Modern medicine comes online: how putting Wikipedia articles through a medical journal's traditional process can get free, reliable information into as many hands as possible.

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If you graduated from medical or nursing school before the turn of the millenium, a single visit to a teaching hospital can show you the landscape has changed. Resident and student physicians no longer huddle in groups, listening to their seniors: they lean alone over smartphones, or computers, searching for diagnoses and doses. With an internet connection, you don't need to talk to the smartest person in the room to get the information you need. With the right access, you are one.

Of course, becoming a good doctor requires more than wifi. It requires one to accumulate and contextualize disparate bits of knowledge, integrate them into a larger impression that combines clinical experience, a patient's evolving clinical trajectory, and the limits of the health environment they are seeking treatment in. After skillfully gathering consensus from other allied providers, an informed and compassionate discussion with a patient is had to make the entire process clear.

If the latter points are the "art" of medicine, then the former are its science, and it's science moves quickly. With each passing day, new evidence pours in, to the tune of 12 systematic reviews per day <1>, and deciding whether to include it, and how, is an almost impossible task. A study in the British Medical Journal showed that if one hoped to take account of all that has been published in the relatively small discipline of echocardiography, it would take 5 years of constant reading, by which point, the reader would be a year behind <2>.

Thirty-five years ago, Archie Cochrane remarked that the medical profession could use a critical summary of available evidence to aid in decision-making <3>, so the echocardiographer could stop reading and do some echocardiography. The Cochrane collaboration launched in 1994 <4>, has lead to a better synthesis of available evidence, but it's far from convenient or complete. More than half of the articles are out of date, and it is getting worse all the time <5>, because having busy academics decide on what topics are important, reach consensus, then publish the findings on a growing number of studies, is a losing battle. In 2012, there were nearly a million new citations, and the number is increasing each year <6>. The Cochrane collaboration has also recognized, that in the age of Wikipedia, it needs to change with the time <7>. There have been regular calls for a new way of making end-users aware of new evidence, and translating it to the bedside, including making systematic reviews a "living" document, one that exists only on-line in a form that evolves with time <8> at the hands of many authors, something that we have explored in this journal's pages <9>.

If you type "Archie Cochrane" into a search engine, the first link will be a Wikipedia one. The same is true if you type in pneumonia, azithromycin, or "life after death". Wikipedia is the most heavily used health resource on the internet, much more than Medline, and is the sixth most popular website in the world <10>. In it's printed form, it would have more than one million paper pages <11>, and it grows each day. Anyone with internet access can connect, provide content, and correct mistakes.

Or make them. Despite its popularity <12><13>, in medical circles, its constant evolution causes Wikipedia to endure skepticism. While often used to gather information, it is rarely considered accurate or complete enough to guide treatment decisions <14>. In the face of this, clinicians and trainees turn to resources like UpToDate with greater frequency <15> and confidence <16>, because in clinical medicine, a small error can make a big difference.

It pays to be certain. Some institutions pay UpToDate as much as one million dollars per year for that sense of security. It has allowed Wolter Kluwers, the owners of UpToDate, to accrue more than $400 million in global revenue in 2012, and forecast continued double digit growth as "market conditions for print journals and books...remain soft" <17>. In contrast the Wikimedia foundation has a forecasted operating budget in the upcoming year of $58 million <18>.

What is the difference between the clinical information that makes up Wikipedia and that from UpToDate, or for that matter, a textbook, or scholarly journal article? Three main things. First, a single, responsible author, who accepts liability for scholarship of the work. Second, the careful eye of an editor, often a series of them, who ensure consistency and accuracy throughout many iterations of an article. Third, formal peer review by at least one, and often many, experts who supplement the authors' attempts to be complete, point out improvements or redundancies, and fill in gaps. These form an accepted ground from which decisions can be made with confidence.

In this issue of Open Medicine, we are pleased to publish the first ever formally peer-reviewed, and edited, Wikipedia article. The clinical topic is Dengue Fever <19>. It has been submitted by the author who has made the most changes, and who has designated 3 others who contributed most meaningfully. It has been peer reviewed by international experts in infectious disease, and by a series of editors at Open Medicine. It has been copy-edited, proofread, and once published, will be indexed in Medline. Though by the time this editorial is read, it will have changed many times, there will be a link on the Wikipedia page that can take the viewer back to the peer-reviewed, and published piece in our journal <19>. In a year's time, the most responsible author will submit the changed piece so it can move through the same editorial process, and continue to function as a valid, reliable, and evolving free and complete reference for everyone in the world. Though there may be a need for shorter, more focused clinical articles published elsewhere as this one expands, it is anticipated that the Wikipedia page on Dengue will be a reference against which all others can be compared. Though it might be decades before we see an end to Dengue, perhaps the end to exhaustive or expensive searches about what yet needs to be done, might bring it sooner.

There were challenges with this article, as there will be with others. A lack of a single, authorial voice means not only is it unlikely to have strong personal recommendations informed by experience, but the style can be inconsistent, the sentences and transitions between them less smooth, resulting in a paper that can be more challenging to read. Many "Wikipedians" have less traditional experience in publishing, and the editorial process that accompanies it, which can lead to frustrations about changing content or format to fit a journal's preference. In Open Medicine's case, we preferred a different order to the article, but deferred to keep it consistent with Wikipedia's standard flow. Papers might lack the traditional "senior" author that is typical of many clinical reviews to provide guidance on when a piece is ready for submission, what editorial changes should be accepted or challenged, which journal's readership might be the best audience for a clinical topic, or write accompanying editorials to contextualize the new information or frame controversy. This will lead to a great number of submissions that are rejected. As time goes by, the articles will lose their brevity, as they become truly encyclopedic.

The issue of authorship is particularly controversial. We talked about many different possibilities, including listing an author even if she made only a single change, or setting a threshold based on percent changes, and finally settled on letting the most responsible author, the one who had made the most changes, decide who should share authorship according to widely accepted authorship criteria <20>.   A single change, though, may be an important contribution, depending on what it is, and a case can be made to include all those who contributed, in this case, 143 people <21>. Since the number of changes made to an article are freely available for everyone to see, what of the "senior" authors mentioned in the previous paragraph, who may suggest small but important revisions, or too common in traditional academia, are added honorifically, without having changed a comma? If a decision is made by a journal to include every person who made a minor change, or only those people, how will a University determine who to reward with merit? Will medical journals be as tuned to potential conflicts when there are hundreds of authors?

The line between editors and authors will become even more blurred. In the case of the Dengue article, we deliberated over whether editorial changes should be made on the "wiki", or simply "suggested" to the primary author. If journals were truly "open", recorded every change an editor advised, we might see that some publications require more than a careful eye and attention to conflict of interest. Some require an editor to do research of his own, find relevant citations, communicate with experts in the field, even interpret data. In this case, we opted for a more traditional, invisible role, though a compelling case could be made that disambiguation, in all spheres, brings valuable change.

A trend towards improvement is not just typical of a Wikipedia page, but so too of medicine. It's progress is determined, and marked, by what appears on the pages of medical journals and textbooks, or these days, on computer screens. It is our hope, and that of the Wikimedia foundation, that this endeavor leads other scholars to refine and improve Wikipedia articles so they might become the world's most accurate and trusted reference, in addition to the most well read (the Wikipedia page on Dengue was accessed more than 10 000 times yesterday) <20>. Freely open, and accessible, Wikipedia can improve clinical care at the bedside for physicians around the world, regardless of their ability to pay high fees. Already, Wikipedia's zero project is working with mobile providers in developing countries to minimize, or even remove, data costs associated with accessing their site <22>. This might envourage greater numbers of clinicians and scholars to contribute their experience and research to our shared, global knowledge, and begin to repair some of the great publishing bias that exists between the high and low income world <23>. Further, in a time when newspapers and traditional publishers struggle to explain their relevance, medical journals can more easily describe what we deliver: content you can trust.

At least temporarily. Medicine and science, like the diseases they attend do, move fast, much faster than the systems that are responsible for making it known. As this editorial is being written, Ebola continues its surge in West Africa. Since 2014's epidemic started, there have been 1400 changes to Wikipedia's Ebola disease page, 10 times as many as the year before <24>. Which ones are accurate? Given Wikipedia's history, one would suspect most of them. All of them? Without the attention of dedicated, capable, and responsible eyes, one can't be sure. What we can be certain of is that the story of the 2014 Ebola epidemic, like the recent Dengue outbreak in Japan <25>, will be told

on Wikipedia and that a determining factor on its final sentences will be how much relevant information about how to treat and control the diseases made its way into capable hands.

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