Introduction:
The International Medical Informatics Association (IMIA) has a global membership of over eighty countries. It holds a major informatics conference every three years called MEDINFO. MEDINFO 2007 was held in Australia. This conference report describes the current discussions about informatics education and how they have implications for how we define informatics as a discipline.

Informatics education is part of IMIA’s strategy:
IMIA includes setting standards and defining core content in education among its strategic goals. IMIA has defined a curriculum for medical informatics and this has been widely adopted by informatics educators. The outgoing president of IMIA, Nancy Lorenzi, included a statement reaffirming the importance of IMIA taking a strategic role in informatics education. She included in her presentation to the IMIA General Assembly held in August 2007 at the MEDINFO conference in Brisbane that IMIA should be defining the components of informatics courses and offering sample curricula. The new IMIA president, Reinhold Haux, has endorsed the importance of education to IMIA and is an active member of the IMIA Education Working Group.

What is a “benchmark” and why are they used in higher education?
Benchmarking statements are a well established method for setting out the content and standards of degrees in a range of subjects; they are commonly used for subjects at undergraduate level. However, they are not currently part of the IMIA education strategy. Benchmarking statements list the learning outcomes and competencies a student should have acquired at the end of their course of study. In the UK the Quality Assurance Agency for higher education sees subject benchmarks as a statement about the standard of the degree. Although a wide range of subject benchmarks have been developed as yet none has been developed for informatics.

Benchmarks are not just a UK phenomenon; subject benchmarks are used internationally. Inevitably, there are a range of definitions of subject benchmarks. My favourite benchmarking definition is by Price. He suggests that benchmarking should be open and evaluative in nature with the purpose of emulating best practice and raising standards. The European network for quality assurance (ENQA) also helpfully describes what it terms “False benchmarking.” This is the use of league tables or simplistic rating scales, which do not have as their core quality improvement.

UK’s contribution to developing IMIA’s education strategy:
In the UK there have been two developments which are influencing the future development of informatics education and IMIA’s recommendations. These were both discussed at the education workshops and working group meetings held during MEDINFO. Firstly, IMIA and the British Computer Society (BCS) have set in motion a process to define the core knowledge base which defines medical and health informatics as a discipline – this piece of work is referred to as either the “Otley meeting” or “Education steps.” The IMIA General Assembly proposed that this process be extended to include the elements of bioinformatics relevant to medicine so that the work would encompass biomedical informatics. Secondly, a new informatics course at St. George’s, University of London has been developed. The curriculum has been developed as a result of developing a benchmarking statement of what learning outcomes and competencies students have at the end of their course rather than following the IMIA curriculum model. The justification for a benchmarking approach is that it is more important to compare what students’ learning outcomes and competencies are (i.e. what they know and what they can do) than to know what proportion of their course was IT. There is scope to further develop a benchmark for informatics university courses. The benchmarking statement should map to the core knowledge domains of informatics which are currently being defined through the Otley process.
Current work-streams in informatics education:

The “Otley meeting” – Educational steps – a conceptual map for informatics:
This piece of work is close to its final report6. The method used in the workshop involved bringing together an international panel of informatics experts in Otley in North Yorkshire for a residential meeting. The group was given the task of creating a cognitive map for informatics. The task focused on the concepts within health and medical informatics with the emerging discipline of bioinformatics excluded.

St. George’s biomedical informatics benchmarking statement:
St. George’s, University of London with two partner institutions, Kingston University and Royal Holloway, has established the UK’s first undergraduate biomedical informatics degree course. Like other courses it has incorporated the elements of bioinformatics relevant to clinical practice, principally genetic disease, biomarkers and genetic engineering to produce a therapeutic tool, into its curriculum. In the absence of any existing benchmarking statement St. George’s has developed its own benchmarking statement as mentioned in the introduction9. This approach also appears to be supported by other UK institutions who also acknowledge the need for benchmarking of informatics curricula10. Additionally the author was invited to the IPHIE (International Partnership in Health Informatics Education) summer school held at UMIT in Austria11. The workshop set out to explore the validity and utility of having a benchmarking statement for biomedical informatics. Initial findings from the workshop were that there may be core and optional elements of the informatics curriculum (Fig 1) and that the scope of a benchmark (i.e. whether it includes just core, or core and optional elements) needs further exploration. For example, there was clear consensus that informatics is an information science based on the study of how data, information and knowledge can be harnessed to improve health and medical care – but much less agreement as to whether computer programming or bioinformatics is a core part of this discipline. This is work in progress and a fuller report will be produced in 2008.

Figure 1: Defining the core and optional elements of informatics

Extending the “Otley process” to include bioinformatics:
A small task force has been set up by IMIA to extend the Otley work into bioinformatics. The parts of bioinformatics which are probably a core part of medical/health/biomedical informatics are currently often referred to as either “translational” or “clinical” bioinformatics. They are the elements of bioinformatics which have clinical application. The author and Graham Wright (Winchester University) are the two UK members of this team – with other representatives from USA, Australia, New Zealand, Taiwan and Spain. The first step taken by the group has been for Peter Elkin (USA) to take the abstracts reviewed as a result of the “Otley-process” and the results of a literature review of the key bioinformatics literature relevant to medicine12 and map them to SNOMED CT (Systematised nomenclature for Medicine Clinical Terms) and generate a concept map. It is hoped that this map can be compared with that generated within AMIA (American Medical Informatics Association)13.

Discussion:
Educationalists, including several from the UK, are involved in helping define informatics as a specialty. Creating a conceptual map of what is and isn’t informatics is important, as without it the discipline will lack coherence. Many of us have had to write our own definitions of the sub-specialities of informatics in which we work, in my case defining primary care informatics14, as without this we may lack identity.

There are opportunities for informaticians who want to contribute to this process. The UK is an IMIA member, and BCS members with an interest in informatics education can contact the Education Working Group chair if interested in participating in this process. I would welcome contact from informaticians who would like to contribute to current benchmarking and mapping exercises.

Contact details:
Benchmarking statement comprises a catalogue of core and optional modules. Benchmarking statement could just include core.

Core learning objectives + competencies in biomedical informatics

Optional learning objectives + competencies

References:

11 IPHIE (International Partnership in Health Informatics Education). URL: http://www.iphie.org