MEDINFO23

8 – 12 JULY 2023 | SYDNEY, AUSTRALIA

@jenbicfin

IMIA Recommendations on education in BMHI – the way ahead

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AIDH IMIA

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IMIA White Paper

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Recommendations of the International Medical Informatics Association (IMIA) on Education in Biomedical and Health Informatics: Second Revision

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International Journal of Medical Informatics, 170, 1-16

Why are recommendations needed?

- Support BMHI curricula development
- Identify BMHI certification skills/competencies
- Provide BMHI program quality accreditation tool
- Motivate establishment and further development of BMHI programs

How were the recommendations developed?

- 29 interested and enthusiastic volunteers
- representing various countries from six continents
- participated in several meetings throughout 2021-2022, assigned to smaller working groups
- engaged in robust discussion and debate
- 3 taskforce members acted as an editing committee

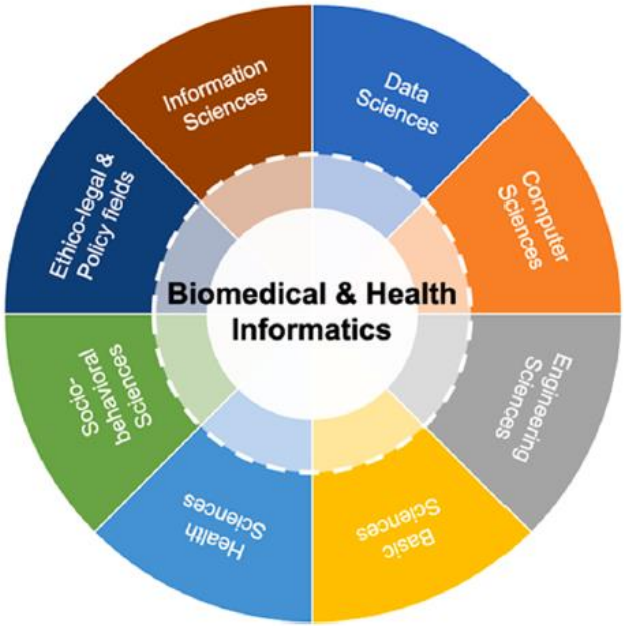
What are the major differences?

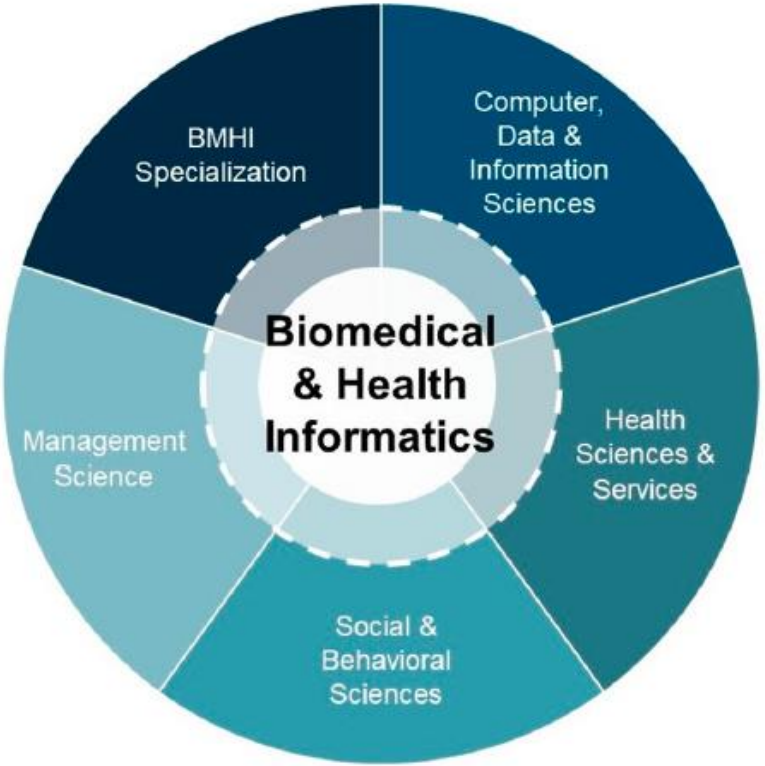
- All information contemporized
- Knowledge domains
- Levels of BMHI roles
- Topics rather than learning outcomes
- Suggested BMHI domains percentage within various programs

Knowledge domains

- Previously 4 – Core, Health, IT/Computer, Optional modules
- Acknowledgement of contributing intersecting disciplines
- Compared BMHI competency frameworks – A, C, SA, EU, UK, US
- Now 6 –BMHI Core Principles / Health Sciences & Services / Computer, Data and Information Science / Social & Behavioural Sciences / Management Science / BMHI Specialization

Knowledge Domains

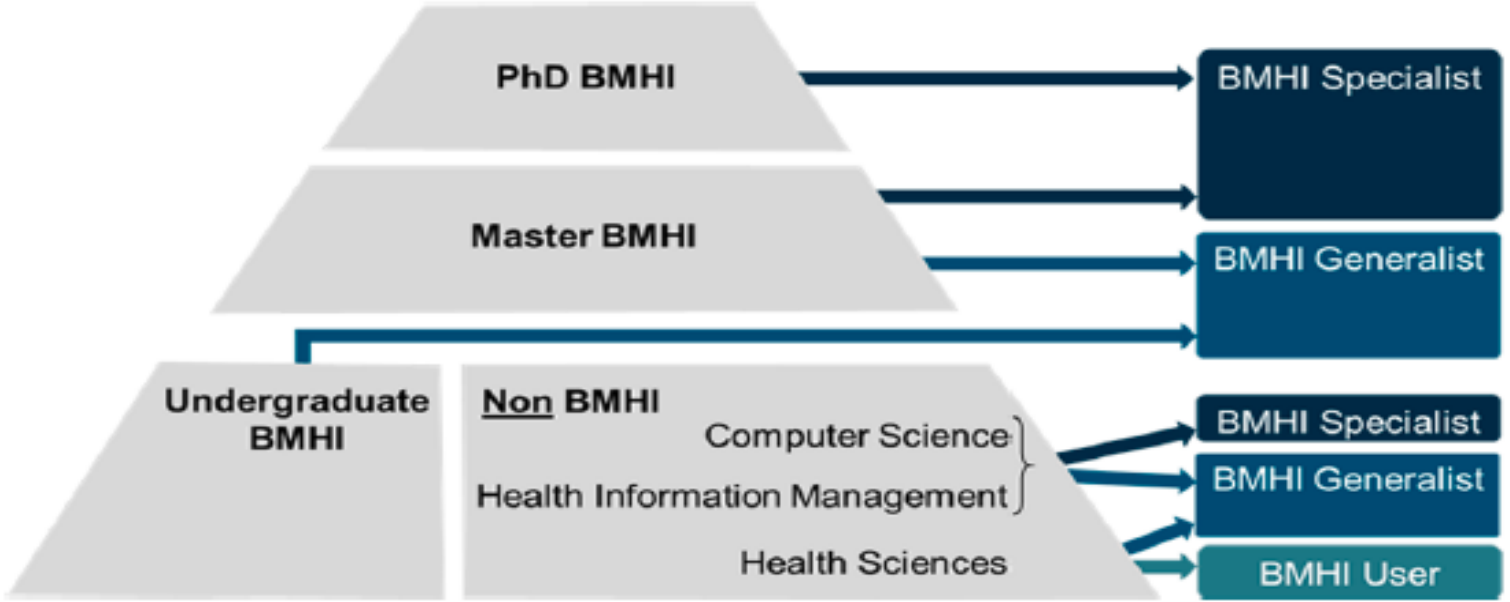




Levels of BMHI roles

- Previously 2 – IT User, BMHI Specialist
- Acknowledgement of pervasiveness of ICT in health sector
- BMHI much more interdisciplinary
- Now 3 –BMHI User / BMHI generalist / BMHI Specialist
- Generalist:
  - non-BMHI learners delivering healthcare or contributing to healthcare services
  - BMHI learners of UG and some PG programs

Levels of BMHI roles



Topics

- Previously 48 learning outcomes
- Now 81 topics

BMHI Knowledge Domains and Corresponding Topics.

1 BHMI CORE PRINCIPLES	2 HEALTH SCIENCES AND SERVICES
Clinical decision support	Biomedicine
Data governance	Care delivery models
Education support through informatics methods and tools	Clinical decision making
Evaluation and assessment of information systems	Determinants of health
Health informatics standards and interoperability	Epidemiology
Health record structure, design, and analysis principles	Evidence informed practice
History of BMHI	Health policies and regulatory frameworks
Information literacy	Health promotion
Information processing in healthcare	Health sector roles
Literature retrieval and analysis	Health terminology
Nomenclatures, vocabularies, terminologies, ontologies, and taxonomies	Healthcare service organization structure and function
Regional networking and shared care	Human anatomy and physiology
Research methods and paradigms	Participatory health
Telemedicine and telehealth	Patient empowerment
	Patient safety
	Person-centred care
	Public health
3 COMPUTER, DATA, AND INFORMATION SCIENCE	**4 SOCIAL AND BEHAVIORAL SCIENCES**
Artificial intelligence	Digital literacy and the digital divide
Blockchain technology	Ethics, Security and Privacy
Cloud and edge computing	Health literacy
Data and information analysis	Indigenous data sovereignty principles
Data and information attributes	Medical law
Data and information visualization	Problem solving
Design and development principles	Sociotechnical aspects
Information science theories	Stakeholder education
Information structure and design	Stakeholder engagement
Internet of Things	User experience
Network architectures and topologies	
Robotics	
System design	
System lifecycle	
System security	
Wireless technology, sensor-based systems	
5 MANAGEMENT SCIENCE	**6 BMHI SPECIALIZATION**
Business alignment	Biomedical imaging and signal processing
Change management	Biomedical modelling and simulation
Health economics	Chemoinformatics
Information culture	Clinical bioinformatics and computational biology
Leadership	Clinical research informatics
Interdisciplinary team management	Global health informatics
Process reengineering	Nanoinformatics
Project management	Participatory health informatics
Quality management	Personal health informatics
Resource management	Public health informatics
Risk management	Translational bioinformatics
System governance	
Value management and benefits realization	

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IMIA Recommendations on education in BMHI – examples of the implementation

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Suggested BMHI domain percentages

- Different perspectives for BMHI education due to educational variety
- BMHI courses - part of biomedical and health science programs U / G
- BMHI courses – part of HIM programs G / S
- BMHI courses – part of informatics/computer science programs G / S
- Dedicated BMHI programs – bachelor's, master's, doctoral
- Continuing education

Suggested BMHI domain percentages

Suggested percentage for the six BMHI domains within BMHI bachelor's programs.

Program	Medical informatics, biomedical informatics, health informatics
Program type	Undergraduate BMHI
Program length	At least 3-years full-time study

Knowledge/Skill Area		Percentage
1	BMHI core principles	15
2	Health sciences and services	30
3	Computer, data, and information science	30
4	Social and behavioral sciences	10
5	Management science	10
6	BMHI Specialization	5
∑		100

Suggested percentage for the six BMHI domains within BMHI master's programs.

Program	Medical informatics, biomedical informatics, health informatics
Program type	Postgraduate
Program length	Either 1-year OR 2-years full-time study

Knowledge/Skill Area		Percentage
1	BMHI core principles	40
2	Health sciences and services	15
3	Computer, data, and information science	15
4	Social and behavioral sciences	5
5	Management science	5
6	BMHI Specialization	20
∑		100

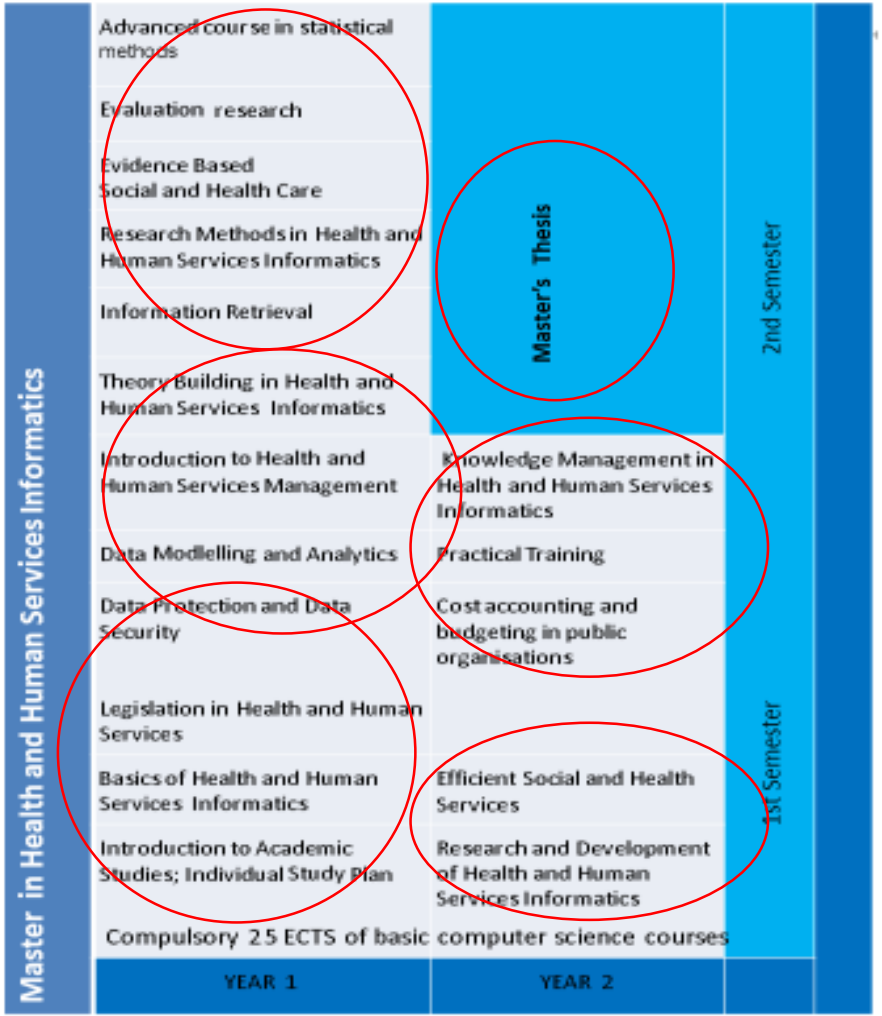
Health and Human Services Informatics master degree program at UEF - Accredited by IMIA

- Only master degree program of its kind in Finland since 2000
- The aim is to produce professionals and researchers in information management for the needs of health and social care
- Based on IMIA Recommendations on Education in Biomedical and Health Informatics from the very beginning
- Two-year master degree program (full time), 120 ECTS points
  - BA degree or corresponding studies as a background
  - Personal study plan for each student
  - Supplementary studies max 60 ECTS points
  - Multifaceted teaching with web studies
  - Electronic assessment and feedback system

IMIA Accredited Health & Biomedical Informatics Program

Curriculum of HHSI

- Depending on the student's previous education, some students must complete complementary basic qualitative or quantitative methods courses.
- The purpose of the methods courses is to expand and deepen students' methodological competencies.
- The aim of these courses is to prepare the student for completion of the thesis.



The six BMHI domains within HHSI Master's program

Master's programmes		Medical informatics, biomedical informatics, health informatics	Health and Human Services Informatics
Programme type		Postgraduate	Postgraduate
Programme length		Either 1-year OR 2-years full-time study	2-years full-time study
Knowledge/Skill Area		%	%
1	BMHI core principles	40	30
2	Health sciences and services	15	10
3	Computer, data, and information science	15	20
4	Social and behavioural sciences	5	5
5	Management science	5	5
6	BMHI Specialization	20	30
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IMIA Accreditation

- Accreditation service to establish worldwide benchmarks for BMHI education
- In addition to traditional local endorsement procedures (may not have enough BMHI expertise)
- Ensures BMHI core competencies covered using these recommendations
- Accreditation service recently reviewed and updated + virtual model
- IMIA Accreditation Committee continues to seek additional qualified experienced BMHI volunteers – letter of interest + CV submitted to CEO via imia@imia-services.org

Questions

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