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Perspective

Engineered in India — Patent Law 2.0

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India is known as the "pharmacy of the developing world," because it supplies much of the world's demand for affordable, generic drugs. So when the Supreme Court of India issued a landmark ruling in April adopting a strict interpretation of the country's new patent law, advocates for global access to medicines celebrated. In fact, the decision in *Novartis v. Union of India & Others* provides an important model for other countries around the world — a step toward a "patent law 2.0" that not only helps to ensure access to medicines but might also help better align pharmaceutical innovation with public health needs.

Patents are government-granted monopolies. As monopolies, they can drive the prices of drugs up dramatically. For example, in 2000, when only patented antiretroviral drugs for human immunodeficiency virus (HIV) infection were widely available, they cost approximately $10,000 per person per year, even in very poor countries. Today, these same medicines cost $150 or less if they are purchased from Indian generics companies.

So why allow patents at all? In theory, to promote innovation. It can cost hundreds of millions of dollars to develop a new drug. Free copying could undermine the profitability of companies that engage in research and development. But the implications of patents for innovation, particularly globally, are rather more complicated than this simple account suggests. Developing countries represent a very small share of the world's market, so patents in these countries tend to yield very little innovation. Moreover, the wrong kind of patent protection can create problems for innovation. Finally, patents cause especially acute problems for access to medicines in developing countries — not only because of low incomes but also because insurance and price-control systems are often absent or inadequate.

Not so long ago, countries around the world were largely free to set their own patent policies. Many developing countries, including India, did not offer patents on medicines. Today, most countries are members of the World Trade Organization, which requires members to provide patents on medicines. When India had to comply with this obligation in 2005, health activists foresaw vast increases in the prices of medicines for people in India and other countries who relied on access to Indian generics. These activists raised the alarm and, along with the local industry, persuaded the Indian government to adopt unprece-

dented limitations in the new patent law. One of these limitations appears in Section 3(d) of the Indian Patent Act, which forbids patents on new forms of known substances (e.g., a salt, ester, isomeric, or polymorphic form of a known compound), unless the new form significantly enhances efficacy.

To understand the importance of the move — and the *Novartis* case — one needs to understand something about patent practice in the industry today. Typically, a successful medicine is covered not by one but by several patents.[1] There is often a primary patent on the active ingredient itself and a set of secondary patents — for example, there may be patents on a salt or isomeric form, on a chemical intermediary, and on a particular formulation (e.g., a sustained-release version). U.S. patent law provides drug makers with 20 years of protection for all these kinds of patents. The practice of creating a thicket of patents to extend patent life is called "evergreening" or "life-cycle management." It can work because the later patents — even if they cover only minor improvements — provide opportunities for litigation and may interact with the regulatory system in a way that gives their holders control over a drug as a whole.

One of the first patents to be considered under the new Indian law was related to the blockbuster cancer drug Gleevec (imatinib mesylate). Gleevec is a lifesaving drug used in treating chronic myeloid leukemia. As is the norm, the originating company, Novartis, sought several patents on the new therapy in the United States. In India, because the new patent law had limited retroactive reach, Novartis could file only for a single follow-on patent, covering the beta-crystalline form of the active ingredient.

The Court concluded that the patent ran afoul of Section 3(d) and adopted a strict interpretation of the provision, whereby new forms of known drugs cannot be patented in India unless the new form yields therapeutic benefits. The Novartis patent failed to meet this standard.

The immediate result of the case is that imatinib can be sold generically in India for a fraction of the price of the Novartis version. More important, the decision means that many drug patents that are granted in the United States should be denied in India. In a recent study, my colleagues and I found that secondary patents are quite common in the pharmaceutical industry and typically provide many years of incremental patent life.[2] We evaluated 17 years' worth of patent data from the so-called Orange Book, published by the Food and Drug Administration, which lists the most critical patents covering drugs registered in the United States. Of the drugs we studied — all new molecular entities registered in the United States from 1988 through 2005 with at least one patent in the Orange Book — one quarter had independent patents on new forms of known compounds. (Other kinds of secondary patents were even more common.) These "new form" patents generated, on average, an additional 6 years of patent life, at least nominally.[2]

Novartis, unsurprisingly, has argued that the Court's decision will undermine pharmaceutical innovation. In truth, India represents such a small portion of the world's market for drugs (about 1%, according to the most recent publicly available data),[3] that the decision has no obvious implications for innovation at all.

But what if Section 3(d) becomes a model for other developing countries, and such countries become, as some have predicted, a much larger share of the global pharmaceutical market? Surprisingly, it could do more to help than to hurt innovation, by encouraging companies to focus on the kind of innovation that provides the most health benefit.

A patent law that treats incremental innovation and significant innovation in the same way encourages companies to prioritize less important research over more important research. Provisions like Section 3(d) can help reverse this effect and encourage companies to undertake the riskier and more expensive research that is required to generate breakthrough drugs. In fact, such provisions are in a sense simply a more direct and affordable way for developing countries to achieve something that may already be occurring in an ad hoc fashion in the United States. A recent study suggests that secondary patents in the United States are often invalidated in litigation, particularly for the most lucrative drugs.[4] But a system that corrects for patent-law distortions after the fact, through expensive litigation, is far from optimal. (Drug companies also still widely seek secondary patents in the United States, which suggests that they still generate meaningful exclusivity despite their vulnerability in litigation.)

The provision interpreted in *Novartis*, if adopted broadly in the

developing world, might help to encourage companies to spend resources on breakthrough innovation, rather than on minor modifications and lawyer fees. But whatever its implications for innovation, this much is clear: poor people around the world need better access to affordable drugs, and this decision will help to provide it.

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1. Hemphill CS, Sampat BN. When do generics challenge drug patents? J Empirical Leg Stud 2011;8:613-49.
2. Kapczynski A, Park C, Sampat B. Polymorphs and prodrugs and salts (oh my!): an empirical analysis of "secondary" pharmaceutical patents. PLoS One 2012;7(12):e49470.
3. IMS India. Market overview (http://www.imshealth.com/portal/site/ims/menuitem.d248e29c86589c9c30e81c033208c22a/?vgnextoid=02d88fd705063310VgnVCM100000ed152ca2RCRD&cps).
4. Hemphill CS, Sampat BN. Evergreening, patent challenges, and effective market life in pharmaceuticals. J Health Econ 2012;31:327-39.

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