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# Writing Assignments in Epidemiology Courses: How Many and How Good?

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## Abstract

**Objectives:** Schools and programs of public health are concerned about poor student writing. We determined the proportion of epidemiology courses that required writing assignments and the presence of 6 characteristics of these assignments.

**Methods:** We requested syllabi, writing assignments, and grading criteria from instructors of graduate and undergraduate epidemiology courses taught during 2016 or 2017. We assessed the extent to which these assignments incorporated 6 characteristics of effective writing assignments: (1) a description of the purpose of the writing or learning goals of the assignment, (2) a document type (eg, article, grant) used in public health, (3) an identified target audience, (4) incorporation of tasks that support the writing process (eg, revision), (5) a topic related to a public health problem that requires critical thinking (1-5 scale, 5 = most authentic), and (6) clear assignment expectations (1-5 scale, 5 = clearest).

**Results:** We contacted 594 instructors from 58 institutions and received at least some evaluable materials from 59 courses at 28 institutions. Of these, 47 of 53 (89%) courses required some writing. The purpose was adequately described in 11 of 36 assignments, the required document type was appropriate in 19 of 43 assignments, an audience was identified in 6 of 37 assignments, and tasks that supported a writing process were incorporated in 19 of 40 assignments. Median (interquartile range) scores were 5 (1-5) for an authentic problem that required critical thinking and 4 (2-5) for clarity of expectations.

**Conclusions:** The characteristics of writing assignments in public health programs do not reflect best practices in writing instruction and should be improved.

## Keywords

communication, critical thinking, pedagogy, writing, writing assignments

Writing is a key part of the work of public health practitioners, helping us to develop and promote policies, change behaviors, prevent and contain disease outbreaks, and communicate new findings and health guidelines. But public health instructors are not trained in teaching writing, and the literature on assigned writing in public health is thin.<sup>1,2</sup> That said, professionals in the field are concerned that we do not provide adequate writing instruction.<sup>1-4</sup> Experts in rhetoric and composition assert that assigning writing to students, providing detailed feedback, and allowing for revision strongly support student writing development, achievement, and engagement.<sup>5-10</sup> However, these activities are not consistently used by instructors across disciplines and grade levels.<sup>6,7,11-13</sup> For example, one of the most comprehensive studies of writing assignments to date, which included a large sample of undergraduate courses, concluded that the types of writing students are asked to do tend to be superficial and overly focused on grammatical correctness, to the point where guidance about spelling and grammatical errors often obscures substance.<sup>7</sup>

We found no published research on the nature of writing assignments in the discipline of public health. Given that public health instructors in general may not be familiar with current techniques for teaching writing or creating effective writing assignments, assessing the prevalence and quality of writing assignments in undergraduate- and graduate-level

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schools and programs of public health could be a first step in helping these instructors to teach writing more effectively.

In a 2017 study, we proposed 6 recommended characteristics of writing assignments from a review of the composition literature.<sup>6,8,11,14-17</sup> According to writing experts, good writing assignments (1) describe the purpose of the writing and the assignment's learning goals, (2) present a problem that is authentic to the discipline and that must be approached with critical thinking, (3) require a profession-specific document type rather than a generic one (eg, an academic journal article rather than a generic research paper), (4) clearly explain the expectations of the assignment and the criteria for evaluation, (5) identify a target audience to which the assignment should be directed, and (6) allow for a process to support the writing through specific tasks, such as multiple drafts with revisions (Box). We assessed the proportion of undergraduate- and graduate-level epidemiology courses that required one or more writing assignments and the extent to which these assignments include our 6 recommended characteristics.<sup>1</sup>

## Methods

### *Recruitment and Data Collection*

We selected a random sample from among all 183 schools and programs of public health accredited by the Council on Education for Public Health as of January 2017. We recruited participants from 4 types of institutions to ensure representation: major research institutions (large institutions), institutions with <5000 students (small institutions), medical schools (sometimes combined with other health science institutions and, for our purposes, referred to as "medical/health science institutions"), and institutions that did not fall into the other categories (other institutions). If an institution was both small and considered medical/health science, we classified it as medical/health science. We stratified by type of institution because we believe the teaching contexts are likely to differ among them and, thus, might affect how the institution's courses incorporated writing instruction. For example, large institutions tend to emphasize research, whereas medical schools tend to emphasize medical practice.

From May through August 2017, we requested syllabi from all instructors of graduate and undergraduate epidemiology courses taught at the sampled institutions during 2016 or 2017, regardless of whether instructors had assigned any writing in their course. If the course required writing, we asked the instructor to send a writing assignment and grading criteria, if available. We collected instructor materials only, not student writing. We asked each instructor to send materials for only 1 course. If an instructor taught more than 1 epidemiology course during the study period, we asked the instructor to send materials for the class with a title that started with the earliest letter in the alphabet. For example, an instructor teaching both Social Epidemiology and Reproductive Epidemiology would send materials for

**Box.** The 6 characteristics of effective writing assignments<sup>a</sup> used to evaluate assignments collected from instructors teaching undergraduate- and graduate-level courses in epidemiology at schools and programs of public health accredited by the Council on Education for Public Health, United States, 2016-2017

1. **The purpose of the writing and learning goals of the assignment is adequately described.** The assignment was adequate if the purpose of the writing (eg, persuade the reader to do something) or learning goal (statements that describe what a student should be able to do after completing the assignment, such as understand why random assignment is used) was included, and it was inadequate if neither was included.
2. **The required document type (eg, articles, grants) is one used by practicing public health workers.** Scored as present or absent. For example, we designated a summary of original research as a professional document type only if the student was asked to format and write the paper for a particular journal (regardless of whether the paper was submitted to the journal).
3. **The target audience of the assignment is specified.** Scored as specified or not specified. For example, the target audience may be readers of a scientific journal, policy makers, or a granting agency.
4. **The assignment incorporated tasks related to the writing process, such as revising or offering assignments as part of a sequence.** Scored as present or absent. This characteristic was judged as present if the assignment included any of the following 3 criteria: The assignment was part of a sequence of assignments, it allowed or required more than 1 draft, or it suggested or required peer review by a classmate.
5. **The assignment required students to think critically about an authentic public health problem.** Scored from 1 to 5 (5 being the most authentic). A score of 5 was given if the assignment presented students with a public health problem (eg, if students are asked to answer a specific research question using data) and required critical thinking skills conceptualized as using judgment to make decisions or solve a problem. A score of 1 characterized an assignment that did not present a context and did not ask students to engage in critical thinking. For example, assignments that asked students to summarize information or provide definitions were given a score of 1.
6. **The expectations of the assignment are clear.** Scored from 1 to 5 (5 being the most clear). An assignment was given a score of 5 if it clearly presented the instructions for completing the assignment and the expectations for a successful performance. A score of 1 characterized an assignment that had vague or minimal instructions and no criteria for how the student would be evaluated.

<sup>a</sup>Data source: August and Trostle (2018).<sup>1</sup>

Reproductive Epidemiology because R precedes S in the alphabet. We used this approach to reduce selection bias in the sample and to discourage instructors from contributing materials from courses where they had assigned the most writing.

If we did not receive a response within 3 weeks, we sent a follow-up email request. As a thank you for participating, the principal investigator (E.A.) provided complimentary consultation on writing assignments to instructors who requested it (2 did).

### Selecting and Scoring Assignments

The unit of analysis for this study and the denominator of the proportions was a course, because not all courses included writing assignments. We identified writing assignments by analyzing the syllabus and assignments, if we received them. We defined a writing assignment as requiring communication mainly through text. The assignment could be any length and could involve both informal writing, often done primarily for the benefit of the writer (eg, a journal entry), and formal writing, often directed to a target audience (eg, an original research article for a journal). The assignment could be completed in or out of class and could include collaborative or individual activities. We did not consider the following to be writing: multiple-choice examinations (including those with short-answer questions), programming code (eg, SAS software), a slide presentation not submitted to the instructor, standalone tables and figures, and questions created for a written survey. In addition, although written interpretations of calculations are an important part of an epidemiologist's scope of work, the language for this task is often so prescribed in educational settings that we did not classify it as writing for our purposes.

If an instructor submitted a writing assignment to us that was separate from the syllabus, we analyzed it. When a writing assignment was described in the syllabus but the instructor did not submit the actual assignment, we counted a writing assignment as being present; from the description of the assignment in the syllabus, we determined how many of the 6 recommended characteristics it contained, if possible. If a given recommended characteristic could not be determined from the description, we considered it to be missing. If an instructor submitted more than 1 writing assignment, we analyzed the assignment that was worth the most points toward a final grade. When one assignment built on another, we analyzed the assignment that was due latest in the semester. Assignments that built on previous assignments were counted as incorporating tasks that supported the writing process, for example, an assignment that built on an earlier draft or brainstorming assignment. Grading criteria, which were created for various document types, were used to supplement information provided by the writing assignment.

From the submitted syllabi, writing assignments, and grading criteria, 2 authors (E.A. and K.B.) scored each assignment on the 6 recommended characteristics. Of 354

decisions, evaluators disagreed on 18, which were then resolved through discussion.

The University of Michigan Institutional Review Board determined the study to be exempt from institutional review board oversight.

## Results

We contacted 594 instructors from 58 institutions. At least some evaluable materials were received for 59 courses; 35 from large institutions, 15 from medical/health science institutions, 4 from small institutions, and 5 from other institutions. Of the 59 courses, 55 (93%) were graduate level, 3 (5%) were undergraduate level, and 1 (2%) was mixed graduate/undergraduate level. Of the 55 graduate-level courses, 22 (40%) were master of public health (MPH) courses, 4 (7%) were doctor of philosophy (PhD) courses, and 1 (2%) was a medical school course; the remaining 28 (51%) courses were a mix of MPH and PhD or unspecified graduate courses.

Full information was not available for every course or for every assignment; hence, denominators varied for the percentages reported. If information about a characteristic was insufficient to determine whether it was present, it was considered missing and was not counted in the denominator for that characteristic. Of the 59 courses, 6 had syllabi that did not provide enough information to determine whether writing was assigned. Of the remaining 53 courses, 47 (89%) required at least 1 writing assignment. Only 11 of 37 (30%) courses explained the purpose of the writing or the learning goals of the assignment, and 19 of 46 (41%) assignments asked students to use a document type used in public health (eg, a National Institutes of Health [NIH] grant proposal). Only 6 of 38 (16%) assignments specified a target audience (eg, an NIH grant reviewer). Of 41 assignments, 20 (49%) incorporated a writing process as part of completing the assignment (eg, drafts, peer review, or an assignment sequence) and 5 of 43 (12%) assignments allowed for multiple drafts. Assignments for the most part posed problems that were authentic to public health or a related discipline and required critical thinking (median score = 5; interquartile range [IQR], 1-5). Assignment expectations were for the most part clear (median score = 4; IQR, 2-5).

Of 47 assignments, the most common were term papers (also referred to as research papers,  $n = 9$ ) or critiques of a published article ( $n = 9$ ) (Table). Several assignments asked students to write a document type used in public health, including a journal article describing a student's original research ( $n = 6$ ), a literature review ( $n = 6$ ), and a grant proposal ( $n = 2$ ). It was not possible to classify whether 1 of these 47 assignments was a discipline-related document type because it was identified only as a "final report."

## Discussion

This study of writing assignments showed that nearly all (89%) epidemiology courses in our sample required at least

**Table.** Number and type of 47 writing assignments identified in a survey of 59 undergraduate- and graduate-level epidemiology courses at schools and programs of public health accredited by the Council on Education for Public Health, United States, 2016-2017<sup>a,b</sup>

Assignment	Public Health Document Type	No. of Assignments
Journal article describing original research	Yes	6
Literature review journal article	Yes	6
Surveillance system evaluation	Yes	2
Grant proposal written for a particular funder	Yes	2
Annotated bibliography	Yes	1
Public health issue brief	Yes	1
Term paper/research paper	No	9
Critique of published article	No	9
Student research proposal (not written for a particular funder)	No	4
Short-answer essay questions	No	3
Summary of student's original research (not formatted or written for a journal)	No	2
Presentation of an epidemiological method	No	1
Final report	Unknown	1
<b>Total</b>		<b>47</b>

<sup>a</sup>Respondents were 59 instructors of accredited schools and programs of public health who taught a graduate or undergraduate epidemiology course during 2016 or 2017, regardless of whether writing was assigned.

<sup>b</sup>Data represent a maximum of 1 assignment per class, the assignment that was analyzed for this study. Courses may have required additional assignments that are not shown.

some assigned writing and that most assignments posed authentic public health problems that required critical thinking. However, the prevalence of the recommended characteristics and document types varied, and there is room for improvement.

Almost all studies on college writing assignments describe the characteristics of the assignments but do not address how many courses require writing assignments. In addition, most of these studies analyze data from undergraduate courses. In one study of 179 undergraduate syllabi from all courses taught at one Canadian college, 79% of courses required writing assignments.<sup>12</sup>

Our findings about writing to a target audience are similar to those of a study by Melzer (2000)<sup>7</sup> of writing assignments from diverse university general education courses. Students were asked to write for an audience other than the instructor in only 18% of the assignments in the Melzer study and in only 16% in our study. If an audience is not specified, students typically assume that they should address their writing to their instructor.<sup>14</sup> Writing to an audience other than the instructor challenges students to provide context, to adjust their writing to the background and expectations of the

reader, to construct well-developed ideas, and to develop persuasive arguments.<sup>14</sup>

In the Melzer<sup>7</sup> study, 50 of 400 instructors (13%) collected at least one rough draft from students. In our study, 48% of assignments incorporated some sort of writing process, including rough drafts, other types of assignment sequences, and peer review, and 5 of 43 (12%) allowed multiple drafts. Providing the opportunity for students to revise allows them to develop their thinking about a given topic, motivates deep learning, and gives them a chance to further develop their writing process.<sup>14</sup> The assignments we reviewed focused more closely on discipline-specific problems and critical thinking than did the assignments in the Melzer study, which is not surprising because public health is an applied discipline with a clear connection to public health practice. Our sample also included more graduate courses than undergraduate courses, which likely reflects the greater variety and number of epidemiology courses offered at the graduate level than at the undergraduate level, as well as the elective nature of epidemiology courses in undergraduate programs.<sup>18</sup>

Most assignments in our study were critiques of published articles, literature reviews, descriptions of a student's original research, or research proposals. However, more than half of these assignments asked students to write in generic, non-professional document types, such as term papers, which are not directed to a specific audience. Requiring professional document types for writing helps students learn about content and offers insights into the activities, roles, values, and context of a discipline.<sup>1</sup> For example, assigning a research proposal in an NIH-style document type allows students to learn about how the creation of new knowledge is described and justified in public health research. Assigning writing in workplace document types also helps students develop critical thinking skills and an awareness of their own thought processes.<sup>5,6,8,10,19,20</sup>

Although the benefits of writing critiques of published articles, literature reviews, descriptions of original research, and research proposals are clear, these document types are only a few of those used in public health. Using document types such as surveillance reports, emergency response plans, and social media planning documents can provide information to help students contextualize their learning by connecting course material to practice.<sup>1,8,14,15</sup> The limited number of professional document types we found in the assignments could relate to instructors' lack of experience with and access to these types; until recently, no such collection of document types existed.<sup>1</sup> (Readers interested in different document types can access the open-source Epidemiology Workplace Writing Repository,<sup>21</sup> which includes job descriptions, workplace writing examples, and a teaching guide. These materials are useful for developing formal and informal writing assignments for public health graduate schools and are based on the best writing practices recommended by liberal arts colleges and universities.<sup>1</sup> A newer collection of documents is Public Health WORKS.<sup>22</sup>)

## Improving Writing Instruction in Epidemiology Courses

Several steps can be taken to improve writing assignments in public health. First, institutions should train their instructors in implementing the 6 characteristics of good writing assignments we discuss here. A closer connection between departments of rhetoric and composition and public health would support this goal, perhaps through collaborative activities such as workshops and conferences, but also through in-service training at school or department levels and guidance on websites. In the meantime, public health instructors can work within their existing infrastructure to incorporate the characteristics. Resources such as writing centers and writing in the disciplines initiatives may be available at some institutions to support these efforts.

## Strengths and Limitations

This study had several limitations. First, the response rates for instructors varied by institution type (large research, medical, or small) from 10% to 20% of those invited. Our sample likely included instructors who were more interested in including writing in their curriculum than the population of epidemiology instructors at large. Therefore, our results likely overestimate the prevalence of writing assignments in epidemiology courses. In addition, our small sample precluded a stratified analysis by institution type. Second, not all instructors who provided their syllabus also contributed the assignment document. In these cases, deeper analysis of an assignment was not possible. Finally, we used the writing assignment that was worth the most points in our descriptive analysis and in our assessment of whether assignments included the 6 characteristics.<sup>1</sup> This approach precluded us from examining all of the writing required in a given course, limiting our observations to longer, more extensive writing assignments at the expense of shorter, less-involved writing assignments.

One strength of this study was that we imposed a specified date range and an assignment-selection process (alphabetical order of course names) to discourage instructors from contributing materials from courses with the most writing. Given this constraint, instructors were, we hope, less likely to choose courses based on what they may have felt were desirable characteristics, thus yielding a more objective data set.

## Conclusions

The characteristics of writing assignments in epidemiology courses do not reflect best practices in writing instruction. Developing writing assignments that include the 6 recommended characteristics described here is a relatively easy first step in this process. Public health programs should pay more and better attention to how—and for whom—their students write.

## Authors' Note

A template writing assignment that incorporates all 6 recommended characteristics is available upon request from Ella August (eaugust@umich.edu).

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