

German Medical Data Sciences in Studies in Health Technology and Informatics - Reflections on the Fifth Volume

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Abstract. Since 2017, the German Society for Medical Informatics, Biometry and Epidemiology e.V. (GMDS) offers the submission of full papers to the annual meetings, optional in Studies in Health Technologies and Informatics (Stud HIT) or in GMS Medical Informatics, Biometrics, and Epidemiology (MIBE). GMDS' aim is to increase the attractiveness of the conference and paper submission process in particular for young scientists and to increase the visibility of the conference. A standardized peer review process was established. Since 2017, a 25-35% of the contributions have been submitted as full papers. A total of 177 papers were published in Stud HTI. With an unofficial journal impact factor of 1.088 (2019) and 0.540 (2020), the papers were cited with a frequency similarly to national medical journals or full paper contributions of International medical informatics conferences.

Keywords. German Medical Data Sciences, proceedings, peer review, citation report, editorial

1. How it started ...

In 2017, the German Society for Medical Informatics, Biometry, and Epidemiology e.V. (GMDS) offered the opportunity to submit full papers to the GMDS Annual Conference for the first time. Prior to 2017, only abstracts were accepted. The abstracts were used by the Scientific Program Committee (SPC) to select the best abstracts and presentations and then to invite the authors to submit their research as a full paper to a special issue of the open access journal GMS Medizinische Informatik, Biometrie, und Epidemiologie (MIBE) or to a special issue of Methods of Information in Medicine. Upon submission, a novel independent review process was conducted. Efforts and publication delay were thus equivalent to publication in another journal for the authors. Furthermore, only the abstracts were available at the annual meeting.

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A different conference and publication culture was established in computer science and the international biomedical and health informatics community. In these communities, full papers are submitted and published that are equivalent to journal articles in terms of structure, quality, and length and likelihood of being cited. In these scientific communities, a full conference paper is included and recognized as original work when evaluating scientific achievements for doctoral or postdoctoral degrees. A two-stage peer review by independent reviewers and an independent editorial board / SPC are the prerequisites for the recognition of conference contributions as original, peer-reviewed work. While the publication of full papers in biomedical health informatics was limited to international conferences such as the Medical Informatics Europe (MIE) of the European Federation of Medical Informatics (EFMI) or MEDINFO of the International Medical Informatics Association (IMIA), their example increasingly established a standard for other national conferences. In particular, conferences in German-speaking countries (Austria, Switzerland) became an attractive competitor for submissions in medical informatics for young scientists

For the 62nd Annual Conference of the GMDS in Oldenburg (Germany), the submission of full papers in English was made possible for the first time. The resulting submissions were reviewed in a peer review process established for the conference. The following objectives/goals were associated with this change:

- To increase the attractiveness of the meeting for authors, especially young scientists, by recognizing their contributions for doctoral and postdoctoral research.
- To increase the attractiveness of the meeting for the conference participants: The publication of the long papers before the congress allowed a more targeted selection of session visits and a more intensive discussion of the presentations.
- Over all, to increase the national and international visibility of the scientific work of GMDS members, the Annual Conference, and of GMDS as a scientific organization.

2. Review Process and Publishing

2.1. Opportunities for submitting and publishing

The GMDS Board of Directors and the conference presidents of the 2017 and 2018 Annual Conferences decided that three different types of contributions should be offered to the authors:

- Full papers in English for publication in *Studies in Health Technologies and Informatics* in the tradition of publishing international conference proceedings as done by EFMI and IMIA. The published articles are indexed in PubMed.
- Full papers in English or German for publication in *MIBE* as one of the official journals of GMDS.
- Abstracts for publication in the *eGMS Conference Proceedings*

The authors may specify the publication type when submitting. The author instructions for the different publication types are available on the GMDS website.²

GMDS supports the practice of open science. Therefore, all conference abstracts and full papers are published in open access format.

2.2. Peer Review Process

The peer review process and the publication process of the full papers are guided by the ICMJE Recommendations [1], as well as by the WMA Declaration of Helsinki [2], if applicable.

It was important to the organizers to establish a review process independent of the interests of the conference organization. All contributions to MIBE are reviewed according to the journal's guidelines under the guidance of the MIBE Editorial Board.

A new Editorial Board was formed for the review of the submissions to Stud Health Technol Inform. The board consists of the chairs of the GMDS technical committees as well as a newly created position of the Editor-in-Chief. To ensure continuity, the editor in chief is appointed by the GMDS Board of Directors for five years. In addition to the chairs as editors, the other members of the technical committees are available as managing editors.

The role of the editors is to select reviewers and to decide on the acceptance for a submission as a full paper. As the medical data sciences are particularly effected by interdisciplinary and inter-professional collaboration, the selection of reviewers must take this into account. Thus, e.g. a manuscript reporting the evaluation of a software system must be reviewed with technical (medical informatics, compute science), statistical and study design (biometry or epidemiology), and clinical (medical, nursing) expertise. In addition to deciding on the preliminary and final acceptance or a rejection, the editors may reject a paper as a full paper and at the same time propose it to the SPC of the annual meeting for acceptance as an abstract.

The review of the abstract submissions is handled by the SPC. This ensures the necessary independence from the interests of the conference organizers. An overview of the review process is shown in Figure 1.

2.3. Three in one: the divided proceedings connected by the conference program

By dividing the publication of the conference contributions into three publication venues, there was concern that the conference contents may no longer be perceived as a whole. To counteract this concern, the conference program plays a special role in the online and print versions: All contributions are listed with their digital object identifier (doi) linking to the abstract or article and links are also provided as QR codes (Figure 2). Thus, three conference proceedings become one virtual proceeding that can be navigated seamlessly by users. The conference programs are published on the GMDS website³.

² <https://www.gmds.de/publikationen/autorenhinweise-fuer-tagungen/>

³ <https://www.gmds.de/publikationen/tagungsbaende/>

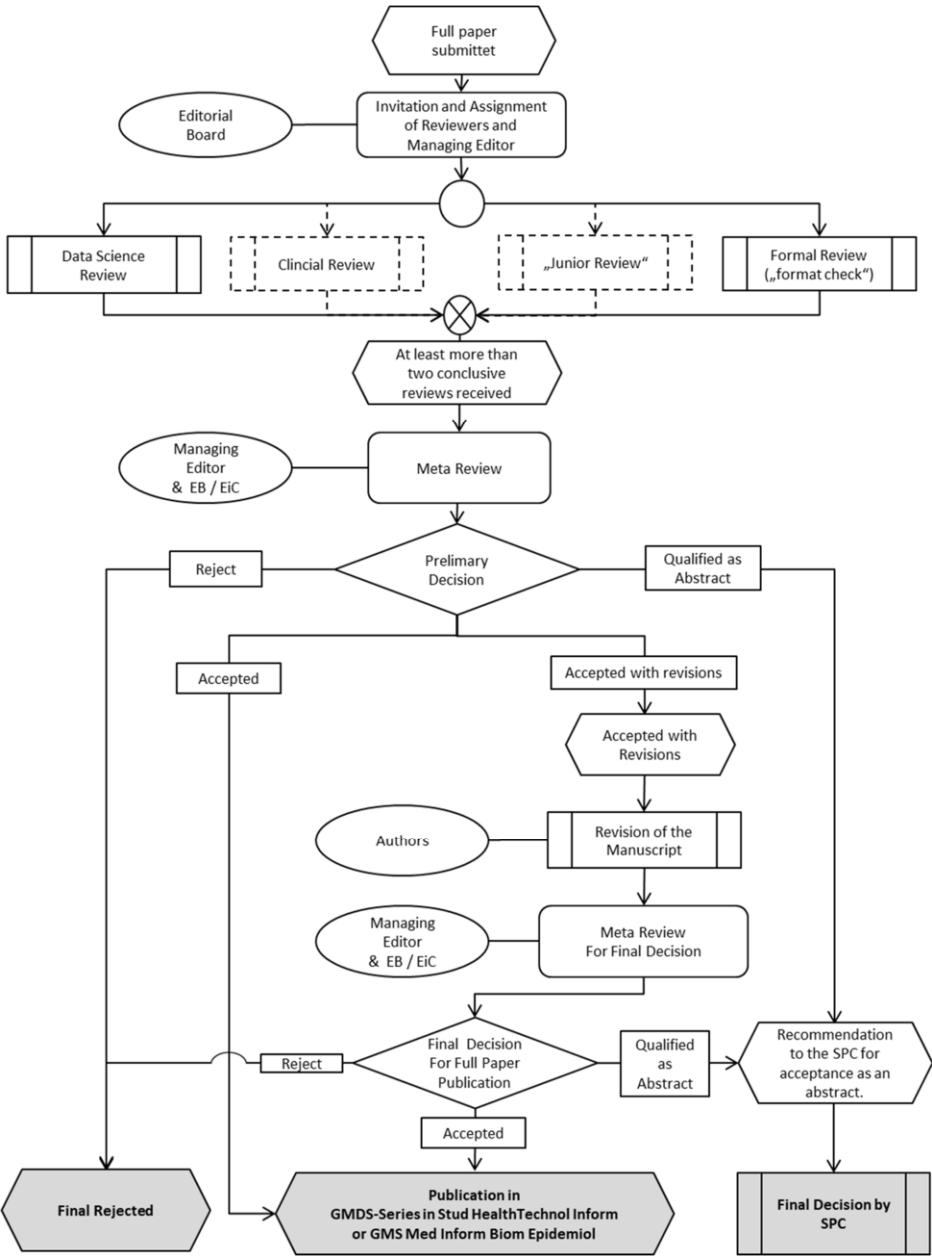


Figure 1: Flow chart of the review process
Abbreviations: EB: Editorial Board, EiC: Editor in Chief, SPC: Scientific Program Committee

Health Care Informations Systems - Patient Safety
 Montag 18.09.2017, 17:00–18:00 Uhr, Senatssaal

Vorsitz: Myriam Lipprandt, Bernd Schütze

17:00 Uhr
Development of a system for the automatic processing of routine care data
 Referenten: M. Hüske, A. Ammenwerth
 DOI: [10.3233/978-1-61499-808-2-107](https://doi.org/10.3233/978-1-61499-808-2-107)

17:15 Uhr
Alarm Fatigue: Causes and Effect
 Referenten: Marc Wilken, Dirk Hüske-Kraus, Anja Schlauch, Rainer Röhrig
 DOI: [10.3233/978-1-61499-808-2-107](https://doi.org/10.3233/978-1-61499-808-2-107)

17:30 Uhr
Cognitive performance of users is affected by electronic handovers depending on role, task and human factors
 Referenten: Mareike Przysucha, Daniel Flemming, Georg Schulte, Ursula Hübner
 DOI: [10.3233/978-1-61499-808-2-117](https://doi.org/10.3233/978-1-61499-808-2-117)

17:45 Uhr
Identification of measures and indicators for the IT security of networked medical devices: A Delphi study
 Referenten: Elske Ammenwerth, Stefan Leber
 DOI: [10.3233/978-1-61499-808-2-147](https://doi.org/10.3233/978-1-61499-808-2-147)

2D code of the DOI (URL) for the printed version.

DOI as link for the electronic version (PDF)

Figure 2. An excerpt from the 2017 conference program: Via 2D code and link, the print and online versions of the conference papers can be accessed in the three publication organs including Stud HTI, MIBE, and the eGMS Proceedings.

3. Conference Paper Volumes and Citations

With this volume, the 5th volume of full papers in English and thus the 5th volume of the German Medical Data Science series in Studies of Health Technologies and Informatics within total 177 articles is now published.

The number of citations was determined via Web of Science (Clarivate Analytics, data of June 30th, 2021). For the analysis of the citations, only the volumes from 2017-2019 were evaluated, since the 2020 conference volume was not published until 2021 and thus no statements can yet be made about the frequency of citations. The articles published in the 2017 - 2019 volumes were cited in total 221 times (Table 1). An unofficial Journal Impact Factor (uJIF) was calculated for 2019 and 2020 as follows:

"The annual JCR impact factor is a ratio between citations and recent citable items published. Thus, the impact factor of a journal is calculated by dividing the number of current year citations to the source items published in that journal during the previous two years." [3]

Using the formulas shown in equation 1 and 2, the reader can see the calculation for uJIF 2019. The uJIF₂₀₁₉ is 1.088 and uJIF₂₀₂₀ is 0.540 (Table 2).

Table 1: Volumes with articles, citations (Clarivate Analytics, Data as of June 30th, 2021), Volume in Studies in Health Technology and Informatics. When interpreting the citations per article, it should be noted that these increase over time and therefore a direct comparison of the volumes is only meaningful after several years.

Year	Subtitle	Volume	ISBN	Article	Cites	Cites per Article
2017	Visions and Bridges	243	978-1-61499-808-2	42	156	3.31
2018	A Learning Health System	253	978-1-61499-896-9	38	53	1.05
2019	Shaping Change - Creative Solutions for Innovative Medicine	267	978-1-64368-017-0	38	51	0.74
2020	Bringing Data to Life	278	978-1-64368-177-1	34	-	-
2021	Digital Medicine: Recognize - Understand - Heal			25	-	-
sum 2017 - 2019				118	260	2.20
sum				177		

$$uJIF\{year\} = \frac{cites\ in\ \{year\}\ of\ articles\ in\ \{year-1\}\ and\ \{year-2\}}{articles\ in\ \{year-1\} + articles\ in\ \{year-2\}}$$

(1)

$$uJIF\ 2019 = \frac{cites\ in\ 2019\ of\ articles\ in\ 2017+2018}{articles\ in\ 2017+2018} = \frac{61+26}{42+38} = \frac{87}{80} = 1.088$$

(2)

Table 2: Citations of GMDS-Series 2017-2018 (Clarivate Analytics, data as of June 30th, 2021)

Year	Citations 2018-2021				Cites	Articles	Cites per	Articles w. cites		Inofficial JIF
	2018	2019	2020	2021				n	%	
2017	32	61	50	13	156	42	3.71	30	71%	
2018	1	26	15	11	53	38	1.39	20	53%	
2019		2	30	19	51	38	1.34	14	37%	
2020						34				
2021						25				
Inofficial JIF 2019		87			/	80	=			1.088
Inofficial JIF 2020			39		/	72	=			0.540

4. Were the objectives/goals achieved?

The leading goal was to offer the authors an attractive opportunity for submitting contributions to the GMDS conferences. Since the first year, already 25-35% of all contributions are submitted as full papers. This can be considered a success.

However, almost all submissions came from the field of medical informatics, with few contributions from medical bioinformatics and systems biology. Contributions from biometry and epidemiology remain underrepresented. One cause might be the different cultures and experiences with this format in the different specialties. Another reason may be the stronger anchoring of biometry and epidemiology in the medical faculties. Many medical faculties still only consider contributions in journals with an impact factor when awarding doctorates and postdoctoral degrees. Perhaps this editorial as well as the list of peer-reviewed journals and conference proceedings recommended by the Association of the Scientific Medical Societies in Germany (Arbeitsgemeinschaft der Wissenschaftlichen Medizinischen Fachgesellschaften e.V., AWMF) can convince local university leaders to reconsider this decision.

MIBE offers the opportunity to publish high quality papers in German resulting in primarily only national relevance. Publication in Studies in Health Technologies and Informatics and the resulting indexing in Medline should allow other reserachers to find these papers and further improve the International visibility of the conference papers. The frequency of paper citation and uJIF of 2019 and 2020 are less than established journals in medical informatics like *JMIR - Journal of Medical Internet Research* (JIF₂₀₂₀ 5.430), *Applied Clinical Informatics* (JIF₂₀₂₀ 2.342) or *Methods of Information in Medicine* (JIF₂₀₂₀ 2.176), but comparable to other German-language medical journals like *Der Anästhesist* (JIF₂₀₂₀ 1.041), *Der Unfallchirurg* (JIF₂₀₂₀ 1.000) or *Notfall & Rettungsmedizin* (JIF₂₀₂₀ 0.826). Figure 3 shows that the uJIF of the GMDS conference in Stud HTI is also comparable to the leading international medical conferences MIE and MEDINFO.

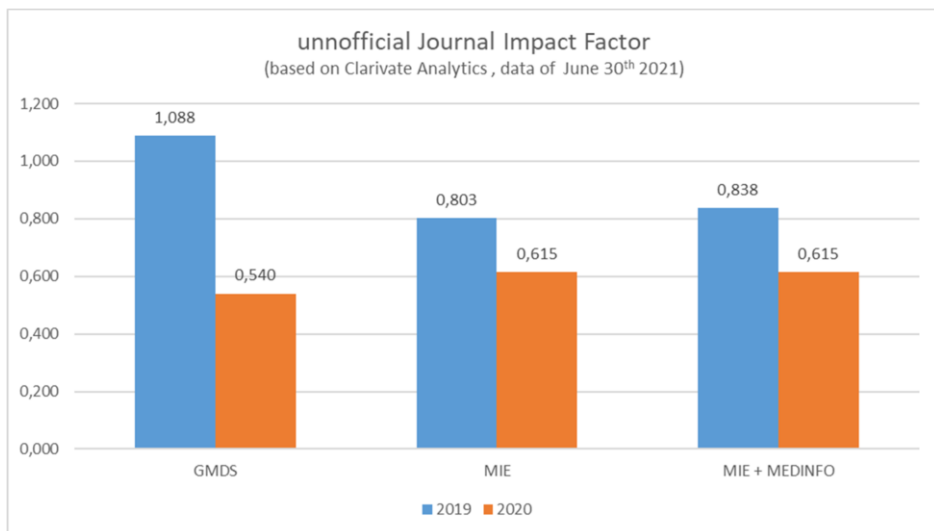


Figure 3: Comparison of unofficial journal impact factors (uJIF) of Stud HTI volumes among the GMDS annual meeting, Medical informatics Europe (MIE) and MIE with MedInfo. The MedInfo is only held every two years. In 2019, only MedInfo and no MIE took place.

However, some medical faculties still only accept publications in journals with official JIF for doctoral or postdoctoral procedures. Attempts to list the MIBE in a database considered by PubMed or Clarivate Analytics have failed several times in recent years. Thus, the listing of Stud HTI in PubMed and Clarivate Analytics represents progress. In the coming years, it will be a task of the GMDS Presidium and Advisory Board to decide which publication organs will be newly or further developed.

5. Lessons learned and Outlook

In 2017 to 2019, the GMDS annual meeting's review and publication processes were established. The significant efforts to achieve a high-quality, interdisciplinary and inter-

professional review process and to involve the expert committees in the editing process have proven successful.

The year 2020 represented a chasm in several aspects due to the SARS-CoV2 pandemic. The change of the face-to-face conferences to an eConference and the increased workload of medical data scientists [8] engaged with medical (CoViD-19) research led to problems in the peer review, editing, and publishing process. The consequence was a delay in the publication of the papers in Stud HTI and of the abstracts in EMGS. The resulting inconveniences for the authors should be avoided by strengthening the organizational structures (see also the prefaces) and involve more international reviewers.

After five years of this new process, it is also time to explore the cost/benefit equation. The inter-disciplinary and inter-professional peer review usually requires 2-4 reviewer per article. The fixed and at the same time short allotted period for the review process can lead to high dropout rates. Ideally, additional expert opinions should be obtained, however this must be weighed against the potential additional delay [4].

It is undeniable, that the process requires additional experts. Here, time pressures become relevant due to the limited period between submission and the conference. Therefore, it is important to invite both more reviewers than typically necessary and to have several reviewers as backup who can step in at short notice. To obtain high quality reviews it is nevertheless important to continue to apply the volunteer principle [5].

Due to the National character of the conference, the reviewer pool is limited as a function of two challenges: With collaborative research projects with authors across many organizations, it is difficult to find independent reviewers. International reviewers are difficult to motivate to review for national conferences or are not familiar with the German health care system or health information infrastructure. In terms of quality, reviewer suggested by authors may be less objective [6,7]. Our special thanks therefore go to the reviewers for their extensive and outstanding work over the last five years.

We look also forward to the next five years as we intend to further develop the format and to attract more contributions from all disciplines of GMDS nationally and beyond.

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