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Review Article

History and evolution of academic publishing from the perspective of 60 years of the Ethiopian Medical Journal

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Abstract
On the occasion of the 60th Anniversary of the Ethiopian Medical Journal (EMJ), the authors briefly explore the history and current trends in academic publishing globally and in Ethiopia. Notable increases in academic publishing are recorded even though, as part of the global asymmetry in research and academic publishing, the share of Ethiopia and Africa in general remains relatively small. Challenges and opportunities and how the EMJ has handled them are assessed. The several voluntary editors over the years are commended for sustaining the quality, consistency and continuity of the journal under quite difficult circumstances which portends well for the future of the Journal and academic publishing in Ethiopia.

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Introduction

Academic Publication

A growing number of academic works is being published with the continuing expansion of higher education institutions (1), in Africa in particular (2). Academic publication based on research is important not only for the status/reputation of individuals and institutions but also for socio-economic development in general (3).

Academic publishing, a subfield of publishing which distributes academic research and promotes scholarship, is considered the primary vehicle for the advancement of scientific knowledge (4). Various definitions exist and future reviews would be expected "to take account of changing academic, social and political realities" (5). In the Ethiopian context, it has been defined by the Ministry of Science and Higher Education as ""Publication" shall mean a book, book chapter, textbook, journal article, review article, conference proceedings, teaching material or a brief, short communication or technical note that having *(sic)* been authored solely or jointly by academic/ research staff…"Academic publishing" shall mean publishing of research articles with the required level of review and editorial services as well as traceable editorial team and publication history" (6).

The first academic journal, "Journal des Sçavans", was published in France on January 5, 1665. This was followed by the publication, on March 6, 1665, of the "Philosophical Transactions of the Royal Society of London" (4,7). In Ethiopia, "The earliest known medicinal texts are the Geez "Metshafa Faws" (መጽሐፈ ፈውስ) mid-17th century and "Metshafa Medhanit" (መጽሐፈ መድሃኒት) of the early 18th century" (8). After this early start, the importance of academic journals as vehicles for research findings has grown substantially (7,9,10). Globally, there are now more than 45,ሠ000 peer-reviewed - i.e. gone through a complex and difficult quality assessment process (11) - scholarly journals, growing at approximately 6% a year (1). Most academic work was previously published in academic journals owned by nonprofit academic

societies; now more and more are owned by private 'multinational publishers'. The drive to commercialize scientific publishing has a long history but accelerated in the 1960s and 1970s when commercial publishers, mostly in the United States of America and United Kingdom, began to selectively acquire "top-quality" journals and now own almost all top publications (1).

Research and Publication

Research is recognized as important for health and development. The World Health Organization (WHO) (12) emphasizes that "All nations should become consumers and producers of research knowledge". Its importance is recognized globally (12,13), in Africa (14), and Ethiopia (6,15), including in program specific documents. Future demands for research/science and technology-based measures against major challenges such as climate change, public health emergencies/pandemics and other emerging or reemerging crisis are bound to increase.

Research is expected to be "…much more complex, multidisciplinary, collaborative, and transnational —and often occur […] at a much more rapid pace—than in the past… challenging … governments … to develop and implement policies that enable countries to benefit from the assimilation of new knowledge" (16).

Globally, the output in publications is increasing (14,16,17). However, in terms of academic publishing, there is a major asymmetry between the global North and South (10). In one example, 96% of primary data for research were collected in Low - and Middle- Income Countries (LIC & MIC) but 56% of first authors were based in High Income Countries (HIC), compared to only 8% in LIC (18). A more recent study that analyzed articles published between 2015 and 2020 across the world Bank regions (19) shows that in studies in LIC, only 43% of first authors are from LIC compared to 98% in studies in HIC being from same countries (Table 1).

Table 1: First Author Income Classification Compared with Studied Country Income Classification

Classification [a], No. (%)	**First Author WB Income Classification**				**Total (No.)**
	LIC	LMIC	UMIC	HIC	
LIC	29 (43.3)	0 (0.0)	0 (0.0)	38 (56.7)	67
LMIC	0 (0.0)	108 (69.7)	0 (0.0)	47 (30.3)	155
UMIC	0 (0.0)	0 (0.0)	98 (72.6)	37 (27.4)	135
HIC	0 (0.0)	0 (0.0)	1 (1.6)	62 (98.4)	63
Total	29	108	99	184	420

NOTE. Bold-italic numbers represent the articles with authors from the same region as the studied country.
Abbreviations: HIC, high-income country; LIC, low-income country; LMIC, lower-middle-income country; UMIC, upper-middle-income country; WB, World Bank.
[a] Includes only articles that studied a single country.
Source: adapted from 19

The pattern is repeated in specialty areas too. For emergency medicine, for example, a large proportion (45%) of studies were done in LIC or MIC but more (40.7%) of the first authors in studies from LIC were from HIC. For infectious disease research, a study showed that only 50% had either a first or last LIC-affiliated author. Among these LIC affiliated authors, 48% of first authors and 52% of last/senior authors also reported a non-LIC institutional affiliation. The asymmetry is due to several reasons, including "inequities in power and influence inherent in the research ecosystem" (10), lack of country ownership (20), entanglement in complex (USA, European Union [EU], Russia, China…) geopolitical maneuvering (21), "algorithmic logic" (22), and limited funding and high article processing charges (23).

Key to laying the ground for institutions'/teams' and researchers' level success and addressing the issue of 'decolonize' (24,25)/rectify the power asymmetry (26) is fair research contracting, which clearly addresses issues such as "1) Intellectual property rights, 2) Ownership of data and samples, 3) Capacity building and technology transfer, 4) Compensation for indirect costs, and 5) Research contracts in (legislative) context" but legal and negotiation resources in LIC are limited (27).

External resources for research in Africa have also been limited, with even the limited available tending to be skewed. For example, none of the seven institutions granted $30 million by the US President's Malaria Initiative in 2021 to help African governments improve data for decision making in malaria control and elimination were in Africa (all from US, the UK, and Australia). Overall, only 1% of research funding for malaria went to African institutions (28). It is clear that a major reform is required, including "… creating a more equal and equitable representation of researchers in LMICs in decision-making, leadership roles, authorship, and funding allocations" (29).

As for Africa in general, there is a long way to go yet. In spite of notable increases, scientific publications remain low in Africa (see below) which, in spite of having 12.5% of the world population, has only 1.1% of the world's researchers (30) and only 5% of world's scientific publications (31). Research outputs are also dominated by a few countries (32) (Fig 1), and African authors are highly underrepresented in academic publishing (33). More recently, in relation to Corona Virus Disease -2019 (COVID-19), about 20% of studies undertaken in Africa had no African author and 66% of authors on African papers were not from Africa (10,33). It is clear that 'trickle-down science' is problematic (34) and this requires reforms at all levels (35,36).

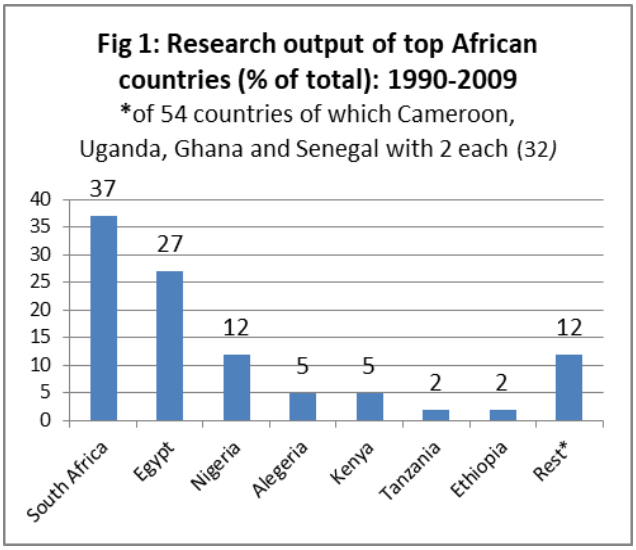

Fig 1: Research output of top African countries (%of total):1990-2009

In fact, as noted by the United Nations Conference on Trade and Development (UNCTAD) (37), "On paper, Ethiopia has most of the policies, regulations, background studies and road maps necessary to kick-start a successful process of technological learning, innovation and technological upgrading. In reality, however, there is a serious implementation gap across public institutions either because of capacity constraints or misallocation of efforts and resources".

A recent assessment (38) depicts a particular concern as there was reportedly no specific health research policy but only as part of the 2012 National Science and Technology Policy (39), the guidelines from Ethiopian Food and Drug Administration (EFDA) (40) and the National Research and Ethics Committee (41), which provide clinical trial procedures, documentation, publication, agreements for cross country studies.

There is a critical need to build bridges for health research in Ethiopia (42). Some of the gaps are attributed to overlapping mandates between the Ministry of Health (MOH) and Ministry of Science and Technology (MOST), and the lack of a coordination unit at the MOH; lack of research laws and legislation; lack of strategic documents to guide health research; and a research priority list that only addressed the research needs of some programs as opposed to sector priorities. When there is such lack of targeted coordination of health research evidence generation and use, it is not surprising that "evidence is not a major input into health-related decisions in the country" (43) even though health research intentions are voiced in major documents such as the Health Policy and the Health Sector Transformation Plan.

Publication output in Africa and Ethiopia

"There exists a big knowledge gap in Africa, which can be attributed to the lack of academic publishing by African academics" (44). Thus, Africa's research output is less than 1% of the global output of around 30000 papers a year – i.e. roughly equal to that of The Netherlands (African academics 2020). In 2005, only 29 African countries had medical journals, most only one for the country; Ethiopia had three and, the highest was Nigeria which had 26. In 2018, there were only 83 Institute for Scientific Information (ISI) indexed journals from Africa of which two were from Ethiopia (45).

As most countries, Ethiopia uses various activities/ forums to disseminate health related research outputs. These include: annual conferences of, for example, professional associations (Ethiopian Medical Association [EMA], Ethiopian Public Health Association [EPHA] etc.) or universities (Gondar, Jimma, etc.); disease based conferences e.g. Tuberculosis Research Advisory Committee (TRAC) conferences in various universities; Abstracts/ extracts of research work related to conferences or independently; digests/newsletters e.g. MOH, ARM Bulletin; Harar Bulletin of Health Sciences; Ethiopian Public Health Institute (EPHI) Newsletter; EPHA, Public Health Digest etc. However, the main forums for dissemination are academic journals and Ethiopia has, in recent years achieved a

notable increase in locally published academic journals with close to 50 additions since 2000 and a total of about 73 in 2018 (46) of which about eight are on medicine and health (Table 2).

Table 2: List of Medical/Health Journals in Ethiopia, 2018 by Year Established and Publisher

Name	Year	Publisher
Ethiopian Medical Journal[1,2]	1962	Ethiopian Medical Association
Ethiopian Journal of Health Development[1,2]	1984	School of Public Health, Addis Ababa University, & Ethiopian Public Health Association
Ethiopian Journal of Health Sciences[1,2]	1990	Jimma University
Ethiopian Journal of Pediatrics & Child Health	2005	Ethiopian Pediatrics Society
Ethiopian Journal of Reproductive Health	2006	Ethiopian Society of Obstetrics & Gynecology
Ethiopian Journal of Health & Biomedical Sciences	2008	Gondar University
Ethiopian Journal Public Health & Nutrition[2]	2016	Ethiopian Public Health Institute
Ethiopian Pharmaceutical Journal[1]	1974	Ethiopian Pharmaceutical Association

[1]Scopus Indexed [2]Referenced in the NCBI Databases

notable increase in locally published academic journals with close to 50 additions since 2000 and a total of about 73 in 2018 (46) of which about eight are on medicine and health (Table 2).

The Ethiopian Medical Journal (EMJ) could, thus be considered the first academic journal in Ethiopia.

The University College of Addis Ababa started the short lived "AAUC Bulletin" in 1961 but, as underscored by its President, it was essentially a means of communication to the public "It is leaven and ferment which enriches and enlivens the otherwise amorphous and lifeless mass around it" (47).

Academic publishing in Ethiopia: Challenges and Opportunities

There are indications that Ethiopia has a relatively high production of research literature in comparison to other sub-Saharan countries. It produced 3,514 (33 per million people) in 2018 i.e. 4.57% of Africa's and 0.11% of the global total. "According to Scimago, Ethiopia ranked 153rd out of 236 countries in terms of the number of citations per paper. International collaborations accounted for 58% of Ethiopia's research outputs in 2018, [a] decrease… from 62% in the previous year and are substantially lower than many other sub-Saharan African countries" (39).

Ethiopia, as most LICs, faces several challenges at the individual academic/researcher and organizational/institutional levels. At the individual level, the most important challenge is that not all academics publish in local journals. Factors leading to this low level of publications include lack of commitment and motivation; lack of experience and exposure to publishing; journal language, inadequate information, knowledge and skills to access accredited journals; lengthy/long publication process; heavy work overload; lack of support from the universities (45).

At the organization/institution level, several barriers have been identified. Lack of infrastructure and equipment – for example, less than 12% of the population had access to internet and there is an overall underinvestment in research infrastructure (39) – is an enduring problem (48) exacerbated by lack of coordination among institutions (49) even though they tend to concentrate in few geographical locations (37).

Authors and editors tend to agree on assessing institutional challenges but differ on individual skills as barriers (Table 3) (50). Lack of/limited funding is a barrier (38) even though there is substantial increase in recent years and with a Gross domestic Expenditure in Research and Development (GERD) of 0.6% in 2013 much higher than the average for SSA or LIC (39).

(Poor research culture, lack of national quality assurance system (51), shortage of skilled, experienced and motivated reviewers etc. compound the challenges. All these challenges tend to standout in clinical trials in LIC including Ethiopia (50).There are also a growing number of opportunities. The recognition of the importance of evidence-based decisions (52,53), supported by increase in dissemination and implementation research, including in Ethiopia (39,54). This, in the context of rapid social and economic growth – "Lions on the Move" (55) - has the potential to strengthen research capacity in LICs, including those in conflict situations (56).

The necessity of increasing the role of female researchers in increasing research productivity, a challenge globally (57) and in Ethiopia (58), is gaining recognition. There is also improvement in research ethics (59); growing recognition of academic publishing as the primary vehicle for the advancement of scientific knowledge (11) and scholarly articles as decisive in indicating societal problems and filling the gaps when, in particular, coupled with integrated knowledge translation/platform (IKT/P) initiatives (60-64). In this connection, there have been increasing calls for scientific academies and individual researchers to work harder to engage the public, "If your science doesn't affect the life of your people, nobody cares about you" (65)

.**Table 3:** Authors and editors rating of challenges in publishing articles
(Adapted from 50)

Challenge	Authors	Editors
Insufficient budget	3.90	3.48
Lack of incentive/motivation	3.68	3.60
Lengthy/long publication process	3.47	3.43
Choosing where to publish	3.16	3.10
Limited language competence in writing articles	2.67	3.75
Lack of research skills	2.55	3.73
Notes: 1=Not at all; 2=Lesser extent; 3=Uncertain; 4=Some extent; 5=Great extent;		

It has been demonstrated that local investigator-initiated studies are more likely to be implemented even though some indicate perceived preference to evidence generated by international experts (25). There are notable increases in specialization (66) and collaborative research (17,67) of the trans-disciplinary research and community-based participatory research types (68). This trend is bound to accelerate driven by continuous challenges to adapt to changes in the global and local environment - "To make global health truly global is to make global health truly local" (69-71). The importance of such collaborations looms prominently in times of crisis such as the COVID-19 pandemic (72) with some wondering "why it had to take such a gigantic human tragedy for us to work together" (73). These collaborations could be between countries – Ethiopia, for example, collaborating with over 10 countries in 2017 (74), consortia, regional organizations such as European Union (EU) and African Union (AU) or the diaspora and could, potentially, be facilitated by technological development in data handling in particular. Guidelines for rigor in design, implementation and reporting (75) and measures to reduce waste and bias (76) are also promising. There are also attempts to achieve greater accessibility, transparency and accountability for research studies designed through digital object identifiers (DOIs) and others such as the Initiative for Open Abstracts (I4OA) (77) globally and to increase the visibility of Ethiopian/African knowledge production and research outputs at the global level (78).

The potential of the rapidly increasing number of academic centers could be promising for knowledge acquisition and academic publishing. Ethiopia is a relatively late starter in the higher education 'massification' which started in the 1950s in the USA and Europe (79). Ethiopia had only two universities in 1991, increased them to 21 by 2009 and 31 by 2013 (39) and some 44 and counting by 2020 (80). 'Massification', **c**onsidered inevitable as "it allows solving the problem of knowledge generation and dissemination … [and] ... helps individuals to achieve the subjective wellbeing and professional and individual orientation, and allows a wide range of development and research projects to be handled by more qualified staff" (81). However, it could lead to major challenges in quality of research and knowledge generation (82) unless supported by expanded and increased funding support (83,84).

A number of measures, in addition to expanding and increasing funding, have been suggested to alleviate the quality problems, including the establishment of 'research universities'. It has been suggested that priority be given to collaborations with established universities that are already engaged in research, with a view to creating national role models for research production and management (44). There are also increasing calls to improve support to early-career scientists with, in particular, appropriate mentorship (85).

Contributions of the Ethiopian Medical Journal (EMJ)

EMJ has, through thick and thin, leveraging opportunities and mitigating challenges, survived – in fact thrived – for 60 years. The Ethiopian Medical Association (EMA) and its members, Addis Ababa University (AAU) and other universities, a number

of government and non-government (health) organizations have made enormous contributions.

However, the major burden was on the Editorial Board members and Editors-in-Chief. All were volunteers with heavy academic and/or service duties, contributing in their spare time without any compensation except the satisfaction of contributing to the *development* of their profession and recognition by their peers.

The Board had, on average, about 10 members with some serving for several terms. Thus, some 80 professionals from various medical and health fields have served on the Board. While most were foreigners in the first few years, Ethiopians predominated in later decades (85) (Table 4).

Table 4: EMJ, Average Number/Range of Editorial Board Members by Decade 1962-2008

Decade	Number		
	Total	Ethiopian	Foreigner
1960s	12	3	8
1970s	5-8	8	3-4
1980s	9-10	6-7	2-3
1990s	6-10	8	1-3
2000s	8-12	10	2-3

Source: Adapted from 85

The heavy burden of ensuring the relevance, quality and timeliness of the journal depended on the Editor-in-Chief. This, under any circumstances but the more so in the Ethiopian context, is a daunting task and all 15 Editor-in-Chiefs of the last 60 years (Table 5) should be appreciated for their dedication and resilience as benefactors of the development of modern medicine in Ethiopia. Special mention should be made of Dr. Oscar Barry who, not only played a major role in launching the Journal, but, as Editor-in-Chief, saw it through the difficult first years, and laid a solid basis for its recognition and development. Prof Nebiat Teferi, as the first Ethiopian and Professors Leithead and Sileshi Lulseged, the longest serving, also deserve special recognition

Conclusion

There is a clear imbalance in the research output and publications between the global north and south. The challenges faced by researchers and academics across LMICs have a complex interplay of individual and institutional level factors. Infrastructure and resource-related constraints underlie the challenges faced while individual capacity and skill fuel the difficulties faced. On the other hand, academic/research centers, science literacy, and evidence-based decision-making are increasing rapidly. The increasing number of local platforms for dissemination and advocacy of research and innovation - local medical/health journals -, an increasing number of academic training centers, improving availability of funding and other resources to support researchers, and open access to published articles are some of the positive developments fostering the growth of research and academic publishing in Ethiopia. Sustaining an academic publication by EMJ for 60 years in the complex context of Ethiopia is not a small feat. As observed over 50 years ago, “In all this flux [high turnover of editors].

Table 5: EMJ, Editor-in-Chief/Chairperson, 1962-2022

Dr B Oscar Barry	1962-1965	Dr Charles Larson	1991-1992
Prof Charles S Leithead	1966-1975	Dr Hagos Beyene	1992- 1995
Dr Craig K Wallace	1975-1977	Prof Kebede Oli	1995-2000
Prof Nebiat Tefari	1977-1978	Prof Sileshi Lulseged	2000-2007
Prof Jemal Abdulkadir	1979-1981	Dr Mesfin Araya	2008-2015
Prof Demissie Habte	1982-1985	Prof Demissie Habte	2016-2017
Prof Morten Harboe	1986	Prof Sileshi Lulseged	2018-2020
Dr Tekelemariam Ayele	1987-1988	Prof Mirkuzie Woldie	2021-Present
Dr Frances T Lester	1989-1990		

it is hard enough to build steadily and progressively, harder still to build with wisdom and foresight. Hard as it may be, however, the attempt must be made" (86). In spite of many challenges, a number of measures have been taken to increase and ensure steady growth and integrit of the publication. The role of volunteers serving as editors-in-chief, editorial board members, and peer reviewers in promoting and realizing academic publishing cannot be overstated. Enhancing EMJ's organizational/ institutional capacity, increasing its national and international recognition, and increasing the quality, frequency, accessibility, and impact of published articles will require informed attention from the next generation of editors. EMJ should prepare and strive to exploit emerging opportunities to expand and thrive proactively. Results obtained in the last 60 years in very challenging circumstances augur well for the future.

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