

New directions in scholarly publishing: journal articles beyond the present

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„If I have seen further it is by standing on the shoulders of giants.”

*Isaac Newton in a letter to Robert Hooke, 1676
(first attribution goes to Bernard of Chartres,
12th c.)*

RESEARCH CYCLE IS NOT VISIBLE

<http://cosrvfile00.utep.edu/couri>

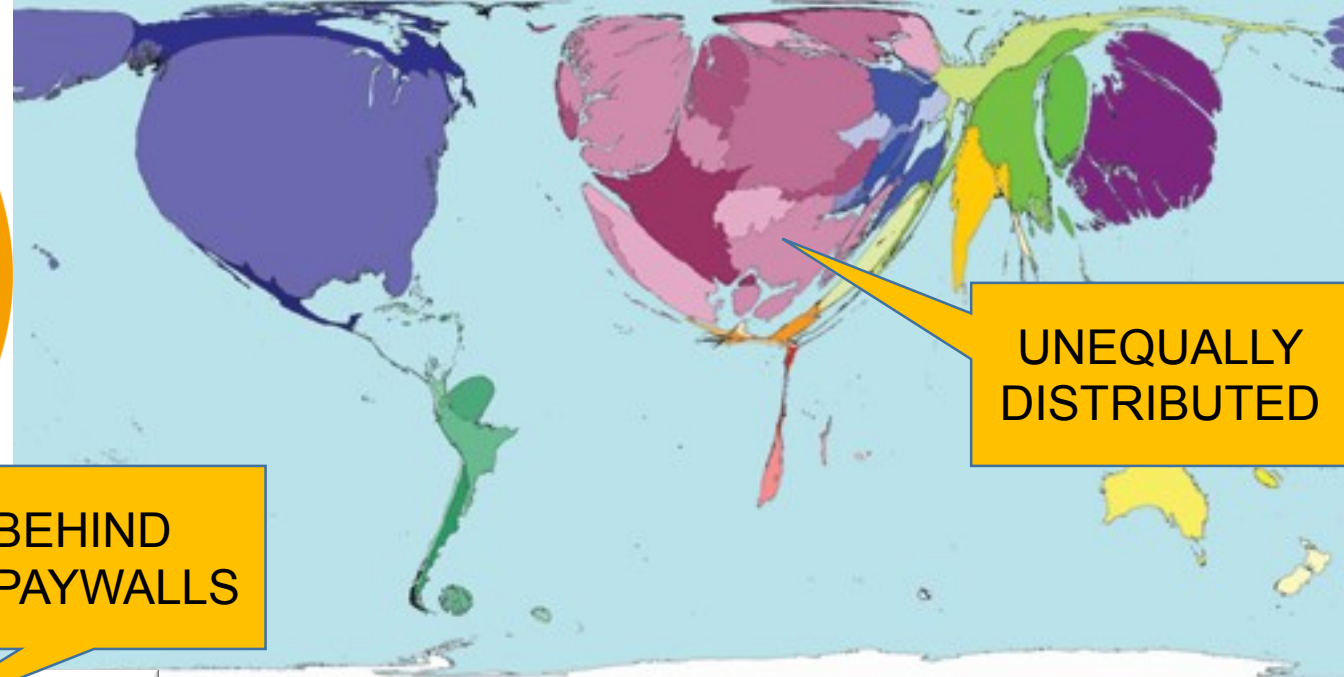


FINAL PUBLICATION – THE ONLY VISIBLE PART
OF SCHOLARLY COMMUNICATION

JOURNAL CITATION REPORTS 2013
2012 IMPACT FACTOR
9.858
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ASSESSMENT –
 INADEQUATE
 INDICATORS

BEHIND
 PAYWALLS



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INAPPROPRIATELY
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Mutational dynamics and phylogenetic utility of noncoding chloroplast DNA

Thomas Borsch · Dietmar Quandt

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Abstract Introns and spacers are a rich and well-appreciated information source for evolutionary studies in plants. Compared to coding sequences, the mutational dynamics of introns and spacers is very different, involving frequent microstructural changes in addition to substitutions of individual nucleotides. An understanding of the biology of sequence change is required for correct application of molecular characters in phylogenetic analyses, including homology assessment, alignment coding, and tree inference. The widely used term “indel” is very general, and different kinds of microstructural mutations, such as simple sequence repeats, short tandem repeats, homonucleotide repeats, inversions, inverted repeats, and deletions, need to be distinguished. Noncoding DNA has been indispensable for analyses at the species level because coding sequences usually do not offer sufficient variability. A variety of introns and spacers has been successfully applied for phylogeny inference at deeper levels (major lineages of angiosperms and land plants) in past years, and phylogenetic structure *R* in intron and spacer data sets usually outperforms that of coding-sequence data sets. In order to fully utilize their potential, the molecular evolution and applicability of the most important noncoding markers (the *trnT-trnF* region comprising two spacers and a group I intron; the *trnS-G* region comprising one spacer and a group II intron in *trnG*; the group II introns in *petD*, *trnI6*, *trnI6*, and *trnK*; and the *atpB-rbcL* and *psbA-trnG* spacers) are reviewed. The study argues for the use of noncoding DNA in a spectrum of applications from deep-level phylogenetics to speciation studies and barcoding, and aims at outlining molecular evolutionary principles needed for effective analysis.

Keywords Spacers · Introns · Phylogenetic structure *R* · Molecular evolution · SSRs · Inversions · Mutational hotspots · DNA barcoding

Introduction

The application of noncoding chloroplast DNA sequence data in plant molecular systematics has been steadily increasing over the last decade. Sequencing of rapidly evolving spacers and introns was initially proposed for unravelling evolutionary patterns among closely related species (Taberlet et al. 1991; Manen and Natali 1995). The idea was to use universal amplification primers that anneal to conserved genes and thereby span more variable spacers and introns. At about the same time, pronounced differences in mutational dynamics and consequently in levels of variability between coding and noncoding plastid regions were pointed out by Morton and Clegg (1993), Clegg et al. (1994), and others. As compared to coding genes, the sequences of introns and spacers are functionally less constrained. This, however, describes average sequence conservation. Introns in particular possess a well-conserved secondary structure that leads to a mosaic of highly conserved and extremely variable parts (Cech 1988; Michel et al. 1989; Cech et al. 1994; Kelchner 2002; Borsch et al. 2009).

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Severe fever with thrombocytopenia syndrome, an emerging tick-borne zoonosis

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Summary

Severe fever with thrombocytopenia syndrome (SFTS) is an emerging haemorrhagic fever that was first described in rural areas of China. The causative agent, SFTS virus (SFTSV), is a novel phlebovirus in the Bunyaviridae family. Since the first report in 2010, SFTS has been found in 11 provinces of China, with about 2500 reported cases, and an average case-fatality rate of 7–3%. The disease was also reported in Japan and Korea in 2012; Heartland virus, another phlebovirus genetically closely related to SFTSV, was isolated from two patients in the USA. The disease has become a substantial risk to public health, not only in China, but also in other parts of the world. The virus could undergo rapid evolution by gene mutation, reassortment, and homologous recombination in tick vectors and vertebrate reservoir hosts. No specific treatment of SFTS is available, and avoiding tick bites is an important measure to prevent the infection and transmission of SFTSV. This Review provides information on the molecular characteristics and ecology of this emerging tick-borne virus and describes the epidemiology, clinical signs, pathogenesis, diagnosis, treatment, and prevention of human infection with SFTSV.

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Vol. I.
 For Anno 1665, and 1666.

In the SAVOY,
 printed by T. N. for John Martyn at the Bell, a little with-
 out Temple-Bar, and James Allestry in Duck-Lane,
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PHILOSOPHICAL
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 OF
 THE ROYAL
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ISSN 0962-8436

Contemporary and future studies in plant speciation, morphological/floral evolution and polyploidy: honouring the scientific contributions of Leslie D. Gottlieb to plant evolutionary biology

Papers of a Theme Issue compiled and edited by Daniel J. Crawford, Jeffrey R. Brink, Douglas E. Soltis, Pamela S. Soltis and Jonathan P. Rastbach

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5 August 2014

Well it looks ok from here

PEER REVIEW
 (BBC RADIO 4 "SCIENCE BETRAYED")

Scholarly publishing

- huge numbers (1.8 mil journal articles per year)
- paper-centric nature of most journals
- large volume of data and complex research processes cannot be squeezed in 5-10 pages of paper
- publish or perish and ethical issues (authorship, plagiarism, misconduct, conflict of interest...)
- no version control (what to cite?)
- APC – problems (predatory publishers – where are the boundaries?)

Openness

- opening all phases of the research cycle could lead to significant changes and to advance science by **sharing and collaborating** as fast and as well as possible – still not ready
- slowly we are opening the content and processes: Open Access (to the publications), Open data, Open peer-review, Open authorship, Open formats, Open assessment...

OPEN = CHANGE

Open Access

- WHO has access to WHAT and WHEN?
- Key issue for the free flow of information between researchers and society
- *“...free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. The only constraint on reproduction and distribution, and the only role for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited.” (BOAI, 2002)*
- BOAI definition limits its scope to peer-reviewed journal literature
- Open Access to the present form of publication is not enough

WHO?	WHAT?	WHEN?
OPEN?	primary research materials, e.g. lab notebooks	during research
	"completed" experimental protocols, source code, raw data, and analysis workflow	during manuscript writing
researchers / authors	manuscript drafts	upon manuscript „done“
moderators (journal editors and conference program chairs)	final manuscripts (including supplementary materials)	upon manuscript submission
reviewers	identities of manuscript authors, official peer reviewers, unofficial peer reviewers	during formal peer review & revision
journal subscribers or conference attendees	official peer reviews, unofficial peer reviews, annotations, and comments	upon journal or conference decision
general public	author responses to reviewers	upon journal publication or conference presentation
	publication revisions	N months post publication
<i>(Soergel et al., 2013)</i>	presentation slides, presentation videos	never

Open Data

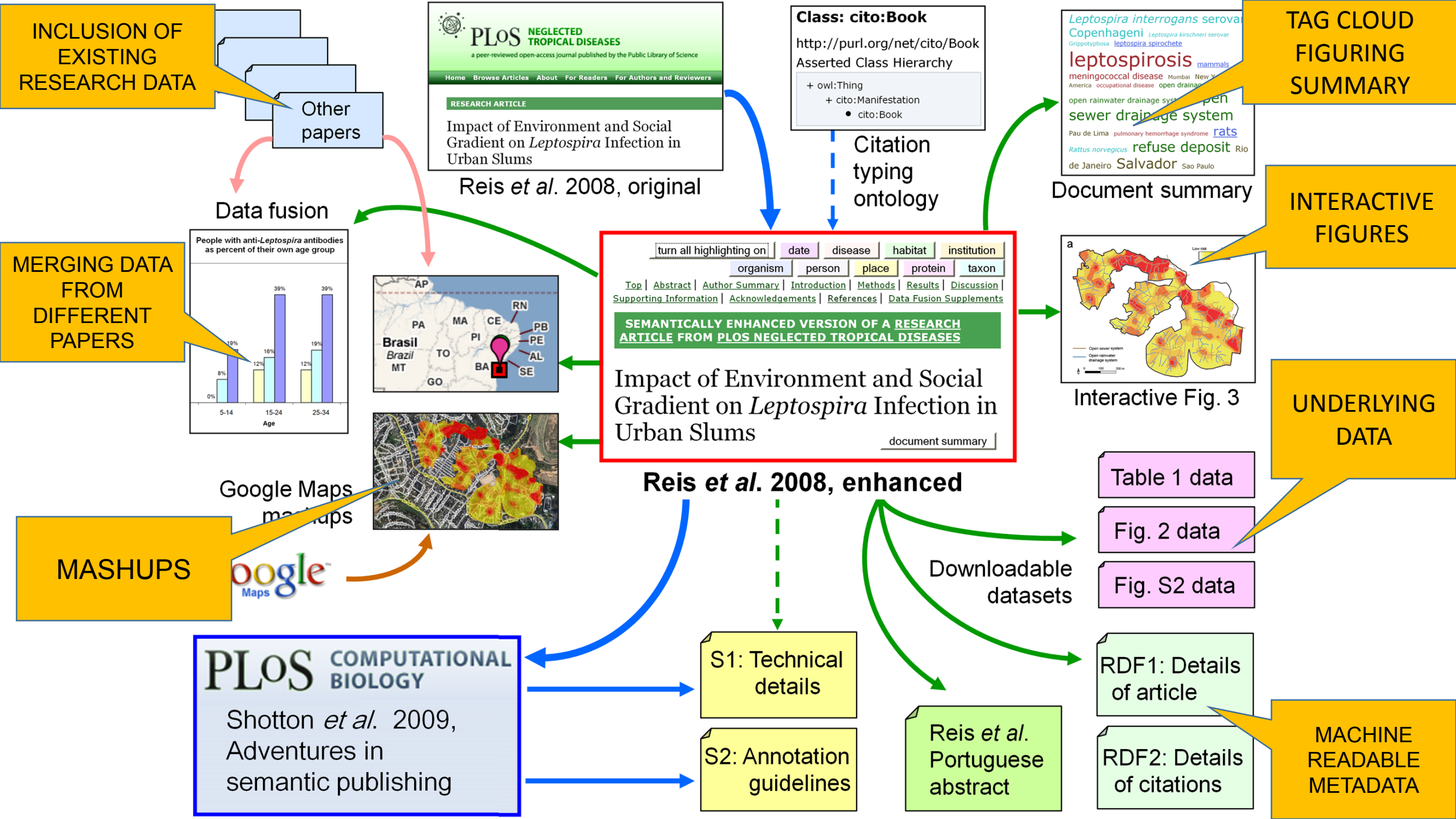
- data (underlying, curated and/or raw) are important
- research funders want to ensure that the data outputs generated by the research they fund can be accessed and used in a way that maximises the benefit
- current data management systems must be improved so that they can meet the capacity demand for secure storage and transmission of research data

Open peer-review

- author – actively participate
 - reviewer's opinions are published together with an article (plus authors' responses)
 - public/readers can comment
 - editor make a decision upon review and comments
-
- authors' and reviewers' identities are known to each other
 - anonymous or signed
 - assessment process or post peer review

Semantic enhancements

- journal articles are mostly static
- big gap between dynamic development of science and their representation through traditional channels
- *„We define the term semantic publication to include anything that **enhances the meaning** of a published journal article, facilitates its **automated discovery**, enables its **linking** to semantically related articles, provides **access to data** within the article in actionable form, or facilitates **integration of data** between articles.”* (Shotton et al, 2009)



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Introduction

At present, one billion of the world's population resides in [slum settlements](#) [1]. This number is expected to double in the next 25 years [1]. The growth of large urban populations which are marginalized from basic services has created a new set of global health challenges [2],[3]. As part of the Millennium Development Goals [4], a major priority has been to address the underlying poor sanitation and environmental degradation in slum communities which, in turn, are the cause of a spectrum of neglected diseases which affect these populations [2],[3],[5].

[Leptospirosis](#) is a paradigm for an urban health problem that has emerged due to recent growth of [slums](#) [6],[7]. The disease, caused by the [Leptospira spirochete](#), produces life-threatening manifestations, such as [Weil's disease](#) and severe [pulmonary hemorrhage syndrome](#) for which fatality is more than 10% and 50%, respectively [7]–[9]. [Leptospirosis](#) is transmitted during direct contact with animal reservoirs or water and soil contaminated with their urine [8],[9]. Changes in the urban environment due to expanding slum communities has produced conditions for rodent-borne transmission [6],[10]. Urban epidemics of [leptospirosis](#) now occur in [cities](#) throughout the developing world during seasonal heavy rainfall and flooding [6],[11]–[18]. There is scarce data on the burden of specific diseases that affect slum populations [2], however [leptospirosis](#) appears to have become a major infectious disease problem in this population. In [Brazil](#) alone, more than 10,000 cases of severe [leptospirosis](#) are reported each year due to outbreaks in [urban centers](#) [19], whereas roughly 3,000, 8,000 and 1,500 cases are reported annually for [meningococcal disease](#), [visceral leishmaniasis](#) and [dengue hemorrhagic fever](#), respectively, which are other infectious diseases associated with urban poverty [20]–[22]. Case fatality (10%) from [leptospirosis](#) [19] is comparable to that observed for [meningococcal disease](#), [visceral leishmaniasis](#) and [dengue hemorrhagic fever](#) (20%, 8% and 10%, respectively) in this setting [20],[23],[24]. Furthermore, [leptospirosis](#) is associated with extreme weather events, as exemplified by the El Niño-associated outbreak in [Guayaquil](#) in 1998 [25]. [Leptospirosis](#) is therefore expected to become an increasingly important slum health problem as predicted global climate change [26],[27] and growth of the world's slum population [1] evolves.

Urban [leptospirosis](#) is a disease of poor environments since it disproportionately affects communities that lack adequate sewage systems and refuse collection services [6],[10],[11]. In this setting, outbreaks are often due to transmission of a single serovar, [L. interrogans serovar Copenhageni](#), which is associated with the [Rattus norvegicus](#) reservoir [6], [28]–[30]. Elucidation of the specific determinants of poverty which have led to the emergence of urban [leptospirosis](#) is essential in guiding community-based interventions which, to date, have been uniformly unsuccessful. Herein, we report the findings of a large seroprevalence survey performed in a Brazilian slum community (*favela*). Geographical Information System (GIS) methods were used to identify sources for [Leptospira](#) transmission in the [slum environment](#). Furthermore, we evaluated whether relative differences in socioeconomic status among slum residents contributed to the risk of [Leptospira infection](#), in addition to the attributes of the environment in which they reside.

Other possibilities

- multimedia
 - videos highlighting critical points in the research process
 - 3D representations of chemical compounds or art works
 - audio clips with the author's reflections and interviews
 - animated simulations or models of ocean currents, tides, temperature and salinity structure
- "living mathematics"
- "executable articles"

Formats

- PDF – portable and simple to use – but several limitations
 - PDF/A – improvements
 - in practice used to reproduce printed version of a document
 - not supporting rich media, interactivity, interoperability, reproducibility....
-
- different disciplines – different software and formats
 - HTML
 - TeX / LaTeX
-
- single solution for all disciplines and all types of files doesn't exist

eXtensible Markup Language - XML

- format describing text itself / format providing metadata about text
- focused at structure of the document and semantics – providing rich usage of text
- easily converted into PDF or HTML
- portable

Importance of assessment (evaluation)

- type and format of the publication, as well as an access – influenced primarily by the present assessment criteria for tenure, advancement in the career, etc.

Assessment (the case of Croatia)

- less and more „valued” types and categories of publications
- quantity above quality (one paper is always 1)
- to define categories, index publications are used (role, history, selection process is neglected)
- metric indicators for journals (like JIF) used to assess the value of single articles
- additional indicators – showing lack of understanding
- impact of the publication is assessed according wrapping (high JIF journals)
- new criteria not apply to already earned positions

Citations

Are citations representing the statement „standing upon the shoulders of giants”?

- (should we cite the crappy Gabor paper here?) and the article “Variation in Melanism and Female Preference in Proximate but Ecologically Distinct Environments”, published in *Ethology* (...and other examples from Retraction Watch)
- positive and negative citations
- citations without context
- self-citations
- non-numerical aspect of citation – language, culture, time
- discriminating whole disciplines, non-English papers, authors from scientific periphery

Open assessment – altmetrics?

How many times:

- journal article, book, blog post, dataset, conference paper...

has been:

- visited (publishers' web site, Dryad)
- downloaded (Slideshare, publishers' web site, Dryad)
- cited (PubMed, CrossRef, Scopus, Wikipedia, DOI, Web of Science)
- reused/adapted (Github)
- shared (Facebook, Twitter, LinkedIn)
- bookmarked / saved (Mendeley, Zotero, CiteULike, Delicious)
- commented (Twitter, Mendeley, blog, publishers' web site, Wikipedia, Faculty of 1000)

ImpactStory.



“4 Rs” of Open

- **Reuse:** the right to reuse the content in its unaltered/verbatim form
- **Revise:** the right to adapt, adjust, modify, or alter the content itself
- **Remix:** the right to combine the original or revised content with other content to create something new
- **Redistribute:** the right to share copies of the original content, the revisions, or the remixes with others

Hilton, J. I., Wiley, D., Stein, J., & Johnson, A. (2010)

Evolution of journal articles and openness

- Increasing the efficiency and cost-effectiveness of science
- Making science more productive
- Better quality of science
- Improving reputation and trust
- Enhancing visibility and impact
- Innovations

Thank you for your attention! 😊

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