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The uptake and use of medRxiv

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ABSTRACT

Objective

The communication of scientific and medical research is time-consuming.[1] Preprints (versions of manuscripts published online before peer review) accelerate the dissemination and accessibility of research.[2,3] Clinical researchers have been slow to embrace preprints, fearing that non-peer-reviewed research may negatively affect public health.[4] However, the benefits of clinical preprints have been demonstrated, particularly in relation to infectious disease outbreaks.[5]

Launched in June 2019, medRxiv is a preprint server for the rapid communication of clinical research in a responsible and transparent manner. This analysis assessed the uptake and use of medRxiv in the 6 months following launch.

Research design and methods

Posting records on medRxiv.org were used to obtain the number of new and revised papers posted each month, and the proportion of papers posted under each subject category.

Results

By December 2019, 1056 (914 new; 142 revised) papers had been submitted to medRxiv; 6% (67/1056) were accepted for publication in a peer-reviewed journal. The subject with most submissions was 'Epidemiology' (16%), followed by 'Neurology' (8%) and 'Genetic and Genomic Medicine' (8%). Approximately one-quarter of submissions were rejected, for reasons that included: content out of scope; insufficient ethical oversight; missing trial ID; and content in a small number of papers that could cause changes in behavior affecting public health (Sever R, pers. comm.).

Conclusions

In just over 6 months since launch, over 1000 preprints have been posted on medRxiv, more than in the first 6 months of bioRxiv.[6] New papers accounted for the majority of published articles. To build on this success, more engagement is needed from the healthcare community to understand the benefits of preprints.

Keywords: *Publication timing, Metrics, Original research*

INTRODUCTION

- The communication of scientific and medical research is time consuming, often involving numerous rounds of peer review.[1]
- Preprints (versions of manuscripts published online before peer review) accelerate the dissemination and accessibility of research.[2,3]
- Engineering and physical sciences researchers have been using preprint servers such as arXiv for over two decades.
- Efforts to encourage the use of preprints in other disciplines largely failed to gain traction until the launch of bioRxiv in 2013, which, as of November 2019, houses over 64 000 preprints from life sciences.[7]
- Clinical researchers, in particular, have been slow to embrace preprints, fearing that non-peer-reviewed research may negatively affect public health.[4]
- However, the benefits of clinical preprints have been demonstrated, particularly in relation to infectious disease outbreaks, including the 2019 novel coronavirus disease (COVID-19) outbreak.[5,8]
- Launched in June 2019, medRxiv is a preprint server for the rapid communication of clinical research in a responsible and transparent manner (Figure 1).

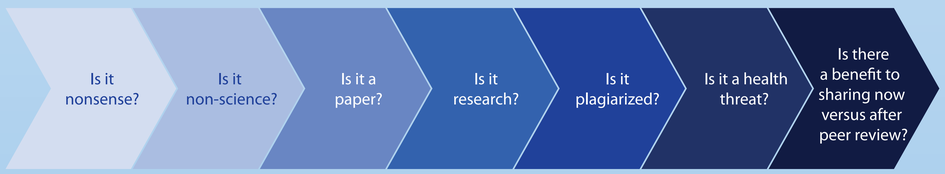
OBJECTIVE

- This analysis assessed the uptake and use of medRxiv in the 6 months following launch.

RESEARCH DESIGN AND METHODS

- The number of new and revised papers posted each month between June and December 2019 were downloaded from medRxiv.org, and the proportion of papers under each subject category was recorded.
  - The proportion of papers accepted for publication in peer-reviewed journals was also recorded.
- Reasons for submissions being rejected by medRxiv were provided by Richard Sever (pers. comm.).

FIGURE 1. The screening process applied to all submissions to medRxiv to ensure transparent and responsible dissemination.



RESULTS

Uptake of medRxiv

- By December 2019, 1056 papers had been submitted to medRxiv (Figure 2).
- Most submissions corresponded to new (914/1056; 87%) rather than revised (142/1056; 13%) papers.
- Approximately one-quarter of submissions to medRxiv were rejected. Reasons for rejection included:
  - content being out of scope
  - insufficient ethical oversight
  - missing trial ID number.
- Only a small number of submissions were rejected over concerns that their findings could cause behavioral changes potentially negatively affecting public health (Richard Sever, pers. comm.).

Use of medRxiv

- 'Epidemiology' was the most popular submission category (16% of papers), followed by 'Genetic and genomic medicine' (8% of papers) and 'Neurology' (8% of papers) (Figure 3); just over one-third of papers were categorized as 'Other'.
- Papers were also published in *BMJ Open* (three papers; 4%), *BMJ Global Health* (two papers; 3%) and *PLOS Neglected Tropical Diseases* (two papers; 3%).

67 preprints posted on medRxiv were published in peer-reviewed journals between June and December 2019

12% of these were published in *PLOS ONE* (8 out of 67)

FIGURE 2. The monthly number of new and revised papers, and the cumulative number of new papers posted on medRxiv between June and December 2019.

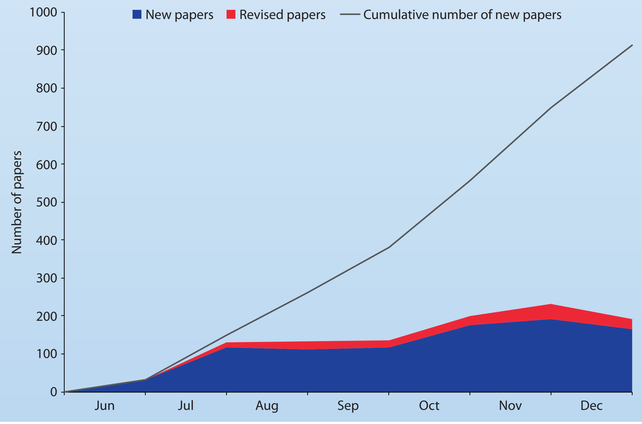
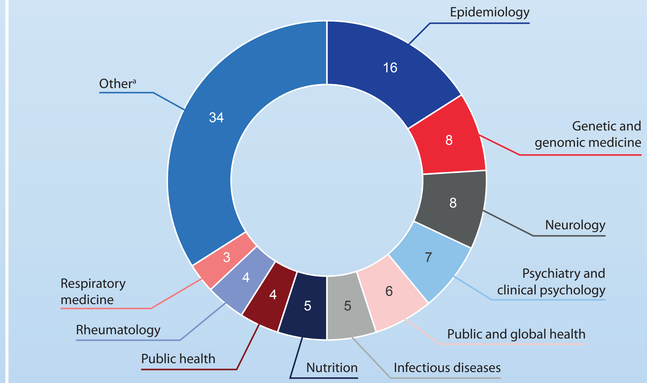


FIGURE 3. The proportion of medRxiv submissions according to subject category.



[a]Other included Addiction medicine, Allergy and immunology, Anesthesia, Dentistry and oral medicine, Dermatology, Emergency medicine, Geriatric medicine, Health economics, Health systems and quality improvement, Hematology, Intensive care and critical care, Medical ethics, Nephrology, Nursing, Obstetrics and gynecology, Occupational and environmental health, Orthopedics, Otolaryngology, Pain medicine, Palliative medicine, Pathology, Pharmacology and therapeutics, Primary care research, Sexual and reproductive health, Sports medicine, Surgery, Transplantation, Urology.

STRENGTHS AND LIMITATIONS

- The current analysis assessed the uptake and use of medRxiv in the 6 months after its launch, monitoring progress across a range of submission categories.
- Publications in peer-reviewed journals were captured only in the 6-month study period, meaning that the total number of preprints published in such journals may now be higher.
- The funding source behind each preprint, which may provide insight into differences in the uptake of preprints between funders, was not investigated.

CONCLUSIONS

- In just over 6 months since its launch, over 1000 preprints have been posted on medRxiv, more than in the first 6 months of bioRxiv.[6]
  - Most of the submissions corresponded to new rather than revised papers.
- Of these papers, 6% were accepted for publication in peer-reviewed journals between June and December 2019.
- To build on this success, more engagement is needed from the healthcare community to understand the benefits of preprints.

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DISCLOSURES

SM (https://orcid.org/0000-0002-9691-0652), SS (https://orcid.org/0000-0003-0611-6226) and TK (https://orcid.org/0000-0001-6152-7365) are employees of Oxford PharmaGenesis and have no relationships with proprietary entities producing healthcare goods or services.

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