EFMI
European Federation for Medical Informatics Association

Prepared by Christian Lovis, IMIA Regional VP, EFMI, EFMI Past President (2018 – 2020)
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President Summary
EFMI members teamed up to work actively for visibility, cooperation and growth of the organization. New activities, as developing the first project building a platform to work with a medical professional European association, having a new Board position supporting young researchers – yEFMI, shifting to professional management of conferences, are several countepoints in EFMI’s current life. We continue to build on the agreed strategy and background in relation with visibility and activities around social media and web presence or publication in conferences. Participating in EU projects is of great importance for EFMI, national members and workgroups will continue the proactive developments in this area. The educational activities are a priority for EFMI and will continue with the same force. EFMI will increase and will be more focused in the future to develop better relations with editors of impact journals. For the cohesion of EFMI members we continuously look for cooperation at research level between national societies through work visits, workshops, invitations and presence during national societies’ events.
Lacramioara Stoicu-Tivadar;
EFMI President (oct. 2018 - oct. 2020)

Introduction
The European Federation for Medical Informatics Association (EFMI) is the leading organization in medical informatics in Europe. All European countries are entitled to be represented in EFMI by a suitable Medical Informatics Society. The term medical informatics is used to include the whole spectrum of Health Informatics and all disciplines concerned with Health Informatics. EFMI is organized as a non-profit organization concerned with the theory and practice of Information Science and Technology within Health and Health Science in a European context. The objectives when founded in 1976 are still guiding:
• To advance international co-operation and dissemination of information in Medical Informatics on a European basis;
• To promote high standards in the application of medical informatics;
• To promote research and development in medical informatics;
• To encourage high standards in education in medical informatics;
• To function as the autonomous European Regional Council of IMIA

The EFMI Council oversees all activities of EFMI and gives the EFMI Board direction, means, and resources for activities to develop health and biomedical informatics in Europe. The EFMI Council fully supports ongoing efforts to professionalize operation of the federation, increase visibility in social media, participate in European projects, and the AC2 initiative (see below) to foster cross-border mobility for health informatics students and professionals in Europe. These activities are elaborated in this report.

Further information about EFMI activities can be obtained via our website: http://www.EFMI.org and our social media outlets on Twitter, Facebook, and LinkedIn.

National Members
All representative societies in countries within the European Region of the WHO are entitled to apply for EFMI membership. Currently members of the EFMI are from Austria, Belgium, Bosnia and Herzegovina, Croatia, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Moldova, Netherlands, Norway, Portugal, Romania, Russia, Serbia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, and United Kingdom.

Institutional Members
EFMI is also open for institutional membership. Institutions, which typically become EFMI members, include non-profit organizations like universities, research organizations, and non-governmental organizations (NGO), and for-profit organizations like small and medium size enterprises (SME) and multi-national companies. We have had different strategies to engage new institutional members and to raise visibility for the current institutional members. We aim to strengthen cooperation among national societies, working groups and institutional members through transparency.

Several minor events to create awareness and visibility of IM, EFMI has been done during the year.
• STC19 in Hannover meeting up with new institutional members
• Medinfo19 in Lyon where IM Officer was represented in the EU¬-China Health Summit on Medical Innovation and Technology Transfer: Blueprint for a joint mission in Aging.

Organization of the Board & Council Members as Institutional Members

It is worth noting that, despite encouragement to both Council and Board to engage their organization to become IM, there has only been a few new IM during the year.
IM representatives in the Council are:
• Representing academia and NON-profit organizations: Christophe Gaudet-Blavignac
• Representing industry: Jacob Hofdijk
Both gentlemen were elected during an online meeting late June. For 2020 we strive for a new approach in recruiting IM. The approach is to create value, based on the core EFMI values represented by the scientific work and the network of researchers, EFMI conference attendees, members of Working groups and other friends of EFMI. We are looking forward elaborating more on this work in 2020.

Congresses

EFMI organizes two main conference series: Medical Informatics Europe- MIE and the Special Topic Conferences - STC. In conjunction with or independent of the main congress series, working groups contribute to organize topic specific workshops, tutorials, and seminars in the EFMI series and elsewhere. In 2019, no MIE took place due to Medinfo taking place in Europe.

1st EU-China Health Summit on Medical Innovation and Technology Transfer

On the 25th of August, Lyon and Medinfo2019 hosted the 1st EU-China Health Summit on Medical Innovation and Technology Transfer. Summit chairs, Catherine Chronaki, the vice president of the European Federation of Medical Informatics, and Zhi Yang, professor of Capital Medical University and the vice president of the China Medical Informatics Association, jointly hosted the opening ceremony and warmly received the respectful speakers and audiences from Europe and China. Closing the 1st EU-China Health Summit on Medical Innovation and Technology Transfer Prof. Yang said “This summit is unique and effective platform for dialogue and collaboration on aging and the associated healthcare technology developments in Europe and China. We want to keep and grow this channel and momentum to produce great solutions to the people’s life quality through technology development and innovations. We are proposing to hold the next summit in China, Suzhou, next August, to continue the dialogue and further our effort for better healthcare outcomes. We are looking forward to welcome you.”

STC2019 “ICT for Health Science Research”

STC 2019 was held at the Peter L. Reichertz Institut in Hanover, Germany from April 8th to 10th 2019. The conference was dedicated to the advances of information and communication technology (ICT) towards health science research. The main goal was to reveal the recent research and development supporting data systems in biomedical, translational and clinical research, semantic interoperability of such systems and analytics of data from multiple systems in application domains such as clinical trials or registries for drug and medical device developments, for diagnostics and for interventions. The conference also honored Prof. Peter Leo Reichertz (1930–1987), one of the founding fathers of ICT healthcare and an originator of the term Medical Informatics.

The Program

The first part of the conference was held in the Leibniz House, Hanover downtown. For the second part, the Lecture Hall A at Hanover Medical School (MHH) was allocated to host the Peter L. Reichertz Symposium.

Oral presentations were organized into the following topics and sessions:
- Digitization of systems medicine
- Data quality, privacy, and security
- Health interoperability through standards
- Medical registries and clinical trials
- Interfaces with diagnostic or therapeutic systems
- Novel approaches in ICT for health research
- Big data analytics
- Towards interoperable health information systems
- Improving the understanding of health data
- Data-driven decision support in systems medicine
- Mobile data capture and electronic patient reported outcomes (ePRO)
- ICT for clinical trials

The conference was mostly split into two parallel tracks so that listeners were able to choose which session they were more interested in. In addition to the oral presentations, two workshops were hosted by the European FAIR4Health Initiative and the German Medical Informatics Initiative. Coffee breaks, lunch breaks and the poster session were suitable to get in touch with people from different fields and discuss the overall interesting subjects of the conference.

Keynote Speakers

The invited keynote speakers were professionals in their specific subjects and did a great job presenting their topics and encourage the audience in discussions as well as in critical thinking.

The first keynote “Raising the impact of real world evidence”, by Prof. Dipak Kalra, President of the European Institute for Innovation through Health Data, was a great start following the welcome session because the presentation involved a lot of key issues of the conference like big health data, data quality and principles to handle safety-critical information. It was a future-oriented keynote that inspired an open discussion.

The second keynote was scheduled on day 2 and was contributed by the Executive Director of The Innovative Medicines Initiative (IMI) Dr. Pierre Meulien. He talked about how to harness big data for the benefit of patients. This presentation covered a technical view on health tools and their data integration, data interfaces and data standards. This keynote provided solutions to these major challenges in handling big data.

Proceedings

The proceedings are open access: http://ebooks.isopress.nl/ISBN/978-1-61499-959-1

More than 90 submissions were received, from which, after review, the Scientific Program Committee (SPC) accepted 50 full papers to be included in this volume of proceedings. In addition, 16 poster presentations were accepted.

In addition, a special section in JOMS is currently being prepared. About 10 authors decided to shorten their accepted proceedings paper down to an extended abstract and prepare a full journal paper. These submissions are currently in review with JOMS.
**Upcoming Congresses**
- MIE 2020: Digital Personalized Medicine, Geneva, April 28–May 1st, 2020
- STC 2020: Citizen centered digital and integrated health and social services—Citizens as service users and data producers Kuopio Finland September 28 to 30, 2020
- MIE 2021: Athens, Greece, April 2021

**Professional Conference Organisation (PCO) Strategy**
For many years, EFMI has pursued the idea of outsourcing the organizational tasks of planning and conducting its MIE and STC conferences more consistently to professional conference organizers (PCOs). The following objectives are pursued:
- The local organizers of the conferences, e.g., an EFMI member organisation, should be relieved of organizational and financial tasks, freed from financial risk and able to concentrate more on the scientific content. This should make it more attractive to host an STC or MIE conference.
- The EFMI conferences represent a large part of EFMI’s revenues. A professional conference organisation should increase the revenues of the conferences and achieve a calculable profit for EFMI. The financial risks for EFMI should also be minimized and calculable with the help of professional controlling.
- The honorary EFMI Board is to be relieved of organizational and controlling tasks in order to be able to devote itself to its core competence, the scientific development of EFMI and its conferences.

Three years ago, offers from four PCOs were obtained. Negotiations with the French company MCO were intensified and a contract has just been signed. Initially for the next three years, MCO will be responsible for the organisation and financial management of the EFMI conferences. The local organizers are responsible for the scientific quality of the STC and MIE.

The contract has been signed in December 2019 by our President Lacramioara Stoicu-Tivadar.

**EFMI Working Groups**
EFMI activities are organized across topic activities reflected in its 15 WGs. During 2019, EFMI WGs prepared and discussed their 3-year business plan articulating goals and measurable objectives.

**Activities**
The EDU WG on Education has been collaborating across working groups to improve training in biomedical health informatics. In the context of the EFMI cooperation with the European Federation for Emergency Medicine (EUSEM) an educational webinar on “Structured Data, Big Data, Health Analytics, and Clinical Decision Support: how does it change emergency medicine?” has been organized. Joint educational activities under the EUSEM-EFMI cooperation are expected to continue and will inform the roadmap of joint educational activities to support the digitization of emergency departments. The EFMI HIIC WG has also been active in the EUSEM-EFMI cooperation contributing towards a shared dictionary of terms for the disciplines of medical informatics and emergency medicine. The resulting work will be available in HeTop platform.

In EFMI STC2019 “ICT for Health Science Research” in Hanover on 7-9 of April 2019 (https://stc2019.plri.de/) was organized with support from EFMI WGs MIP, THI, NI, and HIME as well as several IMIA WGs. In Hannover, the 80th EFMI Council approved a new WG Citizen and Health Data (CHD) chaired by Maria Hägglund and co-chaired by Monika Johansen and Anne Moen. The WG was inspired by a report of EFMI within the European eHealth Stakeholder Group1 prepared under the lead of Anne Moen. The WG CHD has been also quite active on LinkedIn seeking cooperation with similar activities in other IMIA regions, met during the ICIMTH 2019 organized on July 7-10 in Athens, Greece, under the auspices of EFMI. The same council approved Mauro Giacomini as the new chair of the EFMI THI WG.

Several EFMI WGs are engaged in the FAIR4Health project led by Carlos Parra Calderon co-chair of the THI WG. FAIR4Health was funded by the European Commission to support the development of guidelines for a FAIR data policy implementation in Health research (www.FAIR4Health.eu).

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New Chairs
The 79th EFMI Council endorsed the following new working group chairs, which have been elected previously:
• Romaric Marcilly, HOFMI
• Mauro Giacomin, THI

EFMI Communication and Dissemination
New EFMI Website
EFMI developed a new website to consolidate its position on internet media. The new website is using Web 2.0 technologies in order to cover all the needs on information and collaboration between the stakeholders of medical informatics in Europe. The new website is currently offering a direct access to all information regarding EFMI (Members, History, Working Groups etc.) and EFMI’s actions (Accreditation and Certification, Conferences and Meetings, Research Projects), as well as, a link to EFMI’s social media accounts.

On the new website, every person who is interested in medical informatics can create an account and gain access on specific content and to publish his/her ideas or opinions about a subject. The idea is to build an active on-line community for medical informatics in Europe where scientists will exchange knowledge, trends, discuss about challenges, and forming the future of medical informatics. All the content will be reviewed by the website content editors in order to keep a high-quality content on EFMI’s new website. The content of the new website can easily be published to the social media in order to gain more visibility and “reads” to achieve any dissemination requirements.

Social Networks
At the same time EFMI re-enforces its presence on social networks, having an active Twitter, Facebook, LinkedIn account along with the newly created Instagram profile. Social networks are valuable tools for networking, and stakeholders’ connection and collaboration. Currently EFMI’s account on Twitter (www.twitter.com/efmi) has more than 728 followers. EFMI’s Page on Facebook (www.facebook.com/EFMIEuropeanFederationMedicalInformatics/) has over 910 followers who are having access and get informed about the EFMI news and actions. LinkedIn account (https://www.linkedin.com/company/efmi.org) has 146 connections from all over the world.

Books and Proceedings
All EFMI conferences are published in the IOS Press Studies in Health Technology and Informatics (HTI) series, which was started in 1990 in collaboration with EU Research Framework programs, to promote biomedical and health informatics research. The series contains more than 260 volumes of high-quality works from all over the world. The HTI series is indexed by MEDLINE/PubMed; Web of Science: Conference Proceedings Citation Index - Science (CPCI-S) and Book Citation Index - Science (BKCI-S); Google Scholar; Scopus; EM Care.

EFMI AC2 – Accreditation and Certification Committee
A great variety of recent literature describes curricula in Biomedical and Health Informatics (BMHI), Medical Informatics, Medical Engineering, and Biomedical Engineering at European Universities, which are offered at all academic levels.
For this reason, EFMI established the Accreditation and Certification (AC2) initiative to find and present all necessary elements in an appropriate way to implement the Accreditation and Certification process in education in biomedical and health informatics in Europe. The AC2 Committee members are: John Mantas (as Chair), Catherine Chronaki, Arie Hasman, Anne Moen, Inge Madsen, and Rebecca Randell.

Firstly, the AC2 Committee decided to map the educational status of BMHI in Europe by creating a database of educational programs across Europe since study programs in the entire spectrum of the field of Biomedical and Health Informatics, Medical Informatics and Health Technology is continuously growing during the recent years.
This work was focused on European Universities, Colleges, and Institutions. The official website of each university or institution was carefully checked to locate educational programs in: Biomedical Informatics, Health Informatics, Medical Informatics, Medical Technology, Bioinformatics, Nursing Informatics, etc.

At the present time, the educational database includes a variety of specializations at undergraduate and postgraduate level. In particular, a detailed recording of the educational programs in the specializations of Health Informatics, Medical Informatics, Biomedical Informatics, Bioinformatics, Nursing Informatics, Dental Informatics, Health Technology, Healthcare Technology, Medical Technology, Biomedical Technology, Dental Technology, Health Engineering, Healthcare Technology, Medical Engineering, and Biomedical Engineering are included in the database. Furthermore, the database comprises additional educational programs in specific areas such as Nanomedicine, Medical Electronics, Clinical Informatics, Clinical Technology, Clinical Engineering, Computational Biology, Life Science Informatics, Clinical Data Management, Big Data in Healthcare, Data Mining in Healthcare and Medicine, Digital Health Systems, E-Health, Telemedicine, Healthcare Analytics, Wireless Networks in Healthcare, and Internet of Things in Healthcare. The detailed registration of the European educational programs will help to the qualitative comparison of the study programs for accreditation purposes according to international standards.
In more detail, specific information was collected for each educational program. All these elements are included in the educational database. The information that is being collected for each study program includes: university, department, faculty, study program name, academic level (e.g. undergraduate, postgraduate, doctoral, postdoctoral studies), type of education (full time, part time, combined), mode (on campus, e-learning, distance learning), specializations, director of the education program, details about contact person of the program, curriculum, time table, learning outcomes, competences and program’s language (English, local, bilingual), ECTS credits, and academic staff details.
This study has covered almost 30 EFMI Countries-Members out of 32. The study includes 1,900 Universities, which were accessed to locate approximately 1,000 academic programs in the domains related to Biomedical and Health Informatics, including Bioinformatics and Biomedical Engineering at all academic levels.
A brief description of the results:
- Out of the overall number of programs, 25% were undergraduate programs, 56% postgraduate programs, and 19% PhD-postdoctoral programs.
- Most of the study programs were in Biomedical Engineering and Bioinformatics; a significant number of programs were in the Medical Engineering, Medical Informatics, Health and Medical Technology specialties.
- Study programs such as Health Informatics, Medical Informatics, E-Health and Medical Technology are very popular in Norway, Sweden, Denmark, Austria, Switzerland, and the Netherlands.
- In the Netherlands, Austria, and Denmark a variety of study programs and specialties at different academic levels exist.
- Belgium, Iceland, Republic of Moldova and Serbia mainly establish Biomedical Engineering programs.
- Bioinformatics programs mostly exist in Armenia, Ireland, Switzerland, and Slovenia.
- Countries such as Czech Republic, Finland, Greece, Hungary and Sweden conduct related educational programs mainly at postgraduate level.
- Most of educational programs’ language is local (55%). The English language (42%) and bilingual language (almost 3%) also exist.

The corresponding data of each study program was sent to the EFMI Representative Members in order to validate the existing information of each educational program in their corresponding countries. Afterwards, the verified elements are uploaded to the website and they are published on the network (http://efmi-ac2@bmhi-edu.org). It is worth to mention there is pending feedback from certain representatives. Until receiving the feedback from all the countries, we should consider this information as a draft.

The study presents the status of European educational programs in the wider inclusive field of BMHI. More specifically, this initiative aims at the creation of an online database that would provide information about European programs and courses in Biomedical and Health Informatics in order to support the promotion and provision awareness of the educational initiative to the wider biomedical and health informatics community in Europe.

The Committee organized sessions to promote and provide awareness of the Accreditation and the Certification initiative to the wider biomedical and health informatics community in Europe and worldwide. More specific, members of the Committee participated in Hannover at EFMI STC 2019 and in Lyon (France) at Medinfo 2019 to present the current progress of the AC2 Accreditation and the Certification initiative. Further informational events and presentations are scheduled in near future.

In conclusion, all these data are necessary to explore and to understand the present educational status of European countries. The detailed records of the related educational programs will support the short- and long-term needs in order to develop and implement the Accreditation and the Certification initiative in Europe. EFMI participation in European H2020 projects.

**EFMI in EU H2020 Projects**

**The CrowdHEALTH Project — an EU Horizon 2020 project (2017 – 2020)**

The CrowdHEALTH is a three year (2017-2020) European Commission funded project under the Horizon framework that supports the transition from patient health records towards the Holistic Health Records (HHRs) and Social HHR. Furthermore, CrowdHEALTH aims at integrating high volumes of health-related data collected from various sources applying health analytics tools to support policy making decisions. The European Federation of Medical Informatics (EFMI) as partner within the project supports the development of an effective Communication and Collaboration Plan identifying the messages and the tools and channels in disseminating the project and its outcomes to the target audience. The main objective of the envisioned strategy is to engage and inform the target audience about the CrowdHEALTH project and its outcomes. The Dissemination strategy is created through a cyclic process consisting of five components linked together.

The strategy consists of the dissemination objective, the message to be communicated, the tools and channels of communication, and the target audience. Scientific journals, conferences and edited books remain the core traditional means of disseminating research, but social media has become an important channel for disseminating research.

The implemented framework identified a dissemination strategy to better communicate project’s findings with traditional methods (conferences, publications) and through robust digital presence. Scientific journals, conferences and edited books remain the core traditional means of disseminating research, although social media has become an important channel for disseminating research. Social media can play a significant role in all phases of the research lifecycle including the dissemination of research findings and it is important that a large number of audience be addressed through appropriate means in order to be engaged with the progress of the project and raise their awareness about the project and its deliverable outcomes.

In addition, CrowdHEALTH has set up an external advisory body composed of distinguished experts from academia, industry, and chaired by EFMI representative. The impact creation board (ICB) objective provides to the consortium feedback regarding technical issues and comments on project’s dissemination and exploitation strategy. Furthermore, this initiative creates links with different scientific communities related to the healthcare domain. Therefore, the project goals and objectives are aligned to both industry and research demands.

CrowdHEALTH has been presented at Medinfo 2019 in Lyon, MIE 2018 in Gothenburg, and ICIMTH 2019 in Athens.

**The FAIR4Health Project — an EU Funded Project Horizon 2020 (2019-2021)**

FAIR4Health project will have one year in January 2020. The FAIR Data Principles were first published in 2016. FAIR seeks the reuse of data and other digital research output and objects (algorithms, tools and workflows that led to that data) making them Findable, Accessible, Interoperable, and Reusable. The principles consider applications and computational agents as stakeholders with the capacity to find, access, interoperate and reuse data with none or minimal human
intervention and recognize the importance of automated process to do that because humans increasingly rely on computational support to deal with intensive data processes.

Findable: data are assigned a globally unique and permanent identifier; data are described with rich metadata; metadata clearly and explicitly include the identifier of data they describe; data are registered or indexed in a searchable resource.

Accessible: data are retrievable by their identifier using a standardized communications protocol; the protocol is open, free, and universally implementable; the protocol allows for an authentication and authorization procedure; metadata are accessible even when the data are no longer available.

Interoperable: data use a formal, accessible, shared, and broadly applicable language for knowledge representation; data use vocabularies that follow FAIR principles; data include qualified references to other data.

Reusable: data are richly described with a plurality of accurate and relevant attributes; data are released with a clear and accessible data usage license; data are associated with detailed provenance; data meet domain-relevant community standards.

EFMI is responsible for dissemination and promotion activities. EFMI organizes with their members, workshops and tutorials to raise awareness and perform demonstrations of the FAIR4Health platform, associated events at the EU level (such as MIE and STC), and events supported by EFMI institutional and associated members at a national level. The results will contribute to deliverables. FAIRification workshops and tutorials series.

EFMI together with five partners is involved in MOOC-like materials creation. Production of audiovisual content to explain the use and uptake of FAIR4Health platform and agents for research data sharing and re-use is planned.

**EFMI Honorary Fellows**

New Honorary Fellows in 2019:

Anne Moen
University of Oslo
Institute of Health and Society
Oso, Norway

Ragnar Nordberg
Nordangsgatan 18
431 69 Molndal, Sweden

**Members of the EFMI Executive Board, 2019**

**President:**
Lacramioara Stoicu-Tivador
University Politehnica Timisoara
Department of Automation and Applied Informatics
Timisoara, Romania

**Vice President:**
Catherine Chronaki
HL7 International
Brussels, Belgium

**Past President:**
Christian Lovis
University Hospitals of Geneva and University of Geneva
Division of Medical Information Sciences
Geneva, Switzerland

**Secretary:**
Alfred Winter
Leipzig University
Institute for Medical Informatics, Statistics and Epidemiology
Leipzig, Germany

**Treasurer:**
Andrej Orel
Marand d.o.o.
Ljubljana, Slovenia

**Institutional Membership Officer:**
Louise Pope-Haugaard
Aalborg University
Department of Health Science and Technology
Aalborg, Denmark

**Press and Information Officer:**
until April 9, 2019
Alexander Hörbst
UMIT - Private University for Health Sciences, Medical Informatics and Technology
Research Division for eHealth and Telemedicine
Hall in Tirol, Austria

From April 10, 2019, the position is no more existing per se and is assumed by the publication officer.

**Publication Officer:**
until April 9, 2019
Simon de Luigian
University of Surrey
Department of Health Care Management and Policy
Surrey, UK

from April 10, 2019

**Publication, Press and Information Officer:**
Parisis G. Gallos
Health Informatics Laboratory
Department of Nursing, School of Health Sciences
National and Kapodistrian University of Athens
Athens, Greece

**Executive Officer:**
until April 9, 2019
Mira Hercigonja-Szekeres
Department of Informatics in Health
University of Applied Health Sciences Zagreb, Croatia
and Hrvatsko Zagorje Polytechnic Krapina
Krapina, Croatia

from April 10, 2019
Rebecca Randel
University of Leeds
School of Healthcare
Leeds, UK

**Assistant to the EFMI Board**
Patrick Weber
Nice Computing
Le Mont-sur-Lausanne, Switzerland