

# Accuracy of Data in Abstracts of Published Research Articles

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**T**HE ABSTRACT ACCOMPANYING A research article, because it is often the only part of the article that will be read, should reflect fully and accurately the work reported. We observed in 1 medical specialty journal that a quarter or more of manuscripts returned after revision contained data in the abstract that could not be verified in the body of the paper.<sup>1</sup> If this problem were to persist in published articles, then a potential for misinterpretation would exist. In the present study, we surveyed research articles and their accompanying abstracts published recently in 6 medical journals to verify data in the abstract by relating them to corresponding data in the body of the report.

## METHODS

Articles studied included simple random samples of reports of original research (including meta-analyses but not other types of reviews) appearing in 5 medical journals between July 1, 1996, and June 30, 1997 (*Annals of Internal Medicine*, *BMJ*, *JAMA*, *Lancet*, and *New England Journal of Medicine*); all articles appearing in a sixth journal *CMAJ* (*Canadian Medical Association Journal*), between July 1, 1996, and August 15, 1997, were also studied. Additional inclusion criteria were (1) the article was accompanied by an abstract and (2) the article occupied at least 2 full journal pages.

To estimate the sample sizes, we used some preliminary observations<sup>1</sup> that 25%

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**Context** The section of a research article most likely to be read is the abstract, and therefore it is particularly important that the abstract reflect the article faithfully.

**Objective** To assess abstracts accompanying research articles published in 6 medical journals with respect to whether data in the abstract could be verified in the article itself.

**Design** Analysis of simple random samples of 44 articles and their accompanying abstracts published during 1 year (July 1, 1996-June 30, 1997) in each of 5 major general medical journals (*Annals of Internal Medicine*, *BMJ*, *JAMA*, *Lancet*, and *New England Journal of Medicine*) and a consecutive sample of 44 articles published during 15 months (July 1, 1996-August 15, 1997) in the *CMAJ*.

**Main Outcome Measure** Abstracts were considered deficient if they contained data that were either inconsistent with corresponding data in the article's body (including tables and figures) or not found in the body at all.

**Results** The proportion of deficient abstracts varied widely (18%-68%) and to a statistically significant degree ( $P < .001$ ) among the 6 journals studied.

**Conclusions** Data in the abstract that are inconsistent with or absent from the article's body are common, even in large-circulation general medical journals.

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to 50% of articles published in 2 of the journals studied contained 1 or more deficiencies in abstracts. We assumed this rate would range from 10% to 40% across the 6 journals studied and that  $\alpha$  was .05 and power was 0.8, yielding a projected sample size of 44 from each journal. From each of the 5 journals that published more than 44 research articles in the 2 volumes studied (July 1, 1996-June 30, 1997), we selected a computer-generated simple random sample of 44. From the *CMAJ*, we analyzed a consecutive cohort of all 44 articles published from July 1, 1996, through August 15, 1997.

For each selected article, the abstract was scrutinized by 1 of 3 examiners who identified each datum or other piece of information in the abstract and then sought to relate it to its source in the body of the article, including tables and figures. Two types of discrepancies were sought: (1) data given differently in the abstract and the body and (2) data given

in the abstract but not in the body. If either was identified, the abstract was considered deficient. Discrepancies attributable to rounding were not considered to be deficiencies as long as the rounding was done appropriately, and the rounded value appeared in the abstract and the more detailed value in the body.

The proportions of articles containing deficiencies were compared across journals by  $\chi^2$  analysis. On the basis of normal approximation, 95% confidence intervals (CIs) were calculated for each proportion. We also performed a validation study by randomly selecting (using another computer-generated random number sequence) 7 of each set of 44 articles and having these examined by a second (and different) examiner.

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## RESULTS

The TABLE contains the proportions of deficient abstracts and 95% CIs for each journal, tabulated considering the abstract as the unit, as well as the types of deficiencies found in the 6 journals. The proportion of deficient abstracts ranged from a low of 18% to a high of 68%. Inconsistency between abstract and body was generally more common than omitted data (ie, data in the abstract not found in the body). A substantial proportion of deficient abstracts contained both kinds of defects (25/104; 24%).

In the validation study, 38 of the 42 paired comparisons were concordant with respect to identification of deficiencies. The  $\kappa$  value for agreement between the 2 evaluators was 0.81 ( $z = 5.22$ ;  $P < .001$ ).

## COMMENT

The frequency with which we found abstracts to be inaccurate, in the sense of containing information not verifiable in the article's main body (including tables and figures, as well as text) was surprisingly large, ranging from 18% to 68% in the 6 journals surveyed. The more common type of the 2 deficiencies was inconsistency between data in the abstract and those in the body. Giving data or other information in the abstract but not in the body was somewhat less common. These findings are all the more surprising considering that the journals studied are all prominent and highly regarded general medical publications whose editors were founding members of the International Committee of Medical Journal Editors, a respected standard-setting body. These journals have full-time professional staffs who can be presumed to devote a good deal of time

**Table.** Deficient Abstracts\*

Journal	% Deficient (95% CI)	Type of Deficiency, No.		
		Inconsistency	Omission	Both
A	18 (6-30)	2	2	4
B	43 (29-58)	12	5	2
C	30 (16-43)	6	4	3
D	45 (30-59)	9	7	4
E	32 (18-45)	6	7	1
F	68 (54-82)	15	4	11

\*Number of abstracts examined was 44 from each journal. CI indicates confidence interval.  $\chi^2 = 31.3$ ;  $P < .001$ .

and energy to editorial and production processes.

Many of the discrepancies identified were quite minor and not likely to cause serious misinterpretation. For example, 1 abstract<sup>2</sup> reported the population to consist of "42 consecutive patients," whereas the body indicated it to be "44 consecutive patients of which 42 agreed to participate." Sometimes, however, discrepancies were more serious; for example, 1 abstract<sup>3</sup> gave the estimated 15-year survival as 48%, whereas the body of the text indicated it to be 58%.

The specific question we asked in this study—Can the data and other information in the abstract be verified in the body of the article?—does not seem to have been examined before. Previous studies<sup>4,5</sup> of abstract quality generally involved overall or global assessment. Most of the recent literature on abstracts has concerned structured abstracts, introduced in 1987<sup>6</sup> with the goal of making abstracts more informative. Several investigations<sup>7-9</sup> indicated that structured abstracts are actually better in quality, more informative, more readable, and a more efficient use of readers' time. Structured abstracts may well offer all of these advantages, but there is little reason to expect them to reduce the types of deficiencies assessed in this study.

Indeed, if structured abstracts are more informative (ie, if they provide more information), they might be more likely to be subject to deficiencies we assessed. In the present study, we could not discern any relationship between various structured formats and the deficiencies assessed.

It is important to acknowledge that we addressed only 1 aspect of abstract accuracy in asking if what is in the abstract is consistent with the body of the article. There is another, at least equally important question: Is the important information in the article found in the abstract? Our study was not designed to address this question.

We found previously<sup>1</sup> that providing authors with specific instructions about abstract accuracy when they are revising manuscripts is ineffective in preventing the types of defects assessed in this study. If it is important that abstracts be as accurate as possible—and it can hardly be argued otherwise—and if authors cannot be counted on to provide this level of accuracy, the responsibility must be taken by journals' editorial staffs. As part of the copyediting process, the abstract needs to be scrutinized painstakingly on a line-by-line or even word-by-word basis and each bit of information verified individually and specifically.

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