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RESEARCH ARTICLE

THE COMPETENCIES USED BY HEALTH SECTOR INFORMATION QUALITY ADVOCATES TO IMPROVE DATA QUALITY

Manal Almalki[2], Lee Ridoutt[1], Beth Reid[1], Paul O'Connor[1], Vicki Bennett[3], Richard Marshall[1], Bin Jalaludin[1], Rumanusina Maua[4]*

1. Human Capital Alliance Digital Health Unit, NSW, Australia
2. Department of Public Health, College of Nursing and Health Sciences, Jazan University, Jazan, Saudi Arabia
3. Australian Institute of Health and Welfare
4. Health Information Systems Adviser, Public Health Division, Pacific Community (SPC), Fiji

Correspondence: lee.ridoutt@humancapitalalliance.com.au

ABSTRACT

BACKGROUND:

The role of an Information Quality Advocate (IQA) has emerged as critical in ensuring the reliability, applicability, and usability of health information across its lifecycle. IQAs bridge gaps between stakeholders, integrating data management processes and promoting informed decision-making.

OBJECTIVES:

Building on previous research that identified broad competency areas for IQAs, this study explores the specific competencies required for effective IQA performance.

DESIGN:

A qualitative content analysis was conducted using data from semi-structured interviews with eighteen IQAs identified across various countries. The interview schedule attempted to reveal required competencies for the IQA's current and most recent job and for dealing with critical incidents. All IQAs were also asked to detail their 'top four' competencies for the IQA role. The competencies were categorized into conceptual, human, and technical skills, and IQAs assigned into top, middle, and lower management level classifications.

RESULTS:

Findings revealed distinct skill requirements at each different management level, highlighting the evolution of competencies as IQAs progress within organizational hierarchies. Top management requires strategic conceptual skills such as stakeholder engagement and change management and advocates for data quality at a high level, whereas middle and lower management focus more on project management and technical problem solving. At all levels high order communication skills and the capacity to initiate and sustain collaboration are important IQA competencies.

CONCLUSIONS:

This research provides a nuanced understanding of the competencies required for IQAs, supporting the development of targeted training programs and promoting cohesive, high-quality data management practices in healthcare settings. Future work could investigate the relationship between data maturity contexts and the competencies required for IQAs.

This would involve employing a data maturity classification method, with the WHO's SCORE tool being a practical choice due to its widespread application and relevance.

KEYWORDS
information quality advocacy, competency frameworks, healthcare data management, clinical information quality

INTRODUCTION

Globally, healthcare expenditures account for a substantial proportion of many nations' gross domestic product (GDP). In 2022[1] countries like the United Kingdom and Sweden allocated 11% of their GDP to healthcare. This significant investment reflects the importance for efficient and effective health services to maximize health outcomes and patient satisfaction. To achieve this, health systems are increasingly investing in clinical information technology systems, such as electronic health records and electronic finance systems. At the same time, healthcare systems are also placing a greater emphasis on improving the quality of the clinical information to ensure that healthcare delivery is safe, effective, and patient-centered, while also providing mechanisms for accountability and continuous improvement [1].

High quality clinical information supports the establishment of benchmarks that gauge the performance of healthcare providers, informs healthcare providers in refining their clinical practices and organisational processes, and ensures consistency in care delivery across different settings and providers [2]. Good clinical information can enhance coordination and collaboration among different healthcare providers, reduce the incidence of complications, and minimize the need for repeated health care utilisation, leading to cost efficiencies for healthcare systems and more integrated and seamless patient care [3].

To maximise data quality, it is essential to develop a skilled workforce that is capable of handling the complexities of information technology systems and the resulting health information. Data collection, analysis, interpretation, and response requires a range of health professionals working together, including, clinicians, health informatician, data analysts, data custodians, data stewards, clinical coders, health information managers, and finance managers [4; 5]. However, these professionals tend to function, like many other specialised professions in the healthcare system, in operational silos that are connected but not always integrated [6] leading to potential duplication, while responsibility for other areas of the cycle from data collection to action may be unallocated leading to potential gaps. . Therefore, there is a need for a dedicated role to oversee and seamlessly integrate information quality processes in healthcare settings.
An information quality advocate (IQA), a function previously identified and termed by Ridoutt, et.al. [7], ensures the integrity, reliability, applicability and interpretation of health information throughout its lifecycle. IQAs bridge gaps between various stakeholders, promoting cohesive data management and informed decision-making. Where IQAs exist, they significantly enhance the validity, reliability, and fitness for the purpose of collected data [1]. The function is not new but, recognising this role as an IQA, is new. One purpose in publishing this research is to advocate for the recognition of this role

Previous research [7] recognised the need for focused training programs to develop skilled IQAs and identified key broad competency areas. The current study aims to delve deeper into the specific competencies required for effective IQA performance. The key objectives of this research are to:

(1) identify the competencies used by people already working as IQAs,
(2) compare these competencies to those identified previously, and
(3) contextualise the competencies by differentiating the competency requirements based on different contexts, particularly considering the management level of the IQAs.

[1] Available at https://apps.who.int/nha/database/Select/Indicators/en. Accessed 12 July 2024

METHODS

STUDY DESIGN

Interviews were conducted using a semi-structured interview approach. The interview schedule was developed based on a comprehensive review of existing literature on IQA competencies and informed by the research team's preliminary findings [7]. The schedule (Appendix A) was designed to ensure consistency in data collection while allowing flexibility to explore unique perspectives. The interview schedule included the following five areas:

1. Interviewee background characteristics: profession, designated role, seniority, career pathway, geographic and service location, etc.
2. Current position and perceived types and levels of competence required for the IQA role.
3. Previous positions (career path) and the competencies required to perform previous roles.
4. Data quality successes and the barriers to achieving data quality, explored through a critical incident approach as described by Flanagan [8].
5. Perceived key competency requirements for the IQA role.

Note that data collected from the interviews on the competencies required for previous positions and on the critical incidents is not included in this paper. The quality and usefulness of analysis of the previous positions, which was meant to explore evolving competency requirements, was undermined by previous positions being 'too close' to current positions consequent of sideways job movements, or by positions being 'too distant' to current positions, the result of a dramatic change in career from say clinician to IQA (this was more common in Pacific Island Countries). It was found that analysis of the current position requirements when cross-tabulated with management level provided more useful insight to the changing competency requirements of career progression. The critical incident data will be the subject of a separate paper.

RECRUITMENT OF INTERVIEW SUBJECTS

Prospective interviewees were recruited through a judgement sampling process and supported where necessary, by snow-balling techniques (that is interviewees were asked to nominate other IQAs for possible interviews). The interviewees were selected from regions around the world that have implemented the Australian classification system ICD-10 AM for diseases and ACHI procedure classification. While the results apply across the health system, the choice of a common classification system was to remove any potential jurisdictional biases. The research team approached individuals that had participated in previous research as well as through trusted intermediaries. The potential for under representation in the number of interviewees was countered by the selection of respondents that had a disproportionate responsibility in an "expert" capacity of total health systems.

Interviewees were considered to be in an IQA role if they met the following criteria:

- Occupying a senior or executive-level role within a large hospital, a regional health administration, ministry of health, etc. with the capacity to influence data quality or ambition to obtain such a role.
- Using information in decision making processes, or facilitating or advocating for information use by others in acute, outpatient, community or population health settings.
- Demonstrating interest in improving data quality for clinical, financial, health services planning or population health purposes.
- Experiencing or observing critical incidents where data quality was impacted, affecting decision-making processes.

Each interviewee's decision to participate in the research was entirely voluntary and based on sufficient information and adequate understanding of both the proposed research and the implications of participation in the research (Australian

National Statement on Ethical Conduct in Human Research, Section 2.2.1 [9]. The recruitment strategy for the research was fully relevant to the research methodology and the potential participants (Section 3.1.12).

DATA COLLECTION PROCEDURE

The interview schedule was sent to each participant prior to the interview so they could prepare. Interviews were then undertaken by a member of the research team in English. Each interview lasted approximately 60 minutes and was conducted via Microsoft Teams or Zoom. Participants were informed of their rights, including the ability to withdraw from the study or discontinue the interview at any time without any consequences.

With the interviewee's consent, interviews were recorded to ensure accurate data capture. Interview notes were kept by interviewers from each interview and where appropriate, the recording of interviews was used to check the accuracy of the notes. Selected interview notes and transcripts, those nominated as particularly interesting or complex by the original interviewer, were reviewed by a second researcher and summary notes edited.

In our study, a formal institutional ethics approval was deemed to be not required. The decision was made under the Australian National Statement on Ethical Conduct in Human Research [9], which allows for exemption from ethics review where research involves negligible risk (Section 2.1) and uses non-identifiable data (Section 3.1).

The study adhered to internationally recognised ethical standards for low-risk professional research. All participants were engaged in their professional capacity, and no personally sensitive data were collected. The interviews focused exclusively on professional roles, experiences, and competencies. All data were anonymised at the point of transcription, and as noted above, informed verbal consent was obtained from participants prior to their participation.

DATA ANALYSIS PROCEDURE

Interview transcripts and notes were circulated amongst the research team and then thematically analysed in three phases. In the first phase, a broad categorisation of the data was performed by using ChatGPT and Co-Pilot. The incorporation of these AI tools streamlined the initial data processing and theme identification phases, initially allowing for efficient handling of large volumes of qualitative data. While providing competency themes that could be readily sense checked, the AI analysis proved to be insufficiently sensitive to variation in the way competencies were being described (and therefore their meaning) by different interview subjects.

In the second phase then, the interviewee sample population was categorised according to their work location, qualification level and professional background into three management levels (i.e., Top, Middle and Lower). The differentiation by management level was based on the participants' stated positions and profiles. Consensus was reached among the research team on this ranking of the participants' profiles.

In the third phase, a comprehensive list of competencies was compiled from the data. These competencies were categorized into conceptual, human, and technical skills using Katz's three-skill approach [10]. Competencies related to decision-making, strategy, or large-scale organizational understanding were classified as 'conceptual' skills. Competencies emphasizing interaction, communication, leadership, or interpersonal dynamics were classified as 'people' skills. Competencies focused on specific tools, technologies, or data management techniques were classified as 'technical' skills. Similar competencies were grouped, duplications were removed, and discrepancies in the classification were discussed by a subset of the author team and resolved through consensus. Finally, frequency analysis was conducted to identify the most commonly reported competencies.

RESULTS

CHARACTERISTICS OF INTERVIEWEES

We conducted 18 interviews. The background of the interviewees is provided in Table 1.

TABLE 1: DISTRIBUTION OF THE INTERVIEW SAMPLE POPULATION BY SELECTED PERSONAL CHARACTERISTICS

Characteristics	N (18)	Percentage (%) of total interviewees
Country		
Kingdom of Saudi Arabia	7	38.9
Australia	5	27.8
Pacific Island Countries	4	22.2
Ireland	2	11.1
Highest qualification		
PhD	2	11.1
Master's degree	14	77.8
Bachelor's degree	2	11.1
Professional / Educational background		
Clinical	10	55.6
Health Information Management/Informatics	5	27.8
Other	3	16.7

Over half of the interview subjects (n=11, 18%) were currently employed by a Ministry of Health or an allied department / agency or the head office of a corporate health entity, while three participants (18%) were working at a regional, 'cluster' or large hospital level in the health system, and two (18%) were employed in national or multinational information institutes, and the rest in consultant or vendor roles (n=2). Most of the interviewee sample population held at least a Master's degree as their highest qualification (two had a Bachelor's degree and two had a PhD). A majority of the interviewees (10/18%) came originally from a clinical background, five from a health information beginning and three from other backgrounds. Interviewees were categorised as top, middle or lower-level management (Table 2).

TABLE 2: DISTRIBUTION OF THE INTERVIEW SAMPLE POPULATION BY MANAGEMENT LEVEL OF CURRENT POSITION (N = 18)

Management level	Typical job titles	Number of interviewees	Percentage (%)
Top Management level	Chief; Director; Consultant or advisor	8	44.4
Middle management level	Manager; Head of Unit	7	38.9
Lower Management level	Data analyst; Administrator	3	16.7

COMPETENCIES REQUIRED AT DIFFERENT MANAGEMENT LEVELS

The competencies required by interviewees to perform their current job was analysed by the management level assigned in Table 2 above. The results of the comparison are shown in Table 3.

TABLE 3: PERCEIVED COMPETENCIES NEEDED BY MANAGEMENT LEVEL OF CURRENT POSITION

Proportion of interviewees	Management level of current position		
	Top Management (n = 8)	Middle Management (n = 7)	Lower Management (n = 3)
Competencies reported by 50% or more interviewees	Knowledge of classifications and pricing models Communication skills Change management Stakeholder management and influence Effective collaboration Project management Training and mentoring Technical competencies	Data analysis and reporting Communication skills Policy knowledge and development	Communication skills Data analysis Technical systems and network understanding Management and coordination skills
Competencies reported by 25-49% of interviewees	Strategic thinking and decision-making Data and system migration Data analysis	Negotiating skills Stakeholder engagement Continuous professional development Quality tools knowledge Project management	Familiarity with software tools (e.g., Power BI) Attention to detail People skills Professional report writing Leadership engagement Self-motivation and initiative

Several competencies are identified as necessary for the IQA role by two or more levels of management (for example 'communication skills' and 'data analysis' skills), while others appear to be more idiosyncratic to a particular manager level (for example 'change management').

ANALYSIS OF THE TOP 4 COMPETENCIES BY SKILL TYPE AND MANAGEMENT LEVEL

At the end of the interview all interview subjects were asked to identify the top four highest priority competencies that an IQA requires. The competencies identified were classified into type of skill categories (conceptual, human, and technical) and then grouped into levels of management (Table 4).

TABLE 4: DISTRIBUTION OF THE TOP FOUR COMPETENCY REQUIREMENTS OF THE INTERVIEW SAMPLE POPULATION BY MANAGEMENT LEVEL OF CURRENT POSITION AND TYPE OF COMPETENCY BEING NOMINATED

Level of management	Type of skill		
	Conceptual skills	Human skills	Technical skills
Top Level Management	Change management Strategic thinking and decision-making	Effective Communication skills Stakeholder management and influence Training and mentoring	Knowledge of classifications and pricing models Data and system migration Risk management

Level of management	Type of skill		
	Conceptual skills	Human skills	Technical skills
Middle Level Management	Project management Quality tools knowledge	Communication skills with managers Leadership skills Stakeholder management and Negotiation Continuous professional development	Data analysis and reporting Policy knowledge and development
Lower Level Management	Problem-solving abilities	Communication skills	Technical systems and network understanding Familiarity with software tools (e.g., Power BI)

COMPARISON WITH PREVIOUS RESEARCH

Six broad competency areas were identified by a third or more of a sample of participants at the 2022 PCSI Conference as important to the capacity of an IQA to perform their role [7]. These six competencies were compared with those reported by interviewees working at the top management level (Table 5).

TABLE 5: COMPARISON OF PREVIOUS AND CURRENT RESEARCH FINDINGS

Originally identified IQA competency requirements [7]	Competency requirements for IQAs identified in this study*	Comment
Data governance principles		Skills in data governance are more strongly required at the 'Middle' management level
Information and system governance	Technical competence in data management and IT systems Analytical and problem-solving skills Knowledge of classifications and pricing models	These competency areas are often grouped together under a broad term of 'Technical and analytical skills'.
Quality management	Change management skills Strategic thinking and decision-making Project management	Slightly stronger relationship with quality management at the 'Middle' management level

Originally identified IQA competency requirements [7]	Competency requirements for IQAs identified in this study*	Comment
Stakeholder engagement	Communication skills Collaboration work Stakeholder management and influence	At lower management levels communication skills and capacity to engender collaboration are important. At top management level these skills support skills in stakeholder analysis and engagement
Develop organisation's information culture		This area of competence was not identified in the current research, although it could be argued to be part of change management
Apply leadership strategies to digital health	Leadership Training and mentoring	Leadership includes critical and strategic thinking and applies at different levels, but arguably Team Leadership is the highest priority

DISCUSSION

COMPETENCIES REPORTED BY INTERVIEWEES

The comparison between competencies needed at different management levels (Table 3) is limited by the smaller number of interviewees in the lower management level, but differences between required skills mix is discernible - especially if the focus is on the more frequently nominated competencies. **Communication skills** and **Data analysis** were required, in some form, at all levels of management. At the top management level, **Change management** and **Stakeholder management and influence** are distinguishing competencies, whereas at middle management level, the requirement for **Policy knowledge and development** competence is a point of differentiation. At lower management levels, **Leadership** (middle management, probably in relation to teams) and **Problem solving** (lower management, probably more technical problems) are differentiating competencies. At higher levels of management there is some degree of idiosyncratic competence requirement for IQAs depending on the specifics of their roles.

Regarding common competencies frequently nominated by all three management levels (e.g., Communication, Data Analysis), they are seemingly applied in different ways at different management levels. In the lexicon of competency-based training and education [11], these types of competencies are called 'nested' competencies where the more advanced levels of capability are reflected in higher order cognitive processes, levels of specialisation and/or autonomy. Table 4, which uses a list of competencies generated from interviewee nomination of their 'top four' competency requirements, compares competencies by level of management and skill type. This provides a slightly different perspective but delivers quite similar results. Technical skills seem to be important at all management levels, albeit the types of technical competence requirements at top management level are arguably more strategic and more cognitively demanding. There are several other competencies that are required by several or all levels of management

(communication related skills, stakeholder management type competencies). Top level management is differentiated by two key competencies 'Change management' and 'Strategic thinking and decision-making'.

COMPARISON WITH PREVIOUS RESEARCH

Using all the findings detailed above regarding the competencies required for the current job and the top four competencies identified by interviewees, five of the six originally identified competencies were validated (Table 6). While largely validating the direction of the original research findings (except for 'Develop organisation's information culture'), the current research builds a stronger and more nuanced picture of competency requirements. For instance, the broad competence of 'Stakeholder engagement' is now better understood as incorporating a suite of competencies such as communication (written and verbal), interpersonal skills, the facilitation of collaborative actions, and stakeholder engagement and management. It also evolves, over a career, to include increasingly external engagement with stakeholders, first with stakeholders outside one's immediate team and eventually with those outside the organisation.

In Table 6, the place of 'technical and analytical skills' is interesting. The requirement for these competencies is clearly important, but depending on the role context, the competencies actually applied in the role, can vary from more operational (for instance interpreting complex data sets and extract meaningful insights) to more strategic (for instance using data management systems and technologies to underpin data quality improvements). The findings also seemed to suggest that most technical competencies are acquired earlier in the career of the IQA and just continually built upon to accommodate increasingly strategic contexts.

THE IQA ROLE COMPETENCY REQUIREMENTS ARE CONTEXT INFLUENCED

The main contextual variable that influenced competence requirements was the management level of the interviewees current position. Katz [10] defines an administrator (leader) as one who (a) directs the activities of other persons and (b) undertakes the responsibility for achieving certain objectives through these efforts. Even if an IQA is not in a line management position, one could argue they are (leading and) directing the actions of others. Who these might be would vary between lower-level management (e.g., members of own team, colleagues in the HIS department), middle level management (e.g., other managers in health information, finance and clinical services) and top-level management (e.g., senior managers, key stakeholders in the health system, financial controllers).

Katz's theory classically is that as one moves from lower management to top management, the emphasis shifts from requiring mostly technical and direct problem-solving skills to mostly applying conceptual and abstract thinking, along with high-level leadership. The findings of this study do not seem to fully support this theory for IQAs. In particular, the importance of technical skills, even if they might have evolved, seems to remain important at all levels of IQA management.

At the IQA middle management level, the increased requirements for greater human skills does provide more support for Katz's theory. Middle level IQAs seemingly need to develop and direct their communication skills into more focused actions like engaging stakeholders, actively negotiating, and leading and developing people around them.

At the IQA top management level, Katz's postulated greater need for more conceptual skills is only partly supported. However, one could argue that change management is such a large and all-encompassing area of competence that it is likely to be a dominant skill requirement that makes other human and even technical skill requirements subordinate.

Another contextual factor influencing the IQA role and therefore the competence requirement that seemed to be important from the data was the interviewees' country (or geographic region) of work. There were differences between groups of interviewees from different countries, both in types of competencies required and also in how the competencies are applied. However, the number of interviews conducted was not sufficient to support a quantitative exploration of this issue to establish reliable patterns.

While it is tempting to hypothesise that any differences in IQA role across countries or regions relate to health system or cultural approach differences, a more likely and potentially more precise theory is that the key influencing factor on IQA role differences is the level of data maturity of the context in which they operate. Thus, it might be conjectured that a

context (country, region, hospital) where data maturity is high will require an IQA to possess more strategic conceptual skills and competencies to facilitate better collaboration between (already existing) technical capabilities. In a context where data maturity is low, an IQA, even in a top management role, will be required to possess and use technical competencies more and supplement these competencies with human skills that can harness the full potential of the team whose members contribute to the quality of the data.

STRENGTH AND LIMITATIONS

This study has three strengths. Transferability was addressed by recruiting a diverse sample of IQAs from various countries and healthcare contexts. Dependability was achieved through detailed and transparent documentation of the research process. Confirmability was achieved by having multiple researchers independently review and verify the themes and competencies identified, ensuring that the findings were grounded in the data rather than researcher bias.

The main limitation is the small sample size. In order to achieve greater power in the cross-tabulations (for example by level of manager) a larger sample population spread more evenly across the management levels would have been beneficial. As noted elsewhere, a cross-tabulation by country (or digital maturity) was precluded by the small number of interviews.

CONCLUSION

Our sample size is small and based on health sector contacts in a comparatively limited number of countries, so our conclusions are somewhat tentative. Nevertheless, the insights supplied by the interviewees contribute to an emerging understanding of the competencies required to carry out this role. The competency requirements are influenced by the context in which people work including the management level of their current position. The detail of the conceptual, human, technical skills may provide a useful guide for new entrants to the IQA role, for those wishing to advance their career and as a benchmark for IQA capability assessment.

In an earlier paper [7], we proposed that more training and support for people to fill the IQA role is critical to improving the quality of the data. This study has confirmed the need for such training and validated the key competencies of IQAs that need to be developed. However, training content and approaches need to account for variation in learner needs based on their level of career progression and the data maturity of the system within which they work.

To build a cohort of IQAs, the training needs to be appropriate (comprehensive attainment of relevant learning outcomes), and effective (delivering learning outcomes as quickly as possible and for the least cost). Training options will therefore need to be highly flexible and able to be packaged in modules that can be accessed when appropriate. Because of this, it is unlikely a single, all-encompassing course intervention will be efficient. An initial focus on the development of 4-5 key modules (probably non-technical because this will be a strength of most IQAs) would seem appropriate.

Further work could explore the relationship between the data maturity context and IQA competence needs. This will require a means of classifying data maturity. There are a number of methods available (see Carvalho, et al., [12]), some of the most popular being the Global Digital Health Index Indicator Guide [13], Informatics Capability Maturity Model [14], Health Information System Stages of Continuous Improvement Toolkit [15]. A composite of these was recently created specifically for Pacific Island Countries [16]. From a practical perspective it is perhaps safest to employ the World Health Organisation's SCORE tool [17], since this has already been used to rate 133 countries in their level of data maturity.

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APPENDIX A: INFORMATION QUALITY ADVOCATE INTERVIEW SCHEDULE

Name of Interviewee	
Organisation	
Position description	
Country	
Contact details in case of any need to follow up to clarify content	

BACKGROUND

We, the proponents of this research, hypothesize the need for a role within the health workforce of an information quality advocate (IQA) to facilitate the necessary structural and process changes to ensure sustained quality of collected data. We have published on this role and proposed a set of competencies required for this role. If you are interested, we can send you our previously published research.

This study will build on the earlier work to:

(1) Further understand specific competency needs in different settings believed critical to IQA performance

(2) Explore the facilitators and barriers to successful deployment of IQAs in real world environments.

The research will conduct interviews with between 20 and 30 individuals in different data collection contexts and countries. You have been identified for interview by a member of the research team or an associate because it is believed you are already playing the role of an IQA (even if not specifically identified as such) or could potentially be playing that role. You may also be someone who uses data/information for decision-making and has an interest in ensuring that the information you use is timely and accurate.

Participation in this interview is voluntary. If you wish to stop the interview at any point, please just let us know and we will cease the interview. **Are you happy to proceed with the interview?**

Also, I would like to record today's session, with your permission, and I'll also take some notes throughout. The notes and recording will be destroyed once we have analysed the data from all the interviews we do. We won't use any names or identifiable information in our report - confidentiality will be maintained.

CAREER HISTORY

Question 1

What are your qualifications and in what year did you obtain the qualifications?

Qualifications	**Year obtained**

What is your current position (prompt: official title)? How long have you been in your current position? Can you describe the role briefly in terms of key duties / tasks? How does data quality impact on your role?

What skills and knowledge (competencies) did you have to develop, either to gain your current job or to learn on the job, to perform it adequately once appointed?

Question 2

What job were you doing immediately prior to this job? Did it have a focus on data quality … please describe the job? What prompted you to seek that job?

What skills and knowledge (competencies) did you have to develop, either prior to gaining this job or after being appointed, to perform it adequately?

Question 3

Repeat the above questions to gain insight into the career history, tracing back job changes until the career change that initiated a strong focus on data quality.

Question 4

How did you come to take an interest in data/information quality?

CRITICAL INCIDENT TECHNIQUE

Note for interviewers" …

*By **an incident** is meant any specifiable human activity that is sufficiently complete in itself to permit inferences and predictions to be made about the person performing the act. To be critical the incident must occur in a situation where the purpose or intent of the act seems fairly clear to the observer and where its consequences are sufficiently definite to leave little doubt concerning its effects[1]."*

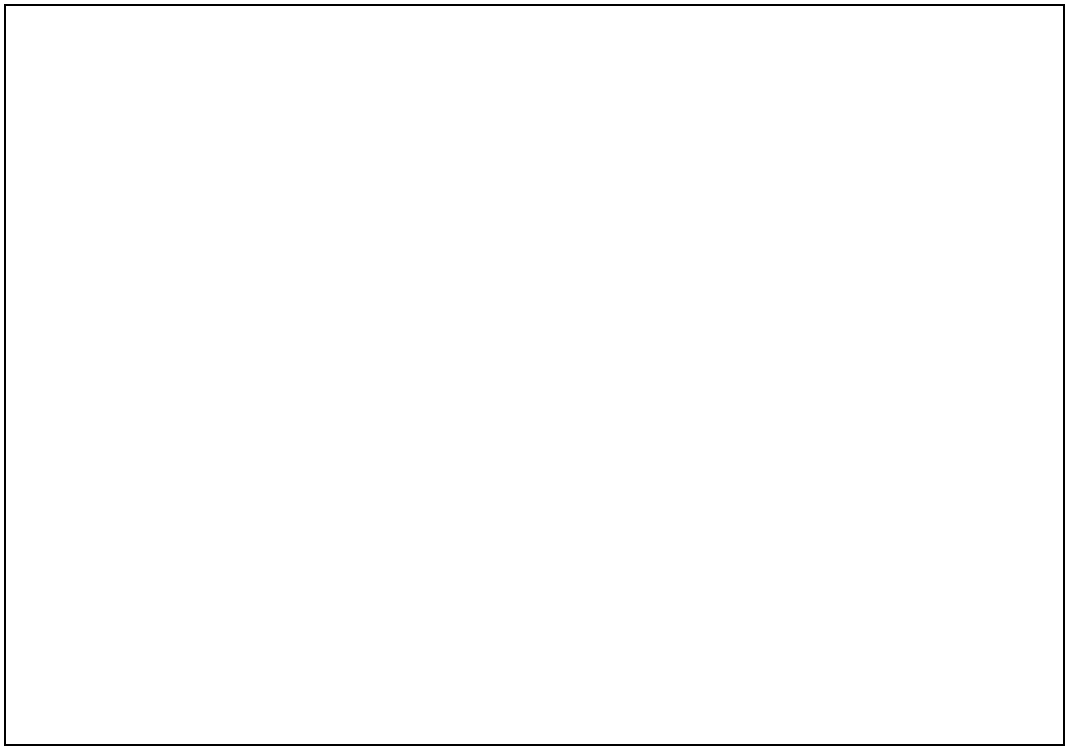
Question 5

I want you to think about a critical incident that you were either involved in or observed as a third party. A critical incident could be a decision, introduction of a new process or procedure, a manager's or worker's behaviour, that you felt clearly impacted quality data outcomes (positively or negatively). The incident might be short term / immediate or longer term. It could have happened in the last 12 months or further back.

An example of a critical incident might be the adoption of a new policy by a specialist doctor to review discharge notes for all junior doctors (interns, registrars) in a hospital department which led to significantly improved details and specificity in the discharge notes available to clinical coders.

Probe options:

- Can you describe the incident?
- What led to or prompted the particular situation or incident?
- How was it able to be considered 'critical'?
- What was the impact on data quality in response to the incident?



Question 6

What were the key competencies (skills and knowledge) that were engaged in the response? Or should have been engaged in order to obtain a better data quality outcome?

Probe options:

- What were the competencies employed that created an improved data quality outcome?
- Alternatively, what competencies (skills, knowledge, attitude) were lacking that might have averted negative consequences?

Repeat these questions for each incident the interview subject can remember and describe.

Question 7

Thinking back on all of the incidents you have described, can you list the top four competencies you think are required to improve and maintain high data quality?

[1] Flanagan, J. C. Critical incident technique. *Psychological Bulletin*, Vol. 51, No. 4, July 1954