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Correspondence

Bibliometrics of global Ebola Virus Disease research as seen through Science Citation Index Expanded during 1987–2015

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Dear Editor,

The present correspondence assesses the global research efforts related to Ebola Virus Disease (EVD) research and can be considered a supplement to the studies by Cruz-Calderon et al. [1] and Quarcoo et al. [2]. The source of data for the present bibliometric assessment is the 2800 journal articles and reviews indexed by *Thomson Reuters Science Citation Index Expanded (SCIE)* during 1987–2015. These records were downloaded by using the keyword Ebola* in the first week of January 2016. The aim of the study is to examine the pattern of growth of the EVD research output during 1987–2015 and to identify most prolific countries and institutions and the impact of their research output using total number of papers and the citations these received; Citations per Paper (CPP) and Relative Citation Impact (RCI). CPP is a relative indicator computed as the ratio of citations to publications (C/P). RCI measures both the influence and visibility of a nation's research in global perspective and is the ratio of a country's share of world citations to the country's share of world publications and calculated as (C%/P%) [3]. Analysis of the data indicates that the total output was scattered over 670 journals which originated from 42 countries scattered over different parts of the globe. About 92% of the total output appeared in journals originating from USA, England, The Netherlands, Switzerland, Germany and France. *Journal of Virology* published

Table 1
Distribution of output by countries and institutions.

#		[a]TNP (%)	[a]TNC (%)	CPP	RCI
Countries					
1	USA	1753 (44.8)	56,680 (47.4)	32.3	1.1
2	Germany	325 (8.3)	11,439 (9.6)	35.2	1.2
3	UK	254 (6.5)	6261 (5.2)	24.7	0.8
4	Canada	239 (6.1)	6826 (5.3)	28.6	0.9
5	France	228 (5.8)	8103 (6.8)	35.5	1.2
6	Japan	166 (4.2)	4331 (3.6)	26.1	0.9
7	China	107 (2.7)	2666 (2.2)	24.9	0.8
	Sub total	3072 (78.4)	96,306 (80.5)	31.3	1.0
	Other 102 countries	845 (21.6)	23,279 (19.5)	27.5	0.9
	Total	3917 (100)	119,585 (100)	30.5	1.0
Other 10 countries with 50 or more publications: Switzerland (88), Australia (78), Belgium (76), Russia and Italy (75), South Africa (70), Spain (69), Netherland (65), Gabon (59), Sierra Leone (59)					
Institutions					
1	US AMRIID (USA)	336 (8.7)	14,558 (12.2)	43.3	1.6
2	CDCP (USA)	279 (7.1)	11,969 (10.0)	42.9	1.7
3	NIAID (USA)	240 (6.1)	7145 (6.0)	29.8	1.1
4	Philipps University Marburg (Germany)	154 (3.9)	7223 (6.0)	46.9	1.7
5	Public Health Agency Canada	128 (3.3)	3558 (2.9)	27.8	1.0
6	University of Manitoba (Canada)	120 (3.1)	3336 (2.8)	33.3	1.0
7	University of Texas (USA)	119 (3.0)	3112 (2.6)	26.2	0.9
	Sub total	1376 (35.2)	50,901 (42.6)	37.0	1.2
	Other 2314 institutions	2541 (64.8)	68,684 (57.4)	27.0	0.9
	Total	3917 (100)	119,585 (100)	30.5	1.0
Other 5 institutions with more than 80 publications: University of Pennsylvania (95), Harvard University (94), University of Tokyo (88), University of California Systems (83), WHO (81)					

TNP: Total number of publications, TNC: Total number of citations, CPP: Citation per paper, RCI: Relative citation rate. USAMRIID: US Army Medical Research Institute of Infectious Diseases, CDCP: Centre for Disease Control and Prevention, NIAID: National Institute of Allergy & Infectious Diseases.

[a] Total is more than the actual number of publications (2800) and the actual number of citations (76,905) as the authors have used the method of complete counting in which each author and institution is given a unit weight for the contributions they have made which inflates the publication and citation data.

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10% of the total papers.

A steady growth of output on EVD related research has been observed during 1987–2015 with low number of publications in the initial years and a spectacular growth during the last two years i.e. 2014–2015 contributing about 38% of the total output. One possible reason of growth in the last block is the sudden epidemic from December 2013 till date in the African countries, which resulted in pursuit of global research resulting in large number of publications from different parts of the globe.

Further analysis of data indicates that the total contributions were made by 9558 authors spread over 109 countries in 2321 institutions. However, the output is concentrated among the G8 nations with US on the top. Table 1 lists seven countries and seven institutions which contributed more than 100 publications. These seven countries contributed more than two-third of the total output and attracted about 80% of all citations. The seven institutions contributed about one-third of the total output and attracted about 42% of the total citations. An examination of the impact of the papers published by these countries and institutions using citation per paper (CPP) and relative citation rate (RCI) indicate that the value of CPP was less than average (30.5) for UK, Canada, Japan and China. RCI also followed similar trends. This implies that the impact of research of these four countries is not commensurate with their research output. Among the seven listed institutions the value of CPP was highest for Philipps University Marburg (Germany). The paper by Jones, Kate E., et al. published in *Nature*, 451 (7181), 2008, 990–993 was the most cited with 1306 citations and Feldmann, Heinz of NIAID of USA was the most prolific author with 188 publications. The study indicates a lack of output on topics related to public health, which needs to be given a priority.

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