

Science reporting in Accra, Ghana: Sources, barriers and motivational factors

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Abstract

In Ghana, as in many other developing countries, most science reporting is done by general reporters. However, few studies have investigated science reporting in such a situation. To understand better the dynamics of science reporting in such context, we surveyed 151 general reporters in Ghana. Respondents' demographic characteristics resembled those found in studies elsewhere. Respondents perceived health professionals and scientists as very important sources of information for reporting science. There was an inverse correlation between journalism experience and the number of science feature stories reported in the past 12 months ($p = .017$). Most respondents indicated that science journalism training would motivate them to report science more. Likewise, most reported that easier access to research findings would do so. We identify characteristics of reporters, media, scientific, and training institutions that are important influences of Ghanaian reporters' coverage of science. We provide recommendations for advancing science reporting in Ghana.

Keywords

Africa, general reporters, Ghana, journalists, science journalism

I. Why a study of science journalism in Africa is important

There are many studies of science journalists in Western countries. Such studies have addressed the characteristics of journalists covering science and the factors that may influence science journalism, including backgrounds of journalists reporting on science (Dennis and McCartney, 1979; Henningham, 1995; Sachsman et al., 2002; Stora, 1984; Ward and Jandciu, 2008), barriers to, or motivators for, science reporting (Larsson et al., 2003; Maillé et al., 2010), and sources used by science reporters (Conrad, 1999; Hinnant and Len-Ríos, 2009; Reed, 2001).

These studies offer many useful insights on science journalism in Western countries, but it is unclear whether their findings are applicable in non-Western countries, especially in Africa. For

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example, Ward and Jandciu (2008) interviewed 25 science journalism in Canada and categorized the challenges science journalists face into two main groups: individual and systemic. The individual challenges include the personal abilities, skills, and qualifications of the individual journalists interviewed. Systemic challenges include how newsrooms gather and edit science stories. According to Ward and Jandciu, science journalists usually do not have control over systematic factors although such factors significantly influence their work. Ward and Jandciu said that journalists are not given enough time to report science; hence, they depend increasingly on science journals as the main source of information. However, the findings of a recent study suggest that some science journalists may not be “slaves to journals” after all. According to Suleski and Ibaraki (2010), despite the increase in number of scientific papers published, very few articles are covered by the mass media. The authors provide this analogy:

If the output of science articles were the volume of a swimming pool, the total papers that made it to a mainstream audience through news media would fill only a quart, and the nonhealth/medicine papers would be just two tablespoons. (p. 120)

But in many African countries, journals often do not send press releases to media institutions, and thus, journalists hardly report on studies published in local journals. A lack of institutional support also impedes science reporting in developing countries. For example, in Pakistan, Ahmed (2005) has identified a lack of institutional support—particularly for publishing science journals—and inaccuracies in science reporting as barriers to science journalism.

Studies of science journalism in non-Western countries, especially those in Africa, are needed for at least three main reasons. First, reviews of science journalism studies globally have not identified studies conducted in Africa perhaps due to lack of research (Amend and Secko, 2012; Schäfer, 2012). For example, in a meta-synthesis to determine experiences of science and health reporting from the perspectives of science and health journalists, Amend and Secko (2012) identified 21 studies, only one of which came from outside Western countries. Also, Schäfer identified empirical studies from the Social Science Citation Index, which showed the representation of science in the mass media. He found 215 publications none of which related to Africa. Schäfer (2012) stated, “[T]he media coverage in Western countries is most often analyzed, with almost no African, South American, or Asian countries in the literature. This contrasts sharply to descriptions of science as a global system” (p. 658). Also, in part because archives of the print media can readily be obtained compared with radio and television, many studies of science journalism are content analyses of the print media (Schäfer, 2012), thereby missing the perspectives of science reporting from other media, including radio and television.

Finally, many science journalism studies mostly focus on science journalists (Bauer et al., 2013; Dennis and McCartney, 1979; Henningham, 1995; Sachsman et al., 2002; Storad, 1984; Ward and Jandciu, 2008), and thus, little is known about the subject from the perspective of general reporters who cover science. In Africa, because most science reporting is done by general reporters, it is critically important to assess science journalism from their perspectives.

Aim and research questions

Based on the above, the purpose of this article is to examine science reporting from the perspectives of general reporters—both specialized science reporters and other reporters—in Ghana, West Africa. We explored the following research questions:

1. What are the demographic and professional characteristics of journalists in Ghana?
2. What sources do they use in preparing science stories?
3. How many science stories do they recall covering within the past 12 months?
4. What barriers do they face in covering science?
5. What factors motivate them to cover science?

2. Methodology

Sample

For this study, we surveyed active members of the Ghana Journalists Association (GJA) who work in Accra, the capital of Ghana. We used a self-administered questionnaire. It was pretested among four journalists in Accra, who were then excluded from the study. The outcome of the pretest resulted in a minor change to the questionnaire items. For instance, a possible barrier to reporting science “I am already involved enough” was added after the pretest. We planned to randomly select a sample from all 592 GJA members in Accra, but the GJA stated that the contact details of members were confidential. Instead, the GJA provided contact information of senior members within media organizations in Accra. Starting by contacting these members at their worksites, we used the snowball sampling technique. In addition, we sampled reporters at the Ghana International Press Centre and Ghana Parliament House. Respondents were asked if they were GJA members, and only if they answered affirmatively were they asked to complete the questionnaire. The lead author (B.A.) hand-delivered a total of 300 questionnaires to potential respondents. From 20 January through 1 February 2010, the worksites were visited multiple times. Of the 300 questionnaires distributed, 151 (50.3%) were completed and returned. The sampled journalists came from both government and private media. For example, of the 138 respondents who indicated their sector of employment, 78 came from government media and the remaining came from private media. The relatively high response rate may be due to two main factors. First, B.A. is familiar with the respondents’ culture because he is Ghanaian, and thus, he knew that the study population prefers face-to-face contacts to mail or online surveys. Second, to encourage participation, B.A. gave a customized pen to each journalist who agreed to participate in the study.

Questionnaire

The questionnaire had 21 questions that related to different aspects of science journalism. The questionnaire was designed as part of a large study, which resulted in a master’s thesis. First, we asked the respondents to rate the importance of 12 human sources of information for science stories, including one to be specified, from a four-point Likert-type scale where 1 = *not important at all* and 4 = *very important*.

To minimize bias, the order in which we listed sources was randomly selected. Second, we asked participants to indicate how many times in the past 12 months, they had interviewed each type of source for science stories. The options were *none*, *1–5 times*, *6–10 times*, and *more than 10 times*.

Third, we asked participants to indicate for the past 12 months the number of (a) science news stories and (b) science feature stories they recall preparing. Options were *none*, *1–6*, *7–12*, *13–20*, *21–30*, and *more than 30*.

Fourth, the questionnaire listed nine potential motivations for science reporting, including awards, support from employer and easy availability of scientific research findings. Respondents

Table 1. Some demographic characteristics of general reporters in Ghana during 2010.

Characteristic	Number (%)
Age categories (n = 148)	
<20 years	2 (1.4)
20–30 years	67 (45.3)
31–40 years	49 (33.1)
41–50 years	25 (16.9)
>50 years	5 (3.4)
Gender (n = 145)	
Female	55 (37.9)
Male	90 (62.1)
Journalism experience (n = 147)	
<5 years	45 (30.6)
5–10 years	55 (37.4)
11–15 years	20 (13.6)
>15 years	27 (18.4)
Type of mass media (n = 148)	
Newspaper	80 (54.1) ^a
Magazine	15 (10.1)
Radio	45 (30.4)
Television	29 (19.6)
Other ^b	15 (10.1)

^aThe percentages add up to more than 100 because some respondents chose more than one option.

^bNine respondents who listed “other” indicated they work for a wire service.

were asked to rate how important these motivations were to them on a 4-point interval scale, ranging from 1 = *not important at all* to 4 = *very important*.

Fifth, the questionnaire listed 13 potential barriers to science reporting, including one to be specified, and the respondents were asked to select any that applied to them. Finally, we asked participants to indicate their demographic and professional characteristics, including the types of media they worked for, age, years spent in journalism, and gender. We also asked questions about the future of science journalism in Ghana, published elsewhere (Appiah et al., 2012).

3. Results

Some demographic characteristics of journalists in Ghana

We identified the following demographic characteristics: age, gender, years spent in journalism, and type of mass media. Many respondents were in the age category 20–30 years and most were men (Table 1). The largest proportion of respondents had been working in journalism for 5–10 years. Most respondents worked for newspaper (Table 1). When gender was cross-tabulated with years in practice or journalism experience, among men the highest proportion of respondents said they have been practicing journalism for 5–10 years (36.4%), and among women the highest proportion of respondents said they have been practicing journalism for 5–10 years (40.7%).

Also, the proportion of men who said they have been practicing for more than 15 years was more than that of women (21.6% vs 13.0%). However, there was no correlation between gender and years in journalism or journalism experience ($df=3$, $p=.158$).

Table 2. Rating of the importance of sources used for reporting science by journalists in Ghana.

Source	Not important at all	Neither important nor unimportant	Quite important	Very important	Total number	Mean ^a
Health professionals (e.g. doctors, nurses, pharmacists)	0 (0%)	4 (2.8%)	22 (15.3%)	118 (81.9%)	144	3.79
Scientists	1 (0.7%)	2 (1.4%)	33 (23.6%)	104 (74.3%)	140	3.71
Consumers	2 (1.4%)	14 (9.8%)	56 (39.2)	71 (49.7%)	143	3.37
Staff of science journals	1 (0.8%)	18 (13.6%)	73 (55.3%)	40 (30.3%)	132	3.15
Traditional or alternative medical practitioners (e.g. herbalists)	5 (3.5%)	19 (13.4%)	74 (52.1%)	44 (31.0%)	142	3.11
Public information officers	5 (3.7%)	21 (15.6%)	70 (51.9%)	39 (28.9%)	135	3.06
Staff of industry or business community	6 (4.4%)	33 (24.1%)	69 (50.4%)	29 (21.2%)	137	2.88
Staff of non-governmental organizations	12 (9.0%)	24 (17.9%)	77 (57.5%)	21 (15.7%)	134	2.80
Others ^b	5 (14.7%)	11 (32.4%)	12 (35.3%)	6 (17.6%)	34	2.56

^aThe mean responses were calculated using 1 = *not important at all*, 2 = *neither important nor unimportant*, 3 = *quite important*, and 4 = *very important*.

^bOther sources cited were students, politicians, and websites. Because of the low number of other sources which the respondents cited, findings related to other sources will not be described in the text.

Sources used for reporting science

Of the listed human sources, health professionals and scientists received relatively higher mean ratings of importance on a four-point Likert-type scale from 1 = *not important at all* to 4 = *very important* (Table 2).

Also, on a scale of 1 = *none*, 2 = *1–5 times*, 3 = *6–10 times*, and 4 = *more than 10 times*, respondents selected the frequency of contact with the listed sources within the past 12 months. The respondents indicated interviewing health professionals, public information officers, and scientists more frequently than the other listed sources (Table 3).

Number of science stories reported by journalists

A total of 137 respondents completed the questionnaire item on number of news stories they recalled reporting in the past 12 months by selecting one of six options: *none*, *1–6*, *7–12*, *13–20*, *21–30*, and *more than 30*. Of the total respondents, 16 (11.7%) chose *none*, 71 (51.8%) chose *1–6 news stories*, 22 (16.1%) chose *7–12 news stories*, 10 (7.3%) chose *13–20 news stories*, 11 (8.0%) chose *21–30 news stories*, and 7 (5.1%) chose *more than 30 news stories*. In comparison, a total of 128 respondents completed the questionnaire items on number of feature stories they recalled reporting in the past 12 months. Of this number, 46 (35.9%) chose *none*, 58 (45.3%) chose *1–6 feature stories*, 12 (9.4%) chose *7–12 feature stories*, 4 (3.1%) chose *13–20 feature stories*, 4 (3.1%) chose *21–30 feature stories*, and 4 (3.1%) chose *more than 30 feature stories*.

When we cross-tabulated demographic characteristics such as age, gender, and years of practice, with numbers of news stories and feature stories the journalists recalled reporting in the past 12 months, the association between number of years spent in journalism and number of science feature stories reported was statistically significant ($\chi^2(15, N=124)=28.793, p=.017$).

Table 3. The frequency of interview of sources for reporting science by journalists in Ghana during the past 12 months.

Source	None	1–5 times	6–10 times	More than 10 times	Total number	Mean ^a
Health professionals (e.g. doctors, nurses, pharmacists)	23 (16.4%)	45 (32.1%)	42 (30.0%)	30 (21.4%)	140	2.56
Public information officers	40 (30.5%)	36 (27.5%)	37 (28.2%)	18 (13.7%)	131	2.25
Scientists	36 (28.3%)	51 (40.2%)	29 (22.8%)	11 (8.7%)	127	2.12
Consumers	43 (31.2%)	59 (42.8%)	22 (15.9%)	14 (10.1%)	138	2.05
Staff of industry or business community	51 (37.2%)	51 (37.2%)	21 (15.3%)	14 (10.2%)	137	1.99
Traditional or alternative medical practitioners (e.g. herbalists)	60 (43.8%)	42 (30.7%)	21 (15.3%)	14 (10.2%)	137	1.92
Staff of non-governmental organizations	49 (36.8%)	57 (42.9%)	20 (15.0%)	7 (5.3%)	133	1.89
Staff of science journals	71 (52.6%)	46 (34.1%)	11 (8.1%)	7 (5.2%)	135	1.66
Others	27 (71.1%)	4 (10.5%)	4 (10.5%)	3 (7.9%)	38	1.55

Question: Thinking about reporting about science, roughly how many times in the past 12 months have you interviewed each of the following?

1 = none, 2 = 1–5 times, 3 = 6–10 times, and 4 = more than 10 times.

^aThe mean responses were calculated using 1 = none, 2 = 1–5 times, 3 = 6–10 times, and 4 = more than 10 times.

The Cramer's V for this association was 0.278. In general, the proportion of journalists less than 5 years in journalism practice who recalled having reported at least seven news and feature stories was more than those who have spent at least 15 years in the journalism profession. There was no significant relationship between any other demographic characteristic and number of science stories the respondents recalled reporting.

Barriers to science reporting

The questionnaire listed 13 potential barriers to science reporting. We asked respondents to indicate any that applied to them. A total of 140 journalists responded to this item (Table 4). Of the barriers, the one that the highest proportion of journalists cited was "I am already involved enough" (47.9%). This was followed by "I do not have the training needed to report science" (40.7%).

Motivational factors toward science reporting

On a four-point Likert-type scale from 1 = *not important at all* to 4 = *very important*, the journalists rated the importance of nine factors that could influence their decision to report science. Most respondents (69.5%) rated receipt of (more) training in science journalism as *very important*, and thus, this factor had the greatest mean (Table 5).

4. Discussion

Demographic characteristics of journalists in Ghana and influence on science reporting

We found the demographic characteristics such as age, gender, and years of practice, and type of media to be similar to studies conducted in Ghana and elsewhere.

Table 4. Reported barriers to science reporting in Ghana (n = 140).

Barrier ^a	Number (%) ^b
I am already involved enough	67 (47.9)
I do not have the training needed to report on science	57 (40.7)
I do not have the contact information of scientific researchers	47 (33.6)
I am too busy with non-science stories	47 (33.6)
The public doesn't understand science	46 (32.9)
There is no senior level support	42 (30.0)
There is no benefit or recognition	32 (22.9)
I have had one or more bad experiences with scientists	22 (15.7)
The public doesn't want to know about science	19 (13.6)
I just don't want to report on science	12 (8.6)
I do not have the confidence	9 (6.4)
I am too junior	7 (5.0)
Other ^c	10 (7.1)

^aOrder of barriers differs from that on the questionnaire to aid in relative frequencies.

^bPercentages do not add up to 100 because some respondents chose more than one option.

^cRespondents cited barriers including the tendency for editors to prefer political stories, research being too technical, no capacity, or having senior editorial responsibilities.

Age and gender. The age of respondents in this study resembled that found in other studies done in Ghana and other countries. Kasoma (2007) did a study among journalists in Ghana and Zambia and found that most journalists in Ghana were aged between 26 and 30. Such observation may not be unique to journalists alone. Similarly, in our study, the highest proportion of respondents (45.3%) was aged 20–30 years. Weaver and Wilhoit (1996) found that the highest proportion (37.2%) of journalists in the United States belonged to the age category 25–34. However, studies of science journalists have found higher averages. Sachsman et al. (2002) found that about half of 45 environmental reporters in New England (51%) were 45 years or older. The tendency for science or environmental reporters to be older than general reporters might be attributable to hiring of only older journalists for the environment or science beats, a tendency for the environmental or science reporters to stay in that beat for a longer time, or both (Sachsman et al., 2002). Furthermore, a more recent study of science journalism globally found that of 946 respondents, 37% were aged 21 and 34 years, 33% 35–44 years, and 26% 45–64 years (Bauer et al., 2013).

Like age, the gender of respondents in this study resembled that found in other studies in Ghana and elsewhere that focused on reporters, including science journalists. Kasoma (2007) found that most journalists in Ghana were men (73%). Similarly, in Mwesige's (2004) study of 104 journalists in Uganda, men constituted 73%. We found that beyond the age of 30 years, the percentages of both men and women decreased, but more so for women. This observation was similar to that of Weaver and Wilhoit (1996), who found that men were more likely than women to stay longer in the journalism profession. The decreasing proportion of journalists with increasing age could reflect at least two reasons. First, media organizations—like non-media organizations—may tend to prefer younger women to older ones because younger women may have fewer family responsibilities, particularly if they do not have children. Finally, women journalists may be leaving the profession at later ages to attend to family responsibilities. Bohere (1984), who has studied the working conditions of journalists in many countries, has noted, "The conditions of work in the profession, such as irregular and late working hours, could certainly account for the exclusion of women with family responsibilities" (p. 41).

Table 5. Potential motivational factors for science reporting in Ghana.

Factor	Not important at all	Neither important nor unimportant	Quite important	Very important	Total	Mean ^a
Receipt of (more) training in science journalism	9 (7.0%)	9 (7.0%)	21 (16.4%)	89 (69.5%)	128	3.48
Help with advancement of my own career	5 (3.5%)	13 (9.2%)	43 (30.3%)	81 (57.0%)	142	3.41
Easy availability of science research findings	6 (4.4%)	7 (5.1%)	51 (37.5%)	72 (52.9%)	136	3.39
More support and encouragement from employer	19 (7.2%)	9 (6.5%)	56 (40.3%)	64 (46.0%)	139	3.25
Awards and prizes for me as an individual	23 (16.8%)	28 (20.4%)	53 (38.7%)	33 (24.1%)	137	2.70
Recognition of my employer with awards	21 (15.9%)	31 (23.5%)	50 (37.9%)	30 (22.7%)	132	2.67
Increase in my own income	30 (22.4%)	34 (25.4%)	34 (25.4%)	36 (26.9%)	134	2.57
Profitability to my employer	24 (18.3%)	33 (25.2%)	53 (40.5%)	21 (16.0%)	131	2.54
Relief from reporting non-science stories	42 (32.6%)	37 (28.7%)	34 (26.4%)	16 (12.4%)	129	2.19

^aThe means were calculated using 1 = *not important at all*, 2 = *neither important nor unimportant*, 3 = *quite important*, and 4 = *very important*.

Years in journalism. Our study found that of 147 respondents, 30.6% had been in journalism for less than 5 years, 37.4% 5–10 years, and 13.6% 11–15 years. This finding mirrors that of the recent science journalism study (Bauer et al., 2013), which found that 38% of 586 respondents had practiced for less than 5 years, 27% 6–10 years, and 15% for 11–15 years. In the current study, beyond 11 years, among both men and women the numbers of journalists decreased, but more markedly in women. This finding resembles that of Dennis and McCartney (1979), who found that on the average male science reporters working for metropolitan dailies were more experienced than their women counterparts (11 years vs 4.8 years). The lower number of years in journalism for women observed in the current study may reflect the reasons cited earlier.

Type of mass media. In terms of the type of mass media in which journalists are employed, our findings resemble those from the United States (Weaver and Wilhoit, 1996), United Kingdom (Weitkamp, 2003), and Uganda (Mwesige, 2004), which showed that many journalists worked in the print media. And in both the United Kingdom (Weitkamp, 2003) and the current study, many journalists cited more than one type of mass media organization. Journalists may freelance. In Ghana, some journalists are allowed to work in more than one media organization.

During data collection for this study, B.A. found out that more than half of the journalists practicing in Accra, Ghana, are not members of the GJA. Thus, because most GJA members work for the government media institutions such as the Ghana Broadcasting Corporation (for radio and television), the Times Corporation, and the Graphic Communications Group (print media), most reporters working for private media might have been missed. According to Ghana's National Communications Authority (n.d.), as of the first quarter of 2014, Ghana had 342 FM radio stations with 234 of them being commercial radio stations or mostly owned by private entities. Also,

according to BBC World Service Trust (2006) as of April 2006, Ghana had 106 newspapers, majority of which were privately owned. Given that most journalists work for private media, including non-GJA members as respondents could have led to different results.

Distribution of demographic factors and science reporting. An important finding of our study is that analysis of the relationship between demographic characteristics (namely age, gender, and years of practice) and numbers of news stories and feature stories the journalists recalled reporting in the past 12 months revealed statistically significant difference between only number of years spent in journalism and number of science feature stories reported ($\chi^2(15, N=124)=28.793, p=.017$). However, the Cramer's V for this association, which was 0.278, suggests that the association is low. Given that journalists who have spent up to 10 years in journalism tended to report more feature stories compared to those beyond 10 years in journalism, this significant relationship has implications for science reporting practice and training. Perhaps more experienced journalists work as editors (or "on the desk"), and therefore rarely report feature stories. Thus, training programs should consider younger general reporters. However, involving editors or more experienced journalists in such programs can also be useful because ultimately editors often decide what to publish.

Human sources of information

Journalists who report science rely on human sources for information (Conrad, 1999; Elias, 2007; Van Trig et al., 1994). Journalists may also call on human sources for effective quotations (Conrad, 1999). The interaction between sources and science reporters has been studied in a number of Western countries (e.g. Dunwoody et al., 2009; Peters, 1995; Peters et al., 2008). In the current study, many respondents rated health professionals and scientists as important. First, journalists may have more frequent interactions with health professionals than with the other types of sources. Second, health professionals and scientists may be perceived as credible because of their qualifications and their affiliations to credible professional bodies or institutions.

In the current study, the business community received the lowest mean rating of importance as a source of information: only 21.2% of 137 respondents rated them as very important compared to 81.9 of 147 respondents rating health professionals as very important. One factor might be that reporters in Ghana do not perceive the business community as being very relevant to science. In addition, this observation may relate to credibility in keeping with the findings of a study of medical, health, and science journalists in the United States (Yoon, 2005): "reporters perceived not-for-profit research institutes as the most credible, followed by university sources, professional associations, government sources, advocacy organizations, and business sources, in that order" (p. 291). It was surprising to find that traditional or alternative medicine practitioners (e.g. herbalists) received nearly the same mean rating of importance as public information officers, and an even higher mean rating than staff of non-governmental organizations. One possible reason for their relatively high rating could be their easy accessibility and the tendency for respondents to use the services of alternative medicine practitioners. For example, traditional healers provide health-care to about 70% of the people of Ghana (Warren et al., 1982). As noted by Conrad (1999), "[l]ocating sources depends in part on space, time, and accessibility" (p. 290). Another possible reason could be that traditional medicine practitioners may have good interpersonal skills that aid interaction with both patients and journalists.

In the current study, the most frequently interviewed source was health professionals. However, although respondents rated scientists as the second most important source, they contacted public

information officers more frequently than scientists. Three main factors may account for this. First, the journalists may not know how to contact scientists. Second, scientists, unlike public information officers, may not be accessible to interview in part due to bureaucracy. For example, journalists might have contact information for public information officers because they were classmates at the Ghana Institute of Journalism, an institution that has trained more than 60% of communication professionals, public information officers, in Ghana. Third, there may be uneasy relationship between journalists and scientists in Ghana. Indeed, in Ghana, both scientists and journalists have accused each other of not aiding better communication of science to the public (Boakye-Dankwa, 2010).

Number of science stories

Our respondents were general reporters, who do most of the science reporting in Ghana. Indeed, we found that most media organizations in Ghana did not have science desks. Thus, as expected, our respondents produced fewer science stories than found globally for science journalists (Bauer et al., 2013). For example, of the 137 respondents who responded to the questionnaire item on number of science news stories in the past 12 months, only 5.1% indicated reporting more than 30. In addition, for science feature stories, only 3.1% of the 128 respondents indicated reporting more than 30 in the past year. In contrast, Bauer et al. (2013) found that science journalists in Sub-Saharan Africa are among the busiest in the world, with an average of 11 stories over 2 weeks.

Barriers to science reporting

To explore barriers to reporting science, the respondents were asked to select one or more of 12 possible such items. Additionally, the respondents could list other barriers. Nearly half of the respondents (67 of 140 or 47.9%) selected "I am already involved enough." Respondents might have considered that item a socially acceptable answer.

The second most commonly cited barrier to science reporting was "I do not have the training needed to report on science" (57 of 140 or 40.7%). Two barriers, "I do not have the contact information of scientific researchers" and "I am too busy with non-science stories," were tied for third place (33.6%). The lack of contact information of scientific researchers was found in a qualitative study of three science journalists and three scientists in Australia (Reed, 2001), which offered recommendation for addressing this barrier:

Perhaps the most concrete proposal to advance science reporting was the establishment of a central national "meeting point" or clearing house where scientists would register their names and expertise. This would not be simply a paper database but would include a "hot line" which could be promoted to all journalists, especially news journalists. (p. 294)

Although a third of the journalists had been practicing for less than 5 years, only 5% chose "I am too junior" and only 9% chose "I do not have the confidence" as barriers to science reporting. This finding suggests that being young or lacking confidence may not influence science reporting. In addition, because many respondents (30%) chose the barrier "There is no senior level support," it was a surprise that few chose "I am too junior" as a barrier to science reporting. Two main factors may account for this finding. First, perhaps younger respondents chose to give more socially acceptable responses to avoid being considered as incompetent in science reporting. Second, whereas we intended being "too junior" to mean having too little experience, some respondents might have interpreted being "too junior" differently. For instance, some might have understood it

to mean their age, level of responsibility, level of confidence, or job title. Future research should make clearer the statement “I am too junior.”

Given that we asked the reporters to choose any barrier that applied to them, it was interesting to note that other than those who selected “I am already involved enough,” all those who responded to this questionnaire item selected more than one potential barrier. This observation suggests that barriers to science reporting may have multiple causes in Ghana.

Motivational factors for science reporting

When respondents were asked to rate nine motivational factors that may influence them to report more science stories, the one that received the highest mean rating on a scale of 1=*not important at all* to 4=*very important* was “receipt of (more) training in science journalism” (3.48). This was followed by “help with advancement of my own career” (3.41) and “easy availability of science research findings” (3.38). The fact that most respondents considered more training in science journalism as a motivation for reporting more on science suggests there should be more training in the field. Mbarga et al. (2012) have proposed peer-to-peer mentoring program to advance science journalism in Africa.

It was not surprising that “help with advancement of my own career” received a high mean rating. Given that we found younger journalists to be reporting more science feature stories, perhaps younger reporters consider science reporting a means to advance in their journalism career. The motivational factor “increase in my own income” received a lower mean rating (2.57) than “easy availability of science research findings” (3.39). This finding might suggest that journalists in Ghana consider the interests of the public more than themselves or might care more about performing their journalistic duties. Unfortunately for their employers, “profitability to my employer” received the second lowest mean rating (2.54), although “more support and encouragement from employer” received the fourth highest mean rating (3.24). Given this finding, employers might have little motivation to support journalists in science reporting.

Because “easy availability of research findings” had a relatively high rating, initiatives that promote easy access to science research findings in Ghana should be considered. For example, Ghanaian scientific institutions should consider having frequent media interactions with the media in order to let reporters have access to their research findings.

Like respondents to a global survey of science journalists (Bauer et al., 2013), our respondents seemed more concerned about the quality of their work than about their financial well-being. Whereas only 36 of 134 (26.9%) rated “increase in my own income” as “very important” for motivating them to report science, 72 of 136 (52.9%) rated “easy availability of scientific research findings” as “very important.”

A surprising finding of the current study was that relieving journalists from reporting non-science stories was not rated highly as a motivation for reporting science. This finding may have an implication in journalism training. Given that journalists in Ghana may not want to give up reporting non-science stories, an attempt at introducing science journalism as an elective course may not be ideal for Ghana. Rather, if science journalism is introduced as a core course, all journalism students may benefit from it. After graduation, the journalists may decide to report only science or combine science reporting with other beats.

This study presented only nine motivational factors for journalists to choose from, and there was not the option of listing others. Thus, other motivational factors may also exist. Such factors may include the desire to help humanity, having time to report science feature stories, and having financial resources for travel (as noted by Obeng-Quaidoo, 1988). These topics are worthy of further research.

5. Conclusions, recommendations, and limitations

This article found that general reporters who cover science in Ghana have demographic characteristics such as age, gender, journalism experience, and type of mass media similar to their counterparts in Africa and elsewhere. Regarding information sources for reporting science stories, most respondents perceived health professionals and scientists as very important sources. Respondents indicated contacting public information officers more frequently than scientists even though public information officers received lower mean rating of importance than scientists. Respondents indicated that they reported more science news stories than science feature stories within the past 12 months. There was a statistically significant inverse correlation between years of experience and the number of science feature stories respondents said they reported. We also identified important barriers to, and motivators for, science reporting.

Advancing science reporting in Ghana: our recommendations

The current study suggests the need for a framework for advancing science reporting in Ghana that considers the individual reporter, the media institutions, the scientific institutions, training institutions, and the wider public as important.

Individual general reporters may be more willing to report about science if a number of conditions exist. First, media training institutions must train current and would-be reporters in science reporting. Second, individual reporters must believe that reporting more about science will enhance their careers, especially given that our study found that those with up to 10 years in journalism experience tended to write more about science. Third, media institutions must have senior level management providing individual journalists with support and encouragement. Fourth, scientific institutions must make the contact information of their researchers and their research findings easily accessible to reporters. Finally, the wider public must show an interest in, or understand, scientific issues to motivate journalists to write more about science.

Our specific recommendations relate to training, easy access to scientific findings, and having access to contact information of scientists and journalists. Although these recommendations are specific to the study population—general reporters in Accra, Ghana—we believe other general reporters in different parts of Ghana and sub-Saharan Africa may find them useful.

Training. First, journalism institutions in Ghana should consider introducing science journalism as part of their curricula. However, instead of offering science journalism instruction as certificate, diploma, or degree program, as is available in many European countries and the United States, for Ghana it may be advisable to pilot it as a core course or subject. The main reason is that offering the instruction as a core course may help many journalists to get the skills for reporting science. Such a course or subject is likely to lay a better foundation for introducing science journalism as a diploma or degree program in the future.

Second, media institutions should consider encouraging their staff—especially younger reporters to attend workshops or programs on science reporting. Existing books on science journalism should be more available in Ghana. Journalism students and professionals should be directed to openly accessible books or publications on science journalism, particularly the one developed by the World Federation of Science Journalists (<http://www.wfsj.org/course/en/>).

Easy access to science research findings. When asked to rate the importance of some motivational factors that may influence science reporting, many journalists highly rated “easy accessibility to science research findings.” Scientific research institutions should consider making their published research findings more readily available and accessible to the media. To do this, public information

officers, if available, should be tasked to translate research findings into easy-to-understand information or press releases to distribute to media houses. Such information should include contact information of scientists who would be ready to speak with journalists on the findings.

Contact information of scientists and journalists. Many journalists chose “I do not have the contact information of scientific researchers” when asked to select from a list of potential barriers to science reporting. Thus, a database of scientists with their contact information and the areas of expertise should be developed for media organizations in Ghana. Conversely, a database of the names and contact information of journalists interested in science reporting should be developed and made available to scientists to aid in journalist–media interactions.

Limitations

Our study provides useful insights on science reporting from the perspectives of general reporters in Accra, Ghana, who work for different mass media, including newspaper, magazine, radio, and television. However, we acknowledge such limitations as small sample size, a focus on only journalists working in Accra, and recall bias. In addition, qualitative studies with key stakeholders could help provide insights into the findings. For example, de-Graft Aikins et al. (2010) have identified the use of mass media as effective for addressing chronic diseases in Africa. Thus, future studies could involve health professionals in particular. Future studies should also include content analyses of science news reports. For example, through content analyses of news reports about genital shrinking in six West African countries, including Ghana, Dzokoto and Adams (2005) showed that the public and health professionals’ perceptions of the medical condition were different. Finally, there is a need for multi-country studies on science journalism among Ghana and other African countries or Western countries to find broader patterns. One such study (Larsson et al., 2003) was conducted among medical journalists in Europe, Canada, and Australia (37 countries in all). Such studies may help determine whether collaborative training programs would be helpful.

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