Maximising the impact of research publications – a funder’s perspective

STM – Publication impact
19 November 2015

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Wellcome Trust
The Wellcome Trust

- Set up in 1936 under the will of Sir Henry Wellcome.

- Our philosophy:
  - Good health makes life better. We want to improve health for everyone by helping great ideas to thrive.

- Our framework:
  - We support great ideas and inspired thinking.
  - We bring ideas together to make a big difference.
  - We change ways of working so more ideas can flourish.

- We intend to spend up to £5 billion over the five years to 2020.
The “Impact Agenda”

- **Research Excellence Framework**
  - 20%: ‘reach’ and ‘significance’
  - Case studies

- **RCUK**
  - “the demonstrable contribution that excellent research makes to society and the economy”
  - *Pathways to Impact*: “Grants will not be allowed to start until a clearly thought through and acceptable Pathways to Impact statement is received.”

- **Wellcome Trust**
  - We want to improve health
  - No specific requirements at application stage
# Monitoring progress: WT’s key indicators

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Key indicators of progress</th>
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<tr>
<td><strong>Discoveries</strong></td>
<td>1. significant advances in the generation of new knowledge</td>
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<td>2. contribute to discoveries with tangible impacts on health</td>
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<td><strong>Applications</strong></td>
<td>3. contribute to the development of enabling technologies, products and devices</td>
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<td>4. uptake of research into policy and practice</td>
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<td><strong>Engagement</strong></td>
<td>5. enhanced level of informed debate in biomedicine</td>
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<td></td>
<td>6. significant engagement of key audiences &amp; increased reach</td>
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<td><strong>Research leaders</strong></td>
<td>7. develop a cadre of research leaders</td>
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<td></td>
<td>8. evidence of significant career progression among those we support</td>
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<td><strong>Research environment</strong></td>
<td>key contributions to the creation, development and maintenance of major research resources</td>
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<td></td>
<td>10. contributions to the growth of centres of excellence</td>
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<td><strong>Influence</strong></td>
<td>11. significant impact on science funding &amp; policy developments</td>
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<td>12. significant impact on global research priorities and processes</td>
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Reporting outputs / outcomes / impacts:

- Publications
- Collaborations
- Further Funding
- Infrastructure & Equipment
- Training & Capacity
- Recruitment & Careers
- Technologies & Products
- Clinical Trials & Interventions
- Spin Outs & Companies
- Scientific Communications & Media
- Public Engagement
- Policy
- Prizes & Awards
What can publishers do to help

- Provide article-level metrics
Publication impact - citations

Article level metrics vs. Journal level metrics

- Cited 2904 times;
- Normalised Citation Impact = 327;
- Acta Crystal D JIF = 7.232

*PHENIX: a comprehensive Python-based system for macromolecular structure solution*

Macromolecular X-ray crystallography is routinely applied to understand biological processes at a molecular level. However, significant time and effort are still required to solve and complete many of these structures because of the need for manual interpretation of complex numerical data using many software packages and the repeated use of interactive three-dimensional graphics. *PHENIX* has been developed to provide a comprehensive system for macromolecular crystallographic structure solution with an emphasis on the automation of all procedures. This has relied on the development of algorithms that minimize or eliminate subjective input, the development of algorithms that automate procedures that are traditionally performed by hand and, finally, the development of a framework that allows a tight integration between the algorithms.
Beyond citations – Article level metrics

An atlas of genetic correlations across human diseases and traits


Affiliations | Contributions | Corresponding authors

Nature Genetics 47, 1236–1241 (2015) | doi:10.1038/ng.3406
Received 02 February 2015 | Accepted 26 August 2015 | Published online 28 September 2015

Page views

Mentions in news, blogs & Google+

Twitter demographics

Total citations

Online attention

This Altmetric score means that the article is:
• in the 99th percentile (ranked 1,980th) of the 100,01 similar age in all journals
• in the 92 percentile (ranked 5th) of the 64 tracked articles of a similar age in Nature Genetics
RNA-programmed genome editing in human cells

Martin Jinek, Alexandra East, Aaron Cheng, Steven Lin, Enbo Ma, Jennifer Doudna

Howard Hughes Medical Institute, University of California, Berkeley, United States; University of California, Berkeley, United States; Lawrence Berkeley National Laboratory, United States

DOI: http://dx.doi.org/10.7554/elife.00471
Published: January 28, 2013
Cite as: eLife 2013;2:e00471

HTML views

20,421

PDF downloads

6,587

saved and cited

CiteULike
1 Saved

Mendeley
437 Saved

CrossRef
132 Citations

Scopus
127 Citations

PubMed Central
86 Citations

Europe PubMed Central
116 Citations

F1000Prime
4 Score

Citations via Google Scholar

Discussed

Facebook
3 Likes

Wordpress.com
5 Citations
• 2012 Trust-associated paper in *PLOS Neglected Tropical Diseases*.

• Cited very few times, but discussed extensively on social media.

• However, likely due to funny title rather than genuine public engagement.
Altmetrics – potential to show impact outside academia

Industry Use of Evidence to Influence Alcohol Policy: A Case Study of Submissions to the 2008 Scottish Government Consultation

Jim McCambridge, Ben Hawkins, Chris Holden

Published: April 23, 2013 • DOI: 10.1371/journal.pmed.1001431
Engagement and Influence

C_Stihler_MEP @petericev2 now commenting on today’s article exposing tactics of alcohol industry. Link beneath http://t.co/88r2Wdjw9K
Apr 24, 2013

bermaninstitute #PLOSMedicine: Industry Use of Evidence to Influence Alcohol Policy: Case Study of Submissions to 2008 Scottish Govt
http://t.co/fox0UpWlP
Apr 24, 2013

RTaylor_MEP #LSHTM publishes article suggesting #alcohol industry submissions on #Scottish alcohol policy are misleading:
http://t.co/zEsYTFQwJ4
Apr 24, 2013

MaroaskaRovers “@veitchemna Alcohol industry influence on policy. http://t.co/4dB7RuYnkd @plosmedicine” As expected comparable to tobacco industry.
Apr 24, 2013

veitchemna Alcohol industry influence on policy: misrepresented strong evidence and promoted weak evidence. http://t.co/WWszV5MMLw
@plosmedicine
Apr 24, 2013

andy_rowell Big Alcohol, Bad Habits: RT@PLOSMedicine: Drinks industry attempted to influence Scottish Government’s alcohol policy
http://t.co/nxbAv9Dnks
Apr 24, 2013

IOGTint RT @SCPHRP MT @PLOSMedicine Drinks industry attempted to influence Scottish Government’s alcohol policy
http://t.co/CSFKU1wkW #bigalcohol
Jun 3, 2013

SojiAdeyi Shaken and stirred. @PLOSMedicine: Drinks industry attempted to influence Scottish Government’s #alcohol policy
http://t.co/na8QSdlx3
Apr 24, 2013
Case studies – telling us more than metrics can
Research careers: Nazneen Rahman

Nature Genetics paper: ‘ATM mutations that cause ataxia-telangiectasia are breast cancer susceptibility alleles’

Nature Genetics paper: ‘PALB2, which encodes a BRCA2-interacting protein, is a breast cancer susceptibility gene.’

Nature Genetics paper: ‘Genome wide association study identifies five new breast cancer susceptibility loci’
Trials for drinkable one-dose typhoid vaccine reach end of phase II

Impact:
- Emergent BioSolutions has completed a phase II trial of a single-dose drinkable typhoid vaccine, which requires health practitioners to see the patients only once to prevent life-threatening typhoid fever.
- Plans for a phase III trial of the vaccine have stalled, as the company has been unable to assemble a funding consortium.

There are 22 million cases of typhoid worldwide each year. Caused by *Salmonella typhi*, the disease is particularly endemic in countries with compromised sanitation and water supplies.

Emergent BioSolutions was previously in 2007/08 for its development of a single-dose drinkable typhoid vaccine. It received funds in 2005 for its vaccine, a live attenuated vaccine for the *S. typhi* bacterium. It aims to eliminate virulence by deleting two specific genes.

The phase II study in Vietnam was successful, showed that the vaccine was safe and eliciting an immune response in 97 per cent of children who received a dose. The company then announced plans for a ‘bridge study’ in the USA as a prelude to further clinical trials at population level.

Major malaria study leads WHO to revise treatment guidelines

Impact:
- The AQUAMAT study concluded that the drug artesunate should be the preferred treatment for severe malaria in both children and adults worldwide.
- The study led the WHO to revise its guidelines for the treatment of the disease in African children.

Severe malaria kills nearly 1 million people each year, mainly young children and pregnant women. In 2005, a major trial in patients with severe malaria showed that artesunate, given by injection, reduced the death rate compared with quinine, the standard treatment. However, this trial was conducted in Asia and most of the patients studied were adults, so there was uncertainty over whether artesunate injections should replace quinine as a treatment for children.

Now, the AQUAMAT study ('African quinine versus artesunate malaria trial') has recommended that artesunate should be used in both children and adults worldwide. The randomised controlled trial, which involved researchers across Africa and scientists in Thailand and the UK, enrolled 5,425 children hospitalised with severe malaria across nine countries. The results showed a 22.5 per cent reduction in mortality among those treated with artesunate compared with quinine.

The trial was led by Professor Nick White of the Wellcome Trust–Mahidol University–Oxford Tropical Medicine Research Programme in Bangkok, and was funded entirely by the Trust. As a result of the findings, the World Health Organization has changed its treatment guidelines to recommend artesunate as the first-line treatment in the management of severe malaria in African children.
What can publishers do to help

- Provide added content
Added content – data, images, etc.
Editors’ Summary

Background

Worldwide, more than a billion people are infected with soil-transmitted helminths (STHs), parasitic worms that live in the human intestines (gut). These intestinal worms, including roundworm, hookworm, and whipworm, mainly occur in tropical and subtropical regions and are most common in developing countries, where personal hygiene is poor; there is insufficient access to clean water, and sanitation (disposal of human feces and urine) is inadequate or absent. STHs colonize the human intestine and their eggs are shed in feces and enter the soil. Humans ingest the eggs, either by eating contaminated food or eating uncooked vegetables grown in such soil. Hookworm may enter the body by burrowing through the skin, most commonly when bare-footed individuals walk on infected soil. Repeated infection with STHs leads to a heavy parasite infestation of the gut, causing chronic diarrhea, intestinal bleeding, and abdominal pain. In addition, the parasites compete with their human host for nutrients, leading to malnutrition, anemia, and, in heavily infected children, stunting of physical growth and slowing of mental development.

Why Was This Study Done?

While STH infections can be treated in the short-term with deworming medication, rapid re-infection is common, therefore a more comprehensive program of improved water, sanitation, and hygiene (WASH) is needed. WASH strategies include improvements in water access (e.g., water quality, water quantity, and distance to water), sanitation access (e.g., access to improved latrines, lithi maintenance, and local sludge management), and hygiene practices (e.g., handwashing before eating and/or after defecation, water treatment, soap use, wearing shoes, and water storage practices). WASH strategies have been shown to be effective for reducing rates of diarrhea and other neglected tropical diseases, such as trachoma; however, there is limited evidence linking specific WASH access or practices to STH infection rates. In this systematic review and meta-analysis, the researchers investigate whether WASH access or practices lower the risk of STH infections. A systematic review uses predefined criteria to identify all the research on a given topic; a meta-analysis is a statistical method that combines the results of several studies.

What Did the Researchers Do and Find?

The researchers identified 94 studies that included measurements of the relationship between WASH access and practices with one or more types of STHs. Meta-analyses of the data from 35 of these studies indicated that overall people with access to WASH strategies or practices were about half as likely to be infected with any STH. Specifically, a lower odds of infection with any STH was observed for those people who used treated water (odds ratio [OR] of 0.46), had access to sanitation (OR of 0.66), wore shoes (OR of 0.30), and use soap or have soap availability (OR of 0.53) compared to those without access to these practices or strategies. In addition, infection with roundworm was less than half as likely in those who practiced handwashing both before eating and after defecating than those who did not practice handwashing (OR of 0.51 and 0.55, respectively).

What Do These Findings Mean?

The studies included in this systematic review and meta-analysis have several shortcomings. For example, most were cross-sectional surveys—studies that examined the effect of WASH strategies on STH infections in a population at a single time point. Given this study design, people with access to WASH strategies may have shared other characteristics that were actually responsible for the observed reductions in the risk of STH infections. Consequently, the overall quality of the included studies was low and there was some evidence for publication bias (studies showing a positive association are more likely to be published than those that do not). Nevertheless, these findings confirm that WASH access and practices provide an effective control measure for STH. Controlling STHs in developing countries would have a huge positive impact on the physical and mental health of the population, especially children, therefore there should be more emphasis on expanding access to WASH as part of development guidelines and targets, in addition to short-term preventative chemotherapy currently used.
What can publishers do to help

- Open access
- CC-BY licence
Open access publications have more views

“Web traffic to 722 articles published in the first 6 months of 2013 and found that open-access articles were viewed three times as often as subscription articles in html format, and twice as often in PDF format.”

The future of sex: The first female condoms were derided, mistrusted and shunned - but will their modern counterparts catch on?

In 1987, an American pharmaceutical executive called Mary Ann Leeper flew to Copenhagen to get a first-hand look at what she thought might be the world's next great health innovation. She didn't expect to find it tucked away inside an old cigar box.

1. Excitement
¿El futuro del sexo?

Aunque su 'sex appeal' se haya equiparado al de una medusa, y su aspecto al de una bolsa de plástico, el condón femenino va camino de transformarse en la gran novedad del sexo seguro. Casi dos décadas después de su presentación en sociedad y con solo el 1,6% del mercado, un punado de investigadores, ingenieros y empresarios va a presentar un amplio repertorio de condones vaginales rediseñados y reinventados.

Female condoms article – translated into Spanish; reaching a new audience

Article about polio in Hungary – translated into Hungarian
What can publishers do to help

- Provide article-level metrics
- Provide added content
- Open access
  - CC-BY licence
thank you

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