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Capacity building in longitudinal HIV research

Many international health research programmes aspire to the twin goals of acquiring new knowledge and building research capacity in the institutions and workforce of low-income and middle-income country (LMIC) partners. Health research is now seen as an essential instrument to tackle health inequalities in LMICs,[1,2] and has benefited from increases in funding and trained personnel, but these indicators might not equate to a greater ability to do research.

Authorship of scientific reports shows academic contribution[3] and has been used as a proxy for research capacity.[4] We undertook a bibliometric analysis to measure expanded LMIC capacity in HIV research and identify correlates of success. We chose HIV because global funding for HIV research increased six-fold from 2002 to 2008[5] and because many key questions in HIV can only be addressed in LMICs, where the burden of disease is highest, particularly in Sub-Saharan Africa.

In July 2012, we searched PubMed, for articles published in 2000–11 using the key words "HIV" AND ("treatment" or "prevention") AND the names of World Bank classified LMICs[6] with an HIV prevalence of at least 1% in 2000.[7] Inclusion criteria were full papers reporting on a cohort study or randomised trial, in a LMIC, with the outcome HIV acquisition or disease progression.

We calculated the proportions of articles with first authorships and last (or senior) authorships from LMICs. Authors' country of origin was determined by stated affiliations. We retrieved financial support from acknowledgements. For multicountry studies, we identified the region on the basis of the majority of participants. We obtained Impact Factors (IF; 2009) from ISI Web of Science. We restricted our analysis to cohort studies and randomised trials because these methods require a substantial level of research capacity. We analysed data using STATA 12, with the unit of analysis being a published article.

From 13 443 articles returned by the online search, 747 met inclusion criteria. The number increased from 15 articles in 2000 to 116 in 2011. We identified 6878 authors, a median of nine per paper. The research was mainly done in Africa (586 [78%] articles), followed by east Asia and the Pacific (143 [19%]). Primary academic partner institutions were from North America (45%) or Europe (28%), whereas 18% reported no high-income country partner.

Overall 50% of first authors, 60% of second authors, and 36% of last authors were from LMICs. Over time, the number of LMIC authors increased in all three authorship positions (figure). As a proportion of all papers, the proportion of authorships decreased from 60% to 47% in first position, from 76% to 53% in second, and from 57% to 33% in last position.

Research done in upper-middle-income countries was almost twice as likely to have LMIC first authorship, compared with research from low-income countries. The difference was even greater for last authorships (table). Articles with a European primary partner were more likely to have LMIC first or last author than those with a North American partner. Research funded by pharmaceutical organisations was more likely to have LMIC first or last authorship than work funded by bilateral arrangements. Articles published in low-IF journals were more likely to have LMIC first authors than papers published in medium-IF and high-IF journals. Articles with fewer authors (one to three) had a greater proportion of LMIC last authorships than did articles with a greater number of authors.

South Africa (147), Thailand (135), and Uganda (111) had the most publications meeting inclusion criteria. Uganda (low income) had 41% of first and 14% of last authorships. Thailand (upper-middle income) had 79% of first and 70% of last authorship, while South Africa (upper-middle income) had 61% of first and 58% of last authorship.

In our detailed study of long-term trends across all journals, we found a substantial absolute increase in LMIC first and last authorships but a decrease in the proportion in both positions. Although it is reasonable to assume that research competencies are transferable, so that an increase in capacity through HIV-related projects is related to a more general increase, our analysis might not be representative of trends in other fields. Other limitations to our methods include possible misclassification of countries of affiliation, and the lack of assessment of research impact.

The status of first author as the researcher who has contributed the most in terms of writing and conduct of research has been established for some time.[3] The conventions

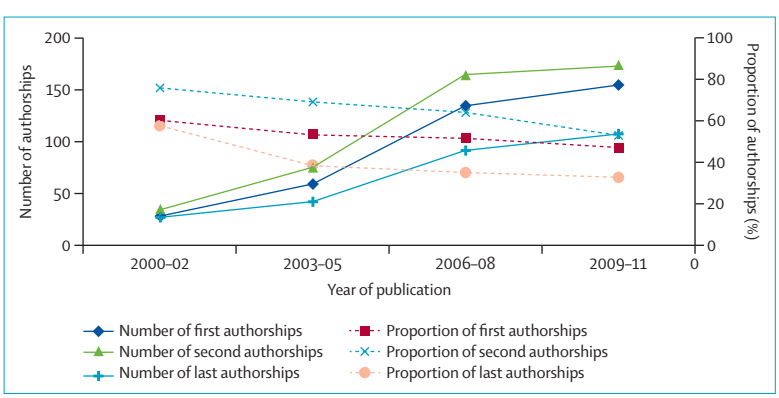

Figure: **Number and proportion of LMIC authors in first, second, and last position**
LMIC=low-income and middle-income countries.

are less clear for second authorship but generally indicate a substantial role in multi-author papers. The status of last authorship is a more recent development and has come to represent leadership in scientific research.[3] Although a lag period is anticipated for last authorships, the decrease in the proportion of authorships found in our analysis suggests that researchers from high-income countries continue to have a prominent role in LMIC research.

While broadly indicating research capacity and leadership, authorship decisions might also be influenced by the wishes of funding and collaborating agencies, individuals' academic drive, and English language skills. The association between LMIC authorship and publication in lower-IF journals might have resulted from a combination of such factors. The decrease over time in the proportion of LMIC authorships suggests that investment in HIV research exceeded the growth in local leadership capacity.

Our analysis shows expanding HIV research enterprise in LMICs, while suggesting that ongoing efforts are required to shift the balance towards LMIC leadership, particularly in low-income countries.

	LMIC first authorship		LMIC last authorship	
	n (%)	p value	n (%)	p value
Income level		<0·0001		<0·0001
Low	121 (36%)		55 (17%)	
Lower-middle	55 (44%)		31 (25%)	
Upper-middle	199 (69%)		181 (63%)	
Region research undertaken in		<0·0001		<0·0001
Sub-Saharan Africa	253 (43%)		166 (28%)	
East Asia and Pacific	110 (77%)		98 (69%)	
Latin America	12 (67%)		3 (17%)	
Year		0·313		0·010
2000–2002	28 (60%)		27 (57%)	
2003–2005	59 (53%)		42 (38%)	
2006–2008	134 (51%)		91 (35%)	
2009–2011	154 (47%)		107 (33%)	
Number of authors		0·002		<0·0001
1–3	26 (74%)		27 (82%)	
4–6	83 (60%)		77 (55%)	
7–9	118 (48%)		85 (35%)	
10–12	96 (44%)		47 (22%)	
≥13	52 (46%)		31 (27%)	
Journal impact factor		<0·0001		<0·0001
None	97 (72%)		74 (56%)	
Low (<3)	103 (55%)		79 (42%)	
Medium (3–8)	141 (43%)		85 (26%)	
High (>8)	34 (34%)		29 (29%)	
Partner region		<0·0001		<0·0001
North America	126 (38%)		59 (18%)	
Europe or UK	90 (42%)		49 (23%)	
East Asia and Pacific	5 (42%)		6 (50%)	
NA	131 (97%)		131 (99%)	
Mixed	23 (44%)		22 (42%)	
Funding		<0·0001		<0·0001
High-income country government	83 (32%)		45 (17%)	
LMIC government or none	59 (87%)		52 (76%)	
International organisation	4 (57%)		2 (29%)	
Philanthropic or not-for-profit organisation	12 (24%)		10 (20%)	
Mixed or other	84 (50%)		43 (2265%)	
NA	103 (66%)		92 (60%)	
Pharmaceutical	30 (75%)		12 (55%)	

NA=no funding information provided in the article. LMIC=low-income and middle-income country.

Table: **Predictors of LMIC first and last position authorship**

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1 Nchinda TC. Research capacity strengthening in the South. *Soc Sci Med* 2002; **54:** 1699–1711.
2 Sitthi-Amorn C, Somrongthong R. Strengthening health research capacity in developing countries: a critical element for achieving health equity. *BMJ* 2000; **321:** 813–17.
3 Wren JD, Kozak KZ, Johnson KR, Deakyne SJ, Schilling LM, Dellavalle RP. The write position. A survey of perceived contributions to papers based on byline position and number of authors. *EMBO Rep* 2007; **8:** 988–91.
4 Adam T, Ahmad S, Bigdeli M, Ghaffar A, Rottingen JA. Trends in health policy and systems research over the past decade: still too little capacity in low-income countries. *PloS One* 2011; **6:** e27263.
5 Avert. Funding for The HIV and AIDS Epidemic. 2011. http://www.avert.org/aids-funding.htm (accessed Oct 25, 2011).
6 The World Bank. Country and Lending Groups 2010. http://data.worldbank.org/about/country-classifications/country-and-lending-groups#Low_income (accessed Oct 21, 2010).
7 UNAIDS. HIV estimates GR2010 1990–2009. UNAIDS Report on the Global AIDS Epidemic, 2010 http://www.unaids.org/globalreport/documents/HIV_Estimates_GR2010_1990_2009_en.xls (accessed Feb 20, 2014).