

# Trans-O-MIM—An International Research Project on Open Access Transformation: Outcomes and Lessons Learned

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## Abstract

**Background** During the last decades, the Open Access paradigm has become an important approach for publishing new scientific knowledge. From 2015 to 2020, the Trans-O-MIM research project was undertaken with the intention to identify and to explore solutions in transforming subscription-based journals into Open Access journals. Trans-O-MIM stands for strategies, models, and evaluation metrics for the goal-oriented, stepwise, sustainable, and fair transformation of established subscription-based scientific journals into Open-Access-based journals with *Methods of Information in Medicine* as an example.

**Objectives** To present an overview of the outcomes of the Trans-O-MIM research project as a whole and to share our major lessons learned.

**Methods** As an approach for transforming journals, a Tandem Model has been proposed and implemented for *Methods of Information in Medicine*. For developing a metric to observe and assess journal transformations, scenario analysis has been used. A qualitative and a two-tier quantitative study on drivers and obstacles of Open Access publishing for medical informatics researchers was designed and conducted. A project setup with a research team, a steering committee, and an international advisory board was established. Major international medical informatics events have been used for reporting and for receiving feedback.

**Results** Based on the Tandem Model, the journal *Methods of Information in Medicine* has been transformed into a journal where, in addition to its subscription-based track, from 2017 onwards a Gold Open Access track has been successfully added. An evaluation metric, composed of 5 scenarios and 65 parameters, has been developed, which can assist respective decision makers in assessing such transformations. The studies on drivers and obstacles of Open Access publishing showed that, while most researchers support the idea of making scientific knowledge freely accessible to

## Keywords

- ▶ open access
- ▶ journal transformation
- ▶ medical informatics

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everyone, they are hesitant about actually living this practice by choosing Open Access journals to publish their own work. Article-processing charges and quality issues are perceived as the main obstacles in this respect, revealing a two-sided evaluation of Open Access models, reflecting the different viewpoints of researchers as authors or readers. Especially researchers from low-income countries benefit from a barrier-free communication mainly in their role as readers and much less in their role as authors of scientific information. This became also evident at the institutional level, as Open Access policies or financial support through funding bodies are most prevalent in Europe and North America.

**Conclusion** With Trans-O-MIM, an international research project was performed. An existing journal has been transformed. In addition, with the support of the International Medical Informatics Association, as well as of the European Federation for Medical Informatics and of the German Association for Medical Informatics, Biometry and Epidemiology as European and German medical informatics organizations, we did run an international experiment on Open Access incentives. Both together are, as far as the authors know, unique. We therefore expect that this research could add new knowledge on Open Access transformation.

## Introduction

### Background

During the last decades, the Open Access paradigm has become an important approach for publishing new scientific knowledge.<sup>1–8</sup> This also applies to medical informatics.<sup>9</sup> However, there are still a large number of well-established journals with high scientific reputation which are subscription-based.

In 2015, a research project was launched with the intention to identify and explore solutions in transforming subscription-based journals into Open Access journals, the so-called Trans-O-MIM research project. The project, conducted from 2015 to 2020, was located at TU Braunschweig and was jointly performed with Schattauer Publishers (from 2017 onwards Schattauer became part of Thieme Publishers). Details can be found at the project's web page.<sup>10</sup> Having been funded by the German Research Foundation (Deutsche Forschungsgemeinschaft, DFG),<sup>11</sup> Trans-O-MIM was from its beginning on also endorsed, promoted, and supported by IMIA (International Medical Informatics Association),<sup>12</sup> as well as by EFMI (European Federation for Medical Informatics)<sup>13</sup> and by GMDS (German Association for Medical Informatics, Biometry and Epidemiology),<sup>14</sup> as European and German medical informatics organizations (–Fig. 1).

### Trans-O-MIM

Trans-O-MIM stands for strategies, models, and evaluation metrics for the goal-oriented, stepwise, sustainable, and fair transformation of established subscription-based scientific journals into Open-Access-based journals with *Methods of Information in Medicine* as example. The research project aimed at developing and exploring such strategies, models, and evaluation metrics. As a concrete example for such transformations, the journal *Methods of Information in Medi-*

*cine* has been taken. Details on the Trans-O-MIM project plan and on the meaning of the terms goal-oriented, stepwise, sustainable, and fair in the context of such journal transformations can be found in Haux et al.<sup>15</sup>

### Methods

Founded in 1962, *Methods of Information in Medicine* (or, briefly, *Methods*) is the “longest running journal devoted to information in biomedicine and health care.”<sup>16</sup> The “journal stressing, for more than 50 years, the methodology and scientific fundamentals of organizing, representing and analyzing data, information and knowledge in biomedicine and health care”<sup>17</sup> is an official journal of EFMI and IMIA and an official international journal of GMDS. From 1962 to 2016, *Methods* had been solely subscription-based.

### Objectives

In this report, we present an overview of the outcomes of the Trans-O-MIM research project as a whole, in particular:

- On the transformation approach.
- On the transformation metric.
- On the outcomes of the transformation applied to *Methods*.
- On the outcomes of two empirical studies on drivers and obstacles of Open Access publishing in medical informatics (all in the “Results” section).

We also want to share our major lessons learned (in the section “Lessons Learned”).

First, we will outline the methodological approaches used as well as Trans-O-MIM's project setup (in sections Methods and Project Setup).

Please note that this is an overview to see the research design and outcomes of the Trans-O-MIM project as a whole with all its components. Each of these components has been

## University:



## Publisher:



now: Thieme

## Medical Informatics Associations:



## Funding Organization:



**Fig. 1** Organizations involved in the Trans-O-MIM research project.

described in more detail in other publications. Readers, interested in further details, are recommended to also have a look at these publications. We will refer to them in the respective sections of this report. A complete list of publications of the Trans-O-MIM project can be found on the project's web page.<sup>10</sup>

Summarized results have also been presented in a "Special Lecture and Workshop on Open Access Publishing in Medical Informatics"<sup>18</sup> at APAMI 2020, the Asian-Pacific Congress on Medical Informatics, taking place on November 2020 both virtually and in Hamamatsu, Japan.<sup>19</sup> All figures, presented here, have been taken from the special lecture and from workshop presentations there and have not been published elsewhere.

## Methods and Project Setup

### Transformation Approach

For transforming subscription-based scientific journals into Open Access journals, in Trans-O-MIM a Tandem Model was proposed and, for *Methods*, implemented.

In this Tandem Model, a subscription-based publication organ adds to its existing subscription-based track an additional new Open Access track, strictly following the so-called Gold Open Access way; Gold Open Access implies that manuscripts are freely accessible to everyone online, from the moment they are published. Moreover, Gold Open Access grants both authors and readers extensive usage rights.<sup>6</sup> The other, traditional track, remains, as long as it continues to exist, subscription-based.

With the Tandem Model an immediate change from subscription to Open Access with all its risks in maintaining reputation and financing is avoided. As it remains one publication organ, MEDLINE/PubMed referencing and Impact Factor listing remain as they have been.

The intention of applying the Tandem Model should be that in the end the subscription-based track will disappear. However, in case of difficulties during transformation, an option to slow down transformation, to pause it, or even to backtrack remains.

The intention of this approach is to achieve transformations, being goal-oriented, stepwise, sustainable, and fair (terms described in [Table 1](#)). Further details on the Tandem Model as well as on the meaning of these terms in the context of this transformation approach are described in Haux et al.<sup>15</sup>

### Transformation Metric

From the beginning on there was a consensus that offering and applying transformation approaches like the Tandem Model should be accompanied by further activities such as monitoring such journal transformations, promoting Open Access publishing, and exploring drivers and obstacles of Open Access publishing.

Because of this, developing a metric to observe and assess journal transformations was such an accompanying activity in the Trans-O-MIM project. For its development scenario, analysis has been used. The central element was a three-step procedure. In stage one, necessary preconditions for a transformation were considered. Stage two was the actual elaboration of the evaluation metric by means of a scenario analysis, and stage three comprised the exemplary testing with *Methods*. During its development phase, initial versions of the metric have been presented and discussed at workshops and, afterwards, refined.

Further details on the methodological approach for the developing of the transformation metric can be found in Mielke et al.<sup>20</sup>

### Studies on Drivers and Obstacles of Open Access Publishing in Medical Informatics

Further accompanying activities were studies on drivers and obstacles of Open Access publishing in medical informatics.

As preparatory steps, incentives of Open Access publishing were discussed in workshops at international medical informatics conferences and a survey was conducted among the members of the 2016 General Assembly of IMIA.<sup>21,22</sup>

Then two prospective empirical studies on drivers and obstacles of Open Access publishing in medical informatics have been designed and conducted.

**Table 1** Description of the criteria (goal-oriented, stepwise, sustainable, and fair) in the Tandem Model

<i>Goal-oriented</i>
All journal articles should finally be published in Open Access
Potential to reach out for new forms of adequate communication
No risk for a journal to lose its scientific reputation
Strategies should enable an improved competitiveness in publishing
<i>Stepwise</i>
A transformation strategy should serve as a base for decision making
By using evaluation metrics, the transformation risk should be kept low
In case of positive prognosis, transformation should converge to open access
In case of critical prognosis, slowing down or backtracking must be possible
<i>Sustainable</i>
Existing quality standards for reviewing and publishing should be preserved
No or at least limited financial risks
Established criteria for a journal's reputation should not have to be modified
Long-term availability of publications has to be considered
<i>Fair</i>
Broad availability and usability of publications for authors and readers
Good publications can be published from all authors
Fair financing (e.g., no double dipping)
Multiple world-wide usability, automatic analyzability

Note: Adapted from Haux et al<sup>15</sup> (there Table 1).

- In a qualitative study, relevant individual and institutional factors that speak both in favor and against Open Access publishing from a medical informatics researcher's perspective have been explored. This study relied on guide-based, open group discussions and individual interviews with medical informatics researchers. The open approach allowed us to reveal new and hitherto disregarded aspects pertaining to perceptions, attitudes, and behaviors of this research community regarding Open Access publishing, as the respondents had the opportunity to talk about their own experiences in detail. From July 2017 to February 2018, 42 medical informatics researchers were interviewed, coming from the six regions Africa, Asia and the Pacific, Europe, Latin America, Middle East, and North America. Within each region we interviewed researchers within the three seniority levels "junior" (researchers at the beginning of their careers such as Ph.D. students),

"middle" (researchers with intermediate experience such as postdoctoral researchers), and "senior" (researchers with long experience such as professors or department chairs). Details can be found in Greussing et al<sup>23</sup> and here later in [Table 2](#).

- In addition, a two-tier quantitative study on these drivers and obstacles was designed and conducted, comprising scientific organizations (Module A) and individual researchers (Module B) in medical informatics. The scientific organizations under study were the member societies of IMIA, the individual researchers were the members of these IMIA member societies. Module A was based on a semi-standardized online survey, fielded in May and June 2019, comprising the, at this time, 56 member societies of IMIA. The participants (presidents and/or CEOs representing the IMIA member societies) were invited via email. The online survey consisted of eight questions, asking about the current situation of Open Access publishing in the member society's country of origin. From the 56 IMIA member societies invited to participate in the study, 22 returned the survey. In Module B the target group for investigation was individual medical informatics researchers. An online survey was conducted in August and September 2019. For recruitment we used the IMIA Newsletter mailing list as well as a mailing list from the MEDINFO 2019 world conference. With this online survey, it was intended to complement the picture of Open Access publishing in medical informatics by focusing on researchers' attitudes, behaviors, and needs regarding Open Access in their country. This online survey consisted of 13 questions, asking, among others, on experiences with Open Access and on perceptions of Open Access from the perspective of an author and of a reader. In total, 155 medical informaticians participated in the online survey. Details can be found in Greussing et al.<sup>24</sup>

### Project Setup

The core group of the Trans-O-MIM project was its research team, consisting of the authors of this report. Their work has been significantly supported by the project's Steering Committee and by its International Advisory Board. Persons, participating in various roles in Trans-O-MIM in addition to the authors of this report, are listed in the Acknowledgments section.

A timeline with work steps and milestones of the Trans-O-MIM project is presented in [Fig. 2](#), which also lists the Trans-O-MIM workshops and the International Advisory Board meetings.

The figure includes a DFG workshop on transforming renowned e-journals into Open Access journals, taking place in May 2013. This workshop finally motivated Schattauer's publisher and CEO at this time to agree with the corresponding author's suggestion (at this time Editor-in-Chief of *Methods*) to try to transform the journal into an Open Access journal. After this decision, leaders of the of IMIA, EFMI, and GMDS as the field's international, European, and German



**Table 2** Participants in the qualitative study of Trans-O-MIM by region and level of seniority (n: 42)

Region	Level of seniority		
	Junior	Middle	Senior
Africa	2 (GD, GD)	3 (GD, I, I)	2 (I, I)
Asia and the Pacific	2 (I, I)	2 (GD, I)	3 (GD, GD, GD)
Europe	2 (GD, I)	3 (GD, GD, I)	4 (GD, GD, I, I)
Latin America	3 (I, I, I)	2 (I, I)	2 (GD, I)
Middle East	2 (I, I)	2 (GD, I)	2 (GD, I)
North America	2 (GD, I)	2 (GD, I)	2 (GD, I)

Note: Types of interview: GD: interviews in group discussions, I: individual interviews. Original figure in Greussing et al<sup>23</sup> (there Table 1).

medical informatics associations, as well as the Core Editorial Team of *Methods* have been asked on whether they would support such a project. As they all supported this initiative, too, the Trans-O-MIM project proposal had been elaborated and was submitted to DFG in 2014. After positive peer review, the respective DFG committees decided in 2015 to accept the proposal for funding.

### Results

As mentioned in the Objectives section, in this report we are presenting an overview of the outcomes of the Trans-O-MIM research project as a whole, with all its components. Readers interested in further details are recommended to also have a look at the respective publications, mentioned here, or to visit the project's web page,<sup>10</sup> containing a complete list of publications of the Trans-O-MIM project.

### Transforming Methods

From 2017 onwards, the journal has added an Open Access track, called *Methods Open*, to its subscription-based track. In implementing the Tandem Model and in trying to follow the criteria for adequate journal transformation (goal-oriented, stepwise, sustainable, and fair; details in Haux et al<sup>15</sup>), authors can since 2017 decide whether their manuscript will be published in the journal's subscription track or in the new *Methods Open* track (as Gold Open Access publications, -Fig. 3).

By the Tandem Model, it could be achieved that *Methods* clearly remained one journal with consistent procedures, in particular for peer reviewing. By this, we did not expect any risk of losing reputation. Fortunately, this expectation was met. Details on the transformation approach can be found in Haux et al,<sup>15</sup> and further information on the journal's transformation process can be found in previous studies.<sup>20,25,26</sup>

## Trans-O-MIM: Timeline & Milestones

- 2013
  - DFG workshop on transforming renowned journals into Open Access
  - Initial ideas on transforming MIM
- 2014
  - TOM research proposal submitted
  - Letters of support: IMIA, EFMI, GMDS
- 2015
  - DFG decision: TOM will be funded
  - MedInfo 2015, Sao Paulo, Brazil:*
  - Reports at IMIA meetings (project plan)
- 2016
  - TOM starts, Tandem Model
  - MIE 2016, Munich, Germany:*
  - Reports & survey on OA at IMIA mtg.s,
  - 1<sup>st</sup> IAB meeting, workshop on OA
- 2017
  - Start of *Methods Open*
  - MedInfo 2017, Hangzhou, China:*
  - Designing eval. metrics & incentives studies, starting qualitative study
  - Reports at IMIA meetings (studies), ...
  - 2<sup>nd</sup> IAB mtg., workshop on incentives
- 2018
  - running quantitative studies
  - MIE 2018, Gothenburg, Sweden:*
  - Workshop on OA metrics
  - APAMI 2018, Colombo, Sri Lanka
  - Reports at IMIA mtg.s (studies)
- 2019
  - Analysing study & metric results
  - Medinfo 2019, Lyon, France:*
  - Reports at IMIA meetings
  - 3<sup>rd</sup> IAB Meeting, Talk on infl. factors
- 2020
  - APAMI 2020, Hamamatsu, Japan:
  - Special Lecture and Workshop with final results

**Fig. 2** Work steps and milestones of the Trans-O-MIM project. IAB: International Advisory Board; OA: Open Access; EFMI, IMIA, and GMDS: see Refs. 12,13, and 14; APAMI 2020: Asian-Pacific Congress on Medical Informatics, Medinfo 20xx: World Congress on Medical Informatics, MIE 20xx: European Congress on Medical Informatics—during these international congresses, in those years, meetings of the IMIA Board and of IMIA's Annual General Assembly also took place. Figure as presented in Haux et al.<sup>18</sup>



**Fig. 3** Visualizing the transformation of *Methods*. The image was designed by Schattauer Publishers. When adding the *Methods Open* track to the journal's subscription-based track by implementing the Tandem Model in 2017, it was used to promote this new opportunity of Open Access publishing. Figure as presented in Haux et al.<sup>18</sup>

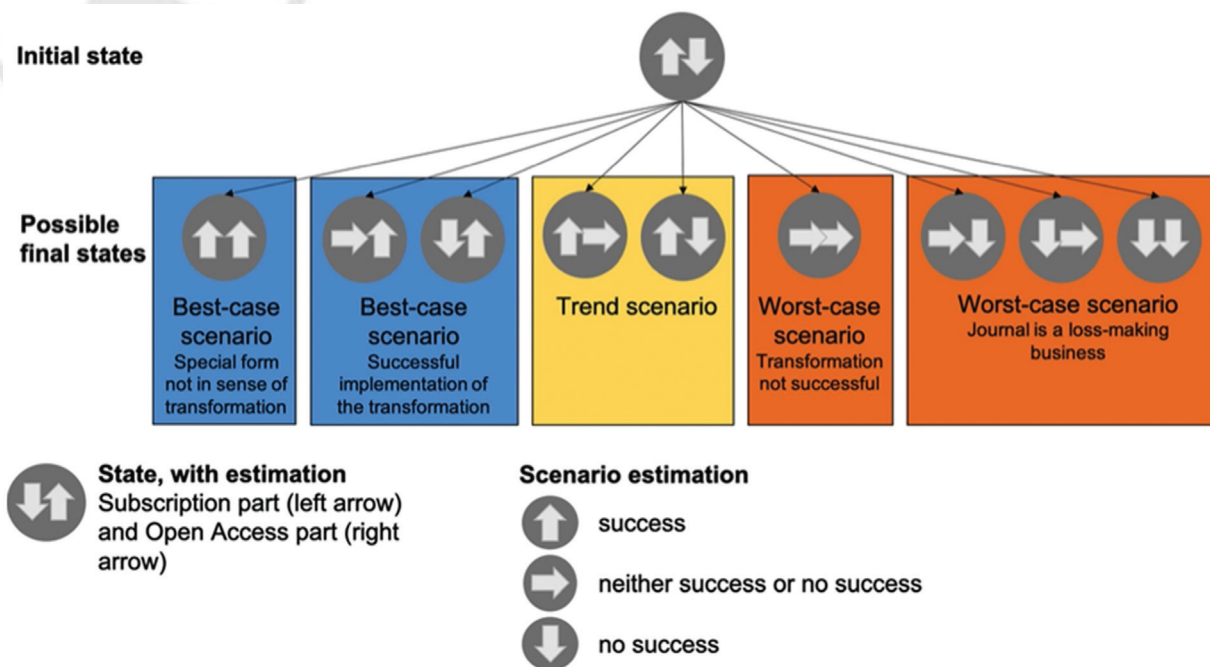
**Transformation Metric**

The three-step procedure mentioned in the Methods section has primarily resulted in five scenarios with nine different final states from the scenario analysis. The transformation metric, developed in the Trans-O-MIM project, is composed of these five scenarios, which can be used to evaluate the success or failure of a transformation (→ Fig. 4). As additional outcome, a list of 65 suitable parameters to measure changes in scenario was compiled (→ Figs. 5 and 6).

With this metric, it is now possible to evaluate such transformations. Further details on the metric can be found in Mielke et al.<sup>20</sup>

**Transformation Metric Applied to *Methods***

A comparison of subscription-based and Open Access submissions to and publications in *Methods* between 2017 and September 2019 is presented in → Fig. 7.



**Fig. 4** Scenarios of the transformation metric. Best-case and worst-case scenarios describe the most positive and negative cases for journal transformations to be performed, whereas trend scenarios show situations with unclear outcomes of transformation processes. Figure taken from Mielke et al.<sup>20</sup> (there Fig. 1), and as presented in Haux et al.<sup>18</sup>

**Category: publication parameters**

- Subscription part
  - Number of publications
  - Number of submissions
  - Acceptance rate
  - Number of citations
- Open Access part
  - Number of publications
  - Number of submissions
  - Acceptance rate
  - Number of citations
- Difference of publications
- Difference of submissions
- Difference of acceptance rate
- Difference in the number of citations
- Access rate (e.g., download rate) for the publications

**Category: financial parameters**

- Subscription part
  - Revenue
  - Advertising revenues
  - Operating costs
    - Variable costs/ running costs
    - Fixed costs
- Open Access part
  - Revenue
  - Advertising revenues
  - Operating costs
    - Variable costs/ running costs
    - Fixed costs
- Difference of revenue
- Difference of cost
- Development costs (cost for the transformation)

**Fig. 5** Primary parameters of the transformation metric. Parameters in this figure are taken from Mielke et al.<sup>20</sup> (there part of Table 1), and as presented in Haux et al.<sup>18</sup>

**Category: quality parameters**

- Quality of publications
  - Relative Citation Ratio
  - Value of publications
- Time aspects
  - Duration of the processing procedure
    - Needed process time by the publisher
    - Duration from acceptance to release of the publication taking Online First into account for the subscription part
- Author satisfaction
- Quality of process of the subscription part versus the OA part
  - Simplification of process
  - Speed-up of process
  - Breakdown and comparison of workflows from the subscription part and the OA part

**Category: other parameters**

- Accessibility
  - Number of individuals who have access to the journal
  - Usage statistic of online segment through the number of downloads and DOI access
- Supply of the journal
- Demand of the journal
- Comparison between the user group of the subscription part and the user group of the OA part
  - Comparison of age
  - Comparison of origin
- Comparison of the topics from the subscription part and the OA part

**Fig. 6** Secondary parameters of the transformation metric. Parameters in this figure are taken from Mielke et al.<sup>20</sup> (there part of Table 1), and as presented in Haux et al.<sup>18</sup> DOI, Digital Object Identifier; OA, Open Access.

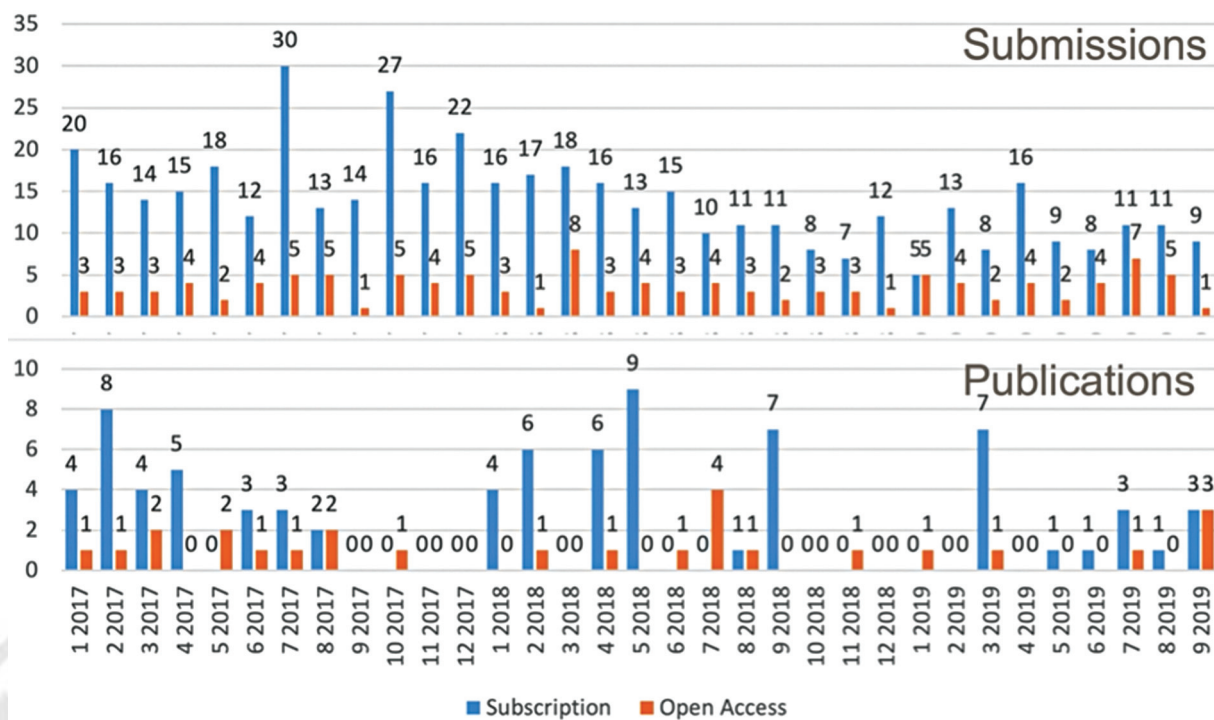
With respect to the scenarios, the current situation of the transformation of *Methods* is presented in ▶ **Table 3**. When looking at the data and at the scenario assessments, the results are still unclear in terms of the journal's transformation. As discussed in Mielke et al.<sup>20</sup> they may still be interpreted as interim results. Factors, having in addition to this transformation since 2017 changed, too, may also have influenced the journal's development (change of publishing house, new business models in particular for Open Access

publishing, change of attitudes of authors and funding institutions, ...).

### **Outcomes of the Qualitative Study on Drivers and Obstacles of Open Access Publishing in Medical Informatics**

▶ **Table 2** shows the regions and levels of seniority of the interviewed medical informatics researchers. Of the 42 researchers, 28 were male and 14 were female.





**Fig. 7** Subscription-based and Open Access submissions and publications in *Methods* between 2017, where the transformation process has started by implementing the Tandem Model, and September 2019. Data in this figure are taken from Mielke et al<sup>20</sup> (there in Figs. 2 and 3), and as presented in Haux et al.<sup>18</sup>

**Table 3** Scenario assessment for *Methods* between 2017, where the transformation process has started by implementing the Tandem Model, and 2020

Year	2016	2017	2018	2019	2020
Number of published manuscripts in the subscription track	74	29	33	23	19
Number of published manuscripts in the Open Access track	0	11	9	7	12
Scenario Assessment (symbols explained in <a href="#">►Fig. 5</a> )		⊖	⊕	⊕	⊕

Note: This is a table from Mielke et al<sup>20</sup> (there [►Table 2](#)), which has been updated for 2019 and 2020. Please note that in 2019 one Open Access manuscript and in 2020 four Open Access manuscripts were part of the journal’s subscription track. As they were Open Access publications, we

A detailed report on the results of the interviews can be found in Greussing et al,<sup>23</sup> where some major outcomes, presented here, are all taken from:

- For the majority of medical informatics researchers interviewed, the increased and easier accessibility of articles was the main driver of Open Access publishing. Moreover, about half of the interviewees pointed out that scientific findings should be accessible to everyone. Greater accessibility also implied greater visibility and impact of their own work. Better accessibility was also regarded as positive from the perspective of readers (see Greussing et al,<sup>23</sup> p. 5).
- The by far most mentioned obstacles in Open Access publishing were the related costs. Some researchers—in particular from Africa, Latin America, and Asia and the Pacific—further perceived Open Access journals to be less reputable than their subscription-based counterparts (see Greussing et al,<sup>23</sup> p. 6).
- Open Access publishing was closely linked to the respective resources. Researchers from economically weaker regions reported far more often to be unable to go for Open Access alternatives due to financial reasons (see Greussing et al,<sup>23</sup> p. 6).
- Regarding seniority levels, some of our interviewees led us to assume a generation gap, with younger researchers being already more into Open Access than their more experienced colleagues (see Greussing et al,<sup>23</sup> p. 9).

Overall, the results of the interviews showed that while most researchers support the idea of making scientific knowledge freely accessible to everyone, they are hesitant about actually living this practice by choosing Open Access journals to publish their own work. Article-processing charges and quality issues are perceived as the main obstacles in this respect, revealing a two-sided evaluation of Open Access models, reflecting the different viewpoints of



researchers as authors or readers. The results highlight hitherto underexplored influencing factors regarding institutional frame conditions, located on the level of the scientific system, the publication service providers, or the national/international Open Access policies (see Greussing et al,<sup>23</sup> p. 1).

### Outcomes of the Two-Tier Quantitative Study on Drivers and Obstacles of Open Access Publishing in Medical Informatics

Through the (semi-)standardized surveys of the two-tier quantitative study, we received additional information on individual and institutional frame conditions, influencing dissemination and reception of scientific knowledge of scientific organizations and individual researchers in the field of medical informatics. A detailed report on the results of the survey can be found in Greussing et al,<sup>24</sup> where some major outcomes, presented here, are all taken from:

- With respect to individual-level drivers and obstacles, the majority of the medical informatics researchers positively rated Open Access publishing. The most positive attitude toward Open Access was attributed to early-career researchers (e.g., Ph.D. students), the least positive to researchers with long experience (e.g., professors or department chairs) (see Greussing et al,<sup>24</sup> section results).
- The analyses disclosed that reading of Open Access articles is regarded as more positive than reading of subscription-based articles, which is mostly due to their ease of access and perceived higher visibility (see Greussing et al,<sup>24</sup> section results).
- However, the tenor was more heterogeneous, when it came to actually publishing one's own work in Open Access journals. Here some barriers were perceived, which left researchers rather with the traditional system of closed-access publications (see Greussing et al,<sup>24</sup> section results).
- With respect to institutional-level drivers and obstacles, guidelines or recommendations on Open Access issued by governments, academic institutions, or publishing houses played an important role. Whereas there were differences in the researchers' countries on the availability of policies at the governmental level (funding bodies, ...), policies at the institutional level (universities, ...) seemed to be common (see Greussing et al,<sup>24</sup> section results).
- It appeared that institutional frame conditions are important determinants for academic publishing behavior. Costs and funding opportunities remained a central issue for Open Access publishing (see Greussing et al,<sup>24</sup> section results).

Overall, the findings provided a heterogeneous picture of how Open Access is perceived and practiced. Respondents appreciated the convenient way to access Open Access articles as readers and the opportunity to reach broader (nonacademic) audiences as authors. However, due to high publication fees and concerns regarding quality and reputation, positive attitudes toward Open Access did not necessarily translate into willingness to choose this publication

model. Especially researchers from low-income countries benefitted from a barrier-free communication mainly in their role as readers and much less in their role as authors of scientific information. This became also evident at the institutional level, as Open Access policies or financial support through funding bodies is most prevalent in Europe and North America (see Greussing et al,<sup>24</sup> abstract).

### Lessons Learned

Among our major lessons learned were that, since we started the Trans-O-MIM project in 2015, publishers and financing Open Access publishing had changed:

- Schattauer Publishers is no more existing and became part of Thieme Publishers, with new priorities coming up within the framework of the changed corporate goals.
- New business models for financing Open Access publishing were established, in Germany in particular through the DEAL Project,<sup>27</sup> having considerable impact on the transformation strategies of publishers regarding their established subscription-based journals. Also for authors' decisions, this project had (positive) consequences. In those journals, included in the DEAL project, authors of involved institutions as well as these institutions (universities, ...) did no more have to take care of article processing charges themselves for articles published in Open Access.

This also influenced the course of the Trans-O-MIM project, which had to be adapted.

When organizing our workshops on Open Access publishing and presenting our research at major national and international medical informatics conferences, we learned that there was a limited interest in this topic. Also, in particular with respect to young researchers, basic knowledge on copyright matters and on Open Access was not always sufficiently available. The reason is, in our opinion, to some extent obvious. Medical informatics researchers are primarily interested in doing medical informatics research. Publishing their research is important, too, but on a second level.

On an individual level it would clearly be helpful for researchers to know more about copyright matters of their publications than they usually know today. On an institutional level, we therefore recommend to more intensively provide frameworks, helping authors to obtain this knowledge as well as to more intensively encourage them and even to provide incentives for Open Access publishing.

### Limitations

A major limitation of the research of the Trans-O-MIM project as a whole is that its focus was on one scientific discipline, on medical informatics. We agree that the results of this research may not be transferable to other scientific disciplines, as they may differ in their way of communicating scientific knowledge. On mentioning and discussing limitations within the components of the Trans-O-MIM research

project, we want to refer to the specific in-depth publications mentioned before, all listed in Ref. 10.<sup>10</sup> In these publications, we also reported and discussed related research.

## Conclusions

With Trans-O-MIM, an international research project had been performed. It could—at least from the authors' point of view—be successfully completed, although the underlying conditions had changed considerably and unexpectedly during the course of the project.

The success comprised, among others, the transformation of *Methods* into a journal, publishing since 2017 according to the Tandem Model, i.e., with a Gold Open Access track in addition to its still existing subscription-based track. This transformation took place on the one hand with the intended advantages for authors and publishers that Gold Open Access publishing was now possible in *Methods*, and on the other hand without disadvantages that could have been associated with this change, especially with regard to the journal's reputation, with regard to the scientific quality of contributions, with regard to the high scientific standards in peer reviewing, and also with regard to the economic stability of the journal.

In addition, an evaluation metric for a stepwise transformation of subscription-based journals into Open Access journals has been developed, and drivers and obstacles of Open Access publishing for medical informatics researchers around the globe have been investigated and are now, as we hope, better understood, including individual and institutional influences.

In the Trans-O-MIM project, we did transform an existing journal (not just reflected on transformation). In addition, with the support of IMIA (i.e., with “the” medical informatics organization, representing medical informatics researchers worldwide), as well as with EFMI and GMDS on the European and German level, we did run an international experiment on Open Access incentives. Both together are, as far as the authors know, unique. We therefore expect that, despite its limitations, this research could add new knowledge on Open Access transformation.

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### Conflict of Interest

None declared.

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and at the start of the project Editor-in-Chief of *Methods*, and made significant contributions. Transforming *Methods* so that Gold Open Access publishing was possible since 2017 could not have happened without the team of Schattauer as part of this project. When in 2017 Thieme Publishers took over Schattauer, it was by no means self-evident that this publisher, with different strategies on how to deal with Open Access publishing at this time, would continue to support this project. Thieme, however, clearly supported and even invested in Trans-O-MIM, so that this project could continue and could successfully be finished.

The International Medical Informatics Association (IMIA) as well as the European Federation for Medical Informatics (EFMI) and the German Association of Medical Informatics, Biometry, and Epidemiology (GMDS) as our national and international scientific organizations also supported the Trans-O-MIM project from the beginning on. Through their support, Trans-O-MIM was not just a project, managing the transformation of a journal. It became an international research project helping to better understand how Open Access publishing is viewed and how it can be supported with respect to better communication of scientific knowledge.

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