

Open access publication of public health research in African journals

There are many claims to the benefits of open access publishing in general and for Africa in particular. This study aimed to describe the characteristics of scholarly journals expected to publish articles on public health from a number of African countries. Using African Journals Online and African Index Medicus, 174 journals from 13 African countries were identified. The six countries above the group's median gross domestic product (GDP) published 145 journals, while the seven countries at or below the median GDP published 29 journals. Two thirds of the journals were freely available to download, but only a third had a Creative Commons licence, and most were not indexed. Around half of the journals levied full article processing charges (APCs) – journals from countries at median GDP or below were less likely to charge APCs than those from countries above the median GDP. One of the key findings is that only a few journals were indexed, limiting the ability of potential readers to find the results of research performed in local settings. The results suggest a need to assist journals and researchers to make the work they publish more accessible to the audience who might want to use the results.

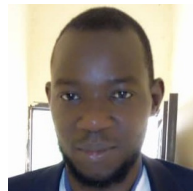
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Introduction

Most countries in the Global South lack locally relevant and globally valid research on their populations.¹ The number of research publications from the Global South is low relative to the Global North.² Despite a 51% increase between 2008 and 2014, in 2014 sub-Saharan Africa produced only 1.4% of the world's share of scientific publications.³ Research outputs from Africa have mainly been limited to ten countries, with more than 90% of the total publications in Africa from these countries.⁴

There are many potential reasons for this poor research output, which may include the lack of access to scientific literature – research needs to be communicated⁵ and published in a way that ensures its accessibility.⁶ There has been a movement towards open access publishing and research data publishing, and UNESCO has described this to be part of the field of open science which it defines as '...an inclusive construct that combines various movements and practices aiming to make scientific knowledge openly available, accessible and reusable for everyone...'.⁷ In 2015, 45% of global scholarly literature was freely available, and open access articles had an 18% citation advantage, suggesting that they reached a wider audience than those behind a paywall.⁸

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There are many claims made about the benefits of open access in general and for Africa in particular,⁹ and the benefits of open access to research findings have been discussed in an African context concerning the urgent need to respond to the Covid-19 pandemic.¹⁰

The proportion of journals publishing open access articles has increased over time. Basson et al. estimated that, between 2015 and 2019, 50% or 57% (depending on the data source) of scientific articles were published as open access.¹¹ Open access rates from sub-Saharan Africa were high relative to other regions, consistent with Wilson et al.¹² and Iyandemye and Thomas¹³ who showed, during 2015, a high rate of open access publication of articles in the biomedical sciences in sub-Saharan Africa and a negative relationship with the per capita income of the country. While there is still room for improvement in the rate of open access publishing, the relatively high rates in sub-Saharan Africa suggest the popularity of this approach. To what extent articles published as open access can be discovered through appropriate indexation requires further exploration.

'most open access articles were written by authors from high-income countries'

When articles are published in journals that live behind a paywall, the reader pays, but in an open access mode, the publication costs are usually paid by institutions, funders or authors. These article processing charges (APCs) may be a barrier to open access publication for scientists, especially to those from the Global South. The hypothesis that APCs are a barrier to publication in open access journals is supported by Smith et al.¹⁴ who found that most open access articles were written by authors from high-income countries.

The availability and accessibility of the publication of health research is an initial focus of interest by PublicHealth Africa – an organization which was established to leverage the strengths of African alumni from international and local online and face-to-face master's courses in public health.¹⁵ In a small, unpublished survey of African public health practitioners by the UK charity Peoples-Praxis, over half of the 114 respondents reported barriers to research and writing. Two thirds reported that they would be willing to publish their research as open access if the journal waived or did not levy an APC, half would publish if their institution had to pay, but only a quarter would if they had to pay for the APC themselves.¹⁶

This study aimed to explore open access publication of public health research and practices in Africa, to describe the characteristics of scholarly journals expected to publish articles on public health published in a number of African countries and examine the proportion of journals that publish articles as open access, charge APCs and are appropriately indexed. The study also explored any variation in open access and APCs according to the country's per capita gross domestic product (GDP).

Methods

A collaboration was developed for this project between two organizations, PublicHealth Africa and LIBSENSE¹⁷ – the latter supports librarians to build capacity for open science in Africa. One email was sent to invite graduates of the Peoples-uni master's programme in public health,¹⁸ members of the African Forum for Research and Education in Health¹⁹ and members of LIBSENSE to collect data for the study.

Using the African Journals Online (AJOL) and the African Index Medicus (AIM), journals that were expected to publish articles in the area of public health were identified. In addition, participants in their respective countries used their local knowledge to complement the list of journals from AJOL and AIM. Furthermore, some local participants used other sources (Google search, National Library of Medicine (NLM) Catalog) to confirm or complement journals identified through AJOL and AIM. Also, data about the identified journals on their respective official websites were examined. Journals were selected based on the name of the country where the journal is published as listed on AJOL and AIM. Furthermore, journals with pan-African or regional African labels were explored to find journals from each targeted country. To capture those that publish articles on public health, the net was spread widely among journals in the field of health, wishing to be inclusive rather than exclusive.

The authors developed and piloted a data collection sheet in three countries (Mali, Tanzania and Nigeria). The authors then developed a spreadsheet to compile the results. For each journal, the country of publication, journal ownership, frequency of publication, APC and open access policies, use of Creative Commons licences and the journal indexation status were assessed. This study used in-country investigators to collect data in their respective countries (Ghana, Kenya, Malawi, Mali, Namibia, Nigeria, Rwanda, South Africa, Sudan, Tanzania, Uganda, Zambia and Zimbabwe) using a standard spreadsheet. In-country investigators were alumni from public health courses, researchers or librarians in the 13 countries listed above. For each country, the authors checked each spreadsheet initially for the completion of data. Later, one of the authors checked the accuracy of the data by re-examining each individual journal and amending the spreadsheet if necessary. Journals which had not published an issue for at least a year were excluded.

Population and per capita gross domestic product for each country were recorded in US\$ from the World Population Review.²⁰

Descriptive statistics are shown as numbers and percentages of the prevalence of the measured variables among the total number of publications. The chi-square (χ^2) test, used to test differences between discrete variables, was used to compare the prevalence of each measured variable across countries at or below the median GDP and those above the median GDP for the 13 countries.

Results

This study identified and assessed 174 journals from 13 countries. The number of journals identified varied from 1 to 85 in each country. Table 1 shows the number of journals, population and per capita GDP in each country. The median GDP among the 13 countries was US\$3,342. Among the seven countries at or below the median GDP, 29 journals were identified, compared with 145 journals in the six countries above the median GDP.

Table 2 shows the characteristics of all journals and those above, or at or below the median GDP of the country of publication. Among the 174 journals, 70 were published by universities, 96 by professional societies and 16 by others (some jointly), and 89 were published only twice a year or annually. In total, 112 journals were free to access and available for free download, usually directly from the journal site as PDF files, although only 68 used a Creative Commons licence. Eighty-eight journals (51% of the total) levied full APCs, which could be waived either fully or partly by 32 (36%) of these 88 journals.

Country	Population in millions*	Per capita GDP (\$)*	N journals identified
Nigeria	216	5,187	85
South Africa	61	12,032	32
Ghana	32	5,693	10
Kenya	56	4,926	10
Zambia	19	3,342	7
Tanzania	63	2,821	6
Namibia	3	9,936	6
Uganda	48	2,574	6
Mali	21	2,401	5
Rwanda	13	2,337	3
Sudan	46	4,098	2
Zimbabwe	15	2,622	1
Malawi	20	993	1
Total			174

Table 1. Number of journals, population and per capita GDP in each country (*2022 population and GDP from World Population Review)

Twenty-two per cent of the journals were indexed in PubMed (n = 39), 9% in MEDLINE (n = 15), 21% in the Directory of Open Online Journals (DOAJ) (n = 37) and 66% (n = 115) in the AJOL. Fifty-eight per cent (n = 101) of the journals used a digital object identifier (DOI) for their articles.

Journals from countries at or below the median GDP were less likely than those from countries above the median GDP to require full APCs, 28% compared with 59% (chi-square 7.36, p = 0.007). Table 2 shows the characteristics of all journals and those above, or at or below, the median GDP of the country of publication.

'Journals from countries at or below the median GDP were less likely than those from countries above the median GDP to require full APCs'

Characteristics of Journals	Total: n = 174 N (%)	Above median GDP: n = 145 N (%)	Median GDP or below: n = 29 N (%)	Difference between Above median and median or below χ^2 ; p-value
University publisher [@]	70 (40%)	56 (39%)	14 (48%)	0.94; p = 0.33
Professional society publisher [@]	96 (55%)	83 (57%)	13 (45%)	1.51; p = 0.22
Other publisher [@]	16 (9%)	14 (10%)	2 (7%)	0.22; p = 0.64
Annual/biannual	89 (51%)	73 (50%)	16 (55%)	0.23; p = 0.63
Full APC [§]	88 (51%)	80 (55%)	8 (28%)	7.36; p = 0.007
Partial or full APC waiver	32/88 (36%)	31/80 (39%)	1/8 (12%)	2.17; p = 0.14
All free to access	112 (64%)	89 (61%)	23 (79%)	3.39; p = 0.07
None free to access	35 (20%)	31 (21%)	4 (14%)	0.87; p = 0.35
Creative Commons licence	68 (39%)	60 (41%)	8 (28%)	1.93; p = 0.16
Indexed PubMed	39 (22%)	30 (21%)	9 (31%)	1.49; p = 0.22
Indexed Medline	15 (9%)	11 (8%)	4 (14%)	1.18; p = 0.28
Indexed DOAJ [*]	37 (21%)	33 (23%)	4 (14%)	1.16; p = 0.28
Indexed AJOL [^]	115 (66%)	99 (68%)	16 (55%)	1.85; p = 0.17
DOI [®] given	101 (58%)	84 (58%)	17 (59%)	0.00 p = 0.95

Table 2. Characteristics of all journals and those above, or at and below, the median GDP of the countries of publication ([@]Some jointly published, [§]APC, ^{*}DOAJ, [^]AJOL, [®]DOI)

Discussion

The study found that the journal publishers were mainly professional societies and universities, with some being jointly published. Half of them were published only twice a year or less. The majority were freely available to download, but only a third had a Creative

5 Commons licence, most were not indexed in PubMed, MEDLINE or the DOAJ and only around a half had a DOI. About half of the journals levied full APCs – in a third of these, the journal stated that these charges could be fully or partially waived.

Among the 13 countries in the study, those at median GDP or below were less likely to charge full APCs than journals from countries above the median GDP. The median number of journals per country was twice as high for countries in the higher than in the lower GDP group. South Africa and Nigeria published the largest number of journals, 32 and 85 respectively.

One of the key findings of this survey is that only a few of the journals were indexed, limiting the ability of potential readers to find the results of research performed in local settings. This study does not give reasons why only a few of the journals are indexed, but if it is a lack of knowledge among editors of indexing requirements, an educational or mentoring programme may be worth considering. Such programmes would also help journals to meet a majority of the criteria identified by the Journal Publishing Practices and Standards (JPPS) framework, which is partly managed by AJOL.²¹

Taubert et al.²² suggest that it should be economically feasible for large publishing houses to waive APCs for the group defined by the United Nations as 'least developed countries', many of which are in Africa. Although this may not be the case for smaller local publishers, that half of the journals in this survey did charge APCs confirms the importance of further exploration into ways of reducing the costs of publication.

In 2015, UNESCO encouraged African countries to establish training centres focused on building capacity in open access philosophies and systems,²³ and the Dakar Declaration, which in 2016 recommended that publicly funded research in Africa and the Global South should be made freely available to the public, added momentum to promote and support open access publishing in Africa.²⁴

Mwelwa et al.²⁵ have made a number of recommendations for capacity building in this area, including the need for pan-African collaboration on infrastructure to allow the development of open science in Africa through the digital revolution. They indicate that solutions to improving open publishing involve complex issues requiring a number of steps. However, this is important since the development of open science in Africa will enhance the ability of science to contribute to national and pan-African socio-economic priorities. Many of these recommendations are supported by Okafor et al. who emphasize the need for funding and leadership to institutionalize open science in Africa.²⁶

These recommendations are broader than can be derived from this survey, since the study only explored one aspect of open science, that of open publishing, and that in selected journals. However, the results do suggest a need to assist journals and the researchers who publish in them to make the work they publish more accessible to the audience who might want to use the results. This is planned as the next phase of the work between PublicHealth.Africa and LIBSENSE, as others are welcome to collaborate on this.

Study limitations

The authors chose to identify the country that published the journal rather than the nationality of the author of the articles within them. The AJOL platform allows the identification of the country of the journal through a filter, while in the AIM database, the country filter is for the subject of the paper rather than the journal itself, and thus relevant journals may have been missed. Since the source of the data may have an impact on the measurement of open access,²⁷ this study may not have captured the correct proportion of open access journals in each country from the different databases.

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'the need for pan-African collaboration on infrastructure to allow the development of open science in Africa through the digital revolution'

- 6 The findings may not apply more generally to journals publishing in areas other than health. The choice of journals likely to publish articles about public health was to some extent subjective as the authors did not examine the articles themselves in detail. However, the journals selected by the individual country investigators were checked and amended if necessary by a single expert medical librarian to attempt standardization. The use of AJOL and AIM as the primary source of journals would tend to act as a quality filter and exclude journals that do not meet the criteria for inclusion in those databases. This will also be likely to have excluded predatory journals. Although investigators were encouraged to use local knowledge, the NLM Catalog and Google search, the methods will tend to favour online rather than print-only journals.

Conclusions

In the 13 African countries examined in this study, there were varying numbers of journals published likely to cover public health issues. While many journals were free to access, this access was limited due to low publication frequency and inadequate indexation. APCs were common, limiting the ability of African researchers to publish in these journals.

In order to improve opportunities for African researchers to publish their findings in local journals, and hence for the users of research to access these findings, a number of improvements would be required. These might be aided by an education and support programme aimed at African journals and the researchers who hope to publish in them.

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Data Accessibility Statement

The data files for this article can be found at: Open Access Publication of Public Health Research in African Journals: Dataset. <https://doi.org/10.5281/zenodo.7011613>.

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Abbreviations and Acronyms

A list of the abbreviations and acronyms used in this and other *Insights* articles can be accessed here – click on the URL below and then select the 'full list of industry A&As' link: <http://www.uksg.org/publications#aa>.

Competing Interests

The authors have declared no competing interests.

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