Fig. 1 (A) H&E section showing breast carcinoma at a blue inked margin. (B) Corresponding AE1/AE3 IHC slide showing change of the blue dye colour to black.

possibility, the anatomical designation of an involved margin may be incorrect.

Margin re-excision specimens may be particularly problematic if the blue and black ink combination are used to mark the old and new margins. Often only two colours are used in these specimens and the shape of the tissue has little variation to assist with orientation.

It is particularly unfortunate that the problem is specific to the blue ink and results in its change to black, since these two colours are preferred by pathologists when scored for discernment of colour, intensity, and consistency of coverage⁵ and these colours are not subject to misinterpretation caused by red green colour blindness which affects 8% of males and 0.5% of females.

We have found no prior reference to this problem in the breast pathology literature. Williams *et al.* did describe this phenomenon in more general terms, when tissue was subjected to prolonged decalcification as well as H&E and IHC.⁶ They also saw the blue and the violet inks from DMS change to black after IHC. None of the samples in our study were decalcified. In all cases, the surgical records verify that the tissue was placed in formalin promptly after excision and certainly within less than 1 hour of cold ischaemic time recommended by the American Society of Clinical Oncology (ASCO)/College of American Pathologists (CAP) and endorsed by the Royal College of Pathologists of Australasia for optimal biomarker assessment.

Since becoming aware of this potential pitfall and carrying out a formal audit in the Ventana platform with the ultraView Universal DAB detection kit, we have found that a blue dye by a different manufacturer (CDI REF0728-2; Cancer Diagnostics Inc, USA) is colour-fast after IHC staining and we now use this product routinely.

We highlight a consistent colour change in the DMS tissue marking blue ink to black after IHC staining, independent of IHC platforms. Awareness of this pitfall may prevent potentially serious errors in anatomical designation of involved margins by pathologists.

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Understanding and using journal metrics: seeing past the numbers

Sir,

The Editorial by Delahunt *et al.*, asks the question ‘Publication metrics: what do they mean?’ and, after a discussion of the Journal Impact Factor (JIF) and CiteScore, dismisses publication metrics generally by answering the question posed with ‘not much’.¹ The meaning of any metric, I would argue, is not inherent in the metric, but dependent on the context in which it is presented and the purpose to which it is

applied. The Journal Citation Reports (JCR) provides that proper context, with full transparency to the content, citations and calculation of the JIF, as well as presenting the metric within a detailed report of journal performance.

JCR data are derived from all cited references in the six indexes comprising the Web of Science Core Collection: Science Citation Index Expanded, Social Sciences Citation Index, Arts and Humanities Citation Index, Emerging Sources Citation Index, Book Citation Index, and Conference Proceedings Citation Index. The coverage in these indexes has been curated for over 50 years according to the same principles: adherence to publication standards, editorial board and author publication records, contribution to global representation in the database, scholarly quality of the published materials, and citation analysis.^{2–4} Cited references from indexes hosted on the Web of Science platform are not included in JCR, as the coverage and indexing are not managed by Clarivate; errors and inconsistencies cannot be managed or corrected. The consistency and the quality of the sources and data are necessary to maintain the consistency and quality of the metrics.

The 2019 JCR summarises over 100 million cited references occurring in approximately 28,000 publications, journals, books, and proceedings.

The JCR journal profile page includes a range of metrics and data summaries that create a textured view of the content, citation network and author community that represent diverse aspects of the journal value.⁵ They show the volume and citation performance of Open Access materials,⁶ the countries and institutions of contributing authors, and over a dozen additional top-line metrics. Millions of individual data points are reported.

The JIF, among the millions, receives the most attention, so the most attention is given in the journal profile to support the understanding of this number and its derivation. Journal profiles show the JIF in the context of a journal's performance across time, as well as within a category of journals on the topic. Twenty-three years of data are available for *Pathology*, showing an increase from a JIF of 0.395 in 1997, to 3.744 in 2019. However, more salient is the fact that in 1997, *Pathology* ranked in the 13th percentile (4th quartile) of

journals in the pathology category, while in 2019 data, the journal is in the 79th percentile (1st quartile).

Eager for the release of the annual JCR, many editors, publishers and analysts began to use the Citation Report feature in the Web of Science to anticipate the value of the JIF. Without accounting for possible sources of error, this often results in a false expectation, either higher or lower than the JIF that is published weeks or months later. Some common sources of miscalculation are discussed below.

Web of Science continues to add content: JCR data are extracted from the Web of Science data file and held as a snapshot of the article and citation content on that date. A fixed data set is necessary in the JCR for stable and reproducible metrics, but the Web of Science receives daily updates of sources and citations to show the evolving scholarly landscape. Delayed publication schedules, as well as updates to the Web of Science coverage list will result in overcounting citations. A journal added to coverage in 2020 will usually have 2018 and 2019 back-year volumes indexed as well. These items and citations will contribute to a current citation count in the Web of Science, but were not present at the time of JCR extraction. At the time of this writing, 13 such items in Web of Science show citations to 2017 or 2018 content in *Pathology* but were not included in the JCR extraction.

Citations to all item types are included: JCR metrics consider citations to the journal across all content types — including Letters to the Editor and Editorials. This supports a richer consideration of how published content is incorporated into the literature, allowing the journal to be more than a list of research articles and reviews and the JIF more than an average citation count.⁷ The diversity of item-level performance and the contribution of non-scholarly items is represented in the Citation Histogram feature, released in 2018 (Fig. 1). This citation histogram can be mined to show that the 2019 JIF for *Pathology* included 505 citations to the articles and reviews published in 2017 or 2018; and an additional 77 to editorials and letters (non-scholarly content). Although the majority of editorials and letters, and a portion of the articles receive no citations in the JIF year (0 Times Cited display in Fig. 1), the presence of these materials is a

Fig. 1 Citation distribution graph from the journal profile page of *Pathology* in the 2019 JCR data.

necessary part of the journal's contribution to the literature and to the subject.

Unlinked citations: The histogram also shows 17 citations that were 'unlinked', that is, they clearly identify the journal *Pathology*, but incorrect or incomplete reference metadata prevented a link being created to any specific item. Not including unlinked citations is often a cause for under-counting journal citations when using Web of Science.

Including citations from Early Access content: The most complex source of error in prediction is due to Early Access content. From late 2017 onward, Clarivate has been expanding the indexing of Early Access content. In Web of Science, Early Access content is sorted according to the first publication date of the Version of Record,⁸ so that an item published online in 2019 would show as contributing to the 2019 count of citations. JCR policy, however, has remained focused on the final volume/issue publication.⁹ In 2019, the expansion of Early Access indexing made it more important to identify and exclude these citations when comparing Web of Science and JCR data. The increase in Early Access content on-boarding in the 2019 data resulted in a level of over-counting of citations by Web of Science relative to JCR that was much larger. Errors of under-counting (unlinked references, citations to non-citable items, etc) no longer out-weighed the errors of over-counting through including Early Access.

In reviewing the current Web of Science citation counts to *Pathology*, I identified 39 items and 40 citations that were indexed as Early Access content in 2019 by the Web of Science. Ten of these items still do not have a volume and issue assignment and remain 'Early Access'; the other 29 were assigned to a volume in 2020. All 39 items were excluded from the JCR citation count, and explain most of the over-count observed by Delahunt and co-authors.¹

Much of this will be resolved in the 2020 JCR, when cited references in 2020 Early Access content will be included as part of the JIF numerator.¹⁰

The Web of Science user interface is designed primarily for search and discovery within a rapidly evolving scholarly landscape. Sort, filter and analysis features allow users to generate simple bibliometric data, but the product is not designed to conduct advanced bibliometric analysis in the product interface. Fully detailed and transparent JIF data, and links to the Web of Science from JCR have improved the degree to which users can explore and validate the components of the JIF, allowing you to see past the numbers and into a more nuanced definition of journal performance. It's worth waiting for.

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Publication metrics: it really is all about the numbers

Sir,

In her response to our Editorial,¹ McVeigh asks us to see past the numbers.² We would argue that the numbers are the core business of Web of Science (WoS) and as such consistency, transparency and inclusion are paramount.

It is now apparent that the lack of consistency between data reported in daily updates of the WoS and the final Journal Impact Factor (JIF) reports, released in June the following year, are the result of major differences in the way the data have been collected for the two databases. We are advised that since 2017 the data in the WoS updates has increasingly included citations from early access content of journals. One of the problems with WoS updates prior to 2017 was that, although the end of the year was the cut off for citations and publications included in the JIF released the following June, citation data continued to be added to the daily WoS updates (and presumably to the JIF) right up to the time of the release of the JIF. In some years we have noted that citations continued to be received after the JIF was announced, although the JIF was not updated to reflect this increase in the citation numerator. The incorporation into the WoS updates of Early Access articles, which are articles published online in their final form prior to assignment to a completed issue, serves to largely circumvent this problem. Here papers are available for listing at the time of online publication rather than when they are available in a print issue, which may appear sometime after its declared publication date. It is noted in McVeigh's response that that 'journal profiles show the JIF across time'. Surely this also applies to the citations recorded