



Over 10 years “Health and Technology”

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Abstract

Over 10 years ago, in August 2011, this IUPESM and Springer journal “Health and Technology” published its first issue. In this editorial paper we give an overview on the origins, the developments, the achievements and the future of this journal.

Keywords Health and Technology · HaT · Heal · IUPESM · IFMBE · IOMP

1 About “Health and Technology”

For over 10 years the journal “Health and Technology” has been around serving the global Medical Physics and Biomedical Engineering community. It is jointly published by Springer and the International Union for Physical and Engineering Sciences in Medicine (IUPESM) in cooperation with the World Health Organization (WHO). Initially established as the first truly cross-disciplinary journal on issues related to health technologies it addresses all professions related to healthcare and health technology.

During the first decade of its life “Health and Technology” faced all the challenges associated with growth and gaining recognition in the ever changing fields of technology and health.

Charged with a mission to serve as a platform connecting medical technology and healthcare, the journal encourages open communication between medical physicists, biomedical/

clinical engineers and other specialists on topics of both professional and societal importance.

With this paper we would like to focus on “Health and Technology” - its history, team, partners, key aspects, achievements and future prospectives.

2 The history of “Health and Technology”

The concept of “Health and Technology” is much older than the journal itself. The first concrete steps were already taken in 2006 at a meeting of Christoph Baumann, Joachim Nagel and Monika Nagel in Stuttgart. At this time, Joachim Nagel had just become Past-President of IFMBE (The International Federation for Medical and Biological Engineering) as well as new President of IUPESM, and a cooperation between IFMBE and Springer for the journal “Medical & Biological Engineering & Computing” had just been established. Christoph Baumann was in charge of biomedical engineering at Springer. He had to evaluate a proposal on the topic “Computers in Healthcare”. Therefore, it was natural for Christoph to ask Joachim to be reviewer. Obviously, the IUPESM community had been dealing with the topic of IT in healthcare for quite some time, because the answer to the question was: “Computer in Healthcare” was relevant at this moment (2006), but would quickly become obsolete due to technical developments in IT and Medicine. In addition, he said, there were already several relevant journals.

However, according to Joachim Nagel, there would always be technological innovations that were developed by technologists and then had to be applied by healthcare and nursing professionals who themselves had no technological background. What is needed is a communication platform where

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all relevant professional groups can communicate in a non-specialized language about technology in healthcare. This platform could be a new journal developed in collaboration between IUPESM and Springer. So, the idea of “Health and Technology” was born.

Even an Editor-in-Chief was proposed: Lodewijk Bos was known as an organizer of conferences dealing with precisely these topics. Although Lodewijk had a deep understanding of technical topics, he was not an engineer or physicist. It was therefore decided that a second Editor-in-Chief with deeper roots in technology would be helpful, and Luis Kun agreed to take on the task. This process was not as straight forward as IUPESM and Springer had hoped, so that the contract to the new journals was signed only four years later, in June 2010, and some months later we proudly presented the first online-article of “Health and Technology” describing the concept of the journal in detail: “Just another journal? No, a different one!” [1]. The first issue was published in the summer of 2011.

In the following years, Lodewijk Bos took over the day-to-day running of the journal, organizing the peer review of submitted articles and recruiting more and more researchers to join the board, while Luis Kun mainly acted as advisor and acquirer for special issues. The journal had to cope with its first shock when Lodewijk Bos passed away very suddenly in the summer of 2014, leaving a huge gap. Fortunately for the journal, Luis Kun had just retired from active service at the university and could now devote himself fully to “Health and Technology. However, the journal had grown in the meantime and was publishing about 30 articles a year. These articles discussed topics from all areas of medical technology and medical physics, so that it became difficult to find the right reviewers for all submissions. Therefore, the IUPESM journal committee met to look for help for Luis. Thus, Magdalena Stoeva was asked if she would be available as a second Editor-in-Chief for the journal, and at the end of 2016 there were again two Editors-in-Chief, with Magdalena taking care primarily of Standard Submissions and Luis of Special Issues.

Another sad moment for the journal occurred in the summer of 2017, when Founding Editor Joachim Nagel passed away. Joachim had always considered the journal a bit like his baby, and was always available with advice and support, and so HaT had lost two of its main protagonists in a very short time. Moreover, a year later, in the summer of 2018, Luis Kun began to step back from his active role and to take care exclusively of the last Topical Collections he had acquired. Of the founding team, only Christoph Baumann from Springer was now left, but he accepted a new position at the publishing house in spring 2019, handing over responsibility for the journal to his colleague Chew-Juan Low.

3 Achievements

3.1 Size

Since the journal started in 2011, number of submissions have been steadily increasing, with significant growth especially in the last three years. In 2020, Health and Technology saw an 82% increase in its submissions from 2019. Last year, the journal marked its highest number of submissions so far, having received 750 papers, a 62% increase from 2020 numbers. This is an impressive achievement, especially when the journal received only 50 papers when it first started.

3.2 Usage

As the journal grew, its visibility and usage among the research community also increased. As shown in Fig. 1, there was a surge in article downloads over the recent few years, with the journal seeing over 66,000 downloads in 2019, 109,000 downloads in 2020 and 187,000 downloads in 2021. The journal is on track to surpass its usage this year, with 86,000 downloads as of April, 2022. With Springer Nature’s content sharing initiative ‘SharedIt’ [2], authors are also able to share links to view-only, full-text subscription articles with the wider research community, contributing to the overall increase in usage.

3.3 Impact

Health and Technology’s success is also reflected in its impact and citation growth. The journal’s cite score [3] Scopus has consistently improved and number of citations has more than tripled [4] from 2018 to 2021. It is indexed in major indexing databases such as Scopus and Emerging Sources Citation Index (ESCI).

Attention by over fifty newsoutlets was in particular drawn to the article [5] about Machine Learning algorithms used for Health. The accuses in this article lead to lively discussion between Google Deep Mind and the authors from the University of Cambridge which were published in HaT [6, 7].

Health and Technology’s Google DeepMind article continues to be cited and has accumulated 117 k downloads since publication in Mar 2017. The article has an altmetric score of **1039**:

- in the top 5% of all research outputs scored by Altmetric (in the 99th percentile of 21,026,901 research outputs tracked across all sources)
- has one of the highest-scoring outputs from this source (#2 of 201 outputs)

Total Item Request

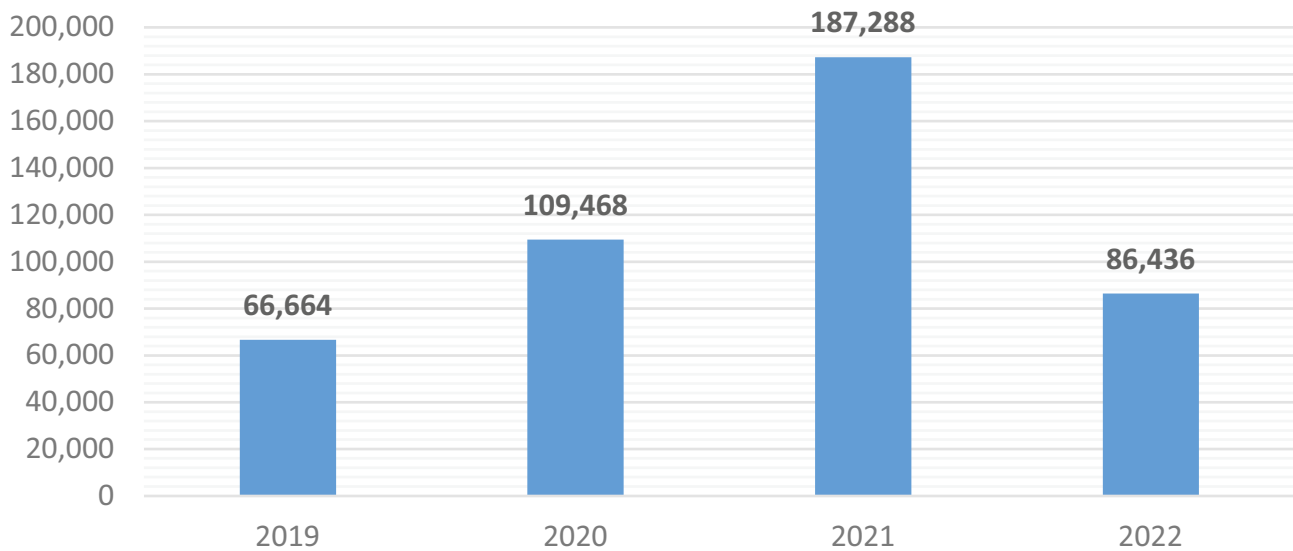


Fig. 1 COUNTER Usage Data from Google BigQuery

- High Attention Score compared to outputs of the same age and source (scoring higher than 99% of its contemporaries)
- previously cited by WHO in Jan 2021 and was last cited in April 2022 here
- extremely highly cited and has received approximately 63 times more citations than average
- 61% of citations received in the past two years, which is higher than expected, suggesting that it is currently receiving a lot of interest

(Data retrieved from <https://link.altmetric.com/details/17398645>)

The article Robotic surgery [8], reviewing the value of technological innovations and whether it is worth purchasing the related products received similar public attention.

4 Relation with IUPESM

4.1 IUPESM

IUPESM plays a key role both in the journals establishment and history, as well its present and future perspectives to gain the deserved recognition in the world of healthcare and technology.

The IUPESM represents the combined efforts of more than 25,000 medical physicists and 120,000 biomedical engineers working on the physical and engineering science of medicine [5].

IUPESM was established in 1980 as an umbrella organization representing the two major global professional societies of medical physicists and biomedical engineers - the International Organization for Medical Physics (IOMP) and the International Federation for Medical and Biological Engineering (IFMBE). IUPESM is a member of the International Science Council (ISC). The principal objective of IUPESM is to contribute to the advancement of physical and engineering sciences in medicine for the benefit and well being of humanity.

4.2 WHO

The IUPESM constituent organizations - IOMP and IFMBE are both recognized as WHO Non-Governmental Organizations (NGOs). Therefore the deep involvement of the WHO with the two professions leading to an fruitful collaboration in the field of, but not limited to healthcare, technology, safety and professional recognition.

“Health and Technology” is the next level of organizational collaboration between IUPESM and WHO. Proudly

published in cooperation with the WHO, the journal contributes to the vast scope covered by this UN agency - the health work force (physicians, nurses, medical physicists, clinical engineers, biomedical engineers, hospital engineers, etc.), the ministries of health, hospital management, self-employed doctors, health care providers and regulatory agencies, the medical technology industry, patients' associations, universities (biomedical and clinical engineering, medical physics, medical informatics, biology, medicine and public health as well as health economics programs), research institutes and professional, scientific and technical organizations.

4.3 IUPESM Union Journal Committee

The IUPESM Union Journal Committee (UJC) has been established in 2012, shortly after the journal's first volume was published. Among UJC's main objectives are to facilitate the communication between IUPESM and the journal, to provide assistance to the journal, and to support its broad profile as a platform for collaboration between medical physicists, engineers and other related professions.

Some of the world's leading medical physicists and biomedical engineers have served as members of the IUPESM Union Journal Committee during the 3 terms of its existence:

Union Journal Committee 2018-2022 Ratko Magjarevic (Chair) James Goh (IUPESM President) Slavik Tabakov (IUPESM Vice President) Leandro Pecchia (IUPESM SG) Magdalena Stoeva (Editor-in-Chief) Kang Ping Lin (Editor-in-Chief) SM Krishnan (IFMBE) Paolo Russo (IOMP) Per Ask (IFMBE)

Union Journal Committee 2015-2018 Per Ask (Chair) Lodewijk Bos (Co-Editor-in-Chief HEAL) Luis Kun (Co-Editor-in-Chief, HEAL) James Goh (President, IFMBE) Peter Smith (Treasurer, IUPESM) Joachim Nagel (Founding Editor, HEAL)

Union Journal Committee 2012-2015 Per Ask (Chair) Lodewijk Bos (Co-Editor-in-Chief, HEAL) Luis Kun (Co-Editor-in-Chief, HEAL) James Goh (Secretary General, IUPESM) Peter Smith (Treasurer, IUPESM) Joachim Nagel (Founding Editor, HEAL)

5 Outlook

The Covid-19 pandemic has emphasized the critical role medical technology plays in managing public health emergencies and its impact on the overall healthcare industry.

Health and Technology constitutes an essential platform connecting medical technology and informatics with the needs of care, health care professionals and patients. The journal plays a vital role as a communicative source for the health work force.

With the combined expertise of current Editor-in-Chief Magdalena Stoeva and new Editor-in-Chief Kang-Ping Lin who will be on board in June, the journal is making good progress towards getting indexed in Science Citation Index Expanded (SCIE) and obtaining an Impact Factor. Future plans for development and expansion are also underway, with a focus on increasing journal reach and engagement among the wider research community.

Declarations

Conflict of interest The authors declare that they have no conflict of interest.

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