

# **Public-Private Management of Intellectual Property for Public Health Outcomes in the Developing World**

## **The Lessons of Access Conditions in Research and Development Agreements**



Initiative on  
Public-Private  
**Partnerships  
for Health**

# **Public-Private Management of Intellectual Property for Public Health Outcomes in the Developing World: The Lessons of Access Conditions in Research and Development Agreements**

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# Preface

An array of not-for-profit ventures has been created in recent years to develop products to combat diseases that predominantly affect populations in developing countries. Such ventures collaborate closely with profit-oriented pharmaceutical companies, but need to develop strategies leveraging their own investments to achieve public health goals – access to the products that emerge from these collaborations at acceptable prices, for poorer populations.

The current topic of intellectual property management has surfaced repeatedly as a topic of vital interest to the PPPs involved in developing new tools of intervention for neglected diseases. Hence, the Initiative on Public-Private Partnerships for Health (IPPPH) has endeavored to help PPPs navigate these relatively uncharted territories. IPPPH surveyed the product development PPPs for specific examples of how they have structured clauses relative to intellectual property and product ‘access’ within R&D agreements with commercial companies. Richard Wilder, Partner, Sidley Austin Brown & Wood LLP, in Washington, D.C. and Melinda Moree, Director, Malaria Vaccine Initiative, PATH, in Seattle helped us develop our approach and contributed valuable early guidance on this topic.

Then IPPPH was fortunate enough to be referred to Antony Taubman who undertook to complete this initial monograph on the management of IP to benefit the health of poor populations.

As experience accumulates, the Initiative on Public-Private Partnerships for Health will be gathering additional knowledge on the topics of intellectual property management and negotiating ‘deals’ with commercial companies, as part of our ongoing efforts to assist those engaged in product development to combat disease associated with poverty. Hence, periodic revisions of this monograph are anticipated. Further information can be obtained by emailing [info@ippph.org](mailto:info@ippph.org) or visiting our website at [www.ippph.org](http://www.ippph.org).

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# Executive Summary: Harnessing Private Interest for Public Welfare

This study considers specific practical options for managing intellectual property (IP) to promote the creation, development and effective dissemination of medical research outcomes for neglected diseases or diseases of poverty.<sup>1</sup> In contrast to the diseases prevalent in industrialized countries, established drug development processes have given scant attention to a number of widespread infectious diseases that are suffered by the poor and predominantly afflict the developing world. The research and development effort falls well short of the level of need proportionate with the scale of this disease burden. This ‘fatal imbalance’<sup>2</sup> can be attributed to many causes, and has led to calls for international policy initiatives to refocus research and drug development.<sup>3</sup> There are three chief challenges to the creation and delivery of new pharmaceuticals for neglected diseases:

- the identification of promising leads and the creation of new compounds as candidate drugs and vaccines, an essentially scientific activity requiring the application of basic research capacity to neglected diseases;
- the transformation of promising compounds into new medicines, a complex process which typically requires extensive clinical testing, regulatory approval, and access to associated technologies, manufacturing capacity and delivery platforms;
- health infrastructure, distribution chain and cost issues which can determine how many patients gain access to new medicines and how effectively they are delivered and administered within the context of overall health care.

Analysis of the problem of neglected diseases has highlighted impediments or shortcomings at each of these stages, but particularly emphasis has been laid on the need to improve the drug development pipeline, since there is evidence of promising new compounds remaining undeveloped due to the lack of incentives to take such compounds through the development process.<sup>4</sup> Policy settings are also seen as an obstacle to translating medical knowledge into actual tangible benefits, where the basic science is well known and current technology offers solutions in principle.<sup>5</sup> There are diverse possible structures for filling this drug development gap, which draw on a range of inputs and are adapted to the practical needs in each case. These responses typically use a mix of ‘push’ mechanisms to promote research and development, such as by direct funding or tax incentives, and ‘pull’ measures, which enhance the value to the producer of bringing new drugs to the market. While various initiatives and policy responses differ considerably, for convenience of discussion, these approaches can be classed into four general categories, along a spectrum of varying engagement of public investment and private interest:

<sup>1</sup> D.R. Gwatkin and M. Guillot, ‘The Burden of Disease among the Global Poor,’ World Bank, Washington, 2000.

<sup>2</sup> Fatal Imbalance: The Crisis in Research and Development for Drugs for Neglected Diseases,’ MSF Access to Essential Medicines Campaign and the Drugs for Neglected Diseases Working Group, 30 November, 2001.

<sup>3</sup> For example, Carlos Morel, ‘Neglected diseases: under-funded research and inadequate health interventions,’ EMBO Reports, Vol 4, 2003, at p. S35.

<sup>4</sup> ‘Numerous promising drug and vaccine leads are sitting on the shelf. It is time for pharmaceutical science to deliver on its tremendous promise for the developing world,’ Dr. Victoria Hale, at [www.oneworldhealth.org](http://www.oneworldhealth.org).

<sup>5</sup> This point is made by Alimuddin Zumla, ‘Reflection & Reaction: Drugs for Neglected Diseases,’ The Lancet Infectious Diseases, Vol 2 (July 2002), p. 393.

- an essentially public approach, marshalling public resources and building capacity to create more effective public-sector drug development vehicles;<sup>6</sup>
- a philanthropic or not-for-profit approach, drawing on private funds (such as charitable foundations) and donated private research and development resources;<sup>7</sup>
- an essentially commercial approach, aiming to create stronger incentives for private investment in drug research and development (R&D) and for investment in regulatory approval and distribution of needed treatments, such as orphan diseases schemes – these may include ‘push’ incentives such as cost reduction, and pull incentives that enhance the operation of markets;<sup>8</sup>
- a hybrid public-private approach that blends public-sector resources and policy directions with private sector expertise and investment – these may operate with an amalgam of commercial and non-commercial mechanisms, for instance allowing profits in wealthy markets to cross-subsidize at-cost or charitable distribution in priority areas of public health need.<sup>9</sup> This study concentrates on this last approach, and in particular on public-private partnership (PPP) agreements for the development and dissemination of new treatments for neglected diseases.<sup>10</sup>

Both public and private inputs have in practice been vital in achieving public health outcomes: one estimate indicates that of the more than US\$70 bn

invested in global health R&D in 1998, 50% of the funds came from public sources, and 50% from private sources (84% of which was provided by the pharmaceutical industry, the remainder from private not-for-profit funding).<sup>11</sup> The private sector role has been important when research moves beyond basic science to the clinical trials and other development steps required to prove the efficacy and safety of new products and to bring them to fruition as readily available treatments. The scientific and technical skills that are the traditional strengths of the research community need to be supplemented by cross-disciplinary expertise in product development, regulatory processes, production and distribution.<sup>12</sup> Both sets of skills are vital for the pharmaceutical development process, whether it is public-funded or based in the private-sector.

Hence even publicly-funded research programs have entailed some form of engagement of private sector entities at some stage as the initial research breakthrough is taken from the laboratory to the dispensary, to be available to the public as a proven, tested, stable, mass produced and efficacious pharmaceutical. In this process, public and private inputs may be required, both to marshal the necessary resources and development skills, and to secure access to associated technologies and know how. So the immediate and pressing concerns about major public health problems tap into a broader, long-running public policy debate: how best to promote innovative research and development in the private sector, and to focus it on areas of need, while still ensuring effective public availability of new technologies for the overall welfare of society?

<sup>6</sup> For example, the Drugs for Neglected Diseases Initiative (DNDi) aims to ‘move away from the traditional Public Private Partnership structure’ and ‘to take drug development out of the marketplace by encouraging the public sector to take more responsibility for health,’ ‘Best Science for the Most Neglected,’ at [www.dndi.org](http://www.dndi.org). A purely public sector approach has particularly been associated with vaccine development (e.g. the first AIDS vaccine was made at U.S. NIAID's Vaccine Research Center, news release, Oct. 9, 2001, <http://www.niaid.nih.gov/>). Other examples include the experience of Cuba (e.g. development of a vaccine against meningitis B - <http://www.ibike.org/cuba/library/CU%20vaccine%20meningitis.rtf>) and Brazil (e.g. FarMaguinhos, the Brazilian government's drugs producer, is involved in the development of new products <http://www.fiocruz.br/ingles/historia/farmanguinhos.htm>).

<sup>7</sup> E.g. the ‘nonprofit model for drug development’ implemented by the Institute for OneWorld Health ([www.oneworldhealth.org](http://www.oneworldhealth.org)).

<sup>8</sup> For example, the U.S. federal government offers economic assistance to small pharmaceutical companies in the pre-approval period of drug development for the conduct of clinical trials as well as economic incentives post-approval to reward innovation in drug development <http://www.fda.gov/cder/about/smallbiz/Economic.htm>.

<sup>9</sup> Adetokunbo Lucas, ‘Public-Private Partnerships: Illustrative examples,’ 2000, at [www.who.int/tdr](http://www.who.int/tdr)

<sup>10</sup> A comprehensive study of PPPs is provided in Hannah Kettler and Adrian Towse, ‘Public Private Partnerships for Research and Development: Medicines and Vaccines for Diseases of Poverty,’ Office of Health Economics, London, 2002.

<sup>11</sup> ‘Monitoring Financial Flows for Health Research 2001,’ [www.globalforumhealth.org](http://www.globalforumhealth.org)

<sup>12</sup> ‘While supporting basic and drug-lead discovery research, the public sector has rarely developed its own drug development expertise and capacity. It is the pharmaceutical industry that leads product development, from pre-clinical research through regulatory approval,’ ‘Fatal Imbalance, The Crisis in Research and Development for Drugs for Neglected Diseases,’ MSF and DND Working Group, 2001, p.20.

How to encourage private activity that promotes the broader public interest? It is perhaps inevitable, then, that the debate turns to some extent on the role and effect of patents in the health domain. Patents are a long-established policy mechanism intended to promote innovative private sector activity (research and investment in development of new technologies) for the overall public good, but how to optimize the public interest, especially public health outcomes, within the patent framework remains a contested issue.

PPP agreements created to address neglected needs for medical research and development constitute an important, focussed practical mechanism for harnessing private interests to achieve specific public health outcomes. These partnerships typically aim to achieve two distinct outcomes – first, creating a new technology (typically a new pharmaceutical treatment or vaccine), and second, ensuring that this technology is practically available as a safe and effective finished product to as many intended beneficiaries as possible – this means some mix of

positive incentives and contractual guarantees that ensure the product will be distributed well beyond the scope that the regular commercial market would service. Broadly, these mechanisms are described as access conditions. Access conditions usually entail strategic use of IP and agreements on IP management to generate the desired outcomes.

This study considers how PPP research and development agreements with access conditions have been developed, negotiated and implemented, and how they are structuring to ensure the widest effective access to the finished product. This should offer practical guidance into how to optimize outcomes from future PPP initiatives. But it should also provide insights into the broader policy issue of how to define and promote a clearer, more effective contribution on the part of private sector players within programs seeking to deliver stronger public health outcomes in geographical areas and for diseases that have been poorly serviced by the conventional drug development processes.

# 1. Introduction: The Challenge of Neglected Diseases

Neglected diseases are those for which there has been insufficient attention to the research and development of vaccines and drugs for their treatment – typically due to a combination of lack of public funds and an absence of private sector incentive. These ‘diseases of poverty’<sup>13</sup> or ‘economically orphan’<sup>14</sup> diseases are concentrated in the developing world: the comparative lack of resources in developing countries and the strength of the health market in the industrialised world leads to a dramatic disparity between the focus of health research and development, and the actual pattern of suffering from infectious diseases. While an estimated \$70.5bn was spent in 1998 on health research, less than ten percent of this ‘is devoted to diseases or conditions that account for 90% of the global disease burden.’<sup>15</sup>

To bridge this ‘10/90 gap’ is, on one level, a general challenge for national and international policymakers: the World Health Assembly has requested a study focusing on ‘the question of appropriate funding and incentive mechanisms for the creation of new medicines and other products against diseases that disproportionately affect developing countries.’<sup>16</sup> The overall challenge

involves, at core, mobilizing and better focussing the necessary resources to match more closely the global pattern of need: this is an urgent and grave instance of the general policy question<sup>17</sup> of how optimally to provide for public goods or ‘collective consumption goods.’<sup>18</sup> Public health is a pre-eminent public good, and there is accordingly a broader policy debate about public funding policies, research and development priorities, and incentive structures for private sector involvement, including the policy settings that apply to drug regulatory processes, the balance of interests reflected in the IP system, and related mechanisms such as orphan drugs programs.<sup>19</sup> Established ‘orphan disease’ programs focus on those diseases that are neglected due to the low numbers of those afflicted with certain life-threatening or grave diseases, in contrast to the ‘economically orphan’ nature of neglected diseases which are typically suffered by millions in the developing world.<sup>20</sup>

But the problem must also be addressed at the immediate practical level, through practical programs. A number of initiatives have been launched in recent years to draw together public and private partners so as to fill specific gaps in research and development

<sup>13</sup> Performance and Innovation Unit, Cabinet Office, ‘Tackling the Diseases of Poverty: Meeting the Okinawa Millennium Targets for HIV/AIDS, Tuberculosis and Malaria,’ London, 2001.

<sup>14</sup> Accelerating the fight against AIDS, TB and malaria: an EU perspective, speech by Commissioner Poul Nielson, New York, 28 April 2003.

<sup>15</sup> ‘What is the 10/90 Gap?’ [www.globalforumhealth.org](http://www.globalforumhealth.org)

<sup>16</sup> Paragraph 2.3, Resolution 56.27 of the World Health Assembly (2003).

<sup>17</sup> See Francis Sagasti and Keith Bezanson, Financing and Providing Global Public Goods, Ministry of Foreign Affairs, Stockholm, 2001, and Inge Kaul, Pedro Conceicao, Katell Le Goulven and Ronald Mendoza, ‘How to Improve the Provision of Public Goods,’ in Providing Global Public Goods, UNDP, New York, 2002.

<sup>18</sup> Samuelson, P., ‘The Pure Theory of Public Expenditure,’ *Review of Economics and Statistics*, 36, 387.

<sup>19</sup> Specific programs to promote the development of orphan drugs or orphan medicines have been implemented, for example, in the European Union, Japan, Australia and the United States. EU Regulation 141/2000 defines an ‘orphan medicine’ as one ‘that without incentives it is unlikely that the marketing of the medicinal product ... would generate sufficient return to justify the necessary investment.’ The US Orphan Drug Act refers to drugs to treat rare diseases, which are defined as diseases or conditions that affect fewer than 200,000 people in the U.S., or ‘for which there is no reasonable expectation that the cost of developing and making available in the US a drug for such disease or condition will be recovered from sales in the US of such a drug.’ These programs typically provide a mix of push and pull incentives, such as tax credits for research or clinical trials, limited market exclusivity for an approved new drug, assistance or facilitation of regulatory approval and fee reductions or waivers, and direct funding or grants for drug development.

<sup>20</sup> See DND working group <http://www.neglecteddiseases.org/1-5.pdf>.

activity, with the aim of developing and disseminating treatments for specific neglected diseases.<sup>21</sup> Public-private partnerships (PPPs) for neglected diseases have had to find practical responses to some important questions: what mechanisms actually function to ensure that necessary research and drug development are undertaken when they otherwise would not be done; and what mechanisms actually function to ensure that new drugs and vaccines, once developed, are effectively distributed to as many as possible of those suffering from neglected diseases? Typically, although not universally, these programs entail some form of involvement of both public (governmental, publicly-funded international and multilateral agencies) and private actors (including commercial enterprises – typically pharmaceutical companies -- as well as privately-funded philanthropic and non-governmental organizations), although their respective roles and inputs may vary widely between programs. One study distinguishes between partnerships that are ‘public sector programmes with private sector participation, operating under the auspices of intergovernmental agencies; and not-for profit public-private partnerships operating under

the national laws of various countries.’<sup>22</sup> Some of these programs are beginning to bear fruit - in terms of immediate research and development outcomes, but also in terms of practical understanding of effective partnership mechanisms: they provide insights into what structures actually yield results, and what approaches have been less successful.

The fruits of this experience will be invaluable for planning and implementing new initiatives to deal with neglected diseases. But understanding the practical choices made in implementing these initiatives may also contribute to the broader policy debate. These initiatives, individually, are case studies in how to find new ways of harnessing public and private interests, and effective mechanisms for managing resources for the public good – how public and private investment, intellectual property and know-how can be harnessed for overall public health goals. Surveyed together, these initiatives may help provide practical insights for policymakers seeking to set new policy directions to address the public health challenges in the developing world.

<sup>21</sup> Product-development public-private partnerships (PPPs) considered in this study include the International AIDS Vaccines Initiative, the Institute for OneWorld Health, the Concept Foundation, Consortium for Industrial Collaboration in Contraceptive Research (and CONRAD), the Alliance for Microbicide Development, the Medicines for Malaria Venture, Infectious Disease Research Institute, Aeras Global Tuberculosis Vaccine Foundation (formerly the Sequella Global Tuberculosis Foundation), the UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases (TDR), Drugs for Neglected Diseases Initiative (DNDi), Malaria Vaccine Initiative (at PATH), Global Alliance for TB Drug Development, Hookworm Vaccine Initiative (at the Albert B. Sabin Vaccine Institute), Foundation for Innovative New Diagnostics (FIND), Concept Foundation, and the Gates Foundation/U. of North Carolina Partnership for the Development of New Drugs (GFUNC), as well as provisions from other agreements which, for confidentiality reasons, will not be specifically identified. Other relevant material includes the general funding policies and specific program activities of government agencies, foundations, multilateral agencies such as WHO and the World Bank, and academic institutions, including Special Programme for Research and Training in Tropical Diseases (TDR). See [www.ippph.org](http://www.ippph.org) for more information on public-private partnerships for health.

<sup>22</sup> ‘Tackling the diseases of poverty,’ (see note 13 above), p. 60.

## 2. Defining the Need and Meeting the Challenge

Successfully bringing a new drug or vaccine to the public requires a diverse blend of inputs and contributions, in terms of intellectual, material and financial resources. These include background IP and know-how, provision of research facilities and funding, the specific research outcomes and innovations that form the basis of a new drug, access to platform technologies and manufacturing capacity, drug development capacities, including the capacity to manage clinical trials and regulatory approval processes and investment in downstream development, and capacity to disseminate drugs to the public while providing necessary clinical support and health infrastructure. The market for finished drugs is also hybrid and diverse in character, in many countries combining price subsidies, public procurement programs, and various incentive structures.

Inevitably, how this is achieved in practice varies greatly between different pharmaceutical development activities, and one specific template is unlikely to apply to each distinct new initiative to meet a disease need. Drug research and development have been achieved by a host of different structures, formal and informal partnerships, and varying levels of public and private sector input. Given the complexity of the research and development processes, and the diffuse nature of medical knowledge and background technology and know-how, it would be difficult to attribute all inputs to any given drug development outcome exclusively to either wholly public or private sources. Any particular outcome is likely to rest at some point along a spectrum between the extremes of purely public and purely private inputs. Typically, both public and private actors make various levels of contribution at each stage in the process of undertaking basic research, proving the safety and efficacy of candidate products, and creating the necessary mechanisms for production and dissemination of the pharmaceutical. The distribution of drugs and vaccines occurs through public procurement and

distribution programs, the private market, and hybrid markets involving various forms of public intervention.

Broadly, then, the full development of any pharmaceutical from a research insight through to a widely distributed treatment inevitably involves public and private interaction, and varying degrees of public funds and private investment, of public sector research programs and private research and development, and scientific, technology management and product development skills. The lack of research and development activity for neglected diseases is therefore generally attributed to twin causes, one concerning private sector initiatives and priorities (the absence of a sufficiently attractive market in developing countries) and the other the allocation of public resources (lack of direct public funding and failure to develop and disseminate the fruits of public research). Publicly funded research programs rarely have the stand-alone capacity to take a promising candidate product through the entire drug development process, and accessing all necessary background technologies and industrial capacities. Hence a comprehensive approach to fulfilling unmet needs involves addressing shortfalls in both public resources and private incentives. As part of the overall drug development process, private sector players need a secure basis and rationale to invest the capital and specialist know-how required and to bear a share of the risks in the later stages of drug development, including clinical trials and regulatory approval, and ramping up for production.

### **Resolving the paradox: securing the public interest from private rights**

It is increasingly difficult to divide these diverse inputs neatly into public and private components, and it is not always clear what the full contribution of public and private players has been for a pharmaceutical product. The situation is somewhat clearer when there is a specific product development partnership, defined and structured by a formal agreement that defines the relationship

between the different players, including rights and responsibilities concerning the development and dissemination of new technologies. Such partnerships routinely require strategic use of IP rights, especially patents, and include provisions on how IP rights should be owned, managed, and exercised so as to achieve the objectives of the partnership. Hence patents and other IP tools are increasingly used, even when the initial research and discovery processes have a strong publicly-funded component.

This can lead to concerns that public policy interests need to be safeguarded when such research is developed further and commercialized, and in particular to ensure new technologies are made available on reasonable terms, including through the exercise of IP rights covering the technology. One study, noting that IP issues are crucial in PPP arrangements, comments that ‘depending on the balance of funds and risk between the public and private partners,’ the incentives for private sector investment may be weakened, but that ‘public funds should be used to ensure patent arrangements mean prices to the end consumer are affordable.’<sup>23</sup> Further, to the extent that public investments are made in early research and development, there may be concerns that the public should own or control the technologies produced, or should ensure that all research outputs are placed squarely in the public domain. Yet it remains the case that private sector entities have played a direct role in developing most new drugs, and are normally responsible for taking a candidate drug from the early stages through the clinical trial and regulatory approval processes to yield a finished, approved product. This role is increasingly important in the complex stages of drug development beyond the initial discovery of a candidate drug. It is often the private sector players who can best marshal the necessary product development expertise,<sup>24</sup> and who bear the commercial risk of investing capital and other resources in this process. This can mean that the path chosen for drug development and delivery entails the private sector player holding and exercising IP rights over the new technology –

while this may be the most effective choice to achieve the desired outcomes, it can touch on concerns about the apparent privatisation of public sector research and the imposition of constraints on public access to new technologies. This paper discusses the kind of public interest mechanisms for IP management, such as access conditions, conditional licensing obligations, and segmented and favourable marketing structures, that can alleviate concerns about commercial control.

### **Managing intellectual property for the public good**

These concerns create the need to assess carefully the role of IP systems in the complex environment of public health policy. Patents in the pharmaceutical sector have been a particular focus of concern. Yet the patent system is not intended to set private rights at odds with the public interest, nor to create an intolerable burden for the community. To the contrary, the patent is a purpose-built vehicle for transferring technology into the public domain, not for withholding its benefits, preserving private interest while harnessing it for public welfare. The patent system has been established and crafted over time as a partial solution to fundamental issue at the core of the neglected disease debate: how to stimulate beneficial innovation by private players while ensuring the public gets tangible benefits from this innovation? If the patent system is intended as a solution to this dilemma, it is on the face of it a paradoxical, even contradictory one: the use of exclusive private rights over new technologies to promote public welfare. In principle, the patent system was not established with the objective of privileging private interests over the public interest, but because of the essential judgement that in the absence of the system, public welfare would suffer. The system evolved as a means of transferring practical knowledge about new technologies into the public domain, promoting the benefits of new technology, and recognizing legitimate private interests while still harnessing them for public welfare. However, these private rights are bounded to some extent (most obviously in the limited duration of patents) to safeguard public welfare. The patent system has other

<sup>23</sup> ‘Tackling the diseases of poverty,’ (see note 13 above), Annexes, p. 28.

<sup>24</sup> ‘While supporting basic and drug-lead discovery research, the public sector has rarely developed its own drug development expertise and capacity. It is the pharmaceutical industry that leads product development, from pre-clinical research through regulatory approval,’ ‘Fatal Imbalance, The Crisis in Research and Development for Drugs for Neglected Diseases,’ MSF and DND Working Group, 2001, p.20.

remedies and interacts with other areas of regulation (such as the rules for testing and approving new pharmaceuticals), to provide other guarantees of the public interest.

Properly managed, therefore, patents should be used to extract practical public benefits out of public health research (whether it be public or private), through defining the relationship between public and private players, and tapping into the necessary private capital and private sector expertise required to achieve concrete outcomes. For instance, one

funding program for research and training in neglected tropical diseases stipulates that acquiring and exercising IP rights ‘is often necessary to facilitate the development in the public interest of [research] results into a useful health-related product.’<sup>25</sup> In some cases, acquiring and exercising IP rights may be the most effective way of ensuring that the public does get access to a pharmaceutical even if it is based on research initially funded by the public or by philanthropic agencies – for example, where the absence of IP rights would mean a private sector player would have no rationale for investing

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## Basics of the patent system:

The following essential features of a typical patent system are relevant to this study:

- A patent is intended to be available for only those technological advances that are genuinely new (or ‘novel’), involve an inventive step (or are ‘not obvious’), and are useful (or are ‘capable of industrial application’) – this puts patents in the domain of practically applicable technology rather than purely scientific insights.
- The patent is granted only in exchange for a full public description of how actually to carry out the claimed invention – so if a patent concerns a new pharmaceutical, it contain enough practical information so that anyone familiar with the general field is able to replicate and produce an effective copy of the pharmaceutical. If a patent fails to meet this standard, it can be refused or cancelled. The reader of a patent is however presumed to have the general background and technical knowledge appropriate to the field of technology it addresses.
- A patent does not give its owner a positive right to distribute or sell a new product, and especially does not create an entitlement to put a new pharmaceutical on the market. When a patent application is filed for a prospective new pharmaceutical, it is normally very early in the development phase. Much more still needs to be done to demonstrate the safety, efficacy and viability of a new pharmaceutical. A new drug or vaccine would normally have to be separately approved for use by a health authority. This approval process can be lengthy and complex, and typically involves producing test data through clinical trials. Separate legal systems affect the protection and use of such test data.
- A patent holder receives a 20-year exclusive right to produce, make use of, exercise, and sell the product or process that constitutes the invention. This runs from the time a patent application is first filed. Since the initial invention often long precedes the regulatory approval and entry into market of a new pharmaceutical, the actual effective period of exclusivity for a new drug or vaccine can be less than this in practice, in some cases only several years.
- The rights granted under a patent can be licensed – the patent owner formally agrees with a third party to allow certain uses of the patented invention. In practice, the licensed uses might be limited according to purpose, field of use, territorial coverage and other conditions. A license may be conditional, for example being triggered if the patent owner fails to meet certain agreed conditions. Licensing is often covered by other legal considerations – e.g. patent laws or competition (anti-trust) laws may require that licenses not be excessively restrictive.
- In many countries, there are exceptions to patent rights that allow third parties to use the invention without the consent of the patent owner – for example, to conduct research or to prepare for regulatory approval of a pharmaceutical.

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<sup>25</sup> UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases (TDR).

- In addition, public authorities have a vital role in ensuring that a patent is exploited in a way that is consistent with the public interest: firstly by encouraging the patent holder to undertake voluntary exercise of the patent right in a way that benefits the public, and secondly by providing for corrective action if this doesn't eventuate. Legal remedies have been developed to allow third parties and state authorities to take action if patent rights are abused, if the obligation to work the patent is not adequately carried out, or if there is overwhelming public need.
- Patents are territorial in effect – in other words, distinct and independent patents are separately granted for different jurisdictions (for the most part each country has a different patent system, but there are several regional systems that provide a regional patent with effect throughout the region). This means that the exclusive rights under a patent granted under the laws of one country have no effect elsewhere. It often happens that an invention is covered by a patent in one or several countries, but this doesn't prevent others from freely using the invention in any other country where there is no patent in force – most inventions are protected by patents in just a minority of the countries in the world. The transparency of the patent system means that anyone skilled in the field worldwide can tap into the information needed to carry out the invention. There are of course many other substantive factors – lack of background know-how, economic and infrastructure factors, investment and capacity needs – that can in practice impede actually putting this knowledge into effect.
- Territoriality also means that patents on the same invention for different countries can be separately owned and licensed in each different country.

in the process of downstream development, clinical trials and regulatory approval, and the development of manufacturing capacity. At the same time, funding and public institutions use agreements on the dispensation of IP rights to ensure monitoring, input and control over the application and exploitation of core technologies by research/industry partners, structuring a package of access conditions with necessary incentives as the basis of the partnership. A new, hybrid conception of IP management is therefore being increasingly used that spans the conceptual divide between public and private. For the philanthropic funding partner, public sector agency or intergovernmental organization, IP helps define and structure the technology development and distribution relationships so as to guarantee public health outcomes; for the private sector partner, agreement over access, ownership and exploitation of IP provides the needed clarity, predictability and freedom to operate that enables private sector resources to be invested in the drug development process and, as needed, in the distribution of the new product.

This study reviews the practical mechanisms that have been used to structure public-private alliances to create and make available new treatments for neglected diseases. It looks in particular at how

partnership agreements define the distinct expectations on private, non-profit, and public partners within an alliance, and therefore seek to guarantee specific public health outcomes resulting from the alliance, and considers how these expectations and guarantees are expressed through a public-private form of IP management. Examining how ownership of IP rights is determined, and how those rights are required to be exercised in PPP agreements, may help illustrate the potential role of IP rights in ensuring that the necessary investments are made, while safeguarding necessary public access to new products developed in part through public or philanthropic funding or other public-sector inputs such as background IP. It highlights a need to clarify what is meant by 'access' as a goal for public-oriented programs and public-private partnerships – for instance, whether the objective for public funded health programs should be full public ownership (or public domain status) of all essential technologies – in which case 'access' may mean the lack of legal impediments to using a new technology – or whether the objective should be the actual, practical availability of a finished product and its active distribution to the public (such as through the kind of access conditions included in PPP agreements to define and to guarantee the necessary level of availability of the drug or vaccine).

### **Policy tools to optimize public-private interaction: policy overview of the patent system**

Achieving public health outcomes potentially requires the use of a wide array of policy mechanisms, ranging over public-funded drug production or distribution programs, pharmaceutical subsidy schemes, higher education and research policy, and industry development programs. The options include direct public funding of new research and development and other non-patent incentive mechanisms, such as orphan drug schemes and test data exclusivity schemes. This study focuses in particular on public-private interaction, so the policy tools most immediately involved are those which seek to establish an optimal balance between public and private interests, for overall public welfare. This, in particular, is the central objective of the IP system, and patent laws in particular.

There is an extensive critical literature about the impact of the patent system on the public interest, which is at its most acute when public health is at stake. On the one hand, there is an accepted need to make use of private sector capacities and resources to yield the public interest outcomes that arise from the creation and dissemination of new technologies. On the other hand, there is concern that public welfare should not be subordinated to the public interest. Addressing these concerns involves, at core, a practical resolution of a policy tension that dates back to the pre-industrial age, when the first legal codes were drawn up that still underpin today's patent laws: how to stimulate beneficial innovation by private players while ensuring the public gets tangible benefits from this innovation.

The patent system should therefore function as a positive linkage between the private and public domains, between the generation of basic research and the implementation of useful technological solutions. The patent, in principle, is not only a private right, nor just an incentive to develop innovations: each patent right can be construed as a public-private deal between the patent owner and the State. In essence, the government grants a limited-term patent right to the creator of a truly new, inventive and useful technological advance, which gives its owner the entitlement to exclude others from use of the new invention. This entitlement runs in principle for at least twenty years from time of file application (in practice, many

patents lapse well before that time). The actual period of commercial exploitation of this exclusive right is usually considerably shorter than the actual patent term: for instance, because of the long lead time for development, testing, and regulatory approval of a new drug, the actual period of exclusive access to the market is generally considerably less than the full twenty year term. During the term of the patent, the patent owner has the scope to invest in the new technology, prove its efficacy, safety and viability, pass through any regulatory approval process (especially significant for new pharmaceuticals), deliver it to the market, and secure profits by licensing and directly marketing its technology so as to offset the investment in research and development. Once the patent term expires, the technology falls into the public domain for anyone to use. In exchange for this exclusive right, the applicant for the patent right has to put on the public record how to carry out the invention – in the case of a patent on a new pharmaceutical product, this amounts to publishing all the information that a generic competitor with general technical skills would need to be able to put the claimed invention into effect, in other words to be able to produce the new pharmaceutical so as to achieve its claimed benefits. Failure fully to carry out this disclosure obligation means that a patent can be refused or held invalid. Further, in many countries' laws, the owner of the patent right can be held to the obligation to make the technology available to the public, expressed in various conditions such as 'working the patent,' 'meeting the reasonable expectations of the public,' 'adequately meeting demand for the invention on reasonable commercial terms,' or 'not unreasonably denying' opportunities to license the invention.

So a patent does not just give its owner the right to restrict others' use of the invention: it can impose obligations on its owner to ensure the invention is put into effect, or worked, to a reasonable degree. The patent system was conceived as a conduit to deliver technology from private hands to the public, first in terms of knowledge about the technology, second in terms of using the technology for public benefit, and third (when a patent expires) leaving it free for all to use unconditionally. A patent, therefore, is an undertaking to the public as well as a private entitlement – each patent is, in principle, a public-private partnership in itself. This is in contrast to trade secrets and know-how, which can indeed remain locked up indefinitely.

In practice, patents can be used to define and structure technology partnerships, reaching across the public and private divide through a diverse range of licensing and technology access arrangements. Hence patent ownership should not be seen in absolute terms – in the kind of technology partnerships that this study considers, patent ownership is often counterbalanced by undertakings to grant licenses not merely over the technology covered by the patent, but also over other necessary technology and know-how, as well as other resources, as a means of ensuring optimal availability of new technologies for public benefit. From a regulatory point of view, also, the patent right is not absolute: governments often reserve the right to use patented technology even without the authorization of the patent holder, subject to important safeguards to protect the patent holder's interests. This prerogative is in practice rarely invoked, but can be an important factor in the framework for licensing negotiations.

Other policy tools relevant to the present study are test data protection, and limited market exclusivity schemes such as those provided under 'orphan drugs' programs. Regulatory approval of new pharmaceuticals typically involves clinical trials and the generation of test data as to the safety and efficacy of a candidate drug, quite apart from the investment in the initial research that leads to the identification of a potential new treatment. The production of these test data is therefore linked to government regulatory requirements, yet normally involves private investment on a significant scale. To the extent that the public relies on private investors to generate these essential data, policymakers have introduced incentives for this productive investment: test data protection typically entails giving limited forms of exclusivity over the use of clinical test data, so that an investor has incentive to undertake this important element of the drug development pipeline. As this study will illustrate, technology partnerships such as PPPs can be used to leverage access to such test data that third parties may need for regulatory approval in neglected markets.

### 3. The Policy Framework: Partnerships For Public Goods

This section briefly reviews the general policy framework, to set in context the specific practical choices that are surveyed in this study. The provision of health care, including the creation and supply of new drugs and vaccines to serve unmet needs, is a fundamental public good. Globally, the provision of this public good to developing countries, and in particular the poor in those developing countries, is an urgent policy challenge. Finding effective means for improving the response to neglected diseases is a particularly demanding issue in the provision of global public goods. There is an active international policy debate concerning the options for securing the necessary resources for the provision of global public goods, including through public-private partnerships, and appropriate structures for the financing of global public goods.<sup>26</sup> The provision of public health typically involves a combination of public and private contributions: this entails a complex interaction of public funding and public infrastructure development, the operation of the commercial market (including the market for innovative and established technologies), targeted funding from public, private and philanthropic sources, and specific incentive mechanisms to encourage private actors to invest financial and other resources in priority areas dictated by public policy objectives.

The dynamic interaction between public interests and private players is an inevitable and essential element of the provision of public health. This applies in particular to the provision of drugs and vaccines. Contemporary policy debate and analysis, while wide-ranging and diffuse, does have as a common element an acceptance that public interest and resources need to interact more productively and harmoniously with private interests and resources. How to structure this interaction, and how to find the most effective way of harnessing the

particular assets, know-how and delivery capacity of private sector players, is a key policy challenge both at the broadest policy level – a striking instance of this is the WTO negotiations about the appropriate balance of interests in relation to pharmaceutical patents, culminating in the Doha Declaration on the TRIPS Agreement and Public Health<sup>27</sup> and subsequent work on its implementation – and at the practical level of managing specific projects or programs, for instance in creating practical and effective structures for defining the relationship between public and private players in drug and vaccine development and distribution.

Three general responses to the challenge of neglected diseases can be discerned: an essentially commercial or private sector approach, relying on private enterprise and market-based initiatives, which would be enhanced by creating stronger incentives for private investment in drug research and development (R&D) to enhance supply, and strengthening the market for neglected diseases to enhance demand; an essentially public approach, marshalling public resources and building capacity to create more effective public-sector drug development vehicles; and a hybrid public-private approach that blends public-sector resources and policy directions with private sector expertise and investment. In fact, these categories are not absolute and exhaustive; considering the wide range of inputs and investments that are necessary and the overall cost and complexity of drug development, actual drug programs are likely to have this hybrid quality, regardless of whether they are nominally situated in the public or private sectors.

At the most general level, public health and in particular the provision of drugs and vaccines entails some form of public-private partnering. Achieving better public health outcomes therefore entails

<sup>26</sup> Francis Sagasti and Keith Bezanson, *Financing and Providing Global Public Goods*, Ministry of Foreign Affairs, Stockholm, 2001.

<sup>27</sup> WTO document WT/MIN(01)/DEC/2 of 20 November 2001, available at [http://www.wto.org/english/thewto\\_e/minist\\_e/min01\\_e/mindecl\\_trips\\_e.htm](http://www.wto.org/english/thewto_e/minist_e/min01_e/mindecl_trips_e.htm)

understanding how this partnering can be optimised. This conception of optimal partnering can be considered at the broad policy level and at the immediate project level. The two levels interact – the approach taken to balancing public and private interests in a national IP system can be a major factor in encouraging productive partnerships at the project level, and in promoting their viability. The national policy and legal framework is an important factor in determining outcomes, as is the choice of partners, and the mix of expertise, capacities and resources that partners bring to a program. This study considers the project level, where a defined public health objective is established (such as the development and effective distribution of a vaccine for a disease that particularly afflicts developing countries), and a research and development program is undertaken to serve that objective. The study considers available options for structuring partnerships and the factors that increase the practical likelihood of attaining the desired public health objective.

Partnership proposals and established partnerships can both founder on IP issues. Differing perspectives by partners on IP management have been identified as a ‘significant impediment to partnership-building:’ for instance, in relation to medical research charities and universities, one report notes that some charities ‘tend to under-estimate the investment uncertainties and risks that the commercialisation process entails. This means that they can seek a higher financial return than their commitment of risk capital warrants. In contrast, some charities have raised concerns that universities insist on ownership of IP but pay insufficient attention to ensuring that adequate technology transfer takes place.’<sup>28</sup> Optimal partnering also depends in part on the formal legal agreements that give expression to the structure of the collaboration and the specific roles and obligations of the partners. More importantly, achievement of program objectives require a common understanding of shared values and objectives, recognition of and respect for distinct interests and operational constraints, and the establishment of realistic expectations of the two partners. The immediate interests and overall goals of partners may diverge,

as may their cultural values, and lack of confidence and mutual understanding can itself impede or prevent the attainment of shared objectives and the most fruitful pooling of resources. Ideally, a shared understanding of common interests and different priorities should be reached prior to their articulation in a formal legal agreement, but the process of negotiating an agreement typically brings these concerns to the surface and sets them in concrete terms. Once a successful program is under way, the project partners may come to see their collaboration as extending beyond the minimal levels established by the legal agreement, especially if mutual confidence and understanding develops in the course of program implementation. On the other hand, practical experience may also lead to a reassessment of the assumptions and structures that underpinned the partnership, and may lead to insights about rights, undertakings, flexibilities and clarifications, as well as the overall mix of incentives and inputs, that could have made the project more successful.

The review of actual agreements may shed light not merely on the formal aspects of partnerships and how mutual expectations are defined, but also on how the differing roles and the different allocation of resources, rights and responsibilities are determined, and how management of IP issues can be structured so as to bridge between the differing perspectives of funding and industry partners and to reinforce shared objectives. In turn, this may uncover practical ways of resolving the public policy dilemma of balancing private sector incentive to generate needed public health products against the goal of guaranteed access to those in most need of them.

The notion of a public-private partnership (PPP) has drawn extensive policy attention in recent years, and is increasingly discussed as a practical response to development needs in many areas<sup>29</sup>, especially in the provision of global public goods. Despite this current focus, the PPP is by no means universally favoured, and there have been calls – and specific initiatives<sup>30</sup> – for an approach more clearly centred in the public sector. As we have noted, in practice, no public health program or initiative is likely to fit neatly within either category; and to some extent the actual provision of public health as a global

<sup>28</sup> ‘Managing Intellectual Property: Strategic Decision-Making in Universities,’ Auril/UUK/Patent Office, 2002, p. 92.

<sup>29</sup> ‘Building Partnerships: Cooperation between the United Nations system and the private sector,’ United Nations, New York, 2002.

<sup>30</sup> Notably the Drugs for Neglected Diseases Initiative (see working paper entitled “DNDi : An Innovative Solution,” <http://www.dndi.org/Publications>).

public good will inevitably involve both public and private inputs, ranging from public funding and background research, to private investment and the infrastructure and management capacity required for effective product development, or the contracting of certain elements of research, development or manufacture. The complex matrix of financial, technological and logistic inputs for the creation

and development of a new pharmaceutical is difficult to break down into specific private and public components. However, the emergence of specific initiatives to develop new drugs or vaccines to treat or prevent neglected diseases has crystallized understanding about the significance of the respective role of public and private entities in drug development.

## 4. Public-Private Partnerships in Research and Development

This study concentrates on product-development PPPs that aim to ensure that those in need in developing countries can obtain these drugs and vaccines at lowest practicable prices to ensure a sustainable supply of the product. This focus is not intended to suggest that PPPs are the sole, or even necessarily the best, option for addressing the neglected diseases problem. Nonetheless, the PPPs are a precise distillation of the kinds of interactions between public and private interest that operate in the public health domain more generally. This study should therefore illuminate and assist broader policy choices about how to achieve public health outcomes by making use of private sector resources, commercial structures, and market mechanisms.

### 4.1 Structuring research and development agreements to optimise effective access

Access to new pharmaceutical treatments for neglected diseases entails two distinct steps, development and distribution:

- Creation of research and development outcomes that would not otherwise have been attained – including the development steps that transform a new scientific insight into a safe, viable, clinically proven and approved product.
- Promotion of the widest possible actual availability of the drug or vaccine once it has been clinically proven and approved – this includes infrastructure and distribution factors, and cost factors. Effective availability may also include completing any regulatory processes that are necessary prerequisites for distribution of the drug or vaccine.

In principle, PPP agreements targeting neglected diseases are developed with both of these objectives in mind – ideally, even a research and development agreement concerning fundamental research should anticipate the need for effective means to promote the dissemination of the finished product, even though this may not occur for a decade or longer.

The need to ensure widespread effective availability to target communities may be manifested in specific access conditions within the research and development agreement, setting the terms of access to the finished product even before the research program has commenced. But the model that is envisaged for downstream distribution can also determine some basic choices over such issues as: ownership of IP generated by the funded research, access to background IP (including expertise and know-how of the private sector player, and specific technology such as drug delivery platforms and manufacturing technologies), provisions governing licensing of new technologies (such as ensuring favourable licenses to developing country health programs), and undertakings to take steps necessary for the availability of pharmaceuticals (for example, the research/industry partner may agree to make test data available as necessary to enable the distribution of the covered product by a third party).

Some PPP agreements do not actually provide for new research, but rather licence private sector players to use technology users in the dissemination of existing technologies as licensees of certain IP:<sup>31</sup> the experience of these partnerships in promoting effective access to established and proven technologies for developing countries may be instructive in considering options even for those agreements that seek to produce new technologies and then ensure their effective distribution. In other words, both development and downstream distribution issues need to be considered, both as distinct sets of issues, but also as integrated elements of an overall longer-term partnership. A research agreement that allows for vital research breakthroughs and early drug development, but then provides no certainty that the fruits of the research will be developed and adequately disseminated to the targeted population is undesirable; but so is an agreement that provides for rigorous access conditions for new treatments

<sup>31</sup> For instance, the work of the Concept Foundation (<http://www.conceptfoundation.org>)

while failing to offer any incentive to engage in the research and development required to create and prove the needed treatments.

Hence the overall package for access to new treatments needs to be planned and implemented as an integrated program. Even so, the conditions in PPP agreements that affect practical access fall into two general areas, corresponding to the development and the downstream or distribution phases:

- Technology development and access obligations: such provisions concern research and creation of new technology per se, or the availability of necessary technology and associated data – this may establish obligations on the research/industry partner to undertake research and development, and to make available background IP, know-how and associated data (including technical know-how or skills and resources required for product development, clinical trials and regulatory approval know-how, as well as the data on safety and efficacy produced by clinical trials). Such provisions may amount to a positive undertaking – such as an agreement to undertake research or to provide technology, or an obligation to license or transfer IP rights in the event the research/industry partner fails to, or has insufficient interest to, develop and disseminate covered technology in a particular market.
- Downstream technology dissemination provisions: provisions which set conditions for how the covered technology (typically a pharmaceutical or vaccine) is to be distributed or marketed by the research/industry partner – these may set a price or criteria (such as ‘reasonable price’ or ‘public sector price’) for determining the price for distribution in a certain market); conditions may stipulate more generally that the pharmaceutical will be ‘reasonably available’ or otherwise comply with similar criteria; and conditions may also provide distinct requirements for how the pharmaceutical is to be distributed in distinct markets, such as an undertaking to cross-subsidize developing country or public sector distribution on the basis of preferential pricing, and other conditions defining how access to the covered pharmaceutical should be granted on the basis of market or non-market mechanisms.

At both of these stages – generation of new technology, and dissemination of proven technology

– any program has to deal with a host of external factors well beyond the control of either party. One key factor is the pattern of ownership and control over background technologies relevant to the project objectives. It may be necessary to survey and assess the IP landscape, and determine whether there is pre-existing IP that could impede freedom to implement any technology developed under the project; alternatively, there could be existing IP held by third parties that is considered necessary or highly desirable to achieve the goals of the project. Negotiating access to such technology may be an important common goal of the PPP partners. One consideration in the choice of industry partner for the project may indeed be the access which that partner can bring to necessary technology, or its negotiating strength should third party technology still be needed. Especially for those projects that are focussed on the creation of new science and the development of new technologies, there is a tendency for such freedom-to-operate issues to be overlooked, with the result that impediments are later encountered to actual development and implementation of the finished product. This is a further illustration of the need to consider both technology development and downstream dissemination issues at the time of the conception and initiation of the project.

Other external limiting factors include the health infrastructure in target markets, broader infrastructure and developmental issues, and the legal and regulatory environment. These issues are briefly reviewed below.

#### 4.2 Review of access conditions and PPP agreements

This review of PPPs does not closely analyse individual agreements, but reports on general trends and patterns in the agreements surveyed. The nature of agreements and the role of partners to agreements vary considerably. For convenience, the discussion will identify a ‘project partner’ and an ‘industry/research partner’ as a way of typifying the respective players within each PPP. The ‘project partner’ may be a philanthropic foundation, a non-profit corporation, a government agency, or an international organization, with responsibility for delivering a certain public health outcome: typically, the project partner will be providing financial support, but also may be making available background technology and other drug development skills and capacity. The desired outcome, the

pharmaceutical or vaccine the development and availability of which the agreement is intended to promote, is termed the ‘covered product.’

PPP agreements typically define the conditions under which the party must make the covered product available. These conditions – commonly referred to as “access conditions” – are agreed to in return for value, within the context of the overall structure of the research and development program. The ultimate goal of “access” is for the covered product to be made available at the lowest practicable prices to ensure a sustainable supply into a given market and widest access within that market. But how this objective is defined in practice varies considerably, the actual approaches including setting specific criteria for a ‘reasonable price’ or a ‘public sector price,’ creating structures that allow sales in rich markets to cross-subsidise sales in markets of need, and other blends of market and non-market mechanisms.

The value that passes to the industry/research partner in a PPP has an up-front component and a prospective component. The up-front component can include valuable contributions brought to the partnership by the project partner, such as funding for research and development, necessary technology (including background IP), or technical and regulatory expertise which the project partner can provide. The prospective component can include benefits from marketing new products developed through the partnership, and in particular the commercial benefits that flow from exclusive positions in the technology developed through the partnership outside the target market. The project partner may also undertake to purchase the finished product at certain levels or in certain quantities consistent with the goals of the partnership.

Access conditions are commonly defined in terms of setting a preferential sales price in developing countries, or in specific targeted markets. This is generally offset by leaving the commercial parties free to commercialize the product in more lucrative markets without contractual constraints as to price levels or other performance guarantees. Access conditions may also be defined in terms of performance standards, such as conditions setting agreed volume and delivery term commitments for the manufacture and distribution of drugs or

vaccines. Other conditions provide for access to the developed technology in the event that the research/industry partner abandons the project or elects not to service a particular market or sector: this can be achieved through an agreement to assign or license IP and to provide know-how and regulatory approval data.

PPP agreements show considerable variation in access conditions. This variation is partly due to different strategic judgements and assessments about the most effective incentive structure, and the negotiating dynamics that yield a particular agreement. It is also dependent on the nature of the contributions brought by the two parties – whether the public partner is providing background IP, for example, and whether the funding is sufficient to support a stand-alone research program or is simply supplementing an existing program.<sup>32</sup> But it is also due to external, more objective factors, including market and infrastructure issues such as:

- the size and characteristics of patient population for the target disease,
- the availability of sustainable funding from private and public sources,
- the cost and cost-effectiveness of given vaccines and drugs,
- health care delivery systems, including drug or vaccine distribution and delivery plans,
- the economics and structure of the relevant industry sector,
- the pattern of ownership of and freedom to use necessary background technology,
- the availability of alternative interventions (e.g. for a new malaria drug there could be competing drugs, preventives such as potential vaccines, insecticide treated bednets, and new insecticides), and
- broader policy settings and regulatory factors (such as WHO recommendations or ‘essential drug’ status, and selection for use by national health authorities and aid agencies).

The survey of the content of access conditions will aim to identify the influence of such internal and external factors on the choices made, with the goal of distilling some general principles and practical

<sup>32</sup> For instance, one partnership is based on an agreement to ‘fund a portion of reserach and development related to the development of a [target compound] over a four-year period.’

insights on how to optimize access conditions and associated IP strategies.

#### 4.2.1. Setting the context for access conditions: general PPP agreement provisions

A survey of PPP agreements for neglected diseases shows how technology development and dissemination conditions, and access conditions broadly, are deeply embedded within the agreements. It may only be possible to understand how access conditions actually operate through a comprehensive reading of an overall agreement – for example, an access condition for market distribution of a new pharmaceutical may hinge on a ‘reasonable price’ criterion, which draws both on a distinct definition of ‘reasonable price’ and on provisions concerning covered technologies and relevant geographical and other sectoral distinctions, as well as provisions acknowledging the legitimate interests of the research/industry partner. Some agreements do have specific clauses setting out access conditions, but even these clauses need to be read and understood within the broader context of the agreement. This is not surprising: the very purpose of the agreement is to achieve a public health outcome through a certain level of access to hitherto unavailable (indeed non-existent) or practically inaccessible technologies, and so the overall effect of access conditions may only be manifest through an understanding of an agreement as a whole. Accordingly, the following discussion considers how conditions setting access to covered technologies in PPP agreements for public health outcomes are variously expressed in different components of the agreements surveyed.

##### **Purpose of agreement**

The very purpose of the agreement will help determine the effect of the access conditions it contains. The agreement’s preamble, or specific undertakings, may establish the goals of the partnership, either in general terms (promoting access to needed drugs or vaccines in the developing world), or more precisely (identifying exactly the targeted needs and the specific sections of the public concerned). Clarifying a common purpose has the practical benefit of guiding the definition, management and implementation of the partnership. Yet defining the purpose also frames the context in which the agreement is formally interpreted as a legal contract. It may have bearing, for example, in

interpreting specific undertakings to make drugs available at a reasonable price for certain markets, or to licence all technology as may reasonably be necessary. It may guide the interpretation of ‘march-in’ clauses and similar provisions that give third parties access to necessary technologies in the event that the original private sector party has no interest in developing and marketing a product for a specific sector or need or is insufficiently diligent in addressing the needs identified in the agreement.

For example, one PPP agreement specifies the purpose of the partnership and explicitly links this to the way in which reasonable pricing is determined: “[Industry partner] understands and acknowledges that the [project partner] is making the Grant in furtherance of its charitable purposes’ and therefore agrees that it will make all products developed under the agreement ‘available for purchase in the developing countries of the world at a reasonable price.’ Another preamble provides that the project partner ‘negotiates agreements to ensure that the fruits of [its] sponsored development will be readily available and affordable in Developing Countries.’

The stated purpose of the agreement may also be a relevant factor in establishing reasonable pricing arrangements and other performance guarantees – it may have the effect, for example, of clarifying whether the pricing mechanism that applies is market-based and derived from market conditions, or based on other considerations closer in nature to philanthropic or non-profit pricing structures. The overall purpose of the agreement may, indeed, explicitly clarify that the very aim of the agreement is to give the research/industry partner an unrestricted capacity to exploit the technology in the open market in developed country markets so as to provide an enhanced incentive to supply the pharmaceutical at marginal cost or other non-profit terms to specified developing country markets.

##### **Specific conditions on interpretation**

The way PPP partners specify how certain aspects of their agreements should be interpreted can have direct implications for access to pharmaceuticals. For example, agreed rules on interpretation may require that key terms be interpreted in terms of the public policy goals of the arrangement. One agreement provides that ‘this entire paragraph [concerning a guarantee that developed products be available to developing countries at a reasonable price] shall be interpreted in a manner that furthers

the [project partner's] charitable purposes.' Such agreed interpretative rules may not merely determine how certain terms and conditions are interpreted, but may also influence the management of the partnership so as to reinforce the public health goals.

### **General undertakings**

Another way that is used to align the interpretation and implementation of the agreement, and thus the practical terms of access, is the identification of general undertakings. For example, an agreement may impose a general undertaking on the private sector player to exercise IP rights and to manage technologies for the public interest, including undertaking to license rights to others who may be in a better position to achieve some of the public interest goals of the partnership. In another agreement, the research/industry partner agrees 'to use commercially reasonable efforts to develop the product candidate.'

### **Key definitions**

Some of the most important aspects of the purpose of the partnership, and indeed specific access conditions, may be established in the definitions agreed for key terms. For instance, as examples cited in this study will show, definitions have been established for distinct market sectors (including distinct public sector markets), different users of covered technology (including public sector, non-profit and government use of the technology), pricing mechanisms (including the definition of a reasonable price and a reasonable profit), fields of use (for neglected diseases and vulnerable communities, as against diseases affecting wealthy populations) and beneficiary countries; definitions also help to establish and define IP ownership and access arrangements. Hence the operative effect of access conditions will naturally only be determined in substance by reference to these key definitions.

#### **4.2.2. Provisions governing IPRs and access conditions**

IPRs have a crucial role in setting access conditions, both in terms of promoting the research and development of new drugs (including clinical trials and regulatory approval), and in structuring manufacturing and distribution arrangements so as to ensure the optimal dissemination of the finished product. By the same token, insufficient attention to IPRs or poorly structured IPR arrangements could frustrate the goal of effective access to the new

treatments. Most PPP agreements therefore contain detailed provisions governing the background IP brought to a partnership by either partner, and governing IP rights on new technologies developed under the program (or through related research).

### **Obligations concerning background and prior IP rights**

Ensuring future access to drugs developed under the program may require agreement on background IP and prior IP. For example, if a key background technology is necessary, or desirable, for the successful development and marketing of a new product developed under the program, the public sector or project partner may wish to guarantee future access to that background technology in the event that a third party has to produce and distribute the new product. The background IP respectively brought to the partnership by the two partners may also determine what access conditions are reasonable, in the light of the value of their respective contributions. Accordingly, PPP agreements provide for reporting of background IP and for licensing arrangements concerning that IP. For instance, under one PPP agreement, "all Collaborators agree to grant a non-exclusive, royalty-free, non-sublicensable, research use license to any Background IPR to other Collaborators to enable the other Collaborators to carry out tasks under the Research Program that are within the Field of Use," and another provides for a "royalty-free, non-exclusive license and sublicense in the Developing Countries" covering background IPR "for the sole non-commercial purpose of making [a product] readily available and affordable in the Public Sector of the Developing Countries."

Clarity about the relationship between background IP and the actual covered research program is essential. One agreement distinguishes four distinct categories: 'Basic Technologies, Prior IPR, Background IPR and Program Inventions.' In this instance, "Basic Technologies" are defined as "generally useful in research and development both inside and outside the Field of Use and do not uniquely and specifically relate to the Research Program." By contrast, background IPR is "essential in the conduct of the Research Program," and prior IPR is "useful but not essential in the conduct of the Research Program and ... would not preclude nor pose a legal bar to pre-clinical and clinical development and marketing and distribution of drugs or drug candidates developed in the course of the Research Program." Distinct obligations are defined for each category of

technology, so as to focus the grant of licenses on the most effective mix of access to necessary technologies, and incentives on the part of the technology provider to contribute this technology to the partnership.

#### ***Obligations concerning new IP rights: disclosure***

A crucial element of the overall package of access conditions concerns the obtaining, ownership, maintenance, exercise of rights and licensing IP rights granted in respect of new technologies generated by the research activities undertaken under the agreements. Agreements may need to impose certain obligations on the parties undertaking original research to pursue IP rights, or to disclose inventions that may be eligible for IP protection. This is important in determining whether, and how, IP rights may be used to structure arrangements for optimal distribution of the new technology; it can also ensure that appropriate licensing provisions are available to ensure any necessary third party access to IP-protected technology developed under the agreement. These mechanisms include:

- reporting requirements concerning inventions that may be eligible for patent protection, or concerning IP rights applied for or granted;
- obligations on the part of the research/industry partner to apply for and exercise IP rights so as to further the goals of the agreement;
- undertakings not to pursue IP rights for certain technologies or in certain jurisdictions; and
- obligations to consult with the public sector or financing partner on key decisions concerning patent protection for covered technology.

#### ***Ownership of IP***

Agreements generally specify who should own IP developed as a result of the research and other activities undertaken within the framework of the agreement (e.g. regulatory process that generate proprietary data). The basic options are:

- the research or research/industry partner owns the IP – in this instance, the agreement normally requires various forms of licenses to be granted by the IP holder. Any IP ensuing from the activities is frequently licensed back to the project partner or related institute;
- the project partner (such as a funding agency or public sector technology manager) owns the IP; and
- the IP is held jointly by the two partners.

The initial focus in partnership negotiations is often on the question of IP ownership, and this can have symbolic importance. Strict research agreements – when a researcher undertakes research as a contracted service, against a fee – often require the assignment of IP rights, so that the party financing the research owns the IP rights on the research outcomes. For drug research and development, where research takes place in a more complex context, project partners tend to lay greater emphasis on questions of control of the use of IP rights, access to the technology protected by the IP, and clarifying the responsibilities for maintaining and enforcing an IP portfolio. Practical questions concern which partner should actually manage IP from the project, and what management structure is best match of management capacities and objectives and needs. For the project partner, a choice lies between ownership of IP and contractual assurances of access, licensing back and other forms of management of IP rights (such as fall-back licensing to third parties in some circumstances) as an alternative to retaining ownership as an end in itself. Typically, the party undertaking research is entitled to seek patent or other IP protection for new technologies developed under the funded research, but is subject to strict requirements for diligent development and dissemination of the technologies, and requirements not to let IP rights lapse without notice to the project partner. This entitlement is also generally subject to reporting or disclosure requirements concerning any inventions developed in the funded research, and an obligation to license out (or even assign or transfer) the IP in the event that this is needed to meet the overall program objectives, especially when the IP owner and industry partner fails to meet agreed access conditions. Similarly, rights in test data and other data tends to vest in the industry partner undertaking clinical development, but with guarantees of access and diligent use of these data.

Another approach is for the project partner to seek ownership of relevant IP in the main countries of operation – that is to say, the developing countries where the target disease is endemic – while leaving ownership in other markets to the industry partner (in which the industry partner may rely on for commercial incentives to get involved in the project). One initiative adopts as a general policy that it shall ‘always get free and unfettered access to the key research outputs, including rights to IP within [its] field of interest,’ and in practice this means aiming to secure IP rights in disease endemic countries, IP

rights in the field of the target disease, and royalties on sales in countries where the disease is not endemic. Another approach, reflected in a clinical development agreement, is for the industry partner to own any invention created during the clinical development process and to have the entitlement to seek patent protection at its own expense; but if the industry partner chooses not to file for patent protection, the project partner retains the entitlement to secure patent protection in its own name and at its own expense. The industry partner is also required to notify the project partner in the event that it chooses to abandon a patent, giving the project partner the option of ownership of the patent and related IP. As a safeguard to balance the ownership of IP by the industry partner, the project partner also retains the reserve right to ‘an irrevocable, royalty-free, sublicensable, nonexclusive license’ under all relevant IP, to be invoked in the event that the industry partner does not undertake the required development and marketing activities of the covered product in any country.

A key practical consideration in determining ownership arrangements is the financial and resource cost of managing a portfolio of intellectual property titles. These costs – covering filing and attorney fees, prosecution of patents through the examination process, grant and maintenance fees, and the costs of monitoring and enforcing compliance - can be very high, especially if they range over several jurisdictions. These costs may amount to a significant diversion of both project finances and capacity for a project partner. Conferring ownership of IP titles on the industry partner may lead to economies of scale, so that the portfolio management resources of the industry partner can be applied to this complex task, and profits made by the industry partner from exploitation of the patented invention in other markets and for other applications may also support the portfolio management costs. Even if conceding ownership of IP to the industry partner, the project partner should be able to secure firm guarantees of access to the necessary technology to fulfil the PPP’s objectives; it may also be able to negotiate a portion of the royalty stream if the technology covered by the agreement is licensed to third parties. In short, ownership of patents per se should be distinguished from safeguarding access to technologies and to ensuring an entitlement to royalty or other payments from the commercial exploitation of technology beyond the philanthropic goals of the PPP.

### **Access to IP – new IP or background IP**

In line with these considerations concerning ownership, one model for ensuring access to the covered product is to establish the research/industry partner as the principal agent in developing, producing and disseminating the relevant technology – with the goal of creating incentives for the research/industry partner to exploit technology under the coverage of relevant IP rights in accordance with the objectives of the PPP agreement. This may create an assumption that the research/industry partner should be entitled to manage and exercise IP rights in accordance with this incentive structure:

- to grant licenses over covered technology, background IP or test data to ensure that third parties can provide the covered product to markets that the research/industry partner is unable or unwilling to service;
- to provide similar access in the event that the industry partner fails to meet other performance standards, such as reasonable or preferential pricing for certain sectors, or undertakings to make products available within a prescribed time frame;
- to grant licenses as necessary to allow public sector and philanthropic programs to obtain the covered product from alternative sources (including from alternative manufacturers); and
- to grant licenses to third parties so as to facilitate research, clinical trials, regulatory approval or product development, such as for new disease applications or additional markets that the industry partner is not able to service.

#### **4.2.3. Other intellectual property licensing issues**

##### **Licensing test data for regulatory approval**

Reasonable access may include agreement on the generation and use of clinical trial data – including data already in the hands of either party to the agreement, or data that is generated in the course of the research program. For instance, in agreements which are based on differential marketing and distribution arrangements, a private sector researcher may be required to grant access to clinical trial data as required to ensure that third parties can obtain regulatory approval in developing countries, while maintaining exclusive rights over the data in developed country markets.

The scope of license to clinical trial data that the industry partner is required to grant can depend on its own diligence in making the drug available in specific markets. Failure to do so would trigger the need for third parties to gain access to the test data, for instance when timely steps are not taken to service lower volume or commercially unattractive markets. In other arrangements, licensing of clinical trial data may be provided for third parties for use in particular geographical markets or market sectors. For instance, one agreement provides for a ‘know-how licence’ for the industry party to gain access to clinical trial data (as well as trade mark rights and other technical information and know-how). This is a semi-exclusive license for private sector distribution of the covered product, and non-exclusive for public sector distribution of the product. This ensures that other industry actors could also service the public sector needs, while providing the industry partner with exclusivity in the private market. This is another example, but in a different manner, of how IP licensing associated with clinical trial data and the regulatory processes is used to promote low-cost access to a targeted market, while ensuring that the industry partner can have reasonable expectations of commercial benefits in other sectors.

More generally, the investment made by the industry partner in gaining regulatory approval (in particular tests and clinical trials, and the assembly and preparation of data in the necessary format) can be made available through the project partner to other parties, so as to accelerate and facilitate approval in other markets not directly served by the industry partner.

#### **Trademark rights**

Trademarks play a particularly important role in the identification and distribution of pharmaceutical products and vaccines. For reasons linked to marketing, clinical practice, practitioner awareness and regulatory approval, a PPP agreement may need to provide for access to this form of IP right. For example, one agreement provides two alternatives: the industry partner can use the project partner’s trademark in the designated territory; or it can use its own mark, but in that event must assign it to the project partner before sales commence. Such provisions may be necessary to ensure that the project partner is able to continue to benefit from any market recognition in the trade mark and from any regulatory approval associated with the mark,

especially when the industry partner ceases to supply the designated territory or when it becomes necessary for the sake of the objective of wide distribution for a third party to supply that territory as well. Another agreement, which licenses existing technology for distribution in the developing world, requires the industry partner to use a defined trademark on ‘all manufactured products, advertising media, promotional brochures, and any other technical data transmitted regarding the licensed product.’

#### **4.2.4. Access conditions through marketing and distribution arrangements**

##### ***Distribution channels***

Agreements may define distinct markets for the covered products, and on this basis set differential conditions and undertakings for product distribution. For example, an agreement may distinguish between developed and developing country markets, and may include a specific undertaking for differential or tiered pricing, with the objective that developed country markets should cross-subsidize sales at cost or at some other minimal level to developing countries. The markets may also be distinguished within a country, and in several tiers. One agreement identifies public sector distribution, social marketing and private sector distribution as three distinct modes of distribution; the obligations on the research/industry partner, the pricing structure and licensing arrangements differ considerably, depending on the mode of distribution. An exclusive license may be granted, for instance, solely in respect of private sector distribution, allowing for other non-exclusive licensees to service public sector procurement. These other suppliers could then benefit from the regulatory approval secured by the original industry partner, thus facilitating and expediting the sourcing of alternative suppliers for public sector needs.

##### ***Pricing structures***

Where distinct markets are identified or defined, access conditions may set distinct prices for each market. The mechanisms used for setting prices may be relative or absolute: relative mechanisms include differential pricing levels for developed or developing country markets, or for private, social marketing<sup>33</sup> and public channels, with the pricing structure required to favour one market over the other. Absolute mechanisms seek to set a firm benchmark for pricing, through general criteria

such as the notion of a reasonable price or a precise formula – for example, one agreement specifies and defines a ‘public sector price;’ it also separately defines a ‘social marketing price’ by a relative standard, setting it between the public sector and private sector distribution prices.

Other partnerships have explicitly avoided setting prices as a means for ensuring access, because this had been found in practice to deter investment research and development investment. An advance commitment to a guaranteed price ceiling on a downstream product at a relatively early stage in drug discovery and development may be difficult for industry partners. This underscores the difficult task in drawing up an appropriately balanced partnership that is sufficiently attractive to industry partners while giving effective guarantees of effective access. In the US context, the NIH has reported a shift in practice of away from a ‘reasonable pricing’ policy, because this reportedly ‘had the effect of posing a barrier to expanded research relationships,’ as evidenced in the flat growth of Cooperative Research and Development Agreements (CRADAs), a trend which was reversed when the pricing policy was changed.<sup>34</sup>

Alternative approaches to setting access conditions include a more general undertaking to ensure access worldwide and not just established market economies. Access conditions also need to take account of the fact that, in many developing countries, there is a greater dependence on the private market for drug dissemination than is the case in many industrialized countries, so that closer attention to the private market price is needed, and there is little prospect of offsetting the cost of public sector distribution against returns from the private market. In some cases, including some developing country environments, private distribution through formal and informal markets, such as street vendors, peddlers or drug shops, may be the most effective or even the only viable means of dissemination to those in most need of the new medicine.

### **Factors in setting a reasonable price**

Where agreements seek to set a ‘reasonable price,’ this is done either by a formula based on the cost of actual production, or by reference to more general

factors in the context of the policy objectives of the agreement. The formulas include:

- a public sector price defined as ‘the Company’s manufacturing costs plus a mark-up of [a certain percentage to be agreed]’ - this formula was for distribution of established technologies for which the private sector player is not required to incur research or development costs;
- social marketing defined as a price higher than that for public sector distribution, but lower than for private sector distribution;
- factors defining the ‘reasonableness’ of pricing including:
  - ‘the industry partner’s technology investments related to the product’
  - ‘the industry partner’s worldwide market for the product’
  - ‘the relative market size in developing countries, or more specific target markets’

The overarching objective of pricing formulae is that of access and prompt and widespread distribution. Accordingly, the pricing may be defined with reference to an objective, rather than a particular pricing formula, for example a price defined ‘so that the Developed Products reach the widest and most rapid deployment possible.’

The commercial reality of the industry partner is also acknowledged in pricing formulae, for instance acknowledging the industry partner’s ‘need for a minimum return on sales.’ One approach to defining a ‘reasonable profit’ shows how the incentive mechanism (with a focus on private market in developed country markets) is balanced against access in developing country and public sector markets: it requires consideration of ‘the need for the Product to be affordable in the Developing Countries and the ability of [the industry partner] to otherwise generate a profit through the sale of Product in markets outside of the Public Sector in Developing Countries. [The industry partner], its subcontractors, consultants, agents and permitted assignees shall be the exclusive manufacturer for [the covered technology] and the Public Sector in the Developing Countries for all Product.’

<sup>33</sup> Social marketing refers to the channels for marketing and distribution of products planned, funded, and/or managed by non-profit organizations and/or public sector programs to influence the voluntary behavior of target audiences.

<sup>34</sup> ‘The NIH Reasonable Pricing Clause Experience: A Plan to Ensure Taxpayers’ Interests are protected,’ NIH, July 2001, at [www.nih.gov/news/070101/wyden.htm](http://www.nih.gov/news/070101/wyden.htm).

#### 4.2.5. Intellectual property licenses as a guarantee of access

A key provision in PPP agreements concerns the guarantees of access to necessary technology in the event that the industry party elects not to make the covered product available to the target market in accordance with the agreed criteria. Such a guarantee is the essence of this kind of partnership. It means that if there is insufficient incentive or capacity on the part of the chosen industry partner to achieve the widest availability envisaged, the project party can take full advantage of the research and development undertaken by the industry partner and - with the benefit of the necessary IP - can use alternative avenues for dissemination of the covered product. This kind of contingency access may also come into play if the research opens up possibilities for drug development in fields of technology that lie beyond the core competence and overall priorities of the industry partner.

Under one PPP agreement, the industry partner agrees ‘to use commercially reasonable efforts to manufacture or have the Product manufactured and supplied in reasonable quantities for sale or distribution to the Public Sector of such Developing Country and at prices that do not exceed ... actual incremental costs of production (consisting of additional material costs, labor costs, license fees (including royalties) and other costs which would not have been incurred but for such production and shall exclude all overhead, general, administrative and similar costs and all previously incurred research and development or capital expenses) plus a reasonable profit to be agreed upon by the Parties.’ This has a precise time line: the industry partner agrees to meet this obligation ‘within twelve months after the first commercial sale of a covered product anywhere in the world and ‘no earlier than the conclusion of the Ramp-Up Period after receipt of regulatory approvals for the sale ... in a particular Developing Country.’ Should the industry partner fail to meet this obligation, it loses status as exclusive manufacturer for the covered product in developing countries, and is required to disclose on a confidential basis both background IP and IP developed under the program. The industry partner is also required to assist in the transfer of technology for this purpose (see following section).

Such mutual obligations are expressed in direct terms in another research and development agreement, in which the research partner ‘agrees to undertake to

develop and commercialize a product,’ but ‘in the event that [it] does not undertake the development and commercialization of a product, it agrees to grant ... an exclusive license’ under all relevant patents and patent applications. Another similar arrangement applies when the industry partner fails to comply with an obligation to make products available ‘in the developing countries of the world at a reasonable price:’ if an arbiter determines that this obligation is not met, then the project partner has the right to require the industry partner ‘to transfer to a third party ... a non-exclusive, non-sublicensable license to produce the developed products and make the developed products available for purchase in the developing countries of the world.’

#### 4.2.6. Technical assistance and transfer of know-how

Effective access to drugs or vaccines in a particular market may entail an enhanced technical aspect or capacity building for the administration and distribution of the new product. The research/industry partner within a PPP agreement may have particular expertise and resources that would enable the necessary technical support or training, so that the covered pharmaceutical is both physically available and administered to those in need of treatment. Several agreements therefore provide for all necessary technical assistance required to deal with regulatory approval in the markets covered by the agreement. Equally, the provision of technical assistance to third parties concerning production of the product may be an important ingredient of a world-wide distribution strategy. This may apply when the industry partner is unable or unwilling to supply a market as agreed or on the terms agreed, or to assist others to service markets that are not covered by the agreement. Hence one agreement requires the industry partner ‘to cooperate ... on request in training technical and supervisory personnel of firms outside of the territory licensed by [the project partner] to produce the licensed product.’

Some agreements require technology transfer and the provision of know-how to deal with the situation when the industry partner loses its status as exclusive manufacturer or distributor for developing country markets. A PPP agreement may stipulate that sufficient transfer of technology and know-how, potentially in the form of technical assistance, is required to ensure that a third party

can meet the needs not effectively serviced by the industry partner. Accordingly, in establishing the framework for overall IP management in an agreement, ownership of new IP may be less important for the project partner than ensuring a reserve capacity to claim access as and when needed not merely to IP on new research outcomes but also to necessary background IP, know-how and technical assistance, as well as regulatory approvals.

#### 4.2.7. Reporting and monitoring provisions

Access conditions may be supported by auditing or monitoring compliance, or reporting requirements. Agreements have provided for both quality and financial auditing. One crucial aspect of effective access to drugs and vaccines covered by a PPP agreement is compliance with quality standards – once again, ‘access’ has to amount to the actual availability of safe and effective drugs, not the absence of legal obstacles. This may be especially important in destinations where there is limited effective government regulation of quality. Hence agreements may implement procedures and obligations for quality auditing. Special financial monitoring and auditing mechanisms may apply to those access conditions that stipulate criteria for the price charged – for instance, one agreement sets the agreed price according to the actual cost of production, and accordingly provides for independent financial auditing of this cost.

#### 4.2.8. Other forms of access to technology: non-financial incentives

The clinical development, regulatory and manufacturing processes all may require effective access to a matrix of background and associated technologies. PPP initiatives therefore adopt a range of strategies to bring other technology partners into these processes. This may involve a wider approach to defining and implementing technology collaboration arrangements that provide non-financial incentives for other industry partners to supply necessary technology. For example, one initiative has adopted the approach of establishing no-cost collaborative agreements that offer, as an incentive, the potential of getting the collaborator’s new technologies into human clinical trials with the product being developed by the PPP initiative. This way of structuring the partnership involves a clear understanding of common interests and a flexible approach to seizing opportunities for reaping broader benefits from the core activities under the partnership. This kind of partnership – where the project partner and other third partners themselves provide technological, product development and regulatory skills – can evolve into a kind of public private pooling of technologies, with the structure of the technological partnership defined by IP rights and using the IP of the various players, and other technical and financial inputs, to reach a mutually satisfactory bargain over pooled access.

## 5. Practical Lessons: What Models, What Choices for Optimal Access?

This section draws on the preceding survey to find some tentative conclusions about the factors that determine effective access arrangements. The principal constraint in drawing authoritative conclusions is the very long lead-time that typically is associated with PPPs for the development of new pharmaceuticals. Conclusive lessons from practical experience will typically not be available for many years. Even ten years into certain projects (e.g. IDRI, created in 1993), they are only now entering into first clinical trials – with actual evidence of their effectiveness in providing guarantees of access for the new medicines still some time off. This long-term perspective also points to the necessity of structuring arrangements with the necessary long-term perspective and flexibility – this cuts both ways, in that it is difficult to predict what access conditions will be appropriate, possibly a decade after the agreement is reached (due to varying market and economic conditions, and the nature of the technology), yet it is also necessary to provide for firm and convincing guarantees of access that will be effective in this long time-frame while being responsive to changed circumstances.

So uncertainty inevitably surrounds an agreement over a drug or vaccine in an early stage of development – in particular when the basic science is uncertain. While PPP agreements are a means of funding public goods, they often operate in a way akin to venture capital, with the attendant risks and need for flexibility and a longer-term focus, rather than routine funding of utilities or services. Further uncertainty arises from the shifting market conditions for drugs and vaccines, due to the kind of economic changes, shifts in the regulatory environment, and impact of interventions such as public sector and philanthropic programs that can occur over the innovation cycle of a new pharmaceutical, which can easily span more than a decade. A realistic PPP arrangement for unproven, genuinely path-breaking technology may need to avoid too deterministic an approach for access conditions, and be responsive to shifts in the economics of the pharmaceutical market.

The potential need for access to third-party technologies, such as platform technologies (adjuvants, excipients, drug delivery technologies, etc.), and freedom to operate issues adds a further layer of uncertainty – but it also points to the potential need to create incentives and IP management structures to bring in such technologies.

### 5.1. Setting the basic objective and structure of the partnership

Naturally, the basic objective and structure of the partnership are the central factors in determining what access arrangements are established. The survey disclosed structures differ in terms of the varying levels of involvement by the project partner, across the following possibilities:

- Core funding for a distinct new drug program with the aim of developing a candidate technology, but in which the industry/research partner is expected to bear some of the risk and to invest in downstream product development and marketing.
- Substantial funding and provision of background technologies or expertise for a drug development program, in which the nature of the contribution by the project partner is considered sufficient in itself to create an adequate incentive for the industry partner to bring the candidate product to the market
- Supplementary funding for an existing program, intended essentially to influence favourably the industry partner's decision about the commercial viability of the product and to push a candidate product over the threshold into the development and downstream phases
- Licensing of existing technology to an industry partner whose essential role is to manufacture and distribute a covered pharmaceutical to a defined market on reasonable terms
- Contracted research in which the research is essentially undertaken on a fee for service

basis, with the expectation that the technology developed will be transferred to and developed and marketed by the project partner

Not surprisingly, such differences in the overall goals and structures of partnerships lead to wide diversity in the way access arrangements are defined. The different levels and forms of contribution (funding, technology, expertise) brought by the two parties greatly influence the stringency and precision of access guarantees. Clearly the project partner is in no position to set rigid conditions for access in an arrangement in which it is simply supplementing an existing program, when the bulk not merely of the investment but also the risk is still taken on by the industry partner. By contrast, an arrangement in which the research is wholly funded by the project partner may create expectations of much stronger access conditions – although this will be tempered by the need for a realistic structure that a competent and circumspect industry partner will be prepared voluntarily to sign up to.

Another factor influencing access arrangements is the definition of the respective roles of the two parties in terms of technology management. Is the project partner essentially providing financial resources and an overall objective (including promoting particular technologies and research and development directions), leaving the R&D to the industry/research partner, or is it itself a technology manager, with an active role in maintaining an IP portfolio, in gaining regulatory approval and in shepherding the new product onto the market? The project partner's perceived role will influence core issues such as ownership of IP rights – both because this affects the incentives for the industry partner to invest in product development, trial and approval, and because it determines the administrative viability of the development process. Typically, the PPP exists precisely to draw on an industry partner's depth of expertise in technology management and in product development, and this is a key factor in determining ownership of IP rights. Ownership of the IP resulting from the funded research is typically not seen as an end in itself, and the approach is rather to establish agreements that provide for the licensing to the project partner and designated third parties in the event that, and to the extent that, access to technology is needed – this may include funded technology, background technology and associated know-how, as well as access to clinical trial data.

<sup>35</sup> NIH Report, note 33 above.

## 5.2. Setting guarantees of access

The fundamental choice in establishing guarantees of access in a PPP agreement is whether or not access is defined with reference to a certain pricing standard. The choices that have been implemented include a specific formula for setting prices in particular markets, a pricing standard defining certain general criteria, and no price requirements at all (with access defined in other ways, or the competitiveness of the market in question assumed to ensure that access will be adequate or reasonable). Access agreements without a pricing standard may yet create a firm obligation to make the product effectively available in target markets, with other measures of performance and the rights reserved to access necessary IP in case those performance standards are not met. The choice of pricing structure or other criteria for adequate access needs to balance the necessary incentives for drug development and dissemination with access guarantees – in practice, the agreement needs to be structured in a way that can attract the commitment of a business partner with the necessary resources and capacities. A 'reasonable pricing' policy, while possibly attractive in principle from a public sector perspective, has in some cases led to a failure to attract the necessary private sector cooperation, especially where the private sector is still expected to carry a substantial amount of the risk and uncertainty associated with drug development.<sup>35</sup> This has been the experience for product development agreements aimed at rich markets when the research/industry partner is required to bear much of the risk. When the target markets are poor countries, the industry partner is unlikely to take on pricing risks without other compensation, such as exclusive access to more wealthy markets. Along this line, other agreements have found this mechanism applicable in two scenarios: (i) PPPs aimed at developing country needs, when the industry partner is able to benefit from the more profitable private market in industrialized countries, making price ceilings and reasonable pricing standards more feasible in developing country or public sector markets; and (ii) PPPs in which the industry partner assumes much less risk, for instance when the industry partner is supported to produce and disseminate an already proven and approved product.

### 5.3. Incentives and technology access guarantees

Whatever access arrangements are defined, agreements can reinforce access guarantees by allowing a third party to step in with access to all necessary technology (not merely the technology developed under the program, but all that is necessary to put the product into the hands of its beneficiaries – including manufacturing know-how and data needed for regulatory approval). For example, one agreement provides that, in the event that the industry partner does not ‘continue development of [a viable candidate vaccine]’ nor ‘initiate marketing activity’ in any country, then the industry partner is obliged to grant back a licence under

- ‘all intellectual property covering any and all inventions conceived or reduced to practice during the Clinical Development Program, including without limitation patent applications, patents and know-how’ and
- ‘all intellectual property reasonably necessary for the development, manufacture, sale and marketing of the [covered product]’ including ‘copyright, rights in data and know-how’

However, this licence is restricted both by the chain of events that trigger it, and by its purpose – restricted to permit the project partner and its sublicensees ‘only to develop, manufacture, sell and market’ the product to the extent that the industry partner has elected not to undertake these activities.

Such licensing arrangements have the advantages of: (i) overcoming the shortcomings of project partner not holding the title in IP; (ii) removing from the project partner the costs and liabilities of maintaining an IP portfolio; and (iii) ensuring access to other related IP in a more general sense, in particular the IP (which may not be generated directly by the funded research activities) which is necessary to develop the technology as a viable product and to meet the requirements of the regulatory approval process. This experience illustrates that the core issue is not the ownership of IP as such, but how a successful partnership involves a blend of access to technology and incentive to the industry partner to develop and market the new product, underpinned by guarantees – guarantees of availability of the covered product, and guarantees that when the industry partner is unable or unwilling to deliver some of the projected outcomes, other industry partners can be brought in and given access to any needed IP, know how and regulatory approval.

One important incentive structure in PPP agreements is to define a clear field of use that is directly relevant to achieving the project objectives, and to concentrate on securing highly favourable access conditions within that specific field, while acknowledging the industry partner’s entitlement to seek alternative uses in other fields. Focussing on the specific field of use can create additional benefits, for instance in enabling the collaborating industry partner to take advantage of clinical trials undertaken under the aegis of the project which would generate data about the industry partner’s technologies that can be used to secure regulatory approval in other markets and for other applications. Accordingly, PPPs can in effect create favourable access arrangements not only by cross-subsidizing between wealthy markets and neglected target groups, but also by cross-subsidizing between the PPP’s priority field of use and other potential applications of the technology and test data that could be of interest to the industry partner. A compound that is effective in treating a neglected disease could possibly also have therapeutic effect against other diseases that predominate in rich country markets – such as cardiovascular problems, cancer, male-pattern baldness – so that investment in exploiting the compound for these applications could subsidize its development and dissemination for the neglected disease.

### 5.4. Getting the most from intellectual property in PPP agreements

It is difficult to isolate the operation of the patent system from broader range of infrastructure issues that influence the process of developing and effectively disseminating new pharmaceuticals. Even the more specific issue of pricing and access to existing pharmaceuticals depends to some extent on the degree of industrial development and in particular the interplay between the research and generic pharmaceutical sectors; this becomes even more important when considering the creation of new products altogether. The cost, and the technical, logistical and regulatory complexity of bringing a new pharmaceutical to the market has required large-scale investment on the part of private companies, and the application of a range of technical, medical and managerial skills.

There are differing, and disputed, estimates of the exact scale of investment required, the degree of risk assumed by the various players, the level of public funding for basic research and the dependence on

private sector mechanisms in developing drugs beyond the discovery phase. Yet it is manifest that governments have, in practice, relied to a considerable extent on private investment to bring new technologies to the public as effective pharmaceuticals, especially in bridging the gap between basic research and drug development. Other models for pharmaceutical development are of course available, such as direct public funding of new research and development and other non-patent incentive mechanisms, such as R&D tax breaks, orphan drug schemes and test data exclusivity schemes.

Yet whatever the legal framework, some form of partnership with the private sector has typically proven to be essential to bring the new pharmaceutical in a usable, safe, and approved form to the dispensary from even the public-funded laboratory bench. Partnerships routinely require strategic use of IP rights, especially patents. Properly managed, the patent system can be one way for extracting practical public benefit out of public research, while tapping into private capital and private sector expertise to achieve practical outcomes.

In practice, the role of IP rights in PPP agreements is essentially twofold: helping to structure and define the nature of the technology partnership, and how rights over technology are shared and exercised; and providing incentives for investment in drug development and regulatory approval, particularly in a private market context. Hence, on the first point, structured ownership and licensing of IP rights allow for distinct markets to be distinguished – geographically distinguished between countries in which patients have high purchasing power and countries in which patients have insufficient resources; and distinguished by sector, so that distinct markets can be identified and discretely serviced according to whether they are public sector, fair marketing or private sector markets. Effective management of IP rights allows the PPP to offset the cost of favourable access conditions in some markets, while ensuring an exclusive position in high purchasing power markets to parties – in particular for-profit companies – to promote investment in the development and approval of the target product.

By securing broad rights for technologies developed under the covered research, a PPP may itself develop licensable or marketable IP with applications outside of its target field of use – it may, for instance, develop

its own platform technologies. Such rights may either generate additional revenue to the PPP for use in the same or different projects, or provide leverage for negotiating access to other needed technologies. Such revenue may also be shared with other parties, thus offering an additional inducement to participate in a given project and to support favourable “access conditions” for developing countries. IP rights can therefore be used strategically to both bring about access conditions, and to define their operation. The judicious use and management of IP rights is therefore central to the effective implementation of access conditions. This is not because IP rights serve as a panacea for dealing with the neglected disease problem. Rather, it is because IP can serve as one practical tool for dealing with the failure of incentive mechanisms, even in the absence of an effective private market in the targeted populations.

### 5.5. Overall factors influencing access conditions

As a distillation of the foregoing discussion, this section considers the factors that influence the basic structure of access conditions, and the arrangements for ownership and access to IP associated with PPP initiatives on neglected diseases. These factors can be classed as those which are internal to the partnership, and external factors relating to the pattern of the disease burden, the market structures and public sector programs which initiatives need to work within, and other commercial and policy constraints. Among the factors that are integral to the relationship between the industry and project partners are:

- The scale of the technological investment made by the industry partner, and the amount of necessary background technology the industry, as well as the scale of investment by the industry partner in clinical trials and the development and packaging of test data;
- The significance of the funding and technological contribution brought to the project by the project partner, for instance whether it is a self-standing commitment to fund the necessary research or whether it is simply supplementing or complementing an existing program;
- The continuing research and commercial interests of the industry partner, such as whether it has a distinct commercial interest in the further development and application of the technologies developed under the project, so that potential

commercial benefits may be broader than that from the specific product covered by the agreement; and conversely, the degree to which the investment of capital and resources in the covered project diverts resources and creates opportunity costs for the industry partner;

- The extent to which the industry partner focuses on the corporate social responsibility aspects of involvement in public-private partnerships to alleviate health inequities, which could mean that it sees investment in such project as being beneficial to its public image and enhancing long-term shareholder values;
- The stage of development of the targeted product under the agreement (which may range from the identification of candidate compounds to bringing an already proven product to market);
- The degree to which the distribution mechanism is intended by the partners to rely on the purchasing power of philanthropic or public sector funding, and the degree to which it relies on the operation of an open market.

External factors that may affect how the partnership is structured include:

- The nature of the market for the projected product – for example, the market for diagnostics tends to be low-value and high-volume, so that competitive pressures may already ensure reasonable pricing; by contrast, a new pharmaceutical may not be substitutable, and where the lack of competition creates pricing pressures that exacerbate developing countries' limited purchasing capacity ;
- The structure and geographical spread of the market – including such factors as whether there is a distinct public sector market or large-scale philanthropic distribution program for the product in the relevant country, or whether the bulk of consumption by those in need is essentially self-financed on the open market (including informal or unregulated distribution networks);
- The pattern of prevalence of the targeted disease – does it span rich and poor markets alike, so that discriminatory pricing for wealthy consumers can effectively cross-subsidise consumption in poor markets or in public sector procurement programs aimed at the disease; or is there simply a lack of an overall sustainable market, so that the prospect of a 'reasonable profit' or overall margin from production and distribution is very low; similarly, arrangements have differed between countries in which a disease is endemic or not;
- The technological matrix in which the product development is operating, for example the need for the industry partner separately to gain access to platform technologies such as adjuvants, excipients or drug delivery technologies, and the availability of alternative technologies, or the need to create inducements for third parties to provide access to their background or platform technologies for successful development;
- The legal and regulatory environment, including government policies and applicable laws concerning the investment of public funds in medical research, and the requirements in all target countries for regulatory approval of new pharmaceuticals; in turn, this determines the degree of risk and investment the industry partner may be required to undertake, and the potential need for third parties to gain access to test data for regulatory approval; and
- The structure of the industry and the range of drug development and manufacturing enterprises who may provide alternative avenues to achieve the goals of the project – on the one hand, this determines the degree to which the partnership may need to create active positive for an industry partner to invest resources in the project, and on the other, this influences the credibility and effectiveness of negative incentives for failure to meet performance criteria.

## 6. Conclusions

### 6.1 Towards practical guidelines for PPPs

The following tentative conclusions can be drawn from this review of practical experience with PPPs for product development and dissemination:

- The delivery of new health products inevitably entails some degree of interaction between public and private players – the public or not-for-profit contribution ranging from financial backing to an active role in research and management of technology, and the private sector input may range from providing goods and services (including contracted research and manufacturing services) to playing the central role in researching, developing and bringing to the market a new pharmaceutical product.
- The PPP is a focussed and distilled form of this kind of public-private interaction, with lessons more broadly for public interest management of IP rights. It illustrates a hybrid form of IP management that bridges across the value systems and priorities of public and private players. In practice, the necessary access to new technologies may not be achieved by minimising IP rights or avoiding any legal restrictions to new technology, but by strategic, public-interest management of IP firstly to bring about the development of technologies that would not otherwise exist, and secondly to build an optimal pathway to ensure the new technology is actually put within reach of all who need it and to ensure that it is not just accessible in a legal sense.
- On the other hand, if the IP component of a PPP is ill understood and poorly managed, or if IP rights are either pursued or avoided as an end in itself, then differences over IP issues can thwart the negotiation of a workable agreement, and can accentuate rather than bridge across the inevitable differences in priorities, incentives, values and constraints that partners bring to a project.
- There is no single template for PPPs that will apply in all cases – each case should be considered uniquely and planned strategically in its own terms, given the diversity of inputs (financial, technological, product development know-how) that are brought by both project and industry partners, and the differing external factors (including the epidemiological pattern of the target disease, the regulatory environment, and the health infrastructure needed to deliver and administer the product).
- Even the agreement that is struck to structure one partnership will need to be flexible and adaptable, since the partnership is operating in an area of uncertainty, risk and unexpected developments over a long timeline, and needs to be receptive to additional partners should they become necessary.
- This need for flexibility and a strategic perspective flows through to access conditions – both access conditions expressed in terms of price standards for defined markets, and access conditions expressed in terms of march-in rights and other conditional guarantees of access to new IP, background IP, product development know-how and regulatory test data.
- IP arrangements – such as ownership structures, portfolio management protocols, filing strategies – should not be determined a priori, but developed according to the overall objectives of optimal access to the new product in the target populations
- This means that ownership of IP should not be an end in itself, but that the overall dispensation of IP should be structured so as to best serve the PPP’s objectives – this probably means that a project partner need not pursue ownership (indeed, the project partner may wish to avoid the liabilities and administrative and commercial burdens of maintaining an international IP portfolio), but should be confident of having a reserve capacity to access IP as and when required. Conceding on IP ownership may in fact have the effect of enabling the project partner to negotiate

access on necessary IP and know-how that reaches beyond the IP generated by the funded project, thus providing stronger guarantees and better serving the interests of the project partner than simple ownership of project IP.

- It is essential to consider development and dissemination as a whole, rather than as two distinct steps – some conception of the ultimate vehicle for distributing the finished product will need to be built into the partnership from an early stage, although the risk and uncertainty of the process should also be taken account of.
- The efficacy of defined price ceilings (for developing country or public sector market sectors) may depend on the scope of the uncontrolled market that the industry partner is free to exploit for the covered product, and on the degree of risk (which ranges from very little to very high) the industry partner is asked to bear;
- The dispensation of IP ownership, control and access can be used to structure hybrid mechanisms that combine public interest guarantees with targeted and appropriate private sector incentives; these include:
  - Defining and enforcing discrete territorial markets (separating industrialized markets from developing countries, or focussing on target markets), allowing investment in research and development and the earnings from market prices in one region to cross-subsidize product availability in target regions;
  - Establishing distinct structures for public sector, social marketing and regular private market, for example with more open licensing arrangements for public sector, philanthropic or developing country markets, balanced by exclusivity over more lucrative markets;
  - Carving out rights for within and outside the field of use, allowing the use of the covered products if applicable to treat other health conditions which could cross-subsidize product availability for the neglected disease;
  - Setting up royalty rights on future sales to benefit the parties needing greater incentives to release IP rights or licensing in a given market;
  - Structuring alternative access pathways in case an industry partner is unable or unwilling to deliver the projected outcomes, or fails to meet performance standards, by ensuring reserve or

contingency access not merely to IP over funded research, but also necessary background IP, product development know-how, regulatory approval data, and training and technical capacity, so that third parties can step in as required and supply the neglected sectors – such arrangements can give considerable benefits to the project partner by giving access to technologies and other IP that is valuable for project objectives, but has not directly resulted from the funded research.

The structuring of the IP arrangements essentially pivots on the necessary trade-off between creating incentives for an industry partner (which will need a reasonable rationale to enter into what is a voluntary partnership) and guarantees of access for the project partner. Concessions to the industry partner in terms of freedom to make use of market opportunities have in practice been offset by guarantees of access that can go beyond even the IP on the funded research, and reach into, firstly, governing how, when and on what terms (e.g. price) the product is made available to certain target groups, and secondly, guaranteeing access to background technologies, regulatory approval processes and technological and product development know-how that extend well beyond an interest in project IP per se. This arrangement has to be accepted as a genuine trade-off, however, and this does involve accepting the entitlement to seek benefits from the open market in non-target countries. It is instructive that price-limiting guarantees (such as reasonable pricing standards) have been less successful for product development agreements that are focussed on developed country markets – because there is no such trade-off to provide a balanced incentive structure (with the result that voluntary agreements are simply not concluded subject to those terms), whereas this kind of arrangement has been accepted more readily where such constraints are confined to certain target markets (developing countries, public sector programs, the philanthropic sector, etc) and do not restrain legitimate commercial benefits from other markets.

## 6.2 Concluding observations

There is an urgent need to find practical mechanisms that deliver effective and affordable new treatments for the diseases of the poor. This challenge needs to be tackled at two levels – it is a pressing policy issue and an immediate practical need. The kind of practical approaches surveyed in this study may help in the creation of new

practical tools for specific public-private initiatives, but it also may shed light on the broader policy debate. Central to resolving the practical and policy issues is the need to develop and understand new, hybrid forms of management of IP that give funding agencies, government authorities and philanthropic initiatives a degree of bargaining power, control, freedom to operate, and the capacity to attract and negotiate access to the panoply of technologies needed to deliver affordably a new drug that is safe and effective; and that give private sector players the legal clarity and workable commercial structures that enable them to commit the necessary product research, development and manufacturing resources. This is not a matter of searching for a template, or for a model text that can be cut and pasted from one

agreement to another. It is a matter of understanding the complex dynamics that shape and direct successful technology partnering for public health outcomes. This, in turn, entails grasping how to devise and put into effect the right mix of ownership, access and control of IP. Such public-interest IP management should be based on a pragmatic conception of how public interest guarantees of access, public funded and private sector research, necessary private incentives and safeguards for investment in product development, and the deployment of product development know-how can be coherently combined and channelled into delivering actual public health outcomes for the developing world.

# Glossary

<b>Access conditions</b>	Within an agreement for the development and dissemination of a drug or vaccine, mechanisms that ensure that the covered technology is practically available as a safe and effective finished product to as many intended beneficiaries as possible,. The conditions may include a mix of positive incentives and contractual guarantees that ensure the product will be distributed well beyond the scope that the regular commercial market would service. They may entail strategic use of IP and agreements on IP management to generate the desired outcomes. Conditions under which the party must make the covered product available may include price levels, quantities, periods of time, geographic coverage.
<b>Background IP</b>	Intellectual property, already in existence, which one of the collaborating parties brings to a new project. Usually, each party retains ownership of any background IP it brings to a research partnership, but may agree to give a licence to the other party of those rights which are necessary to achieve the purposes of the project. Background IP may be essential either in research, or in effectively delivering research outcomes, such as through platform technologies (including adjuvants, excipients and drug delivery technologies).
<b>Clinical trial</b>	Experimental research in which preventive, diagnostic, or therapeutic agents, devices, regimes, and procedures are given to human subjects under controlled conditions in order to define their safety, efficacy and quality (includes phase I, II, III, and IV studies). The data generated by clinical trials is typically required to be submitted to regulatory authorities as part of the drug approval process.
<b>CRADA</b>	A Cooperative Research and Development Agreement is a written agreement between a private company and a U.S. government agency to work together on a project. Created as a result of the Stevenson-Wydler Technology Innovation Act of 1980, as amended by the Federal Technology Transfer Act of 1986. A CRADA allows the federal government and non-federal partners to optimize their resources, share technical expertise in a protected environment, share intellectual property emerging from the effort, and speed the commercialization of federally developed technology.
<b>Field of use</b>	A licence may extend to any use or potential application of the licensed rights; or may be limited to cover only certain uses (such as a disease or treatment category).
<b>Intellectual property (IP)</b>	Intangible property that is derived from the intellect and that is recognized and protected under law. IP includes patents, trademarks, geographical indications, service marks, trade names, trade secrets (undisclosed information), industrial designs, and copyrights. IP confers limited exclusive rights on its owners; these rights are often referred to as ‘intellectual

	property rights.’ IP law also includes more general provisions such as suppression of unfair competition, consumer deception and passing off, and protection of confidentiality.
<b>Invention</b>	The specific form of innovation that is recognized and protected by a patent. A patentable invention must be new (novel), non-obvious (inventive, or involving an inventive step) and useful (or industrially applicable). There is no specific international definition of invention, but one approach is to consider it as a distinct solution to a technical problem (this could entail the formulation of an idea or of a problem to be solved, the solution being obvious once the problem is clearly stated; the devising of a solution to a known problem; or the arrival at an insight into the cause of an observed phenomenon, the practical use of this phenomenon then being obvious). Patent laws can exclude certain inventions from patent protection, for instance on moral and public order grounds – a patent on human cloning might be excluded for example. Patent laws have specific categories of exceptions to patentable inventions, for instance methods of medical treatment are excluded under many patent laws.
<b>Know-how</b>	Technical information, data, or knowledge resulting from experience or skills which are applicable in practice, particularly in terms of manufacturing a product.
<b>Licence</b>	In the context of IP management, a legally-binding agreement between the owner of a patent or other IP (the licensor) and another party (the licensee) that gives the other party the right to use (but not own) or the invention or benefit from rights; this usually involves some compensation from the licensee to the licensor; does not include legal title (remains with licensor). Licenses are typically granted on a territorial basis, and the same technology can be licensed to different licensees or according to different standards and conditions in different countries or regions. World-wide licenses may also be agreed.
<b>License: exclusive</b>	A form of licensing intellectual property that gives the licensee exclusive use of the covered IP. The parties agree that the licensor cannot grant a licence to any other party (and cannot directly use the covered IP) unless otherwise agreed, or if the licensee fails to meet certain conditions (such as ‘best endeavours’ or ‘reasonable pricing’ standards in disseminating the licensed product).
<b>License: non-exclusive</b>	A form of licensing intellectual property which permits the licensor to grant licences to more than one licensee, who may use the covered technology in parallel. The covered intellectual property may be licensed to additional parties for use in the same field or in fields other than the ones specified in previously executed license agreements.
<b>Licence: sub-license</b>	Depending on the terms of a licence, the licensee may in turn grant licences to third parties to exercise some or all of their rights granted under the original licence – this is known as sublicensing. Typically, the original licence will specify if any, all or some of the rights granted under the licence can be sublicensed, and if so, subject to what conditions (for instance, there may be an obligation to report on or seek agreement for any proposed sublicense)
<b>March-in rights</b>	Rights which permit an entity to grant rights in an R&D project to a third party, usually the PPP, if the private industry collaborator does not commercialize the invention in a given market or according to an establi-

	shed standard, or if a public entity needs access to the technology to address a public health or safety concern.
<b>Neglected disease</b>	A disease or condition affecting millions of people (as opposed to an orphan disease) which is not well addressed with effective interventions mainly due to lack of economic profitability or market, scientific or public failure. Includes infectious tropical diseases like malaria, kala azar (leishmaniasis), sleeping sickness (trypanosomiasis) Chagas disease, but also TB and HIV/AIDS which are not confined to the tropics. (see: DND working group <a href="http://www.neglecteddiseases.org/1-5.pdf">http://www.neglecteddiseases.org/1-5.pdf</a> )
<b>Orphan disease</b>	A disease that affects so few people or has such a low incidence and/or prevalence that there are not enough patients to assure a sufficient market for its treatments under prevailing economic and commercial settings, so that the development of a new treatment is not commercially viable. Orphan drug status is usually dependent on the rate of prevalence of the disease - e.g. less than 200,000 in the U.S. (75 per 100,000), or less than 50,000 in Japan (40 per 100,000) – or the impossibility of recovering costs of developing the needed product.
<b>Orphan drug program</b>	A specific legislative and policy initiative to address the failure of the regular drug development system to deliver new treatments for orphan diseases. Signed into U.S. law on January 4, 1983, the intent of the Orphan Drug Act is to stimulate the research, development, and approval of products that treat rare diseases. (Source: <a href="http://www.fda.gov/cder/handbook/orphan.htm">http://www.fda.gov/cder/handbook/orphan.htm</a> )
<b>PPP</b>	A public-private partnership in the context of this paper can be defined as an innovative arrangement that combines different skills and resources from institutions in the public and private sectors to address a persistent global health problem, where regular drug development processes and incentives fail to operate (see <a href="http://www.ippph.org/index.cfm?page=/ippph/about/whatisppp">http://www.ippph.org/index.cfm?page=/ippph/about/whatisppp</a> )
<b>Patent</b>	A grant by a government to an inventor or his/her successor in title for an invention (e.g. a device, substance, method or process), which is new, inventive and useful, giving the latter the right to exclude others for a limited period of time for making, using, or selling the invention.
<b>Private sector</b>	The sector of society or an entity that is funded by private or non-governmental sources including both civil society, nongovernmental or non-profit organizations, and commercial enterprises. In the area of health PPPs the ‘private’ part of PPPs often includes a pharmaceutical industry or biotech company partner. Not for profit or philanthropic enterprises may technically be private entities while operating with the goal of advancing certain public interests.
<b>Project IP</b>	Intellectual property arising from the R&D project covered by a specific agreement. An agreement will typically define how project IP is to be managed, including who is to own and administer project IP, and how and on what terms it is to be licensed. Project IP may be jointly owned by the parties to the agreement, or assigned to one party in exchange for better access conditions or other concessions.
<b>Project partner</b>	The party in a PPP which is running the project on behalf of the public good – this may be the PPP itself, if it is an independent non-profit

	<p>entity, but could also be a public authority, a private philanthropic foundation, or an international organization or program (but in some cases this could be a public entity such as the Special Programme for Research and Training in Tropical Diseases (TDR) at WHO. The project partner may provide funds and other forms of support, overall direction and management, and logistical or knowledge inputs. The project partner may also retain key entitlements vis-à-vis the industry partner to safeguard the partnership's public health objectives.</p>
<b>Public sector</b>	<p>The sector of society or an entity that is government-funded or funded by taxpayers, in contrast to the private or market sector. In the area of health PPPs the 'public' part of public-private partnership often includes intergovernmental or multilateral agencies such as the World Health Organization, UNAIDS or the World Bank, bilateral international development assistance agencies such as the UK Department for International Development or US Agency for International Development, ministries of health in development countries or other governmental agencies.</p>
<b>Research or industry partner</b>	<p>The party to a PPP agreement that provides the outside technical expertise in drug research and development, usually a commercial pharmaceutical or biotech company or an academic or government research organization.</p>
<b>Royalty</b>	<p>In the context of licensing and managing IP, a share of income, in accordance with the terms of a license agreement, paid by a licensee to the licensor for the right to make, use or sell products or processes covered by IP owned by the licensor.</p>
<b>Social marketing</b>	<p>Application of commercial marketing technologies to the analysis, planning, execution, and evaluation of programs designed to influence the voluntary behaviour of target audiences in order to improve their personal welfare and that of their society (Andreasen, 1995).</p>
<b>Test data</b>	<p>The information generated through pre-clinical and clinical trials regarding the safety and efficacy of a candidate drug.</p>
<b>Reasonable price</b>	<p>A standard for pricing of a new drug or vaccine developed through public-private collaboration or partly through public or non-profit resources, with the aim of ensuring favourable access conditions so that the candidate drug will be affordable by the target populations. May variously be defined with reference to the actual cost of production, other reference products, price established in other markets, and conditions in the target market.</p>

The aim of the Initiative on Public-Private Partnerships for Health is to increase the effectiveness of public-private collaboration, particularly by helping those seeking to develop health products, or to improve access to such products needed to fight neglected diseases and other health problems in developing countries.

Created in 2000 in Geneva, Switzerland, the Initiative on Public-Private Partnerships for Health is sponsored by the Bill and Melinda Gates Foundation, the Rockefeller Foundation and the World Bank. It operates under the aegis of the Global Forum for Health Research, an independent international foundation helping to correct the 10/90 gap in health research, from which it also receives support ([www.globalforumhealth.org](http://www.globalforumhealth.org)).

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