



Next-generation altmetrics: responsible metrics and evaluation for open science

**EU Expert Group Altmetrics
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Economics;*

Paul Wouters, Leiden University

*Team Leader-Open science policy coordination and
development: Rene von Schomberg*



Aims

- ✓ *assess role (alt)metrics in research evaluation*
- ✓ *consider how altmetrics can be developed for **open science***
- ✓ *engage stakeholders*
- ✓ *consider implications of metrics*
 - ✓ *Positive and negative*
- ✓ *explore altmetrics for impacts, research actions, in Horizon 2020 and in the next framework programme*

Before starting to measure ...

- ✓ *Decide what matters and how to measure it*
- ✓ *Then decide if there are available indicators for the task*
- ✓ *If not develop new indicators*
- ✓ *Check validity and reliability !*
- ✓ *Take into account that measurements influence the measured processes*

“Not everything that can be counted counts, and not everything that counts can be counted”
(attributed to Albert Einstein)

Traditional metrics

Based on citation and publication counts are not sufficient

- ✓ *Citations take time to accumulate*
- ✓ *IF often used as a proxy for citation count*
- ✓ *h-index*
- ✓ *Disciplinary differences in publication and citation culture*
- ✓ *Ignore societal impact*

(As expressed in DORA, Leiden Manifesto, Metric Tide)

Traditional metrics

However this does not mean that they need to be abandoned, or that are useless for the assessing open science

Some examples

- ✓ *Measuring citation advantage of open access publications*
- ✓ *Collaboration in open science projects*
- ✓ *Usage (downloads, views, reads)*



Altmetrics

Intend to capture and measure additional aspects of scholarly information

✓ *Altmetric advantage*

✓ *Increased visibility of researchers/publications (showcasing)*

✓ *Expanding our view of what impact looks like*

✓ *Exposing research to the public*

✓ *Involving the public*

✓ *Discussion/commenting*

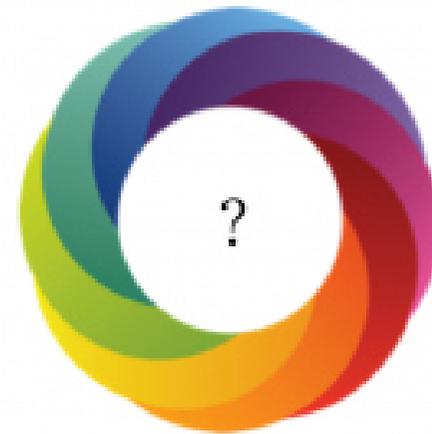
✓ *Including non-traditional sources (blogs, data, software, tools)*

✓ *Altmetric events can be measured/counted*

✓ *Altmetric events occur **fast***

Altmetrics - challenges

- ✓ *Coverage*
- ✓ *Transparency*
- ✓ *Validity*
- ✓ *Dynamics*
- ✓ *Disciplinary differences*
- ✓ *Gaming*
- ✓ *Acceptance*
 - ✓ *Research community*
 - ✓ *Decision makers*



http://blogs.biomedcentral.com/wp-content/image_archive/altmetric.png

Bibliometrics

Peer review



Altmetrics

https://www.simpson.one/s/cc_images/cache_5223246.png?t=1480081323





Development of recommendations

EU Expert Group Altimetrics
Isabella Peters

Development of recommendations



Answers to Call for Evidence

Respondents N =20, 19 valid responses



companies: 1



individuals: 4



publishers: 4



research
institutions: 4



associations, learned
societies: 6

Answers to Call for Evidence

Respondents N =19

Countries

- 1 = Sweden, Switzerland, Poland, Romania, Belgium, Netherlands
- 3 = Germany, France
- 7 = UK



Answers to Call for Evidence

Reasons for not using altmetrics

no dynamics
skewness of data
no substitute for peer review
limited uptake of social media
biases
misuse gaming
flatten science
no standards
closed metrics
no one-fits-all
lack of reproducibility
not well studied
need to keep pace
never neutral
do not acknowledge diversity
what to infer
misleading term
citations are gold-standard



Answers to Call for Evidence

Reasons for not using altmetrics

- › “altmetrics are not seriously regarded as tools for assessment” (LERU)
- › “researchers think that altmetrics are a fun way of seeing their impact” (VA Sweden)
- › “citations are not fungible” (JISC)
- › “open science doesn't change the view on metrics – all issues of metrics also apply on open science – all traditional metrics can be applied to open science” (Helmholtz Open Science Coordination Office)



Answers to Call for Evidence

Potential for altmetrics

research emergencies
trending topics
foresight vision
addition to citations
post-hoc assessment
self-assessment
information about users & beneficiaries
acknowledge diversity
faster
applicable to various research outputs & activities
options for text and data mining
public engagement
policy relevance
budget allocation
interdisciplinarity
track dissemination of concepts & results
author-level metrics
impact on society & economy

Answers to Call for Evidence

How to make metrics work? Prerequisites





Recommendations

Report available now:

<https://tinyurl.com/nextgenmet>



Recommendations

- **5 headline findings**
- **12 targeted recommendations organised under four of the headings of the European Open Science Agenda:**
 - Foster open science
 - Remove barriers to open science
 - Develop research infrastructures for open science
 - Embed open science in society





Headline findings

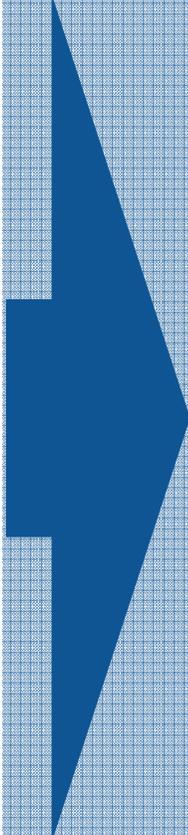
- No perfect metrics: neither alternative, nor traditional
- Responsible use of metrics is key
- Open science requires open metrics



Selected recommendations

| Recommendations | Short Term Goals | Long Term Goal |
|--|---|---|
| Ground an open science system in a mix of expert judgement, quantitative, and qualitative measures | Provide guidelines for responsible metrics in support of open science |  <p>Fostering open science</p> |

Selected recommendations

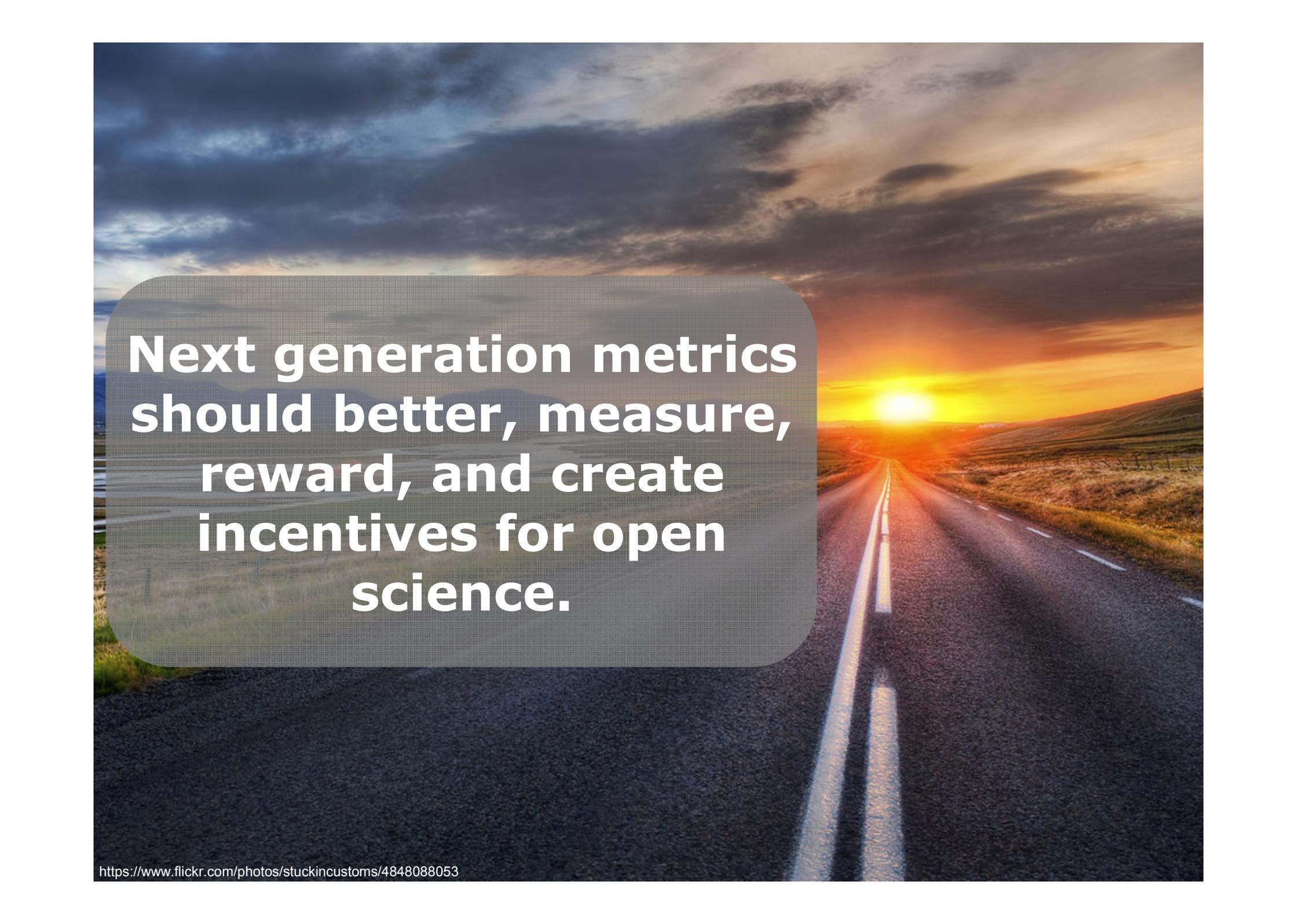
| Recommendations | Short Term Goals | Long Term Goal |
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| Ground an open science system in a mix of expert judgement, quantitative, and qualitative measures | Provide guidelines for responsible metrics in support of open science |  <p>Fostering open science</p> |
| Make better use of existing metrics for open science | Assess suitability of indicators, encourage development of new indicators | |

Selected recommendations

| Recommendations | Short Term Goals | Long Term Goal |
|--|---|--|
| Open, transparent and linked data infrastructure for metrics in open science | Use open metrics and reward adoption of open science principles and practices |  <p>Removing barriers to open science</p> |
| | | |

Selected recommendations

| Recommendations | Short Term Goals | Long Term Goal |
|--|---|--|
| Open, transparent and linked data infrastructure for metrics in open science | Use open metrics and reward adoption of open science principles and practices | Removing barriers to open science |
| Measure what matters | Highlight how inappropriate use of indicators can impede open science | |



**Next generation metrics
should better, measure,
reward, and create
incentives for open
science.**

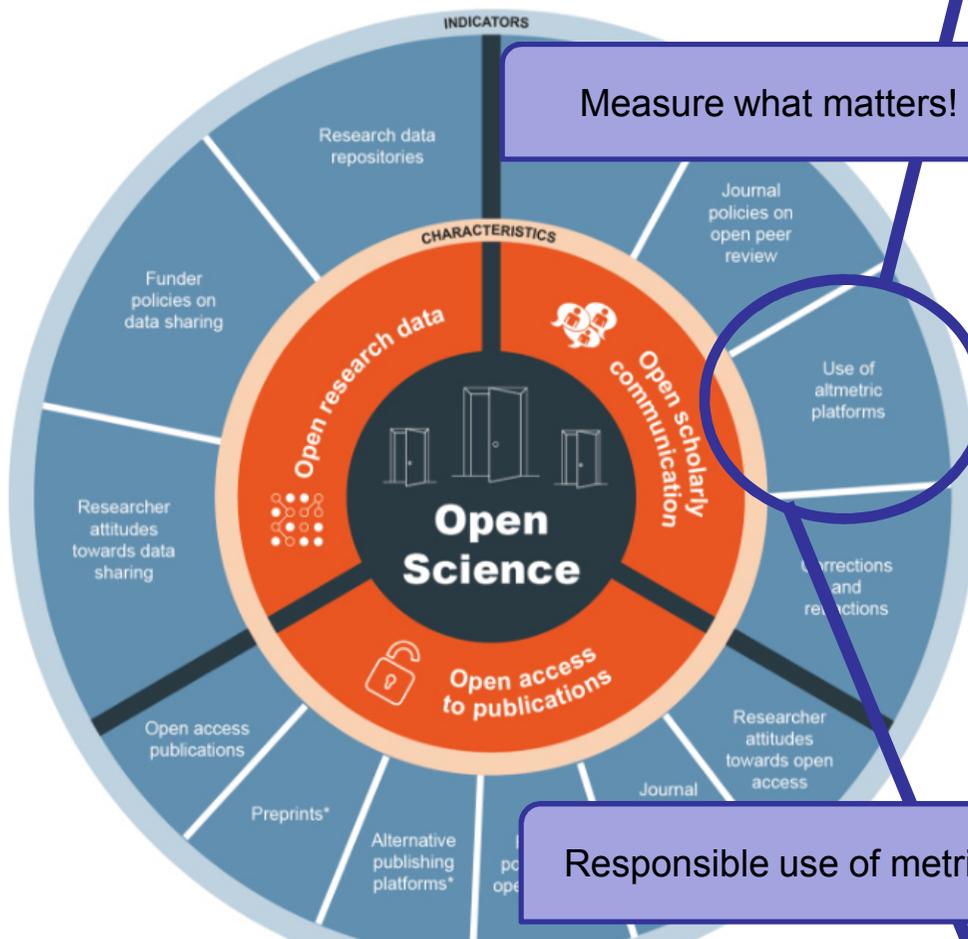


European Commission

Handshake needed!

Explore the indicators related to open scholarly communication

Select an indicator to see its description, visualise the data, understand its limitations, identify the data sources.



Measure what matters!

Responsible use of metrics

Open peer reviews

- Percentage of peer reviews that are published
- Percentage of publications in PeerJ that use open peer review

Journal policies on open peer review

- Journal policies on open peer review

Use of altmetric platforms

- Number of mentions of publications in media and social media

Corrections and retractions

- Corrections and retractions recorded in Web of Science

Preprints

- Number of preprints

Alternative publishing platforms

- Articles published before peer review



Discussion



Discussants

Prof. Dr. Stefan Hornbostel

German Center for Higher Education Research
and Science Studies, Berlin

Benedikt Fecher

Alexander von Humboldt-Institute for Internet
and Society, Berlin

Altmetrics: Theories and Difficulties

Open Science Conference

EU Expert Group on Metrics

Berlin, 22. März 2017

Stefan Hornbostel

New Data – New Concepts?

No!

Basic Idea:

Scientific Knowledge is socially constructed

Therefore we observe scientific communication

→ Analogies to traditional bibliometrics

New Data – New Insights?

Yes!

New objects: Books, blogs, projects, discourses ...

New actors: Scientists, not visible in bibliometrics,
interested citizens, user of scientific
knowledge ...

New Data – Old problems?

Yes!

Data driven indicator construction. We have a lot of process-produced data, but we don't know what they stand for

Who is participating (representativeness)?

And why (motives)?

→ Lack of theory and empirical knowledge
(Indicator construction)

New Data – Old problems?

more detailed information about user demographics and particularly their motivation to interact with scholarly contents on social media is, however, mostly lacking

(cf. Haustein, S. (2016): Grand challenges in altmetrics : heterogeneity, data quality and dependencies. In: Scientometrics, 4. doi: 10.1007/s11192-016-1910-9)

New Data – New Quality?

No!

Validity (the degree to which the tool measures what it claims to measure)

Reliability (overall consistency of a measure)

Robustness (resistant to errors in the results, produced by deviations from assumptions)

Transparency & Reproducibility (Lack of free access to the underlying data (data collection algorithms are assets of the altmetric providers; Standards are not (yet) universally defined)

New Data – More triangulation?

It is a commonplace since many years that a set of indicators should be used in assessments.

What does it mean if these indicators don't show correlations?

New Data – New utilisation?

Yes!

If new indicators are used in evaluations, individuals and organisations alter their performance or behavior due to the awareness that they are being observed

→ Gaming

→ Falsifikation

→ Baseless rumors

→ Indicator polishing

New Data – New problems?

Yes!

We are producing more and more data (research data and meta-data)

An archive has two functions:

- **to remember**
- **to forget**

→ Need for indicators to organize oblivion

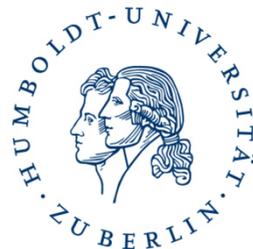
Thank you for your attention!

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Humboldt-Universität Berlin
Institut für Sozialwissenschaften



BENEDIKT FECHER

ALTMETRICS TRENDS IN RESEARCH AND WAYS TO MEET THEM

Open Science Conference 2017 – Berlin, 21. März
2017

WHY IS IT IMPORTANT THAT WE TALK ABOUT ALTERNATIVE IMPACT SCORES?

- Promotion
- Funding
- Signalling
- Reporting

3 DEMANDS

Impact scores should ...

1. ... reflect research practice.
2. ... benefit the community.
3. ... be able to tell attention and impact apart.

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The image shows a screenshot of a Nature journal article page. At the top, the 'nature' logo is displayed in white on a dark red background, with the tagline 'International weekly journal of science' below it. A search bar is located in the top right corner. Below the logo, a navigation menu includes links for 'Home', 'News & Comment', 'Research', 'Careers & Jobs', 'Current Issue', 'Archive', 'Audio & Video', and 'For Authors'. A secondary navigation bar shows 'News & Comment', 'News', '2017', 'March', and 'Article'. On the right side of the header, there are social media icons for E-alert, RSS, Facebook, and Twitter.

The main content area features the article title 'Physics paper sets record with more than 5,000 authors' in a large, bold font. Below the title, a short summary states: 'Detector teams at the Large Hadron Collider collaborated for a more precise estimate of the size of the Higgs boson.' The author's name, 'Davide Castelvecchi', is listed below the summary, followed by the date '15 May 2015'. A 'Rights & Permissions' button is visible below the date.

To the right of the article text is a small image with the caption 'Palm up' and a sub-headline 'A makeover for the world's most hated crop'. Below this is another small image with the caption 'Sign up for FREE today' and a green leaf icon.

At the bottom of the page, there is a 'Recent' section with a list of three articles: '1. Genome-based cholesterol drug boosts heart health', '2. Pasteur Institute's scientists make last-ditch plea to keep their president', and '3. Snapping Earth for more than seven decades'. Below this is a 'Newsletter' section with the text 'The best science news from Nature and beyond,'.

3 DEMANDS

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The screenshot shows the LSE Impact Blog website. At the top is the LSE logo (The London School of Economics and Political Science) and the title 'LSE Impact Blog'. Below the header is a navigation menu with links: Home, About, Latest, Our books, Series, Resources, LSE Comment, Popular, and a search icon. The main content area features a post titled 'Credit where credit is due: Research parasites and tackling misconceptions about academic data sharing'. The post includes a social media sharing bar with icons for Facebook, Twitter, LinkedIn, and Email. Below the title is a featured image with the text 'citation needed' overlaid. The post text discusses an editorial by Benedikt Fecher and Gert G. Wagner, which criticized researchers who use or build on previous datasets as 'research parasites'. The text argues that the editorial misses the point, not only of data sharing, but of scientific research more broadly. It points to a wider issue for the scientific community, which is adequate mechanisms for credit and contribution. The post concludes that more should be done to provide proper recognition for researchers' data sharing, data production and data curation efforts. Below the main text is a paragraph starting with 'In a recent editorial in the New England Journal of Medicine, the authors Longo and Drazen critically assessed the concept of data sharing in medicine. Their main concern is that a "new class of research person will emerge" that uses data for their own original research questions. The authors, although indirectly, later refer to this class of researcher as "research parasites". The label "research parasites" certainly does not reflect the zeitgeist of an increasingly collaborative research and initiatives towards openness and transparency. However, it does reflect many common misconceptions about academic data sharing.' On the right side of the page, there are social media icons for Twitter, Facebook, and RSS, an email address field, a 'Subscribe to the Impact' button, a Creative Commons Attribution 3.0 Unported License logo, and a 'Tweets by @LSEImpact' section showing a tweet from @LSEImpactBlog: 'New: Equal parts researcher advocate - having an impact to-reach communities'.

3 DEMANDS

Impact scores should ...

1. ... reflect research practice.
2. ... **benefit the community.**
3. ... be able to tell attention and impact apart.



Roche et al. (2014)

3 DEMANDS

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Sarah_Ackerman

How will you make sure that intelligent Altmetrics will be adapted by funding agencies and research institutions?

What about impact beyond the available data?

Discussion + questions

- Do we need metrics in open science? What role should metrics play in open science?
- Measure what matters: what matters in open science?
- Why should we evaluate the impact of science on society?
- What are the reasons for (possibly) limited impact of science?



Thank you!