

# An analysis of Malawi's publication productivity

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## Abstract

**Background:** Publications productivity, the number of scientific articles published, is a measure of a country's scientific output. If measured carefully it can be a useful indicator that describes a country's research activity. Our objective was to analyze trends in publications originating from Malawi between 1996 – 2006.

**Methods:** The MEDLINE/PubMed database, a registry of articles from over 5,000 scientific journals was searched for articles originating from Malawi between 1996 – 2006 by typing Malawi in the author affiliation search field. A review of abstracts was performed to determine health field and origin of first author – Malawian vs foreign.

**Results:** 506 articles were retrieved of which 489 were on health. 15.5% on TB, 14.5% on HIV and AIDS, 11.2% on infectious disease, 7.2% on TB and HIV, 7.2% on Malaria. 20.9% of the authors were of Malawian origin and Tropical Doctor was the journal that had the most articles originating from Malawi. The number of articles published from Malawi has grown by 106% in the past ten years.

**Conclusions:** Our results suggest there is growth in scientific publishing in Malawi but the main contribution is from foreign researchers residing in Malawi. More needs to be done to promote publishing by Malawian authors.

## Introduction

Research has the potential to address many challenges that affect developing countries such as poverty, health, food security, HIV/AIDS, malaria, and education. It is for this reason that developing countries should strengthen their research activities. One measure developed by the Organisation for Economic Cooperation and Development (OECD) is to describe research activity as the amount of money that is spent on research and development (R&D), as a proportion of a country's gross national product (GNP). These figures have formed the basis of scientific league tables which allow countries to measure their relative position with Western countries (UK and USA) and Asian countries (China) in the forefront<sup>1</sup>. African science ministers in 2004 agreed at a New Partnership for Africa's Development (NEPAD) meeting to increase their countries spending on R&D to 1.0 per cent of GNP. Most advanced nations spend between 2.0 and 3.0 per cent of GNP on R&D; in Africa, the figure tends to be 0.2 to 0.3 per cent. New measures are now being used to measure research activity such as the number of papers published. Despite using this measure, research shows that there is still a large north to south gap in scientific publications originating from Africa however there is a slow but steady increase<sup>2-3</sup>. Studies have been published on quality and quantity of scientific output in African countries<sup>4-6</sup> however there have been no studies which examine comprehensively the scientific output from Malawi.

This study aims to analyze publication productivity in Malawi and discuss qualitative aspects of its growth. We

evaluate trends in quantity, discipline, journal, and origin of first author to determine contribution of local Malawian authors.

## Methods

We used the electronic Medline database even though it favours North-American and European publications, the Medline/PubMed database is the one of the most widely used international database for the health with over 5000 scientific journals. In order to characterize an article of Malawian origin, we used "Malawi" as the key term in the author affiliation field in the limits/search window. The study time period was defined in the "Limits" tab of the PubMed search interface. We reviewed abstracts of the retrieved articles and articles not pertaining to health were excluded. First author's origin i.e. Malawian vs foreign was determined by inspection of his or her name. For cases in which an author's name was uncertain, a third party was asked to determine. We tabulated the articles published per journal and quantified the numbers of articles originating from Malawi per year.

## Results

We retrieved 506 of articles for the study period 1996 to 2006 of which 489 were health related. 4 articles were excluded from the analysis as they were considered non-medical as they were methodology papers. 20.9% of the articles had Malawian first authors (table 1). Of the 489 health articles 15.5% (76) were on TB, 14.5% (71) were on HIV and AIDS, 7.2% (35) were on TB and HIV, 11.2% (55) were on infectious diseases, 7.2% (35) were on Malaria, 6.3% (31) were on reproductive health (table 1). There has been a 103% increase in the number of articles published in 10 years. Tropical Doctor was the journal that had the most articles originating from Malawi followed by Journal of Tuberculosis and Lung Disease and Transactions of the Royal Society of Tropical Medical Hygiene (table 2).

## Discussion

Our study shows that publications productivity has increased in Malawi by 103% from 26 in 1996 to 63 in 2006 (figure 1). A majority of the papers are published on TB followed closely by HIV and AIDS and then TB and HIV and AIDS jointly. These findings are similar to another study in which for the period 1996-2005 Malawi published 450 papers, this study suggested Malawi had a relative growth of 67.6%. Multi-subject papers that included TB, HIV and malaria were assigned to either TB or HIV or Malaria or TB and HIV others were assigned to infectious diseases.

There is a two fold increase in the number of publications in the year 2000. The reasons for this is unclear however 50% of these articles are from the University of Malawi College of Medicine. In addition from 2001, the National AIDS Commission was launched in Malawi, which has funded several local research projects through funding from the Global Fund to fight AIDS, TB and Malaria.

The majority of tuberculosis papers are attributed to the articles by Prof. Tony Harries. A single search of author

Table 1. Number of publication by disease type and year of publication

Totals for All	Totals no. of papers	TB and HIV	TB	AIDS	Malaria	Reproductive Health	Infectious Disease	Other medical	Nutrition	Other non medical	1st author Malawian
1996	26	0	3	2	6	2	2	11	0	0	4
1997	28	2	7	2	1	2	3	10	3	0	3
1998	25	4	5	1	2	5	2	7	0	0	4
1999	25	0	8	0	4	2	3	8	0	0	3
2000	50	2	11	2	7	6	9	12	3	0	2
2001	58	8	10	5	3	2	8	20	1	1	10
2002	49	2	5	10	0	4	12	17	1	0	6
2003	53	2	11	12	2	3	7	15	3	0	9
2004	58	5	11	13	3	2	5	24	2	0	19
2005	54	6	3	9	0	1	3	30	3	0	17
2006	63	4	2	15	7	2	1	28	1	3	25
TOTALS	489	35	76	71	35	31	55	182	17	4	102
Percentage of total		7.2	15.5	14.5	7.2	6.3	11.2	37.2	3.5	0.8	20.9

Table 2 Top 10 Journals

Title	Number of articles
Trop Doct	34
Inter J Tuberc	30
Trans R Soc	30
East Africa Med.J	25
Lancet	20
Ann Trop Med Parasitol	16
Arch Dis Child	14
AIDS	10
Bull World Health Org	10
J Infect Dis	10

“Harries AD”, affiliation “Malawi”, limits “1996 to 2006” reveals 113 papers suggesting that Prof. Tony Harries has coauthored 22% of the papers originating from Malawi.

Tropical Doctor has the highest number of publications from Malawi (table 2). The International Journal of Tuberculosis and Lung Disease and the Transactions of the Royal Society of Tropical Medicine Hygiene has featured several papers on TB which Prof. Tony Harries has co-authored.

We may under have represented the research activity in Malawi as several research institutions have been set up centres in Malawi – Malawi-Liverpool Wellcome Trust, the Johns Hopkins Research Project, Baylor College of Medicine – Centre of Excellence, and University of North Carolina. These international organizations are affiliated to local academic institutions and hospitals and are conducting research on a variety of diseases. Further investigation is

Figure 1 Total number of publications per year for publications originating from Malawi

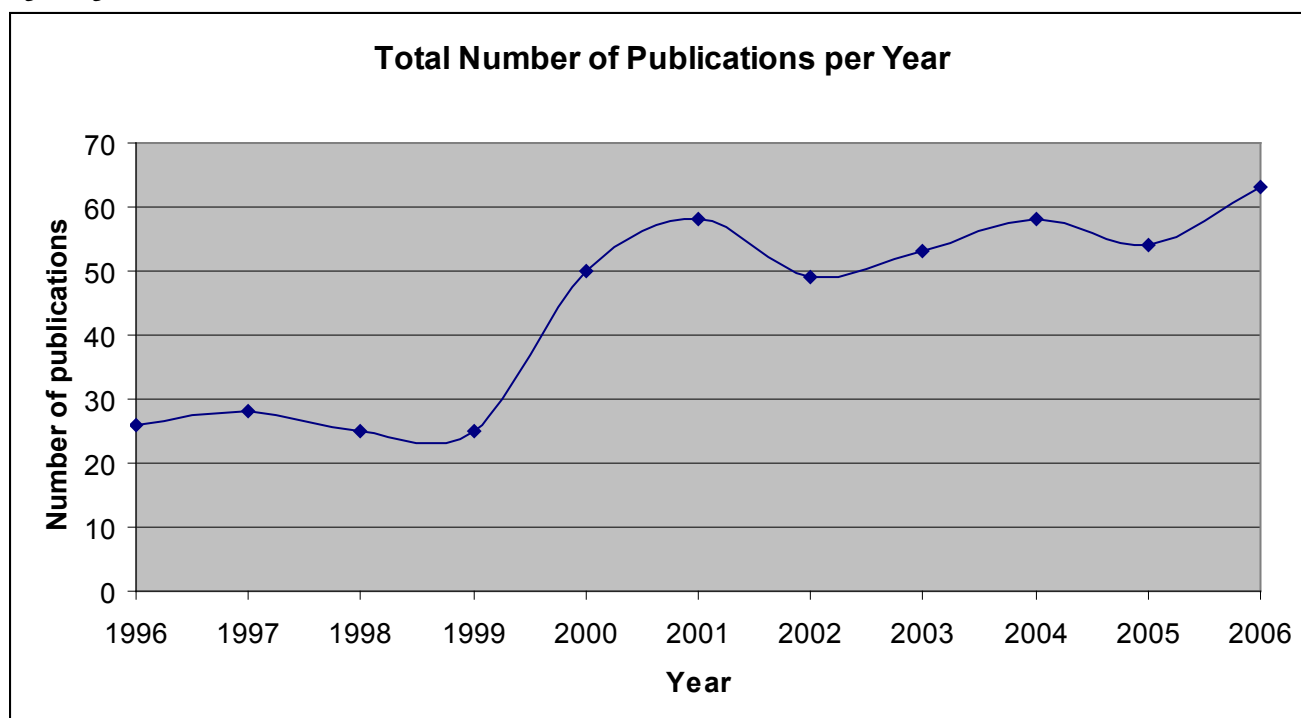
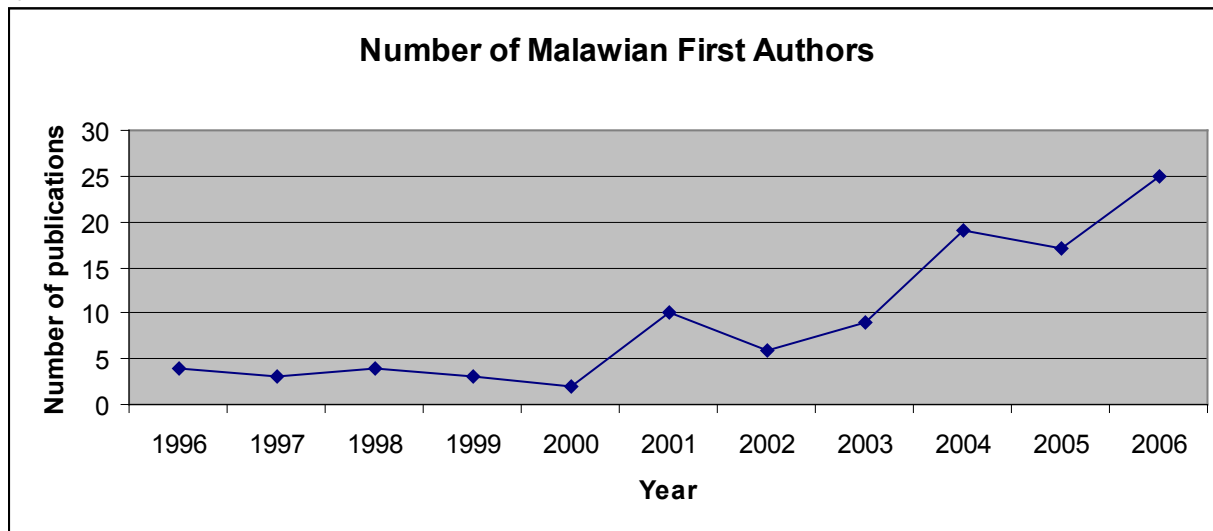


Figure 2 Number of articles with Malawian first authors per year



needed to determine what their contribution is to Malawi's scientific output and if it is inclusive in the number of articles that were retrieved. Studies examining the number of articles based on research conducted in Malawi and not on affiliation alone may reveal more articles. A comparative study assessing College of Medicine Research and Ethics Committee and Malawi's National Health Research Council approved research proposals to determine research productivity to scientific output may reveal interesting data.

Although the number of papers with Malawian authors is only 20.9% of the total, the number of papers authored has significantly increased from 4 in 1996 to 25 in 2006 which is a major increase (figure 2). The number of papers from Malawian researchers was estimated by looking at the names of first authors, this method has limitations. As foreign authors may have Malawian names through marriage and vice versa. Malawian researchers in the diaspora may be affiliated to non-Malawian institutions and their articles would therefore be excluded from this study. The results exclude Malawians on postgraduate studies who are affiliated overseas but maybe doing research work in Malawi.

The reason of under representation of Malawian first authors may include lack of research funding, poor facilities, limited technical support and inadequate training<sup>8</sup>. Malawian researchers may be choosing to publish their work in national or regional journals that are not indexed in Medline. These journals are mostly owned by academic institutions, have small circulations, lack adequate funding, have a difficulty maintaining publication frequency, and are rarely indexed in major databases<sup>9,10</sup>. However most researchers prefer to publish their work in journals with high impact factors and wide circulation. However, these 'western' journals are under some pressure to publish material which is relevant to the majority of the readership and may reject papers from the developing world<sup>11</sup>.

Uthman and Uthman's study on African biomedical publications ranked Malawi at fifteenth with 450 articles published between 1996 and 2005. South Africa was in first position with 11218 articles. Malawi's relative growth was 67.6% in this study which positioned it at number 13, while Nigeria came top of the list with 2094.7%<sup>7</sup>.

The number of articles published per disease type reveal

HIV, AIDS and TB as the leading research interest collectively representing 36% which for a country with an HIV prevalence of 14%<sup>12</sup> is commendable but for a country with over a million reported malaria cases in 2000<sup>13</sup>, research on malaria needs to be encouraged. 37% of papers in 'other medical research' include papers on ethics and anatomy.

## Conclusion

Our study reveals considerable growth in publications originating from Malawi. Further studies of Malawian authorship in grey literature may reveal a higher representation of Malawian authors however more needs to be done to increase Malawian authorship in international recognized databases.

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