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Responsible dissemination of health and medical research: some guidance points

Raffaella Ravinetto [1], Jerome Amir Singh [2,3]

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[1]Public Health Department, Institute of Tropical Medicine, Antwerpen, Belgium
[2]Howard College School of Law, University of Kwazulu-Natal, Durban, South Africa
[3]Dalla Lana School of Public Health, University of Toronto, Toronto, Ontario, Canada

Correspondence to:
Dr Raffaella Ravinetto,
Public Health Department, Institute of Tropical Medicine, Antwerpen, Belgium;
rravinetto@itg.be

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Ravinetto and Singh argue that better practices can be implemented when disseminating research findings through abstracts, preprints, peer-reviewed publications, press releases and social media

Dissemination has been defined as 'the targeted distribution of information and intervention materials to a specific public health or clinical practice audience',[1] and as being 'simply about getting the findings of your research to the people who can make use of them, to maximise the benefit of the research without delay'.[2] Ethics guidelines concur that research stakeholders have ethical obligations to disseminate positive, inconclusive or negative results,[3] in an accurate, comprehensive and transparent way[4]—even more so during public health emergencies.[5]

Traditionally, research results were first shared within the scientific community, and then 'translated' into lay language for policymakers and other audiences via the media, policy briefs, lobbying. Today, preprints[6] and press releases[7] often come first. Dissemination of research findings to research participants and communities requires contextualised approaches and have been explored elsewhere.[4] Similarly, trial registries[8] and data sharing are explored elsewhere in this series. Here, we navigate the challenges and opportunities presented by dissemination through peer-review publications, abstracts, preprints, press release, media coverage and social media (box 1—summary of research dissemination).

Peer-reviewed publications

Publication in peer-reviewed journals remains the benchmark dissemination modality. Independent peer-review aims to assure the quality, accuracy and credibility of reports, but does not always prevent the publication of poorly written, dubious or even fraudulent manuscripts,[9] particularly if there is dearth of qualified reviewers, and/or an findings are hastily published to gain competitive advantage and visibility.[10] Furthermore, researchers who are inexperienced or subject to an institutional ethos of 'publish or perish', may choose to publish in predatory journals with highly questionable marketing and peer-review practices.[11] While target audiences may be unable to access findings if journal content is not freely accessible on the Internet, some researchers, particularly those in resource-constrained settings[12] may be unable to publish their research due to resource constraints (eg, publication fees may be prohibitively high).[13] Some may be poorly motivated to publish inconclusive or negative data.[14] Because of such shortcomings, commentators such as Horby warn that 'clinicians should not rely solely on peer review to assess the validity and meaningfulness of research findings'.[15]

For peer-reviewed publications to remain a key-dissemination modality, editors should follow the *Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals*, of the International Committee of Medical Journal Editors, and comply with the *core practices* of the Committee on Publication Ethics (eg, data and reproducibility, ethical oversight, authorship and contributorship, etc.). This entails going beyond a 'checklist approach' and subjecting manuscripts to rigorous screening and assessment. Journals should strive to select qualified independent reviewers and prioritise open-access policies. Research institutions should distance themselves from a 'publish or perish' culture which, together with the willingness to hide 'unfavourable' results, remains a major driver of unethical publication practices—which, in turn, translates to ill-informed policies and practices.[16]

Abstracts

Scientific conferences are valuable venues for sharing research results with peers, and getting prepublication critical feedback. Abstracts often appear in the supplement of a scientific journal, which reaches a broader audience. However, even if attendance costs are not prohibitively expensive, the selection of abstracts may be highly competitive. As a result, not all research findings—even of topical interest—are selected. Furthermore, even if selection is conducted by independent experts, the limited information contained in an abstract may mask scientific and/or ethical shortcomings in the work.

Communication via abstracts is laudable, but should be rapidly followed by peer-reviewed publications, which allows for the findings to be comprehensively reviewed by experts. When abstracts remain the sole source of information, the findings' significance might be misunderstood, overestimated or wrongly used to guide behaviours, policies and practices.

Preprints

Preprints, that is, preliminary reports of work not yet peer-reviewed, are uploaded in dedicated free-access servers, such as https://www.medrxiv.org/. Preprints are increasingly being used by health

Box 1 Summary of research dissemination

What—Dissemination of health and medical research entails communicating the findings of research to stakeholders in ways that can facilitate understanding and use.
Why—Any positive, inconclusive or negative research findings should be disseminated to maximise the social value of the research and to accurately inform medical policies and practices.
When—Dissemination of health and medical research should occur as soon as possible after completion of interim and final analysis, particularly during public health emergencies.
Who—Researchers, research institutions, sponsors, developers, publishers and editors must ensure the timely and accurate dissemination of research findings. Similarly, the scientific community should critically appraise research findings; policymakers and clinicians should weigh the implications of research findings for policy and clinical practice; while mainstream media should communicate the implications of research findings to the general public in a manner that facilitates understanding.
How—Research findings are primarily disseminated via press releases, preprints, abstracts and peer-reviewed publications. To ensure timely, comprehensive, accurate, unbiased, unambiguous and transparent dissemination, all research stakeholders should integrate ethics and integrity principles in their institutional dissemination policies and personal belief systems.

researchers, thanks to the evolving policies of major journals that now accept manuscripts previously posted as preprints.[17] Theoretically, preprints possess high value as they allow for rapid, open-access dissemination, and immediate yet informal peer-appraisal in the comments section. However, preprints also hold implicit risks. For instance, rapidity may detract from quality and accuracy; most peers will not be able to systematically invest time for the expected high-quality feedback; rushed or inexperienced readers may miss the (sometimes, small print) cautioning that preprints should not be considered established information, nor become the basis for informing policy or medical guidelines; and findings from preprints that may later be substantially revised or rejected after undergoing peer-review processes, could continue to be relied on and disseminated if, for example, they were included in scoping or systematic reviews before peer-review (the same applies to retracted peer-reviewed manuscripts).

To mitigate such risks, researchers should submit preprint manuscripts to a peer-reviewed journal as soon as reasonably possible, and transparently communicate on negative peer-review outcomes, or justify why the preprint is not being timeously submitted to a peer-review journal. Once accepted or published, researchers could remove their preprint from preprint servers or link to the final published version. The media have a duty to communicate preprint findings as unreviewed and subject to change. The scientific community should reach agreement on 'Good Preprint Practices' and ascribe less ambiguous terminology to preprints (eg, 'Not peer-reviewed' or 'Peer-review pending').[18]

Press releases, media coverage and social media

Since 2021, the dissemination of clinical trial findings by corporate press release has almost become synonymous with announcements of COVID-19 scientific breakthroughs. Therefore, it seems important to briefly contextualise the strategy underpinning such dissemination. Corporate press releases are often preceded by stock repurchasing or 'buybacks', that is, companies buy back part of their own stock held by executives. This increases demand for the stock and enhances earnings per share.[19] Pharmaceutical or biotechnology companies typically engage in strategically timed buybacks, before press releases announcing significant research findings. Furthermore, corporates in the USA and elsewhere may employ press releases to comply with the legal requirements to disclose information that impact on their market values, and changes in their 'financial conditions and operations'.[20] Press releases are typically drafted by marketing experts and they are often first aimed at the market, and driven by corporate interests rather than social value.

For researchers, the potential to amplify scientific visibility through mass media may act as a powerful incentive to indulge in flattering but inaccurate language. Nonetheless, they have a moral responsibility to review press releases for accuracy, and to immediately make key-information including the protocol, analysis plan and detailed results, publicly available. For instance, the media briefing that announced on 16 June 2020 the life-saving benefit of dexamethasone in severe COVID-19 was followed on 26 June by a preprint with full trial results[15] . In ab sence of such good practices, press releases can contain inaccuracies or overhype findings[7] with major damaging downstream effects.[16]

The media have an equally significant impact on science dissemination: peer-reviewed publications which receive more

Box 2 Recommendations for journalists

Recommendations for journalists who cover (early) press release
A. Always be conscious of the power of the media to shape the views, fears and beliefs of the public, in the short term, medium term and long term.
B. Weigh the tone and the extent of coverage afforded to press releases, based, among other factors, on:
⇒ A critical appraisal of whether the press release was preceded by stock buyouts and/or aimed at influencing corporates share values.
⇒ A critical appraisal of the science underpinning the press release, such as the sample size, study population representativeness (for instance, age, sex, ethnicity), research questions that are not addressed yet, and any omissions of potential harms.
⇒ A recourse to the views of independent scientists, paying attention to any declared or undeclared conflicts of interest that may bias their opinions.
C. Critically appraise the accuracy and possible biases of (independent) scientists' opinions on press releases, when shared on personal social media feeds, before deciding whether to afford coverage to such views.
D. Afford the same coverage given to the initial press release (or more, if necessary) to any significant follow-up information-related thereto.

Table 1 Summary of the recommendations for good dissemination practices

Dissemination modality	Recommendation
Peer-reviewed publication	Avoid predatory journals (researchers, research institutions)
	Publish all findings, even if 'negative' or inconclusive (researchers, research institutions, developers)
	Avoid fostering an institutional 'publish or perish' culture (research institutions)
	Publish open access when possible (researchers, research institutions, developers)
	Adopt fair prices for open access publication fees (publishers)
	Rigorously ensure compliance with ICMJE requirements, beyond a checklist approach (editors of medical journals)
	Rigorously ensure compliance with COPE core practices, beyond a checklist approach (editors of medical journals)
Abstracts	Ensure they are rapidly followed by (preprint and) peer-reviewed publication (researchers, research institutions, developers)
Preprints	Ensure they are rapidly followed by peer-reviewed publication (researchers, research institutions, developers)
	Be transparent about lack of submission to peer-review journals or rejection. On peer-review publication, withdraw preprint or add a link to the final publication (researchers, research institutions, developers).
	Present preprints contents as 'non-confirmed yet' (researchers, research institutions, developers, mainstream media)
	Develop formal 'Good Preprint Practices' (scientific community, editors of medical journals)
	Agree on a non-ambiguous terminology, such as 'Not peer-reviewed' or 'peer-review pending' (scientific community, editors of medical journals)
Press releases	Ensure accuracy, clarity and completeness of contents (research, research institutions, developers)
	Immediately make key information, for example, protocol, analysis plan and detailed results, publicly available (research, research institutions, developers)
	Critically appraise press release for ethics, science and biases, and afford coverage to further communications accordingly (mainstream social media, journalists, social media actors, opinion leaders)
	Be mindful about personal comments, particularly but not only in social media feeds (researchers, opinion leaders)
	Be cautious about disseminating scientists' opinions shared on personal social media feeds (mainstream media, journalists, social media actors)
All modalities	Disseminate in a timely, comprehensive, accurate, unbiased, unambiguous and transparent manner (researchers, research institutions, developers)
	Critically appraise all information before commenting, disseminating to secondary audiences or use (opinion leaders, mainstream media, journalists, social media actors, policy-makers in health systems, regulators, clinicians)

COPE, Committee on Publication Ethics; ICMJE, International Committee of Medical Journal Editors.

attention from lay-press, are more likely to be cited in scientific literature.[21] Perceived media credibility also impacts on dissemination: once individuals trust a media source,[22] they often let down their guard on evaluating the credibility of that source. This speaks to the importance of discerning media dissemination (box 2). Journalists who cover early press releases should critically appraise them considering their limitations and potential conflicts of interest.

A call for good dissemination practices

The scientific community, health system policy-makers and regulators are the primary audience of peer-reviewed manuscripts, abstracts and preprints. These constituents should be, or become, 'sufficiently skilled in critical thinking and scientific methods that they can make sensible decisions, regardless of whether an article is peer reviewed or not'[15] ; understand that the nature of scientific knowledge is incremental and cumulative (one study seldom changes practice on its own); and also critically assess other sources, for example, pharmacovigilance, etc. Conversely, corporate press releases are aimed at influencing the market, and society as a whole—and not suited for scientific appraisal.

Irrespective of dissemination modalities, upstream information is cascaded to mainstream and social media, spreading knowledge but risk catalysing misunderstanding or overemphasis. Risks are only partially mitigated by *independent* quality control on the upstream information (relatively stringent in peer-review, weaker in preprints and abstracts, and virtually absent for press releases). In table 1, we summarise recommendations for good dissemination practices, aimed at researchers, research institutions, developers, medical journals editors, media, journalists, social media actors, medical opinion leaders, policy-makers, regulators and the scientific community. All these stakeholders should integrate ethics and integrity in their policies and behaviours, to ensure timely, comprehensive, accurate, unbiased, unambiguous and transparent dissemination of research findings.

Twitter Raffaella Ravinetto @RRavinetto

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ORCID iDs
Raffaella Ravinetto http://orcid.org/0000-0001-7765-2443
Jerome Amir Singh http://orcid.org/0000-0002-6275-6853

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