"DigiHealthDay–2020@DIT-ECRI"

A Global Look at Digital Health from the Heart of Europe

An international symposium held at the European Campus Rottal-Inn, November 13, 2020

ABSTRACT

Digital Health is gradually being recognized as an indispensable tool in today's healthcare and includes the fields of medicine and information technology. At the moment, it is important to have professionals come together in order to present recent advances, instruct on various topics, discuss recent initiatives and propose further initiatives. In order to revisit the key branches of Digital Health, an inaugural symposium was held at the European Campus Rottal-Inn of the Deggendorf Institute of Technology (DIT-ECRI) in Germany. The DIT-ECRI is a member of the European Federation for Medical Informatics (EFMI), and was host to internationally renowned speakers from Europe, US, Russia, and other countries. Together with an enthusiastic audience from around the world, the symposium "DigiHealthDay-2020@DIT-ECRI" proved to be a significant contribution to the Digital Health field.

SYMPOSIUM REPORT

On November 13 of 2020, a symposium was convened at the European Campus Rottal-Inn (ECRI), Pfarrkirchen, Germany to address '**Global Digital Health – Today, Tomorrow, and Beyond**.' The event was hosted by the European Campus Rottal-Inn of the Deggendorf Institute of Technology (DIT-ECRI). Delegates from around the world including academics, health professionals and managers, companies, students and citizens were invited to take part in the inaugural event.
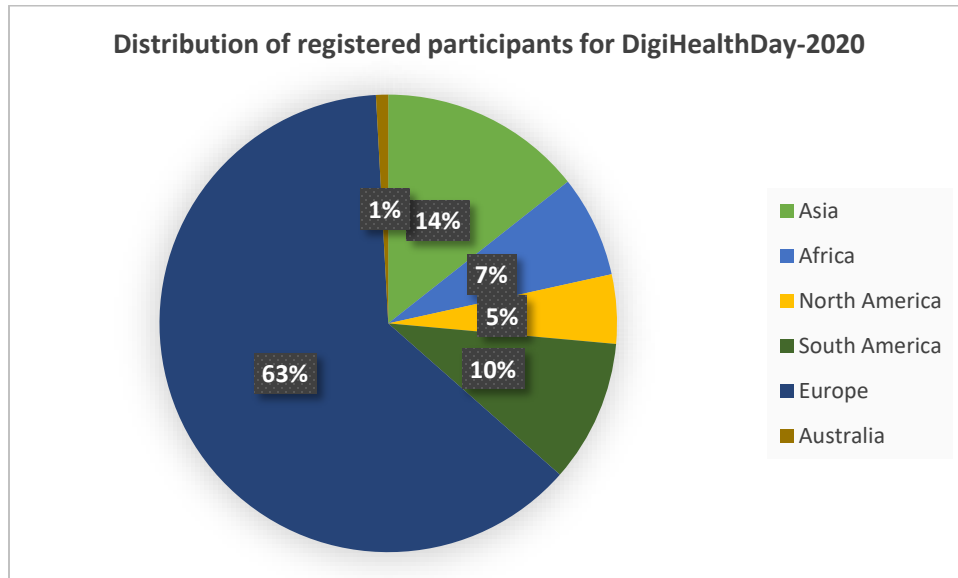
Though the event was initially planned to invite delegates on-site at the ECRI, the restrictions of the pandemic prompted the organizers to convert the event into a virtual event, allowing participants from across the globe to take part in the symposium. The symposium consisted of pre-event workshops and a symposium. Participants were also invited to send abstracts of their research work, which were then displayed as papers and posters during the symposium.

The main topics for the symposium were EHR, Health Information Systems, Data Standards and Interoperability, Telemedicine and Remote Health Care, mHealth, IoMT, and Telemonitoring, Health Data Management and Analytics, Artificial Intelligence in Medicine and Healthcare, Privacy, Security, Trust, and Patient Engagement, Robotics, Blockchain, New and Emerging Technologies, DigiHealth Innovation and Entrepreneurship with a special focus on Digital Health Education.

The event was sponsored by the International society for Telemedicine & eHealth (ISfTeH), International Medical Informatics Association (IMIA), European Federation for Medical Informatics (EFMI), German Telemedicine Society (DGTelemed), Bavarian Telemedicine Alliance (BTA), m.Doc (Cologne, Germany), the City of Pfarrkirchen and Digital Health News (digitalhealthNews.eu) as the media partner.

Participant Overview:

The organizers received an overwhelming response of 348 registrations from 59 countries from across the world representing a variety of health care disciplines.

Distribution of registered participants for DigiHealthDay-2020

■	Asia
■	Africa
■	North America
■	South America
■	Europe
■	Australia

1% 14% 7% 5% 63% 10%

More than 60% of the attendees were from universities and research institutions. Apart from a sizeable number of participants from the Deggendorf Institute of Technology, other universities that took part included universities and institutes from Germany, Russia, Italy, Ukraine, Slovenia, Finland, United Kingdom, The Netherlands, Switzerland, Portugal, France, Sweden, Australia, Canada, Mexico, Brazil, Colombia, Ecuador, Bolivia, Chile, Venezuela, Georgia, Nigeria, Ethiopia, India, Pakistan, Algeria, Egypt, Turkey, Morocco, Bangladesh, Indonesia and The Philippines.

The rest of the attendees included representatives from the private sector (13%), healthcare providers (12%), non-profit organizations (6%), the public sector – authorities, regulators and others (6%).

Summary of Symposium Events on November 13th, 2020:

With almost 350 registered participants and over 120 live participants, the entire day of the symposium was conducted via a Zoom meeting. The summary that follows highlights the welcome, plenary and scientific sessions and the important aspects presented in these sessions of DigiHealthDay-2020.

Welcome Session:

Prof. Horst Kunhardt, Vice President of Health Sciences at the Deggendorf University of Technology and Director at European Campus Rottal-Inn welcomed the participants to the

symposium. He described the mission of the DigiHealthDay-2020 and the need of having a symposium dedicated to digital health. He was joined by Prof. Dipak Kalra, Professor of Health Informatics at the University College London and President of the European Institute for Innovation through Health Data and Prof. Yunkap Kwankam, Executive Director of ISfTeH to welcome the participants. The Bavarian minister for science and art, Mr. Bernd Sibler, explained the educational efforts of the symposium, in a pre-recorded message to DigiHealthDay-2020@DIT-ECRI.

Plenary Sessions:

The plenary sessions consisted of 5 keynote speeches and 4 impulse talks. The sessions were moderated by Prof. Horst Kunhardt and Prof. Dipak Kalra.

In the first keynote speech, Prof. Dipak Kalra, Professor of Health Informatics at the University College London and President of the European Institute for Innovation through Health Data, spoke of the importance of data in digital health. He stressed the need of good quality data, the efforts and frameworks needed to capture better data, and the necessity to involve all stakeholders including citizens to efficiently scale up the use of data to improve health and healthcare. He urged academia and researchers to share data for the greater good of society.

Prof. Bernd Blobel from the University of Regensburg informed the audience about the paradigm changes in health and social care systems and how it is interrelated with the paradigm changes in technology. Prof. Blobel also discussed the role of artificial intelligence in the automation of healthcare, the modelling of 'Future-Proof' health and social care ecosystems and the standard for system integration and interoperability.

The role of mobile health (mHealth) was addressed by Prof. Robert Istepanian from Imperial College London. He pointed out that mobile health in its current smartphone-centric model fails to address increasing healthcare challenges and demands in many countries, especially the low-income countries. He called for the need to reinvigorate the science of mHealth to complement the existing market-driven mHealth models. In advocating the inclusion of mHealth in digital public health policies, Prof. Istepanian explained how an 'mHealth 2.0 system' would better help to combat the impact of COVID-19.

A screenshot of the keynote speech delivered by Prof. Dipak Kalra

The impulse talk from Dr. Malcolm Fisk of De Montfort University Leicester, highlighted the importance of building digital health knowledge and skillsets in telecare services. He gave an introduction to the technologies associated with telecare services in the United Kingdom. He explained how the lack of effective use of existing data and technology is a challenge in meeting the healthcare needs of people, particularly in rural regions. Prof. Fisk concluded by providing essential knowledge and skill areas that will help to respond to challenges in demographic change, sophisticated technologies and access to healthcare services.

Ms. Pirkko Kouri from Savonia University of Applied Sciences in Finland, presented the pivotal role citizens play in Finland's e-health and e-welfare strategies, and their many roles as an actor in different sectors which are recognized and identified by the government. She detailed the significance of engaging common people in all phases of project management and the challenges encountered by nurses in adapting to digital services. Ms. Kouri exemplified the role of citizens with the success of the 'Omaolo' application used during the COVID-19 pandemic.

With the increasing inclusion of artificial intelligence in medicine and healthcare, the problems faced in reaching the long-term goal of intelligence that closely resembles human intelligence was discussed by Prof. Lenka Lhotska from the Czech Technical University, Prague. She spoke on the problems faced in artificial intelligence research, the role of personal portable devices, and IoTs in healthcare. She emphasized the difference between healthcare data and information, how they are core in developing clinical decision systems, and the necessity to understand the factors influencing them.

Dr. Andreas Keck from the SYTE Institute spoke about the concept of a digital health business model. He gave an insight into how digital health exists outside the realm of chronic disease

management, and the two factors driving digital health business models are cost and better care. The importance of validated calculation during the planning phase and effective ways of approaching a digital health business project, the economic impact of artificial intelligence in healthcare was discussed.

An inspiring keynote was delivered by Dr. Brian E. Dixon from Indiana University, USA concerning 'Applied Public Health Informatics: An eHealth Discipline Supporting Response to COVID-19, Chronic Diseases, and Social Determinants'. He presented real-world data sources, data collection, data visualization, and predictive models for COVID-19 response currently being used in the US state of Indiana. Prof. Dixon also explained the role of the Indiana Network for Population Health.

In addressing the international digital transformation of healthcare, Prof. Dale Alverson, Medical Director of the center for Telehealth University of New Mexico Health Sciences Center and past president of the American Telemedicine Association explained the development of telehealth in the global community. He explained that the advance in communication technology will be critical in supporting the expansion of health applications locally and globally, which is especially true for developing countries. Prof. Alverson also described the development of an international collaborative telehealth network.

Scientific Sessions:

The scientific session included a number of interesting papers in the fields of telemedicine and remote health care, data standards and interoperability, electronic health record and health information systems, digital health innovation and entrepreneurship as well as artificial intelligence in medicine and healthcare. The scientific sessions were followed by lively discussions on the papers presented.

An interesting paper by Dr. Kirill Arzamasov focused on the use of tele-ultrasound imaging using smartphones and singleboard computers was presented. Mr. Jonathan Okereke, healthcare solution architect at Uniklinik Köln presented insights into the use the HDF5 data format in radiology information systems. Mr. Ram Prakash Suriyanarayanan explained the use of a domain specific clinic management software. Professor Ganna Nevoit from the Ukrainian Medical Stomatological Academy presented her paper on the systemic representation of information and energy processes in the body based on a short recording of heart rate variability.

In a parallel scientific session, Ms. Soraia Damião spoke about the perception of medical students regarding the practice of telemedicine against COVID-19. Prof. Ozar Mintser, head of department of Medical Informatics of Shupyk National Medical Academy of Postgraduate Education of Ukraine proposed a special training program within the framework of the systematic system of continuous pedagogical development in his paper on information technology in the transformation of medical education. Oleksandra Kovyrova from the V.M. Glushkov Institute of Cybernetics, Ukraine explained the development of a software for automation of assessment of quality of life based on a standardized questionnaire (MOS SF-36). Finally, Ms. Helana Lutfi enlightened the audience about the impact of artificial intelligence on human society, the individual human being and how the future will look like in terms of artificial intelligence and personalised treatments.

CONEDIG Special Session: A special session was dedicated to the introduction of CONEDIG (Consortium of Educational Institutions in Digital Health). This is an initiative under the ISfTeH (International Society for Telemedicine and eHealth) to create a set of educational programs for digital health and the evaluation of existing programs in digital health. The five founding institutions from Universidade do Estado do Rio de Janeiro in Brazil, the Université de Bordeaux in France, Deggendorf Institute of Technology (DIT-ECRI) in Germany, Peoples' Friendship University of Russia and the University of KwaZulu Natal in South Africa presented their institutions and their digital health programs. This was followed by a presentation detailing the goals of CONEDIG and the roadmap to serve as a global platform for advancing digital health education and the sharing of expertise for joint educational and research projects. A stimulating discussion about the CONEDIG initiative brought out relevant points in digital health education and the way forward. Various global digital health education issues such as teaching, research, development as well as practical applications in view of initial graduation and post-graduation were discussed.

Prof. Georgi Chaltikyan concluded the event by thanking all the speakers, organizers, partners and participants. Prof. Chaltikyan highlighted DIT-ECRI's efforts in bringing people to share experience and knowledge in using technology for bettering health and healthcare beyond international borders. He extended an invitation to all delegates for the next edition of DigiHealthDay which would hopefully be an onsite event at the European Campus Rottal-Inn.

Statistics from Post-Event Survey:

The following statistics are from respondents of a post-event survey.

The overall satisfaction with the International Scientific Symposium 'DigiHealthDay-2020@DIT-ECRI' in the context of acquiring new information and obtaining novel insights in the domain of Digital Health was more than 75%. Satisfaction with the individual Plenary and Scientific sessions was consistently rated as satisfied (more than 80%).

Use of the Zoom platform and attendance in person:

On the ease of using Zoom for this event (e.g. asking questions, etc.), more than 50% of the respondents reported that they were very satisfied, with the remaining being satisfied. When questioned on the ease of following instructions to join the virtual event, the response was similar with more than 50% of the respondents claiming they were very satisfied, while the rest reporting that they were satisfied. A majority of the attendees did not experience any technical difficulties during the event (87%) with 10% of the respondents having difficulties with the internet such as an unstable internet connection. On attending the event physically if the circumstances allowed it, 68% of the respondents said they would like to attend the symposium in-person.

On recommending 'DigiHealthDay-2020 @DIT-ECRI' to a colleague:

More than 85% of the respondents reported that would be willing to recommend 'DigiHealthDay-2020@DIT-ECRI' symposium to a colleague. Among the main reasons was the need for a digital health system and that current and relevant topics in Digital Health were discussed. The respondents also pointed out that rich, scientific, informative content with a wide spectrum of knowledge from different Digital health applications and branches was

presented resulting in a great opportunity for learning. The choice of speakers, their experience and friendly demeanor was also mentioned. Other reasons included a well-organized event, quality presentations, education on better career opportunities and the presence of an international input from different individuals across different sub-specialties related to Digital Health. Some respondents also noted that there are few conferences on the topic of digital technologies and it is important to obtain new actual information and establish new connections. It also exposed participants to industry professionals and real world applications of digital health solutions, thus giving the participants an opportunity to learn more beyond their own country and continent. The respondents noted that the discussions were insightful and enlightening for young digital health enthusiasts.

On topic/topics that would be preferred to be covered in a future event:

Responses to the survey revealed the top five topics of interest that could be covered in upcoming symposiums of the 'DigiHealthDay-2020@DIT-ECRI'. These are:

1. Artificial intelligence (AI) in Medicine including AI in medical diagnostics
2. Telemedicine related topics including telerehabilitation, synchronous telecardiology, engagement of governments, involvement of nurses and caretakers, evaluation of teleconsultations during the pandemic and future development and challenges in telemedicine
3. Technological innovation, Blockchain, IoT in medicine and Big Data in Digital Health
4. Education and career related topics, research, career opportunities in the medical informatics domain and digitalization of the education and health care system
5. Heath Data Interoperability

Other topics of interest to the respondents included ethics in telemedicine, health data analytics, data protection in the health sector and privacy by design in health. A number of recommended topics were related to the use of mHealth, patient or people engagement models, multi-stakeholder engagements and interactions and improving compliance with digital health applications. A few recommendations were on the business model of Digital Health, product ownership and design thinking. Much of the responses were based on the multidisciplinary experience in Digital Health, especially the application of Digital Health in developing countries and how digitalization can help poor countries an access to good healthcare. These recommendations were related to the digital transformation of health including dental health. Respondents also mentioned that they would like updates on the topics covered in DigiHealthDay-2020@DIT-ECRI.

A respondent noted that it was required to address the complexity, ethical, educational and social challenges of future 5P medicine as well as autonomous, intelligent systems as an interdisciplinary approach. The respondent stated that unfortunately, educational systems and international projects move to specialization and efficiency, thereafter facing the problem of interdisciplinary considerations and integration.

A screenshot of the DigiHealthDay-2020@DIT-ECRI symposium held on 13th November, 2020
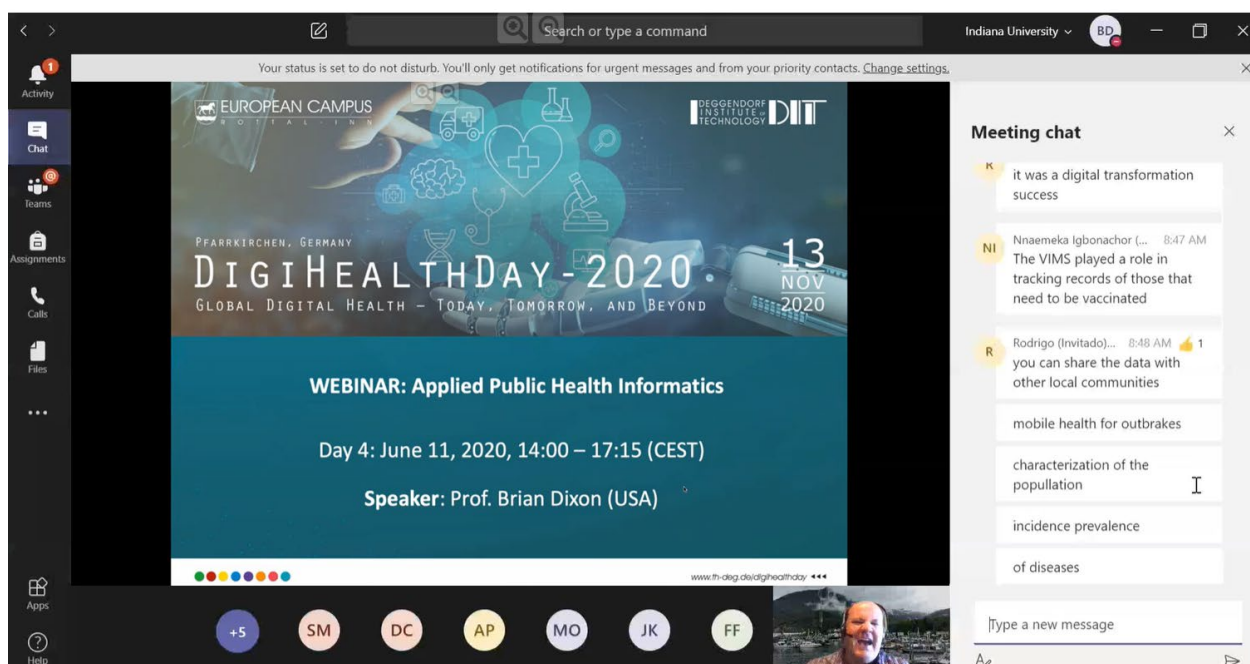
General comments and suggestions:

The overall comments on the 'DigiHealthDay-2020@DIT-ECRI' symposium was that it was an excellent event with great presentations and discussions with the possibility to connect with colleagues and update knowledge. Survey participants noted that excellent information on Digital Health was provided. Some respondents responded that they would like to have an in-person event and that they look forward to the next symposium. The respondents requested that more workshops and hands on training be implemented. Other suggestions included maintaining the online option of the event, auto reminders before the event for ease of joining and maintaining the low cost of attending, thus encouraging many to join. It was also noted that the event was too long for one day, and since it was an online event, it would have been more productive to understand if it was divided over two or three days.

Summary of Pre-event Workshops:

The symposium was a culmination of a yearlong event consisting of seven educational-scientific workshops hosted by the European Campus Rottal-Inn. The virtual workshops spanned over the course of 14 days over a total of 45 hours from April 2020 to July 2020, featuring 28 sessions, and attended live or viewed on-demand. The workshops were attended by 163 registered attendees from Germany and 40 countries around the world with positive reviews from the participants. Almost all workshops were conducted on Microsoft Teams with very few technical issues and the participant survey responses suggested good audience reception. The audience appreciated the informative and engaging sessions, adding that the content was essential for their professional knowledge and career.

The workshops organized included prominent speakers in the field of health informatics. Prof. Dr. Brian E. Dixon from Indiana University and Regenstrief Institute's Center for Biomedical Informatics (USA), Dr. Malcolm Fisk from De Montfort University (UK), Prof. Dr. Thais Russamano from King's College London (UK), Mr. Justus Wolff from the company Syte (Germany), and Mr. Florian Hettenbach from Amazon Web Services (Germany), conversed on topics that include "Applied Public Health informatics", "Key Ethical Benchmarks for Digital Healthcare", "Telehealth Applied to Extreme Environments", "Artificial Intelligence in Healthcare", and "Innovate faster with AWS – The Cloud Fundamental". Virtual workshops from DIT-ECRI alumni included "Clinical Decision Support Systems" by Dr. Arunakyri Natarajan, and "Data Integration and Interoperability" by Jonathan Okereke, Fernando Portilla, and Samir Irshaid. To help strengthen the concept, in addition to the presentation and discussions, several the virtual workshops also featured hands-on training sessions.

A screenshot of the pre-meeting Virtual Workshop conducted by Prof. Brian Dixon on Applied Public Health Informatics

Feedback on the pre-meeting Virtual Workshops:

Of all the attendees of the pre-meeting virtual workshops, 28% attended the virtual workshops while 72% did not attend any of the virtual workshops. Of the respondents who attended the pre-meeting workshops, the satisfaction scores were more than 80%. Comments on the pre-meeting workshops were largely positive due to being informative, motivating, as a good addition to professional knowledge, and with excellent speakers. Suggestions were to have the workshops on a regular yearly basis. Other comments stated that some workshops were of a long duration and were quite hectic. The respondents also noted that the speakers kept the participants engaged. A further recommendation was to have focused presentation

topics in order to be a little more specific so that the speakers could provide further details based on their specialty. Some respondents mentioned that the time allocated was rather little compared to the content delivered, which made the speaker to rush the presentations, thus suggesting that the timing be tailored properly especially with regard to practical sessions. Recommended topics included issues related to telehealth.

Conclusion:

The inaugural DigiHealthDay-2020@DIT-ECRI received an overwhelming response in terms of attendance and participation. The delivery of the entire symposium as a virtual event was noteworthy. With the current capacity, the organizers plan to implement the symposium as a recurring and annual event.