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1 in 4 Statisticians Say They Were Asked to Commit Scientific Fraud

By Alex Berezow — October 30, 2018

Credit: Storyblocks [1]

As the saying goes, "There are three kinds of lies: lies, damned lies, and statistics." We know that's true because statisticians themselves just said so.

A stunning report [2] published in the *Annals of Internal Medicine* concludes that researchers often make "inappropriate requests" to statisticians. And by "inappropriate," the authors aren't referring to accidental requests for incorrect statistical analyses; instead, they're referring to requests for unscrupulous data manipulation or even fraud.

The authors surveyed 522 consulting biostatisticians and received sufficient responses from 390. Then, they constructed a table (shown below) that ranks requests by level of inappropriateness. For instance, at the very top is "falsify the statistical significance to support a desired result," which is outright fraud. At the bottom is "do not show plot because it did not show as strong an effect as you had hoped," which is only slightly naughty.

Table 1. Biostatician-Reported Frequency and Severity Rating of Requests for Inappropriate Analysis and Reporting (n = 390)*

Violation Request	Respondents Rating the Item as "Most Severe," %†	Reported Requests During the Past 5 Years, %		
		0	1–9	≥10
Falsify the statistical significance (such as the *P* value) to support a desired result	84	97	2	1
Change data to achieve the desired outcome (such as the prevalence rate of cancer or another disease)	84	93	7	–
Remove or alter some data records (observations) to better support the research hypothesis	80	76	22	2
Interpret the statistical findings on the basis of expectations, not the actual results	68	70	28	2
Do not fully describe the treatment under study because protocol was not exactly followed	62	85	15	–
Do not report the presence of key missing data that could bias the results	68	76	23	1
Ignore violations of assumptions because results may change to negative	64	71	28	1
Modify a measurement scale to achieve some desired results rather than adhering to the original scale as validated	55	79	20	1
Report power on the basis of a post hoc calculation, but make it seem like an a priori statement	54	76	23	2
Request to not properly adjust for multiple testing when "a priori, originally planned secondary outcomes" are shifted to an "a posteriori primary outcome status"	56	80	18	2
Conduct too many post hoc tests, but purposefully do not adjust α levels to make results look more impressive than they really are	54	60	36	4
Remove categories of a variable to report more favorable results	48	68	31	1
Do not mention interim analyses to avoid "too much testing"	50	81	18	1
Report results before data have been cleaned and validated	48	56	39	5
Do not discuss the duration of follow-up because it was inconsistent	45	84	15	1
Stress only the significant findings, but underreport nonsignificant ones	42	45	48	7
Do not report the model statistics (including effect size in ANOVA or R^2 in linear regression) because they seemed too small to indicate any meaningful changes	42	76	23	1
Do not show plot because it did not show as strong an effect as you had hoped	33	58	39	3

ANOVA = analysis of variance.
* Based on findings from questions 1–18 of the Bioethical Issues in Biostatistical Consulting Questionnaire, which asked biostatisticians "to estimate the number of times—during the past 5 years—that you, personally, have been DIRECTLY asked to do this." Data are presented in decreasing order by the percentage of respondents with a perceived severity score of 4 or 5.
† Items were defined as "most severe" if respondents ranked the severity as 4 or 5 on a scale of 0–5.

On the right, the authors report how often the biostatisticians estimated that they received such a request over the past five years. The results are jaw-dropping.

The absolute worst offense (i.e., being asked to fake statistical significance) occurred to 3% of the survey respondents. Another 7% reported being asked to change data, and a whopping 24% -- nearly 1 in 4 -- said they were asked to remove or alter data. Unequivocally, that is a request to commit scientific fraud.

Of the less serious offenses, 55% of biostatisticians said that they received requests to underreport non-significant results.

Liar, Liar

It's quite remarkable that a scientist would have the audacity to ask another professional to fudge data. While there is simply no excuse for the egregious offenses (e.g., falsifying statistical significance), some of the other lesser offenses may not reflect maleficence but ignorance. Scientists often aren't very good at statistics, and they may make inappropriate requests simply because they don't know any better. The study didn't tease that out.

Still, this study should serve as a reminder that the ongoing reproducibility crisis may have, at least in part, a more sinister explanation.

Source [2]: Min Qi Wang, Alice F. Yan, Ralph V. Katz. "Researcher Requests for Inappropriate Analysis and Reporting: A U.S. Survey of Consulting Biostatisticians." *Ann Intern Med* 169(8): 554-558. Published: 16-Oct-2018. DOI: 10.7326/M18-1230

Links

[1] https://www.storyblocks.com/stock-image/business-man-is-trying-to-increase-market-statistics-r0jxxkowwj3bj3dxk

[2] http://annals.org/aim/article-abstract/2706170/researcher-requests-inappropriate-analysis-reporting-u-s-survey-consulting-biostatisticians