

# Barriers and Facilitators to Scientific Writing Among Applied Epidemiologists

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## ABSTRACT

**Context:** Communication in the form of written and oral reports and presentations is a core competency for epidemiologists at governmental public health agencies. Many applied epidemiologists do not publish peer-reviewed articles, limiting the scientific literature of best practices in evidence-based public health.

**Objectives:** To describe the writing and publishing experiences of applied epidemiologists and identify barriers and facilitators to publishing.

**Design:** Telephone focus groups and an 18-question multiple-choice and short-answer Web-based assessment were fielded in 2014.

**Setting and Participants:** Six focus groups composed of 26 applied epidemiologists and an online assessment answered by 396 applied epidemiologists. Sample selection was stratified by years of experience.

**Main Outcome Measures:** Past publishing experience, current job duties as related to publishing, barriers and facilitators to writing and publishing, and desired training in writing and publishing were assessed through focus groups and the online assessment.

**Results:** Focus groups identified 4 themes: job expectations, barriers to publishing, organizational culture, and the understanding of public health practice among reviewers as issues related to writing and publishing. Most respondents (80%) expressed a desire to publish; however, only 59% had published in a peer-reviewed journal. An academic appointment (among doctoral educated respondents) was identified as a facilitator to publishing as was access to peer-reviewed literature. Time (68%) was identified as the greatest barrier to writing and publishing. Other major barriers included lack of encouragement or support (33%) within the public health agency and agency clearance processes (32%). Assistance with journal selection (62%), technical writing skills (60%), and manuscript formatting (57%) were listed as the most needed trainings.

**Conclusion:** Public health agencies can be facilitators for epidemiologists to contribute to the scientific literature through increasing access to the peer-reviewed literature, creating a supportive environment for writing and publishing, and investing in desired and needed training. The results have implications for modifying workplace policies surrounding writing and publishing.

**KEY WORDS:** capacity building, epidemiology, publications, public health administration, writing

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Communication in the form of written and oral reports and presentations is part of the Applied Epidemiology Competencies (Skill Domain 3) for public health professionals and is emphasized for the 4 different levels of practicing epidemiologists within governmental public health agencies.<sup>1</sup> The 2013 Council of State and Territorial Epidemiologists (CSTE) Epidemiology Capacity Assessment examined several types of publications produced by state epidemiologists.<sup>2</sup> Reports were cited more frequently than conference abstracts and peer-reviewed articles as the vehicle for disseminating

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data-containing publications produced by applied epidemiologists. Many reports published on state health department Web pages are not easy to find compared with published peer-reviewed journal articles, which limits their potential contributions to evidence-based public health.<sup>3</sup>

On the basis of a lack of published articles written by epidemiologists, CSTE conducted a needs assessment focused on scientific writing and publishing to identify tools and resources needed by epidemiologists in state and local health departments to publish their work. The goals of the assessment were to (1) describe the writing and publishing experience of epidemiologists for the general public, peer-reviewed publications, and Centers for Disease Control and Prevention (CDC)-specific publications (*MMWR*, *Preventing Chronic Disease*, and *Emerging Infectious Diseases*), (2) identify the expectations of public health agencies for epidemiologists regarding scientific writing, and (3) identify barriers and facilitators that epidemiologists experience relevant to scientific writing and publishing.

## Methods

The CSTE Scientific Writing Workgroup led the needs assessment of scientific writing and publishing among applied epidemiologists. The needs assessment was completed in 2 phases: telephone focus groups and an online assessment. The needs assessment was not intended to be research and an exempt determination by the institutional review board for the analysis, and publication of the data was obtained by workgroup members. Current members of the CSTE Epidemiology Methods Subcommittee were invited via e-mail to participate in focus groups about scientific writing and publishing. A total of 26 CSTE members volunteered to participate in 1 of 6 focus groups, representative of our target range for years of experience. Focus group participants were asked about resources related to scientific writing. Two workgroup members took notes of the focus groups' discussions. No identifying information about focus group participants was collected. One CSTE staff member read the notes, listened to the recordings, and created lists of themes identified through the focus groups using thematic coding and analysis techniques. The list was verified by a second CSTE staff member to develop the questions for the online assessment.

The online assessment consisted of 18 multiple-choice and short-answer questions and was administered online via SurveyMonkey.<sup>4</sup> A link to the online assessment was sent via e-mail to all CSTE members and the National Association of County

& City Health Officials' Epidemiology Workgroup. Membership in CSTE was not required to complete the assessment. Answers to the questions were kept anonymous and confidential, although demographic information related to highest level of education, type of workplace setting, and number of years as an epidemiologist was collected. Using a quota sampling method based on distribution of work experience (<5 years, 5–9 years, ≥10 years) of the epidemiology workforce adapted from the 2013 Epidemiology Capacity Assessment,<sup>2</sup> a total of 396 responses were collected. These responses represented approximately 25% of the enumerated workforce. (See Supplemental Digital Content Table, available at: <http://links.lww.com/JPHMP/A223>). Univariate and bivariate analyses were conducted using SAS (version 9.4).

## Results

Themes highlighted by focus group participants around scientific writing and publishing included (1) whether job duties explicitly included writing and publishing, (2) lack of institutional resources to support publishing, (3) differentiating the culture of publishing and scientific writing between public health practitioners and academicians, and (4) concerns about peer reviewers misunderstanding about applied public health versus research.

From the online assessment, 89% ( $n = 353$ ) of respondents indicated they had previous writing experience, but only 66% ( $n = 262$ ) indicated they had previous publishing experience. There was a desire to publish among 80% ( $n = 317$ ) of respondents and is reflected in the high percentage (almost 90%;  $n = 357$ ) of respondents who responded they created a report or manuscript for public use (not peer-reviewed). Less than three-fourths of respondents said they had submitted (67%) or published (59%) a report or manuscript to a peer-reviewed journal. For CDC-specific peer-reviewed journals, the percentages were lower—38% submitted and 34% published. Doctorate degree holders were more likely to report past publishing experience than master's degree holders ( $P < .001$ ). In addition, epidemiologists with academic appointments were significantly more likely to report past publishing experience for peer-reviewed and CDC-specific publications than epidemiologists who did not have appointments ( $P < .001$ ).

Publishing in peer-reviewed journals was expected as a job duty for less than half (45%) of respondents, whereas publishing in CDC-specific journals was expected for only 30% of respondents. Identified barriers to scientific writing reported by respondents

included time and agency support (Table). Time was most often cited as a moderate or major barrier to writing and publishing (68%; n = 268). Across agencies, lack of encouragement or support was indicated as a moderate or major barrier to scientific writing by 33% (n = 130) of respondents. Agency clearance or approval processes were also listed as significant barriers to publishing.

In response to what resources their agency provided to facilitate scientific writing, more than half (56%) indicated they had access to peer-reviewed literature. Only 28% (n = 111) reported having dedicated time for writing and publishing, although it was desired by more than 65% (n = 258) of respondents. Almost 25% (n = 97) responded their agency provided no resources to support writing and publishing activities. In addition to dedicated time for writing and publishing, respondents indicated a desire to have access to a journal club to encourage publishing and peer review, best practice models of supportive writing resources within health departments, best practice examples of supportive organizational culture to foster writing and publishing activities, and templates for general publications. Respondents indicated the most needed training to improve scientific writing was knowledge of how to select an appropriate journal for submission (62%), technical writing (60%), and navigating various formats of peer-reviewed journals (57%).

Discussion

Publishing in peer-reviewed publications is desired by epidemiologists and necessary to communicate findings from programmatic and surveillance activities. Unfortunately, many results from local and state public health activities may be presented at conferences

Implications for Policy & Practice

The CSTE, as the national organization representing epidemiologists, proposes the following approaches to encourage scientific writing and publishing in local public health agencies. First, increase resources for scientific writing at governmental public health agencies including training and dedicated time for writing. Second, foster an organizational culture supportive of writing and publishing through inclusion of peer-reviewed publications on job descriptions for epidemiologists, establish peer networks to encourage writing and publishing, and facilitate a clear and responsive internal review process. Third, promote collaboration among local, state, and national public health partners to increase opportunities for scientific writing and publishing. Fourth, encourage epidemiologists to provide leadership in scientific writing and publishing among public health practitioners.

or written into internal reports but will not be published in the peer-reviewed literature. Lack of dedicated time and agency support or clearance processes to create peer-reviewed manuscripts contribute to this gap.

State and local epidemiologists have many demands on their time; however, making scientific writing a priority within public health agencies will improve communication with community members, policy makers, research partners, and other epidemiologists. In addition, publication of epidemiology analyses may foster a better understanding of applied epidemiology as a field among the larger scientific community. Respondents identified several actions public health agencies and epidemiologists can take to improve scientific writing in the field.

The current assessments are subject to several limitations. Beyond sampling epidemiologists based on

TABLE  
Barriers to Scientific Writing of Analytic Sample (N = 396)

|                                                            | Not a Barrier, n (%) | Minor Barrier, n (%) | Moderate Barrier, n (%) | Major Barrier, n (%) |
|------------------------------------------------------------|----------------------|----------------------|-------------------------|----------------------|
| Time                                                       | 41 (10.4)            | 84 (21.2)            | 114 (28.8)              | 154 (38.9)           |
| Access to peer-reviewed literature                         | 191 (48.2)           | 90 (22.7)            | 61 (15.4)               | 49 (12.4)            |
| Knowledge on how to submit a peer-reviewed publication     | 181 (45.7)           | 131 (33.1)           | 47 (11.9)               | 31 (7.8)             |
| Lack of previous writing experience                        | 232 (58.6)           | 99 (25.0)            | 43 (10.9)               | 13 (3.3)             |
| Lack of previous publishing experience                     | 181 (45.7)           | 110 (27.8)           | 67 (16.9)               | 28 (7.1)             |
| Agency clearance or approval process                       | 111 (28.0)           | 136 (34.3)           | 83 (21.0)               | 44 (11.1)            |
| Lack of encouragement or agency support                    | 155 (39.1)           | 99 (25.0)            | 73 (18.4)               | 57 (14.4)            |
| Costs associated with submitting an article for publishing | 146 (36.9)           | 109 (27.5)           | 67 (16.9)               | 33 (8.3)             |

the number of years of experience, we cannot be sure whether epidemiologists who participated in the assessments were different from those who did not participate with regard to interest or motivation in publishing. Background information on participants beyond degree, years of experience, and high-level agency information was not collected and it is possible that training in academia or other employment opportunities may have shaped participants' views on scientific writing and publishing. Furthermore, the results of the analysis may be limited by the self-reported data through recall and social desirability biases.

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