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EXCLUDING THE POOR FROM ACCESSING BIOMEDICAL LITERATURE: A RIGHTS VIOLATION THAT IMPEDES GLOBAL HEALTH

Gavin Yamey

ABSTRACT

Most biomedical journals charge readers a hefty access toll to read the full text version of a published research article. These tolls bring enormous profits to the traditional corporate publishing industry, but they make it impossible for most people worldwide — particularly in low and middle income countries — to access the biomedical literature. Traditional publishers also insist on owning the copyright on these articles, making it illegal for readers to freely distribute and photocopy papers, translate them, or create derivative educational works. This article argues that excluding the poor from accessing and freely using the biomedical research literature is harming global public health. Health care workers, for example, are prevented from accessing the information they need to practice effective medicine, while policymakers are prevented from accessing the essential knowledge they require to build better health care systems. The author proposes that the biomedical literature should be considered a global public good, basing his arguments upon longstanding and recent international declarations that enshrine access to scientific and medical knowledge as a human right. He presents an emerging alternative publishing model, called open access, and argues that this model is a more socially responsive and equitable approach to knowledge dissemination.

INTRODUCTION

Arthur Ammann, president of the nonprofit organization, Global Strategies for HIV Prevention (<http://www.globalstrategies.org>), tells the following story:

I recently met a physician from southern Africa, engaged in perinatal HIV prevention, whose primary access to information was abstracts posted on the Internet. Based on a single abstract, they had altered their perinatal HIV prevention program from an effective therapy to one with lesser efficacy. Had they read the full text article they would have undoubtedly realized that the study results were based on short-term follow-up, a small pivotal group, incomplete data, and unlikely to be applicable to their country situation. Their decision to alter treatment based solely on the abstract's conclusions may have resulted in increased perinatal HIV transmission.¹

The physician in southern Africa could not afford to view the full text article due to its exorbitant cost. The full text version of a research article in a medical journal typically costs US\$30 to download, while an annual subscription to a journal usually costs several hundred dollars. Hence the physician was forced to rely on abstracts alone (abstracts of some research articles are made freely available in the online database, PubMed, at www.pubmed.gov). The full text versions of most biomedical studies — an essential treasury of life-saving knowledge — are locked away behind

access barriers. These access tolls bring enormous profits to the traditional corporate publishing industry, but at the same time make it impossible for many people worldwide to access the biomedical literature. The imposition of such tolls arguably violates the spirit of the Universal Declaration of Human Rights, which states that everyone has the right “to share in scientific advancement and its benefits” (Article 27, section 1).²

In this article, I take a rights-based view of this current crisis of restricted access to the results of scientific and medical research. Such research is conducted in the interests of the public, and yet the results are largely kept out of the public domain by traditional corporate publishers who own them, subject them to extremely tight copyright restrictions, and sell them in a market worth about US\$5 billion.³ The results of biomedical research have unfortunately been privatized, monopolized, and concentrated in the hands of a tiny number of multinational corporations.

This article considers how exclusion from accessing the biomedical research literature harms global public health. I argue that this literature should be considered a global public good and base my argument upon long-standing and recent international declarations that enshrine access to scientific and medical knowledge as a human right. I present an emerging alternative publishing model, called open access, and argue that this model is a more socially responsive and equitable approach to knowledge dissemination. I situate open access publishing within a broader movement that has emerged in the digital era to create a public “knowledge commons,” which can play a crucial role in supporting an informed citizenry in its efforts to promote human rights.⁴ Finally, I propose that *Health and Human Rights* itself, as an open access journal, could help to catalyze the creation of an online “health and human rights commons.”

“THE WALLED GARDEN”: THE ENCLOSURE OF THE SCHOLARLY COMMONS

When researchers submit their papers to a traditional subscription-based journal, they enter into a kind of “devil’s bargain” with the journal’s publisher. Researchers hand their work over to publishers without receiving any payment, and the publishers in turn own and copyright the researchers’ work. This publishing arrangement lies at the heart of the current crisis of restricted access to the research literature.

Publishers do very well in the bargain, as they make vast profits from sales of the researchers’ work. Indeed, publishers subject the work to extremely tight copyright restrictions in order to protect their commercial interests and have recently sued US photocopying firms for including copies of research articles in student course-packs without paying royalties to the publisher.⁵ Sales of a single research article can earn a journal hundreds of thousands of dollars. For example, the *New England Journal of Medicine* sold 929,400 reprints of a single research article (a clinical trial of the analgesic rofexocib [Vioxx]), mostly to the pharmaceutical company Merck, bringing in between US\$697,000 and US\$836,000 to the journal; the journal’s owner, the Massachusetts Medical Society, listed US\$88 million in total publishing revenue for the year ending May 31, 2005.⁶

The reward to the researcher for entering into this bargain is the imprimatur that is associated with being published in a scholarly journal, a reward that bestows standing in the academic community and compensates authors for relinquishing royalties on their journal articles. Peter Suber, Research Professor of Philosophy at Earlham College, has argued that these intangible rewards explain why scholars “are not merely willing, but eager, to submit their articles to journals that do not pay for them, and even to journals that have the temerity to ask for ownership or copyright as well.”⁷ In a sense, universities have become branch chains of publishing companies: academics (paid by universities) hand ownership of their work over to publishers who earn massive profits from selling it, and these profits are not returned back to the university.

Publishers have enjoyed a long monopoly over researchers’ work because until recently, there were no alternative venues for researchers to publish their papers (this situation has changed dramatically since the arrival of online open access publishing, which I discuss below). Publishers have capitalized on their monopoly power by increasing the cost of both print and online journal subscriptions much faster than the underlying rate of inflation. As a result of the spiraling costs to access a journal, subscribers worldwide — particularly librarians — have been forced to cancel their subscriptions, which in turn has led publishers to raise subscription costs even further, “a death spiral that few traditional publishers seem ready to escape.”⁸

This “death spiral” has been exacerbated in recent years by mergers and acquisitions within the publishing industry. Four companies — Reed Elsevier, Taylor and Francis, Springer, and Wiley-Blackwell — now own most of the biomedical research articles indexed in the world’s leading citation index, the ISI Web of Science.⁹ When commercial companies purchase small publishing companies or journals published by small scholarly societies, this consolidates an increasing amount of content into the hands of fewer and fewer firms and is consistently associated with journal price increases.¹⁰ After Reed Elsevier acquired Pergamon Press, for example, the deal resulted in an average price increase of 22% for former Pergamon Press journals and an 8% increase for Elsevier journals.¹¹

While the economic impact of these mergers is of grave concern to the scholarly community, there are additional serious implications of concentrating biomedical research results in the hands of just a few multinational corporations. These implications include the aggressive lobbying by these powerful companies for tighter and tighter restrictions on the use of their copyrighted works.¹² Charlotte Hess, Director of the Digital Library of the Commons, and Elinor Ostrom, Professor of Political Science, both at Indiana University, argue that the “information arms race,” in which corporations are battling for larger and larger shares of the global knowledge pool, “leads to speculation that the records of scholarly communication, the foundations of an informed, democratic society, may be at risk.”¹³ James Boyle, Professor of Law at Duke Law School, warned: “Around the world, corporations are lobbying their governments, demanding more expansive copyright, patent, trademark and data-base rights. Governments are complying, granting monopolies over information and information products that make the monopolies of the 19th century robber barons look like penny-ante operations.”¹⁴

Another form of monopoly behavior, called “journal bundling,” is yet another cause for concern. Publishers have profited not only by increasing the cost of journal subscriptions faster than the rate of inflation, but also by insisting that libraries purchase “bundles” of their journal titles rather than individual journal titles. In other words, the library is forced to purchase several titles at once and is locked into a no-cancellation policy for all journals in the bundle. The effect, argues

John Willinsky of the Public Knowledge Project, is to “increase the publisher’s share of subscribing libraries’ budgets beyond the number of titles that libraries might have otherwise ordered.”¹⁵ Traditional publishers tend to have a higher profit margin on their lower-quality journals, and the bundling agreement means that libraries cannot cancel subscriptions to these lower-quality journals unless they also cancel the higher-quality ones in the same bundle.¹⁶

An analysis of the scientific and medical publishing industry commissioned by the Wellcome Trust, the world’s largest charitable sponsor of medical research, concluded that “the current market structure does not operate in the longterm interests of the research community.”¹⁷ The private ownership of scientific and medical research articles by a monopolized publishing industry puts the results of the global biomedical research enterprise — an enterprise largely funded by governments, public universities, and charitable foundations — out of reach of most potential audiences. Worldwide, only a small fraction of researchers, clinicians, health and science policymakers, teachers, patients, and the broader public can afford to pay access tolls on biomedical research articles. “We feel compelled to share our frustrating experience in accessing biomedical journals in our home countries of Indonesia and China,” wrote a group of researchers in *The Lancet* recently.¹⁸ The researchers explained how Indonesia has been affected by the South Asian monetary crisis that started in 1997 and that has hindered not only access to health care for those of low economic status but also access to the latest research findings for health care providers. “In 2002,” they wrote, “we were obliged to do a compulsory research project in order to complete our residency training. However, many journal subscriptions were suspended in many medical school libraries. We tried accessing full-text articles online, since the recent printed articles remain very limited, but almost all the essential articles were only available to subscribers or those who could pay.”

Autar S. Paintal, former director general of the Indian Council of Medical Research, pointed out that “an Indian [researcher] is often unaware of the latest trends in science publishing [because] hardly 10 percent of our libraries get the top journals.”¹⁹ At the close of the 20th century, over half of the research and higher-education institutions in the lowest-income countries simply had no current subscriptions

to international journals.²⁰ The “unbearable cost” of accessing journals means that even the world’s richest libraries, such as the Harvard University Libraries, cannot access some of the crucial biomedical literature.²¹ Such unbearable costs also mean that research funded through public taxes remains largely inaccessible to the public, an inequity that is currently being challenged by a vocal alliance of patient advocacy groups.²² Medical research relies on patients altruistically volunteering to participate in clinical trials, and a strong case can be made that patients should have public access to the results of these trials.

The exponential rise in global access to computers and the Internet offers great promise for the universal dissemination of biomedical research results. Unfortunately, the imposition of access tolls, and of restrictive copyright licenses that prohibit readers from copying, disseminating, and translating articles, removes these results from the public arena. This process of online enclosure results in what Nancy Kranich, past president of the American Library Association, calls a “walled garden,” which, she argues, poses “an increasing threat to democratic principles of informed citizens and academic principles of building on the shoulders of giants.”²³

PUBLIC HEALTH CONSEQUENCES OF ENCLOSURE

Health is perhaps the area of most intense demand for greater access to scientific and technical information, partly because failure to obtain it can be literally fatal.²⁴

There are at least five important ways in which the process of online enclosure described above has profound consequences for public health, particularly in low- and middle-income countries. First, health care workers are prevented from accessing the information that they need to practice effective medicine. Second, policy-makers in developing countries are prevented from accessing the essential knowledge that they require to build better health care systems. Third, restricted access to the literature impedes health research capacity and sustainable development in these countries. Fourth, clinicians, health policy-makers, and health researchers in the developing world are unable to participate as equals in global scientific conversations (for example, on setting a new

health policy), since they are barred from accessing the latest research evidence. Such clinicians and policy-makers are forced to rely on abstracts alone, and reliance on abstracts can be hazardous to the public’s health. Finally, one of the reasons that subscription-based medical journals have shown so little interest in raising the profile of health problems in the developing world is that, to remain profitable, these journals are forced to publish materials that will appeal to readers who can pay.²⁵ I now discuss each of these consequences in more detail.

Health workers are starved of information

James Tumwine, a professor of pediatrics at Makerere University, Kampala, Uganda, describes how he was asked by the World Health Organization to investigate a mysterious illness in southern Sudan called “nodding disease,” in which affected children experience seizures when they eat. Before beginning his investigation of the outbreak, he went online to read all previously published papers on this disease — but the access tolls were prohibitive.²⁶

Health workers such as Professor Tumwine in developing countries, which shoulder 90% of the world’s burden of disease, have the greatest need for reliable health information, and yet they currently have the least access to it.²⁷ This is analogous to what primary care physician, Julian Tudor-Hart, termed “the inverse care law” (that is, those who need health care most are least likely to receive it).²⁸ Neil Pakenham-Walsh, coordinator of the Global Healthcare Information Network, and his colleagues say that health workers in the developing world are being “starved of the information that is the lifeblood of effective health care” and “as a direct result, their patients suffer and die.”²⁹

The late James Grant, former executive director of UNICEF, argued that: “The most urgent task before us is to get medical and health knowledge to those most in need of that knowledge. Of the approximately 50 million people who were dying each year in the late 1980s, fully two thirds could have been saved through the application of that knowledge.”³⁰ Restricted access to the biomedical literature is one way, among many others, in which health workers in low-income countries are prevented from accessing reliable peer-reviewed health information. Granting such access would potentially be the single most

cost-effective and achievable strategy for sustainable improvement in health care.³¹

Health system strengthening is hindered

The economist Joseph Stiglitz has suggested that “developing countries are poorer not only because they have fewer resources, but because there is a gap in knowledge. That is why access to knowledge is so important.”³² Developing countries are increasingly improving their capacity to use medical, scientific, and technical knowledge to solve local health, environmental, and social problems themselves — hence closing the knowledge gap is a crucial factor in international development. Many of these countries, such as Jamaica and Rwanda, have invested heavily in improving communication infrastructure and technology policies. They have built institutions that stand ready to convert knowledge into goods and services, such as public-health care. For such investments to be effective, however, these countries have an urgent need for greater access to the world’s pool of knowledge.³³ The development of the Cuban health care system, for example, relied heavily on the use of scientific and technical information, much of which was translated from other languages.³⁴

Lack of access to information impedes health research and sustainable development

Health research is a central tool in the growth and development of people and nations. In many countries, however, the benefits of health research are not optimized due to “low investments, absence of a culture of evidence-based decision-making or lack of capacity.”³⁵ One factor that undoubtedly contributes to the lack of scientific and health research capacity in low-income countries is the exclusion of researchers from the biomedical literature. A United Nations report presented in Addis Ababa in 1969 proposed that if the “vicious circle of underdevelopment” was to be overcome, an indigenous scientific capability needed to be fostered, which meant overcoming the “highly imperfect access to the body of world scientific knowledge.”³⁶

Barbara Kirsop, of the Electronic Publishing Trust for Development, and colleagues have highlighted the crucial ways in which restricted access to scientific research articles can impede sustainable development.³⁷ It is widely recognized, they argue, that sustainable economic growth cannot take place with-

out a strong science base. Indeed a 1982 UNESCO report stated that “assimilation of scientific and technological information is an essential precondition for progress in developing countries.”³⁸ How, then, can low-income countries strengthen their research capacity? Kirsop and colleagues argue that research is an “international activity” where progress builds on the reported results of colleagues around the world. “It follows,” they say, “that access to published results in a refereed journal is a critical ingredient to forging a strong research environment. But, as is now well recorded, the cost of access to published journals has become prohibitive for developing countries and has deteriorated in the past decade as journal subscription prices exceed general inflation figures three- or four-fold.”³⁹

Inequality persists in the global scientific conversation

Health problems, said Gro Harlem Brundtland, former director general of the World Health Organization, are “no longer just local, national or regional, they are global.”⁴⁰ The obvious corollary is that such problems require a global response that has, at its heart, communication among scientists, clinicians, and policy-makers worldwide. But the current status quo of restricted access means that the scientific conversation between those in the rich and poor worlds — conversations in which clinical evidence is critiqued or new clinical trial reports are used to set policy — is an unequal one. By excluding African physicians from accessing the latest studies on preventing mother-to-child transmission of HIV, how can such physicians come to the table as equals in global policy discussions and debates? “Authors from developing countries,” say Ana Langer and colleagues at the WHO and Population Council, “are often not adequately prepared to participate in the international scientific debate, as they have limited access to the published literature.”⁴¹

As Ammann’s story demonstrates, clinicians and health policy-makers in low-income settings, barred from reading the full text of the latest research articles, are often forced to rely on abstracts alone. But it is arguably dangerous to the public’s health to base clinical and policy decisions just on abstracts, because they frequently misrepresent what is in the full text version of the article. Leah Ward and colleagues studied the accuracy of abstracts of original research articles published in nationally represented, widely circulated pharmacy-specific journals from

June 2001 through May 2002.⁴² They found that 24.7% of abstracts contained omissions, and 33.3% of abstracts contained either an omission or an inaccuracy. A total of 60.5% of abstracts were classified as deficient. Roy Pitkin and colleagues examined the accuracy of abstracts in six major medical journals (*Annals of Internal Medicine*, *Journal of the American Medical Association*, *British Medical Journal*, *The Lancet*, *The New England Journal of Medicine*, and *The Canadian Medical Association Journal*) in the years 1996 and 1997.⁴³ The frequency with which they found abstracts to be inaccurate, in the sense of containing information not verifiable in the article's main body, ranged from 18% to 68% in the six journals surveyed. A recent editorial in *The Lancet* concluded that "abstracts are known to be fickle representations of an article."⁴⁴

Journals neglect health problems of the developing world

Bernard Lown and Amitava Banerjee recently examined 416 weekly issues of the *New England Journal of Medicine* over an eight-year period to assess the journal's coverage of health issues of the developing world.⁴⁵ They found that less than 3% of articles were devoted to such issues. Other studies have shown similar evidence of systematic bias by medical journals against highlighting diseases of poverty.⁴⁶ Why does such bias matter? It matters, say Lown and Banerjee, because skewed coverage of the magnitude and gravity of global health problems diminishes awareness and impedes mobilization of attention and resources in rich countries to respond to prevailing conditions. Thus publication imbalances adversely affect global health. And why does such bias exist? While there are probably many different explanations, one factor, say Elizabeth Slade and Pritpal Tamber, of the open access publisher, BioMed Central (www.biomedcentral.com), is the "economic logic" at play at a subscription-based medical journal.⁴⁷ In other words, a journal that profits from selling content to wealthy readers has an incentive to focus its content on the health problems of the rich world. To put it another way, "researchers from poor settings have a limited capacity to buy reprints, which constitute a substantial source of income for scientific journals."⁴⁸ If journal editors are beholden to the interests of readers in the rich world, who form their subscription base, there is little reason for editors to pay attention to global health problems.

ACCESS TO THE BIOMEDICAL LITERATURE AS A HUMAN RIGHT

I have argued that excluding readers in low- and middle-income countries from accessing the scientific and medical research literature is hindering efforts to promote health. I also believe that in discriminating against the poor, such exclusion contravenes both the spirit and the letter of a number of human rights declarations.

These declarations frame the right to access knowledge in two major ways. Several global, regional, and national declarations confirm that all people should have the right to seek and access knowledge without *political* barriers. In other words, knowledge should be "free," where free has the same meaning as "free speech" (that is, freedom from political barriers). Having the political freedom to access a scientific or medical research paper is meaningless, however, if the cost to download it puts it out of the reach of most of society. Thus, a series of more recent international charters and treaties enshrine the right of people to read research results without *economic* barriers.

The right to access knowledge, free of political barriers

Both the Universal Declaration of Human Rights (UDHR), the primary UN document articulating human rights standards and norms, and the International Covenant on Economic, Social, and Cultural Rights (ICESCR), which translates the rights articulated in the UDHR into a legally binding instrument, place access to science firmly within a human rights framework.⁴⁹ The UDHR states that "everyone has the right freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits" (Article 27, section 1). The ICESCR recognizes the right of everyone to "take part in cultural life" and to "enjoy the benefits of scientific progress and its applications" (Article 15, section 1).

As Willinsky has argued, these declarations make a crucial distinction between, on the one hand, sharing in *scientific advancement*, and on the other hand, enjoying the *benefits* of such progress.⁵⁰ The human right at issue, then, is not just the right of everyone to access the *fruits* of progress, such as a new medicine for treating HIV, but also a "right to science as a form of knowledge and understanding."⁵¹ Research papers

in peer-reviewed scholarly journals are the premier means by which scientists and physicians communicate “scientific advancement,” and I would argue that access tolls imposed by these journals are an impediment to the universal right to science as a *form of knowledge*. Article 19 of the UDHR, which states that everyone has the right to “seek, receive and impart information and ideas through any media and regardless of frontiers,” also suggests that the poor should not be discriminated against with respect to access to scientific and medical information.⁵²

In fact, in multiple declarations, the UN has repeatedly called attention to the global inequities in access to biomedical literature. In 1999, for example, the World Conference on Science, under the auspices of UNESCO and the International Council of Scientific Unions, adopted the Declaration on Science and the Use of Scientific Knowledge.⁵³ The Preamble, section 16, states that “access to data and information is essential for undertaking scientific work and for translating the results of scientific research into tangible benefits for society.” The declaration emphasizes “the importance for scientific research and education of full and open access to information and data belonging to the public domain” (Article 3, section 38). It also notes that “Equal access to science is not only a social and ethical requirement for human development, but also essential for realizing the full potential of scientific communities worldwide and for orienting scientific progress towards meeting the needs of humankind” (Article 4, section 42).

The UN World Summit on the Information Society, held under the auspices of the International Telecommunication Union in Geneva, Switzerland, in 2003, and Tunis, Tunisia, in 2005, produced several documents that frame access to information and knowledge as a human right.⁵⁴ The first of these, the Geneva Declaration of Principles, begins with *Our Common Vision of the Information Society* (Article A), which states:

We, the representatives of the peoples of the world, assembled in Geneva from 10–12 December 2003 for the first phase of the World Summit on the Information Society, declare our common desire and commitment to build a people-centred, inclusive and development-oriented Information Society, where everyone can create, access, uti-

lize and share information and knowledge, enabling individuals, communities and peoples to achieve their full potential in promoting their sustainable development and improving their quality of life, premised on the purposes and principles of the Charter of the United Nations and respecting fully and upholding the Universal Declaration of Human Rights.⁵⁵

The declaration includes an entire article (B3) devoted to the issue of access to information and knowledge, which states: “We strive to promote universal access with equal opportunities for all to scientific knowledge and the creation and dissemination of scientific and technical information” (B3.28).

One theme is common to all of these UN declarations — the idea that access to information is *in and of itself* a crucial tool for supporting other human rights. Indeed, an October 2003 note written by the Office of the UN High Commissioner for Human Rights, addressing the issue of information and human rights, stated that Article 19 of the UDHR (the right to seek, receive and impart information) “forms the necessary condition for the realization of other internationally recognized human rights.”⁵⁶ The UN Special Rapporteur on Freedom of Opinion and Expression went even further, writing in his 1995 report that “freedom will be bereft of all effectiveness if the people have no access to information. Access to information is basic to the democratic way of life.”⁵⁷ Framed in this way, the continuing “intellectual land-grab” by the major multinational publishing corporations, who own most of the world’s crucial biomedical knowledge, is an unnecessary barrier to building democratic systems, processes, and institutions.⁵⁸

In addition to the international human rights declarations discussed above, several national and regional human rights declarations enshrine the right to seek and receive information.⁵⁹ For example, the American Convention on Human Rights states that everyone should have the “freedom to seek, receive, and impart information and ideas of all kinds” (Article 13), and the European Convention on Human Rights also states that everyone has the right to “receive and impart information and ideas” (Article 10).⁶⁰ The Declaration of Principles on Freedom of Expression in Africa, by the African Commission on Human

and Peoples' Rights, states that everyone shall have an equal opportunity "to access information without discrimination" (Article I, section 2).⁶¹

The right to access knowledge, free of economic barriers

A more recent series of charters and treaties have enshrined the universal right to access scientific and medical knowledge at no cost to the reader. First, with the advent of new digital technologies for disseminating information, there has been a growing realization of the importance of ensuring equity and justice with respect to who benefits from these technologies. The Association for Progressive Communications (www.apc.org), a global network of civil society organizations that uses these technologies to empower those working in the realm of human rights, development, and protection of the environment, states: "The internet is a global public space that must be open, affordable and accessible to all."⁶² Its Internet Rights Charter contains a section on access to knowledge, which says that widespread access to knowledge forms the basis for sustainable human development, and that "all information, including scientific and social research, that is produced with the support of public funds should be freely available to all."⁶³

Second, championing universal access to the biomedical literature has become an important component in the fight to adopt a human rights-based approach to medical research. This approach involves orientating such research toward serving the poor. Currently only 10% of health research funds are spent on the health problems of developing countries, even though these countries bear 90% of the global burden of disease — an inequity known as the "10/90 gap."⁶⁴ A growing alliance of activists, researchers, intellectual property lawyers, clinicians, students, and nongovernmental organizations is campaigning to address this gap — and, in particular, to adopt the open sharing of scientific data and ideas in order to develop new treatments for neglected diseases of the poor.⁶⁵

The campaign includes a call to end restricted access to the health research literature. For example, the Medical Research and Development Treaty, organized by the Consumer Project on Technology and supported by, among others, the International Red Cross, Oxfam, Médecins sans Frontières, and several government officials, is a "a Kyoto-style treaty designed to boost medical innovation and affordable

treatment."⁶⁶ The parties to the treaty, in the treaty's preamble, "seek to create a new global framework for supporting medical research...which recognizes human rights and the goal of all sharing in the benefits of scientific advancement."⁶⁷ Section 13 of the treaty specifically calls for open access to the results of publicly funded research, free of economic barriers.

Third, activists have also adopted a rights-based approach to challenge the notion that private interests should be allowed to *own* essential knowledge. One recent global campaign is to urge the World Intellectual Property Organization, one of the specialized UN agencies, to focus on the needs of developing countries with respect to intellectual property legislation. In 2004, several nonprofit organizations, scientists, academics, and individuals signed the Geneva Declaration on the Future of the World Intellectual Property Organization.⁶⁸ This declaration states that there is a global crisis in the governance of knowledge, technology and culture and that "concentrated ownership and control of knowledge, technology, biological resources and culture harm development, diversity and democratic institutions." It also argues that "morally repugnant inequality of access to education, knowledge and technology undermines development and social cohesion" and that "private interests misappropriate social and public goods, and lock up the public domain." The leading UK newspaper, *The Guardian*, put it rather more bluntly: "Information ought to be free and should be helped to escape its chains."⁶⁹

It would of course be rather odd — and self-limiting — if human rights required that a publisher lose money or risk bankruptcy in order to provide universal access to research articles at no charge. Fortunately, nothing of the kind is required. A radical new way of publishing biomedical research articles — called open access publishing — is financially viable and ensures that anyone on the planet with Internet access can read these articles at no cost.

OPEN ACCESS: THE LOGICAL ALTERNATIVE

Increasingly outraged by the publishing industry's stranglehold over essential medical knowledge — a stranglehold that I have argued impedes public health and contravenes the spirit and letter of many human rights declarations — health and science researchers have begun to mutiny in a variety of ways. Several

universities across the United States have passed resolutions that urge researchers to take back ownership of their work and distance themselves from corporate publishers.⁷⁰ For example, the Faculty Senate at the University of California Santa Cruz adopted a resolution on October 24, 2003, that “resolves to call upon its tenured members to give serious and careful consideration to cutting their ties with Elsevier: no longer submitting papers to Elsevier journals, refusing to referee the submissions of others, and relinquishing editorial posts.”⁷¹ Over 30,000 clinicians and scientists signed an open letter to subscription-based publishers stating that “the permanent, archival record of scientific research and ideas should neither be owned nor controlled by publishers, but should belong to the public and should be freely available.”⁷² Meanwhile, a growing number of academics who were editors of journals owned by corporate publishers have resigned their posts to launch alternative journals that are easier to access.⁷³ Many of these editors signed a statement “declaring independence from publishers and journals that do not serve the research community.” The statement reads:

We scientists *can* exercise control of our journals. We can transform them from commercial commodities back to instruments of service to education and research. When we are in control, we fulfill our responsibility to ourselves, to society, to our institutions, and to our colleagues throughout the world. In recent times, purely commercial interests have gained sway over too many of the journals that we depend on for research information. Maximizing profits has become the controlling goal. A system that should serve us is at the mercy of corporate acquisitions and profit-oriented planners. Disseminating scholarly research seems to be an afterthought.⁷⁴

As Tony Delamothe (deputy editor, *British Medical Journal*) and Richard Smith (former editor, *British Medical Journal*) have argued, these rebels were emboldened by the arrival of the Internet, which offers an alternative mechanism for disseminating research results.⁷⁵ The Internet gave scholars the means to take back ownership of their work and publish it under conditions that guarantee universal access to it and also the universal right of readers to copy, distribute,

and translate it and to create derivative works. This radical new way of scientific publishing, called open access publishing, has emerged as an alternative to subscription-based publishing. Open access publishing aims to end the commoditization and privatization of the scientific and medical research literature and make it a truly public resource. For supporters of open access, the vision is to create a digital public library of science and medicine.

There are two crucially important ways in which the Internet provides the means to revolutionize biomedical publishing.⁷⁶ First, it makes it possible to disseminate medical and scientific information *at no charge* to anyone in the world with online access. Although it costs a publisher money to track a manuscript through peer review, edit and produce it, and host the final article online, this is a relatively small one-time, fixed cost. If research funders are willing to pay this cost, then the published work can be made freely available to all readers worldwide, and there would be no need for access tolls. This is one of a range of different ways of financing an open access model of publishing (others include funding from foundations, universities, individual donations, and advertising). A detailed report by the Wellcome Trust concluded that the open access model supported by research funders “is economically viable, guarantees high quality research and is a sustainable option which could revolutionise the world of traditional scientific publishing.”⁷⁷ The report also concluded that open access publishing could reduce the overall costs of publishing by up to 30%.⁷⁸

Second, because the Internet allows not just ease of access but also ease of *reuse* (a digital file can be transferred globally in a second and at almost zero cost), the traditional role of copyright has to change. While subscription-based publishers use restrictive copyright licenses to prevent readers from reusing the literature (these licenses make it illegal, for example, to make unlimited copies or to disseminate the work globally), open access publishers grant the public the right to creatively reuse the research literature. In addition, open access publishers grant the copyright to the authors themselves — meaning that authors have the right to always be credited when their work is reused. Many open access publishers adopt the progressive copyright licenses developed by the nonprofit organization, Creative Commons (www.creativecommons.org), which facilitate rather than prohibit reuse of articles. The Creative Commons Attribution License

(CCAL), for example, allows anyone on the planet to “copy, distribute, display, and perform the work” and “to make derivative works.”⁷⁹ The result is that: “copyright can be used for what it is meant to in science, not to make the articles artificially scarce and in the process restrict their distribution, but instead, to ensure that their potential for maximum possible dissemination can be realised.”⁸⁰

THE BENEFITS OF OPEN ACCESS

The potential benefits of making biomedical literature freely available and publishing it under a Creative Commons license are enormous. No longer will physicians or health policy-makers have to base their clinical practice or policy decisions on the half-truths contained in article abstracts. Instead, everyone can read for themselves the full evidence on which the most important science and health policy decisions are made. A good example of a research article with profound public health implications is South Africa’s Orange Farm Intervention Trial, the first randomized trial of male circumcision to prevent HIV infection.⁸¹ This research paper, which documented that circumcision is associated with a 60% reduction in the risk of men acquiring HIV, is freely available and published under the CCAL. Health ministers worldwide are free to make unlimited copies of this article and send copies to every health professional in the country. Readers are free to translate the paper into local languages and to create derivative works — such as creating a teaching module based on the study. The free availability of this study, and all related science and policy discussions, has allowed a lively, informed, international debate to flourish.⁸²

Authors have a great deal to gain from open access, because their work becomes available not just to those who can afford access tolls, but also to anyone in the world with Internet access. As a result, the impact and reach of an author’s work becomes magnified. Although open access is still a relatively new phenomenon, there is already evidence that open access articles are cited more frequently and more rapidly after publication than articles behind access tolls.⁸³

An important benefit for editors of open access journals is that, because these journals are free from the space constraints imposed by print, editors can publish more articles, and at a fraction of what it would cost to publish them on paper. Additionally, because

open access journals are not selling their content, they have more freedom as to what kinds of material they can publish. The result, say Slade and Tamber, is that open access journals can “choose a greater range of topics that would appeal to a broader base of readers,” including topics relevant to readers in the developing world.⁸⁴ Open access journals have much greater scope to be inclusive and more international in terms of authorship. Authors from the developing world have largely been excluded by traditional subscription-based journals, an inequity that the open access movement hopes to redress.⁸⁵

Open access journals facilitate new kinds of interaction with the literature. These journals are beginning to use the functionality of the Internet to allow readers to participate more directly in the publishing process, for example by annotating articles (see, for example, <http://www.plosone.org>), starting discussion threads and blogs, and ranking the quality of published research. In this new era, post-publication peer review by a multitude of readers is likely to become particularly important — Smith has argued that “peer review will become the job of the many, not the select few.”⁸⁶ We are witnessing a new form of scientific discourse, called “open access 2.0,” which maintains those elements of traditional journals that benefit the scientific and medical community but also embraces the potential of the Internet to create a more interactive, community-driven literature. “The more we use, share, and exchange information on the web in a continual loop of analysis and refinement,” says Dean Giustini, medical librarian at the University of British Columbia, “the more open and creative the platform becomes; hence, the more useful it is in our work.”⁸⁷

If every single biomedical research article were made freely available and published under a Creative Commons license, all articles could be collected together in a single open access information space. The literature could then be seamlessly integrated with important databases, such as gene or protein databases, and it could be more easily searched and mined. The result would be the discovery of new scientific medical knowledge. We now have machines that can scan research papers and find linkages among them that no human could have discovered. Let’s say, for example, that you are a clinical researcher looking for promising drug candidates for treating Alzheimer’s disease. It is impossible for you to track

every single laboratory study that provides data on possible candidates — but computers can do this for you. The Wellcome Trust has argued that “as the tools for such mining become more sophisticated, we will see new knowledge being created by the linking of research papers that previously had not been seen as relevant to each other. For this to happen, however, papers must be held in an open access repository and not remain hidden behind publishers’ authentication systems.”⁸⁸

Open access would also have profound benefits to the broader public. Those who particularly stand to benefit from removing access tolls are patients and health organizations seeking reliable peer-reviewed health information, teachers looking for materials for use in the classroom, journalists investigating science and health stories, and lawyers, policy-makers, and activists searching for empirical studies that could inform their work on, for example, protecting the environment or promoting human rights. “Increasing public access to relevant research,” says Willinsky, “could provide, say, antipoverty organizations in Vancouver, Aborigine organizations in Sydney, union organizers in Washington, and health organizations in Indonesia with the latest findings, historical pat-

terns, international comparisons, and proven methods, all of which would further their efforts and improve the quality of their work.”⁸⁹ The box below gives a striking example of why open access matters to “ordinary” citizens.

INTERNATIONAL SUPPORT AND CORPORATE RESISTANCE

There is now growing international support for open access from research funders, universities, governments, authors, journal editors, civil society organizations, patient advocacy groups, and the broader public. Three events stand out for their particular importance in sparking the worldwide wave of interest in making research results a public good.

The first was the Budapest Open Access Initiative, which arose from a meeting convened in Budapest by the Open Society Institute on December 1–2, 2001.⁹⁰ The purpose of the meeting was “to accelerate progress in the international effort to make research articles in all academic fields freely available on the internet.” The result was a declaration, signed so far by 4,423 individuals and 395 organizations at the time of writing this article, which reads: “Removing access

WHY OPEN ACCESS MATTERS TO “ORDINARY” CITIZENS: THE CASE OF SHARON TERRY

Critics of the open access movement often state that the public would have no use for, or understanding of, the primary biomedical literature.⁹² However, Sharon Terry’s story suggests that such a view is inaccurate and arguably patronizing.⁹³

Terry’s two children were diagnosed with the genetic disorder pseudoxanthoma elasticum (PXE) in 1994, which led her and her husband to become activists in the fight to remove the barriers faced by ordinary citizens to peer-reviewed health information. Terry has described the process that she and her husband followed to get information about PXE. She was frustrated by her physician’s lack of specialist knowledge on PXE and began to try to educate herself about the condition. Unfortunately, she experienced major hurdles to accessing the biomedical literature, including \$25/day fees to enter a research library and charges for interlibrary loan articles. She had to come up with a number of schemes to become an “authorized user” of the literature, such as volunteering to work in a hospital to gain access to its library, and borrowing the logon and password from sympathetic friends who had access to subscribed systems.

As a result of these efforts, the Terrys, two “lay people” with no formal education, created a chart of the disease (its genesis, behavior, and progression) that remains highly valued to this day, patented the gene responsible for PXE along with its co-inventors, and wrote articles that were published in scholarly journals. Sharon Terry is now President and CEO of the Genetic Alliance (<http://www.geneticalliance.org/>), a coalition of over 600 disease-specific advocacy organizations; the founding Executive Director of PXE International, a research advocacy organization for PXE; and an active member of the Alliance for Taxpayer Access.⁹⁴

barriers to this literature will accelerate research, enrich education, share the learning of the rich with the poor and the poor with the rich, make this literature as useful as it can be, and lay the foundation for uniting humanity in a common intellectual conversation and quest for knowledge.”⁹¹

Reflecting on its five-year anniversary, Suber argued that the initiative was important because it “offered a definition of open access that has structured action and opinion ever since.”⁹⁵ The initiative defined open access as the “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.”⁹⁶

The second landmark event was a conference held in Berlin on October 20–22, 2003, which led to the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities.⁹⁷ At the time that this article went to press, 248 organizations had signed the declaration, including the Indian National Science Academy and China’s National Science Foundation.⁹⁸ The declaration reads: “Our mission of disseminating knowledge is only half complete if the information is not made widely and readily available to society. New possibilities of knowledge dissemination not only through the classical form but also and increasingly through the open access paradigm via the Internet have to be supported. We define open access as a comprehensive source of human knowledge and cultural heritage that has been approved by the scientific community.”

The third event was a meeting on open access in Salvador, Brazil, on September 21–22, 2005, which led to the Salvador Declaration on Open Access: The Developing World Perspective, which reads: “Open Access promotes equity. For the developing world Open Access will increase scientists and academics capacity to both access and contribute to world science.”⁹⁹

Research funders are increasingly embracing, or even mandating, open access to the research articles that they support. For example, the Wellcome Trust now makes it a condition of receiving a grant that the grantee make the final paper freely available, and

it encourages grantees to use a license in which the author (not the publisher) retains copyright.¹⁰⁰ On May 2, 2005, a new United States National Institutes of Health (NIH) voluntary policy, the “Policy on Enhancing Public Access to Archived Publications Resulting from NIH-Funded Research,” took effect.¹⁰¹ The NIH requested that its grantees make their published papers freely available. The US Congress went even further in 2007, when, in an appropriations bill, it included a mandatory public access directive for research funded by the NIH.¹⁰² President George Bush signed the bill into law on December 26, 2007. The new law mandates NIH researchers to deposit their papers in the NIH’s PubMed Central database, making them publicly available within a year after publication. In addition, on May 2, 2006, two US senators, a Democrat and a Republican, introduced the Federal Research Public Access Act (FRPAA).¹⁰³ The act would require that US government agencies with annual extramural research expenditures of over US\$100 million make manuscripts of journal articles stemming from research funded by that agency publicly available via the Internet. The act is receiving strong support from an alliance of patient groups across the US, the Alliance for Taxpayer Access, as well as from university provosts and the broader public.¹⁰⁴

In many ways, 2006 was “the year of open access.” Not only was there an explosion in the number of research funding agencies mandating open access to the works that they support, but also universities worldwide took action.¹⁰⁵ Eleven research institutions adopted open access mandates or strong open access policies. Many universities established digital repositories, often free to access, into which their academics could deposit copies of their manuscripts — such archives provide an important mechanism for increasing access to the archival literature. More recently, on February 12, 2008, Harvard University’s Faculty of Arts and Sciences adopted a policy that requires faculty members to allow the university to make their scholarly articles freely available online.

Even some traditional publishing companies have begun experimenting with open access, giving authors the option of having their article made freely available under the CCAL, provided the authors’ research funding agency or research institution covers the cost of producing the article.¹⁰⁶ Meanwhile, many publishing companies will now allow authors to archive an early version of an article (that is, a version that has

not yet been copy edited or corrected) in a university's digital repository, provided there is a link to the final version on the journal's website (which is nearly always subject to an access toll).¹⁰⁷ These companies often insist, however, on retaining copyright on the final copy-edited, corrected version of the work. Some traditional medical publishers have agreed to give access to their journals to nonprofit institutions in the world's poorest countries, an initiative known as the Health InterNetwork Access to Research Initiative (Hinari).¹⁰⁸ While Hinari is certainly a step in the right direction, unfortunately it excludes many developing countries, such as Brazil, India, China, and Indonesia, which have huge populations, are struggling with enormous health problems, and have an acute and urgent need for health information. In addition, participating institutions must abide by conventional, restrictive copyright agreements — it remains illegal, for example, to freely distribute or reproduce articles or create derivative works. Furthermore, individual clinicians, researchers, or policy-makers who have no formal affiliation with a nonprofit institution are excluded from Hinari. The initiative is therefore a very long way from providing universal open access.

The United Nations has now formally backed *universal* open access to the biomedical literature as a crucial tool for human development. The UN Millennium Project's Task Force on Science, Technology and Innovation, for example, in its report, *Innovation: Applying Knowledge in Development*, states: "The United Nations has championed the need to promote open access to information and technology. It can play a critical role in promoting the concept of open access. The dissemination of scientific discoveries and ideas provides the foundation for progress in science and medicine. The more widely and freely accessible information is, the greater is the value of peer-reviewed research."¹⁰⁹ The Geneva Declaration of Principles, arising from the UN World Summit on the Information Society, included specific support for open access scientific publishing.¹¹⁰

Unfortunately, some traditional publishers — threatened by the specter of lost profits — have campaigned vigorously to protect their right to ownership over research articles. The most visible aspect of this campaign has been the way in which publishers have lobbied aggressively against the FRPAA and the appropriations bill discussed above.¹¹¹ Some of the largest corporate publishers, including Reed

Elsevier and Wiley, recently hired the public relations campaigner, Eric Dezenhall, to help them craft their communications campaign opposing open access.¹¹² According to an investigative report in *Nature*, Dezenhall advised the corporate publishers to join forces with groups that may be ideologically opposed to government-mandated projects, including groups such as the Competitive Enterprise Institute, a conservative think-tank based in Washington, DC, that has used oil-industry money to promote skeptical views on climate change.¹¹³ In addition, the American Association of Publishers recently announced the creation of a lobby group called PRISM (Partnership for Research Integrity in Science and Medicine) to campaign against open access initiatives.¹¹⁴ Embarrassed by PRISM's actions, several university publishers that are supportive of open access have publicly distanced themselves from the lobby group.¹¹⁵

It is not just the large corporate publishers that are lobbying against the FRPAA; a coalition of nonprofit publishers allied to scholarly societies, eager to continue receiving major revenue from applying access tolls to their journals, is also working hard to oppose open access. The coalition's coordinator, Martin Frank, of the American Physiological Society, said in a press release from the coalition: "We as independent publishers must determine when it is appropriate to make content freely available, and we believe strongly it should not be determined by government mandate."¹¹⁶

This is arguably a rather bizarre position for the Society to take — the Society is saying that neither the authors themselves (those who did the work) nor the public (those who paid for the work) should have any say in how long the work remains locked away behind access tolls.¹¹⁷ Instead, the decision should be made by the "independent publishers" — who did not conduct, write up, or fund the research. In addition, advocates of open access argue that the mission of these scholarly societies must surely include the dissemination of knowledge, and restricting access to society journals seems to run counter to this mission.¹¹⁸

BUILDING A GLOBAL KNOWLEDGE COMMONS

Even though the traditional publishing industry is throwing its considerable political and financial might into opposing open access — Dezenhall's fee alone is reported to be US\$300,000–500,000

— the momentum toward creating a digital public library of medicine and science now seems unstoppable.¹¹⁹ Traditional subscription-based publishers are, I believe, grasping at a dying model.

This momentum around open access is paralleled by, and intimately linked with, a surge in interest in creating a “knowledge commons” (also known as an “information commons”). This term refers to a body of knowledge that is a globally shared resource that the public can use freely. Librarians, scholars, civil libertarians, and others who believe in open access to information and ideas are, says Kranich, “coming together around the emerging notion of the *knowledge commons*, which offers a new model for stimulating innovation, fostering creativity, and building a movement that envisions information as a shared resource.”¹²⁰ This commons, she argues, “offers a way not only of responding to the challenge posed by enclosure, but also of building a fundamental institution for twenty-first century democracy.”

In many ways, knowledge is the perfect public good. One person’s using it does not subtract from its value to another person (economists call such a good “non-rivalrous”). Thomas Jefferson put this eloquently when he said: “He who receives an idea from me, receives instruction himself without lessening mine; as he who lites his taper at mine, receives light without darkening me.”¹²¹ Hess and Ostrom have argued that in fact, the more people who share useful knowledge, the greater the common good.¹²² In the knowledge commons, the more people who join the community and the more they use the resource, the greater its value becomes, a phenomenon that has been termed the “cornucopia of the commons.”¹²³ This phenomenon is particularly true of open access biomedical literature, whose value increases when readers add their own commentaries, debates, discussions, analyses, replications, derivative works, and additional experimental data.

The Internet provides the technology to disseminate knowledge universally as a truly public good, free of access tolls.¹²⁴ Nevertheless, publishing companies are using this same technology to own information, restrict access to it, and limit the flow of ideas. Stiglitz has pointed out that such ownership of ideas enables “one person or company to have exclusive control of the use of a particular piece of knowledge, thereby creating monopoly power. Monopolies distort the economy. Restricting the use of medical knowledge

not only affects economic efficiency, but also life itself.”¹²⁵ The worldwide push to create a knowledge commons is a response to such monopolies over essential knowledge.

We are now witnessing an extraordinary frenzy of activities that aim to wrestle essential information out of corporate ownership and put it back into the public’s hands, where it can be used freely and built upon for all legal purposes. The Science Commons, for example, works to remove barriers to scientific cooperation that are imposed through traditional intellectual property rights: “Built on the promise of Open Access to scholarly literature and data, Science Commons identifies and eases key barriers to the movement of information, tools and data through the scientific research cycle.”¹²⁶ The BIOS project (Biological Innovation for Open Society) was established to harness the power of the knowledge commons to respond to global inequities in food security, nutrition, health, and natural resource management, using “the communications tools of the Internet and open source to generate open access to capabilities for innovation.”¹²⁷ The Drugs for Neglected Diseases Initiative, whose mission is to develop safe, effective, and affordable new treatments for tropical diseases of poverty, states that it “will make all possible efforts to ensure that the results of its work are placed and remain in the public domain.”¹²⁸ The Conservation Commons, which aims to foster a global community of informed conservation practice, “supports open access to, and in particular the fair use of, data and information related to the conservation of biodiversity.”¹²⁹ EconPort is an open access digital library of microeconomics for students, teachers, researchers, and the general public that also gives readers tools to conduct their own economics research.¹³⁰

These are just a few of a multitude of organizations that are building a commons movement that is becoming comparable in its influence to the environmental movement of the last few decades. This commons is collaborative and participatory. Peter Levine, Director of the Center for Information and Research on Civic Learning and Engagement (<http://www.civicyouth.org/>), has argued that the *process* of creating public knowledge is in itself an *additional* public good, because it builds social capital, strengthens communities, and gives people skills that they need for effective citizenship.¹³¹ Levine is currently engaged in a youth civic development project, based at the University of Maryland, in which disadvantaged adolescents

create “sophisticated and valuable research that they can give away to the public.”¹³² The project focuses on geographic variations in obesity. High school students — all African American or new immigrants — are framing the research question, collecting the data in the field, and making analytic maps for a public website. The Internet was born as a commons, says Levine, and as such it can benefit civil society and democracy “because it permits people to be creative as citizens — to contribute things of value to the commonwealth.”¹³³

TOWARD A HEALTH AND HUMAN RIGHTS COMMONS

Through its transition from a subscription-based to an open access journal that publishes materials under the CCAL, *Health and Human Rights* joins the knowledge commons movement. The journal now has the opportunity to help catalyze the creation of an online “health and human rights commons” that would be an extremely powerful tool in the worldwide promotion and protection of health as a human right. This commons could, among other things, provide researchers, clinicians, and activists with unfettered access to the data that they need to support their human rights work. It could become a rich public venue for sharing research and policy data, global analysis, discussion and debate, case reports, and experiences from the field.

Other open access journals that feature work on health and human rights, such as *BMC International Health and Human Rights* (<http://www.biomedcentral.com/bmcinthealthhumrights/>), *Open Medicine* (<http://www.openmedicine.ca>), and *PLoS Medicine* (<http://www.plosmedicine.org>), would be natural allies in this enterprise. Collectively these open access journals could feed their articles into a centralized, public domain “health and human rights hub.” Since all the information in this hub would be freely available under a Creative Commons license, the entire global community would be empowered to reuse and repurpose the knowledge for research, education, and activism. Readers would be free to use text mining and data mining tools to make new connections and discoveries from the totality of this open access literature.

A health and human rights commons could even play a role in monitoring or highlighting health-related human rights abuses. We now have the technology to crawl the Internet looking for the first reports of

infectious disease outbreaks; similar technology could be used to crawl the health and human rights commons to look for health-related human rights abuses. David Gordon, Director of Bristol University’s Townsend Centre for International Poverty Research, has suggested that, with moderate funding, it would be feasible to create an online global detection system that monitors whether states are fulfilling their obligations to provide an adequate level of health.¹³⁴ Such a system, he says, would require 1) a typology of health rights; 2) systematic search criteria in multiple languages; 3) a web crawler that searches the academic literature, the popular press, and personal blogs; and 4) critical appraisal of the results in multiple languages. The digital enclosure of information by publishers is an obvious barrier to the success of such a detection system — and is yet another reason why such enclosure must be resisted.

CONCLUSION

Advocates of open access have a vision of a world in which the research literature is a public resource that can be accessed by *anyone* on the planet, not just the rich, and used to support public health, scientific progress, and human rights. The Internet provides the means to make this vision a reality. Progressive copyright licenses give readers the opportunity to maximize the impact of the literature, using it in innovative ways to create new knowledge and insights. The scholarly literature is now — at long last — being wrestled from the hands of “Big Publishing” and firmly established as a public good for all to use.

It is time to throw out the old publishing model that envisions knowledge as a commodity for sale. In the digital era, this old-fashioned model is no longer serving society and is severely limiting the reach and influence of authors’ work. Open access publishing, which is part of a broader movement to create a global knowledge commons, offers a more hopeful future premised on the principles of equity, sharing, and cooperation. As the 19th century British Prime Minister, William E. Gladstone, famously remarked in a historic speech in 1866, “You cannot fight against the future.”

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