Although there are opportunities for classroom training, there needs to be the time and opportunity to apply this to your own work, to cement the learning*
- IT capability and capacity (7 respondents)
  - *Lack of an appropriate IT infrastructure that serves new and not that new software tools: we are still using Excel 2007 in the NHS. How are we supposed to keep up with the latest thinking in the field? There is no investment in us or our*

- tools. New graduates find our set-up laughable; they are being trained to use technology that no one in the NHS will be using for 10 years or more.*
- *Unwillingness of IT teams to allow innovation to flourish due to governance concerns around new software - the software is there but not allowed to use it.*
  - *Out-posted staff do not have access to geNSS, where a lot of training/information is held. We have not received any reassurance that the new intranet will be any more accessible to out-posted staff.*
  - *Lack of space / server capacity*
  - **Undefined scope of role (5 respondents)**
    - *My role involves me being a Jack of all Trades and it is difficult to become expert in any field when many differing demands of my analytical skills are made.*
    - *Lack of understanding by senior management about skills and experience needed for specialist roles they do not have experience of. Senior staff not valuing the expertise and experience of their specialist staff if it isn't an area they understand*
    - *Lack of acknowledgement of the data/information expert's role; almost seen as secondary role to that of the Analyst role!*
    - *It doesn't help that quite a few people seem to drift into knowledge roles without a sound grounding in analytic skills or even mathematical literacy. And there aren't enough senior people challenging the poor output and raising standards.*

## 8.4 Current learning activities

11.2% (69) respondents provided details of their current learning activities, of whom 15 clearly stated that they had no current activities leaving only 8.8% (54) respondents who said that they were currently engaged in learning activities. 15 of these respondents described learning that was ongoing on-the-job learning, such as web-searching, learning from colleagues, leaving only 40 (6.5%) who described more 'formal' learning. This varied widely, with respondents tending to define it in terms of subject (see table 43) and provider – with online learning activities appearing to be the best used. Only 5 respondents detailed current learning activities related to gaining formal qualifications – none of which directly related to specialist data/information/knowledge work, see table 45.

*Table 43: Current learning activities*

<b>CURRENT LEARNING</b>	<b>#</b>
Defined in relation to subject	16
Defined in relation to provider	15
None	15
Ongoing on the job learning	14
Defined in relation to qualification	5
MOOCs format	4
In-house	3
Other	2

N=69

*Table 44: Providers of current learning activities*

<b>Providers</b>	<b>#</b>
------------------	----------



Coursera	2
DataCamp	3
EDX	1
HEA	1
LearnPro	1
Lynda.com	1
Microstrategy ePEPs	1
MyOnlineTrainingHub	1
NES	1
New College Lanarkshire	1
Open University	2

Table 45: Currently learning activities leading to formal qualifications

Qualifications	#
CIPR Diploma in Public Relations	1
MSc Epidemiology - Distance Learning	1
MSc Health Psychology	1
MSc in Health Economics at Aberdeen University	1
PG Diploma in Health Economics	1

Table 46: Subjects of current learning activities

Subjects	#
R (and R Shiny, R Studio, R/R Shiny knowledge sharing)	6
Cochrane Systematic review training	2
HPS Epidemiology Pathway	2
Active Implementation learning - including the role of Decision Support Data Systems	1
Quality improvement tools and processes	1
Scottish Coaching and leading for Improvement Programme	1
SNOW Administration	1
System Dynamics	1
Terminology Authoring Course (Level 1)	1

## 8.5 Current professional networks

17% (105) respondents provided details of the professional networks they were currently involved in, with 161 networks identified, see table 47. There was a very wide variety of networks that the specialist data/information/knowledge workforce/s engaged with, with the Scottish Health Information Network (SHINE), K2A Network and CILIPS being those most frequently engaged with. It is notable that 10 respondents stated that they were not currently engaged with any professional network, bring the number of respondents engaged in professional networks down to 95: 15.4%.

Table 47: Current professional networks

<b>NETWORKS</b>	<b>#</b>
Adobe online resource groups.	1
AphA – Association of Professional Healthcare Analysts	5
BCS	5
BI Hub	1
British Psychological Society	2
Caldicot Guardians Forum	1
Centre for Child Wellbeing and Protection	1
Centre for Research on Families and Relationships	1
Centre for Youth and Criminal Justice (CYCJ)	1
CHAIN	1
CILIPS	9
CRUK statistics operational group	1
DAISy	1
Data Science meetups	1
Data Science Scotland Slack group	2
Datalab	1
Discovery Network	1
dNMAHP Network	1
EiC	1
European Association for Health Information and Libraries	1
Expert searching network	1
Faculty of Clinical Informatics	1
Faculty of public health	1
FPMA	1
GSS	1
Highland Library group	1
IHM	1
Improvement Advisors Network	2
Information & Records Management Society	1
International Futures Forum	1
International Population and Data Linkage Network	1
ISACA	2
K2A Network	12
Knowledge broker network	5
Knowledge Hub	1
Knowledge Network	1
LinkedIn	3
lis-medical mailing list	1
Local informal R Coding club	4
National FOI Forum	1
National IG Forum	2
National Information Leads	2
National workforce planning	1
NE Fife cluster	1

NHS Scotland Records Management Forum	1
None	10
Operational Research Society	1
Physiotherapy Informatics Network	1
PMVTS	1
Practice Administrative Staff Collaborative (PASC)	3
Practice Managers Network	3
Prescribing Advisors Network	1
Primary Care Pharmacists (leads)	1
Project Lift	1
Public Health Librarian CoP	1
Public Health Specialist Improvement and Interest Group (PHSIIG);	1
Public Mental health special interest group	1
Public Relations	1
Public sector R Shiny user group	2
Q network (Health Foundation)	2
Quality Academy	1
Records Managers Forum	1
Restorative Justice Forum (Scotland)	1
Royal Pharmaceutical Society	1
Royal Statistical Society	2
Scotstat	1
Scottish Evaluation Network	1
Scottish Health Information Network	1
Scottish health protection network	1
Scottish NMAHP eHealth Leads Network	1
Scottish Privacy Forum	1
Scottish Trauma Advisory Group (STAG)	1
SHINE (Scottish Health Information Network)	16
SLIC	1
SMR Analyst Forum	1
Snomed International	1
Social Work Scotland	1
Statistical Analyst Group	1
Tableau	2
Tayside Analytical Network	1
The Governance Institute	1
U Lab	1
UK Classifications Technical Advisory Committee	1
UK regulator analyst network	1
UKCRN	1
Unison staffside	1
What Works Scotland did provide good networking but that will finish shortly	1
Total networks identified	161

N=105 respondents, with some providing more than one response



## 9 Summary (designed to be stand-alone)

This baseline survey of the specialist data, information and knowledge (SDIK) workforce in health and care in Scotland was designed to:

- Provide an initial indicative description of that workforce as a baseline foundation for the next stages.
- Seek confirmation (or otherwise) of the initial statement of scope of the Specialist Data, Information and Knowledge workforce in health and care (see appendix XX)
- Explore the future needs of SDIK staff in relation to:
  - Skills development
  - New ways of working

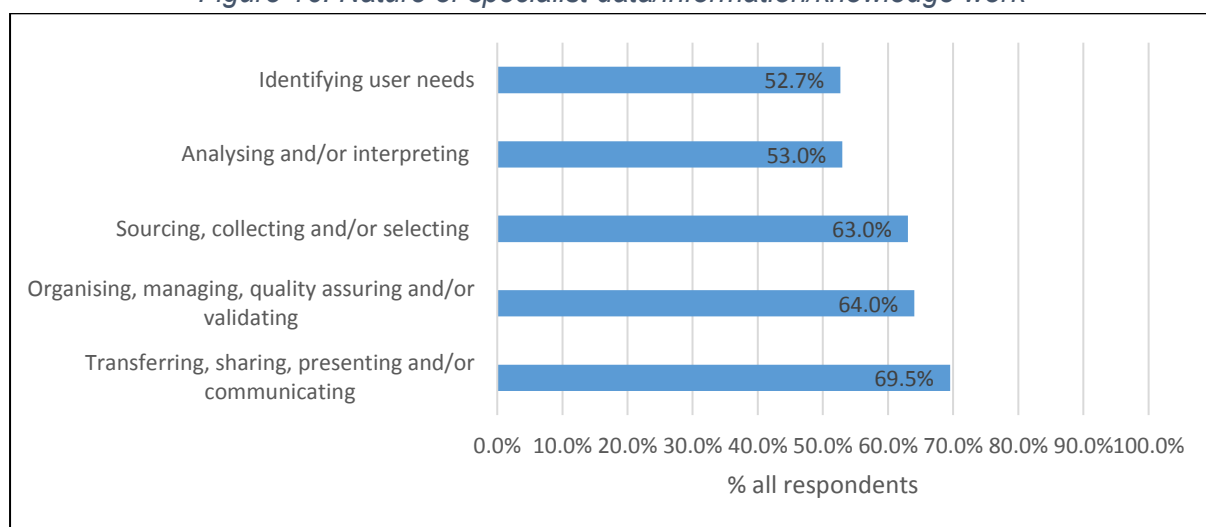
Strategic stakeholder engagement and a scoping literature review undertaken to inform the development of the initial statement of scope of the SDIK workforce showed that this workforce is currently ill-defined, and relatively 'invisible' in terms of workforce planning and development. As such, it was anticipated that survey would be very much a baseline exploration.

As such, the dissemination of the survey was through extensive use of known networks and communication channels. The survey was live from 7<sup>th</sup> December 2018 to 8<sup>th</sup> February 2019.

- There were 617 respondents to the survey, indicating that – despite the relative 'invisibility' of this workforce, **respondents identified sufficiently strongly with the title 'specialist data, information and knowledge workforce' to complete the survey.**
- There were relatively few respondents from **Local Authorities** (10%) than from the NHS (81%), which may be due to there actually being fewer SDIK staff in this sector, or because of the means of dissemination of the survey – or both. It suggests **that there may be more work to do to engage with SDIK staff in this sector.**
- There is a strong cluster of staff (51%) in NHS National Services Scotland (NSS), with remaining respondents being widely dispersed, and generally working in small teams – with a quarter (24%) in teams of 5, and a third (33%) in teams of 6 – 10. **This dispersal is likely to provide challenges in developing awareness of SDIK staff across the health and care sectors.**
- Salary ranges are relatively low, with 70% earning less than £40,000. A quarter (26%) respondents have been in their current job for more than 10 years, with almost a third (30%) being older than 50 years of age.
- Team names, managers job titles, and respondents job titles indicate **that 'information', 'analysis', 'library', 'business intelligence' and 'knowledge' are current key descriptors** of the SDIK workforce.
- **Almost three quarters (72%) respondents said that their 'day-to-day work' was in 'data/information analysis/management'; with 17% working in 'knowledge management, research & development, libraries'; and only 4% working in 'records'.**
- Almost two thirds (60%) of all respondents said that their work involved all of the activities suggested in the survey questionnaire i.e.

- Transferring, sharing, presenting and/or communicating data/information/knowledge
- Organising, managing, quality assuring and/or validating data/information/knowledge
- Sourcing, collecting and/or selecting data/ information/knowledge
- Analysing and/or interpreting data/information /knowledge including synthesising knowledge e.g. through systematic reviews
- Identifying user needs for data/information/ knowledge
- **Slightly more respondents (70%) were involved in ‘transferring, sharing, presenting and/or communicating data/information/knowledge’, and slightly fewer (53%) were involved in ‘identifying user needs for data/information/ knowledge’.** See figure 1.

*Figure 16: Nature of specialist data/information/knowledge work*

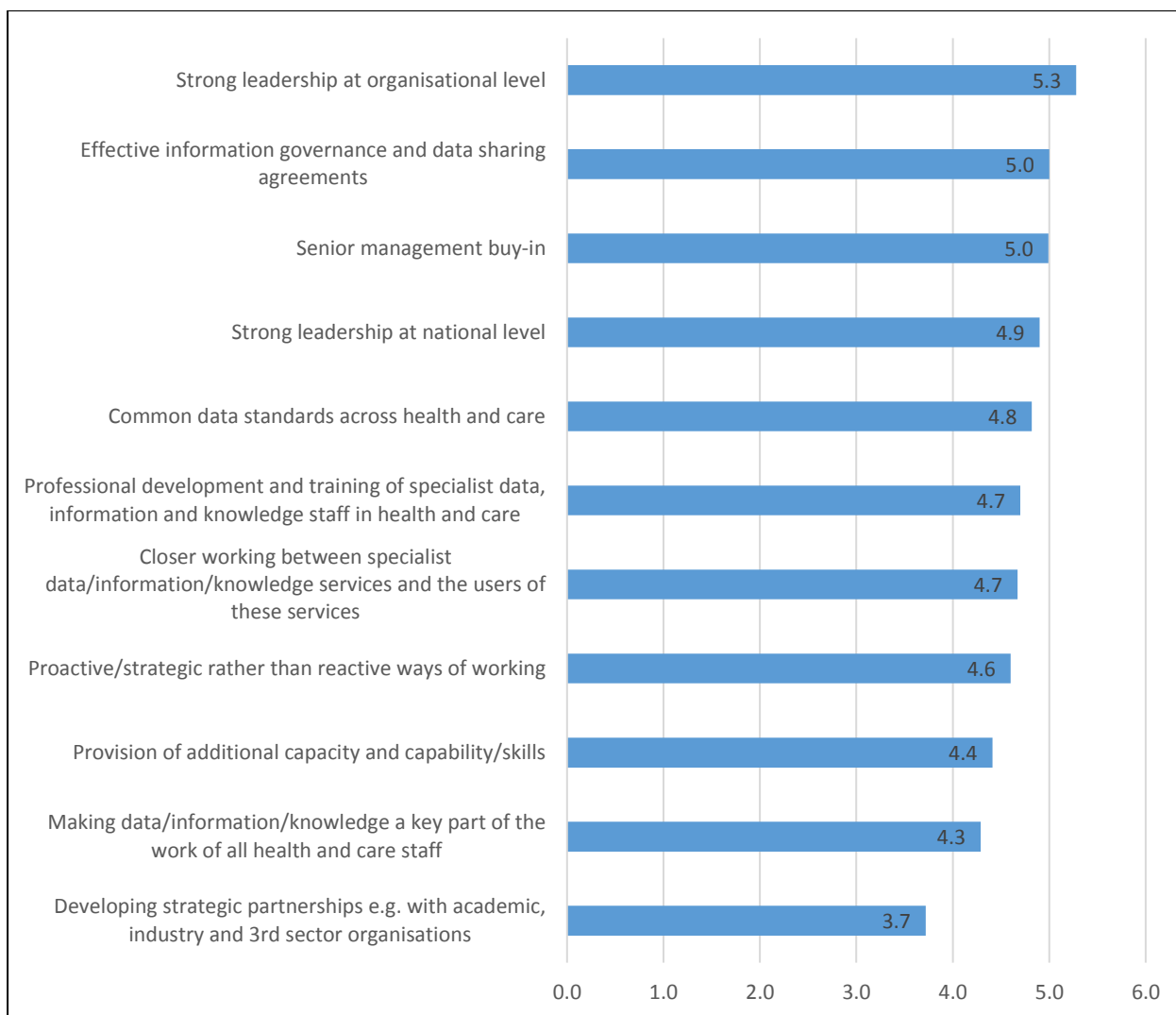


N=617

- The main purpose of the majority (82%) of respondents' job roles is in **service improvement/development and/or in service planning**. Only 15<sup>th</sup> Only 15% respondents said that their main job purpose was in 'frontline care'.
- The main users of specialist data, information and knowledge services are service managers or team leaders (58%) and clinical or frontline teams (51%); with national government being the main users of 44% respondents. Service users/patients and the general population were the main users of more than a fifth (23%) of all respondents.
- The vast majority (92%) respondents considered that their specialist data/information/knowledge work has a positive impact on health and social care; however, it is notable that 8% respondents did not think that their work had had a positive impact. **Almost one third of all respondents (30%) provided examples that ‘demonstrate the value of specialist data/information/knowledge staff in health and social care – indicating that they are proud of the work that they do.** These examples of value related to:
  - Service planning and efficiency (23%)
  - Strategic planning (13%)
  - Performance management (10%)
  - Patient/service user safety and outcomes (10%)
  - Making data/information/knowledge accessible and usable (7%)

- Workforce planning (6%)
- Public health (5%)
- Public trust (3%)
- Workforce development and training (2%)
- The 'most important influence of change' in specialist data/information/knowledge work is seen as the **growing demand for data/information/knowledge**; with digital transformation of health and care being identified as the second most important driver. Service focused developments (specific health and care policy development, new health and care models, and the development of service-user led health and care) are seen as important, but less so. Advances in the potential of data, information and knowledge, such as Artificial Intelligence are seen as important, but the least significant driver.
- **Strong leadership at organisational level is seen as the most helpful way to enable SDIK services respond to changing needs. Senior management by-in and effective information governance and data sharing agreements** were also seen as very important facilitators. The development of common data standards, professional development and training and closer working between specialist data/information/knowledge staff – together with proactive/strategic rather than reactive ways of working were also seen as very helpful. See figure 2.

*Figure 17: What would help specialist data/information/knowledge services respond to changing demands/needs for specialist data, information and knowledge services in health and care*

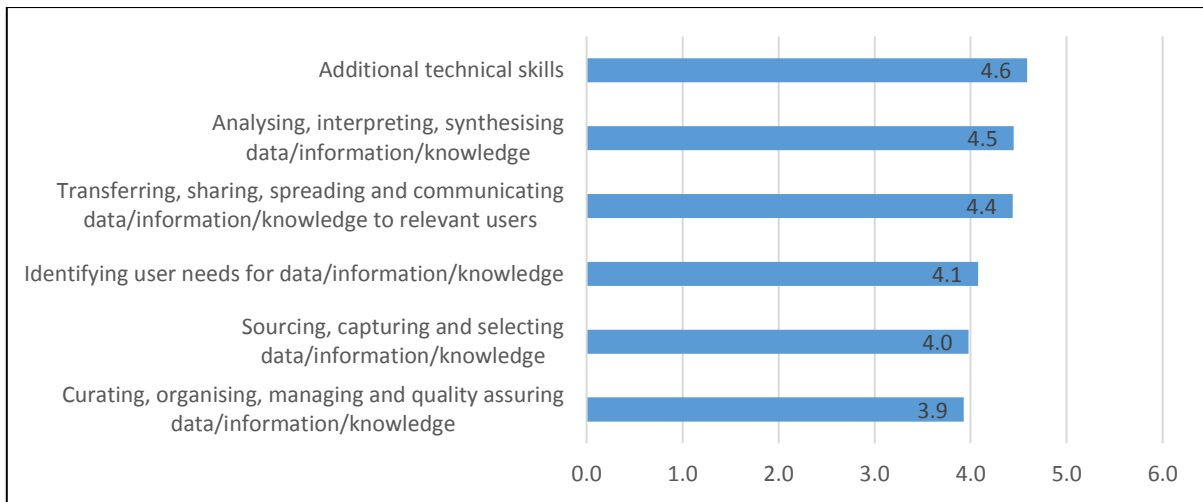


On a scale of 0 – 6, where 0 = not helpful and 6 = essential  
 396 responses; 64% all respondents

- Respondents **welcome all suggested learning and development opportunities**, with opportunities for developing additional technical skills; analysing, interpreting and synthesising; and transferring, sharing spreading and communicating data/information/knowledge being particularly welcome. See figure 3.

*Figure 18: Learning/development opportunities welcome*

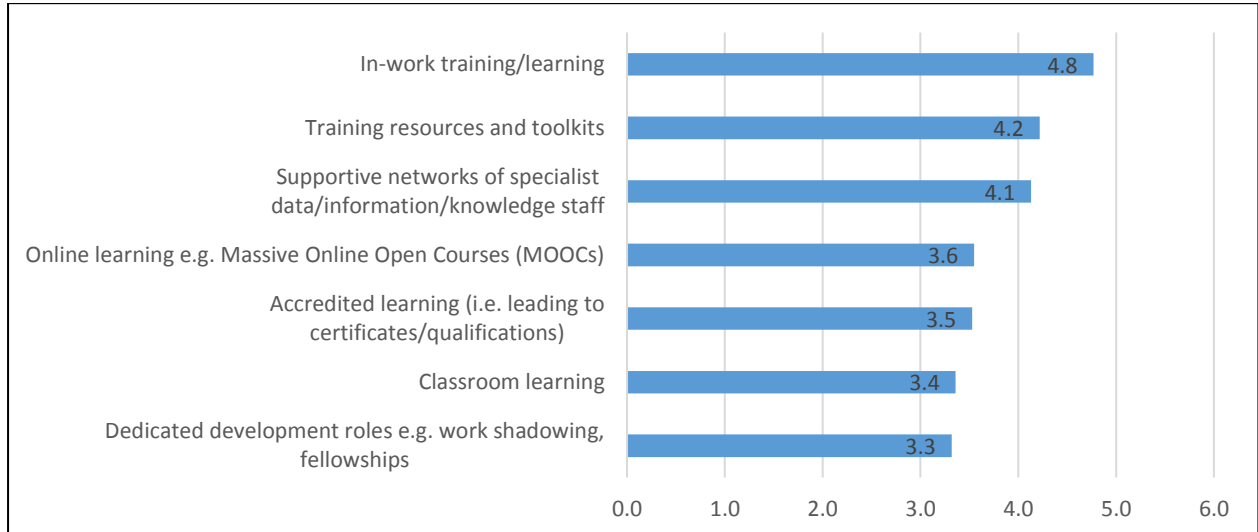




On a scale of 0 – 6, where 0 = not welcome and 6 = definitely welcome  
395 responses; 64% of all responses

- **In-work training/learning** is the most welcome approach to meeting learning and development needs. Accredited learning opportunities were not as preferred as **less formal, more self-directed learning approaches** such as training resources and toolkits, and supportive networks of colleagues. Respondents comments stressed the importance of learning and development being linked with day-to-day work practice. See figure 4.

Figure 19: Preferred approaches to learning and development



On a scale of 0 – 6, where 0 = not preferred and 6 = definitely preferred  
395 responses; 64% total response

- Lack of funding was perceived as the biggest barrier to learning and development needs, with lack of capacity in the specialist data/information/knowledge workforce, and lack of clarity about the skills required by that workforce seen as a bit of a barrier. **Respondents did not consider that the lack of networking opportunities, lack of awareness about colleagues in similar roles, or lack of management support as major barriers.**

- Only 6% respondents said that they were currently engaged in defined learning activities (i.e. not ongoing on-the-job-learning, such as web-searching, learning from colleagues), notably online learning activities. One reason for this may be the **absence of any national framework for specialist data/information/knowledge education.**
- Only 15% of respondents said that they were currently involved with professional networks, with 161 widely varying networks identified. This perhaps reflects the **factionalisation of the specialist data/information and knowledge workforce, with an absence of a platform for this staff group as a whole.**