Brazil, and more efforts are to be made to compile this information. For instance, LINACs in Brazil have a worrying extended life cycle, with official estimates in the Brazilian Public Healthcare System reporting an obsolescence rate of 38% and 50% in 2018 and 2022, respectively, among available LINACs.[5] To improve access to modern radiation therapy, the Brazilian radiation therapy expansion plan is in place, but with <50% of its goals completed.[6] The expansion plan, in the past 10 years, has added an increase of 17% (47 new LINACs) in the national capacity against a 32% growth in cancer incidence in Brazil in the same period.[7]

Finally, owing to the high rates of patients with advanced cervical cancer in Brazil and based on previous reports, we considered that 70% of patients with cervical cancer would require both BCT and external beam radiation therapy.[2,7] Our study did not evaluate the effect of cervical cancer histology and outcomes, owing to a lack of available data. However, clinicians' treatment preferences and different institution protocols were assessed and reported in the supplementary Table E2. For the external beam radiation therapy component, 25 fractions of radiation therapy was considered as the standard. As prospective hypofractionated radiation therapy studies emerge, our estimates will need to be re-evaluated.[8] However, shorter treatment courses usually require LINACs with more advanced technologies, frequently unavailable in developing countries.[9,10]

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Bayesian Versus Frequentist Statistics

In Regard to Fornacon-Wood et al.

To the Editor:

We appreciate the authors bringing attention to controversies surrounding the use of Bayesian and frequentist statistics.[1] There are many benefits to frequentist statistics and disadvantages of Bayesian statistics which were not discussed in the referenced article. We write this accompanying letter to aim for a more balanced presentation of Bayesian and frequentist statistics.

With frequentist statistical significance tests, we can learn whether the data indicate there is a genuine effect or difference in a statistical analysis, as they have the ability to control type I and type II error probabilities.[2] Posteriors and Bayes factors do not ensure that the method rarely reports one treatment is better or worse than the other erroneously. A well-known threat to reliable results stems from the ease of using high powered methods to data-dredge and try to hunt for impressive-looking results that fail to replicate with new data. However, the Bayesian assessment is not altered by things like stopping rules—at least not without violating inference by Bayes theorem.[3] The frequentist account,[4] by contrast, is required to take account of such selection effects in reporting error probabilities. Another caution for those unfamiliar with practical Bayesian research is that estimation of a prior distribution is nontrivial. The priors they discuss are subjective degrees of belief, but there is considerable disagreement about which beliefs are warranted, even among experts. Furthermore, should conclusions differ if the prior is chosen by a radiation oncologist or a surgeon?[5] These considerations are some of the reasons why most phase 3 studies in oncology rely on frequentist designs.

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The article equates frequentist methods with simple null hypothesis testing without alternatives, thereby overlooking hypothesis testing methods that control both type I and II errors. The frequentist takes account of type II errors and the corresponding notion of power. If a test has high power to detect a meaningful effect size, then failing to detect a statistically significant difference is evidence against a meaningful effect. Therefore, a *P* value that is not small is informative.

The authors write that frequentist methods do not use background information, but this is to ignore the field of experimental design and all of the work that goes into specifying the test (eg, sample size, statistical power) and critically evaluating the connection between statistical and substantive results. An effect that corresponds to a clinically meaningful effect, or effect sizes well warranted from previous studies, would clearly influence the design.

Although their article engenders important discussion, these differences between frequentist and Bayesian methods may help readers understand why so many researchers around the world still prefer the frequentist approach.

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In Reply to Chowdhry et al.

To the Editor:

We thank the authors for their response[1] to our "statistics for the people" article[2] that aimed to introduce perhaps unfamiliar readers to Bayesian statistics and some potential advantages of their use. We agree that frequentist statistics are a useful and widespread statistical analytical approach, and we are not aiming to revisit the frequentist versus Bayesian arguments that have been well articulated in the literature.[3-5] However, there are a couple of points we would like to make.

First, we acknowledge that the majority of phase 3 studies use frequentist designs, and this has the advantage of facilitating meta-analyses using established techniques. However, we would argue that the reason such frequentist designs are so prevalent is likely to have as much to do with convention (from funders/regulators as well as from researchers themselves), the relative exposure of the 2 approaches in educational materials, and the historic difficulties in calculating Bayesian posteriors as it does with the arguments the authors make.[6,7]

Second, although we agree with Chowdhry et al that there are many challenges associated with the estimation of prior probability distributions, we note that similar arguments apply to effect size estimation, which they cite as a strength of the Neyman-Pearson/null hypothesis significance testing approach (ie, the use of power calculations to limit the risk of type II errors).[8,9] We would also re-enforce the point we make in the article about the importance of testing the influence of the prior (represented as the divergent beliefs of the hypothetical radiation oncologist and surgeon in the communication by Chowdhry et al) in the analysis results. If the data are strong enough, the posterior distributions will be in close enough agreement to convince both parties. As we noted, it is also possible to undertake Bayesian analyses without prior information, using an uninformative prior, in which case the analysis is driven directly by the data, as for a frequentist calculation. As an aside, there is continued debate about the relative merits and deficiencies of the different frequentist approaches to significance testing, particularly around the widespread use of the hybrid Neyman-Pearson/null hypothesis significance testing approach.[10]

Disclosures: none.