EDITORIAL

The art of amusing the public while conducting research may be fruitful

The American Academy of Periodontology (AAP) sent recently out a newsflash titled “Red wine prevents tooth decay, gum disease” (U.S. News and World, 2018b), which I believe was meant to be a joke. A story, published on February 21st in the U.S. News and World, refers to a research paper from Spain and commentaries presented on February 21st on BBC under the heading: “Red wine compound could help tooth decay and gum disease fight” (BBC, 2018). Except for the added quotations marks, the heading is reasonably similar to another heading that appeared on February 21st on the website of the Spanish national newspaper ABC: “Un compuesto del vino tinto podría prevenir las caries y combatir la enfermedad de las encías” (ABC, 2018). Unfortunately, the three stories are spun disproportionally beyond the substance of the research paper accepted in the Journal of Agricultural and Food Chemistry (Esteban-Fernández et al., 2018) on, yes, February 21st. The research paper describes how wine polyphenols, in the presence of a particular candidate probiotic, influences the adhesion of oral bacteria to fibroblasts under particular experimental conditions. Today, the story is viral on WWW and adds to other irresponsible spin stories about health and lifestyles. Particularly for wine-lovers, it may be of interest to learn that on February 20th, the same U.S. News and World journalist enlightens readers that “Drinking Alcohol More Important than Exercise to Living Past 90” and “Instead of an apple a day, try a glass of wine” (U.S. News and World, 2018a).

It may appear as if source criticism is outmoded in some forms of modern journalism. Within a few hours after the acceptance of a complicated research paper, three newspaper stories came online in Spain, U.K., and the USA, and one even containing commentaries. Should we be concerned that our new brave world of university activities seems to include amusing the public with what might one day become, given the circumstances, some luck, and prolongation of funding to continue an ongoing scientific research program?

Many seem today to share a belief that universities and higher education institutions “honour their social contract” by popularizing the research output for the public through press releases. It is therefore likely that the authors, or perhaps their employer, in this case the Instituto de Investigación en Ciencias de la Alimentación sent out a press release. Having read the paper, I do not believe that an unnamed journalist in ABC was able to interpret the validity and essence of the research paper and draft a story within a few hours. However, I do not find any sections in the paper where the authors claim any easy-fixes to prevent or cure oral diseases. Rather, they conclude with the reasonably sober statements that the study is “…an initial approach to go deeper into the mechanisms of action of red wine polyphenols against oral diseases. Further steps should be addressed toward the use of mixed biofilms models which can mimic bacteria–bacteria interactions as well as some other conditioning factors that should be added to multifactorial assays”.

So, who have blended the reality and fantasy in the stories? The blend of reality and fantasy in the BBC story was a moderation of the Spanish ABC story. E.g., the Spanish story contains a subheading that translates to “Red wine has previously been linked to a series of health benefits, from helping the heart reduce the risk of diabetes”. Moreover, several statements in the body text in the ABC story do not appear in the BBC story, which otherwise would have qualified for several cryptic commentaries on the badscience.net website managed by Ben Goldacre. One speculation is that the BBC-journalist forwarded either a press release, or a translation of the ABC story, to an unknown number of experts in U.K. to solicit commentaries and at least two must have responded rapidly. Both admirably demonstrate their experience and proficiency by characterizing the study graciously as “interesting”, before predictably cautioning against any excessive drinking of wine (to avoid tooth erosion and mortality, respectively). Many old-fashioned scholars like undersigned would more likely have stated something analogous to a quote in the famous British television show named Yes, minister. “If you ask me for a straight answer, then I shall say that, as far as we can see, looking at it, by and large, taking one thing with another in terms of the average of scientific research [sic. departments], then, in the final analysis, it is probably true to say, that at the end of the day, in general terms, you would probably find that, not to put too fine a point on it, there probably wasn’t very much in it one way or the other. As far as one can see, at this stage”.

Such responses are not exactly what makes any journalist exited, but it is worth noting that interview objects that receive inquiries from representatives of the media seldom have any influence on story profiles and never on story headings. I learned this following an interview about soft drinks and tooth erosion some years ago. A very abridged story appeared later in ten national newspapers in Norway on New Year’s Eve with the heading: “Professor of dentistry caution all to...”
be careful and not consume too much champagne tonight to avoid any tooth erosion’. The message is that if a representative of the media contacts you to solicit your opinion as an expert, you should be aware that you might yourself become a more-or-less involuntary component of a media story. A prudent approach to minimize such is to offer your commentaries to story drafts authored by journalists, and not comment directly on original research papers that may be open for multiple interpretations and few generalizations, and only after careful and time-consuming scrutiny of the contents.

A lingering question is who should make press releases based on research for the public – the original authors or a university media office? We all know that it is very challenging to condense a complicated study into a 300-word abstract intended for peers. Conveying the same by using far less words to laypersons without becoming too simplistic is far more challenging. Who then is ultimately responsible for ensuring that even the popularized versions of new research findings are quality assured and truthful? The responsibility must rest either with the researcher-authors or with their employer. I am not sure the answer to the question is clear in all higher education organizations, but acknowledge that the answer depend on the prevailing perception of ownership of intellectual property, which is secondary to local academic culture, –traditions, and –practices. In a former editorial, I criticized a particular university for a press release that highlighted that “Breastfeeding does not protect children against asthma and allergies” (Uppsala University, 2017), while leaving out that the same multivariate statistical analyses also showed that “maternal smoking had a protective effect on hay fever and eczema”. (Jokstad, 2017) Leaving out the second part in their press release is in my opinion deceptive because many readers, including journalists and decision makers, are unaware that statistical associations based on observational registry data may only be spurious and not necessarily causally related. My key concern with press releases of this kind is who selects what to highlight and ignore in press releases to the media and according to which format and criteria? Newspapers have over at least the last 50 years reported that researchers have finally solved the riddle of cancer. We should question who deceive who when we repeatedly are exposed to newscasts about the finally solved the riddle of cancer. When science becomes too difficult to understand, or too costly and time consuming to evaluate, decision makers may feel more comfortable than others and recognized that spinning press uncertainty to distribute limited research funds. Deciding on further funding amongst competing research projects is like practising a “Pascal’s wager” on an everyday basis. Serious governance bodies rely on true expertise to critically appraise soundness of research methodology, a potential for biases, and correct interpretation and translation of experimental data. Consequently, many researchers today spend excessive time on compiling data and write grant applications to persuade granting agencies to pursue one particular line of experiments. Obviously, experienced grant writers must ensure to also point out in applications today items such as “citation impact,” and “number of publications in high-status journals” and alternative citations in social media, i.e., altmetrics – elements that otherwise are meaningless in terms of judging the probability that one particular project will succeed and advance science.

Using the example of research on “healthy foods”, the experts or – the bureaucrat comparing the grant applications – must consider which natural product to prioritize. E.g., about alleged positive effects of polyphenol or polyphenol metabolites for health, should the focus be on cranberries, black raspberries, lingonberries, green tea, black tea, grape seeds, peanut skin, wild blueberries or some other food polyphenol (Esteban-Fernández et al., 2018)? I do not believe a green tea or peanut skin project would attract much funding from a granting agency in Norway, but maybe studying lingonberries from a remote rural district may do the trick.

For the sake of argument, given that funding is disseminated to appraise any effects of a polyphenol against a dominant disease in dentistry, the first challenge is to decide which experimental in vitro study design that is most meaningful. Should the focus be on the symbiotic and pathogenic microbial cells that first colonize the host surfaces and cavities or is the maturation and signaling (quorum sensing) that is more meaningful? Should the focus be on studying the microbiomes or metabolomics and which biochemical biomarkers are the most relevant? Should the antimicrobial effects of promising compounds be appraised by assessing cell metabolism, or should instead the bioactivity of different phenolic compounds be tested? Is it correct that the nuclear factor kappa B (NF-κB) signaling pathway is the most promising therapeutic strategy against marginal periodontitis or should also other molecules be considered? Has an experimental biofilm model for oral bacteria been developed and validated, including for oral streptococci or periodontopathogenic colonizers such as porphyromonas gingivalis or fusobacterium nucleatum? Somewhere along the long line of challenging and difficult questions, the number of potential experts who would be able to supply to the decision makers with the right answers to all these questions dwindle precariously while increase likelihood of potential conflict-of-interest issues.

When science becomes too difficult to understand, or too costly and time consuming to evaluate, decision makers may feel more confident by adopting surrogate indices as a basis for distributing limited research funds. Amongst these are the societal impact of contemporary research activities. It seems like a comforting approach to equate societal impact with an altmetrics score, but should we not ask whether it is likely that altmetrics can be inflated by bombarding the media with hyperboles? Perhaps, after all, some universities have been more avant-garde than others and recognized that spinning press...
releases that may please prevailing confirmation biases or can allude to promises of the sun, the moon, and the stars are more fruitful than spending time and efforts writing grant applications to fund complicated scientific research.

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