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# TRIPS-Plus, Public Health and Performance-Based Rewards Schemes Options and Supplements for Policy Formation in Developing and Least Developed Countries

Mohammed K. El-Said

# ARTICLE

# TRIPS-PLUS, PUBLIC HEALTH AND PERFORMANCE-BASED REWARDS SCHEMES OPTIONS AND SUPPLEMENTS FOR POLICY FORMATION IN DEVELOPING AND LEAST DEVELOPED COUNTRIES

MOHAMMED K. EL-SAID[1]



1. *Dr. Mohammed El-Said: Staff Profiles*, U. CENT. LANCASHIRE, http://www.uclan.ac.uk/staff_profiles/dr_el_said_mohammed.php (last visited Feb. 6, 2016). The research leading to these results has received funding from the European Research Council ("ERC") under the Seventh Framework Programme of the European Union (ERC grant agreement number 339239), but reflects only the author's views and not those of the European Union. The author would like to thank the editorial team for their assistance with this paper.

> [W]here the market has very limited purchasing power, as is the case for diseases affecting millions of poor people in developing countries, patents are not a relevant factor or effective in stimulating [Research and Development] and bringing new products to market.[2]

# I. INTRODUCTION

The debate surrounding the creation of a balanced patent protection regime in countries is not new. For decades, policy makers experimented with the levels of protection.[3] For example, the Netherlands abolished patents in the field of chemistry for decades between 1869 and 1910, in order to catch up with other European countries such as Germany.[4] Similarly, between 1960 and 1980 a number of Asian economies—often referred to as the Tiger economies—adopted a systematic national policy of reverse engineering and imitation.[5] When South Korea introduced patent protection in 1961, the protection term was limited to only twelve years and protection did not extend to foodstuffs, pharmaceuticals, or

2. WORLD HEALTH ORG., PUBLIC HEALTH INNOVATION AND INTELLECTUAL PROPERTY RIGHTS, REPORT OF THE COMMISSION ON INTELLECTUAL PROPERTY RIGHTS, INNOVATION AND PUBLIC HEALTH 22 (2006) [hereinafter WHO, PUBLIC HEALTH INNOVATION].

3. On the history of the weak regime for intellectual property protection in the United States, see Jerome H. Reichman, *Intellectual Property in the Twenty-First Century: Will the Developing Countries Lead or Follow?*, 46 HOUS. L. REV. 1115, 1116-18, 1120 (2009).

4. ADAM B. JAFFE & JOSH LERNER, INNOVATION AND ITS DISCONTENTS: HOW OUR BROKEN PATENT SYSTEM IS ENDANGERING INNOVATION AND PROGRESS, AND WHAT TO DO ABOUT IT 86-90 (2004).

5. *See* COMM'N ON INTELLECTUAL PROP. RIGHTS, INTEGRATING INTELLECTUAL PROPERTY RIGHTS AND DEVELOPMENT POLICY 20 (2002) (finding that East Asian countries, Taiwan and South Korea in particular, imposed weak patent systems to expand technical knowledge and foster rapid economic development).

chemicals.[6] Similarly, many of the developed nations adopted a relaxed protection regime during their initial stages of development, utilizing their preferred intellectual property regime only after reaching a certain level of advancement.[7]

This debate remains as relevant as ever.[8] A 2013 report published in Australia sums up the dilemma facing many governments in the area of public health, noting:

> Thus the question of how much patent protection to offer is crucial. Pharmaceutical patent rights that run for too long or that are defined too expansively will deprive people of drugs because purchasers, including Governments, cannot afford them. They can also constrain follow on innovation: too weak a patent system means patients will suffer because the industry has inadequate incentives to develop new drugs.[9]

On March 31, 2015, the Harper Report, triggered by major concerns about the current regime, requested that the Australian government should direct the Productivity Commission to conduct a twelve-month overarching review of the intellectual property regime in the country.[10]

6. *See id.* at 19-20 (conveying the prevalent belief at the time that states had to restrict patents on "essential goods" such as food, medicine, and basic chemicals; the Agreement on Trade-Related Aspects of Intellectual Property prohibits such discriminatory policies today).

7. *See* CTR. FOR STRATEGIC STUDIES & DEBATES, BRAZIL'S PATENT REFORM INNOVATION TOWARDS NATIONAL COMPETITIVENESS 224, 225 (2013) (citing Ha-Joon Chang who implied that many developed countries mistakenly believe that stronger intellectual property protection led to their economic growth).

8. There has been a number of reports in recent years of this type including a report by the Government of the United Kingdom. *See* COMM'N ON INTELLECTUAL PROP. RIGHTS, *supra* note 5, at 155 (weighing arguments for and against stronger intellectual property rights and deciding that intellectual property rights should be customized to meet the economic and social needs of the developing country in question); *see also* GOWERS REVIEW OF INTELLECTUAL PROPERTY 59 (2006) (finding that flexibility to choose the strength of intellectual rights is necessary for developing countries).

9. TONY HARRIS ET AL., PHARMACEUTICAL PATENTS REVIEW REPORT v (2013).

10. IAN HARPER ET AL., COMPETITION POLICY REVIEW FINAL REPORT 41 (2015); *cf.* GOWERS REVIEW OF INTELLECTUAL PROPERTY, *supra* note 8, at 1 (stating that the United Kingdom commissioned a similar report examining whether its intellectual property regime was meeting its "purpose in an era of globalisation, digitisation, and increasing economic specialisation").

Many factors affect the intellectual property regime in any country.[11] This also means that the responsiveness of intellectual property protection itself to any reform will vary depending on these factors. Therefore, it is baseless to advocate that stronger economic growth in any given country would be triggered by strengthened intellectual property protection.[12] The World Bank, in a 2005 report, concluded that "[e]vidence is inconclusive about the responsiveness of Foreign Direct Investment ("FDI") to intellectual property regimes."[13]

Home grown factors, including a country's level of development and progress, its national priorities, and standards of living are often important factors in shaping the debate. Yet in more recent times, external factors became more visible—and even more influential to that effect—in the formation of such a process. Following the creation of the World Trade Organisation ("WTO") and its Agreement on Trade-Related Aspects of Intellectual Property Rights ("TRIPS Agreement") in 1994, an upward trend in the regulation and enforcement of intellectual property rights in general was noticeable.[14] More recently, TRIPS-Plus rules were included under various bilateral, regional, and multilateral arrangements and forums resulting in strengthened levels of intellectual property protection and enforcement in many parts of the world.[15]

11. *See* Carlos Correa, *Designing Patent Policies Suited to Developing Countries Needs*, 10 ECONÔMICA, RIO DE JANEIRO 82, 87 (2008) (discussing, among other things, growing limitations on a developing country's ability to shape their patent system because of TRIPS-Plus provisions in Free Trade Agreements such as expanding patents to protect "the second indication of existing medicines").

12. *See generally* Fritz Malchup & Edith Penrose, *The Patent Controversy in the Nineteenth Century*, 10 J. ECON. HIST. 1 (1950) (presenting how the nineteenth century arguments for and against patent protections remained unchanged despite economic changes during that time period).

13. WORLD BANK, GLOBAL ECONOMIC PROSPECTS: TRADE, REGIONALISM, AND DEVELOPMENT 110 (2005).

14. *See* Ruth L. Okediji, *Legal Innovation in International Intellectual Property Relations: Revisiting Twenty-One Years of the TRIPS Agreement*, 36 U. PA. J. INT'L L. 191, 205 (2014) ("Certainly, the TRIPS Agreement has not produced the normative stability many imagined, desired or feared.").

15. Wadhwa recently explained the developments and change of approach in following manner:

> The framers of the U.S. Constitution were not wrong. Patents did serve an important purpose during the days when technology advances happened over decades or

More crucial than any other branch of intellectual property in today's global debate is the issue of patent protection and its relation to the accessibility and affordability of medicines. The TRIPS Agreement made it obligatory for the first time in history for all member states to provide patent protection for pharmaceutical products and processes.[16] This meant that many developing—and developed—countries are no longer capable of making drugs cheaper and affordable for their citizens, due to the need to pay royalties to the pharmaceutical producers originating from the developed countries.[17] With the support of the major pharmaceutical producers, these developed countries incorporated the protection of intellectual property in their international trade agenda under the auspices of free trade, resulting in, and subjecting developing countries into accepting, higher TRIPS-Plus levels of intellectual property protection under their national legal regimes.[18]

> centuries. In today's era of exponentially advancing technologies, however, patents have become the greatest inhibitor to innovation and are holding the United States back. The only way of staying ahead is to out-innovate a competitor; speed to market and constant reinvention are critical. Patents do the reverse; they create disincentives to innovate and slow down innovators by allowing technology laggards and extortionists to sue them.

Vivek Wadhwa, *Here's Why Patents are Innovation's Worst Enemy*, WASH. POST (Mar. 11, 2015), https://www.washingtonpost.com/news/innovations/wp/2015/03/11/heres-why-patents-are-innovations-worst-enemy/.

16. *Essential Medicines and Health Products, WTO and the TRIPS Agreement*, WORLD HEALTH ORG., http://www.who.int/medicines/areas/policy/wto_trips/en/# (last visited Jan. 26, 2016).

17. *See* John H. Barton, *TRIPS and the Global Pharmaceutical Market*, 23 HEALTH AFF., May-June 2004, at 146, 146-48 (noting that India possessed an established industry in generic drugs that became threatened by the patent provisions in the TRIPS Agreement).

18. *See* CAROLYN DEERE, THE IMPLEMENTATION GAME: THE TRIPS AGREEMENT AND THE GLOBAL POLITICS OF INTELLECTUAL PROPERTY REFORM IN DEVELOPING COUNTRIES 13 (2008) ("Over a third of the WTO's 106 developing country members included a broad range of TRIPS-plus provisions in their laws. Over half of the countries in this TRIPS-plus group were [least developed countries]—the same countries that the economic literature anticipates would adopt the lowest levels of IP protection."); Courtenay Atwell, *Corporate Involvement in Intellectual Property Policy-making*, 36 EUR. INTELL. PROP. REV. 306, 308 (2014) (examining the history of corporate involvement in intellectual property protections in the United States in the years leading up to the TRIPS Agreement).

Significantly, many countries—including developed ones—are no longer able to cater and provide adequate public health care coverage for their citizens due to the high costs of medicines. The situation is worsened due to various austerity measures taken by many of these countries.[19]

In the light of the above, this article will provide an overview of the current global debate with relation to public health and access to medicines and its relationship with patent policy. It will also touch upon the flexibilities of the TRIPS Agreement and provide various utilization examples where such flexibilities have resulted in a positive impact on access to medicines and public health in both developed and developing countries. Although there has been extensive discussion in recent years focusing on the importance of incorporating the TRIPS Agreement's flexibilities under national law, there has been little discussion about the options available to those countries that have already committed themselves to TRIPS-Plus obligations. Taking this into consideration, this article will provide an overview of various examples whereby countries managed to limit the negative impact of TRIPS-Plus rules under their national legal regime through legal and institutional innovative approaches. Finally, this article will also allude to the global debate related to financing of public health care and will explore the viability of one supplementary scheme which could complement the patent protection regime in this regard, namely pay-for-performance schemes.

## II. PUBLIC HEALTH, PHARMACEUTICAL INNOVATION, AND THE COMPETITIVENESS OF THE PHARMACEUTICAL INDUSTRY

The global public health situation is facing many challenges today. One third of the world's population (over 2 billion people) does not have regular access to basic, essential medicine.[20] Of the 34 million

19. *See, e.g.*, Helena Smith et al., *Greek Economy Close to Collapse as Food and Medicine Run Short*, GUARDIAN (July 3, 2015), http://www.theguardian.com/world/2015/jul/03/greece-economy-collapse-close-food-medicine-shortage.

20. *See* Hans V. Hogerzeil & Zafar Mirza, WORLD HEALTH ORG. [WHO], THE WORLD MEDICINES SITUATION 2011: ACCESS TO ESSENTIAL MEDICINES AS PART

people estimated by the World Health Organization ("WHO"), the Children's Rights and Emergency Relief Organization, and the Joint United Nations Programme on HIV/AIDS to be living with the human immunodeficiency virus ("HIV") and who should have been receiving treatment, only 8 million had access to treatment by the end of 2011.[21] As of June 2014, 13.6 million people living with HIV had access to antiretroviral therapy and 41% of all adults living with HIV are receiving treatment.[22] However, just 32% of all children living with HIV are receiving the lifesaving medicines.[23] The burden of the "neglected disease" or "diseases of the poor" overcasts its shadow over this situation leaving the world helpless in saving many lives all over the globe.[24]

On the other hand, the pharmaceutical industry has been engulfed with its own woes in recent years culminating in a number of challenges. The first major challenge is the investment and research ("R&D") dilemma facing the industry. Drug producers are no different than other investors in that their operations are motivated by profits. The fact that their mission implies saving lives, does not speak to whether this mission would be achieved at cost to these companies and their shareholders.[25] The first important element for any pharmaceutical company's decision to indulge in specific experiments and clinical trials is market size and more importantly the ability of that market size (i.e. patients) to be able to purchase the

OF THE RIGHT TO HEALTH 1 (2011).

21. UNAIDS, GLOBAL REPORT: UNAIDS REPORT ON THE GLOBAL AIDS EPIDEMIC 8, 50 (2012).

22. *Fact Sheet 2015*, UNAIDS (2015), http://www.unaids.org/en/resources/campaigns/HowAIDSchangedeverything/factsheet.

23. *Id.*

24. *See Getting to Zero AIDS-Related Deaths: TRIPS and the Potential Impact of Free Trade Agreements*, UNAIDS (June 1, 2012), http://www.unaids.org/en/resources/presscentre/featurestories/2012/june/20120601tripsftas (explaining the impact of TRIPS-Plus provisions on the dire circumstances of millions of people on antiretroviral therapy).

25. Michael Pearson, the CEO of Valeant Pharmaceuticals stated recently that "[i]f products are sort of mispriced and there's an opportunity, we will act appropriately in terms of doing what I assume our shareholders would like us to do." James Woods, *Pharma CEO: We're in Business of Shareholder Profit, Not Helping the Sick*, US Uncut (Oct. 9, 2015), http://usuncut.com/class-war/valeant-ceo-shareholder-profit/.

drug at the asking price.[26] Due to such externalities, this resulted in the well-known equation; the ninety-ten gap. The Commission on Health Research for Development explained in a 1990 report that 90% of the innovation in healthcare relates to the diseases of a mere 10% of the population of the world.[27] This explains why the pharmaceutical industry remains today as one of the most profitable industries around the globe. Strikingly, in 2013, there were five pharmaceutical companies which each made a profit margin of 20% or more—Pfizer, Hoffmann-La Roche, AbbVie, GlaxoSmithKline, and Eli Lilly.[28] Avorn further explains:

> In terms of access to capital, it's interesting to note that large drug makers are among the U.S. firms with the highest amounts of profits held overseas. Two pharmaceutical companies are ranked third and fourth among all U.S. corporations in this regard: Pfizer ($69 billion) and Merck ($57 billion), respectively. Collectively, another eight drug companies reportedly have an additional $173 billion of capital that is retained overseas, untaxed by the United States.[29]

Accordingly, multinational pharmaceutical companies are more interested in how activities relate to certain types of diseases, i.e. lifestyle diseases (including skin care and sexual dysfunctional related disease) to that of neglected diseases (including malaria,

26. *See* Ernst R. Berndt et al., *Decline in Economic Returns from New Drugs Raises Questions About Sustaining Innovations*, 34 HEALTH AFF. 245, 245 (2015) (finding that pharmaceutical companies assessed whether their "life-time sales [would] be sufficient to generate positive returns on investment beyond recouping [research and development] and operating costs").

27. COMM'N ON HEALTH RESEARCH FOR DEV., HEALTH RESEARCH: ESSENTIAL LINK TO EQUITY IN DEVELOPMENT 4, 45 (1990); *see* SOPHIE BLOEMEN ET AL., OXFAM, TRADING AWAY ACCESS TO MEDICINES—REVISITED: HOW THE EUROPEAN TRADE AGENDA CONTINUES TO UNDERMINE ACCESS TO MEDICINES 8 (2014) ("The statistical finding that only 10 percent of the world's R&D expenditure for health is devoted to diseases that primarily affect the poorest 90 percent of the global population has become a symbol of the current R&D crisis.").

28. Richard Anderson, *Pharmaceutical Industry Gets High on Fat Profits*, BBC News (Nov. 6, 2014), http://www.bbc.com/news/business-28212223 [hereinafter Anderson, *Fat Profits*] ("Last year, US giant Pfizer, the world's largest drug company by pharmaceutical revenue, made an eye-watering 42% profit margin. As one industry veteran understandably says: 'I wouldn't be able to justify [those kinds of margins].'").

29. Jerry Avorn, *The $2.6 Billion Pill – Methodologic and Policy Considerations*, 372 NEW ENG. J. MED. 1877, 1878 (2015).

tuberculosis, and even antibiotics).[30] In fact, some studies indicate that neglected diseases (even including type II diseases, such as malaria and tuberculosis) receive a meagre 2% of the annual $160 billion spent globally on R&D.[31] This example is quite similar to the recent Ebola outbreak where no vaccination existed despite the fact that the disease has been around for decades with more than thirty outbreaks.[32] One commentator recently described the full picture by stating that "[o]ur priorities are tilted by marketplace imperatives."[33]

In a widely circulated publication dating to 2002, Trouiller et al. found that of all of the pharmaceutical products developed in the world between 1975 and 1999, only 1.1% were related to neglected diseases.[34] Recently, the same study was repeated and the results

30. MATTHIAS BUENTE ET AL., BOOZ & CO., PHARMA EMERGING MARKETS 2.0: HOW EMERGING MARKETS ARE DRIVING THE TRANSFORMATION OF THE PHARMACEUTICAL INDUSTRY 8 (2013) (finding that pharmaceutical executives believe that "disease patterns in emerging markets are rapidly changing and shifting toward 'lifestyle' diseases"). For instance, there have been no new discoveries of distinct classes of antibacterials since 1987. Michael Torrice, *Antibacterial Boom and Bust*, CHEMICAL & ENGINEERING NEWS, Sept. 9, 2013, at 34, 36. The lack of investment in research and development on the "diseases of the poor" prompted the WHO to adopt the Global Strategy and Plan of Action on Public Health, Innovation and Intellectual Property in 2008. WORLD HEALTH ORG. [WHO], GLOBAL STRATEGY AND PLAN OF ACTION ON PUBLIC HEALTH, INNOVATION AND INTELLECTUAL PROPERTY (2011).

31. Brian Till, *How Drug Companies Keep Medicine Out of Reach*, ATLANTIC (May 15, 2013), http://www.theatlantic.com/health/archive/2013/05/how-drug-companies-keep-medicine-out-of-reach/275853/.

32. *See* Abraar Karan & Thomas Pogge, *Ebola and the Need for Restructuring Pharmaceutical Incentives,* 5 J. GLOBAL HEALTH 1, 1-2 (2015) ("Had there been significant Ebola outbreaks in affluent nations rather than in Sub-Saharan Africa in the past few decades, we would likely have an arsenal of medications in stock today. While pharmaceutical companies continue to profit from sales of non-essential medicines, and neglect investments in medicines that are needed mainly by the poor, the global community ends up paying as result.").

33. Till, *supra* note 31 (quoting Bill Gates explaining that "[t]he malaria vaccine, in humanist terms, is the biggest need, but it gets virtually no funding. If you are working on male baldness or the other things you get an order of magnitude more researching funding because of the voice in the marketplace").

34. *See* Patrice Trouiller et al., *Drug Development for Neglected Diseases: A Deficient Market and a Public-Health Policy Failure*, 359 LANCET 2188, 2188 (2002) (finding that sixteen out of 1,393 drugs marketed between 1975 and 1999 were for neglected diseases).

only marginally changed.[35] Of the 850 products brought to market around the world between 2000 and 2011, the study found that only 4% (a mere thirty-seven) were related to neglected diseases, which mainly exist in least and middle income countries and include malaria, tuberculosis, Chagas' disease, leishmaniasis, and diarrhoeal diseases.[36]

A more in-depth analysis of the fields and areas where the R&D activities are conducted also assists in explaining the selectiveness of the industry. One study found that "[a]mong the 1223 new chemical entities commercialized between 1975 to 1997, . . . only 13 (1%) are specifically for tropical diseases. . . . and only 4 (0.3%) may be considered direct results of R&D activities of the pharmaceutical industry."[37] A more recent study found that pharmaceutical companies conduct thirty times more clinical trials for recurrent cancer drugs than for preventive drugs.[38] The study showed that pharmaceutical companies focus more on profitable recurring sales through diverting their R&D expenditures away from more curable, localized cancers and focus on incurable metastatic and recurrent cancers instead.[39] As the authors of the study explain, "the patent system encourages pharmaceuticals to pump out drugs aimed at

35. *See* Miltos Ladikas & Sachin Chaturvedi, *The Health Impact Fund, Issues and Challenges*, *in* THE LIVING TREE: TRADITIONAL MEDICINE AND PUBLIC HEALTH IN CHINA AND INDIA 33, 33 (Sachin Chaturvedi et al. eds., 2014) ("Of the 1,556 new drugs approved for commercial sale from 1975-2004, only 18 (ca 1%) were for neglected tropical diseases.").

36. Germán Velásquez, *Guidelines on Patentability and Access to Medicines* 8 (South Ctr., Working Paper No. 61, 2015); *see also* Carlos Correa, Guidelines for the Examination of Pharmaceutical Patents: Developing a Public Health Perspective vii (Jan. 2007) (working paper) (on file with the World Health Organization and International Center for Trade and Sustainable Development) [hereinafter Correa, Guidelines] (suggesting that treatments to diseases such as AIDS, malaria, tuberculosis, bacterial meningitis, and pneumonia will require ongoing research and development to combat increasing resistance to the existing medicine).

37. Bernard Pécoul et al., *Access to Essential Drugs in Poor Countries: A Lost Battle?*, 281 J. AM. MED. ASS'N 361, 364 (1999).

38. *See* Eric Budish et al., *Do Firms Underinvest in Long-Term Research? Evidence from Cancer Clinical Trials*, 105 AM. ECON. REV. 2044, 2047 (2015) (discovering that firms conducted 17,000 clinical trials for recurrent cancer treatment versus less than 500 trials toward prevention).

39. A.T., *Patents That Kill*, ECONOMIST (Aug. 8, 2014, 9:50 AM), http://www.economist.com/blogs/freeexchange/2014/08/innovation.

those who have almost no chance of surviving the cancer anyway. This patent distortion costs the U.S. economy around $89 billion a year in lost lives."[40]

Notably, the selectiveness in the development of new medicines also applies to industrialised countries including the United States. For instance, Zakir Thomas reminds us that "the United States is the largest pharmaceutical market of the world. Even there, if you have a disease which does not command a huge market which interests pharmaceutical companies, you don't have innovation."[41]

The stagnation—which some would even argue the decline—in the innovative and productive ability of pharmaceutical companies in recent years is visible.[42] The situation is also exacerbated by the disequilibrium with relation to the breakdown of R&D activities and the focus on the disease related to the minority citizens of the globe who are rich enough to be able to cover the cost of their medication.[43] A 2006 U.S. Government Accountability Office report stated:

> [O]ver the past several years it has become widely recognized throughout the industry that the productivity of its research and development expenditures has been declining; that is, the number of new drugs being produced has generally declined while research and development expenses have been steadily increasing. Similarly, FDA and analysts reported that pharmaceutical research and development investments were not producing the expected results and that innovation in the pharmaceutical industry had become stagnant.[44]

40. *Id.*

41. Zakir Thomas, *The Limits of the Patent System Do Patents Kill Innovation?*, OPEN SOURCE DRUG DISCOVERY (Aug. 13, 2014), http://osddbengaluru.net/osdd/?p=16504.

42. *See* Cynthia M. Ho, *Should All Drugs Be Patentable?: A Comparative Perspective*, 17 VAND. J. ENT. & TECH. L. 295, 300 (2015) (indicating that some academics believe stronger patent protection is necessary to expand research and development into innovating new drugs); *see also* Berndt et al., *supra* note 26, at 250-51 (asserting that protective intellectual property rights are meant to encourage R&D, but evidence shows that new active substances are not producing a significant economic return).

43. COMM'N ON MACROECONOMICS & HEALTH, MACROECONOMICS AND HEALTH: INVESTING IN HEALTH FOR ECONOMIC DEVELOPMENT 78 (2001).

44. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-07-49, NEW DRUG DEVELOPMENT: SCIENCE, BUSINESS, REGULATORY, AND INTELLECTUAL PROPERTY

More recently Kees de Joncheere stated that, "[t]he system has served us well in terms of developing good new medicines, but in the past 10-20 years there has been very little breakthrough in innovation."[45] The situation is no different on the opposite side of the Atlantic. In 2008, the European Commission reported a decrease in new chemical entities registered between 1990 and 2007 (from fifty-one in 1991 to twenty-one in 2007).[46]

A look at available data would assist in explaining the above further. On average and with the exception of the year 2014—when a record forty-one new drugs were approved representing the highest increase in eighteen years—a dramatic decline of newly-developed chemical entities has been observed during the last fifteen years.[47] This positions the industry uniquely as the range of its innovation fluctuates between major "blockbuster" breakthroughs to minor "trivial" improvements and new uses of available medicines.[48] Unsurprisingly, it is within the latter category where the majority of

ISSUES CITED AS HAMPERING DRUG DEVELOPMENT EFFORTS 2 (2006). Moreover, a PricewaterhouseCoopers report revealed that despite increased expenditures on R&D, the U.S. Food and Drug Administration authorized a mere twenty-two new molecular entities in 2006. PRICEWATERHOUSECOOPERS, PHARMA 2020: THE VISION: WHICH PATH WILL YOU TAKE? 5 (2007).

45. Richard Anderson, *Pharmaceuticals Industry Facing Fundamental Change*, BBC NEWS (Nov. 7, 2014), http://www.bbc.com/news/business-29659537 [hereinafter Anderson, *Pharmaceuticals*].

46. EUR. COMM'N, PHARMACEUTICAL SECTOR INQUIRY, FINAL REPORT 38 (2009) [hereinafter EUR. COMM'N, PHARMACEUTICAL SECTOR INQUIRY].

47. Cambria Alpha-Cobb & Anthony D. Sabatelli, *Guest Post: 41 New Drugs Approved in '14 – A Random Spike or a Growing Trend of Drug Innovation?*, PATENT DOCS (Jan. 12, 2015), http://www.patentdocs.org/2015/01/guest-post-41-new-drugs-approved-in-14-a-random-spike-or-a-growing-trend-of-drug-innovation.html; *see* Jeff Cohen et al., Strategic Alternatives in the Pharmaceutical Industry 5 (unpublished manuscript) (on file with the Kellogg School of Management) ("In fact, R&D productivity for the pharmaceutical industry has declined considerably with the number of New Molecular Entities (NMEs) submitted for approval dropping by nearly 50 percent, to about 40, and the number of New Chemical Entities (NCEs) produced per company declining by 41 percent . . . .").

48. *See* Cohen et al., supra note 47, at 8-10 (reflecting the dilemma pharmaceutical companies face with the decline of innovative drugs. The companies cannot rely on the substantial returns they generated from "blockbuster drugs" if they want to appease their shareholders. Instead, they generate new sources of revenue by making slight improvements to existing drugs).

recent innovations—or more accurately improvements—have taken place.[49]

The statistics referred to above, however, do not explain the full story. The issue with the new entrant drugs into the market is that they actually represent "minor" or "combinational" improvements rather than breakthrough or substantial discoveries.[50] Indeed, as Youn et al. eloquently explains:

> By definition, all patented inventions are 'novel', but not all novelty is created equal. The novelty instantiated by patented inventions stems not only from conceiving new technologies but also from combining technologies, either new or old. The history of US patents reveals a slight preponderance of technological combinations not previously seen in the patent record. US patent law, however, allows for patents to be granted to inventions that represent improvements over existing inventions.[51]

For example, a 2005 survey published in France found that 68% of the 3096 new products approved in the country between 1981 and 2004 brought "nothing new" in comparison to previous preparations.[52] Another study concluded that almost half of the new

49. *See id.*; *see also* Carlos M. Correa, *Pharmaceutical Innovation, Incremental Patenting and Compulsory Licensing* 5 (South Ctr., Research Paper No. 41, 2011) [hereinafter Correa, *Pharmaceutical Innovation*] ("The fall in innovative productivity may indicate a crisis in the model of drug development carried out by large pharmaceutical companies, as 'the number of new products has not increased whilst the overall level of resources being invested has risen dramatically.'").

50. *See* Cohen et al., *supra* note 47, at 8-10; *see also* WHO, PUBLIC HEALTH INNOVATION, *supra* note 2, at 131 (*"*[T]here are studies which find that many new medicines offer little or no improvement over existing medicines. For instance, in a recent Canadian study, the conclusion was that in British Columbia, 80% of the increase in drug expenditure between 1996 and 2003 was explained by the use of new, patented drugs that did not offer substantial improvements over less expensive alternatives available before 1990.").

51. Hyejin Youn et al., *Invention as a Combinatorial Process: Evidence from US Patents*, J. ROYAL SOC. INTERFACE, no. 106, 2015, at 7. *The Economist* further elaborates that "invention now proceeds mainly by recombining existing technologies and chimes with the idea that inventions were, in some sense, more fundamental in the past than they are today." *The Process of Invention, Now and Then*, ECONOMIST (Apr. 25, 2015), http://www.economist.com/node/21649448/print.

52. *A Review of New Drugs in 2004: Floundering Innovation and Increased Risk-Taking*, 14 PRESCRIRE INT'L 68, 71 (2005). *See generally* K.I. Kaitin & J.A. DiMasi, *Pharmaceutical Innovation in the 21st Century: New Drug Approvals in*

drugs approved for use during the 1990s in the United States did not offer major or important clinical improvements.[53] A Canadian study of 1,147 newly patented drugs, including derivatives of existing medicines between 1990 and 2003, revealed that 1005 of such drugs did not provide a "substantial improvement over existing drug products."[54] Although as mentioned, the year 2014 witnessed an increase in the number of approved New Molecular Entities, it remains to be an exception than the rule.[55]

Interestingly, accompanying the same trend was the substantial increase in the number of granted pharmaceutical patents, which represented mostly minor and simple improvements in chemistry/ formulation of existing pharmaceutical products (e.g. polymorphs, combinations, dosage forms, isomers) or incremental modifications of existing drugs (e.g. a different dosage or a different form of administration).[56] Correa explains that "[t]housands of patents are granted per year on these incremental innovations, often trivial for a person skilled in pharmaceutical research and production."[57] Such a phenomenon is not confined to the United States. A 1994 Canadian study found that 90% of all patented inventions were minor improvements on existing patented devices.[58] As Ho explains:

> Accordingly, a rational profit-maximizing company would logically seek to focus on incremental inventions. In fact, that is already the case. During the 1990s more than half of applications for "new" drugs were incremental innovations that utilized known active ingredients. In addition, studies of pharmaceutical innovation in the United States, Australia, and Europe all found most new drugs were incremental innovations and that only between 10 and 30 percent of drugs were more

*the First Decade, 2000–2009*, 89 CLINICAL PHARMACOLOGY & THERAPEUTICS 183 (2011).

53. MICHAEL BAILEY ET AL., POLICY DEP'T OF OXFAM, FATAL SIDE EFFECTS: MEDICINE PATENTS UNDER THE MICROSCOPE 26 (2001).

54. Steven G Morgan et al., *"Breakthrough" Drugs and Growth in Expenditure on Prescription Drugs in Canada*, 331 BMJ 815, 815 (2005).

55. Alpha-Cobb & Sabatelli, *supra* note 47.

56. Correa, *Pharmaceutical Innovation*, *supra* note 49, at 4; *see also* Ho, *supra* note 42, at 311 ("Although an incremental modification may be of some clinical benefit, these are notably easier and less expensive to develop; one estimate suggests that the cost of development is only a quarter of the cost of the most expensive drugs (based on new molecular entities).").

57. Correa, *Pharmaceutical Innovation*, *supra* note 49, at 4.

58. *Id.* at 2 (citing the Guide of the Canadian Intellectual Property Office).

therapeutically valuable than existing drugs.[59]

The prices of new medicines are also on the rise, making them out of the reach of the majority of citizens even in developed countries.[60] For instance, many new cancer treatments are biologic drugs priced at more than $100,000 per year.[61] Bristol-Myer's new drug for advanced melanoma, nivolumab (trade name Opdivo), can cost from $2,500 to $3,700 per week, depending upon the patient weight. So explains, "11 of the 12 cancer drugs approved in 2012 were priced over US$100,000 per patient per year."[62] So concludes that among the top 100 drugs in the United States, "the median revenue per patient rose from US$1,258 in 2010 to US$9,396 in 2014."[63] A new hepatitis C treatment (sofosbuvir, marketed as Sovaldi) recently came onto the market at the high price of $84,000 for a twelve-week treatment.[64] This drug, when used in conjunction with another drug,

59. Ho, *supra* note 42, at 312; *see also* Michael Lanthier et al., *An Improved Approach to Measuring Drug Innovation Finds Steady Rates of First-In-Class Pharmaceuticals, 1987-2011*, 32 HEALTH AFF. 1433, 1435-36 (2013) (supporting the view that the sudden increase in new drug approvals during the 1990s were not a result of innovative new drugs, but of incremental innovations).

60. Jan Schakowsky & Peter Maybarduk, *US Trade Policy Could Raise Drug Prices, at Home and Abroad*, HILL (Mar. 6, 2015), http://thehill.com/opinion/op-ed/234801-us-trade-policy-could-raise-drug-prices-at-home-and-abroad. Even the price of some old medicines have been increasing as in the case of multiple sclerosis drugs. The first generation of these drugs which entered the market in the 1990s had prices ranging between $8,000 to $11,000 a year. Despite having new drugs entering the market, one drug that initially cost $8,700 now costs $62,000 a year. In September 2015, the *New York Times* reported that the price of the drug (Daraprim), which was acquired in August by Turing Pharmaceuticals, was raised to $750 a tablet from $13.50, bringing the annual cost of treatment for some patients to hundreds of thousands of dollars. Andrew Pollack, *Drug Goes from $13.50 a Tablet to $750, Overnight*, N.Y. TIMES (Sept. 20, 2015), http://www.nytimes.com/2015/09/21/business/a-huge-overnight-increase-in-a-drugs-price-raises-protests.html?_r=1.

61. Schakowsky & Maybarduk, *supra* note 60.

62. Catherine Saez, *At WTO, Experts Discuss Solutions To Drugs Innovation Crisis; IP Not In The List*, INTELL. PROP. WATCH (Mar. 10, 2014), http://www.ip-watch.org/2014/10/03/at-wto-experts-discuss-solutions-to-drugs-innovation-crisis-ip-not-in-the-list/ (referencing the assertions of Anthony So, director of the Program on Global Health and Technology Access at the Duke University Sanford School of Public Policy).

63. *Id.*

64. Andrew Pollack, *High Cost of Sovaldi Hepatitis C Drug Prompts a Call to*

can have a positive result of curing most cases of hepatitis C in twelve weeks with few side effects.[65] Such prices make this drug largely unattainable by many citizens in developed countries including Australia and Spain particularly for the latter where an estimated 800,000 people infected with hepatitis C live.[66] Anderson

*Void Its Patents*, N.Y. TIMES (May 19, 2015), http://www.nytimes.com/2015/05/20/business/high-cost-of-hepatitis-c-drug-prompts-a-call-to-void-its-patents.html?_r=0 [hereinafter Pollack, *High Cost*]. Another drug, harvoni, a prescription medicine containing ledipasvir and sofosbuvir, used to treat chronic hepatitis C infection in adults costs $95,000 for a course of treatment. *Only Just the Beginning of the End of Hepatitis C*, 383 LANCET 281, 281 (2014); Susan Abram, *Hepatitis C Drugs Sovaldi and Harvoni Out of Reach for Most, Except Inmates*, L.A. DAILY NEWS (Oct. 26, 2015), http://www.dailynews.com/health/20151026/hepatitis-c-drugs-sovaldi-and-harvoni-out-of-reach-for-most-except-inmates&template=printart; Philippe Douste-Blazy, *Hepatitis C Medicines Must Be Made Accessible Faster Than HIV Drugs Were*, GUARDIAN (Mar. 7, 2014), http://www.theguardian.com/global-development/poverty-matters/2014/mar/07/hepatitis-c-medicines-hiv-aids-drugs; *Gilead's Harvoni and Sovaldi Demonstrate Efficacy and Safety Among Chronic Hepatitis C Patients with Advanced Liver Disease*, GILEAD (Apr. 23, 2015), http://www.gilead.com/news/press-releases/2015/4/gileads-harvoni-and-sovaldi-demonstrate-efficacy-and-safety-among-chronic-hepatitis-c-patients-with-advanced-liver-disease. Today's hepatitis C epidemic affects 150 million people around the world, killing 500,000 people annually, according to the WHO. *Hepatitis C: Fact Sheet N°164*, WORLD HEALTH ORG., http://www.who.int/mediacentre/factsheets/fs164/en/# (last updated July 2015); *see also* Avorn, *supra* note 29, at 1879 ("For example, Gilead Sciences did not invent its blockbuster treatment for hepatitis C, sofosbuvir (Sovaldi), which it priced at $1,000 per pill. Rather, it acquired the product from a small company founded by the drug's inventor, a faculty member at Emory University, much of whose work on the usefulness of nucleoside viral inhibitors was federally funded. Gilead paid $11 billion in late 2011 for the rights to market Sovaldi, an amount it totally recouped in its first year of sales after approval of the drug in late 2013."); Anderson, *Fat Profits*, *supra* note 28 ("[B]etween April and June [of 2014], drug company Gilead clocked sales of $3.5bn for its latest blockbuster hepatitis C drug Sovaldi.").

65. Abram, *supra* note 64; Douste-Blazy, *supra* note 64 (discussing how hepatitis C medicine prior to Sovaldi and Harvoni caused severe side effects that would discourage people from receiving treatment).

66. Melissa Davey, *Medicines Forecast to Cost Taxpayers Millions More in Secret TPP Trade Deal*, GUARDIAN (Feb. 22, 2015), http://www.theguardian.com/australia-news/2015/feb/23/medicines-forecast-to-cost-taxpayers-millions-more-in-secret-tpp-trade-deal. It was reported that during the summer of 2014, a number of European countries, including France and Spain, spent months negotiating with the company Gilead on the price of "Sovaldi." The price fixed by Gilead was €56,000 per patient for a twelve-week treatment, that is to say €666 per tablet. According to

states that "[i]f France were to treat all its hepatitis C patients with Sovaldi, it would add €1.5bn ($1.9bn; £1.2bn) to the country's drugs bill."[67] This lack of an active diagnosis strategy, along with an exorbitant price of approximately €25,000 per treatment just for sofosbuvir, has conditioned a national plan that has only been able to commit to the treatment of 5,000 patients with new direct acting antivirals.[68] This is despite the fact that some argue sofosbuvir is not even new as it was previously developed using published information and an existing compound.[69] The list price of a year's supply of Kalydeco, a medicine used in the treatment of cystic fibrosis is $311,000 and a standard course of treatment with Blincyto for treating leukemia is about $178,000.[70] The newer chronic treatment regimes for HIV are close to $30,000, per year while several treatments for rare diseases are priced at more than $200,000 per year.[71]

Failure to provide proper public health care can be seen in other places as well. For example, in April 2014, the United Kingdom's National Institute for Health and Care Excellence rejected ado-

the newspaper *Le Monde*, the price of each tablet was 280 times more than the production cost. In France, it is calculated that 250,000 patients should receive this medicine, the cost of which would represent 7% of the annual State medicine budget. For more, see Pascale Santi, *Hépatite C: le nouveau hold-up des labos*, LE MONDE (Aug. 7, 2014), http://www.lemonde.fr/sciences/article/2014/07/08/nouveaux-traitements-de-l-hepatite-c-le-hold-up-des-labos_4452689_1650684.html; *see also* Pollack, *High Cost*, *supra* note 64 (detailing the United States' Medicaid program's struggle to pay for Sovaldi).

67. Anderson, *Pharmaceuticals*, *supra* note 45.

68. Beatriz Becerra Basterrechea et al., *Life Saving Medicines and Patent Slaving Monopolies*, PEAH (Jan. 29, 2015), http://www.peah.it/2015/01/life-saving-medicines-and-patent-slaving-monopolies/.

69. Priti Radhakrishnan, *One Way to Lower Drug Prices*, CNN (June 2, 2015), http://edition.cnn.com/2015/06/02/opinions/radhakrishnan-drug-prices/index.html.

70. Ransdell Pierson, *Exclusive: Amgen's New Leukemia Drug to Carry $178,000 Price Tag*, REUTERS (Dec. 17, 2014), http://www.reuters.com/article/us-amgen-cancer-exclusive-idUSKBN0JV1YU20141217; Joseph Walker, *Costly Vertex Drug is Denied, and Medicaid Patients Sue*, WALL ST. J. (July 16, 2014), http://www.wsj.com/articles/costly-drug-vertex-is-denied-and-medicaid-patients-sue-1405564205.

71. James Love, *TPP, Designed to Make Medicine More Expensive, Reforms More Difficult*, MEDIUM (June 8, 2015), https://medium.com/@jamie_love/tpp-designed-to-make-medicine-more-expensive-reforms-more-difficult-e6a94a5d4a18#.3z1i4ps1v.

trastuzumab emtansine (Kadcyla), a new breast cancer medicine from Roche, whose treatment course cost £90,831 per patient, because it was too expensive for the National Health Service ("NHS").[72] In the United States, Memorial Sloan-Kettering Cancer Center, in New York, refused to prescribe a new colorectal cancer drug priced at over $130,000 per year prompting the drug maker, Sanofi, to cut the price in half in 2012.[73] Similar stories continue in many other parts in the world. MSF in a recent statement stated:

> Today we see increasing failures with our current system of research and development, whether with respect to Ebola, antibiotic resistance, or a range of neglected diseases. We also see unaffordable prices for essential new medicines, including up to 1000 USD per pill for new medicines to treat Hepatitis C.74

The high prices of new medicines prompted more than 100 influential oncologists from over fifteen countries recently to describe current prices of cancer medicines as "*astronomical, unsustainable and even immoral*"[75] and urged that "moral

72. *Breast Cancer Drug Costing Tens of Thousands of Pounds More Than Other Treatments 'Unaffordable' for NHS*, NICE (Apr. 23, 2014), http://www.nice.org.uk/news/press-and-media/breast-cancer-drug-costing-tens-of-thousands-of-pounds-more-than-other-treatments-unaffordable-for-nhs; *see also* Velásquez, *supra* note 36, at 17 (finding that in another project, in 2010, "a group of English academics analysed the most prescribed drugs in the National Health Service (NHS) and calculated that approximately GBP 1 billion is wasted each year due to the prescription of patented 'me too drugs', for which there is an equally effective out of patent equivalent. What is considered to be a waste of State funds resulting from the use of patented medicines in the English system is the reality in developing countries simply because of the impossibility of accessing the medicine for the majority of the population").

73. Till, *supra* note 31.

74. Katy Athersuch, Médecins Sans Frontières, Address to the 136th WHO Executive Board (Jan. 30, 2015) (transcript available at http://www.msfaccess.org/content/136th-who-eb-msf-intervention-gspa-public-health-innovation-and-intellectual-property).

75. Andrew Pollack, *Doctors Denounce Cancer Drug Prices of $100,000 a Year*, N.Y. TIMES, April 25, 2013, http://www.nytimes.com/2013/04/26/business/cancer-physicians-attack-high-drug-costs.html?smid=pl-share; Jeremy Laurance, *Makers of Anticancer Drugs are "Profiteering," Say 100 Specialists from Around the World*, BMJ, Apr. 30, 2013, at 1, 1; *see* Camille Abboud et al., *The Price of Drugs for Chronic Myeloid Leukemia (CML) is a Reflection of the Unsustainable Prices of Cancer Drugs: From the Perspective of a Large Group of CML Experts*, 121 BLOOD 4439 (2013).

implications" should prevail in order to treat patients rather than focus on profits.[76]

Finally, one should remember the "morning after" effect. In the course of the coming years, producers will face challenge of the expiry and/or revocation of a number of famous brand name patents.[77] Expiry of patents on key blockbuster drugs ("described as the patent cliff") is approaching soon.[78] One 2012 estimate by PricewaterhouseCoopers projects that between 2012 and 2018, patent expiry and consequent generic entry will reduce revenues of R&D-based pharmaceutical companies by about $148 billion.[79] Stephen Whitehead, chief executive of the Association of the British Pharmaceuticals Industry, explains that "[o]ver the past three or four years, we have seen the biggest collection of patent expiries in history" and based on this he estimates that "[t]his has cost the industry some £150bn ($240bn)."[80] Indeed as Burdon and Sloper explains in another study that the sales of Prozac fell 66% in the last year following the expiry of patent protection which in subsequently resulted in Eli Lilly's reduction of its profit estimates three times in the last twelve months.[81] There is no doubt then that the opening of the market for the entry of generic producers would hit hard these companies and reduce prices to a margin of what it used to be sold for.[82]

76. Abboud et al., *supra* note 75, at 4439.

77. *See generally* Jack DeRuiter & Pamela L. Holston, *Drug Patent Expiration and the "Patent Cliff"*, U.S. PHARMACIST (June 20, 2012), http://www.uspharmacist.com/content/s/216/c/35249/dnnprintmode/true/skinsrc/ (estimating that top drug companies may lose hundreds of billions of dollars in the near future to generic competition).

78. *See id.* (defining the "patent cliff" as a period where a number of lucrative pharmaceutical patents will reach their expiration date).

79. STEVE ARLINGTON, PRICEWATERHOUSE COOPERS, FROM VISION TO DECISION, PHARMA 2020 6 (2012).

80. Anderson, *Pharmaceuticals*, *supra* note 45.

81. Michael Burdon & Kristie Sloper, *The Art of Using Secondary Patents to Improve Protection*, 3 INT'L J. MED. MARKETING 226, 226-27 (2003) (discussing similar losses for GlaxoSmithKline's AUGMENTIN and Akzo Nobel's REMERO).

82. *See* MÉDECINS SANS FRONTIÈRES [MSF], UNTANGLING THE WEB OF ANTIRETROVIRAL PRICE REDUCTIONS 4 (13th ed. 2010) (explaining that competition from generic medicines for AIDS treatment caused the price of the first line triple therapy (estavudine, lamivudine, and nevirapine) to drop from

Calls urging pharmaceutical companies to direct their investments where real impact may be felt—i.e. inventing new medicines affecting the majority of citizens all over the world—have been made in recent times. Simply put, to effectively channel available resources towards production lines rather than other promotional and marketing activities.[83]

## III. EVERGREENING, MORE PATENTS, AND MORE MONOPOLY

Faced with the aforementioned challenges, the pharmaceutical industry has been working to identify additional venues to sustain its revenue streams. The need to find alternative routes for monopoly protection through reinventing the "lifecycle management" of its drugs prompted it to shift its focus on another area.[84] Rather than focusing on finding optimal solutions for its productivity challenges and R&D problems, the focus shifted towards legislative norms and legal doctrines. The obsession with "evergreening" in the industry may be seen as one outcome of these initiatives.[85]

approximately $10,000 per patient per year in 2000 to approximately $67 per patient per year).

83. *See* Marc-André Gagnon & Joel Lexchin, *The Cost of Pushing Pills: A New Estimate of Pharmaceutical Promotion Expenditures in the United States*, 5 PLOS MED., no. 1, 2008, at 29, 32 (concluding that available data indicates more resources are spent on marketing medicines rather than on researching and developing new drugs); *Novartis Set to Remain Top Spender as R&D Investment Dips*, EVALUATE (June 18, 2012), https://www.evaluategroup.com/Universal/View.aspx?type=Story&id=302035&isEPVantage=yes (noting that the industry spent $135 billion on research in 2011, which is less than 20% of sales); see also Joseph Engelberg et al., Financial Conflicts of Interest in Medicine 38-39 (Jan. 2014) (working paper) (on file with University of California San Diego Rady School of Management) (finding that pharmaceutical companies engage in marketing techniques that encourage rent-seeking behaviour on the part of doctors who prescribe the company's drugs).

84. Stan Bernard, *Rethinking Product Lifecycle Management*, PHARMEXEC.COM (Feb. 1, 2013), http://www.pharmexec.com/print/197858?page=full (challenging the pharmaceutical industry's traditional approach of only marketing a drug during its product lifecycle—regulatory approval to expiration of the patent).

85. *See generally* Kate S. Gaudry, *Evergreening: A Common Practice to Protect New Drugs*, 29 NATURE BIOTECHNOLOGY 876, 878 (2011) (explaining that pharmaceutical companies frequently engage in an evergreening strategy, which utilizes patent law and FDA regulations to extend a company's patent monopolies

Accordingly, more patents and monopoly term extension represented an integral element of the industry's modern management of its portfolios. An investigation carried out by the European Union about the conduct and practices of the pharmaceutical industry between the years 2000 and 2007 found that a single medicine can be protected at the same time by up to 1300 patents or pending patent applications.[86] Moreover, the number and volume of lawsuits between originator companies and generic companies has increased four-fold in the European Union.[87] The same study found that these lawsuits delay the entry of the generic product to the market between six months and six years.[88] The study estimates that the savings resulting from the entry of generics could have been approximately €3 billion, if the entry had occurred immediately after the loss of exclusivity.[89] In the United States, Frank reports that branded drug firms "now carry an average of 10 patents for each drug—as compared with an average of 2 a decade earlier."[90]

In the light of the above discussion and the stagnation in the pharmaceutical production of new medical entities, one may assume that logically, the number of patents should drop drastically. To the contrary, the recent decade witnessed phenomenal growth in the number of patents granted in all fields including medicines.[91] For

and FDA-grated exclusivities).

86. *See Pharmaceutical Sector Inquiry – Preliminary Report, Fact Sheet "Originator-Generic Competition"*, EUR. COMM'N, http://ec.europa.eu/competition/sectors/pharmaceuticals/inquiry/fact_sheet_2.pdf (last visited Feb. 25, 2016) (adding that many patent applications are submitted very late in a drug's life cycle in order to achieve the longest exclusivity period possible).

87. *Id.*

88. *See Communication from the Commission, Executive Summary of the Pharmaceutical Sector Inquiry Report*, at 11, SEC (2009) 952 (July 8, 2009) (finding that the average duration of court proceedings was 2.8 years).

89. *Pharmaceutical Sector Inquiry – Preliminary Report, Fact Sheet "Prices, Time to Generic Entry and Consumer Savings"*, EUR. COMM'N, http://ec.europa.eu/competition/sectors/pharmaceuticals/inquiry/fact_sheet_1.pdf (last visited Feb. 25, 2016).

90. Richard G. Frank, *The Ongoing Regulation of Generic Drugs*, 357 NEW ENG. J. MED. 1993, 1994 (2007).

91. *See* Michele Boldrin & David K. Levine, *The Case Against Patents* 6 (Fed. Reserve Bank St. Louis Research Div., Working Paper No. 2012-035A, 2012) (contrasting the rising number of patents over the last thirty years with a lack of

instance, in 1983 in the United States, 59,715 patents were issued; by 2003, 189,597 patents were issued; and in 2010, 244,341 patents were approved.[92] In less than three decades, the number of granted patents more than quadrupled. At the same time, neither substantial innovation occurred nor research and development expenditure were demonstrated to correspond to the growth in the number of granted patents.[93]

The above may be explained in part by the industry's attempt to prolong and extend the patent protection term resulting from "evergreening" activities. A look at a number of specific examples would be useful to illustrate the trend.

The drug Atorvastatin calcium is one of the most cited examples in this regard.[94] The drug is the medication for the treatment of high cholesterol and was approved by the U.S. Food and Drugs Administration (FDA) in December 1996 and was first marketed in 1997.[95] The drug became one of the best-selling and successful drugs in history.[96] Notably, a patent was granted earlier for this drug in the United States in 1987, and was due to expire in May 2006. However and prior to its expiry in 2006, the patent was extended to September 2009 under a patent term extension provision.[97] Subsequently, the exclusivity period of the initial patent was also extended for an additional period of six months, to March 2010, under a paediatric exclusivity provision.[98]

In another 2012 study, Amin and Kesselheim identified the evergreening patents associated with two important HIV medicines, ritonavir and lopinavir.[99] Their study found that the original ritonavir

increase in R&D expenditure or innovation).

92. *Id.*

93. *Id.* at 19-20 ("[I]t is apparent that the recent explosion of patents in the U.S., the E.U. and Japan, has not brought about anything comparable in terms of useful innovations and aggregate productivity.").

94. *See, e.g.*, Hans Georg Bartels et al., PROMOTING ACCESS TO MEDICAL TECHNOLOGIES AND INNOVATION: INTERSECTIONS BETWEEN PUBLIC HEALTH, INTELLECTUAL PROPERTY AND TRADE 183 (2012) (highlighting the case of Atorvastatin calcium to exemplify the problem of patent term extensions).

95. *Id.*

96. *Id.*

97. *Id.*

98. *Id.*

99. Tahir Amin & Aaron S. Kesselheim, *Secondary Patenting Of Branded*

patent was filed in the United States in 1995, granted in 1996 and was due to expire on April 25, 2015.[100] The original lopinavir patent was filed in 1996, granted in 1999, and is due to expire on November 21, 2016. Amin and Kesselheim found as of April 2011, a further 108 patent items were found for these two medicines—eighty-two granted patents and twenty-six applications.[101] Together these evergreening patents could delay generic entry to at least 2028—some thirteen to fourteen additional years after original patent expiry.[102] These evergreening patents cover related chemical structures, methods of manufacture and methods of treatment.[103]

Another interesting case of evergreening is related to Tricor-1, a cholesterol-fighting drug which rights were exclusively acquired by Abbott in 2000.[104] Following the lapse of the drug exclusivity protection, a generic pharmaceutical company (Novopharm) applied to the U.S. FDA to produce generic versions of the drug, which would have resulted in the reduction of the price by 80%.[105] To delay the production of the generic version, Abbott filed for patent infringement lawsuit which took months, and at the same time enabled Abbott to produce Tricor-2 (which was almost exactly the same as Tricor-1 with only difference in dosage where Tricor-1 came in 67- and 134-milligram formulations, Tricor-2 would come in 54- and 160-milligram dosages).[106] By the time Novopharm's generic

*Pharmaceuticals: A Cast Study of How Patents On Two HIV Drugs Could Be Extended For Decades*, 31 HEALTH AFF. 2286 (2012) (asserting that the secondary patents used to protect ritonavir and lopinavir from generic competition demonstrate the widespread practice of pharmaceutical manufactures seeking to extend market exclusivity for their products on questionable grounds).

100. *Id.* at 2288.

101. *Id.*

102. *Id.* at 2286.

103. *Id.* at 2288-89 (finding that the largest category of patents and applications covered chemical structures, compositions, or formulations, which affect the drug's physical properties, such as stability, solubility, dissolution rate, absorption, and bioavailability).

104. Sarah Kliff, *Want To Cut Health Care Costs? Start Here.*, WASH. POST (Apr. 21, 2012), https://www.washingtonpost.com/blogs/ezra-klein/post/want-to-cut-health-care-costs-start-here/2012/04/20/gIQA2P0NWT_blog.html.

105. *Id.*

106. *See* Nicholas S. Downing et al., *How Abbott's Fenofibrate Franchise Avoided Generic Competition*, 172 ARCH INTERN MED. 724 (2012) (observing that due to Abbott's patent litigation, Tricor-2 did not face generic competition when it

came onto the market, Abbott had already introduced Tricor-2 and "made it doctors' prescription of choice."[107] Six months after its introduction onto the market, Tricor-2's share represented 97 percent of all prescriptions for this type of medication in the market, known as Fenofibrates.[108] This was not the end of the story, over the past decade, Abbott repeated the same process a few times, Tricor-3 (renamed with a different dosage branded Tripilix) replaced Tricor-2.[109] The cost implications of Abbott's strategy were huge according to the Annals of Internal Medicine which estimated that "if the health-care system had come to rely on Novopharm's generic medication, our health-care system would be saving $700 million every year. Overall, the use of generic drugs is estimated to save the country $158 billion annually, which breaks down to $3 billion a week."[110]

Finally, a more current example is the case of Eli Lilly's lung cancer drug sold as Alimta.[111] This drug has been generating over $2 million in annual sales and it is projected that it will generate $3.5 billion by 2016.[112] The patent on the initial protected compound is due to expire in 2017 however Eli Lilly filed and obtained a second patent on the method of using the compound together with vitamins. This second patent would last until 2022.[113] This will have huge financial implications.

Other studies indicate the impact of evergreening.[114] Kapczynski et al. found that secondary claims were common and added, on average, 6.5 years to patent life and that patents which were filed late

launched).

107. Kliff, *supra* note 104.

108. *Id.*

109. *See id.* (describing the cycle of reformulation and renewed exclusivity for the drug whenever generic competition seemed likely at the new dose level).

110. *Id.*

111. *See* Ho, *supra* note 42, at 315.

112. *Id.*

113. *Id.* at 316.

114. *See, e.g.*, Amy Kapczynski et al., *Polymorphs and Prodrugs and Salts (Oh My!): An Empirical Analysis of "Secondary" Pharmaceutical Patents*, 7 PLOS ONE, no.12, Dec. 2012, at 1, 2-3 (stating that a better understanding of secondary patenting is necessary because pharmaceutical companies view these patents as crucial to their business models and only a few large-sample empirical studies of secondary patents exist).

during the life of the original compound were "more common for higher sales drugs."[115] The same study found:

> [E]liminating secondary patents could free up 36% of new medicines for generic production, since only 64% of drugs in our sample had patents with chemical compound claims. Additionally, for those drugs that still come under patent because a chemical compound claim exists, exclusions on secondary patents could limit the duration of patent protection by 4–5 years.[116]

In Australia, a 2013 study "analysing all of the patents associated with 15 of the costliest drugs in Australia over the last 20 years" found that on average, there are forty-nine patents per Active Pharmaceutical Ingredient (API), of which about 25% are held by the originator company—about twelve evergreening patents per API.[117] In addition, the European Commission Enquiry Report found that in Europe evergreening patenting is prevalent for pharmaceuticals and again the average number of patents per API was greater for the highest volume medicines.[118]

115. *Id.* at 1 (adding that secondary patents on method of use extend patent life by 7.4 years on average); *see also* Ron A. Bouchard et al., *Empirical Analysis of Drug Approval-Drug Patenting Linkage For High Value Pharmaceuticals*, 8 NW. J. TECH. & INTELL. PROP. 174, 174-75 (2010) (examining the "paradoxical drug approval-drug patenting linkage," which provides the largest scope of intellectual property protection to modified drugs rather than true innovation); Lisa Larrimore Ouellette, Note, *How Many Patents Does It Take to Make A Drug? Follow-On Pharmaceutical Patents and University of Licensing*, 17 MICH. TELECOMM. TECH. L. REV. 299, 320 (2010) (finding that drugs patented by public-sector institutions are less likely than their private-sector counterparts to have secondary patents, yet over half of public sector drugs still have secondary patents).

116. Kapczynski et al., *supra* note 114, at 8.

117. Andrew F. Christie et al., *Patents Associated With High-Cost Drugs in Australia*, 8 PLOS ONE, no. 4, Apr. 2013, at 1, 8 (discovering that the roughly seventy five percent of patents owned by companies other than the drug's originator were mostly held by companies that did not have a record of developing top-selling drugs).

118. *See* EUR. COMM'N, PHARMACEUTICAL SECTOR INQUIRY, *supra* note 46, at 352 (questioning the efficacy of using secondary patents for follow-on products as a means of preventing generic competition); *see also* Hazel V. J. Moir et al., Assessing the Impact of Alternative Patent Systems on the Cost of Health Care: The TPPA and HIV Treatment in Vietnam 10 (Nov. 27, 2014) (unpublished conference paper) ("For top-selling medicines the average number of patents and patent applications was 237, compared to 98 for medicines in general.").

Interestingly, evergreening activities are not limited to prolonging the protection term through the granting of additional legal protection by patent offices. For instance, the drug Efexor is an antidepressant drug developed by Pfizer which had major side effects leading to its recall from the market in 2014.[119] In its attempt to deal with the side effects of the said drug, "Pfizer subsequently developed new slow-release versions of the drug, called Efexor-XR, which significantly reduced its side-effects."[120] Pfizer attempted to claim further protection proclaiming that the slow-release versions were different enough from the original to be granted new patents. Although the claim was rejected, the legal battle delayed cheaper generic versions of the drug from entering the market for two and half years.[121] A recent 2015 study explains the impact, stating that "[b]y the time this patent was eventually declared invalid, the delay to the generic market had cost taxpayers $209 million."[122] Moreover, the study found that in general "evergreening" could delay generic competition for up to twenty years.[123]

## IV. THE TRIPS AGREEMENT AND ITS HEALTH-RELATED FLEXIBILITIES

Although the TRIPS Agreement was criticised by many for being in favour of technology exporting countries,[124] the mood shifted

119. *See* Caroline Cassels, *Pfizer Recalls Effexor Antidepressant*, WEBMD (Mar. 7, 2014), http://www.webmd.com/depression/news/20140307/pfizer-recall-effexor (announcing the recall of Effexor because of possible contamination with a heart drug that could cause faintness, dizziness, and abnormal or increased heartbeat).

120. Davey, *supra* note 66 (observing that the slow-release version of the drug became more widely prescribed than the original).

121. *Id.*

122. *Id.*

123. *See* Deborah H. Gleeson et al., *Costs to Australian Taxpayers of Pharmaceutical Monopolies As Proposals to Extend Them In the Trans-Pacific Partnership Agreement*, 202 MED. J. AUSTL. 306, 306-07 (2015) (reporting that, in 1998, Australia introduced five-year delays for patents to be extended, and the extensions in 2012-2013 have cost the Public Benefits Scheme an estimated $480 million in the long-term).

124. *See* Peter Drahos, *BITs and BIPs: Bilateralism in Intellectual Property*, 4 J. WORLD INTELL. PROP. 791, 802 (2001) (arguing that the benefits of TRIPS flow towards the two leading exporters of intellectual property, the United States and the European Union, because the most favoured nation principle in the WTO

during the last decade towards calling upon developing countries to deal with the agreement by taking a more pragmatic approach. In this regard, calls to utilize and explore the policy space available under the agreement have been made by many academics, civil society groups, and various non-governmental organizations.[125]

The suggested approach calls upon developing countries to activate and use the flexibilities available to them under the agreement in a more pro-active manner. Exploring the "policy space" as suggested, would mitigate the negative monopolistic impact of the agreement on these countries and would also go some way in assisting these countries when dealing with their national public health challenges.[126]

Following are some examples of the health-related flexibilities available under the agreement to member states:

> - ***Transitional periods.*** According to the WTO, least developed countries (LDCs) are given an extended transition period to protect intellectual property under the WTO's TRIPS Agreement.[127] This is in recognition of their special requirements and status, their economic, financial and administrative constraints, and the need for flexibility so that they can create a viable technological base. Under TRIPS Council Decision, IP/C/ 25, Extension of the Transition Period under article 66.1 of the TRIPS Agreement for LDC Members for Certain Obligations with Respect to Pharmaceutical Products, LDC members were not obliged, with respect to pharmaceutical products, to implement or apply sections 5 (Patents) and 7 (Protection of Undisclosed Information) or to enforce rights provided for under these sections from the TRIPS Agreement until January 1, 2016.[128] Under General Council decision, WT/L/478, "the obligations of least-developed country Members under paragraph 9 of article 70 of the TRIPS Agreement shall be waived with respect to pharmaceutical products until January 1, 2016." A request on behalf of LDCs for further extension was

requires all WTO members who have entered into a TRIPS agreement to extend the benefits to all other WTO members).

125. *See, e.g.*, SUSAN K. SELL, PRIVATE POWER, PUBLIC LAW: THE GLOBALIZATION OF INTELLECTUAL PROPERTY RIGHTS 17-20 (2003) (contextualizing TRIPS in the larger movement of international neo-liberalism championed by U.S. foreign policy).

126. *See generally* COMM'N ON INTELLECTUAL PROP. RIGHTS, *supra* note 5.

127. *Id.* at 162 (maintaining that least developed countries could use transitional period extensions to give them the opportunity to devise appropriate intellectual property regimes and establish administrative and regulatory infrastructure).

128. *Id.* at 40.

made late 2014 and an extension was granted accordingly.[129]

- ***Compulsory licensing.*** A tool which the state authorizes a third party to exploit patented inventions, generally against a specified royalty made to the patent holder provided that several conditions set under the TRIPS Agreement are complied with.[130] The objective behind this is to curtail anti-competitive behaviour and ensure the transfer of technology and dissemination of knowledge.

- ***Government use exceptions.*** A tool which grants the state the right to use the patent without obtaining the consent of the patent holder for the purpose of public interest, including public health necessities. Although government use conditions are similar to compulsory licensing, government use exceptions provides an added advantage by fast-tracking the process, through granting the government the right to use the pharmaceutical patent without the need for prior negotiations with the owner.[131]

- ***Parallel importation.*** This tool gives the option to obtain patented products when they are lawfully available in a foreign market at a lower price, thus enabling countries to shop for cheaper patented products. This requires as a prerequisite that a country adopt an exhaustion regime suitable to its needs and priorities.[132]

- ***Exceptions to patents rights.*** Article 30 of TRIPS provides that members "may provide limited exceptions to the exclusive rights conferred by a patent, provided that such exceptions do not unreasonably conflict with a normal exploitation of the patent and do not unreasonably prejudice the legitimate interests of the patent owner, taking account of the legitimate interests of third parties."[133] However, the above provision does not define the scope of the permissible exceptions thus awarding member countries some considerable discretion to operate. Examples of these exceptions include the Bolar exception and the research and experimental use exception.[134]

129. *Id.* at 51 (remarking that least developed countries with domestic legislation protecting pharmaceutical patents would need to amend their laws to take advantage of the Doha Declaration's deferral of pharmaceutical patent protection until at least 2016).

130. *See* Agreement on Trade-Related Aspects of Intellectual Property Rights, Apr. 15, 1994, Marrakesh Agreement Establish the World Trade Organization, Annex 1C, 1869 U.N.T.S. 299 [hereinafter TRIPS Agreement] (listing the limitations on use of intellectual property by third-parties authorized by the government).

131. *Id.* art. 8.

132. *See id.* art. 6 (declaring that exhaustion of intellectual property rights is not relevant to the dispute settlement process under TRIPS).

133. *Id.* art. 30.

134. *See* MOHAMMED K. EL SAID, PUBLIC HEALTH RELATED TRIPS-PLUS PROVISIONS IN BILATERAL TRADE AGREEMENTS, A POLICY GUIDE FOR

> - ***Standards of patentability.*** Under TRIPS, patent protection must be granted for products and processes which are *new*, involve an *inventive step* and are *industrially applicable*.[135] However, each of these are not defined and can be interpreted and applied by member states in accordance with their national priorities and objectives. "For example, TRIPS does not specify the patenting of new uses of known products, including pharmaceutical drugs, thus allowing member countries the possibility of rejecting these new uses for lack of novelty, inventive step or industrial applicability."[136]
>
> ***- Other procedural flexibilities.*** Another identified policy tool that may be used to improve the quality of granted patents and limits "evergreening" is pre-grant and post-grant patent oppositions, in addition to patent revocation proceedings.[137] These methods have been used at different times in a wide range of developed and developing countries. Such proceedings enable interested parties to bring claims before the patent office on the basis that a particular patent does not meet local requirements.[138]

Although these flexibilities are available for member states to put into practise, the above flexibilities do not apply automatically in many instances but require a great deal of legislative, administrative and institutional effort. Accordingly, these flexibilities should be explicitly incorporated under the national legal regime of as a part of a pro-active national agenda.[139]

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NEGOTIATORS AND IMPLEMENTORS IN THE WHO EASTERN MEDITERRANEAN REGION 127 (2010) [hereinafter EL SAID, PUBLIC HEALTH] (explaining that the Bolar exception permits the use of a patented invention for the purpose of obtaining approval of a generic product before the patent expires, and the experimental use exception allows for the use of a patented product in scientific and commercial experimentation without the consent of the patent holder).

135. TRIPS Agreement, *supra* note 136, art. 27.

136. EL SAID, PUBLIC HEALTH, *supra* note 134, at 128.

137. Mohammed El Said & Amy Kapczynski, Access to Medicines: The Role Of Intellectual Property Law and Policy 5 (July 9, 2011) (working paper) (on file with Global Commission on HIV and the Law) (adding that the period to initiate post-grant opposition applications varies between countries).

138. *Id.* at 6 (citing examples of successful pre and post-grant patent oppositions in Thailand and India).

139. *Id*. at 9 (commenting that few countries in Africa, Latin America, and parts of Asia have adopted the full range of flexibilities permissible); *see also* EL SAID, PUBLIC HEALTH, *supra* note 134, at 128 (asserting that implementing these flexibilities in a national legal regime may involve new national committees, legislative tools and bylaws, and proper judicial training).

The actual utilization and use of the above flexibilities has in fact supported the above view regarding their importance. Many case studies from both developed and developing countries affirm the role played by these flexibilities in enhancing the affordability and accessibility of medicines to patients all over the world.[140]

There is no scarcity of evidence with relation to the positive impact compulsory licensing has had upon improving access to medicines. For instance, Canada used the system many times in order to ensure that products were made available to the public at the lowest possible price while also rewarding the inventor reasonably.[141] Ho comments on Canada's experience stating that "this was Canada's approach and until NAFTA, over a thousand applications for compulsory licenses were made and the majority were granted."[142] With relation to medicines and between the years 1969 and 1987, Canada used compulsory licensing provisions to promote competition between originator medicines and generics.[143] As recently as 1987, the use of compulsory licensing provisions was curtailed due to change in policy.[144] Jones et al. investigated the impact of originator-generic competition on medicine prices between the years 1981 and 1994 in Canada.[145] In a study that sampled eighty-two therapeutic drug categories, they found that generic competition

140. *See, e.g.*, EL SAID, PUBLIC HEALTH, *supra* note 134, at 131 (providing a case study on the use of flexibilities in India).

141. *See* Ho, *supra* note 42, at 328 (remarking that despite Canada's intention to give due reward to the inventor, patent owners tend to find compulsory license schemes as unsatisfactory).

142. *Id.*; *see also* Jerome H. Reichman & Catherine Hasenzahl, *Non-Voluntary Licensing of Patented Inventions: Historical Perspective, Legal Framework Under TRIPS, and Overview of the Practice in Canada and the USA* v (UNCTAD-ICTSD Project on IPRS and Sustainable Dev., Issue Paper No. 5, 2003) (holding that Canada's regular use of compulsory licenses for pharmaceuticals allowed it to establish a generic medicine industry providing low prices of consumer drugs).

143. Reichman & Hasenzahl, *supra* note 142, at 20 (claiming that Canada's compulsory licensing scheme produced some of the lowest consumer drug prices in the industrialized world).

144. *Id.*

145. *See* J.C.H. Jones et al., *Patents, Brand-Generic Competition and the Pricing of Ethical Drugs in Canada: Some Empirical Evidence from British Columbia, 1981-1994*, 33 APPLIED ECON. 947, 947 (2001) (stating that the study used a sample of eighty-two drugs from the British Columbia Pharmacare Programme).

moderated medicine prices but that this effect was reduced after 1987.[146] They also found that price decrease after 1987 was slower and lower. Within the generics market, there is a strong effect of first entry, with the first generic gaining a substantial market share as well as prices above the minimum.[147] The overall conclusion from the study is the well-established fact; "that facilitating generic entry, and therefore competition, would reduce prices."[148]

There has been a noticeable increase in the use of compulsory licensing by developing countries in recent years too. India recently issued one compulsory license.[149] In March 2013, India issued a compulsory license to Natco Pharma to manufacture an affordable generic version of the German pharmaceutical company Bayer AG's kidney and liver cancer drug Nexavar (chemotherapy drug sorafenib tosylate) in the Indian market.[150] The compulsory license effect on the drug's price was clear and substantial: it brought down the prices to approximately $160 for a month's dose—a fraction of the original price of approximately $5,098.[151] The conditions of the compulsory licence grants Bayer a six per cent royalty only on sales by Natco.[152]

Another example is related to Brazil's issuance of compulsory licenses. In 2007, the country issued a compulsory license for the antiretroviral ("ARV") drug Efavirenz.[153] The drug is mostly used

146. *See id.* at 955 (finding that after market exclusivity was extended to branded drugs in 1987, generic competition's moderating effect was reduced).

147. *See id.* at 954 (concluding that generic first mover prices typically exceeded minimum generic prices by 10% or more).

148. Moir et al., *supra* note 118, at 13.

149. *See* Patralekha Chatterjee, *India's First Compulsory License Upheld, but Legal Fights Likely to Continue*, INTELL. PROP. WATCH (Apr. 3, 2013), http://www.ip-watch.org/2013/03/04/indias-first-compulsory-licence-upheld-but-legal-fights-likely-to-continue/ (reporting the Indian judiciary's verdict upholding the first compulsory licence issued to an Indian generic drug manufacturer).

150. *Id.*

151. *See id.* (adding that Doctors Without Borders urged Bayer to refrain from appealing the compulsory license grant considering the reality that Bayer's prices were too high for the Indian market).

152. *Id.* (noting that the 7% royalty awarded to Bayer is higher than some national and international royalty guidelines).

153. *See* Very Zolotaryova, *Are We There Yet?: Taking "TRIPS" To Brazil And Expanding Access to HIV/AIDS Medication*, 33 BROOK. J. INT'L L. 1099, 1099 (2007) (recounting that the Brazilian President's decree to import a generic version

imported ARV for AIDS treatment in Brazil (covering approximately 38% of HIV patients).[154] The current prices sold by the manufacture (Merck) at that time, were $580 per patient per year.[155] As a result of compulsory licensing, the prices charged for generic product resulted in an annual cost per patient in the range between $163 to $166.[156] Based on this, savings of around $236 million were estimated to have been made by the year 2012, when the patent expired.[157]

Thailand also provides an active developing country case study in that regard.[158] The country issued so far more compulsory licenses than any other developing country with relation to medicines. Between 2005 and 2006, the Thai government issued multiple compulsory licences.[159] Two of the licences covered ARVs (Efavirenz, marketed as Stocrin by Merck, and Lopinavir/Ritonavir, marketed as Kaletra by Abbott).[160] These compulsory licences resulted in substantial price reduction and increase in the number of patients receiving the medicine in the country. For instance, the immediate result of issuing the Efavirenz licence was the acquisition by the Thai health authorities of its generic version from the Indian producer Ranbaxy for USD$216 per patient/year, over a 50% decrease from Merck's price of USD$468.[161] By early 2008 the number of patients using Lopinavir/Ritonavir had tripled in Thailand.[162]

More recently, in April 2010, the Ecuadorean intellectual property office granted its first compulsory licence, also for the ARV

of Merck's Efavirenez came after the company failed to negotiate an appropriate price with the government of Brazil).

154. *Id.* at 1111, n. 84.

155. Beatrice Stirner, *Compulsory Licensing of Efavirenz in Brazil, Summary of the Presentation of J.M. do Nascimento Júnior*, ACCESS TO PHARMACEUTICALS (Feb. 23, 2010), http://www.accesstopharmaceuticals.org/case-studies-in-global-health/efavirenz-brazil/.

156. *See id.*

157. MARTIN KHOR, COMPULSORY LICENSE AND "GOVERNMENT USE" TO PROMOTE ACCESS TO MEDICINES: SOME EXAMPLES 15 (2014).

158. El Said & Kapczynski, *supra* note 137, at 7.

159. *Id.*

160. *Id.*

161. *Id.*

162. *Id.*

combination of Lopinavir/Ritonavir.[163] The licence resulted in substantial decrease in the prices of the medicine. It was reported that Ecuador's compulsory licence "immediately reduced the cost of a major public HIV drug purchase . . . by 27 percent" and it is expected that prices will fall further, reaching a reduction of over 50%.[164] As the above examples show, the issuance of compulsory licenses can result in substantial reduction of prices and improvement of accessibility of drugs to patients.

Another important flexibility is government use licenses. For instance, Ghana issued a government use order in 2005 to import from India generic versions of selected ARVs which are patented in Ghana for HIV drugs to be used for the purposes of government use in the country.[165] Some estimates that the cost of ARVs dropped as a result more than 50% from $495 to $235 for year's treatment.[166] In another case, Malaysia was the first country in Asia to issue a "government use" licence for the importation of generic ARVs in 2003.[167] This resulted in reducing the average cost of the Malaysian's Ministry of Health treatment per patient per month from $315 to $58, an 81% reduction.[168]

More recently, the issue of patentability criteria has been subject to increased legal debate in a number of countries.[169] India has one of the strictest patentability criteria that could be found anywhere in the world.[170] To the dissatisfaction of drug producers who started to find it more difficult to obtain new patents there (especially on minor improvements or new/second uses), challenges to the system were made.[171] More specifically, section 3(d) of the 1970 India Patents Act

163. *Id.*
164. *Id.*
165. KHOR, *supra* note 157, at 10.
166. *Id.* at 15.
167. *Id.*
168. *Id.*
169. *See, e.g.,* Patralekha Chatterjee, *Novartis Loses Patent Bid: Lessons From India's 3(d) Experience*, INTELL. PROP. WATCH (Jan. 4, 2013), http://www.ip-watch.org/2013/04/01/novartis-loses-patent-bid-lessons-from-indias-3d-experience/ [hereinafter Chatterjee, *Novartis*] (describing the Indian Supreme Court's decision to uphold more stringent standards for granting patents).
170. *See id.* (noting that Argentina and the Philippines also have similarly strict standards).
171. *See id.* (highlighting cases regarding denied patents for HIV drugs

was the target of such challenge. The section prohibits patenting of new uses of known products (including medicines) and new forms, formulations, and dosages unless they shows significant enhancements of therapeutic efficacy.[172] This provision has recently led to the denial of a patent to Novartis on the cancer medicine, imatinib mesylate (sold by Novartis as Glivec), leading to a seven-year court battle culminating in the Indian Supreme Court's reaffirmation of the strict interpretation of section 3(d).[173] In 2014, the same section of the India Patent Act "was used to deny a patent on Gilead's blockbuster hepatitis C medicine, sofosbuvir (sold by Gilead as Solvadi),[174] potentially saving India and the developing world hundreds of millions of dollars in treatment costs."[175] The results of the consistent Indian approach were evident. It was found that "[o]ver the next five years, as a result, the continued availability of generic drugs saved governments half a billion dollars globally and medicines reached 13 million people living with HIV/AIDS worldwide."[176]

Other countries are increasingly following India's patentability path. The Philippines patent law, as amended in 2008, introduced a section similar to the Indian 3(d) section (although less stringent than India's Patent Act).[177] China has reformed its Patent Act in 2008 and

appealed by pharmaceutical companies).

172. *Id.*

173. *Id.*

174. It was reported that Egypt also followed suit by finding the application lacking novelty. Although no official rejection was made yet, it was reported:

> [S]enior official at EGYPO has said that Egypt will not grant sofosbuvir a patent. The reason lies in the weakness of the application submitted by the company. Technical examination of the compound has revealed that it is not novel chemically, and therefore does not fulfill the criteria of novelty and inventiveness, both of which are necessary for a pharmaceutical compound to be patented.

*See* Heba Wanis, *Egypt Will Not Patent New Hepatitis C Drug*, MADA MASR (May 23, 2014), http://www.madamasr.com/opinion/egypt-will-not-patent-new-hepatitis-c-drug.

175. Brook K. Baker, *Opinion: Prof Brook K Baker on the Impact of US Pressure to Change India's IP Laws*, FIN. EXPRESS (Jan. 30, 2015), http://www.financialexpress.com/article/pharma/latest-updates/opinion-prof-brook-k-baker-on-the-impact-of-us-pressure-to-change-indias-ip-laws/36919/.

176. Priti Radhakrishan, *One Way to Lower Drug Prices*, CNN (June 2, 2015), http://www.cnn.com/2015/06/02/opinions/radhakrishnan-drug-prices/.

177. Carolos M. Correa, *Tackling the Proliferation of Patents: How to Avoid Undue Limitation to Competition and the Public Domain* 6 (South Ctr., Working

in a similar fashion to that of India's law, introduced a more rigorous standard for the non-obviousness requirement.[178] According to the recent Chinese Patent Act, in order for the non-obviousness requirement to be fulfilled, the invention must possess prominent and substantive differentiating features, as well as be representative of significant improvement in comparison with the state of the art.[179] Aiming to strengthen the standards for patent granting, "Australia adopted in 2012 the 'Raising the Bar Act' which, inter alia, raised the requirements for patentability and disclosure, and expanded the grounds for re-examination of a granted patent to all substantive grounds considered during examination."[180]

Following the same path, in 2012, Argentina introduced new guidelines on the patentability of pharmaceutical products and processes with the objective of limiting evergreening of pharmaceutical patents.[181] The impact was visible in a short period of time. Velásquez demonstrates the impact by stating:

> A policy and strategy change at the patent office level could lead to significant changes. In Argentina, for example, after the introduction of new guidelines for the examination of pharmaceutical patents in 2012, the number of patents granted was 54, while in Mexico, a similar-sized market to Argentina, the number of patents granted in 2012 for

Paper No. 52, 2014) [hereinafter Correa, *Tackling*] ("While in the latter the concept of enhanced efficacy – as a condition of patentability – is understood to allude to the 'therapeutic efficacy' of a drug, in Philippines it may encompass 'any of the "advantageous properties" (e.g. bioavailability, stability, solubility among others) exhibited by the new form of a known substance.'").

178. *See* Patent Law (promulgated by the Standing Comm. Nat'l People's Cong., Mar. 12, 1984, rev'd Dec. 27, 2008), art. 22, STATE INTELL. PROP. OFF. P.R.C. (China).

179. *Id.*; *see also* IPR2, THIRD REVISION OF CHINA'S PATENT LAW, LEGAL TEXTS AND DOCUMENTS ON THE DRAFTING PROCESS 2006-2008 art. 22 (2010).

180. Correa, *Tackling*, *supra* note 177.

181. *See* Federico A. Aulmann, *New Patentability Guidelines for Pharmaceutical Inventions*, INT'L L. OFFICE (Aug. 6, 2012), http://www.internationallawoffice.com/Newsletters/Intellectual-Property/Argentina/Obligado-Cia/New-patentability-guidelines-for-pharmaceutical-inventions ("[T]he new resolution affects the possibility of obtaining patent protection for pharmaceutical inventions by changing the criteria by which the novelty and inventive step of such inventions will be examined, or even considering some as discoveries instead of inventions.").

pharmaceutical products was 2500.[182]

In conclusion, there are clear benefits made as a result of the utilisation of the TRIPS flexibilities resulting in lowering drug prices and increasing the accessibility of medicines at the national level.

## V. THE RATHCHING UP OF INTELLECTUAL PROPERTY PROTECTION AND THE NEGATIVE IMPACT OF TRIPS-PLUS RULES ON PUBLIC HEALTH AND ACCESS TO MEDICINES

As a result of these challenges facing the pharmaceutical industry, efforts were channelled towards exploring alternative methods to preserve and prolong the "lifecycle management" of the production process of pharmaceutical medicines beyond the standards of the TRIPS Agreement.

Although many developing countries were hoping that in exchange for the TRIPS Agreement they would gain concessions in other fields including market access and agricultural subsidies and therefore cut their losses short, little has been achieved on that front. Not only this, in fact TRIPS failed to achieve stability in the global regulation of intellectual property rights. This is attributed to the fact that it adopts a "minimum standards" of protection approach, which means higher levels of protection are tolerated if countries opted to do so.[183]

Following the introduction of the TRIPS Agreement, developed countries embarked on a process of pushing for even higher levels of protection beyond those stipulated under the TRIPS Agreement through a number of trading arrangements.[184] Preferential trade agreements ("PTAs") embodying bilateral and regional free trade

182. Velásquez, *supra* note 36, at 19.

183. *See* JAYASHREE WATAL, INTELLECTUAL PROPERTY RIGHTS IN THE WTO AND DEVELOPING COUNTRIES (2003).

184. *See generally* Peter Drahos, *Developing Countries and International Intellectual Property Standard-setting,* 5 J. WORLD. INTELL. PROP. 765, 783 (2002) ("There is not much that developing countries can do about U.S. and EU bilateralism on intellectual property."); Mohammed El-Said, *From TRIPS-minus to TRIPS to TRIPS-plus: Implications of IPRs for the Arab World*, 8 J. WORLD INTELL. PROP. 53 (2005) (discussing the impact in Arab states of developed countries' push for stricter intellectual property regulation).

agreements ("FTAs"), and other plurilateral arrangements resulted in the introduction of additional levels of intellectual property protection, a phenomenon which became to be known as TRIPS-Plus.[185]

For the pharmaceutical industry, the proposed changes to the global intellectual property regime meant taking the lead in advocating the strengthening and prolonging of the term of patent protection, resulting in additional monopoly years. Maintaining higher prices of medicines provided pharmaceutical producers with an opportunity to maintain their market dominance and annual profits through evergreening.[186] In a recent co-op, Nobel Prize laureate Paul Krugman explains with relation to the recently signed Trans-Pacific Partnership Agreement ("TPP"):

> So why do some parties want this deal so much? Because as with many "trade" deals in recent years, the intellectual property aspects are more important than the trade aspects. Leaked documents suggest that the US is trying to get radically enhanced protection for patents and copyrights; this is largely about Hollywood and pharma rather than conventional exporters. What do we think about that? Well, we should never forget that in a direct sense, protecting intellectual property means creating a monopoly – letting the holders of a patent or copyright charge a price for something (the use of knowledge) that has a zero social marginal cost. In that direct sense this introduces a distortion that makes the world a bit poorer.[187]

So how do PTAs and FTAs increase intellectual property protection levels beyond the TRIPS standards? The objective of TRIPS-Plus obligations is to undermine and weaken the remaining flexibilities available under the international intellectual property regime thus making it more difficult for developing countries to utilise such flexibilities. There are a number of areas where this may

185. Ermias Tekeste Biadgleng & Jean-Christophe Maur, *The Influence of Preferential Trade Agreements on the Implementation of Intellectual Property Rights in Developing Countries: A First Look* 1, 21 (Int'l Ctr. for Trade & Sustainable Dev., Issue Paper No. 33, 2011); *see also* Paul Krugman, *TPP at the NABE*, N.Y. TIMES BLOG (Mar. 11, 2015), http://krugman.blogs.nytimes.com/2015/03/11/tpp-at-the-nabe/ (discussing the pitfalls of the TPP multilateral trade agreement).

186. *TPP: Threats to Affordable Medicines*, PUB. CITIZEN (Dec. 29, 2015), http://www.citizen.org/documents/TPP-IP-Factsheet-December-2015.pdf.

187. Krugman, *supra* note 185.

take place with relevance to patents and public health. These include the following:

> - **Expanding the scope of pharmaceutical patents and creating new drug monopolies:** this is achieved through a number of ways such as:
>  - lowering the patentability standards,
>  - requiring patents be available for surgical and treatment methods, and
>  - minor variations on old medicines, new and second uses.
>  - Further extension of protection to biological products which include vaccines, blood and blood components, and gene therapies in addition to other forms of protection.
> - **Extension of monopolies** by extending patent terms if review at the patent office or regulatory authority exceeds a prescribed period of time. Such leads to "evergreening."
> - **Risk facilitating patent abuse** by requiring countries to condition marketing approval on patent status (patent linkage). Under linkage, patents, even ones that should not have been granted, block generic market entry.
> - **Protection and Extension of "data exclusivity":** by providing at least 5 years exclusivity for information related to new products and 3 more in cases of new uses for old medicines – even when that information is disclosed and available in the public domain.
> - **Prohibition/restriction pre-grant oppositions** – forbid challenges to weak or invalid patents until after they have been granted.
> - **Regulate the decisions to reimburse** new drugs, and give drug companies new rights to challenge decisions on reimbursements if not favourable as currently proposed under the Transatlantic Trade and Investment Partnership (TTIP).
> - **Require new forms of intellectual property enforcement–grant:** customs detaining shipments, including in-transit shipments, suspected of non-criminal trademark/copyright/patent infringements; require mandatory injunctions for alleged intellectual property infringements; raise damages amounts, etc.[188]

There has been growing concern over the impact of recent TRIPS-Plus agreements on public health and access to medicines, in particular the ongoing negotiations on the TPP and Transatlantic Trade and Investment Partnership ("TTIP").[189] One of the major

188. *See* EL SAID, PUBLIC HEALTH, *supra* note 134, at 125-96.

189. *Id.*; *see, e.g.*, Phillip Inman, *UN Calls for Suspension of TTIP Talks Over Fears of Human Rights Abuses*, Guardian (May 4, 2015), http://www.theguardian.com/global/2015/may/04/ttip-united-nations-human-right-secret-courts-multinationals (raising concerns that TTIP gives too much power to

concerns about the process of negotiating these agreements is the evident lack of transparency and public consultation.[190] Stiglitz urged the United States government by stating:

> Powerful companies appear to have been given influence over the proceedings, even as full access is withheld from many government officials from the partnership countries. . . . [T]he T.P.P. could block cheaper generic drugs from the market. Big Pharma's profits would rise, at the expense of the health of patients and the budgets of consumers and governments. . . . We can't be sure which of these features have made it through this week's negotiations. What's clear is that the overall thrust of the intellectual property section of the T.P.P. is for less competition and higher drug prices. The effects will go beyond the 12 T.P.P. countries. Barriers to generics in the Pacific will put pressure on producers of such drugs in other countries, like India, as well.[191]

The discussion surrounding the negative impact of the above TRIPS-Plus rules is not a theoretical one. The negative impact of TRIPS-Plus rules could be seen in accordance with emerging evidence from many parts of the world. Following are some examples in the area of public health.

Data exclusivity has been one of the most controversial issues in recent years because of its direct impact on access to medicines in many countries. A form of protection, data exclusivity restricts the use of clinical test data on pharmaceutical products by national drug regulatory authorities for the approval of generic medicines for a certain period of time.[192] In addition, data exclusivity protection prevents generic producers from relying on such data in the course of establishing the efficacy and safety of their products, in some cases

multinational corporations, undermining democracy and rule of law).

190. *See, e.g.*, Margot E. Kaminski, *Don't Keep the Trans-Pacific Partnership Talks Secret*, N.Y. TIMES (Apr. 14, 2015), http://www.nytimes.com/2015/04/14/opinion/dont-keep-trade-talks-secret.html (noting that free trade agreements have implications far beyond "imports, tariffs or overseas jobs" and that the TPP's secretive negotiation process only involves industry insiders while excluding the general public).

191. Joseph E. Stiglitz, *Don't Trade Away Our Health*, N.Y. TIMES (Jan. 30, 2015), http://www.nytimes.com/2015/01/31/opinion/dont-trade-away-our-health.html?_r=2.

192. Jerome H. Reichman, *Rethinking the Role of Clinical Trial Data in International Intellectual Property Law: The Case for a Public Goods Approach*, 13 MARQ. INTELL. PROP. L. REV. 1, 4-5 (2009).

effectively requiring unethical and expensive repetition of clinical trials hence delaying the entry of generics into the market.[193] Data exclusivity may apply even if no patent protection exists and may also curb the exercise of compulsory licensing.[194] In fact, some have argued that where available, pharmaceutical producers may even favour obtaining data exclusivity protection to that of patent protection.[195] Indeed this was evident in the case of Jordan where was found that "most pharmaceutical companies have not bothered to apply for patent protection for medicines launched onto the Jordanian market" but relied on data exclusivity.[196]

There are many studies detailing the negative impact of data exclusivity.[197] The case of Colchicine provides an interesting example in this regard. In the United States, the price of this drug, which is mainly used for treatment of gout conditions, has increased for more than 5,000% as a result of the introduction of data exclusivity protection in 2009.[198] This caused some uproar since the drug has been known and "been in use for thousands of years and costs almost nothing to produce" locally, hence it is neither new nor inventive and therefore should not be allowed to be patented or granted legal protection.[199] As a result of data exclusivity protection, however, the U.S. FDA started to accept "clinical data from a one-week trial of the drug and granted data exclusivity to URL Pharma," which led to the gigantic price increase of Colchicine.[200] Chakrabarti

193. Bryan Mercurio, *TRIPS-Plus Provisions in FTAs: Recent Trends*, *in* REGIONAL TRADE AGREEMENTS AND THE WTO LEGAL SYSTEM 215, 227 (Lorand Bartels & Federico Ortino eds., 2006) ("[A] generic manufacturer wishing to market and distribute a generic whilst the period of data exclusivity is in force must conduct its own clinical trials and other data and submit its findings to the national authority.").

194. EL SAID, PUBLIC HEALTH, *supra* note 134, at 140; Kapczynski et al., *supra* note 114, at 2.

195. EL SAID, PUBLIC HEALTH, *supra* note 134, at 139.

196. Rohit Malpani, *All Costs, No Benefits: How TRIPS-Plus Intellectual Property Rules in the US-Jordan FTA Affect Access to Medicines* 7 (Oxfam Int'l, Briefing Paper No. 102, 2007).

197. *See* EL SAID, PUBLIC HEALTH, *supra* note 134, at 133-43.

198. Gargi Chakrabarti, *Need of Data Exclusivity: Impact on Access to Medicine*, 19 J. INTELL. PROP. RIGHTS 325, 332 (2014).

199. *Id.* (noting that generic formulations of Colchicine were widely available for a significant time in the market).

200. *Id.*

explains, "URL Pharma subsequently sued to force other manufactures off the market, and raised prices from US$ 0.09 to 4.85 per pill."[201]

The case of Guatemala is also interesting in this context. A study examined the availability of certain drugs in Guatemala and found that as a result of the signing of the Central American Free Trade Agreement ("CAFTA"), "intellectual property rules reduced access to some generic drugs already on the market and delayed new entry of other generics."[202] Even worse, the study found that some drugs protected from competition in Guatemala will become available in the U.S. market for generic competition even before generic versions will be legally available in Guatemala.[203] The CAFTA impact is also felt in other countries:

> [A] 2009 study commissioned by ICTSD concluded that the CAFTA-DR would lead to an annual price increase for active ingredients in Costa Rica of between 18 per cent and 40 per cent by 2030, requiring increased public spending in the range of US$ 2 million to US$ 3.357 million. The strongest repercussions were expected from standards on patentability criteria and standards on test data exclusivity.[204]

Another study cited by Chakrabrti determined that once Guatemala enacted data exclusivity protection, prices of some medicine increased as much as 846% even though just a small number of them were protected by a patent.[205]

Jordan also provides an interesting case study in this area. The U.S.-Jordan FTA signed in 2001 was the first FTA to include a detailed intellectual property chapter which contains many TRIPS-

201. *Id.*

202. Ellen R. Shaffer & Joseph E. Brenner, *A Trade Agreement's Impact On Access To Generic Drugs*, 28 HEALTH AFF. w957, w957 (2009).

203. *Id.*

204. Bartels et al., *supra* note 94, at 190.

205. Chakrabarti, *supra* note 198, at 332; *see also* Shaffer & Brenner, *supra* note 202, at w962 ("In each case, the data-protected drugs are much more expensive than non-protected drugs in the same therapeutic class. For example, the insulin Lantus costs 846 percent more than Isophane insulin; the antifungal Vfend costs 810 percent more than the non-data-protected amphotericin B; and the intravenous antibiotic Invanz costs 342 percent more than the non-data-protected Meropenem (Meronem).").

Plus obligations.[206] With relation to data exclusivity, the FTA provided for five years of data protection plus three years for new uses of known compounds and patent linkage notification.[207] In 2007, Oxfam conducted a study on the impact of the FTA on the country and found some alarming results.[208] The study found that since 2001 medicine prices in Jordan have increased by 20% (this led to price increases between two and ten-fold for key medicines to treat cardiovascular disease and cancer), and data protection has delayed generic entry for 79% of medicines newly launched between 2002 and 2006.[209] The study estimates that the availability of generic equivalents would have reduced Jordan's expenditure on medicines by between $6.3 and $22 million between mid-2002 and 2006.[210] The study draws some comparisons with the situation of Egypt which has also implemented TRIPS but not TRIPS-plus obligations. In comparison to Egypt, medicine prices are between two and six times higher in Jordan.[211] A more recent study on the same case by Abbott et al. also affirmed the same results and found that between 1999 and 2004, there was a 17% increase in total medicines expenditure in Jordan.[212] Compared to the Oxfam study, Abbott et al. found a loss of $18 million in 2004—larger than the additional outlays of between $6 and $22 million between 2002 and 2006 found in the Oxfam study.[213] Abbott et al. concluded that the provisions for data protection arising from the FTA had the most significant effect on the price of medicines on Jordan.[214]

The negative impact of TRIPS-Plus rules is not confined to data exclusivity or to developing countries. For example, it is believed that the Comprehensive Economic and Trade Agreement ("CETA")

206. Mohammed El Said, *The Morning After: Trips-Plus, FTAs, and Wikileaks, Fresh Insights on the Implementation and Enforcement of IP Protection in Developing Countries*, 28 AM. U. INT'L L. REV. 71, 73 (2012) [hereinafter El Said, *The Morning After*].

207. Malpani, *supra* note 196, at 28.

208. El Said, *The Morning After*, *supra* note 206, at 89.

209. Malpani, *supra* note 196, at 2.

210. *Id.*

211. *Id.*

212. Ryan Abbott & Ibrahim Alabbadi, *The Price of Medicines in Jordan: The Cost of Trade-Based Intellectual Property*, 9 J. GENERIC MED. 75, 79 (2012).

213. *Id.* at 81.

214. *Id.* at 82.

between the European Union and Canada will result in the rise of medicines prices by "[c]ommitting Canada to creating a new system of patent term restoration thereby delaying entry of generic medicines by a period up to two years."[215] This will also reaffirm Canada's current term of data protection, and will create additional barriers for future governments in case they decided to change the system nationally (which is of course the same danger applying to all countries accepting TRIPS-Plus obligations through international agreements).[216] Strikingly, "CETA will only affect intellectual property rights in Canada—not the EU," as the latter already applies most of the agreement's standards. "This analysis estimates that CETA's provisions will increase Canadian drug costs by between 6.2% and 12.9% starting in 2023."[217] In attempting to reduce the impact, the "Canadian government committed to compensating provinces for the rise in costs for their public drug plans."[218] The analysis projected that CETA would delay the generics entry by 3.46 years on average and the annual loss for each additional year would be $811 million, which leads to another burden cost of $2.8 billion per year.[219]

In the highly ongoing controversial negotiations of the TPP, the United States has proposed expanded patent protections standards that will likely impact the affordability and accessibility of medicines in all TPP partners.[220] Further extension of protection to biological products which include vaccines, blood and blood components, and

215. Joel Lexchin & Marc-André Gagnon, *CETA and Pharmaceuticals: Impact of the Trade Agreement Between Europe and Canada on the Costs of Prescription Drugs*, 10 GLOBALIZATION & HEALTH, no. 30, 2014.

216. *Id.* ("The agreement will also include a new right of appeal under the patent linkage system that will create further delays for the entry of generics.").

217. *Id.*

218. *Id.* ("[T]his means that people paying out-of-pocket for their drugs or receiving them through private insurance, will be charged twice: once through higher drug costs and once more through their federal taxes.").

219. *Id.* at 4; *see also* PAUL GROOTENDORST & AIDAN HOLLIS, THE CANADA-EUROPEAN UNION COMPREHENSIVE ECONOMIC & TRADE AGREEMENT: AN ECONOMIC IMPACT ASSESSMENT OF PROPOSED PHARMACEUTICAL INTELLECTUAL PROPERTY PROVISIONS 23 (2011).

220. *See generally* Michael Blakeney, *Scope of the Intellectual Property Chapter of the Trans-Pacific Partnership Agreement (TPPA)*, 21 INT'L TRADE L. & REG. 14 (2015) (comparing the terms of the TPP draft intellectual property chapter to current norms).

gene therapies in addition to other forms of protection is also proposed under the TPP.[221] Fears about the impact on poorer countries of the TPP are mounting. In this regard, Vietnam has the lowest GDP per capita of the twelve countries participating in the TPP negotiations.[222] One study analysed the potential impact of the proposed patent regime under the TPP on access to ARVs in Vietnam and found that "82% of the HIV population eligible for treatment would receive ARVs" if the country utilised the TRIPS flexibilities, "while only 30% of Vietnam's eligible HIV patients would have access to ARVs under the US 2014 TPP proposals – more than halving the proportion treated compared to the current 68%" receiving treatment.[223] Similar price impacts can be expected for other countries participating in the TPP, though these are less economically vulnerable than Vietnam.[224]

Moreover, a perspective study by E.U.–Colombia FTA IFARMA commissioned by Health Action International Europe found that by 2030, patent-term extensions could increase expenditure on medicines in Colombia by nearly $280 million; data-exclusivity rules could result in an increase of more than $340 million.[225] Another

221. *See Trans-Pacific Partnership: Curbing Access to Medicines Now and in the Future*, amfAR (May 8, 2015), http://www.amfar.org/uploadedFiles/_amfarorg/Articles/On_The_Hill/2015/IB_TPP_Brief_RC_050615.pdf (raising concern that the agreement could "undermine the entrance of generic biologics into the market—including future vaccines"); *see also* Heesob Nam, *US Ambassador Confirmed Patent Linkage Under Korea-US FTA Includes Biologics – and US Seeks the Same in TPP*, INFOJUSTICE.ORG (Mar. 11, 2015), http://infojustice.org/archives/34087.

222. *See* BROCK R. WILLIAMS, CONG. RESEARCH SERV., R42344, TRANS-PACIFIC PARTNERSHIP (TPP) COUNTRIES: COMPARATIVE TRADE AND ECONOMIC ANALYSIS 4 (2013) (noting Vietnam has a per capita GDP of just over $3,500, compared to $60,000 in Singapore).

223. Moir et al., *supra* note 118, at 1.

224. *Id.* at 25-26 ("[I]f Vietnam were able to use full TRIPS flexibilities, and obtain ARVs at world-best prices, then the proportion of the population who meet the treatment criteria and receive ARV treatment with the available budget would increase to 82%. Equally however, should Vietnam implement the further reductions in patent quality and extend originator monopolies as proposed in the TPPA, then prices could rise substantially. We have estimated a price increase to $501, in which case, given the budget constraint, treatment would fall to 30% of the eligible population. This is less than half of the population currently being treated—over 45,000 people would no longer receive treatment.").

225. IFARMA, IMPACT OF THE EU-ANDEAN TRADE AGREEMENT ON ACCESS TO

cited the effects of the first decade of data exclusivity protection between 2003 and 2011 to cost the public health system approximately $1.3 million "on drugs protected with data exclusivity."[226] When compared with the cost of the same drugs under competitive market conditions, it is estimated that data exclusivity cost the healthcare system nearly $400 million dollars during that period.[227] A sum which would have allowed the state to cover the annual health insurance costs of about 146,000 Columbian citizens.[228] A similar 2009 study for the Dominican Republic predicted a modest price increase of 9% to 15% for active ingredients by 2027.[229] It found that the strongest impact by far was to be expected from provisions on data exclusivity.[230] A perspective study on the impact of the U.S.-Thailand FTA University of Bangkok adopting a macro-economic model measuring the impact of data exclusivity and patent extension proposals forecasted that all scenarios demonstrated a negative impact on the pharmaceutical market and access to medicines.[231] Medicines prices would increase

MEDICINES IN COLOMBIA (2009) ("[P]rospective impacts of the EU–Peru FTA, assessed using the same methodology, are similar to findings in Colombia. These studies were commissioned during the EU–Andean community trade negotiations. After objections by an alliance of Latin American and European civil society groups, and the governments of the countries in question, TRIPS-plus rules have been somewhat modified to reduce public health impacts on negotiating partners.").

226. César Rodriguez-Garavito, *A Golden Straitjacket? The Struggle over Patents and Access to Medicines in Colombia*, *in* BALANCING WEALTH AND HEALTH: THE BATTLE OVER INTELLECTUAL PROPERTY AND ACCESS TO MEDICINES IN LATIN AMERICA 169, 185 (Rochelle C. Dreyfuss & César Rodríguez-Garavito eds., 2014).

227. *Id.* at 185.

228. MIGUEL ERNESTO CORTÉS GAMBA ET AL., IMPACTO DE 10 AÑOS DE PROTECCIÓN DE DATOS EN MEDICAMENTOS EN COLOMBIA 9 (2012).

229. MAGDALENA RATHE ET AL., MEDICAMENTOS Y PROPIEDAD INTELECTUAL, EVALUCIÓN DEL IMPACTO DE LOS NUEVOS ESTÁNDARES DE DERECHOS DE PROPIEDAD INTELECTUAL EN EL PRECIO DE LOS MEDICAMENTOS: EL CASO DE LA REPÚBLICA DOMINICANA v (2009).

230. *Id.* at 62 (finding that data exclusivity is the principal cause of the increase in price of pharmaceuticals in the Dominican Republic due to the FTA).

231. Nusaraporn Kessomboon et al., *Impact on Access to Medicines from Trips-Plus: A Case Study of Thai-US FTA*, 41 SOUTHEAST ASIAN J. TROPICAL MED. & PUB. HEALTH 667, 674 (2010) (alleging that from 2008 to 2023 the impact of data exclusivity provisions on pharmaceutical expenditures would amount to $3,713 million and that of patent extensions would be $4,049 million).

by 32% and the domestic pharmaceutical market would contract by $3.3 million by 2027.[232]

Finally, Australia also was not immune from the negative impact of TRIPS-Plus rules arising from its FTA with the United States.[233] A study found:

> At the time that the EOT [extension of the term] was introduced, the annual cost to the Pharmaceutical Benefit Scheme (PBS) was estimated to grow from $6 million in 2001-02 to $160 million in 2005-06. This cost arises because there is a delayed entry to the PBS of cheaper generic drugs. The estimate for 2012-13 is around $240 million in the medium term and, in today's dollars, around $480 million in the longer term. The total cost of the EOT to Australia is actually about 20 per cent more than this, because the PBS is only one source of revenue for the industry.[234]

There have been many calls upon developing countries to refrain from introducing TRIPS-Plus commitments under their national law. Most recently, the World Medical Association's Council passed a Resolution in its 200th session in April 2015.[235] The Resolution makes a number of recommendations for countries particularly to:

Oppose any trade agreement provisions that would compromise access to health care services or medicines including but not limited to:

> - Patenting (or patent enforcement) of diagnostic, therapeutic and surgical techniques;
> - "Evergreening," or patent protection for minor modifications of existing drugs;
> - Patent linkage or other patent term adjustments that serve to as a barrier to generic entry into the market;
> - Data exclusivity for biologics;
> - Any effort to undermine TRIPS safeguards or restrict TRIPS flexibilities including compulsory licensing;

232. *Id.* at 667.

233. HARRIS ET AL., *supra* note 9, at vi (noting that as a result of signing the Australia-U.S. Free Trade Agreement, Australia extended pharmaceutical patent protection beyond the existing twenty year period).

234. *Id.* at vii-viii.

235. *WMA Council Resolution on Trade Agreements and Public Health*, WORLD MED. ASS'N (Apr. 2015), http://www.wma.net/en/30publications/10policies/30council/cr_20/.

- Limits on clinical trial data transparency[236]

# VI. CURBING TRIPS-PLUS THROUGH NATIONAL POLICIES AND PROGRAMMES

There is now a wealth of evidence widely available about the negative impact arising from various TRIPS-Plus obligations compared to just few years ago. There has been much less study, however, about the actual implementation of TRIPS-Plus obligations under the national law of those countries which undertook such commitments (from both developing and developed countries).[237] The legal recommendation that developing and least developed countries should in fact resist the acceptance and incorporation of TRIPS-Plus obligations under their national legal frameworks remains valid. Both developing and developed countries have in fact attempted to curb and limit the negative impact of TRIPS-Plus rules through creative legal and institutional implementation under their national regime.

One important point to stress is the realization that the successful implementation at the national level of polices curtailing TRIPS-Plus obligations will not take place automatically. In other words, there will have to be a concerted national meaningful effort and holistic approach (preferably a national programme or policy) whose main goal is to ensure collaboration between all concerned stakeholders in order to achieve that objective. It is also important to think outside the intellectual property box when such initiatives are adopted by also looking at competition law for example.

Although TRIPS-Plus rules may have negative impacts, few attempted to see how many countries transposed these TRIPS-Plus rules under their national law in a manner which may curtail their negative effect. This part will attempt to provide a number of examples where countries have succeeded in limiting the negative impact of TRIPS-Plus obligations during the implementation phase in their national intellectual property regimes.

Chile provides an interesting example of a developing country that attempted to limit the impact of TRIPS-Plus commitments under its

236. *Id.*
237. DEERE, *supra* note 18, at 21.

national law arising from the signed FTA with the United States in 2006.[238] After the agreement signing, public debate about the negative impact arose.[239] One area of concern was related to data exclusivity and patent linkage, which were incorporated under the FTA.[240] For instance, María Angélica Sánchez of the Industrial Association of Pharmaceutical Laboratories argued:

> [I]f our already robust present legislation is expanded to establish so-called linkage, and is modified to include the protection of clinical trial data, we must be prepared as a country for prices of medications to increase considerably. In accordance with the last study undertaken by the School of Economics at the University of Chile, prices will increase by 75 percent, which will have a considerable influence on the treatment of illnesses under the AUGE [Chile's Universal Access Plan] and other common illnesses in the country.[241]

In dealing with the situation and following extensive public debate, Chile limited the availability of data protection under its national law to those pharmaceutical products that have been marketed in the national territory in the year after the grant of marketing approval and therefore if the drug was not marketed within a year, the test data submitted for approval purposes will not be protected.[242] The rationale behind such a requirement is to encourage early registration of drugs after first registration abroad, so that the period of protection for the pharmaceutical test data starts early.[243] In addition, the law excluded several elements from the

238. Salvador Millaleo H., *Chile: The Case of IP Opposition from Predominantly Private Interests*, *in* BALANCING WEALTH AND HEALTH: THE BATTLE OVER INTELLECTUAL PROPERTY AND ACCESS TO MEDICINES IN LATIN AMERICA (Rochelle Dreyfuss & César Rodríguez-Garavit eds., 2014).

239. *Id.*

240. *Id.*

241. *Id.*

242. Law No. 19,039 art. 90, septiembre 30, 1991, DIARIO OFICIAL [D.O.] (Chile) (modified on December 1, 2005 by Law 19,996, which classifies active ingredients as new chemical entities if they have not been marketed in the country prior to the health registration or authorization application); *accord* Biadgleng & Maur, *supra* note 185, at 20 (observing that El Salvador, the Dominican Republic, Guatemala, Honduras, and Nicaragua appear to have introduced similar legislation).

243. *See, e.g.*, Law of Ukraine On Medicines, Implemented by Verhovna Rada Resolution No. 124/96-BP, art. 9, Mar. 4, 1996 (Ukr.) (mandating that pharmaceutical companies seeking data exclusivity submit an application for

scope of protection. Accordingly, article 91 of the Chilean law states:

> The protection of this Paragraph shall not apply when:
>
> (a) The owner of the test data referred to in Article 89 has engaged in forms of conduct or practices declared as contrary to free competition in direct relation to the use or exploitation of that information, according to the final decision of the free competition court.
> (b) For reasons of public health, national security, non-commercial public use, national emergency or other circumstances of extreme urgency declared by the competent authority, ending the protection referred to in Article 89 shall be justified.
> (c) The pharmaceutical or chemical-agricultural product is the subject of a compulsory license, according to what is established in this Law.
> (d) The pharmaceutical or chemical-agricultural product has not been marketed in the national territory after 12 months from the health certificate or clearance granted in Chile.
> (e) The pharmaceutical or chemical-agricultural product has a health certificate or clearance abroad that has been in force for over 12 months.[244]

Although the negative impact of data exclusivity is not totally eradicated as a result of the introduction of these provisions, one can argue that the creative implementation approach taken by Chilean legislature has in fact considerably limited the negative impact of such provisions.[245]

Peru provides another example of a developing country in this context. Its Legislative Decree No. 1072 for the Protection of Undisclosed Test Data or Other Undisclosed Data Related to Pharmaceutical Products implemented some flexibility by broadly

medicine registration within two years after the first registration of the medicine anywhere in the world in order to encourage companies to launch medicines in Ukraine as soon as possible).

244. *See* Pedro Roffe, Intellectual Property Provisions in Bilateral and Regional Trade Agreements: The Challenges of Implementation 15 (Oct. 6, 2006) (unpublished manuscript) (on file with the Center for International Environmental Law) (citing Decree No. 153 art. 91, Mechanisms for the Protection of Undisclosed Data, Julio 20, 2005, DIARIO OFICIAL [D.O.] (Chile)).

245. Millaleo H., *supra* note 238, at 151 ("However, the text of the FTA and Law No. 20.160 did not speak to either issue. The text of the FTA section regarding patents and medical products omitted several other topics of interest to the United States, such as procedural issues, the question of parallel importation, and the availability of second-use patents.").

providing a definition of the concept of "new chemical entities" in great detail, which could potentially provide more policy space when interpreted.[246] Moreover, the Decree provides that in cases where the submission of undisclosed test data is "necessary to determine the safety and efficiency of such product," the authorities will protect such data if "generating it has involved considerable efforts."[247] Other modifications introduced in 2009 also provide some policy space to be interpreted under the public health approach.[248] The Decree further allows the five-year term of data exclusivity protection to start concurrently from the date the product is approved in other countries with high sanitary monitoring or approval regime.[249]

Regarding the issue of patent linkage, Colombia implemented the FTA with the United States creatively by requiring Invima (the agency responsible for evaluating drug safety and efficacy) to keep a public record of new applications rather than proactively warning patent holders of applications that may impinge on their rights.[250] Other developed countries are also exercising caution when it comes to dealing with TRIPS-Plus conditions under their national legislations. Two developed countries stand out in this regard: Canada and Australia.

Canada has been active in perusing an international TRIPS-Plus agenda through its participation in a number of international TRIPS-Plus arrangements including the Anti-Counterfeiting Trade Agreement, TPP, and the bilateral agreement with the European Union.[251] However, national debate about the need to cater to the health of citizens has concurrently taken the centre stage. For

246. *See* Legislative Decree No. 1072, modified by Law No. 29316, enero 14, 2009, art. 2 (Peru) (defining "new chemical entity" and providing guidance on what will not be considered a new chemical entity).

247. *Id.* art. 1.

248. *See id.* art. 4 (dictating exceptions and limits to the right to protection of data on the grounds of protecting public health).

249. *See id.* art. 3.

250. See the Decree 733 of 2012. For more on implementation by Columbia of its FTA see César Rodríguez-Garavito, *A Golden Straitjacket? The Struggle over Patents and Access to Medicines in Colombia*, *in* BALANCING WEALTH AND HEALTH: THE BATTLE OVER INTELLECTUAL PROPERTY AND ACCESS TO MEDICINES IN LATIN AMERICA (Rochelle Dreyfuss & César Rodríguez-Garavit (eds) (2014).

251. Roffe, *supra* note 244.

instance, the Commission on the Future of Health Care established by the Prime Minister in 2002 highlighted its concern about the practice of evergreening stating that it "delays the ability of generic manufacturers to develop cheaper products for the marketplace and it is a questionable outcome of Canada's patent law."[252]

The country had taken some measures to limit evergreening even before the Commission issued its report. In 1993, the country introduced the Notice of Compliance Regulations ("NOC").[253] According to the NOC, the Minister of Health has to keep a Patent Register which contains the patents informed by innovator companies in respect of drugs for which marketing approval is sought.[254] In 2006, in an attempt to "strike a balance between effective protection of pharmaceuticals inventions, in order to stimulate research and development (R&D), and keeping the costs of medicines down," the government adopted measures aimed at preventing the use of evergreening patents.[255] The new NOC, therefore, prevents an innovator company from obtaining an order to prohibit the registration of a generic product for a period of twenty-four months as otherwise allowed by the Canadian regulations, for patents listed *after* a generic company submits an application for approval of its product.[256] The new regulations also make it clear that patents covering matters without direct therapeutic application, such as processes or intermediates, cannot be used to delay the marketing approval of generics.[257]

The Canadian judiciary also showed concern about the proliferation of patents in a number of decisions. In *AstraZeneca*

252. ROY J. ROMANOW, COMM'N ON THE FUTURE OF HEALTH CARE IN CANADA, BUILDING ON VALUES: THE FUTURE OF HEALTH CARE IN CANADA 209 (2002).

253. *See* Patented Medicines (Notice of Compliance) Regulations (Patent Act), SOR/93-133 (Can.).

254. *See* Donald M. Cameron et al., *Canadian Drug Patent Laws and Regulations*, *in* CAMERON'S PATENT AND TRADE SECRETS LAW 9 (Donald M. Cameron ed., 2010), http://www.jurisdiction.com/patweb09.pdf.

255. DOMINIQUE VALIQUET, LIBRARY OF PARLIAMENT, PRB 06-14E, THE PATENTED MEDICINES (NOTICE OF COMPLIANCE) REGULATIONS 1 (2006); *see* Regulations Amending the Patented Medicines (Notice of Compliance) Regulations, C. Gaz. Part II, Vol. 140, No. 21, 1503-25 (Can.).

256. Cameron et al., *supra* note 254, at 9.

257. *Id.* at 13-15.

*Canada Inc. v. Canada (Minister of Health)*,[258] the Supreme Court of Canada acknowledged:

> Given the evident (and entirely understandable) commercial strategy of the innovative drug companies to evergreen their products by adding bells and whistles to a pioneering product even after the original patent for that pioneering product has expired, the decision of the Federal Court of Appeal would reward evergreening even if the generic manufacturer (and thus the public) does not thereby derive any benefit from the subsequently listed patents.[259]

Moreover, various Canadian courts started to apply a judicial interpretation to the utility requirement. This has led to the invalidation of a number of pharmaceutical patents in the country. As Ho explains:

> [I]f a patent or patent application "promises" a certain result, such as fewer side effects, evidence of that promise, such as data establishing fewer side effects, must be disclosed or "soundly predicted" in the patent to satisfy utility pursuant to the "promise doctrine." If there is no promise, only a scintilla of utility is required.[260]

Although the Canadian approach to interpreting what is "useful" differs from other countries' interpretation, it is widely acknowledged that a patent should only be granted when the inventor has provided enough benefit to society.[261] Interestingly, the first Supreme Court of Canada case to apply this doctrine did so in the

258. 2006 SCC 49 (Can.).

259. *Id.* para. 39; *see also* Apotex Inc. v. Sanofi-Synthelabo Canada Inc., 2008 SCC 61, paras. 97-98 (Can.) (conveying concern over the use of evergreening for the extension of data exclusivity periods but claiming that the concern over evergreening is an insufficient basis for attacking the selection of patents doctrine). *See generally* Correa, Guidelines, *supra* note 36, at 9, 16 (describing specific mechanisms that enable the evergreening of pharmaceutical patents, such as patents on salts and the exploitation of enantiomers).

260. Ho, *supra* note 42, at 328-29.

261. *See Brenner v. Manson*, 383 U.S. 519, 535 (1966) ("[T]he decisions of the [Court of Customs and Patent Appeals] are in accord with the view that a product may not be patented absent a showing of utility . . . ."); *cf.* John Lechleiter, *How Lax Patent Rules in Canada are Suffocating Life-Saving Innovation*, FORBES (Aug. 26, 2013), http://www.forbes.com/sites/johnlechleiter/2013/08/26/how-lax-patent-rules-in-canada-are-suffocating-life-saving-innovation/#5b8c11dc4dff (critiquing the "Promise of the Patent Doctrine" as arbitrary and detrimental to the Canadian biopharmaceutical industry).

context of an invention on a new use of a known compound—the use of AZT to treat HIV/AIDS.[262] This is a case that might have been barred at a much earlier stage with less cost to society by adopting a model similar to India's section 3(d) statute, which prohibits not only new variations without increased efficacy, but new uses.[263]

Perhaps there is no other developed country which went as far as Australia in attempting to deal with the negative impact of TRIPS-Plus rules. Having seen its public health situation negatively implicated by the signing of the FTA with the United States, discussion ensued nationally about the need to curtail the negative impact arising from the FTA.[264] A 2013 report summarizes the current challenges facing the regime in the country by stating:

> Australia's patent system has allowed and will continue for some time to allow patents to be granted which would not be granted elsewhere; it has awarded a longer effective patent life than is provided in the United States or than seems necessary to underpin drug development in Australia; it has allowed patents to expire later in Australia than in its major trading partners. All of this has limited the generic manufacturing base, employment and exports and it has increased Australia's pharmaceutical costs. The Raising the Bar Act which recently came into force may moderate this, but its efficacy will not be evident for some years, and there is the prospect that, even with the changes introduced by Raising the Bar, patent standards are still insufficient to moderate evergreening in the pharmaceutical industry.[265]

Nevertheless and following the signing of the FTA with the United States in 2006, Australia introduced a number of reforms aimed primarily towards limiting the impact of TRIPS-Plus commitments arising from the FTA.[266] For instance, the FTA included obligations related to the extension of patent duration to compensate delays during marketing approval.[267] During the implementation phase, the

262. *See* Apotex Inc. v. Wellcome Foundation Ltd., 2002 SCC 77, paras. 77, 80-83 (Can.).

263. *See* Chatterjee, *Novartis*, *supra* note 169.

264. *See* HARRIS ET AL., *supra* note 9, at 120-21.

265. *Id.* at xiv.

266. *Id.* at 118.

267. *See* Australia-United States Free Trade Agreement, Austl.-U.S., art. 17.9.8(b), May 18, 2004, 43 I.L.M. 1248 [hereinafter Austl.-U.S. FTA] ("[E]ach Party shall make available an adjustment of the patent term to compensate the patent owner for unreasonable curtailment of the effective patent term as a result of

country limited the negative impact arising from patent term extension by further confining such type of extensions to certain and specific categories of products.[268] Moreover, the Australian patent law imposes *additional* substantive conditions specifically applicable for the extension of patent duration for "pharmaceutical substances."[269] Based on this, the extension of the term is possible only if the following conditions are met:

> i) the patent claim contains at least one "pharmaceutical substance *per se*";
> ii) that *the product* is included in the Australian Register of Therapeutic Goods; and
> iii) marketing approval was issued less than five years after the filing of the patent.[270]

Moreover and in order to widen the available national policy space, the 1990 Patents Act also includes dedicated procedures for the opposition against patent term extension.[271] In addition to these measures, the 1990 Patents Act imposes *additional* limitations on patent rights during the extended period of protection. For instance, article 78 states:

> If the Commissioner grants an extension of the term of a standard patent, the exclusive rights of the patentee during the term of the extension are not infringed:
>
> (a) by a person exploiting:
> (i) a pharmaceutical substance *per se* that is in substance disclosed in the complete specification of the patent and in substance falls within the scope of the claim or claims of that specification; or
> (ii) a pharmaceutical substance when produced by a process that involves the use of recombinant DNA technology, that is in substance

the marketing approval process.").

268. *See* HARRIS ET AL., *supra* note 9, at ix, 93-97 (indicating that unlike the United States, Europe, United Kingdom, and Japan, Australia limits extensions only to patents claiming new active ingredients or formulation).

269. *Id.* at 40, 101.

270. *See Patents Act 1990* (Cth) ch 6 pt 3 s 70 sub-divs (2)-(3) (Austl.).

271. *See id.* s 75 sub-divs (1)-(4); *see also* Austl.-U.S. FTA, *supra* note 267, art. 17.9.8(b) n.17-50 (declaring that the term "pharmaceutical substance" is synonymous to "pharmaceutical product," thereby allowing Australia to preserve its rules on eligibility for extension of patent terms to compensate for delays in the marketing authorization process).

> disclosed in the complete specification of the patent and in substance falls within the scope of the claim or claims of that specification; for a purpose other than therapeutic use; or
>
> (b) by a person exploiting any form of the invention other than:
>
> (i) a pharmaceutical substance *per se* that is in substance disclosed in the complete specification of the patent and in substance falls within the scope of the claim or claims of that specification; or
>
> (ii) a pharmaceutical substance when produced by a process that involves the use of recombinant DNA technology, that is in substance disclosed in the complete specification of the patent and in substance falls within the scope of the claim or claims of that specification.[272]

Despite the above measures, some argue that the government did not go far enough in limiting the negative impact arising from TRIPS-Plus rules.[273] The 2013 *Pharmaceutical Patents Review Report* further recommends that there is a "need for an external body, the Patent Oversight Committee, to audit the patent grant processes to help ensure these new standards are achieved, and to monitor whether they inhibit the patenting of follow-on pharmaceuticals which promote evergreening with no material therapeutic benefit."[274] In addition, it stated that "[t]he Government should also review the effectiveness of the patent scheme when the impact of Raising the Bar Act has become clear."[275] Moreover, one of the report's authors went as far as recommending the shortening of the patent life from fifteen years to twelve years.[276] According to the author, the estimated savings resulting from this reduction is $130 million a year.[277] Furthermore, "if a 70% price reduction from generic entry was achieved as discussed above, the savings would be approximately $260 million a year."[278]

In supplementing the legislative framework, the Australian Patent Office also became more assertive in rejecting requests/applications to extend the duration of patent protection in cases where it determined that the innovation in the patent claim did not involve the pharmaceutical substance *per se*, including the claims where the

272. *Patents Act 1990*, ch 6 pt 3 s 78.
273. *See* HARRIS ET AL., *supra* note 9, at 119.
274. *Id.* at xi.
275. *Id.*
276. *Id.* at xv, 84.
277. *Id.* at 84-85.
278. *Id.* at 85.

patent was primarily related to the arrangement of pharmaceutical substances; a new method of delivery of a known substance or to the use or method of producing a substance.[279]

It is worth noting that the above referred to examples do not emanate from separate national initiatives but rather as a part of a more comprehensive approach dealing with public health challenges within these countries. This demonstrates that many developed countries acknowledge today the negative consequences to TRIPS-Plus rules on public health. At the same time, few developing countries seem to take serious notice of such implications.

Needless to say that there are other approaches currently being utilised by developed countries in their fight against evergreening and patent proliferation. One of these being considered by the European Patent Office ("EPO") is increasing the fees paid for examination and maintenance of patents.[280] Some believe that this approach would "reduce 'strategic behaviour' and the number of claims and thereby improve 'patent quality', particularly with regard to patent 'thickets'."[281] Ecuador is an example of a developing country that has implemented a fee increase policy.[282] "Examination and registration fees, as well as maintenance fees for patents were drastically increased recently, elevating the cost of obtaining a patent to more than U$S [sic] 100,000, except for certain categories of applicants (such as small companies and universities)."[283] As Correa explains, "[t]hese fees – probably the highest in the world – are

279. *See id.* at 100-01.

280. *See* Yvonne Johnson, *European Patent Fees to Increase*, BAKER BRETTELL (Jan. 10, 2014), http://barkerbrettell.co.uk/european-patent-fees-to-increase/; *cf.* EUR. PATENT OFFICE ECON. & SCI. ADVISORY BD., RECOMMENDATIONS FOR IMPROVING THE PATENT SYSTEM 4 (2012) (noting that while the Economic & Science Advisory Board does not recommend an overhaul of the patent fee system, it does recommend the adoption of more "consistent and harmonized fee policies . . . .").

281. Correa, *Tackling*, *supra* note 177, at 21 (citing EUR. PATENT OFFICE ECON. & SCI. ADVISORY BD., WORKSHOP ON PATENT THICKETS 12, 16 (2012)); *see also* EUR. PATENT OFFICE ECON. & SCI. ADVISORY BD., *supra* note 280, at 5 (explaining that patent thickets refers to a high concentration of patents in a particular area, especially those with high market potential).

282. Correa, *Tackling*, *supra* note 177, at 21.

283. *Id.* (citing Resolucíon No. 001-2013 CD-IEPI).

likely to substantially reduce the number of patent applications."[284]

Another approach is related to the adoption of opposition procedures. Oppositions to pharmaceutical patents are much more frequently filed and granted than other types of patents in many countries. Emerging evidence estimates that at least 27% of current patents would be found invalid by U.S. courts[285] while in only thirty-nine out of 283 cases—where patent validity was questioned before a U.S. Federal District Court between 2007 and 2011—the claims that were challenged were found to be valid and enforceable.[286] Other studies indicate that "[w]hen generic competitors challenge . . . patents, courts find many invalid or not infringed."[287] Studies concerning the United States and the European Union found that generic companies win nearly three-quarters of cases.[288] In the European Union and according to the EPO, patents on medicines were twice as likely to be challenged as other types of patents.[289] In

284. *Id.*

285. *See* Shawn P. Miller, Where's The Innovation?: An Analysis of the Quantity and Qualities of Anticipated and Obvious Patents 2 (Feb. 10, 2012) (unpublished manuscript) (on file with George Mason University, Department of Economics).

286. Robert Smyth, White Paper Report: United States Patent Invalidity Study 2012 2 (Sept. 2012) (unpublished manuscript) (on file with Morgan Lewis); *see, e.g.*, Pfizer, Inc. v. Apotex, Inc., 480 F.3d 1348, 1364 (Fed. Cir. 2007) (citing *In re* Corkill, 771 F.2d 1496, 1500 (Fed. Cir. 1985)) (finding invalid a patent on amlodipine besylate on grounds that unpredictability cannot be equated to patentability, and that "obviousness cannot be avoided simply by showing of some degree of unpredictability in the art so long as there was a reasonable probability of success").

287. Ho, *supra* note 42, at 321.

288. *See id.*; *see also* FED TRADE COMM'N, GENERIC DRUG ENTRY PRIOR TO PATENT EXPIRATION: AN FTC STUDY vi (2002) (finding that generic companies win in 73% of challenges, with 28% of patents found invalid, 35% of the cases finding lack of infringement, and 10% of cases abandoned by the patent owner before a judicial finding); Pharmaceutical Sector Inquiry, Preliminary Report 188-89 (Nov. 28, 2008) (working paper) (on file with the Eur. Comm'n) (noting that generic companies won more than 60% of all cases, 71% of challenges they initiated, and 74% cases involving secondary patents). *But see* W. Raghupathi, Pharmaceutical Patent Validity: An Empirical Study of the Recent Decisions of the U.S. Court of Appeals for the Federal Circuit (2008-2011) 20 (2011) (working paper) (on file with Fordham University) ("The current study finds the net ruling of the Federal Circuit to be balanced and nuanced with a nearly equal number of affirmations and reversals, among both valid and invalid patents.").

289. *See* Correa, *Tackling*, *supra* note 177, at 10.

Argentina, it was found that twenty-five patent oppositions were submitted by domestic companies including for the HIV medicines efavirenz, ritonavir, lopinavir, raltegravir, elvitegravir, and the fixed-dose combination TDF/FTC/EFV which led to the rejection of many opposed patent applications.[290] In India, twenty-five out of thirty-four oppositions (73.5%) that were filed by local companies or non-governmental organizations against pharmaceutical patent applications filed between 2005 and 2008 resulted in rejections.[291]

Driven by these considerations, the America Invents Act that amended in 2011 the U.S. Patent Act aimed, inter alia, to boost the use of such procedures.[292] Among other changes, the United States Trademark and Patent Office Director can now institute re-examination on his own initiative on the basis of prior art cited during another re-examination.[293] A new proceeding, called "post grant review," was also "introduced to allow more broadly based challenges to a patent during . . . the nine months after grant or reissue."[294] The aim of these procedures is to be quick, less costly, and use more technically trained adjudicators than the U.S. federal court system. In addition, in order to encourage applications for invalidity, U.S. law awards the first generic company to successfully challenge a patent on a drug the right to enjoy a 180-day exclusivity period in which no subsequent abbreviated new drug application can be approved for that drug.[295]

290. *See New Resources from Argentina Now Available on PODB*, PAT. OPPOSITION DATABASE (May 17, 2013), http://news.patentoppositions.org/post/50651291488/new-resources-from-argentina-now-available-on-podb.

291. *See* Shamnad Basheer, *Patent Oppositions in India: The "Efficacy" of Section 3(d)*, SPICY IP (Sept. 16, 2009), http://spicyip.com/2009/09/patent-oppositions-in-india-efficacy-of.html (finding that approximately twenty out of the twenty-five rejections were based on section 3(d) of the Indian Patent Law, indicating the "efficacy" of this controversial section).

292. *See Post-Grant Proceedings Against U.S. Patents*, LADAS & PARRY LLP, http://ladas.com/education-center/post-grant-proceedings/ (last visited Feb. 27, 2016).

293. *See id.*

294. *Id.*

295. *See* 21 U.S.C. § 355(5)(B)(iv) (2012); *see also* Tony v. Pezzano, *United States: The Drug Approval Process: What's the "Hatch" with the One Hundred Eighty-Day ANDA Exclusivity Period?*, MONDAQ (June 8, 2001), http://www.mondaq.com/unitedstates/x/24779/Life+Sciences+Biotechnology/The+Drug+Approval+Process+Whats+The+Hatch+With+The+One+Hundred+Eighty

Needless to say that the role of judiciary is also essential in restoring the balance. As Okediji explains, "[t]he U.S. Supreme Court has creatively interpreted important policy bases for limiting patent subject matter eligibility in controversial cases involving new technologies."[296] An example of a developing country's judicial involvement can be seen in the Kenyan High Court's decision in *Asero Ochieng v. Attorney-General*,[297] which overturned an anti-counterfeiting statute (The Anti-Counterfeit Act, No. 13 (2008)). This court's decision, which preserved access to generic medicines, found the Act to be unconstitutional because it undermined the fundamental human right to health.[298]

Institutional creativity also plays an important role in preserving the flexibilities of TRIPS, limiting the negative impact of TRIPS-Plus rules and enhancing access to medicines. The widely cited Brazilian practice (prior consent) takes the lead in this regard.[299] Since 1999, applications for pharmaceutical patents must obtain the prior consent from the Brazilian National Sanitary Agency (*Agência Nacional de Vigilância Sanitária*, "ANVISA").[300] In accordance with

Day+ANDA+Exclusivity+Period.

296. Okediji, *supra* note 14, at 18 (citing Ass'n for Molecular Pathology v. Myriad Genetics, Inc., 133 S. Ct. 2107, 2116 (2013); Mayo Collaborative Servs. v. Prometheus Labs., Inc., 132 S. Ct. 1289, 1301 (2012); Bilski v. Kappos, 561 U.S. 593, 606 (2010)).

297. (2012) Petition No. 409 of 2009 (H.C.K.) (Kenya).

298. *See* The Anti-Counterfeit Act, No. 13 (2008) KENYA GAZETTE SUPPLEMENT NO. 97 §§ 32-34 (granting owners of intellectual property with "reasonable cause to suspect" their right is being infringed the right to file a complaint); *see also* Suleiman Mbatiah, *Kenya: Pharmaceutical Companies Pushing Anti-Counterfeit Law*, INTER PRESS SERV. (June 14, 2010), http://www.ipsnews.net/2010/06/kenya-pharmaceutical-companies-pushing-anti-counterfeit-law/.

299. *See* CTR. FOR STRATEGIC STUDIES & DEBATES, *supra* note 7, at 134. *See generally* Kenneth C. Shadlen, *The Rise and Fall of "Prior Consent" in Brazil*, 3 WIPO J. 103, 103 (2011) (examining the development of prior consent and the conflicts surrounding its application).

300. CTR. FOR STRATEGIC STUDIES & DEBATES, *supra* note 7, at 130. It became mandatory for pharmaceutical patent applications to undergo analysis by ANVISA ever since the institution of Provisional Act 2006/1999, which created the prior consent mechanism. Prior consent was consolidated by Law no. 10196, of 2001, which amended article 229 of the Patent Act—including item C: Article 229-C, Patent Act. The granting of patents for pharmaceutical products and processes shall depend on the prior consent of the National Sanitary Agency—ANVISA.

this, the national system in the country divides the examination of pharmaceutical patent applications between two agencies: the National Institute of Intellectual Property ("INPI") and ANVISA.[301] In accordance with this, the INPI is responsible for examining the legal sufficiency of patent applications while ANVISA, is a separate agency devoted to protecting and promoting "public health" in Brazil.[302] Under the prior consent law, INPI no longer has the authority to grant patents on its own; before doing so, it should forward the application to ANVISA for its consent (examination), purportedly based on public health considerations.[303] There is evidence that such a practice has in fact improved the quality of the granted patents in the country drastically.[304] Through national coordination between legislation, patent office action and judicial intervention, the country provides valuable lessons to many developing countries in the area of public health and access to medicines.

## VII. SUPPLEMENTARY MODELS FOR INNOVATION IN PUBLIC HEALTH: PAY-FOR-PERFORMANCE SCHEMES

The preceding section emphasized the need for countries alike to take a pro-active approach in interpreting intellectual property commitments under their national laws in a manner which maximizes the use of remaining policy space even where TRIPS-Plus obligations exist. At the same time, there is a need for a broader approach that goes beyond the parameters of the intellectual property regime. Countries should also indulge and even encourage experimentation with other polices and approaches which may also

301. *See* Shadlen, *supra* note 299, at 104-05.

302. *Id.*

303. *See id.* at 107.

304. ANVISA conducted a qualitative analysis of decisions issued after prior approval from INPI between 2001 and 2009. The study showed that ANVISA's participation increases the quality of granted patents by preventing approval of "inappropriate and frivolous patents." The study found that, out of the 1,346 patent applications analysed in the time period, 119 were denied consent. Of the patent applications denied, 47.9% were denied for lack of novelty and 22.7% were denied for obviousness. CTR. FOR STRATEGIC STUDIES & DEBATES, *supra* note 7, at 147. India also provides an interesting case of a developing country in this field, see Basheer, *supra* note 291.

complement the intellectual property regime with the goal of driving innovation and improving quality and coverage in the public health sector.[305] Adoption of new innovative models in the public health sector is therefore a necessity to deal with the current and future challenges facing humanity.[306] This will require the combined efforts of national governments, multi-national bodies, and the private sector. This will also demand a vision orientation, where "[c]ollaboration and partnership, then, may have to take the place of profit and competition as the key words in the development of the medicines of the future."[307]

A number of global initiatives were launched in recent years[308] including prizes for medical innovation, open source/access drug initiatives,[309] in addition to new access and innovation models such as medicines patent pools,[310] the health impact fund ("HIP"),[311] "and

305. *E.g.*, Paul Grootendorst et al., *New Approaches to Rewarding Pharmaceutical Innovation*, 183 CAN. MED. ASS'N J. 681, 681-85 (2011) (analysing the limitations of the drug patent system and describing alternatives such as public subsidies and funding for research, and impact-based and royalty-based reward systems).

306. *See* Jerome H. Reichman, Lecture, *Nurturing a Transactional System of Innovation*, 16 J. TRANSNAT'L L. & POL'Y 143, 162 (2007) (arguing that developing countries would benefit from "experimentally . . . testing different approaches to stimulating and disseminating innovation in their national and regional systems of innovation and to defining the relevant supporting legal standards that could prove effective for different players at different levels of development").

307. Anderson, *Pharmaceuticals*, *supra* note 45.

308. *See generally The Global Strategy and Plan of Action on Public Health, Innovation and Intellectual Property*, WORLD HEALTH ORG., http://www.who.int/phi/implementation/phi_globstat_action/en/ (last visited Mar. 16, 2016) (announcing the WHO comprehensive Global Strategy and Plan of Action on Public Health, Innovation and Intellectual Property).

309. *See, e.g.*, Christine Årdal & John-Arne Røttingen, *An Open Source Business Model for Malaria*, PLOS ONE, no. 2, Feb. 6, 2015 (recommending the "open source" approach to develop new drugs to fight malaria).

310. *See, e.g.*, *Patent Pools: Assessing Their Value-Added to Global Health, Policy Brief*, RESULTS FOR DEV. INST., http://healthresearchpolicy.org/sites/healthresearchpolicy.org/files/assessments/files/Patent%20Pools%20-%20final%20-%20Brief%2020120409.pdf (last visited Mar. 16, 2016) (assessing whether patent pools work to speed development of new medicines in low to mid-income countries).

311. *See* Amitava Banerjee et al., *The Health Impact Fund: Incentives for Improving Access to Medicines*, 375 LANCET 166, 166 (2010) (proposing the

'open data pools and prize funds that have been created or conceived'".[312] These schemes share one thing in common, dealing with the challenge of lack of resources, incentives and funding while at the same time improving the quality and coverage of public health regime and access to medicines in any country.

Regional powers have also paid special attention to these challenges.[313] For example, the European Union declared its commitment to explore alternative models and proposals in its development, innovation and health policy objectives.[314] In 2010, the European Council released conclusions on an *EU Role in Global Health* in response to proposals from the European Commission.[315] As highlighted, this represents the first formal E.U. strategy of its type, since previous European agreements on health issues focused on more specific areas including AIDS and pandemic diseases.[316] The 2010 E.U. Council Conclusions on Global Health pledged to "ensure that innovations and interventions produce products and services that are accessible and affordable."[317] The European Union's

Health Impact Fund "as an enduring reform that would give pharmaceutical innovators stable financial incentives to develop new medicines that have large effects on global health, and to sell them worldwide at no more than the lowest feasible cost of production and distribution").

312. BLOEMEN ET AL., *supra* note 27, at 10. Alongside these initiatives there are other proposals aimed towards making the pharmaceutical industry more accountable and transparent. *See* Ed Silverman, *Angry Over Drug Prices, More States Push Bills for Pharma to Disclose Costs*, WALL ST. J.: PHARMALOT (Apr. 24, 2015), http://blogs.wsj.com/pharmalot/2015/04/24/angryoverdrugpricesmore-statespushbillsforpharmatodisclosecosts/ (reporting on recent proposed state legislation that require full disclosure of costs in order for pharmaceutical companies to justify raising prices); Sam Stein, *Elizabeth Warren Proposes Big Pharma 'Swear Jar' to Fund Medical Research*, HUFFINGTON POST: HUFFPOST POL. (Jan. 22, 2015), http://www.huffingtonpost.com/2015/01/22/elizabeth-warren-pharma_n_6520746.html (describing Senator Elizabeth Warren's proposed Medical Innovation Act that would require pharmaceutical companies to pay into a fund when sanctioned by the federal government, which would be used to invest in research for the National Institutes of Health and the FDA).

313. *See, e.g.*, Press Release, Council of the European Union, Council Conclusions on the EU Role in Global Health 1, 5 (May 10, 2010) (on file with the European Commission).

314. *See id.* at 3.

315. *Id.*

316. *See id.* at 4.

317. *Id.* at 5; *see* BLOEMEN ET AL., *supra* note 27, at 11 ("These conclusions call

2020 proposal, the Innovation Union,[318] "speaks of introducing a more '*open approach to innovation*', '*increased open access to the results of EU financed research*' and the []promotion of '*patent pools*', as well as '*innovation inducement prizes*'."[319] The ensuing part will focus specifically on performance-based rewards ("PBR") schemes. In the United States, the Senate asked the National Academies in 2012 to consider alternative models based on the notion of funding R&D though a combination of expanded government grants and subsidies, and new innovation prize funds, with the level of the R&D rewards based upon a percentage of GNP or health care outlays.[320]

## VIII. PERFORMANCE-BASED REWARDS

One of the promising approaches gaining ground in this field is related to PBR or pay-for-performance for pharmaceutical innovation schemes. "Pay-for-performance" is a wide term which encompasses various schemes and programmes "aimed at improving the quality, efficiency, reach and overall value and coverage of health care."[321] These arrangements offer financial incentives to various stakeholders and health care providers to carry out such improvements and achieve optimal outcomes/objectives related to

for needs-driven innovation and further exploration of innovation '*de-linkage models*.'").

318. *Innovation Union: A Europe 2020 Initiative*, EUR. COMM'N, http://ec.europa.eu/research/innovation-union/index_en.cfm (last updated Oct. 13, 2015).

319. BLOEMEN ET AL., *supra* note 27, at 11; *see* Sophie Bloemen & David Hammerstein, *Time for the EU to Lead On Innovation: EU Policy Opportunities in Biomedical Innovation and the Promotion of Public Knowledge Goods* (Apr. 2012) (policy paper) (on file with Health Action International Europe) (providing descriptions of the policy proposals).

320. *See* S. 3187, 112th Cong. (2012).

321. Julia James, *Pay-for-Performance: New Payment Systems Reward Doctors and Hospitals for Improving Quality of Care, but Studies to Date Show Mixed Results*, HEALTH POL'Y BRIEF, Oct. 11, 2012, at 1, 1. http://healthaffairs.org/healthpolicybriefs/brief_pdfs/healthpolicybrief_78.pdf; *see Pay for Performance – Models*, HEALTH CARE INCENTIVES IMPROVEMENT INST., http://www.hci3.org/thought-leadership/why-incentives-matter/pay-performance/pay-performance-models (last visited Mar. 16, 2016) (noting that pay-for-performance models all include a performance measurement, incentive design, and transparency and consumer engagement).

the health of their patients which may not (either partially or fully) have been undertaken otherwise.[322] In a nutshell, pay-for-performance is "a set of performance indicators linked to an incentive scheme."[323]

Described by Nathan in 2007 as one of the most promising systems in dealing with the problem of affordability and availability of medicines, pay-for-performance schemes started to gain more ground during the last decade.[324] Put simply, PBR's main objective is to link payment to performance by measuring the effectiveness of medicines through "Quality-Adjusted Life Year[s]" or QALYs.[325] In general, PBR covers various types of arrangements and schemes under its umbrella including risk sharing schemes and patient access schemes.[326] Some of these schemes may reward good results by giving a bonus for instance, or simply penalize failure to achieve the agreed goals and objectives or cost savings in accordance with an identified metric for assessing drug's health impact and monitoring improvement.[327]

Accordingly, "payment schemes are therefore used in an attempt to influence the achievement of objectives such as quality, efficiency

322. *See* James, *supra* note 321, at 1-2 (outlining mixed results of pay-for-performance programs under the Affordable Care Act).

323. Gregory C. Pope, *Overview of Pay for Performance Models and Issues*, *in* PAY FOR PERFORMANCE IN HEALTH CARE: METHODS AND APPROACHES 33, 33 (Jerry Cromwell et al. eds., 2011) (providing a detailed overview of the elements and implementation of pay-for-performance programs).

324. Carl Nathan, *Aligning Pharmaceutical Innovation with Medical Need*, 13 NATURE MED. 304, 307 (2007).

325. *See* AIDAN HOLLIS & THOMAS POGGE, THE HEALTH IMPACT FUND: MAKING NEW MEDICINES ACCESSIBLE FOR ALL 9 (2008) (explaining that "[a] drug that extends a person's life by ten healthy years would be credited with ten QALYs" and describing the way that QALYs are assessed).

326. *See* Louis P. Garrison, Jr. et al., *Performance-Based Risk-Sharing Arrangements—Good Practices for Design, Implementation, and Evaluation: Report of the ISPOR Good Practices for Performance-Based Risk-Sharing Arrangements Task Force*, 16 VALUE IN HEALTH 703, 704 (2013).

327. *See* 4 SIDLEY AUSTIN LLP, SIDLEY GLOBAL PRICING NEWSLETTER 1-2 (2016) (describing an Australian reward-based scheme that determines the price the government pays the drug manufacturer based on the benefit of the drug to each individual patient); James, *supra* note 321 (providing an example of a penalty used by Medicare, which no longer pays for preventable conditions, such as urinary tract infections associated with catheter use, that develop during a hospital stay).

and cost control."[328] There have been a number of pay-for-performance schemes already adopted by a number of developed countries including the United Kingdom and the United States.[329] For instance, in the United Kingdom, before 2003, hospitals were mainly paid using a system of annual block contracts, with an agreed sum of money for a given amount of activity.[330] This changed in 2004, where a new scheme was based "on practices rather than individual GPs, and was funded out of a fixed national global sum for primary medical care. It incorporated a voluntary pay-for-performance component."[331] The UK's General Medical Services Contract, for example, rewards performance in accordance with a criteria based on 146 performance measures.[332] More specifically designated schemes are also gaining ground. More recently, the NHS in Scotland announced a new scheme late 2014, whereby it could be reimbursed for the cost of a new hepatitis drug if sufferers fail to clear the virus.[333] It was reported that the Scottish Medicines Consortium ("SMC") has approved the drug, whose generic name is Simeprevir, for use within NHS Scotland.[334] The "Pay If You Clear" scheme is awaiting a formal decision by NHS Scotland.[335]

There are also a number of similar schemes currently in place in the United States which even preceded those in the United

328. LOUISE MARSHALL ET AL., NUFFIELDTRUST, THE NHS PAYMENT SYSTEM: EVOLVING POLICY AND EMERGING EVIDENCE 6 (2014).

329. *See, e.g.*, Aaron E. Carroll, *The Problem with 'Pay for Performance' in Medicine*, N.Y. TIMES (July 28, 2014), http://www.nytimes.com/2014/07/29/upshot/the-problem-with-pay-for-performance-in-medicine.html.

330. *See* MARSHALL ET AL., *supra* note 328, at 3, 7 (explaining the benefits and drawbacks of block budgets and the United Kingdom's decision to move away from them).

331. *Id.* at 14.

332. *See* Pope, *supra* note 323, at 41 (noting that the focus on physicians' performance is important because they control most health care spending when determining whether or not to authorize care).

333. Reevel Alderson, *Unique "Pay if you Clear" Proposal for New Hepatitis Drug*, BBC NEWS (Oct. 13, 2014), http://www.bbc.com/news/uk-scotland-29569242 ("The 'Pay If You Clear' scheme would come into effect if patients treated with the drug do not become free of the hepatitis C virus (HCV) after 12 weeks.").

334. *See id.*

335. *Id.* ("The novel proposal was revealed after the drug Olysio was cleared for use by the SMC.").

Kingdom.[336] James identified more than forty private sector schemes which were already in place in 2012.[337] She states that "[p]ay-for-performance has become popular among policy makers and private and public payers, including Medicare and Medicaid."[338] The largest of these schemes in the United States is the Premier Hospital Quality Incentive Demonstration project.[339] "From 2003 to 2009, CMS and Premier, a nationwide hospital system, tested the extent to which financial bonuses would improve the quality of care provided to Medicare patients with certain conditions, including acute myocardial infarction, heart failure, and pneumonia."[340] James reports that "[t]he American Medical Association has developed principles for pay-for-performance programs emphasizing that provider participation should be voluntary; that physicians should be allowed to review, comment, and appeal performance data; and that programs should use new funding 'for what's next?'".[341] Pay-for-performance programs are likely to expand across U.S. health care in the near future, especially with implementation of the Affordable Care Act. More countries are also showing interest in such schemes.[342]

## IX. EFFECTIVENESS AND IMPACT

There is an agreement that the patent related challenges described earlier in this article will not disappear over a night nor will the current patent protection regime be able to steer innovation towards solving the global health challenges. In fact, attempts to reform the system have failed so far in bearing fruit. Having said that, many patients' lives in many parts of the world that do not have access to

336. *See* Marin Gemmill, *Pay-for-Performance in the US: What Lessons for Europe?*, 13 EUROHEALTH, no. 4, 2007, at 21, 21-23 (2007) (adding that the United Kingdom was the first out of all the European countries to use a pay-for-performance system).

337. James, *supra* note 321, at 2.

338. *Id.* at 1.

339. *Id.* at 2.

340. *Id.*

341. *Id.* at 5.

342. *See, e.g.*, GILBERT'S LLP, TOWARD PAY-FOR-PERFORMANCE: REIMBURSEMENT OF INNOVATIVE NEW DRUGS 1 (2012) (arguing that there is a renewed interest conditional reimbursement schemes by pointing to more recent programs in Belgium and the Netherlands).

medicines are being lost.[343] Taking a pragmatic approach through exploring available options which at the same time do not conflict with the current patent system is badly needed.

In line with this, HIP enters the picture as a PBR scheme which does not conflict with the intellectual property system but rather coexist with its deficiencies.[344] It offers producers an incentive to be rewarded (through payment of a fixed amount of money each year, divided among the registered medicines according to their respective health impact) from public funds in addition to sales over a period of time in proportion to the impact of their invention on health impact or the global burden of disease against making the invention available to others[345] by giving pharmaceutical companies the option of registering any new medicine, thereby agreeing to provide it at cost anywhere it is needed.[346]

So if the problem is due to market size and purchasing powers for the treatment of a neglected disease, HIP indirectly channels efforts to deal with that by offering a reward, or say an early cashing in mechanism. The HIP, however, does not focus on neglected diseases only nor on developing countries, it rather creates a framework which works globally and for other types of diseases including communicable ones.[347]

343. *See* BAILEY ET AL., *supra* note 53, at 3 (disputing industrialized country claims that patenting of medication is not a crucial health issue because it only affects 5% of current WHO essential drugs by pointing out that it includes vital and prohibitively expensive drugs such as anti-HIV/AIDS medicine); Sigrid Sterckx, *Patents and Access to Drugs in Developing Countries: An Ethical Analysis*, 4 DEV. WORLD BIOETHICS 58, 66 (2004) (arguing that rethinking the global patent regime is essential to providing a third of the world's population access to essential drugs that they currently lack).

344. HOLLIS & POGGE, *supra* note 325, at 16.

345. *See* David Coles & Lynn J. Frewer, *Stakeholder Views Regarding the Objectives and Implementation of the HIF*, *in* THE LIVING TREE, TRADITIONAL MEDICINE AND PUBLIC HEALTH IN CHINA AND INDIA, *supra* note 35, at 51, 51; *see also* Karan & Pogge, *supra* note 32, at 2 (noting that the HIF would have the highest impact for products with a potential high global health impact but low expected profit under the patent system).

346. *See* Karan & Pogge, *supra* note 32, at 3.

347. *See* HOLLIS & POGGE, *supra* note 325, at 8 (arguing that, even though in the short term the HIP will primarily introduce new medicine for diseases that primarily affect the poor, in the medium term it will attract "high impact medicines for global diseases and conditions" that affect both the rich and the poor).

Pay-for-performance schemes are increasingly becoming an integral tool of national public health frameworks. Although there are various studies indicating the positive impact such schemes have in improving the accessibility and availability of medicines, the reality is that one of the biggest challenges facing these schemes is the fact that they remain somehow disconnected and absent from the majority of national public health strategies.[348]

In general, actual measurement of these schemes would vary and engulf a number of indicators depending on the type of the scheme in question thus raising one of the major challenges facing these schemes. Defining "performance" itself and tying payments to absolute or relative levels provides another challenge. In addition, which aspects of performance and targets should be use as indicators and benchmarks of achieving the objectives? Indeed, as proclaimed, "[r]ewarding performance first requires the ability to measure it."[349]

There are a number of additional challenges which face PBRs and HIP today. To start with, they require political support and long term commitment from national authorities which is often lacking. On the technical side of things, they require the existence of an accurate assessment tool of impact of certain medicines on disease treatment and improvement.[350] The lack of institutionalization and adequate legal regime of these schemes also adds another layer of difficulty since these remain largely optional rather than compulsory.

The issue of perception also needs further clarity. Emerging evidence is supportive of the view that these schemes often result in positive outcome. A 2006 review by Petersen et al. found most studies indicating partial or positive effects of performance for pay financial incentives on quality measures.[351] Some studies, however,

348. See James, *supra* note 321.

349. MARSHALL ET AL., *supra* note 328, at 11.

350. Currently, the standard measure of performance in health is the QALY in which quality adjustments are based on studies of how individuals value different health states. Specific QALY-based measurement tools include the EQ-5D, Paul Dolan, *Modeling Valuations for EuroQol Health States*, 35 MED. CARE 1095 (1997), and the Health Utility Index, George W. Torrance et al., *Multiattribute Utility Function for a Comprehensive Health Status Classification System: Health Utilities Index Mark 2*, 34 MED. CARE 702 (1996), which have been used to help determine the cost per QALY to make reimbursement decisions.

351. *See* Laura A. Petersen et al., *Does Pay-for-Performance Improve the*

indicate that not all PBRs have had a positive impact.[352] A 2012 study published by *The New England Journal of Medicine*[353] found that thirty-day mortality, or the rate at which people died within a month after receiving certain procedures or care, was similar at the start of the study between the two groups, and that the decline in mortality over the next six years was also similar.[354] "Moreover, they found that even among the conditions that were explicitly linked to incentives, like heart attacks and coronary artery bypass grafts, pay-for-performance resulted in no improvements compared with conditions without financial incentives."[355]

Finally, lack of funding remains a huge challenge. It was estimated for instance that HIP would need to mobilize $6 billion per year to cater for its objectives.[356] This includes the support for the development of about two new drugs per year in addition to sustaining a stock of about twenty medicines.[357]

## X. THE WAY FORWARD

In the light of the above and in order to create and establish a legally and ethically sound PBRs scheme, more research, assessment, and examination is needed. More specifically, HIP needs to create a new measurement tool which is suitable for various countries and at the same time avoids the pitfalls of the current regime.[358]

*Quality of Health Care?*, 145 ANNALS OF INTERNAL MED. 265, 265 (2006); Torrance et al., *supra* note 350.

352. *See* Carroll, *supra* note 329.

353. Ashish K. Jha, *The Long-Term Effect of Premier Pay for Performance on Patient Outcomes*, 366 NEW ENG. J. MED. 1606 (2012).

354. *Id.* at 1606, 1611.

355. Carroll, *supra* note 329.

356. *See* Bill Hinchberger, *Pay for Performance to get Drugs to the Poor*, DEVEX (Nov. 17, 2014), https://www.devex.com/news/pay-for-performance-to-get-drugs-to-the-poor-84812 (estimating that at that cost, the HIF could support approximately twenty-five drugs).

357. HOLLIS & POGGE, *supra* note 325, at 4.

358. *See* Ladikas & Chaturvedi, *supra* note 35, at 43 (proposing adequate funding is necessary to create a new measurement tool); *see also UCLan Awarded Two Million Euros to Improve Global Access to Medicines Through Pioneering Research*, U. CENT. LANCASHIRE (Mar. 11, 2014), http://www.uclan.ac.uk/news/UCLan_awarded_two_million_euros_to_improve_global_access_to_medicines_through_pioneering_research.php (announcing that the University of Central

The legal regime for initiatives like HIP and pay-for-performance schemes should be reviewed in the light of these initiatives as it is vital to position such schemes accordingly. More specifically, the relationship between intellectual property and PBRs is also under scrutiny. Intellectual property protection's main focus is the protection of property rights while PBRs' main concern is public health and access to medicines.[359]

Despite the above, the inherent deficiencies of the intellectual property regime in this area need addressing to bring it in line with such schemes. Although the TRIPS Agreement sets minimum standards for patent protection for all member states, it neglects the fact that patent protection for medicines is just one element of many that contributes to setting the prices of medicines in any country (procurement, taxes, production ability, and public health insurance schemes are among other factors). By requiring such a monopoly term under national law, however, it places the issue of patent protection as one of the main determinants of the prices of medicines thus neglecting other factors.[360] Governments and individuals alike will bear the costs, although the citizens of developing countries are more likely to suffer more due to the lack of proper and adequate public health coverage and insurance systems in these countries.[361]

So while reaching an understanding at the international level is needed at some point,[362] initiatives at the national and regional levels should also be undertaken. In fact, some countries have already started experimenting with some sort of regimes/funds under their

Lancashire was awarded a 2 million euro grant to research performance-based reward systems based upon measurable global health impact).

359. *See* Hinchberger, *supra* note 356.

360. *See generally* Bartels et al., *supra* note 94, at 70 (examining intellectual property and trade policy as the main determinants of price, and therefore access, of medicine); Sterckx, *supra* note 343, at 58 (analysing the effects of the WTO TRIPS Agreement on global access to pharmaceuticals).

361. *See, e.g.*, Sterckx, *supra* note 343, at 68 (arguing that developing countries lack human and infrastructural capacities to develop health technologies and pharmaceuticals because of underlying economic problems).

362. Paul Grootendorst et al., *Patents and Other Incentives for Pharmaceutical Innovation*, *in* ENCYCLOPEDIA OF HEALTH ECONOMICS (forthcoming) (manuscript at 18-19) (on file with University of Toronto) [hereinafter Grootendorst et al., *Patents*] (examining the debate on various proposed alternatives to the patent regime under international law).

intellectual property regimes. For instance, under the 2002 Egypt Intellectual Property Law,[363] a drug price fund is proposed to deal with high process of medicines. Based on this, article 18 of the law states:

> A Drug Price Stability Fund, having a legal entity and reporting to the Minister of Health and Population, shall be established to maintain stability in the prices of drugs -other than export drugs -with a view to achieve health development and to guarantee that drug prices are not affected by incidental changes. The organisation and resources of the fund shall be determined by a decree to be issued by the President of the Republic. Such resources shall include contributions from donor states and intergovernmental and non-governmental organisations, as agreed by the State.[364]

The preceding discussion paves the way to identify the real problem with today's model for financing medicines. Based on this, HIP and PBRs provide complementary tools which may assist in filling the gap by seeking to "reimburse drug companies that provide an innovative drug at its cost price, with a reward based on the drug's incremental performance in improving health outcomes."[365] This is done by "measuring a drug's health impact in comparison with pre-existing treatments, with a reward payable based on the drug's incremental benefit."[366] More importantly, HIP would trigger the incentive—the reward—for the development of drugs affecting the poor where little R&D activities are undertaken. By doing so, the HIP balances profits and accessibility. Developing countries may find useful tools in such schemes.

## XI. CONCLUSION

This article considered various developments related to the international intellectual property regime impacting access to medicines and public health. Developing countries should adapt a proactive approach in interpreting intellectual property obligations under their national law. Special attention is given to those

363. Law No. 82 of 2002 (Law on the Protection of Intellectual Property Rights), 2 June 2002 (Egypt).

364. *Id.* art. 18.

365. GILBERT'S LLP, *supra* note 342, at 6

366. *Id.*

developing countries committed due to various bilateral and regional agreements to apply TRIPS-Plus rules the paper provides various examples from both developed and developing countries where countries managed to limit the impact of TRIPS-Plus rules on their citizens.

The paper also calls upon countries to also look for supplementary tools to the intellectual property regime which would assist them in dealing with public health challenges.[367] In accordance with this, the paper places the discussion on pay-for-performance schemes as an integral part of an overall national development and health policy-making which is main objective is the enhancement of innovation in public health, accessibility, and availability of medicines.[368]

If the above objectives are to be achieved, then the starting point would be to acknowledge that the current national and global models of financing and promoting medicines innovations are not working and that a new thinking should be adopted. Continuing with the current models will only exasperate the problem rather than solving it.

367. *See generally* Grootendorst et al., *Patents*, *supra* note 362, at 18 (discussing the proposal of a global R&D treaty).

368. Pope, *supra* note 323, at 70 ("We need to consider it as part of a set of complementary and substitutable strategies to achieve payer objectives, such as those discussed in this chapter.").