



Hübner et al. Towards the TIGER International Framework 2.0

Towards the TIGER International Framework for Recommendations of Core Competencies in Health Informatics 2.0 – Extending the Scope and the Roles

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TIGER *Technology Informatics Guiding Education Reform*



Focus:

Engaging and preparing the global workforce in using technology and informatics to improve the delivery of patient care

History:

- 2006: TIGER began as a **grassroots initiative** within the **nursing** community - gradually extending the scope to include other clinical disciplines and move into the **inter-professional** arena
- 2012: Expanded the TIGER vision globally by establishing the **International Committee**
- 2014: TIGER transitioned to HIMSS and today is supported by the Professional Development Department
- 2019: TIGER International Task Force now represented by **29 countries** worldwide; Paula Procter and Bob Brookshire serve as co-chairs

Is Health Informatics education for the workforce still necessary?

User interfaces 1980

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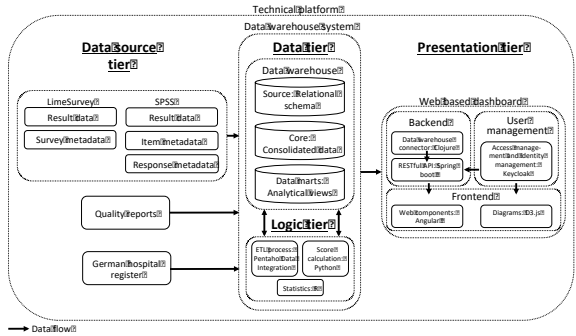
huebner-mobil15:~$ huebners
Last login: Tue Dec 18 09:34:52 on console
huebner-mobil15:~$ huebners root
-bash: root: command not found
huebner-mobil15:~$ huebners
huebner-mobil15:~$ huebners ls -l
total 0
drwxr-xr-x  4 huebner staff  128  7 Dec 11:05 Applications
drwxr-xr-x 32 huebner staff 1024 14 Jan 18:18 Desktop
drwxr-xr-x  9 huebner staff  288 23 Jul 2015 Documents
drwxr-xr-x  3 huebner staff   96  9 Mar 2015 Dokumente
drwxr-xr-x 82 huebner staff 2624 15 Jan 18:22 Downloads
drwxr-xr-x 73 huebner staff 2336  7 Dec 11:05 Library
drwxr-xr-x  3 huebner staff   96 13 Nov 2014 Movies
drwxr-xr-x  5 huebner staff  168  6 Aug 22:39 Music
drwxr-xr-x 41 huebner staff 1312 28 Sep 2017 Pictures
drwxr-xr-x  6 huebner staff  192 16 Jul 2017 Public
drwxr-xr-x 12 huebner staff 384 18 Dec 09:40 netcase
drwxr-xr-x  4 huebner staff  128 17 Dec 2014 wpworkspace
huebner-mobil15:~$ huebners
    
```

to user interfaces 2019



But is it really less complex

or more safe?



J Health Risk Manag. 2017 Jan;36(3):6-15. doi: 10.1002/jhrm.21259.
EHR-related medication errors in two ICUs.
 Caravon P¹, Du S¹, Brown R¹, Cartmill R¹, Johnson M², Wetterneck TB¹.

Nurs Adm Q. 2015 Oct-Dec;39(4):345-56. doi: 10.1097/NAQ.0000000000000119.
A Systematic Review of Nurses' Experiences With Unintended Consequences When Using the Electronic Health Record.
 Gephart S¹, Carrington JM, Finley B.

Where are the priorities and examples in an ocean of options and needs?

What are high priority **core competencies** in health informatics?

Do they depend on the (future) **role** of the health professional?

Is this competency relevant because it is **innovative**?

Should I teach / learn **basic** stuff or **advanced** methods?

How do I know?

What can **I learn from colleagues** and faculty of other institutions?

What courses are they offering?

Can I get **hands-on experience**?

How do I **deliver the content**?

How often do I need to **update** content?

Two projects to show the priorities and provide examples

International Competency Synthesis Project




gefördert vom
 **Bundesministerium für Bildung und Forschung**
 FK 160H22026





TIGER International Recommendations Frameworks

1.0
nurses

2.0
multiple professionals



EU*US eHealth Work Project

Funded by European Commission's Horizon 2020 Research and Innovation Programme (Grant-ID #727552)



TIGER International Recommendation Framework 1.0



Original Articles

OPEN ACCESS

Technology Informatics Guiding Education Reform – TIGER*

An International Recommendation Framework of Core Competencies in Health Informatics for Nurses

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⁷School of Nursing, The University of Auckland, Auckland, New Zealand;

⁸Omni Micro Systems, Omni Med Solutions GmbH, Hamburg, Germany;

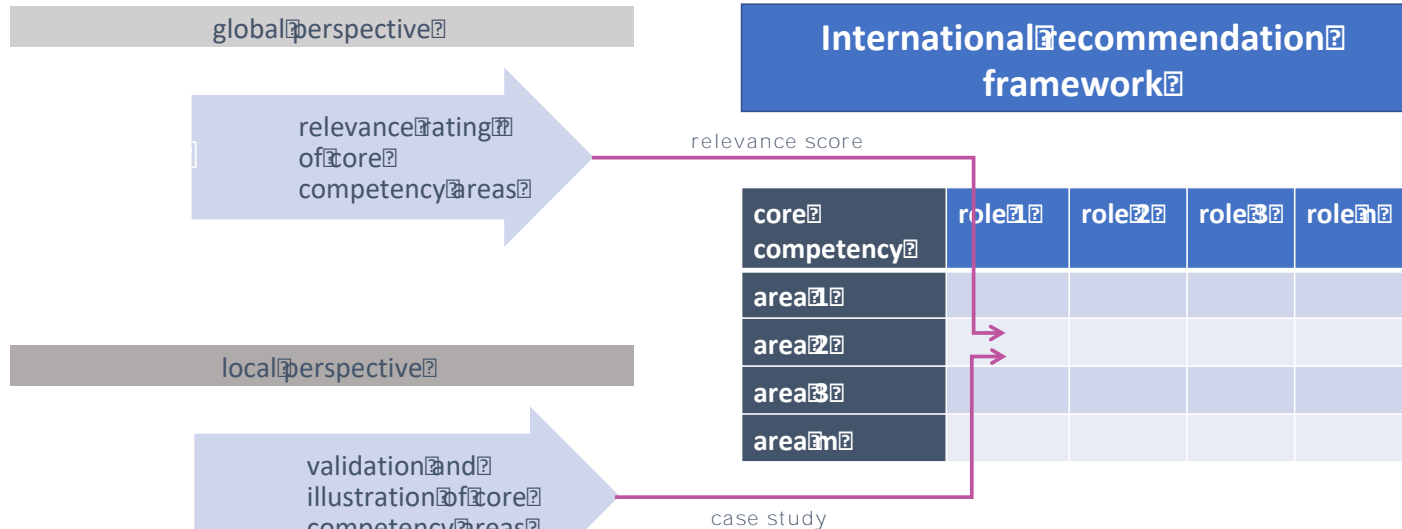
⁹eHealth Education Pty Ltd and Global eHealth Collaborative, East Melbourne, Australia;

¹⁰University of Colorado College of Nursing, Aurora, CO, USA;

¹¹Healthcare Informatics, Center for Computational Health, IBM Research, USA

Methods Inf Med 2018; 57(Open 1): e30–e42
<https://doi.org/10.3414/ME17-01-0155>

Mixed Methods Approach



Sources of core competency areas

- AMIA Board White Paper: definition of biomedical informatics and specification of core competencies for graduate education in the discipline³²
- German NKLM³¹
- Global Academic Curricula Competencies for Health Information Professionals Draft for Public Comment³³
- Health Informatics Scope, Careers and Competencies Version 1.9 from Australia³⁴
- Informatics Professional Core Competencies v3.0 from Canada³⁵
- Informatics Competencies for Every Practicing Nurse: Recommendations from the TIGER Collaborative³⁶
- Recommendations of the International Medical Informatics Association (IMIA) on Education in Biomedical and Health Informatics First Revision.³⁷

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

Table 2 Recommended and optional learning outcomes in terms of levels of knowledge and skills for professionals in health care either in their role as IT users or as BMHI specialists. Additional recommendations, specific for a certain educational program, will be added in Sections 4 and 5. Recommended level of knowledge and skills: + = introductory. ++ = intermediate. +++ = advanced

Knowledge/Skill – Domain	– Level	
	IT user	BMHI specialist
(1) Biomedical and Health Informatics Core Knowledge and Skills		
1.1 Evolution of informatics as a discipline and as a profession	+	+
1.2 Need for systematic information processing in health care, benefits and constraints of information technology in health care	++	++
1.3 Efficient and responsible use of information processing tools , to support health care professionals' practice and their decision making	++	++
1.4 Use of personal application software for documentation, personal communication including Internet access, for publication and basic statistics	++	++
1.5 Information literacy : library classification and systematic health related terminologies and their coding, literature retrieval methods, research methods and research paradigms	++	++
1.6 Characteristics, functionalities and examples of information systems in health care (e.g. clinical information systems, primary care information systems, etc.)	+	+++
1.7 Architectures of information systems in health care; approaches and standards for communication and cooperation and for interfacing and integration of component, architectural paradigms (e.g. service-oriented architectures)	+	++
1.8 Management of information systems in health care (health information management, strategic and tactic information management, IT governance, IT service management, legal and regulatory issues)	+	+++
1.9 Characteristics, functionalities and examples of information systems to support patients and the public (e.g. patient-oriented information system architectures and applications, personal health records, sensor-enhanced information systems)	+	++
1.10 Methods and approaches to regional networking and shared care (eHealth, health telematics applications and inter-organizational information exchange)	+	++
1.11 Appropriate documentation and health data management principles including ability to use health and medical coding systems , construction of health and medical coding systems	+	+++
1.12 Structure, design and analysis principles of the health record including notions of data quality, minimum data sets, architecture and general applications of the electronic patient record/electronic health record	+	+++
1.13 Socio-organizational and socio-technical issues , including workflow/process modelling and reorganization	+	++

Focus on
Biomedical/Health Informatics specialist (BMHI)

Distinction between the two roles:
IT-user and
BMHI specialist

Methods Inf Med 2010; 49: 105–120
doi: 10.3414/ME5119
prepublished: January 7, 2010

Workforce: What are the roles?

Physicians, nurses and other clinicians
Direct Patient Care

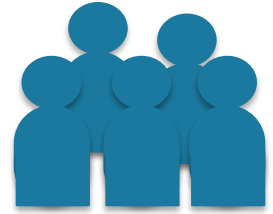
Data management and data analysis
Health information management

Board members
Clinical and Administrative Executives
Clinical and Technical Chief Information Officers

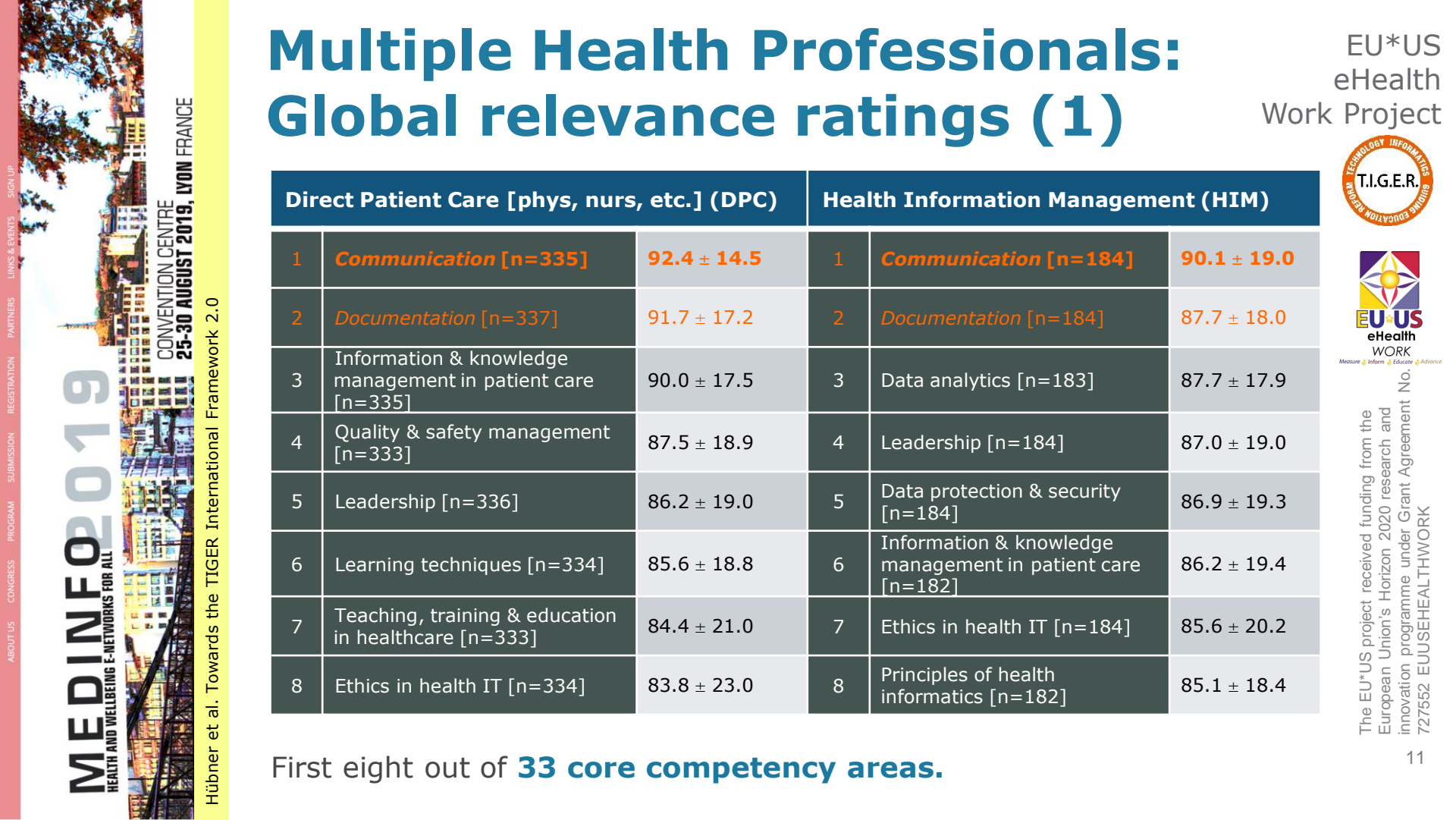
Biomedical and health informatics specialists and engineers
Engineering / Health IT specialists

Biomedical and health informatics researchers and educators
Science and Education

Survey Sample



- A total of **718 experts** from 51 countries responded following an individual and institutional online invitation world wide.
- The **51 countries** were composed of
 - 28 European countries,
 - 10 Asian countries,
 - 8 countries from Middle and South America,
 - 2 African countries and the USA, Canada and Australia
- These answers corresponded with **1,571 relevance ratings** for professional roles.
- **Not** meant for country comparisons.
- **Convenience sample** in cross-sectional study.



MEDINFO2019
HEALTH AND WELLBEING E-NETWORKS FOR ALL

CONVENTION CENTRE
25-30 AUGUST 2019, LYON FRANCE

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Multiple Health Professionals: Global relevance ratings (1)

EU*US
eHealth
Work Project



Measure Inform Educate Advance

The EU*US project received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 727552 EUUSEALTHWORK

Direct Patient Care [phys, nurs, etc.] (DPC)			Health Information Management (HIM)		
1	Communication [n=335]	92.4 ± 14.5	1	Communication [n=184]	90.1 ± 19.0
2	Documentation [n=337]	91.7 ± 17.2	2	Documentation [n=184]	87.7 ± 18.0
3	Information & knowledge management in patient care [n=335]	90.0 ± 17.5	3	Data analytics [n=183]	87.7 ± 17.9
4	Quality & safety management [n=333]	87.5 ± 18.9	4	Leadership [n=184]	87.0 ± 19.0
5	Leadership [n=336]	86.2 ± 19.0	5	Data protection & security [n=184]	86.9 ± 19.3
6	Learning techniques [n=334]	85.6 ± 18.8	6	Information & knowledge management in patient care [n=182]	86.2 ± 19.4
7	Teaching, training & education in healthcare [n=333]	84.4 ± 21.0	7	Ethics in health IT [n=184]	85.6 ± 20.2
8	Ethics in health IT [n=334]	83.8 ± 23.0	8	Principles of health informatics [n=182]	85.1 ± 18.4

First eight out of **33 core competency areas.**

Multiple Health Professionals: Global relevance ratings (2)



Measure Inform Educate Advance

Executives [clinical, administrative] (EXE)			Chief Information Officers [clin, tech] (CIO)		
1	Leadership [n=55]	96.4 ± 7.8	1	Leadership [n=62]	93.8 ± 9.6
2	Communication [n=55]	95.8 ± 8.3	2	Communication [n=62]	93.2 ± 10.7
3	Quality & safety management [n=55]	90.4 ± 16.1	3	Care processes & IT integration [n=62]	91.8 ± 13.7

Engineering/Health IT specialist (ENG)			Science and Education (S&E)		
1	Communication [n=172]	91.3 ± 14.3	1	Communication [n=218]	91.6 ± 16.1
2	Care processes & IT integration [n=171]	87.5 ± 18.9	2	Teaching, training & education in health care [n=220]	89.2 ± 17.9
3	Information & communication technology (applications) [n=171]	87.2 ± 18.0	3	Leadership [n=218]	88.2 ± 17.3

First three out of **33 core competency areas.**

Priorities in core competency areas: Summary

Communication among
Top 3 for all roles

Leadership and
Ethics in health IT among
Top10 for all roles

**Quality & safety management,
Documentation and
Care processes & IT
integration**
among Top 10 for four of the six
roles

Data analytics
among Top 10 for three of the six
roles



EU*US
eHealth
Work Project



Case Study Highlights



- All case studies were developed by the local experts using the **same template** and guiding questions to become comparable.
- Examples of successes and best practices in education & training, skills preparation, competency assessment/workforce development
 - ✓ **22 studies** with 50 contributing authors/co-authors from
 - ✓ Europe representing **10 EU States**
 - ✓ Asia and the Middle East: **Israel, India and China**
 - ✓ North America: **Canada, United States**
 - ✓ Africa: **Nigeria**
- Available at: <https://www.himss.org/professional-development/tiger-case-studies>

Baltic Case Study: Laurea, Arcada, Red Cross Medical College



EU*US eHealthWork Project

Authors: Outi Ahonen,
Jonas Tana, Gun-Britt
Lejonqvist, Marge Mahla,
Sanita Marnauza, Elina
Rajalahti

The curriculum developed by a Finish, Latvian and Estonian university, is **multi-professional** and combines health and welfare with IT and service design. In the three study units (15 credit points), future professionals from different fields of study (IT, social care, economics and health care) are developing their own unique competencies according to the **pedagogical principle "learning by developing"**.

*Understand ethical theories,
safety procedures, principles
and laws affecting digital health
and welfare as well as
customer privacy*



*Have the skills to practice
ethical and high quality
customer service taking
responsibility for the safety
and integrity of the client*

Recommendation Framework in action: example Ethics in health IT

International recommendation framework

core competency area	DPC	HIM	EXE	CIO	ENG	S&E
Ethics in health IT	83,8	85,6	87,0	88,7	83,4	86,5
competencies from Baltic case study	<i>Understand ethical theories, safety procedures, principles and laws affecting digital health and welfare as well as customer privacy</i>					
	<i>Have the skills to practice ethical and high quality customer service taking responsibility for the safety and integrity of the client</i>					

Conclusions

- (1) **Inter-professional** education is possible and necessary particularly regarding communication, leadership, ethics, quality & safety management, documentation and care processes & IT integration
- (2) Different **roles**, however, also require a specific **skill set**.
- (3) The **International Recommendation Framework** with its priorities and case studies can serve as a compass for educators and learners to find their path through the jungle of options.



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TIGER and Project Links

- HIMSS TIGER Initiative: <https://www.himss.org/professionaldevelopment/tiger-initiative>
- International Competency Synthesis Project: <https://www.himss.org/professional-development/tiger-initiative/tiger-international-informatics-competency-synthesis-project>
- EU*US eHealth Work Project: <http://ehealthwork.eu>