Examining the Impact of the National Institutes of Health Public Access Policy: A Case Study
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Introduction & Research Purpose
As of April 7, 2008, all peer-reviewed articles resulting from research funded by the National Institutes of Health (NIH) are required to be submitted to PubMed Central (PMC).

The Law: The NIH Public Access Policy implements Division G, Title II, Section 218 of PL 110-161 (Consolidated Appropriations Act, 2008) which states: SEC. 218. The Director of the National Institutes of Health shall require that all investigators funded by the NIH submit or have submitted for them to the National Library of Medicine's PubMed Central an electronic version of their final, peer-reviewed manuscripts upon acceptance for publication, to be made publicly available no later than 12 months after the official date of publication.

It is reported that research made freely available will be accessed and cited more than articles only available through subscriptions. This study seeks to measure the potential impact of the NIH policy to date.

The year 2009 represents the first full year in which the NIH policy has been in place. Articles published in 2009 and funded by the NIH should have a freely accessible version available in PMC by sometime in 2010. What impact has the free accessibility of the PMC articles had on their citation rates compared to articles that appeared in the same journals but not deposited in PMC?

Methodology
- PubMed searches by author affiliation for the institution examined in the study were performed and limited to the year 2009. The retrieved articles were grouped into two categories: articles available in PMC and articles not available in PMC. Verification of presence in PMC was determined by the presence of a PMCID in PubMed.
- A journal's impact factor is based on the number of times a journal is cited and thus, it was important that the two groups of journal articles not have differing impact factors. A high journal impact factor could be a contributing cause to the number of times an article is cited. To avoid this confounding issue, PMC articles and non-PMC articles from the same journal were matched. If a PMC / non-PMC matching journal pair could not be made, the articles were dropped from the study.
- To avoid further confounding influences, the researchers excluded articles published in open access journals or published in journals where the content became freely accessible after an embargo period.
- The journal's impact factor for each publication group (PMC articles / non-PMC articles) were downloaded from Web of Science, Google Scholar, and Scopus to determine the total number of journal articles for each article.
- The journal's impact factor for each publication group (PMC articles / non-PMC articles) were downloaded from Web of Science, Google Scholar, and Scopus to determine the total number of journal articles for each article. The total number of journal articles for each publication group (PMC articles / non-PMC articles) were compared to determine what if any differences existed in the number of journal articles between the freely available PMC articles and the non-open access articles.

Results

<table>
<thead>
<tr>
<th>Citing References For Each Article by Database Including Total Unique Citations Retrieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>WOS Total Cited References</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>PMC articles (n=165)</td>
</tr>
<tr>
<td>Non-PMC articles (n=165)</td>
</tr>
<tr>
<td>Difference in Cited References</td>
</tr>
</tbody>
</table>

* Differences are not statistically significant.

Discussion/Conclusions
- The results suggest that the NIH public access policy has led to an increased impact for the research due to availability through PMC. However, differences were not statistically significant.
- The sample size may be too small and not enough time may have passed to allow the articles to be fully cited.

Future Areas of Research
- Obtain a larger sample size; ensure two groups do not differ on other factors in addition to journal impact factors (i.e. topic area, funding).
- Compare articles in PMC due to the NIH Public Access Policy to those not in PMC but that also received NIH funding.
- Study 2009 articles over a longer period of time as most articles will see significant citation impact for many years after the publication date but not as much in the first two years.
Examining the impact of the National Institutes of Health Open Access Policy: A Case Study

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Abstract:

Objectives: As of April 7, 2008, all peer-reviewed articles resulting from research funded by the National Institutes of Health (NIH) are required to be submitted to PubMed Central (PMC). It has been reported that research made freely available will be accessed and cited more than articles only available through subscriptions. This study seeks to measure the potential impact of the NIH policy to date.

Methods: Searches by author affiliation for the institution examined in the study were run for the year 2009 in PubMed. The results were further limited to articles funded through NIH, creating two lists of articles: those funded and those not funded by NIH. Verification of presence in PMC was determined by the presence of a PMCID in PubMed. To avoid confounding, the researchers excluded articles published in open access journals. The cited references for each publication in each list were downloaded from Web of Science, Google Scholar, and Scopus to determine the total number of citing references for each article. The total number of citing references were compared to determine what if any differences existed in the number of citing articles between open access articles and non-open access articles.

Results: Typically, Google Scholar found the greatest number of citing reference for each article, while Web of Science presented the fewest number of citing references for both PMC and non-PMC articles. The number of citing references for PMC articles was overall higher than the citing references for non-PMC articles.

Discussion: The results indicate that the NIH public access policy has led to an increased impact of research due PMC availability. However, a methodological flaw was noted where the PMC articles selected for this study came from journals with a slightly higher impact factor than the journals that provided the non-PMC articles. The methodology is being revised to overcome the confounding variable.

Primary Presenter:
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