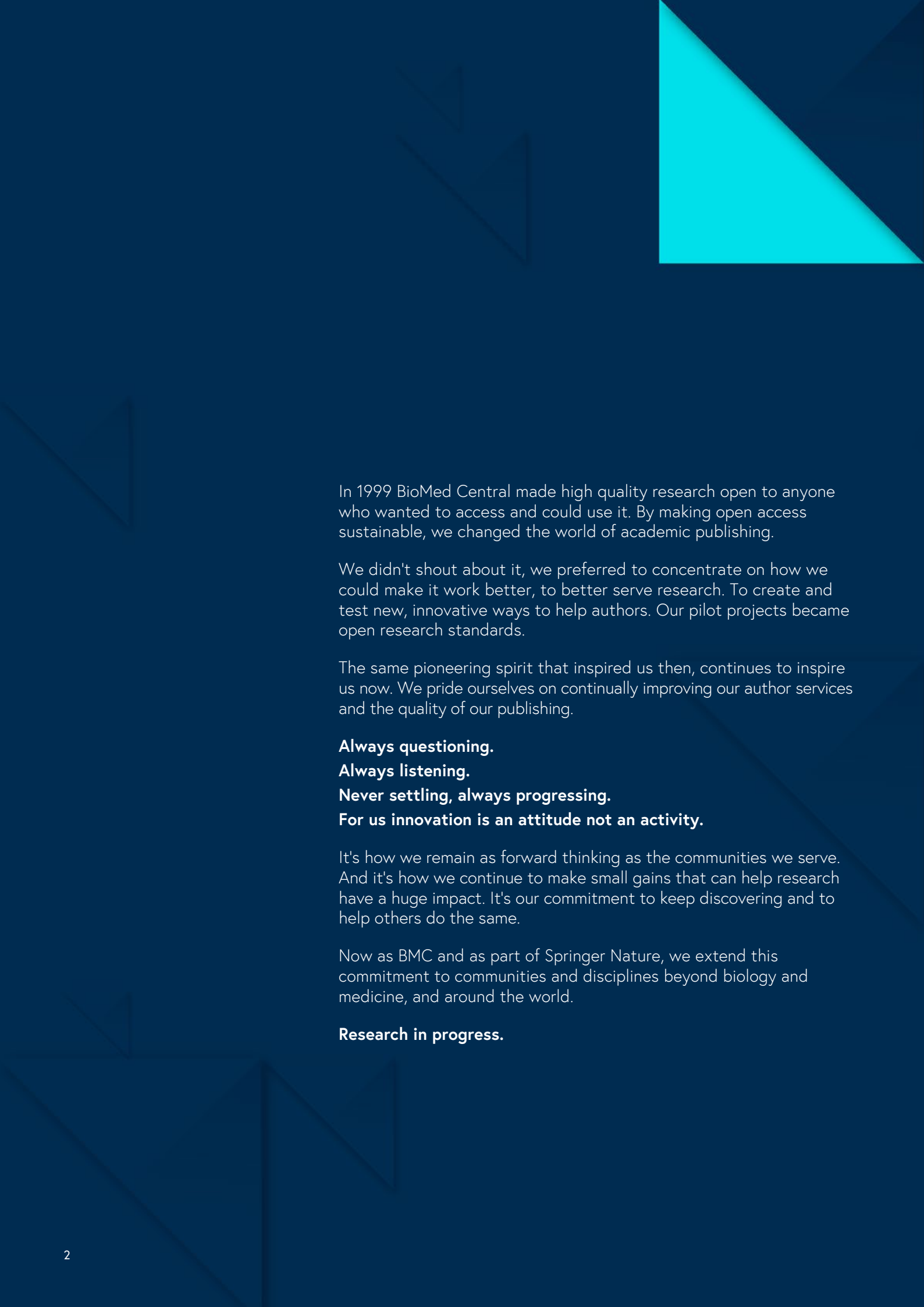




Part of Springer Nature

Annual Review 2018

Research in progress



In 1999 BioMed Central made high quality research open to anyone who wanted to access and could use it. By making open access sustainable, we changed the world of academic publishing.

We didn't shout about it, we preferred to concentrate on how we could make it work better, to better serve research. To create and test new, innovative ways to help authors. Our pilot projects became open research standards.

The same pioneering spirit that inspired us then, continues to inspire us now. We pride ourselves on continually improving our author services and the quality of our publishing.

Always questioning.

Always listening.

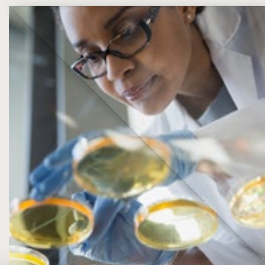
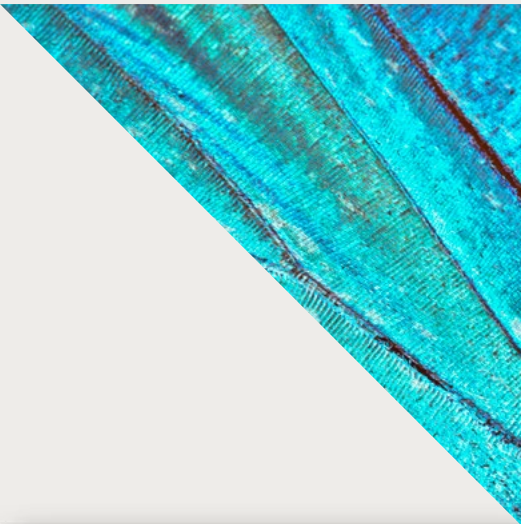
Never settling, always progressing.

For us innovation is an attitude not an activity.

It's how we remain as forward thinking as the communities we serve. And it's how we continue to make small gains that can help research have a huge impact. It's our commitment to keep discovering and to help others do the same.

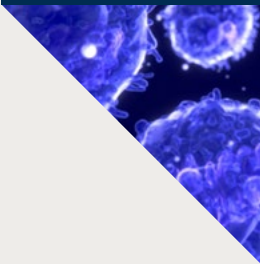
Now as BMC and as part of Springer Nature, we extend this commitment to communities and disciplines beyond biology and medicine, and around the world.

Research in progress.



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1. Introduction

Over the past year at BMC, we've been working as hard as ever to improve our publishing services, continually innovating to meet the needs of our authors and the wider research community.

Our portfolio has grown since our last report, and we're delighted to be welcoming new journals to the BMC family. As part of our mission to expand beyond biomedicine into the physical and applied sciences, we'll be launching a series of journals in these fields over the forthcoming year, with some titles already open for submissions.

A number of journals previously hosted on SpringerOpen have now joined the BMC platform, as we realign and group complementary titles together on one site. These journals, along with our new additions, will provide authors with a wider range of subject fields via a single open access portal.

We're continuing to attract more visitors to our platform. Over the period from July 2017 to July 2018, BMC published 32,466 open access articles in 304 distinct journals. Articles published in BMC journals were downloaded over 195 million times, while our website received more than 100 million page views from 45 million users. In addition, we published 10,318 articles in 206 journals under the SpringerOpen brand.

We're also delighted to shortly be piloting a new initiative to encourage more transparency in the peer review process, something we have long championed at BMC. The pilot will launch later in 2018 for a small number of BMC journals, and will enable authors on submission to one of the journals, to choose to display their manuscript for comment from the community while the peer review process is underway.

BMC was one of the first publishers to operate open peer review, and we hope that others will join us in signing ASAPbio's open letter¹ on the publication of peer review reports. We're also continuing to trial new forms of peer review, along with an exciting scheme to mentor and encourage more early-career researchers to become peer reviewers.

We produce this report every year so that our authors, readers, partners and member institutions can see the wide range of work we do and the role we play in serving the research community.

We hope that this year's report shows you how BMC is as committed as ever to progressing discovery, through opening up access to research for everyone.



Rachel Burley

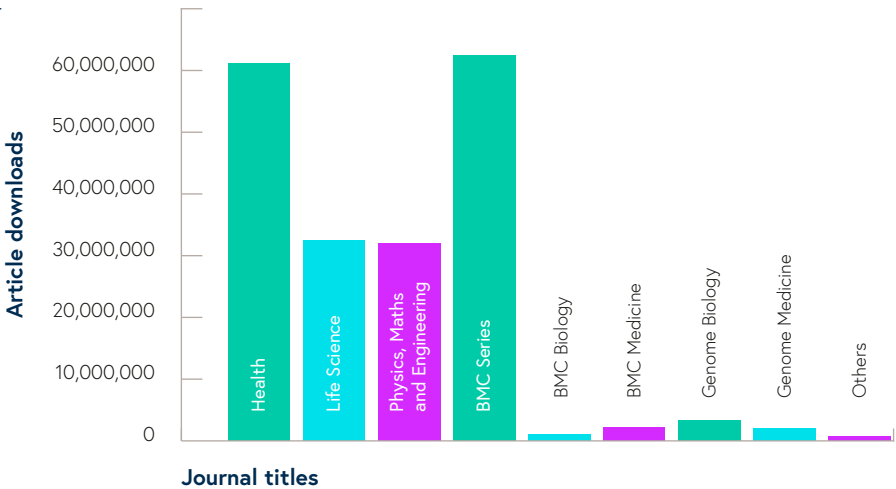
2. BMC in numbers

About our journals

BMC and SpringerOpen are proud to publish 510 journals covering biological sciences, business and commerce, earth and environmental sciences, health sciences, humanities, physical sciences and, as of this year, engineering.

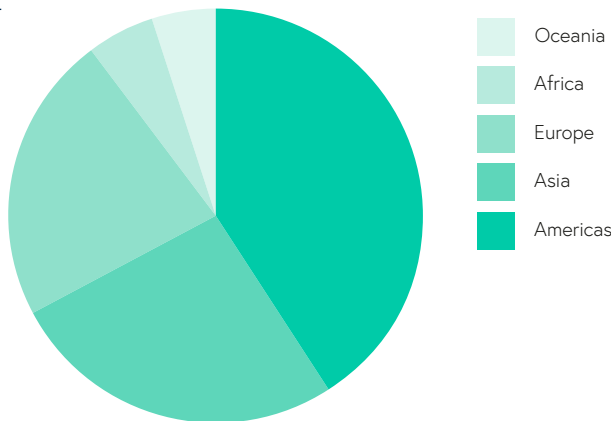
For the period from July 2017 to July 2018, BMC and SpringerOpen published 42,784 open access articles in 510 distinct journals. These articles are freely accessible to anyone in the world, whether they are a researcher or simply an interested member of the general public.

Article downloads



From August 2017 to July 2018, articles published in BMC journals were downloaded more than 197 million times, and our website received over 100 million page views from 45 million users.

Geographic breakdown of users



About our impact

We use a range of metrics to measure the impact and wider reach of the research published in our journals. Altmetric provides information on article accesses, citations, media and social media mentions, assigning each article an Altmetric Attention Score which is an indicator of the amount of attention it has received. The score is derived from an automated algorithm, and represents a weighted count of the amount of attention we've picked up for a research output. Clarivate Analytics allows us to track citations for individual journals. Overall in 2017 and 2018, BMC journals listed in Web of Science² were cited 29,746 times.

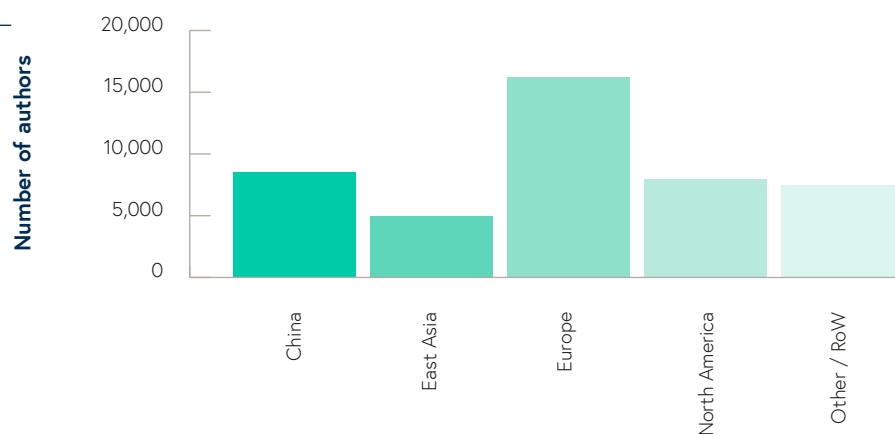
From July 2017 until August 2018, research published in BMC journals was mentioned in more than 14,000 pieces of media coverage, cited in over 550 policy documents, included in over 380,000 tweets and more than 5,000 blogs, and appeared in excess of 13,918 Facebook posts. We now have more than 12,000 WeChat followers. The BMC blogs often receive over one million views during similar time periods.

Our marketing teams run more than 2,000 marketing campaigns each month, ranging from email campaigns to multi-channel campaigns that may include email, online advertising and social media. Our monthly newsletter goes out to a community of more than 600,000 subscribers worldwide.

About our authors

Between August 2017 and July 2018, BMC enabled nearly 44,883 distinct authors from around the world to publish their work.

Number of authors from each country or region



About our staff

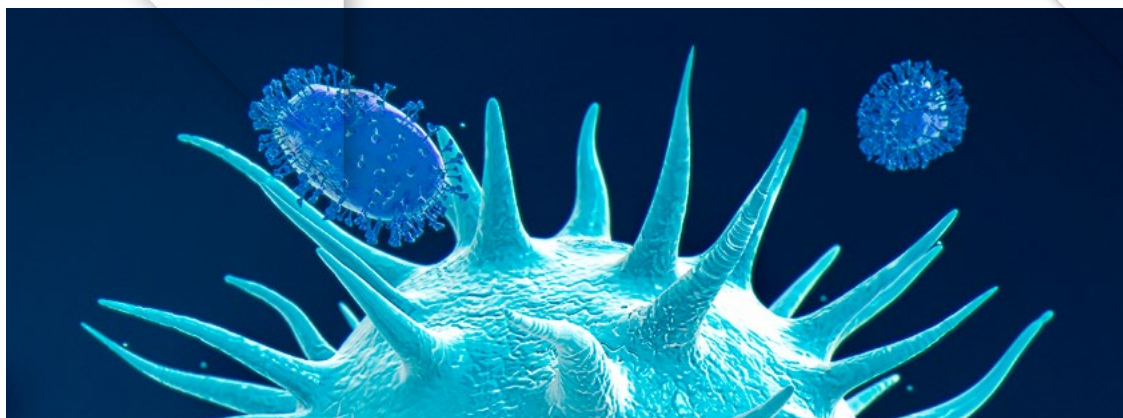
BMC employs 110 people at our offices in London, many of whom are editorial staff working on the BMC Series, BMC Flagships, or BMC branded Academic journal development teams. We also have staff in Beijing, Shanghai, Heidelberg, Berlin, Tokyo, Seoul and New York. We employ a diverse range of people with varied backgrounds, and we are proud to attract staff who have worked in research and understand the needs of the research community. Some members of our staff are also still actively involved in research that aims to improve the publishing industry.

Our membership

We work with more than 500 member institutions around the world. Our membership program addresses the challenges faced by authors and their institutions in supporting payment for article processing charges (APCs). The program enables institutions to centralize funds and to show their support for gold open access (OA) as a sustainable model. Over 500 institutions worldwide have partnered with us to help authors maximize their research funding.

Celebrating journal anniversaries

Two of our flagship journals, *BMC Biology* and *BMC Medicine*, are celebrating their 15th anniversaries this year. 2018 also marks the 10th anniversary of the partnership between BMC and the *Journal of Experimental & Clinical Cancer Research (JECCR)*, which enabled the journal to transition from a printed version to an online open access journal freely available to all. Other journals celebrating major anniversaries this year include: *Journal of Translational Medicine*, *Thrombosis Journal* (15 years), *Parasites & Vectors*, *Thyroid Research*, and *Italian Journal of Pediatrics* (10 years).



Pioneering Registered Reports

In May 2017, *BMC Biology* became the first general biology journal to offer Registered Reports, a new article format designed to promote open science while combating publication bias. A registered report is structured like a research proposal: it provides a rationale for the research and a description of the intended methodology, which may be provisionally accepted for publication before the data is collected. By offering this format at *BMC Biology*, we aim to broaden the ways in which findings can be published, while listening carefully to the scientific communities to identify their needs and understand the opportunities for innovation.

Co-submissions to BMC flagships

BMC's flagship journals work closely together, and from March 2018 we've enabled authors to submit simultaneously to two journals from *BMC Biology*, *Genome Biology* and *Genome Medicine*. Co-submitted manuscripts are independently assessed by editors at each journal, and if the paper is sent for peer review, reviewers are asked to evaluate the manuscript for both journals, thus saving authors time and avoiding the need for multiple submissions.

3. What you told us this year



I am very grateful for the cooperation with you and with the whole team in preparing my article for publishing. Your professional advice and professionalism have contributed to the quality of the article. This was a very positive experience for me.

Author who published in *BMC Musculoskeletal Disorders*, 2018

Listening to our authors

We're always looking for innovative ways to improve the publishing process for our authors. After their articles are published, we invite authors to rate their experience through our Author Satisfaction Survey. From 1 July 2017 to 31 July 2018 we received feedback from 4,576 published BMC authors from around the world. 79% of these published authors rated their experience of publishing with BMC as 'excellent' or 'good'.

Here are some other examples of the feedback we've received from authors about different stages of the publication process:

Submission:

85% of authors rated our online submission process as 'very easy' or 'easy'.

Editorial input:

82% of authors agree that the editorial advice and comments throughout the publishing process improved their paper.

Peer review:

91% agree that the review reports they received improved their manuscript.

Online presentation:

94% of authors rated the online presentation of their published article as 'excellent' or 'good'.

We know that there are still areas where we can improve the publishing experience for authors. The feedback we gather from them helps ensure that we're focusing our improvements on the right areas, while maintaining our high standards in those areas in which we already excel.

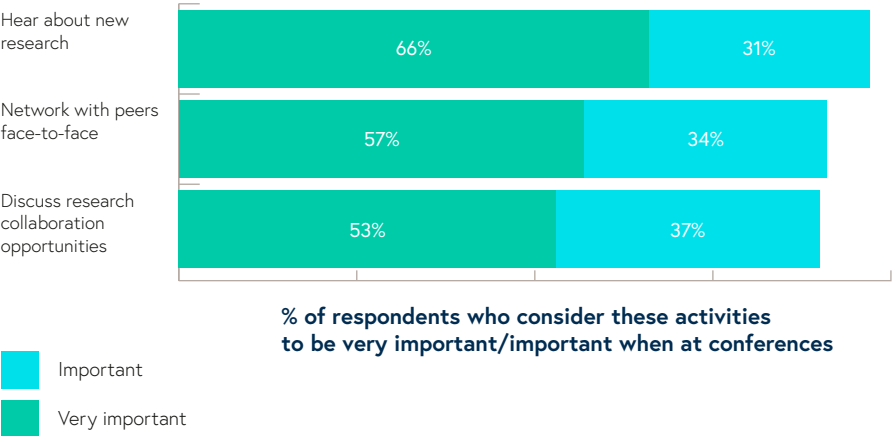
Improving our presence at conferences

In June 2018, Springer Nature conducted a global survey of researchers, to find out how many conferences they attend and what they want to achieve while there. We received approximately 9,500 responses, and the feedback we gained has helped us shape the materials, content and advice we'll offer at future conferences.

More than 80% of respondents told us that attending conferences is 'very important' or 'important' for their job. 46% of respondents think their conference attendance will stay the same over the next five years, while a further 41% anticipate that their conference attendance will increase.

This survey helped confirm to us that BMC must continue to have a presence at key conferences, and enabled us to understand what researchers want to learn, achieve and discuss with us when we are there.

The three most important reasons why researchers attend conferences



Understanding how we're perceived

At BMC, we pride ourselves on continually improving our author services and the quality of our open research publishing communications. We're committed to keep discovering, and to helping others do the same.

We believe that it's important to regularly check in with our research communities to understand how we're perceived. We did this most recently in our December 2017 survey, which asked authors and website visitors what they think about BMC. We received approximately 1,000 responses from people who are familiar with BMC.

We're pleased to report that the majority of respondents recognize BMC as being an established and global open access publisher which is known for publishing high quality research and is well regarded in the research community.

BMC...

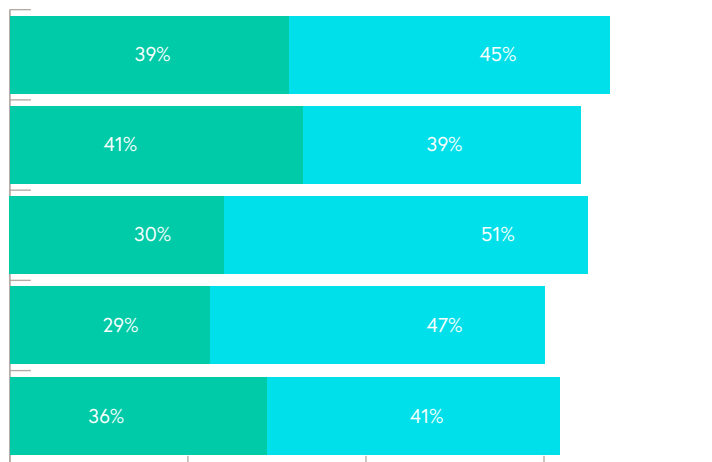
...is a global publisher

...is accessible for all research

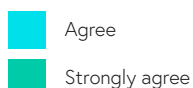
...publishes high quality research

...is well regarded in the research community

...is a leading open access publisher



% of respondents who answered about BMC



Peer review was fair and balanced, the publishing people were very helpful and professional. Great experience, will submit to the journal again in the future.

Author who published in *Virology Journal*, 2017

Always getting better

Of course, there are still areas in which we can improve, and in the future we'll continue to focus on supporting authors in their research communities, developing and improving our services, and helping to shape policies and processes that support the integrity of research.

4. Research in progress

Since first launching nearly twenty years ago, we've continued to serve our communities through initiatives to further open access, innovate in peer review, and help our authors communicate their research to a global audience.

In the past 12 months we've launched new journals as part of our evolving portfolio, expanding beyond biomedicine into the physical and applied sciences, where there is a need for more open access journals to serve some sub-disciplines.

The new journals - *BMC Biomedical Engineering*, *BMC Chemical Engineering*, *BMC Mechanical Engineering* and *BMC Energy* - are now open for submissions, and other new journals in related disciplines are planned for the coming year.

Chemical engineering and biomedical engineering are fields that combine engineering concepts with core scientific principles, to develop real world solutions to the benefit of society – an increasing focus for researchers and engineers across the globe. *BMC Energy* covers theories, developments and applications in the interdisciplinary field of energy and fuel research from across the physical sciences, including engineering, physics, chemistry and the environmental sciences.

As part of the *BMC Series* portfolio, all content in these journals will be fully open access, while making associated data freely accessible online will also be highly encouraged.

This year we launched *NeuroCommons*. The journal aims not only to communicate new findings across the neurosciences but to systematically create a robust, more data- and resources-driven commons on which to build further findings. In doing so, it will look to partner with key initiatives in this space, such as repositories, the INCF, and FORCE11.

1.6
MILLION
links point to open or
free access documents

Working with PubChem

In October 2017, Springer Nature deposited more than 600,000 chemical compounds in PubChem, a database of chemical molecules and their activities against biological assays. The chemical compounds deposited in PubChem offer more than 26 million links back into the primary literature, eBooks or Major Reference Works located on SpringerLink, BMC or nature.com. Of these, 1.6 million links point to open or free access documents.

Depositing data in PubChem will allow researchers worldwide to easily find chemical compounds in Springer Nature content. This is the first time that a publisher has made automatically generated chemistry content publicly available to such an extent and in such a systematic manner.

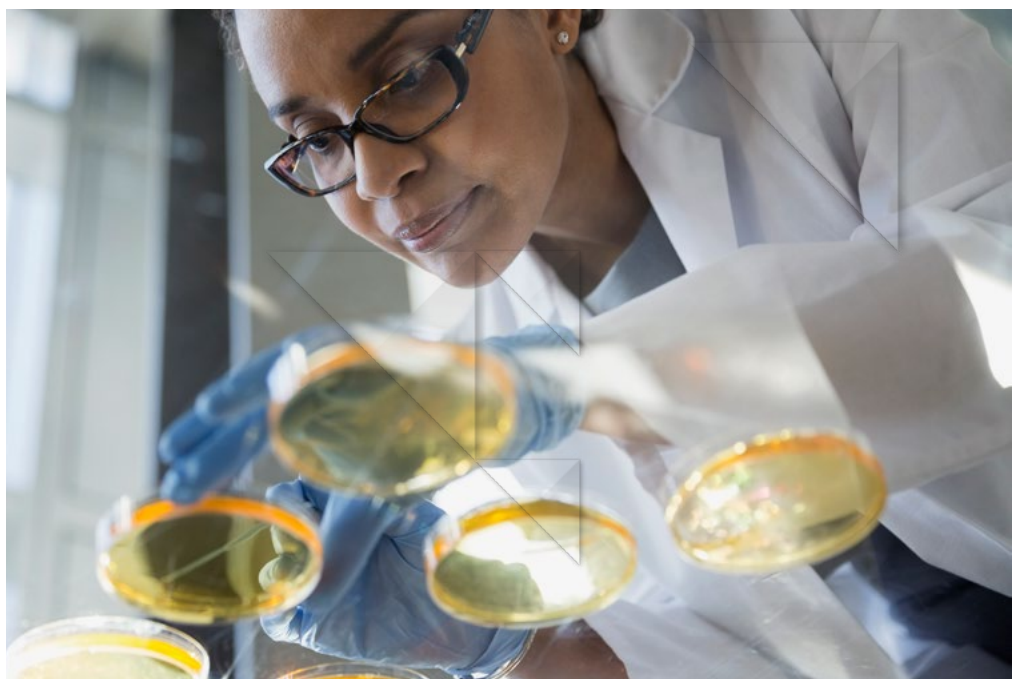
Promoting transparency

This year, we're delighted to be partnering with other publishers in promoting transparency in the peer review process by signing ASAPbio's open letter. As a signatory to the letter on the publication of peer review reports, we encourage others to join us in promoting this approach.

As the original pioneers of open peer review, BMC has actively engaged with the research community for many years, to better understand their evolving needs, as well as the benefits and challenges of opening up peer review.

Since we first introduced open peer review in 1999, the number of journals across the BMC portfolio, now publishing open peer review reports alongside articles, has grown to 70 journals. We'll continue to actively advocate for transparent and open peer review, with the aim of introducing this approach across the wider BMC portfolio over time.

70
JOURNALS
publishing open peer
review reports



Engaging patients and carers

Research Involvement and Engagement (RIE) is an interdisciplinary, health and social care journal focusing on patient and wider involvement and engagement in research. Submissions to the journal are peer reviewed by both academic and patient reviewers, whose reports carry equal weight in the editorial decisions. This year, in cooperation with *The BMJ*, RIE conducted a survey to learn more about the experience of patient peer reviewers.

Overall, the feedback was highly positive. The key motivation of patients to review was the opportunity to add patient or carer perspectives to an article – 90% (157) of respondents felt that this was 'extremely' or 'very' important. The majority of respondents (81%) would recommend being a patient reviewer to other patients and carers, while 92% thought more journals should adopt patient review.

Going forward, the RIE editors aim to strengthen their understanding³ of the contribution and impact of patient peer review to help drive a paradigm change, enabling research to orientate itself towards the co-production of high quality, relevant and impactful knowledge that truly creates patient and public benefit.

Improving diversity through mentoring

In June this year, four BMC journals – *Trials*, *Systematic Reviews*, *Pilot and Feasibility Studies* and *Journal of Medical Case Reports* – launched a pilot⁴ to proactively endorse peer review mentoring, which aims to increase diversity and inclusivity in peer review. The objective of this pilot is to formalize the peer review mentoring process, to make it more transparent, ensure expectations are clear for both mentor and mentee, and maintain the integrity of the peer review process, while adding diversity and inclusivity.

Why publish with us?

By extending the BMC brand to communities and disciplines beyond biology and medicine, we aim to support the global research community and its increasingly interdisciplinary collaboration. Now more than ever, BMC represents the dynamism and innovation of open research and the communities we serve.

As the pioneer of open access publishing, BMC is constantly innovating and offers a globally recognized brand. We strive to continuously improve author services and the quality of publishing, supported by our progressive editorial policies. The research and editorials we publish enjoy a wide reach through our multiple BMC social media accounts and blog networks, with our online portal attracting more than 100 million webpage views per year.

100
MILLION
webpage views per year

5. Events in focus

Getting it SpotOn

In November 2017, BMC, Digital Science and Nature Research hosted SpotOn London, a one-day conference which brought together individuals from across various communities including research, publishing, funding, communications, technology and policy, to discuss the theme: "What makes a great researcher: tools and skills". Held at the Francis Crick Institute in London, the conference followed 2016's incredibly successful event at the Wellcome Collection, which led to the publication of the 2016 SpotOn report⁵.

SpotOn 2017 saw the conference's highest ever number of attendees, with more than 165 people present on the day. The event was broadcast via Facebook Live on the BMC Facebook page.

On Twitter, the main conference hashtag #SpotOn17 trended in the UK⁶. This year we opted for a digital scribe who drew several images of each session⁷ on an iPad.

We're hoping to build on this success even further at SpotOn 2018, which will be held at the Francis Crick Institute in London on 3rd November 2018.



Encouraging peer review diversity and inclusion

As part of #PeerReviewWeek18, Springer Nature hosted an afternoon of talks and debates at a London university, to promote peer review and encourage discussion around this year's theme of 'Diversity and Inclusion in Peer Review'.

Following a BMC blog⁸ featuring an interview with Dina Balabanova on a *Lancet* commentary she co-authored exploring gender and diversity in academic publishing, the Associate Professor from the London School of Hygiene and Tropical Medicine was invited to take part in the panel discussion.

Ella Flemyng, Journal Development Manager at BMC, gave a talk on peer reviewing for BMC, including a new pilot to endorse mentoring in peer review for early-career researchers.

Across Springer Nature's journals, blog platforms and social media networks, editors and authors explored many aspects of peer review, including the patient peer review being trialed by BMC, and ways to increase the pool of peer reviewers to become more inclusive and diverse across the global academic community.



6. BMC Part of Springer Nature

174%
INCREASE
in gold OA articles from 2013
to 2017

26%
OF RESEARCHERS
lack time to deposit data

Better connected

BMC is now part of Springer Nature, giving us greater opportunities to help authors connect and advance discoveries across the world. Springer Nature is the world's largest academic publisher of open access content, with a free open access support service that makes it easier for authors to discover and apply for funding to cover APCs.

A report published this year shows how Springer Nature has been able to deliver rapid growth in gold OA articles in the UK. In 2017, 77% of all Springer Nature publications with UK corresponding authors were published via gold OA, representing a 174% increase in gold OA articles from 2013 to 2017 for this group, according to the report *Gold open access in the UK: Springer Nature's transition*⁹.

The rapid growth in UK articles published via the gold OA route has been driven by a number of factors. These include the collaborative environment in the UK, which sees support from government and institutions for OA, and funders who have developed policies in support of OA and provided the funds necessary for APCs. Other factors include authors who are willing to publish via OA, and a publisher providing authors with a range of publishing options and effective workflows.

Expanding the open access portfolio is just one of the ways in which Springer Nature is making content accessible. We want to advance discovery by supporting data sharing, helping researchers take open approaches to their data wherever possible. Springer Nature's Research Data Helpdesk¹⁰ provides free advice on sharing or publishing research data, including adhering to policies and finding repositories.

A survey of 7,700 researchers published by Springer Nature reveals strong support for data sharing globally, yet identifies a number of common problems amongst researchers when they endeavor to share their data. The main obstacles identified in the report, *Practical Challenges for Researchers in Data Sharing*¹¹, are 'organizing data in a presentable and useful way' (46%), being 'unsure about copyright and licensing' (37%), 'not knowing which repository to use' (33%), and 'lack of time to deposit data' (26%).

In response to these challenges, Springer Nature has launched new Research Data Support¹² services for researchers, institutions and funders, to help the research community manage and share data.

Springer Nature is also partnering with Wellcome on a pilot¹³ to help its funded researchers make their datasets discoverable and available to the wider research community.

Publishers play an integral role in ensuring the soundness of the scientific record, working collaboratively with the research community to maintain the integrity of research. This year, Springer Nature created a new position of Research Integrity Director¹⁴ to ensure the growing volume of scientific content being published continues to be rigorously assessed, with robust processes in place to prevent and address research misconduct and breaches of publication ethics. The Director will lead the Springer Nature Research Integrity Group, which is responsible for working with editors and publishers to maintain the integrity of the published record, preventing misconduct and encouraging sound and reliable research practices.

7. Spreading the word



We are thrilled about this level of coverage. It's been a pleasure working with you.

Irina Mordukhovich,
author of the study

In media, on social

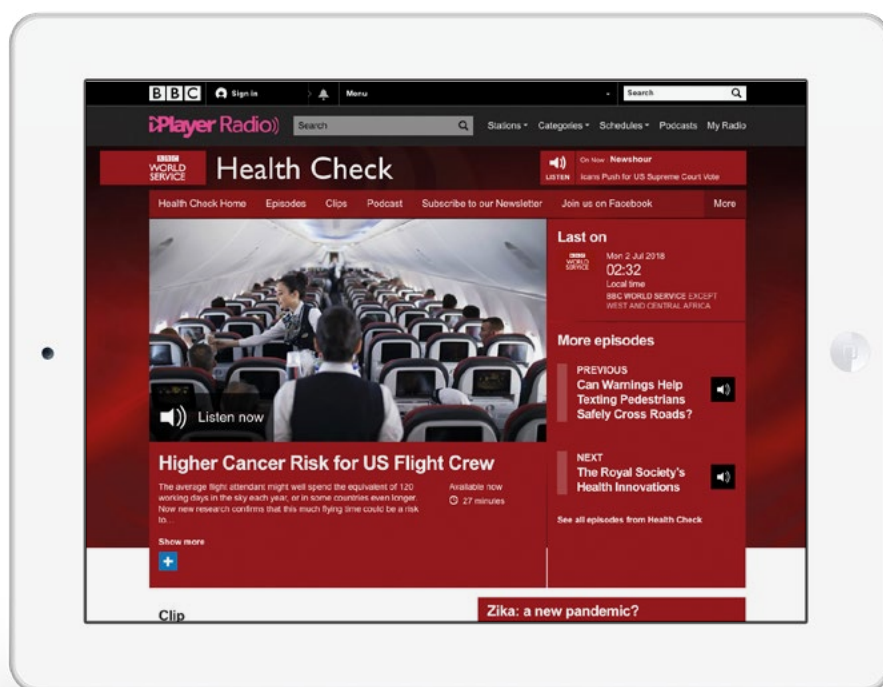
We believe that a great author service should continue after an article has been accepted for publication. The BMC communications team works behind the scenes to help authors create the biggest possible impact. Through press releases, blogs and social media campaigns, the team can significantly increase the number of article accesses post-publication.

Between August 2017 and July 2018, more than 70 press releases were sent to the media on BMC and SpringerOpen research, generating in excess of 11,000 media stories in more than 100 countries around the world.

US flight crew have higher cancer rates than general population¹⁵

In June 2018, the communications team press released a study published in *Environmental Health*¹⁶, which found that US flight crew have higher rates of specific cancers than the general population.

The research attracted considerable attention from the national and international media, gaining 1,196 pieces of media coverage, including outlets such as *Newsweek*¹⁷, *The Guardian*¹⁸ and the *BBC*¹⁹.



Giving authors a voice

The BMC blogs network has always been a platform aimed at giving authors the space to tell great stories about their research. Online since 2007, the network has grown substantially in the last few years and now regularly exceeds 100,000 monthly views. The period between August 2017 and July 2018 saw a total of 1,229,671 views. In this period we published 497 blogs covering everything from eliminating entire chromosomes with CRISPR/Cas9²⁰, to highlighting the links between Lyme disease and celiac disease²¹, and exploring why humans and domesticated animals show multiple eye colours²². Most recently the blogs network has started to incorporate physical sciences, mathematics and engineering research, as the BMC brand begins to grow into these fields.

8. Into the future

Better connected

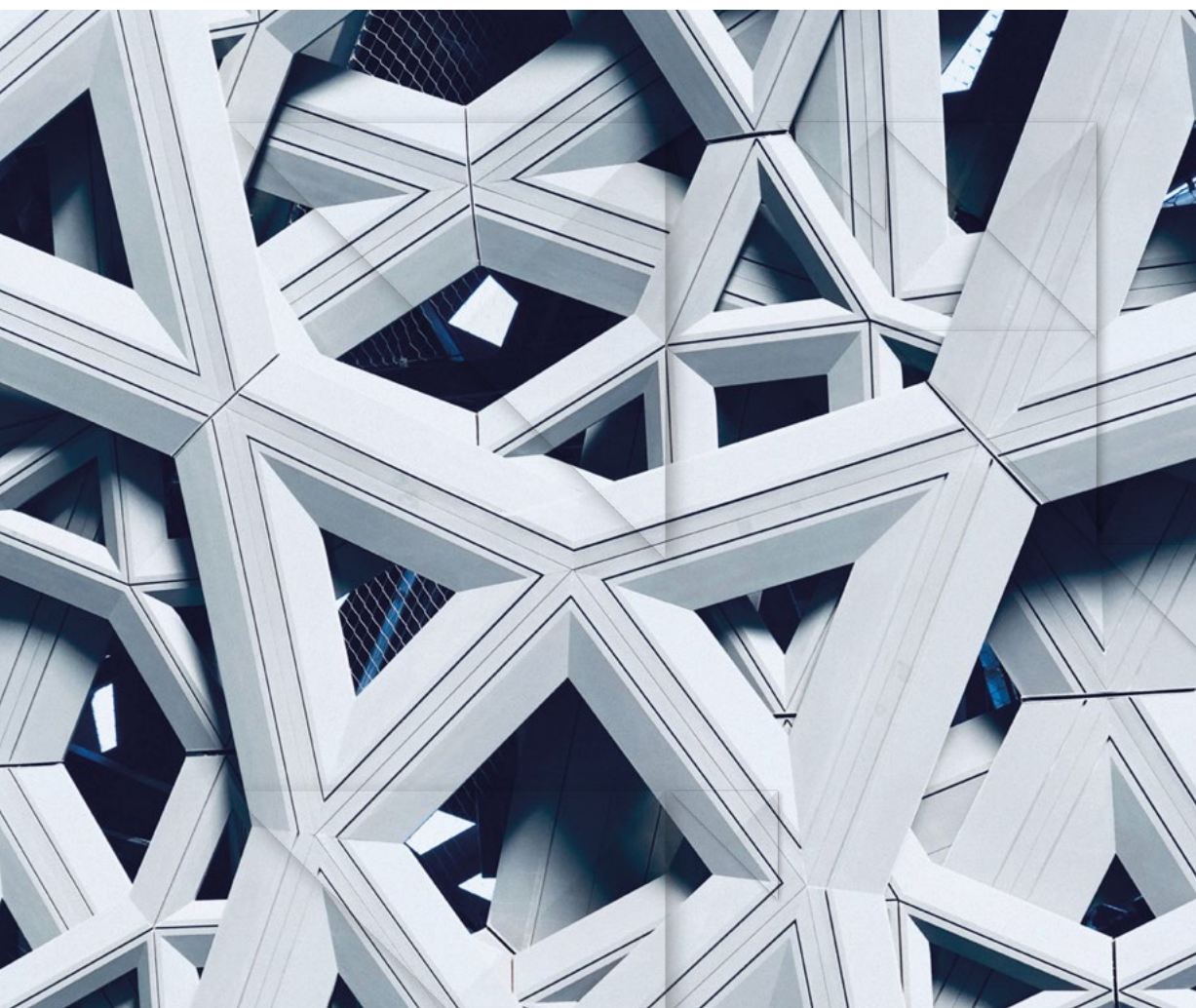
BMC's ambition is to be as forward thinking and progressive as the communities we serve. Always listening and always progressing, we constantly strive to innovate and evolve.

With plans to pilot a new initiative opening up the submission and review process for a small set of journals, we hope to break new ground in our quest to open up all areas of research, from peer review to data and beyond.

As part of our commitment to meeting the research community's needs, we'll continue to test and launch new tools, products and services that drive open research through transparency, accessibility and reproducibility.

Finally, we'd like to sincerely thank all our authors, peer reviewers, editors and partners who helped make 2018 such a successful year. We're looking forward to another year of major progress in 2019.

BMC. Research in Progress.







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