

Faculty of Clinical Informatics

Development of Core Competencies for Clinical Informaticians in the United Kingdom

Report B. Phase 1 Report Validation Study and draft Output Competences for a Clinical Informatician (v1.1)

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18/11/2019

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1. FCI Core Competencies Project – scope and rationale

1.1 Overview

The Faculty of Clinical Informatics (FCI) was established to support the needs of Clinical Informaticians (CIs) in the United Kingdom (UK). The FCI defines CIs as health and care professionals “who use their unique knowledge and experience of both person-centred care and informatics concepts, methods and tools, to promote care that is safe, effective, efficient, timely, person-centred, and equitable”¹.

Two overarching aims for the FCI at its inception were to;

- Develop professional competencies for clinical informaticians.
- Provide accreditation for informatics-based training programmes

The vast scope and range of activities covered by clinical informatics sometimes makes it hard to provide a short and pithy description of what we do and who we are, when challenged to do so. The Core Competencies Project (CCP) has been set up to help the Faculty of Clinical Informatics (FCI) meet this challenge and set out the core competencies required for an individual to be recognised as a professional clinical informatician.

At some stage the FCI will also need to consider the wider training needs for all clinicians at undergraduate and postgraduate level, and the minimum and desirable competencies they must have, whatever career pathway they choose. That is out of scope for this project but will need to be addressed in the near future.

The Core Competencies Project provides a methodology for the development of core knowledge and skills-based competencies for Clinical Informaticians and the mechanism by which these competencies can be mapped to educational and professional developmental initiatives for accreditation. Evidence that an individual has achieved these core competencies should qualify that person for membership of the FCI.

1.2 Project Aims

- I. Develop core knowledge and skill-based competencies required for UK based CIs.
 - a. Develop, test and define the output core competences required of a professional clinical informatician (phase 1)
 - b. Define the core skills, knowledge and traits that constitute the core (input) competencies to enable an individual CI to do the job. (phase 2)
- II. Develop a process for accrediting informatics educational applications through the FCI. (phase 3)

Phase 1 of the CCP was undertaken directly by the FCI project team and is presented as two linked reports:

- A. Develop and define the professional attributes of a clinical informatician – final report (v1.1) [Report A - attached]
- B. Phase 1 Report Validation Study and draft Output Competences for a Clinical Informatician (v1.0) [Report B - this document]

¹ 'Clinical Informaticians, FCI Definition'.

1.3 Method

The key task of phase 1 of the CCP was to define the output competences² we expect of care professionals working as clinical informaticians in the UK. Drawing on the expertise of the multi-professional membership of the FCI we used a mix of qualitative methods to derive and refine the list of output competences. Outputs from this phase of the project will then be used in phase 2 of the CCP to define the skills, knowledge and traits that are required to enable the individual clinical informatician to develop their careers and do their job – *the core input competencies*, testing and developing these with key stakeholders as we go³. This framework will be used to develop a systematic mapping process which the FCI can use to accredit educational CI applications (phase 3) – see the project plan diagram below.

CCP Project Plan			
Phase	Led by	Date	Objectives
Phase 1	FCI CCP team		Develop, test and define the output core competences required of a professional clinical informatician
	A	Jul-19	Develop and define the professional attributes of a clinical informatician
	B	Nov-19	Report Validation Study and draft Output Competences for a Clinical Informatician
	C	Feb-20	Final report on output competences after consultation
Phase 2	UoM		Define the core skills, knowledge and traits that constitute the core (input) competencies to enable an individual CI to do the job
	1		A systematic literature review, content analysis and subsequent thematic analysis
	2		Develop a competency framework
	3		Evaluate the framework via expert consultation (semi-structured interviews)
	4	Mar-20	Refine framework & seek wider evaluation via survey
Phase 3	UoM / FCI	May-20	Develop a process for accrediting informatics educational applications through the FCI

Key UoM = University of Manchester

² Competence may be defined in terms of what the individual brings to the job (the input), what the individual does in the job (the process), or what is actually achieved (the output).

³ 'Core' in this context denotes the minimum knowledge base that all CIs must have to be eligible to become members of the FCI and excludes further sub-specialist avenues of education.

The second (main) phase of the project is a systematic review to identify literature-based competencies from recognised databases and the grey literature⁴. Expert opinion, gathered through semi-structured interviews and surveys, will identify expert derived competencies, omissions from and clarifications on the literature competencies in addition to determining the pragmatic scope of the competencies applicable to CIs working across UK health and care. The resultant documents and transcripts will be analysed to identify and group the competencies.

The methodology for this project has been developed with expert academic advice from Dr Lydia Jidkov and Prof. Trish Greenhalgh and is being undertaken jointly by the FCI and the University of Manchester.

1.4 Core Competencies Project (CCP) Progress – Phase 1

Our first report (Report A) set out to develop and define what we tentatively called the professional attributes of a clinical informatician. Report A presented:

- I. Evidence based definitions for clinical informatics and clinical informaticians, and professional attributes of clinical informaticians in the UK
- II. The methodology adopted to develop the definitions and professional attributes
- III. Recommendations for further work

The initial study was based on 16 deliberately sampled interviews with a cross-section of the faculty membership, by speciality, stage of career and gender. A key recommendation from Report A was that the ideas presented should be reviewed and validated by FCI experts, advisers and the wider FCI membership.

The validation stage of phase 1 was undertaken as a semi-structured questionnaire, sent to a second (different) deliberative sample of FCI members, extending the criteria to try to ensure we continued to reflect the expanding membership of the faculty and including members of the public. The FCI is committed to ensuring that the public viewpoint is heard and respected. After seeking assistance from the National Data Guardian (NDG) to identify suitable candidates, we successfully recruited two volunteers from the NDG team (with IT experience) to represent the public perspective in project matters. Volunteers offered their support on a personal basis, drawing on their knowledge about the use of data and evidence of public attitudes towards this.

1.5 Next steps

The findings of the validation survey and draft output competences for clinical informaticians are presented in this report (Report B) to a wider group of FCI experts and advisers for further review, revision and consideration.

The outputs from phase 1 of the CCP will inform and underpin the systematic literature review (phase 2) of the project and will themselves be revised and updated as the project progresses in an iterative way. Phase 2 of the project will be undertaken by the Univ. of Manchester (UoM) under Prof Georgina Moulton, who has close ties with Health Education

⁴ Grey' literature can be defined as 'materials and research produced by organisations outside of the traditional commercial or academic publishing and distribution channels'.

England, Connected Health Cities & Health Data Research UK. We have explicitly included social care within the scope of the study and the UoM protocol will also ensure we hear the public / citizen voice. We expect a final report on the CCP (phases 2 & 3) by the end of March 2020, which will mark the completion of the project.

2. The validation study

2.1 Approach

The FCI secretariat were asked to identify and contact a sample of the FCI membership, broadly representative of the wider membership in terms of age, sex, professional background and career stage, to see if the ideas presented in our first report (Report A) made sense and resonated with our members. 18 individuals responded to the secretariat expressing willingness to be contacted by the lead author (AH) to discuss participation in the validation study. Two members of the public were also recruited after seeking advice from the NDG (see 1.4 above), making 20 individuals in total.

Of the 20 individuals contacted by the FCI secretariat, 18 replied stating that they were prepared to read our first report (Report A) and respond to it by completing a questionnaire. 16 completed responses were received by the end of September 2019 (report cut-off). The questionnaire responses were tabulated where it was sensible to do so (e.g. yes / no responses) and where detailed comments were received, these were copied into the recording schedule, which contains a full transcript of all the questionnaire responses. The questionnaires were analysed using tallies of yes/no, agree/disagree responses and textual analysis of the detailed transcripts to identify commonalities and differences in the responses, to review, revise and update the findings from the first part from Report A.

A copy of the questionnaire in abbreviated form is attached as appendix A at the end of this document and the individual questions detailed responses are discussed below (in 2.2).

2.2 Findings

2.2.1 Q1-4. Professional identity of respondent.

Table 1 provides a description of the questionnaire respondents by area of informatics practice, clinical practice, gender and membership status in the FCI (noting that 2 members of the public were included) and is summarised in Table 2, which shows responses to Questions 1 and 2 from the validation questionnaire.

Q1. What are your areas of clinical practice?

Q2. What are your areas of clinical informatics practice?

Table 1 Description of questionnaire respondents			
Area of Informatics practice	Clinical focus	Sex (m/f)	FCI membership status F=fellow, M=member, A=associate, P=member of public
Clinical informatics lead nurse	Nurse	m	A
Clinical transformation manager	Nurse	f	M
n/a	Member of public	m	P
n/a	Member of public	m	P
Adult social care information sharing projects	Adult social care	m	F
Coding, statistics, data analysis, standards, quality & collection	Public health medicine consultant	m	F
Systems integration, IG, software development & systems integration	Medical physics, imaging, radiotherapy,	m	F
Professional Record Standards Board work	Paramedic	m	A
Clinical data research	GP academic	m	A
Clinical systems evaluation, data analysis, audit & quality improvement	Plastic surgery	m	M
Clinical lead for Health & justice Information System & MOD projects	GP / Prison med / MoD	m	F
Health tech startup founder clinical digital support tools, trained CSO, IG & security aspects	Former surgical registrar	m	M
Diagnostic data handling, messaging and knowledge synthesis from data / information	Path / biomedical scientist	m	M
Healthcare process & systems consultancy	GP	f	A
Integrated health records, patient facing apps & services, digital transformation in primary care, EPS	nurse informatician	f	F
Developing & implementing EPR across acute & community care	nurse	f	M

Table 2 - Summary table of respondents

Nurse	Adult social care	Memb public	Para-med	Pub health med	Med physics	GP	Biomed science	Surgery	Health tech'gy	sum
4	1	2	1	1	1	3	1	1	1	16
male		female								
12		4								16
FCI membership status										
Fellow		Member		Associate		Public				
5		5		4		2				16

Table 3 shows the tabulated responses to the questionnaire (see Appendix A) excluding Q1 & 2 which are shown in Tables 1 & 2 above. The responses are explored in more detail below.

CCP Validation Questionnaire Responses - Recording Schedule - Summary of responses

Table 3													
Respondent details													
Q	Question No.	Nurse	Adult social care	Memb public	Para-med	Pub health med	Med physics	GP	Biomed science	Surgery	Health tech'gy	sum	
	1	4	1	2	1	1	1	3	1	1	1	16	
Table 3													
CCP Validation Questionnaire Responses - Recording Schedule - Summary of responses													
		yes	no	n/a	null							sum	
	4	8	5	2	1							16	
Principles													
		yes	no	partial	n/a	null							sum
	5	12	3	1							16		
	6	11	4	1							16		
	7	13	1			2						16	
	8	13	1			2						16	
	9	14	1			1						16	
	10	15					1						16
Definition of Clinical Informatics													
		yes	no	partial	n/a	null							sum
	11	9	7							16			
	12	8	5			2	1						16
CI areas (scope)													
		yes	no	partial	n/a	null							sum
	13	13	2							1	16		
	14	8	5							3	16		
Definition of Clinical Informatician													
		yes	no	partial	n/a	null							sum
	15	12	3							1	16		
	16	12	1			2	1						16
Professional attributes of Clinical Informatician													
		yes	no	partial	n/a	null							sum
	17	15	1							16			
	18	16							16				
	19	16							16				
	20	14	1					1					16
	21	16							16				
	22	16							16				

Detailed responses for Q3: *Do you represent a professional body in any capacity? If so which one(s)?*

6 respondents were members of representative professional bodies. These included; Inst. Physics & Engineering in Medicine, Science Research & Innovation Council, Health Education England, the National School of Healthcare Science, the British Institute of Radiology, the British Medical Association and Joint GP IT Committee, the British Burns Association Special Interest Group, GPs working in prison environments and the Ministry of Defence, the Inst. of Biomedical Science and Royal College of Pathologists Informatics Ctte.

Detailed responses for Q4: *Do you describe yourself as a clinical informatician?*

8 respondents described themselves as clinical informaticians, 5 did not and there was 1 missing response. The question was not relevant to the 2 members of the public. This is a really interesting set of responses given that 14 respondents are at least associate members of the FCI, yet 5 do not consider themselves as clinical informaticians. The detailed transcripts provide a real insight into respondents' thinking in this area. These are presented below:

"I do and am widely considered as this as part of my clinical scientist role. My role includes pushing hard so that information systems are used to their full potential and getting involved during procurement or implementation initiatives when clinical requirements may not fully have been taken into account. However, as described in the draft report, I'm often reluctant to describe myself as an informatician when I'm working alongside individuals with professional backgrounds in traditional informatics related disciplines such as corporate ICT. "

"Sometimes, I describe it as an element of what I do, describing it as the type of clinical practice that I now undertake - note I've brought question 1 and 2 together. I think it is an unhelpful distinction, your clinician informatics work may absolutely be part of your clinical practice. Why would it not be considered 'clinical practice'?"

"In the role of the Clinical Lead for HJIS, I have had to explore and research the necessary attributes relevant to this role and develop these within my portfolio of skills. This has been undertaken in part as a result of specific requirements of the job description, seeking advice from active clinical informaticians and online research. The acquisition of these attributes and knowledge have provided me with a distinct perspective that I would not otherwise have had, had I not developed this aspect of my career. These attributes, once obtained, have then provided a new 'lens' through which other aspects of my work can now be viewed (as a clinical informatician). The more I have become absorbed into this role, the more I have been convinced of the ever-increasing importance and integral aspects that clinical informatics provides to the evolution of the communication and delivery of high quality, consistent and relevant data for the provision of healthcare and the improvement of health outcomes. In other words, if we do not continue to strive to ensure that clinical informatics is evolved in this way, our ability to improve healthcare and health outcomes will be curtailed. In particular, I see this as being crucial for the NHS in view of its increasing demand in ensuring we can better understand how and where to invest in services and solutions and also ensure we commission the right services and interventions needed for better patient care and improved health outcomes. "

"It's not recognised as a career path or an area of expertise"

“I describe myself as a consultant in public health medicine and clinical director; that’s my job title and many of my colleagues would not be sure what was meant by a clinical informatician.”

“Similarly to the respondents in the report, as I do not have a formal training or qualification in clinical informatics and as it is not included in my job description, I do not readily describe myself as a clinical informatician – I consider myself more as “a clinician who works on informatics projects”.

“I describe myself as a biomedical scientist or healthcare scientist with a special interest in clinical informatics. This is pragmatic approach on my part, partly a “tribal” thing, and also to maintain a credibility with professional colleagues and ensure their ready engagement.”

“I am not a clinical informatician in that I have very little IT competence beyond that of software user. I don’t do any coding, or app creation, or genomics number crunching. I have been involved in healthcare website design as a commissioner and clinical editor. Does that make me an informatician?”

These responses are consistent with those described in detail in Report A section 3.4 and are considered further in section 3 of this report.

2.2.2 Q5-10. The principles of clinical informatics. Section 3.3 of Report A.

Q5-10 *Please indicate whether or not you agree with each of the principles listed and if not explain why not. Feel free to say what you think may be missing.*

Detailed responses for Q5: Purpose

12 respondents agreed, 3 disagreed and 1 partially agreed with this principle. Several respondents thought the purpose should be more patient-centred and also reflect the needs of the end-user. Another stressed the importance of clinical informatics as a “bridge” again reflecting the interview results described in section 3.4 of Report A.

“would actually like to see some that has the word patient in here, although I accept that the statement is about the patient, I do think this needs to be explicit and also for it to discuss improving the experience of the patient also.”

“Purpose: of clinical informatics is the improvement for people we support in the quality and experience of health and social care so enabling them to live an independent and fulfilling life as possible.”

“I am keen that part of its purpose should be to also explicitly support work to inform citizens to enable them to make choices.”

“I agree with the definition but think that the users should also be included as a primary concern. The ICT implementation programmes that I have been involved in require the informatician to understand how the user will use the system, complete the electronic forms, the processes involved and being able to sell the benefits to the users when there is resistance to change. The patient is at the centre of care and should always remain so, but the user should also be central during the design and improvements to ensure that what goes into the system, really does lead to improvements.”

“However, I’d suggest including wording along the lines of clinical informatics being a bridge between other disciplines to ensure these goals are achieved. Without contributions from non-informaticians to informatics initiatives those initiatives would not succeed.”

Detailed responses for Q6: Inclusivity?

11 respondents agreed, 4 disagreed and 1 partially agreed with this principle. Only 1 respondent strongly disagreed with this principle, more typical of the 4 negative responses was partial agreement (as below) that seemed to focus on the extent to which “clinical” includes social care. This comes up again in the responses to Q8. One respondent reminds us of how new technologies need to inform our thinking here.

“Agree health and social care should be given equal weight, and the flow of information between settings should be as seamless as possible.”

“Agree partly. I certainly agree that health and social care services have equal contributions to make to health and well-being and that health practitioners need to collaborate closely with social care colleagues and to value their contribution. However, I wonder whether the word “clinical” requires a “health” interpretation? Dictionaries mention ‘patients’, ‘treatment’ and ‘medical’ in their definitions, making it difficult to see how colleagues with a professional background in social care could be described as “clinical”. If I’m wrong about this then this needs to be explained more clearly for people who might share my impression.”

“In my mind, this is probably more about ‘integration’ and ‘interoperability’ rather than just ‘inclusivity’.”

“With the consumerisation of healthcare exploding around us it would be a mistake to limit the role of clinical informatics to within traditional boundaries of health and social care. We should have clinical informaticians within start-ups innovating in ‘wellness’ and ‘fitness’ spaces which might have a far greater opportunity to improve health and can equally cause significant issues.”

Detailed responses for Q7: Diversity?

13 respondents agreed, 1 disagreed and there were 2 missing responses. The breadth and diversity of the discipline is well recognised in section 3.3 of Report A and in the detailed responses to the questionnaire presented here. One respondent felt that diversity should also reflect the need for systems to reflect human diversity in order for safer systems to be developed and deployed.

“Agree. This poses a challenge – how can such diverse roles all come together under a clinical informatics heading? I see an overlap of about 30% between my work and that of clinical informatics and I wonder if others might be similar.”

“Agree with statement, but examples stated are limited and do not indicate the real breadth of that diversity. I recognise the challenge – a long list might be perceived as definitive. Given statement elsewhere in the report it may be possible to give an example of what is not included? Epidemiology?”

“To cover every aspect would be an enormous task, hence some staff focus on individual aspects.”

Detailed responses for Q8: Inter-disciplinary?

13 respondents agreed, 1 disagreed and there were 2 missing responses. Detailed responses reflected the need for inter-disciplinary to explicitly include disciplines beyond clinical informatics. However, the list of related and inter-related disciplines seems almost boundless, but even so, responses indicated gaps in terms of epidemiology and the physical sciences. One front-line respondent reminded us that clinical informaticians operate at all levels of operation (see also responses to Q10).

“Interdisciplinary may be interpreted purely within context of “clinical informatician”, but in practice the clinical informaticians also need to engage with non-clinicians that engage in informatics. Do not expect this comment to lead to a change in description – but may be important in getting to understand the social care space.”

“I agree that clinical informatics involves many disciplines, but it would be interesting to give a very approximate order of relevance to the list – engineering, maths and computer science suggest an information science specialty which I have little / no involvement in. I’m not sure about biology or linguistics – if these are key then maybe I don’t understand what clinical informatics really is. The items in the list that are meaningful for me are statistics, data science and medicine; the missing item that is important for my work is epidemiology.”

“I’d suggest also specifically including medical physics in the list, or at the very least a general reference to “physical sciences”.”

“It focuses very much on senior leadership e.g. CCIO, CNIO I wonder if there is an opportunity to recognise those that lead at ward, practice level?”

Detailed responses for Q9: Whole cycle?

14 respondents agreed, 1 disagreed and there was 1 missing response. There was strong support for this principle, with responses providing examples of how this does and should work in their practice.

“Strongly agree – good to see this.”

“Those working in informatics can operate at one or more parts of the cycle.”

“Yes but looking at how larger projects work utilising the ‘agile’ approach, should we not ensure that a more dynamic approach to the development of solutions is not restricted to the classical ‘cycle’.”

“Increasingly a lot of the ‘whole cycle’ is happening outside of NHS organisational boundaries, I’m not reading much in this report about those working in such spaces, where often best practice guidance might be even more valuable given commercial pressures etc.”

“I wonder if decommissioning of a system could be incorporated here? Rather than ‘shut down’?”

“I don’t fully relate to this. I don’t deal much with processes, programmes, products or projects. This has more of an engineering or IT sound to it, and while I value these disciplines I don’t work in these areas or offer particular expertise.”

Detailed responses for Q10: Unit of operation?

15 respondents agreed and there was 1 missing response. There was strong support for this principle. Responses gave extended examples of the unit of operation from their practice and indicated that clinical informaticians could work at any of these levels.

“I agree with these principles. Unit of operation is essential – the level at which the system operates is vitally important.”

“Perhaps include specification and commissioning in the list.”

“I agree that clinical informatics practitioner could operate at service, system or population levels. However, my focus is very clearly on the population and system-wide view. Does this mean I am not working in clinical informatics? Or might it be better to say that clinical informatics practitioners could work at any of these levels?”

Detailed responses for Anything Missing? The responses here are discussed in more detail in section 3. Clinical safety cropped up and there are occasional references to its importance in the detailed responses elsewhere and in responses to Q21.

“I do not think there are any principles missing, but the interpretation could be significantly different in the social care space (social worker is a restricted title in both adult and children’s social care carrying out social work tasks). Social care is a much wider concept. Social workers as a proportion of the social care workforce is low – hence challenge of finding the information about what really happens in that space in the desk top work.”

“I am not sure this description is specific enough. I think that most of these points could equally apply to (for example) medicine of the elderly, which also stresses collaboration with social care, involves a range of disciplines and can operate at different levels. What distinguishes clinical informatics is the statement of purpose (which I think could be clearer – how does clinical informatics help?) and the list of disciplines in the paragraph under diversity (which I think could be selected more carefully – i.e. which ones are central and which ones are additional?).”

“Do we need to add a safety stand-alone element here?”

[2.2.3 Q11-12. Definition of Clinical informatics. Section 3.3 of Report A.](#)

Detailed responses for Q11: Please indicate if you agree with this definition or not and if not explain what you would change.

9 respondents agreed and 7 disagreed with the definition of clinical informatics. The Detailed responses are shown below. indicate that people found the definition confusing, complex,

unclear and incomplete. A simpler alternative definition was offered from a social care perspective.

“I think this (part of the) definition is confusing and unclear.”

“I am not sure what "closing" means”

This seems rather complex. Is it ‘study’ or ‘use of’? Do we need the word ‘human’ in there? Doesn’t need the mention of ICT (or any other abbreviations). Would ‘digital technology’ work better than ‘computing technology’? No explicit mention of the people we care for and support. This is the framework for person centred care from the Health Foundation and perhaps could influence more the definition above?

- *Affording people dignity, compassion and respect.*
- *Offering coordinated care, support or treatment.*
- *Offering personalised care, support or treatment.*
- *Supporting people to recognise and develop their own strengths and abilities to enable them to live an independent and fulfilling life.”*

For example; “Clinical Informatics involves embracing the benefits of digital technology with respect to health and wellbeing to advance treatment and the delivery of personalised, coordinated support from health and social care.”

“I have relatively limited interactions with information and computing technology – I need to be aware of what colleagues do in this area, but I don’t consider this my area of expertise. I spend most of my time working with data – understanding, analysing, interpreting, presenting, communicating.”

“I mostly agree with this definition. However, I think it would be strengthened by somehow mentioning computer science, or even science more generally.”

“Maybe there should be some mention of research?”

“I am happy with the wording and would add it’s application in supporting and creating the synthesis of new knowledge.”

“This is interesting as it states at the beginning ‘study’ not sure this is the correct term, as often clinical informaticians are also involved in redesigning more efficient workflow for the benefit of the patient and system. Also doesn’t include deployment or leadership skills and feels like informaticians are just ‘studying’ it. Feels rather an academic way to phrase it.”

“To my mind, one of the key objectives of clinical informatics should be to ensure that our aim is to achieve better health outcomes. The current definition helps towards meeting this aim but does not quite go far enough.”

“Implementation of the systems also needs to be included. I don’t feel that “integrating and applying” adequately describe the complexity of the implementation process.”

“I suppose, but heck it’s a lot of words.”

Detailed responses for Q12: *Does the definition adequately reflect your role as a clinical informatician? Please indicate if you agree with this definition or not and if not explain what you would change.*

8 respondents agreed, 5 disagreed, there was 1 missing response and the question was not relevant to the 2 members of the public. Many of the comments reiterated those given in response to Q11 and several referred back to their responses to Q11. Again, the need to need to promote and deliver better health outcomes is emphasised.

“I seem to spend an awful lot of my time looking at how we could digitally enhance our patients’ pathways to improve patient’s experience of using our services and while this is intimated in the definition, I think it could be more explicit.”

“This is tricky. Please see my comments under Q11. To some extent this depends on interpretation. To scientists (and I suspect those involved with information governance) the ICT acronym may be off putting. For example, I don’t really think of a radiation dose calculation system, or an advanced image reconstruction algorithm which suppresses metal artefacts in a CT scan as “ICT innovations”, although they are of course underpinned by computer technologies and rely on data processing and the communication of data for their operation. Perhaps more importantly, someone outside of my discipline would struggle to link the current definition to their perception of what I do.”

“I am only very loosely an informatician so it’s very difficult for me to comment. This definition would include me, so perhaps it’s too wide – I’m not sure!”

“Not sure the present definition does if I’m a care professional working with an individual, using technology to support them in their own environment and sharing information digitally with other health and social care professionals.”

“Key aspect for me is around advancing the comprehension / understanding of human health and wellbeing, to improve delivery.”

2.2.4 Q13-14. Clinical informatics areas (scope). Section 3.3 of Report A.

Detailed responses for Q13: *The draft report states that clinical informatics includes a list of areas representing the scope of clinical informatics activity. Please indicate if you agree with this list or not and if not explain what you would change.*

13 respondents agreed with the areas of activity, 2 disagreed and there was 1 missing value. There was broad support among respondents for the clinical informatics areas described in section 3.3 of Report A. Detailed comments are discussed further in section 3 (below)

“But I would amend 5 as follows: “Innovative communications with those receiving care and/or support to facilitate their appropriate and informed use of health and social care provision” This would more accurately reflect some social care activity.”

“I’d suggest adding something to point 3 about specification and commissioning. For example, Application of informatics across the lifespan, from specification and commissioning through to system replacement, in the multi-layered and complex context in which health and social care services operate.”

“The list makes sense to me, though I am only involved in some of the areas and assume you can still work in clinical informatics without being involved in all of these areas?”

“Perhaps include something within these areas about interoperability?”

“I would add that all healthcare research data, particularly normality data, is part of informatics.”

“Technical capabilities understanding (not necessarily being able to code, that is for the techies), Clinical safety, Deployment, Leadership and collaboration, Clinical engagement.”

Detailed responses for Q14: *Do you agree epidemiology should be excluded from this list?*

8 respondents agreed epidemiology should be excluded from the list, 5 disagreed and there were 3 missing responses. While the majority of respondents agreed that clinical informatics should exclude epidemiology, the detailed responses suggested that ‘big data’ and population medicine were clearly part of clinical informatics and necessary to improve health outcomes.

“I think an epidemiological component of health informatics is very important on the basis that ‘big data’ will enable population-based benchmarking and subsequent analysis. I am of the view that clinical informatics should incorporate the overall aim to improve health outcomes and this therefore needs to include the epidemiological and research elements. Even if it is not the core component of a solution, having the acknowledgment (and ambition) that the data capture ‘could’ / ‘should’ facilitate this aim seems to be key in my mind.”

The study of the distribution and determinants of health-related states requires the continuous analysis of clinical and ‘big data (Point 2). Our long-term goal should an ‘intelligent’ health and social care system. If the top aim is ‘advance comprehension of health and wellbeing’ a key part of that is analysis integrated into the system. Population level analysis integrated into the design of the ICT systems, rather than ‘Bespoke data collection’ for specific cohort studies. If clinical informatics restricts itself to the ‘engineering of the data’ it misses the key aspect of the ‘whole cycle’ of designing intelligent

systems which not only collect data, but also analyse and act on that analysis. ‘Clinical’ informaticians bring a unique front-line perspective and ability to ask questions of our health and social care data. Hence, I would disagree that ‘clinical informatics is the engineering of the data’. By restricting the job description, we miss a vital opportunity of having individuals trained to design ICT systems which engineered to not only collate data, but also analyse and adapt in real-time.”

It depends. If clinical informatics is fundamentally ‘data engineering’ then epidemiology should certainly be excluded. (In this case I clearly don’t qualify as working in clinical informatics). However, in this case those working in clinical informatics should abstain from making comments about what the data ‘mean’ (what they tell us about health and wellbeing) and confine themselves to shifting it around more quickly, accurately and effectively (put too crudely, but hopefully my meaning is clear!). If clinical informatics does include using and interpreting data – saying what it is telling us about healthcare delivery, health and wellbeing – then you can’t do that without some epidemiological understanding. If ‘interpreting data’ just means correctly mapping numbers to values, then we’re back to ‘data engineering’. Put far too crudely, we don’t want software engineers telling us why asthma admissions or elective waiting times are increasing. (Equally, I’m sure software engineers don’t want a doctor telling them how best to design a clinical database.) The debate seems to me to reflect an important source of professional division – we are often frustrated because we feel our IT and ‘e-health’ colleagues don’t understand the data or what they are being used for. No doubt they often feel frustrated because we don’t understand the whole system that collects, processes and holds these data.”

“Could be argued either way. I think there should be a nod to understanding the principles of epidemiology at least.”

“I would be more comfortable if clinical informatics were seen as providing opportunities for the support of epidemiological understanding and monitoring. “

“As data is collated from the systems now and in the future and with the use of AI, there is more likely to be greater areas where clinical informatics overlaps with epidemiology. Inclusivity at this stage could prevent cultural boundaries being created and increasing the likelihood of producing effective policy decisions across the entirety of health and social care.”

“Epidemiology is to my mind the study of big healthcare data across systems. To exclude it, given epidemiologists’ expertise, seems artificial.”

2.2.5 Q15-16. Definition of a clinical informatician. Section 3.4 of Report A.

Detailed responses for Q15: *Please indicate if you agree with this definition or not and if not explain what you would change.*

12 respondents agreed with the definition of a clinical informatician, 3 disagreed and there was 1 missing response. The detailed responses to this question suggest that some thought the definition too general and that there should be a clearer focus on health outcomes and professional ethics.

“It’s a good start, but it just tells us that a clinical informatician is someone who uses clinical informatics skills, so is somewhat circular.”

“I would include health promotion.”

“I agree with this but it’s very wide, and could be applicable to a lot of clinicians, not just clinical informaticians.”

“We need to ensure that our objectives are aimed at improving health outcomes.”

“Would it be worth including the word “ethical”?”

Detailed responses for Q16: *Does the definition adequately reflect your role as a clinical informatician? Please indicate if you agree with this definition or not and if not explain what you would change.*

12 agreed the definition adequately reflected their role as a clinical informatician, 1 disagreed, there was 1 missing response and the question was not relevant to the 2 members of the public. While there was general agreement with this statement, others emphasised the need for a holistic approach.

“Love it, it accurately reflects what I do in my day to day role.”

“As above, without a definition of clinical informatics this doesn’t help us very much. Does it reflect my role? I’ve discussed this in my answers to Q13 and Q14 – it depends on whether clinical informatics is ‘data engineering’ or using data to improve health more broadly. In section 3.4 it would not be safe to use data to support prevention or health promotion without some ability to interpret data. Interpreting data will require epidemiological and statistical skills, among others. This would go well beyond ‘data engineering’.”

“The reason I believe we need to include the principles I have set out (focus on better health outcomes) is that by doing so, we will be aiming to future-proof the development of healthcare delivery by ensuring we measure and adapt our services in accordance with changes in populations, treatments and other variables which undoubtedly change over time.”

[2.2.6 Q17-22. Professional attributes of clinical informaticians. Section 3.5 of Report A.](#)

Q17-22. Professional attributes of clinical informaticians. *Please indicate whether or not you agree with each of the principles listed and if not explain why not.*

Detailed responses for Q17: *Define and prioritise?*

15 respondents agreed and 1 disagreed with this attribute. There was strong support for this attribute and few comments, though another reminder of the importance of putting patients first.

“I can see that this makes sense, but I don’t recognise this description as a major part of my job. My interests would focus more on the health and wellbeing of the whole population rather than on the needs of clinicians or patients.”

“But would prefer order of “those receiving care and clinicians”!”

Detailed responses for Q18: Evaluate?

All 16 respondents agreed with this attribute and there were no detailed comments.

Detailed responses for Q19: Identify and act?

All 16 respondents agreed with this attribute. There was one comment.

“Plenty of best practice to be stated here.”

Detailed responses for Q20: Ensure?

14 respondents agreed with this attribute. 1 disagreed and there was 1 missing response. The single respondent who disagreed suggested additional content in this attribute.

“And required (thinking here of the projects that go ahead without priority or real need).”

“OK - and add efficient and effective.”

Detailed responses for Q21: Clinical safety?

All 16 respondents agreed with this attribute. This attribute was well supported, and the clinical safety theme was emphasised by other respondents in various places throughout the questionnaire, though there may well be a separate clinical safety officer role in some (larger) organisations.

“Identify and address clinical safety issues.”

“Although this may be more appropriate to the Clinical Safety Officer role in collaboration with a clinical informatician.”

“Though not a significant part of my role.”

Detailed responses for Q22: Standards?

All 16 respondents agreed with this attribute. There was widespread support for this attribute, including extending it to include standards development.

“Ensure that standards, guidance and best practice are adhered to in clinical informatics.”

*“I’d be keen to add something around the development of standards where none exist.
‘Ensure that standards, guidance and best practice are adhered to in clinical informatics, contributing to the development of these as appropriate.’”*

“But I think it might be appropriate to include “challenge where appropriate”?”

“And developed”

2.2.7 Q23. General. Whole of Report A. Any other comments?

The additional comments are presented below.

“I have noted the report has had challenges dealing with social care. This does not surprise me as there is a significant difference between “social work” and “social care”. Social work is a protected, but small part, of the spectrum of social care. There is also a long history that social care informatics (including social work” is undertaken largely by “non-clinicians” working in collaboration with clinicians and others in the front line of social care activity. Social work is such a scarce and pressured resource that it is rare for social workers to be seen as or have the label as a clinical informatician.”

“This is a good piece of work. I appreciate it is challenging drawing together all the various strands, but the results will be well worthwhile. I think the key to success will be delivering a document which is clear to everyone (informaticians and non-informaticians alike) and which resonates with practising and aspiring clinical informaticians.”

“My software developers, on reading a short excerpt stated: ‘Yep they tried to do that in software development, they’ve failed so far, the field moves so fast. If they do try and introduce any standards they should make sure it’s flexible enough not to mean that it becomes a complete blocker of innovation.’”

“The common themes that have emerged are fascinating. My job description was thrown together and I was told to make the role my own and do whatever I thought was the right thing to do, as my managers didn’t know what they needed. In trying to convey my role I have described it as a “bridge” myself as it was the best description. Seeing that others describe it the same is reassuring, in that I am probably doing the right thing. The soft skills being included in the role requirements enables clinical informaticians to argue the case for these critical skills to be developed further. Networking with colleagues in clinical informatics is invaluable and in Northern Ireland this is very limited. The digital health summer school was great for this but going forward there needs to be more opportunities for this.”

3. Analysis

This section of the report discusses the findings from both Reports A & B. 32 individuals, 30 of whom are fellows, members or associates of the FCI, and 2 members of the public, have contributed to the 2 reports. Interviewees and respondents reflect the broad membership of the FCI by gender, stage of career, professional background and level of membership.

The responses to Q4 of the questionnaire (Q4. *Do you describe yourself as a clinical informatician?*) are reflected in sections 3.3 and 3.4 of Report A and suggest a reluctance by some who are members (in whatever capacity) of the FCI to call themselves clinical informaticians. This may be because it is hard to define clinical informatics and the clinical informatician role is so variable, encompassing many different disciplines and professional groups. Sometimes though, this reluctance seems to be partly “tribal” to maintain professional relationships but also because clinical informatics is not a recognised specialism in most of the clinical professions. Responses from the interviews and the questionnaire indicate that there are few clinical informatician job descriptions except for senior leadership roles (e.g. CCIO or CNIO) and none at all in social care. It seems even harder to know what to call oneself, when clinical informatics covers such a broad spectrum of health and social care professionals, yet the boundaries remain uncertain.

Our developmental journey resonates with that of clinical informaticians in the USA 10 years ago. AMIA worked their way towards clarity and building a consensus among clinical informaticians about their role and key competencies over the years⁵.

At this stage, the only hard definition relates to the *clinical* aspects of clinical informatics and the FCI, which stipulates that professional clinical informaticians *must* be registered with one of the regulators overseen by the Professional Standards Authority (e.g. the Health and Care Professions Council) to be eligible for membership or fellowship of the faculty. This is consistent with the interview responses in Report A section 3.4. Within these constraints, responses describe clinical informatics as a broad and inclusive discipline, which should be reflected in subsequent discussions and descriptions of competences and a competency framework.

Which brings us back to fundamentals and the *principles* of clinical informatics developed and described in section 3.3 of Report A and covered in Q5-10 of the validation questionnaire (Q5-10. *Please indicate whether or not you agree with each of the principles listed and if not explain why not. Feel free to say what you think may be missing*).

These principles were described to try to establish what came to mind when participants described clinical informatics to help set the boundaries that distinguish clinical informatics as a professional discipline. In general, the questionnaire respondents supported the 6 principles. Detailed comments emphasised the need for the principles to be person-centred, inclusive of health and social care, aware of the diverse disciplines that contribute to clinical informatics, so that it is not just inter-disciplinary, but multi-disciplinary. Clinical informaticians bring a vast range of skills to bear across the domain, often acting to build bridges, actively and collaboratively synthesising between disciplines to keep the focus on the people and populations we support.

⁵ Gardner et al., ‘Core Content for the Subspeciality of Clinical Informatics.’

These *principles* are reiterated below.

- a) **Purpose:** of clinical informatics is the improvement in the quality and experience of health and social care, and the areas of primary concern for clinical informatics are data⁶, technology and communication.
- b) **Inclusivity:** clinical informatics encompasses and gives equal weight to health and social care. It was felt that clinical informatics has been predominantly focussed on hospital and GP care, and been led by GPs and physicians. There was concern that the discourse continues to be health and physician/GP biased exacerbating the assumption that informatics is about healthcare and failing to recognise the involvement of teams, multidisciplinary and multiservice, as well as the involvement of patients, carers and family.
- c) **Diversity:** clinical informatics is a diverse discipline and areas of focus vary greatly, e.g. developing Apps, guidance on information governance. Each area of focus is equally important to achieving the overall aim of better person-centred health and social care. One respondent reminded us not to forget the human implications of diversity either.
- d) **Interdisciplinary:** clinical informatics brings together learning from multiple disciplines. Disciplines involved in clinical informatics include social sciences, biology, ICT, computer science, data science, psychology, linguistics, engineering, statistics, mathematics, medicine, and many others.
- e) **Whole cycle:** clinical informatics is concerned with the whole cycle of a process, programme, product, project, that is from inception to identifying improvements from evaluation and process shut down. Those working in informatics can operate at one or more parts of the cycle.
- f) **Unit of operation:** Clinical informatics operates at service, system, and population levels and within organisational, developer, practitioner and end user culture. The benefits of clinical informatics are at the individual, service, system and population levels.

The *Anything Missing* open question after Q10 elicited several really informative responses in relation to the “social care space” and the perceived lack of specificity around the principles, highlighting the challenge we face to say exactly what clinical informatics *is*, what clinical informaticians *do* and why it matters. (also echoed in responses to Q23).

The definition of clinical informatics described in section 3.3 of Report A, gets a lukewarm reception from the questionnaire respondents in Q11-12.

(Q11. *Please indicate if you agree with this definition or not and if not explain what you would change.*)

(Q12. *Does the definition adequately reflect your role as a clinical informatician? Please indicate if you agree with this definition or not and if not explain what you would change.*)

The detailed responses indicate that people found the definition confusing, complex, unclear and incomplete.

⁶ “Data” may be too restrictive in this context, so this should be read as “data, information and knowledge”.

We were impressed with the simplicity and elegance of the definition offered (below) from a social care perspective, which seemed to reflect the principles described earlier rather succinctly. It is also based on the definition of person-centred care suggested by the Health Foundation⁷ and keeps the person / patient / service-user at the centre of our considerations.

Clinical Informatics involves embracing the benefits of information technology with respect to health and wellbeing to advance treatment and the delivery of personalised, coordinated support from health and social care.

Another example perhaps of where saying less, is more inclusive and more in line with the principles discussed above. This may also help to address the issue highlighted in responses to Q4 and allow more FCI members to describe themselves as clinical informaticians with a clear conscience.

We consider the value of descriptions and definitions further in section 4.

The *areas* of clinical informatics are explored next in section 3.3 of Report A and in responses to Q13-14 of the questionnaire.

(Q13. *The draft report states that clinical informatics includes a list of areas representing the scope of clinical informatics activity. Please indicate if you agree with this list or not and if not explain what you would change.*)

(Q14. *Do you agree epidemiology should be excluded from this list?*)

There was broad support among respondents for the clinical informatics areas. Suggestions were made about ensuring the scope also reflected social care and suggesting that clinical informaticians should all be competent to some degree in agreed core areas. These are listed below.

The scope of Clinical informatics includes the following **areas**:

- a) How people interface with ICT in health and social care, including electronic health and care record (EHCR) systems and person care portals
- b) Methods to collect, manage, provide security for, and analyse clinical data and “big data”
- c) Application of informatics across the lifespan in the multi-layered and complex context in which health and social care services operate
- d) Interventions for clinical decision support, safety alerts, and data visualisation to facilitate optimal health and social care delivery
- e) Innovative communications with those receiving care to facilitate their appropriate and informed use of health and social care provision
- f) Ethical and information governance frameworks and data usage policies and procedures for assurance of high-quality ethical use of individuals’ data.

Respondents suggested additional areas of clinical informatics activity, including; interoperability, clinical safety, leadership and clinical engagement, where again core competencies should encompass these to some agreed basic level for all clinical informaticians.

⁷ The Health Foundation, ‘Person-Centred Care Made Simple’.

The issue of whether or not to exclude epidemiology from clinical informatics received lukewarm support (Q14). However, there was a clear recognition that ‘big data’, population medicine and data analytics skills were valuable clinical informatics tools and essential to improve health outcomes. It does seem inconsistent with the principles described earlier, to deliberately exclude epidemiology from the clinical informatics umbrella, when there are clear synergies and overlaps between the two related disciplines.

*We recommend that these areas of clinical informatics should be considered as **functional domains** from a competency framework perspective, that cover the scope of clinical informatics practice.*

The definition of a clinical informatician presented in section 3.4 of Report A received warm support from the respondents to Q15-16 of the questionnaire.

(Q15. Please indicate if you agree with this definition or not and if not explain what you would change.)

(Q16. Does the definition adequately reflect your role as a clinical informatician? Please indicate if you agree with this definition or not and if not explain what you would change.)

This is the definition of a clinical informatician used by the FCI and seems reasonably consistent with the revised definition of clinical informatics offered above. The FCI’s definition is reproduced below.

*A **clinical informatician** uses unique knowledge and experience of person-centred care and informatics concepts, methods and tools to promote care that is safe, effective, efficient, timely, person-centred and equitable.*

We should acknowledge that we only spotted the duplicated “person-centred” in this definition during the review stage of this report. So, the definition has been modified to read:

*A **clinical informatician** uses their unique knowledge, experience and informatics concepts, methods and tools to promote care that is safe, effective, efficient, timely, person-centred and equitable.*

This modified definition is also consistent with the NHS quality domains of; patient safety, clinical effectiveness and the experience of patients⁸.

The revised definition could relatively easily be further adjusted to align more closely with the clinical informatics definition offered earlier but given the support for the definition and evidence that it does broadly reflect respondents’ roles as clinical informaticians, it seems appropriate to leave well-enough alone. We discuss “definitions” further in section 4.

The key purpose of Report A was to develop and define the professional attributes of a clinical informatician as a prelude to describing the output competences of a clinical informatician. The professional attributes are presented in section 3.5 of Report A and are reviewed in responses to Q17-22 of this report.

⁸ Department of Health and Social care, ‘High Quality Care for All: NHS Next Stage Review Final Report’.

(Q17-22. Please indicate whether or not you agree with each of the principles listed and if not explain why not.)

These process competences need to be specific enough to be meaningful and useful for developing the core competencies and a competency framework. There was very strong support for the professional attributes and very few comments. There were only 2 relatively minor disagreements with any of the 6 professional attributes, which are reproduced below, revised slightly to ensure consistency with the new definition of clinical informatics described earlier.

Professional attributes:

The clinical informatician works proactively (often in a leadership role), and collaboratively to:

- g) **Define and prioritise** the needs of those receiving care and clinicians in informatics innovations (processes, systems, policies, products and programmes)
- h) **Evaluate** the opportunities and limitations of informatics innovations (processes, systems, policies, products and programmes) in improving the quality of care delivery and experience
- i) **Identify and take appropriate action** against ethical, legal, data protection and security risks
- j) **Ensure** that informatics innovations (processes, systems, policies, products and programmes) are appropriate for the proposed purposes, that they are practical and implementable
- k) Identify and address **clinical safety** issues
- l) Ensure that **standards, guidance and best practice** are adhered to in clinical informatics

*We recommend that these attributes of clinical informatics should be considered as **process competences**⁹ from a competency framework perspective.*

Finally, Q23 offered another open question to respondents with a chance to comment on any aspects of Report A. It is particularly interesting to note again the challenge that comes from including professional social care (social work) within the remit of clinical informatics.

The final comment in section 2.2.7 seems typical of the experience of clinical informaticians working at the coalface. It resonates with the opening paragraph of this report and highlights the professional isolation that can be felt by some working as clinical informaticians.

We have presented the results from both reports that provide guidance on the principles (themes) and areas (functional domains) that describe the scope of clinical informatics. We offer a revised definition of clinical informatics and a well-supported definition of a clinical informatician. We also have an agreed set of professional attributes (process competences) that together with the other elements described above, should help us establish a framework within which we can describe and test the output competences of a clinical informatician.

⁹ Competence may be defined in terms of what the individual brings to the job (the input), what the individual does in the job (the process), or what is actually achieved (the output).

4. Synthesis & the draft output competences

The Faculty of Clinical Informatics' mission statement, charitable objects and values are described on the FCI website¹⁰. The FCI's vision is to; *To support safe, effective and efficient health and social care to the public through the promotion and encouragement of the study and practice of the science of clinical informatics.*

Two overarching aims for the FCI at its inception were to;

- Develop professional competencies for clinical informaticians.
- Provide accreditation for informatics-based training programmes

The Core Competencies Project provides a methodology for the development of core knowledge and skills-based competencies for Clinical Informaticians, and the mechanism by which these competencies can be mapped to educational and professional developmental initiatives for accreditation.

The key task of phase 1 of the CCP was to define the output competences we expect of care professionals working as clinical informaticians in the UK.

Greenhalgh & Macfarlane (1997), have outlined the process for developing a competency grid for evidence-based medicine¹¹ and we have followed a similar process in this first phase of the Core Competencies project.

Competence may be defined in terms of what the individual brings to the job (the input), what the individual does in the job (the process), or what is actually achieved (the output). Thus, if the input is 'green fingers', the process may be sowing, weeding and pruning, and the output a thriving garden or vegetable patch.

We believe that these two reports, comprising Phase 1 of the CCP, provide a sound basis from which we can proceed to describe the output competences for clinical informatics as presented below.

What does the thriving clinical informatics “garden” look like? We have framed our findings in terms of statements which should be tested further by key stakeholders and our membership in a consultation exercise.

Statement 1

Firstly, and fundamentally, we are describing a landscape occupied by professional clinicians who are also informaticians. So, the first criterion is that a clinical informatician must be a health or care professional registered with one of the regulators overseen by the Professional Standards Authority to be eligible for full membership or fellowship of the FCI.

We can then move on to our two definitions – of clinical informatics and clinical informaticians. A new clinical informatics definition has emerged from Phase 1 and should be considered alongside other accepted definitions.

¹⁰ Faculty of Clinical Informatics, 'FCI Vision, Charitable Objects, Values and Plans'.

¹¹ Trisha Greenhalgh and Fraser Macfarlane, 'Towards a Competency Grid for Evidence-Based Practice'.

Statement 2

Clinical Informatics involves embracing the benefits of digital technology with respect to health and wellbeing to advance treatment and the delivery of personalised, coordinated support from health and social care.

AMIA's definition¹² is even simpler:

Clinical Informatics is the application of informatics and information technology to deliver healthcare services.

We have discussed how “less is more” in terms of being inclusive, given the vast scope and range of activities covered by clinical informatics, so there is a great deal of sense in keeping the definition short, inclusive and consistent with the wider international community.

The FCI's definition of a clinical informatician (below) has come through Phase 1 largely unchallenged and seems consistent with the new definition of clinical informatics introduced in section 3 (and above), with the FCI's aims and objectives and the NHS quality domains.

Statement 3

A clinical informatician uses their unique knowledge and experience of informatics concepts, methods and tools to promote care that is safe, effective, efficient, timely, person centred and equitable.

However, we are wary of definitions, which by their nature are inclusive of some professionals and skills yet exclusive of others. We are not convinced that the various definitions of clinical informatics and clinical informatician fully describe all of what we do and who we are. We have discussed how “less is more” in terms of being inclusive, given the vast scope and range of activities covered by clinical informatics, so there is a great deal of sense in keeping the definitions short, inclusive and consistent with the wider international community.

Statement 4

It seems essential to us that clinical informatics is fully inclusive of the range of professionals and skills needed to meet the challenges of supporting health and well-being in the twenty-first century.

Statement 5

*The set of **Principles** presented and tested in Phase 1 of the CCP study seem to be generally well supported by respondents. Clinical informaticians operate across the whole cycle of information processes, programmes, products and projects, bringing benefit to people and users at service, system and population levels.*

¹² AMIA, 'American Medical Informatics Association (AMIA) Homepage'.

Statement 6

*The set of **Areas** that describe the scope of clinical informatics are also well-supported, alongside the additional areas suggested by respondents including; inter-operability, clinical safety, leadership and clinical engagement. There was a clear recognition that ‘big data’, population medicine and data analytics skills are valuable clinical informatics tools, key to improving health outcomes.*

Statement 7

*The set of **Professional attributes** were strongly supported by respondents and seem to be key components of clinical informatics practice.*

5. Conclusion

In our two reports, we present, describe and discuss a set of principles, areas and professional attributes which we test alongside definitions of clinical informatics and clinical informaticians. We suggest that together these cover the set of output competences needed to describe the landscape of clinical informatics in UK health and care, presented as a set of 7 statements to be developed further through wider consultation with key stakeholders and our membership.

The findings from this consultation exercise will be presented as Report C from Phase 1 of the CCP by the end of March 2020 and will underpin the work to follow in phases 2 & 3 of the Core Competencies Project.

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Acknowledgements

The Faculty of Clinical informatics and the authors would like to thank those members of the FCI and the public who contributed to the Core Competencies Project and to all those who have provided advice, support and constructive criticism.

Appendix A - Core Competencies Project - Phase 1 validation questionnaire

Thank you for agreeing to take part in this validation exercise. Attached to this email is the document “20190628 FCI Competencies phase 1 final report v0.06a” which is the document we would like you to review.

At the core of the paper are several key themes that sit right at the heart of the core competencies project, these are:

- The *principles* of clinical informatics
- The *definition* of clinical informatics
- The *area* (scope) of clinical informatics
- The *definition* of a clinical informatician
- The *professional attributes* of clinical informaticians

We want to test out the findings Nicola Quinn has presented in her paper with a separate group of clinical informaticians at various stages of their careers to see if the ideas being presented there make sense and resonate with our members. We are very grateful for your input, advice and feedback, which will be included anonymously in the next version of the report.

Q1-4. Professional identity of respondent.

Q1. What are your areas of clinical practice?

Q2. What are your areas of clinical informatics practice?

Q3. Do you represent a professional body in any capacity? If so which one(s)?

Q4. Do you describe yourself as a clinical informatician?
Yes No Explain

Q5-10. Section 3.3 of the report. **The principles of clinical informatics.** These are **highlighted** in the report. Please indicate whether or not you agree with each of the principles listed and if not explain why not. Feel free to say what you think may be missing.

Q5 Purpose Yes No Explain

Q6 Inclusivity Yes No Explain

Q7 Diversity Yes No Explain

Q8 Interdisciplinary Yes No Explain

Q9 Whole cycle Yes No Explain

Q10 Unit of operation Yes No Explain

Missing?

Q11-12. Section 3.3 of the report. **Definition of clinical informatics** – the amended version of the definition is **highlighted** in the report & reproduced below:

Clinical Informatics is the interdisciplinary study of data, information and computing technology (ICT) and communication with respect to human health and wellbeing; including understanding, developing, integrating, applying, evaluating and closing ICT innovations to advance comprehension of human health and wellbeing, and the delivery of health and social care.

Q11. Please indicate if you agree with this definition or not and if not explain what you would change.

Yes No Explain

Q12. Does the definition adequately reflect your role as a clinical informatician? Please indicate if you agree with this definition or not and if not explain what you would change.

Yes No Explain

Q13-14. Section 3.3 of the report. **Clinical informatics areas (scope).**

Q13. The draft report states that clinical informatics includes a list of areas (area list header **highlighted**) representing the scope of clinical informatics activity. Please indicate if you agree with this list or not and if not explain what you would change (add or delete).

Yes No Explain

Q14. Do you agree epidemiology should be excluded from this list?

Yes No Explain

Q15-16. Section 3.4 of the report. **Definition of a clinical informatician.** The FCI definition of a clinical informatician is **highlighted** in the report and reproduced below:

A clinical informatician..... *Uses unique knowledge and experience of person-centred care and informatics concepts, methods and tools to promote care that is safe, effective, efficient, timely, person centred and equitable.*

Q15. Please indicate if you agree with this definition or not and if not explain what you would change.

Yes No Explain

Q16. Does the definition adequately reflect your role as a clinical informatician? Please indicate if you agree with this definition or not and if not explain what you would change.

Yes No Explain

Q17-22. Section 3.5 of the report. **Professional attributes of clinical informaticians.** These are **highlighted** in the report. Please indicate whether or not you agree with each of the principles listed and if not explain why not.

Q17 Define and prioritise Yes [] No [] Explain

Q18 Evaluate Yes [] No [] Explain

Q19 Identify and act Yes [] No [] Explain

Q20 Ensure Yes [] No [] Explain

Q21 Clinical safety Yes [] No [] Explain

Q22 Standards Yes [] No [] Explain

General.

Q23. Any other comments?

Finally.

Q24. Would you like to receive a copy of the updated report? If so, please add your preferred email address. Yes [] No []

Email address

Thank you – please send your completed questionnaire to alanhassey@fastmail.com