Global health – two issues

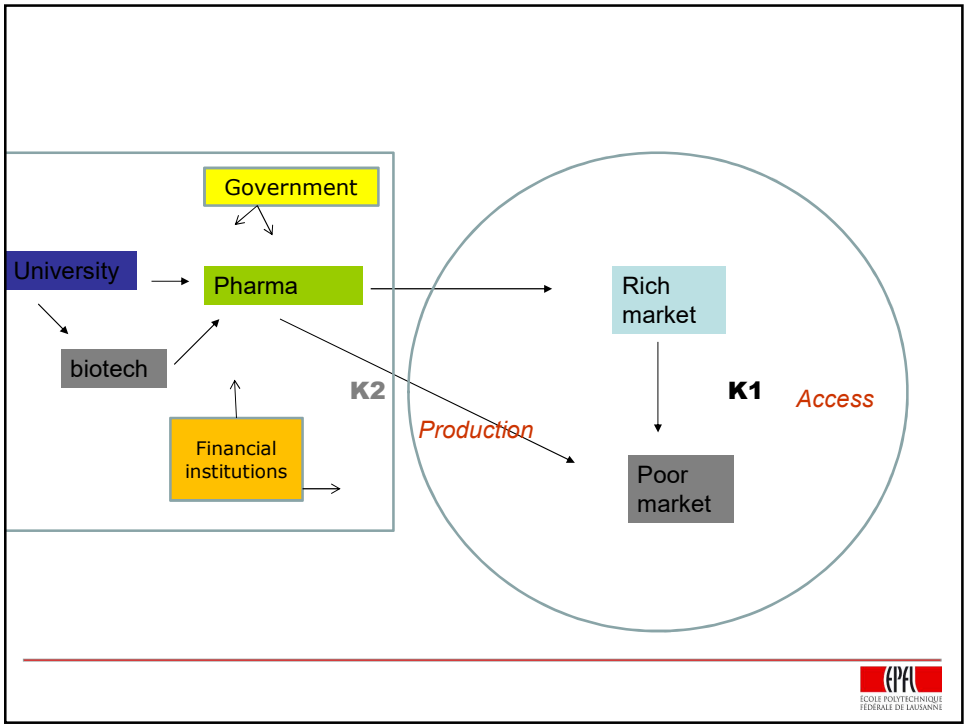
chap.11

Dominique Foray

MGT 403 - Spring 2019

Poor countries and health: two problems

- Two kinds of innovative product
  - K1 is an innovative drug for global diseases
  - K2 : products for diseases that predominantly affect the poor
- For K1
  - the issue is not really to build a market or create incentives. Market and incentives already exist. The issue is to use this opportunity to facilitate low price access for the poor
  - It is not a problem of production (K1 is produced in any case) but of redistribution and ***optimal price***
- For K2
  - the issue is to build markets and create incentives
  - There is a problem of production

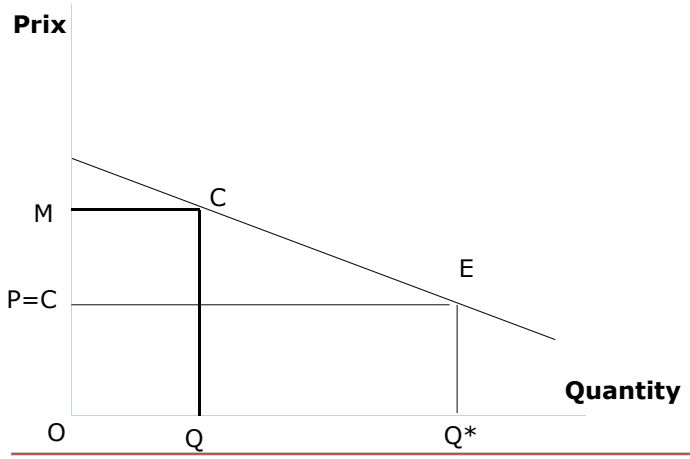


K1

- TRIPS and the new conditions for access to medicines
  - Optimal pricing in a global world (with rich and poor countries)
  - The «good old days» and the new context of TRIPS
  - Institutional solutions

A simple economics of access pricing

- Optimal prices: **prices that gives the highest level of social value, while allowing the innovator to cover R&D fixed cost.**
- Two contradictory terms!
- To maximize social value, price needs to be close to marginal costs (or lower than..)
- To allow innovator to cover costs, price needs to be at level above marginal cost



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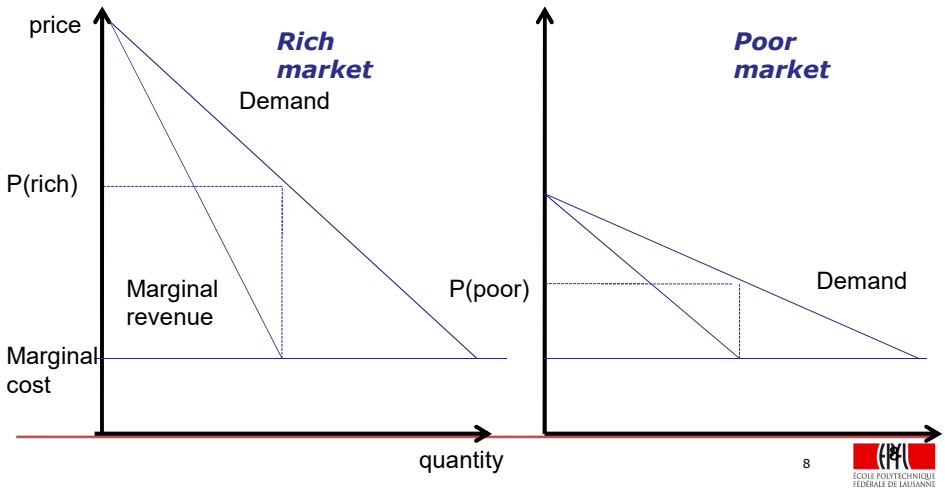
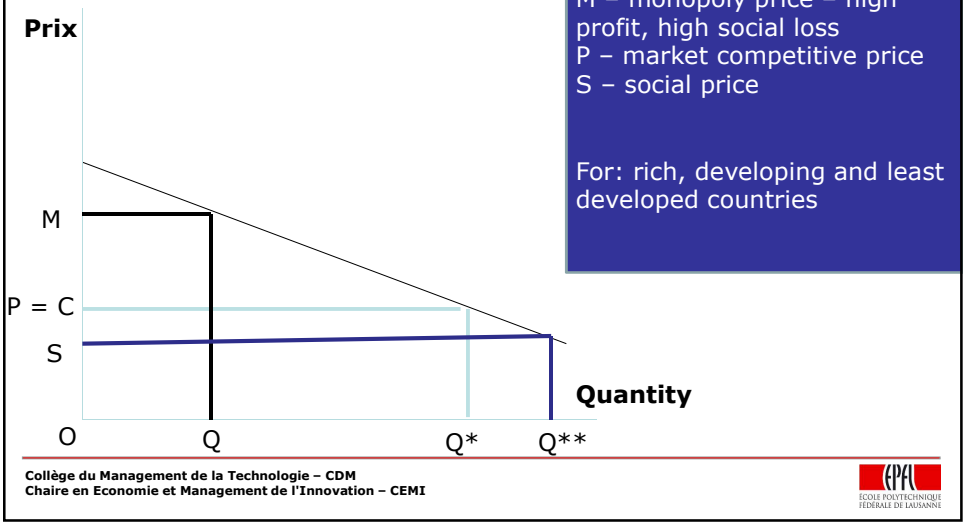
- Ramsey pricing rules show that prices should be lower
  - When demand is very responsive to prices. This implies lower mark ups for those who would cut back most when faced with a price increase.
  - With low elasticity of demand (rich country): larger mark up over marginal costs
- But Ramsey prices are in fact very close to what a monopolist can do in trying to extract maximum revenues from both markets : it is in the monopolist best interest *to act as a Ramsey planner in differentiating prices across markets*

Profit-maximising price discrimination



A simple economics of access pricing

- However, there are arguments to support the notion that the price should be much lower in developing countries than monopoly prices (even in case of price discrimination)
- Optimal prices could imply that some countries would be allowed to pay less than marginal production costs (optimal mark up could thus be negative)



Three prices:

M – monopoly price – high profit, high social loss
P – market competitive price
S – social price

For: rich, developing and least developed countries

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- Ideal policy for K1 pricing should be a policy allowing for :
- Monopoly prices (+ regulations?) in the rich countries
- Generic competition in developing countries (based on some kind of licensing)
- State or Foundation intervention in the poorest countries to support social (below marginal cost) pricing

The good old days

- K1 is created, patented and is sold at monopoly price in rich countries. What happened in poor countries?
  - Until the recent periods most LDCs treated innovation as non patentable or at best offered only minimal protection to new manufacturing process
  - Recall that patent as a national validity and any patent extension to another country requires a legal procedure
  - This provided the possibility to copy and manufacture the product and then sell it at minimum price
  - This also provided the possibility for the local industry to learn and build capacity

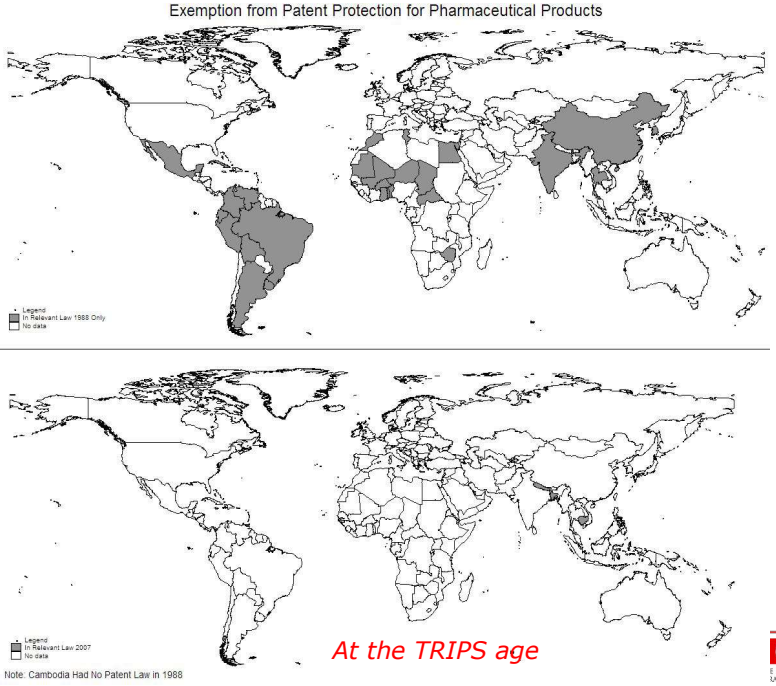
The good old days

- Indian patent act 1970
  - Pharmaceutical innovations became unpatentable, allowing innovations to be freely copied and marketed in India
  - The statutory term was shortened to 5 years on pharmaceutical process patents and automatic licensing was put in place
- Indian industry learned very fast!
  - Indian firms accounted for 70% of the bulk drugs. Of the top ten firms by 1996 pharmaceutical sales,six are now indian firms, rather than subsidiaries of foreign multinationals

The good old days

- Is'nt a nice world?
  - Big pharma did not get bankrupted (just the opposite)
  - They continued spending heavily on R&D and obtained outstanding results
  - People in poor countries got access to treatments at low prices
  - Industries in poor countries built capacities
    - Only true for countries at a certain level of development (learning capacities)
- Recall that developed countries built their industries and succeeded in catching up by copying the invention of others

Exemption from Patent Protection for Pharmaceutical Products



Note: Cambodia Had No Patent Law in 1988

At the TRIPS age

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Trade Related Aspects of IP Agreements

- Signed in 1995 as part of trade negociations at the WTO : every country **has to** provide legal and organisational conditions for the protection and effective enforcement of intellectual property rights
- Countries must follow a list of ground rules describing the protection that a country's legal system must provide
- Introduced standard minimal length of protection (20 years)
- Product patent protection for pharmaceuticals which several important developing countries did not have (India)
- Developing countries (except LDCs) had to implement it by 2005

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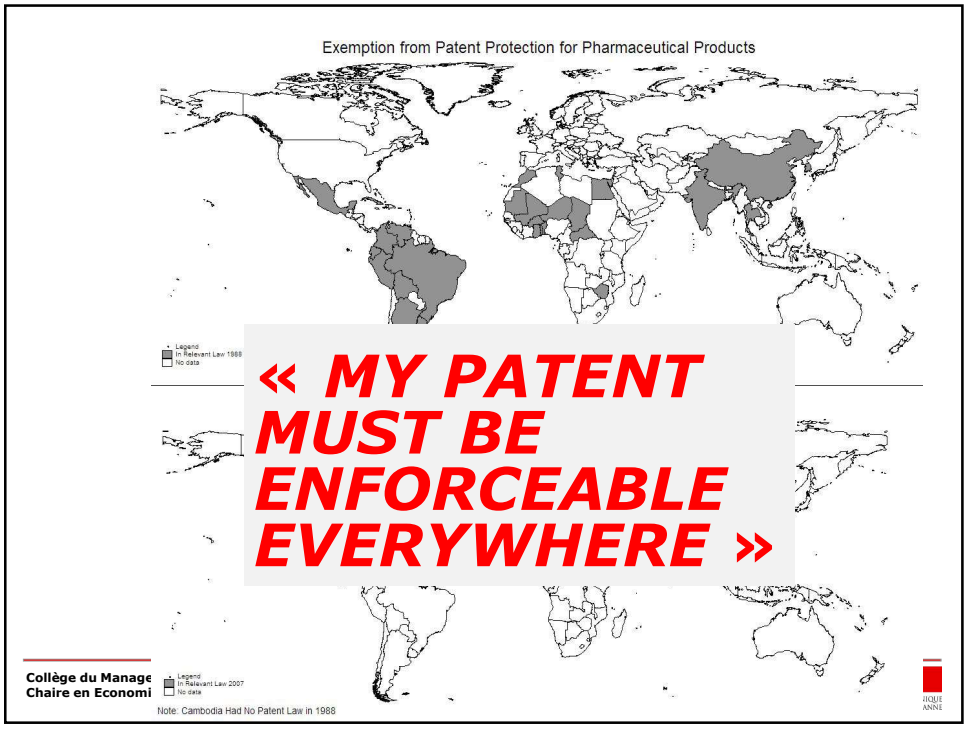


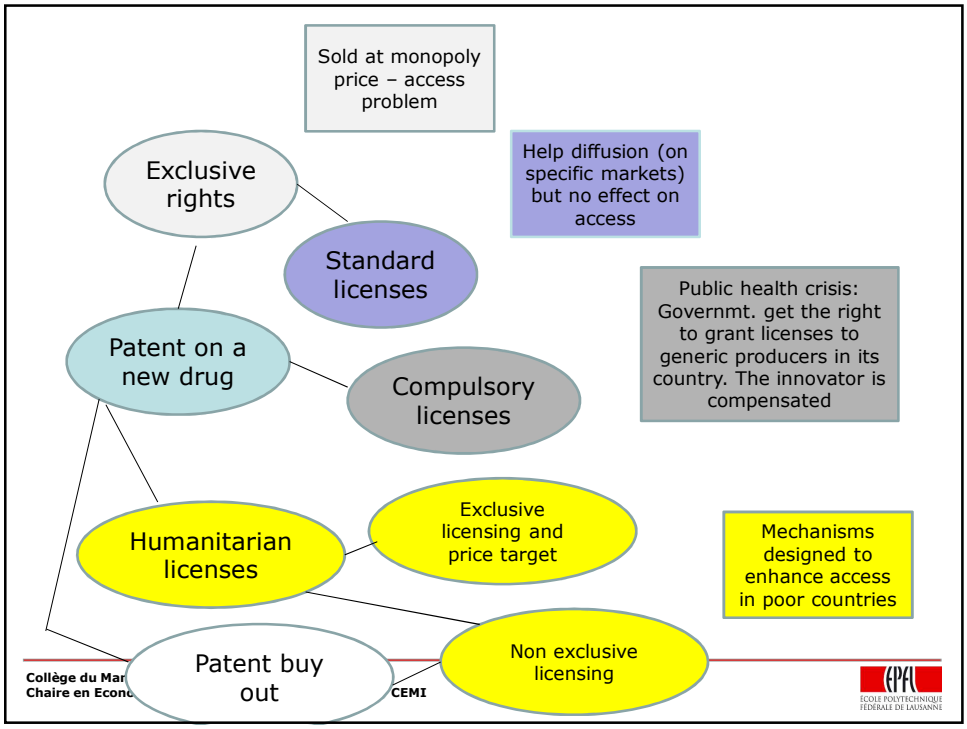
The TRIPS puzzle

- Access to innovative drugs is now explicitly priced far above costs..
  - Prices above marginal costs create access problems
  - For countries which have no knowledge or invention to sell, the loss of consumer surplus is a net cost
- ..but improve firms'expectations toward « new markets »
  - FDI, trade
  - Data from India

- « *Whether low- and middle income countries are struggling to treat million of people living with HIV or to immunize refugee children against pneumonia, unaffordable prices mean that many people simply go without.*» Sueri Moon, 2017

Solutions to access

- At TRIPs time, **patent** is the key institution and solutions need to recognize it as such
- Recognize patent as a key instrument for incentivizing innovation, securing high R&D investments and supporting « the web of R&D contract » while try to strengthen its « distribution side » versus « exclusion side »
- Patent and licenses
- Licensing a private innovation means someones will get the right to produce the protected innovation to serve a specific market
  - This right can be sold by the patent holder on markets for technology at positive price
  - It can be requested by Government in case of public health crisis (compulsory licensing)
  - It can be used in a way that will limit final prices (humanitarian licenses)



4 potential solutions

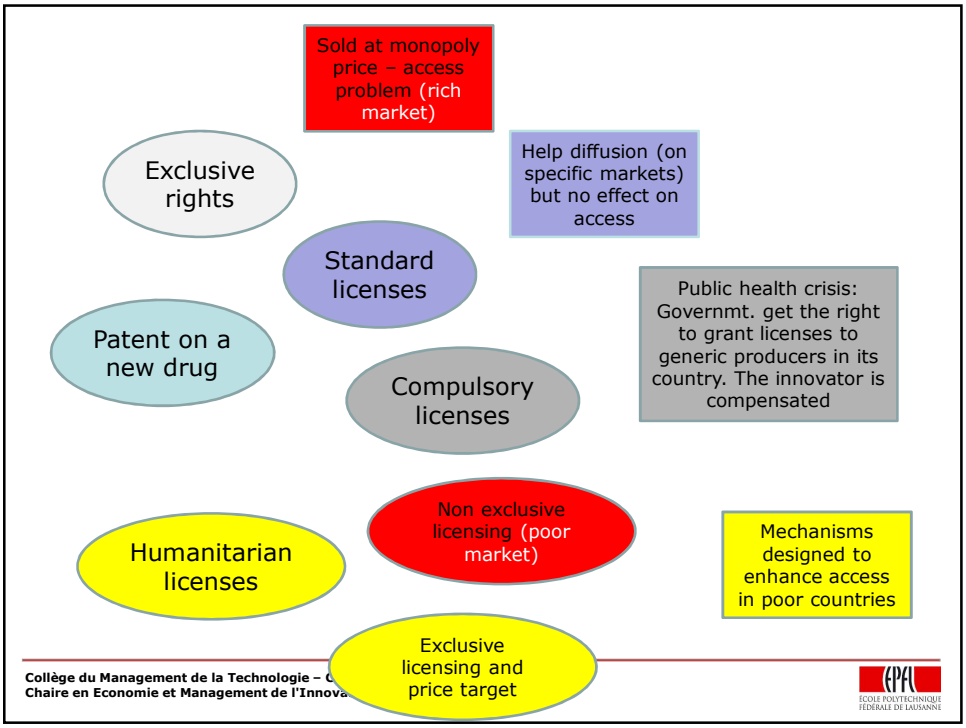
- Compulsory licensing
- Lanjouw solution
- Humanitarian licensing (role of universities)
- Patent buy out

Access problem given patent and high price on the rich markets: *how to improve relationships between IP monopolies and medicine prices?*

1 – Lanjouw mechanism

- Basic principle: patents are national
- Classification of countries in two categories: developed countries and underdeveloped
- Different treatment for K1 and K2
- Cannot have a patent for a global disease (K1) in both types of countries
  - Company has to make a **choice between the two markets.**
    - Rich-classified markets are economically more interesting than poor markets → company chooses to make the patent valid in rich countries
    - Poor countries: no more patent for that drug → possibility to produce and sell generics
  - Simple addition of a declaration at the request for a foreign filing license:
    - *"This permission will not be used to restrict the sale or manufacture of drugs for 'Cancer' in 'India'".* (Replace "cancer" and "India" by X & Y)
- The company will choose the rich market to enforce its patent and therefore let generic industry to produce the drug in the poor
- If the company enforces its patent in poor countries this will invalidate patent rights in the rich countries
- **Self-monitoring principle and easy to implement**

- No patent for the drug in poor countries: free for generic → prices are getting lower for the drug
- No restriction for rich countries to patent K2 diseases → keep patent-based incentive for the specific disease of these countries
- Keep protection of the invention in rich countries: still incentive for companies to develop new products
- Poor countries would still be part of the World Trade Organization



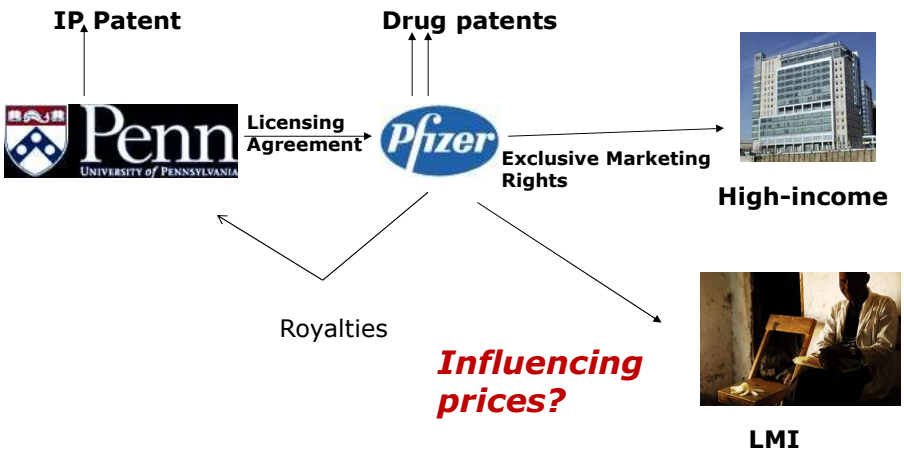
Jenny Lanjouw

- This schema was built by a young economist – Jenny Lanjouw who passed away four years ago
- She worked very hard to get her ideas discussed and adopted in the various relevant policy circles
- She got some impacts : "*the idea is beautifully simple : any member of Congress could prepare a bill amending US patent law, while similar legislation in a handful of other countries would cover the main centers of pharma research. And if Congress is asleep, maybe an enlightened drug firm will do some prodding. On Friday, Aventis called Lanjouw and declared her idea creative and interesting*" Washington Post, June 18, 2001

2 - How can universities contribute to optimal prices?

- Many pharmaceutical products have their origins in university research
- In most cases the university needs to find a licensee (a private firm) to finance the development (clinical trials) and commercialisation of the product
- The licensing contract includes a sales-based royalty for the university
- If universities can influence final prices through their licensing contracts, there is a case for them to use that leverage to fullfill their missions of optimizing (not revenues) but knowledge access

Pricing and Patents



On the other mission

- The TTO typically seeks to obtain royalty payments as high as possible for the universities
- But university's technology transfer's missions *involve much more* than just increasing the marginal « private » return of academic R&D
- Missions may involve also access to (health-related) knowledge, contribution to local development, etc..

- Humanitarian Use Licenses are provisions in a license whereby inventors and product developers protect in advance the possibility of sharing the technology or allowing access to it at a royalty free basis or at lower costs for people in needs
- HL policy creates a legally binding commitment of the licensee to the licensor to respect a price target (max price) that can be charged in poor countries

A small story

- The case of Stadduvine: was exorbitantly priced in South Africa
- Students learned that drug was developed at Yale
- They pressured Yale to compel Bristol-Myers Squibb (the licensee) to allow generic competition in South Africa
- The price dropped dramatically
- Creation of University Allied for Essential Medicines

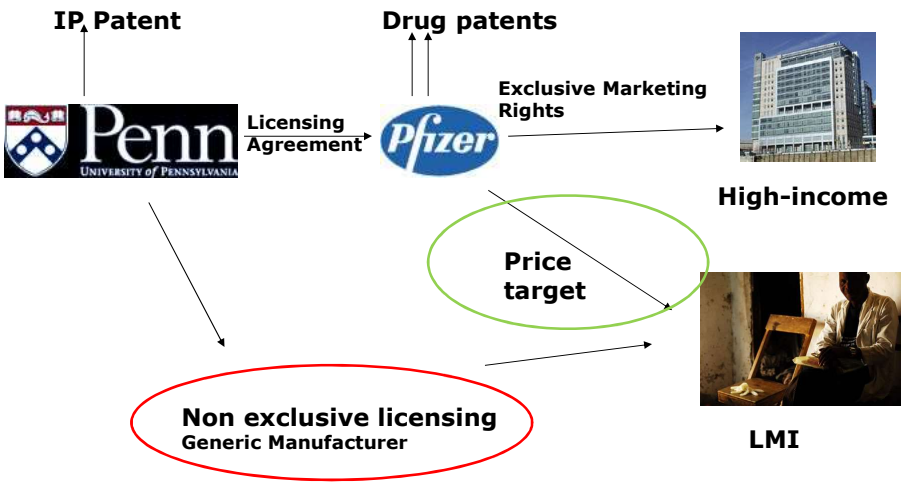
The basic trade off - 1

- Any contractual provision designed to enhance access will make the licensing contract less attractive for the firm (risk of pharmaceutical arbitrage)
- Therefore HL can only work if the university accepts to sacrifice some prospective licensing revenues
- The university can maximize royalties or obtain a low price for LDCs but not both at the same time
- Three cases where the trade off is less difficult:
  - The value of the academic invention is high
  - The target countries (to get low price) is only a small fraction of expected global sales
  - The firm accept to « live » with a far lower expected marginal private return (it cares about: reputation, future markets, etc..): many companies acknowledge sublicensing to generic producers as a socially responsible method to supply medicines to the poor

The basic trade off - 2

- It seems that the expected private value of the academic invention is a key isssue:
  - If the disclosed invention is a « standard » one among many others which are potentially available (in other universities), there will be very little room for negotiations with the firm
  - If the disclosed invention is unique and potentially highly valuable, then there is more possibilities for obtaining a HL provision

What kind of contracts?



What kind of contract? Non exclusive licensing

- Exclusivity limited to rich countries
- The University grants an unlimited number of licenses for sales in developing countries only
- Possible provisions to ensure follow-on patents will not foreclose competition in poor countries
- A potential problem (P): it is uneasy for generic producers in poor countries to enter into the market : it depends on the type of products and industry capacities
- Close to Lanjouw proposition

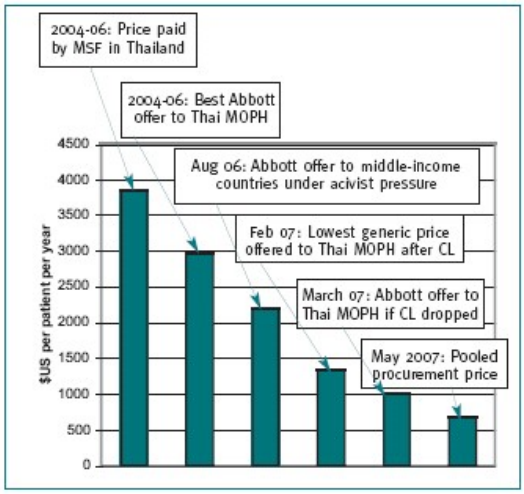
What kind of contract? Price target

- Exclusive licensing specifying a maximum price that can be charged in poor countries
- A good solution when: i) the problem (P) above applies; ii) the originator has a production cost advantage over the generic producers
- But the disadvantage with this kind of contract is that it requires so much information (about production costs and demand)
- What to do if the firm finds it unprofitable to deliver to the poor market at all given max price specified in the HL contract?
- Need for specific clause about « obligation to sell » to poor countries or « loosing exclusivity » in the South

3 - Compulsory licensing

- A TRIPs provision: allows for the use of a patented innovation, without the authorization of the patentholder, by a third party (a generic manufacturer)
  - A compulsory license is an authorization granted by a government to a third party to use the patented invention without the consent of the patent owner
- Cases of national emergency, public health issue
- Political pressures from the rich countries to discourage poor countries to introduce this provision into national legislation
    - Zambia, Zimbabwe have recently issued CL; Malaysia and Indonesia have introduced the provision in their legislation
  - The anthrax episode (2002): While CL has never been part of the « legal culture » of the country, US claimed right to access Bayer drug through CL
  - The Tamiflu episode (idem)

The effect of public pressure and compulsory licensing



Prices for lopinavir/ritonavir offered to Thailand and other middle-income countries

Source: MSF 2007 « Untangling the web of price reductions »

Compulsory licensing is allowed provided that:

- It is done on a case per case basis
- There have been prior negotiations (except in emergencies or for public non-commercial use)
- It is time limited and non-exclusive
- *It is predominantly for the domestic market*
- The right holder is paid adequate compensation
- It is subject to judicial review

Grounds for compulsory licensing

- Refusal to license
- Public interest
- Public health and nutrition (French law: '*in the event of medicines being made available in insufficient quantity or at abnormally high prices*')
- National emergency
- Anti-competitive practices
- Failure to exploit the patents

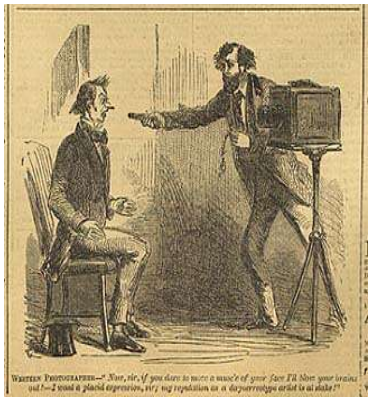
Compulsory licensing for countries with/without adequate capacities

- Countries with adequate capacities may use CL to lower prices and create a sustainable supply
- Countries can use CL as a credible threat to obtain substantial price reduction (Brazil, South Africa)
- Problems remain for countries with no manufacturing capacities
  - Some countries hope to use CL and turn to drug companies in Brazil or India to supply them with cheaper versions
  - The trouble is that there is no explicit provision for this kind of export-oriented CL

4 - Patent buy out

- The State or an international foundation buys patents to put them back in the public domain
- Daguerre -1839

We have much pleasure in announcing an important discovery made by M. Daguerre, the celebrated painter of the Diorama. This discovery seems like a prodigy. It disconcerts all the theories of science in light and optics and, if borne out, promises to make a revolution in the arts of design.



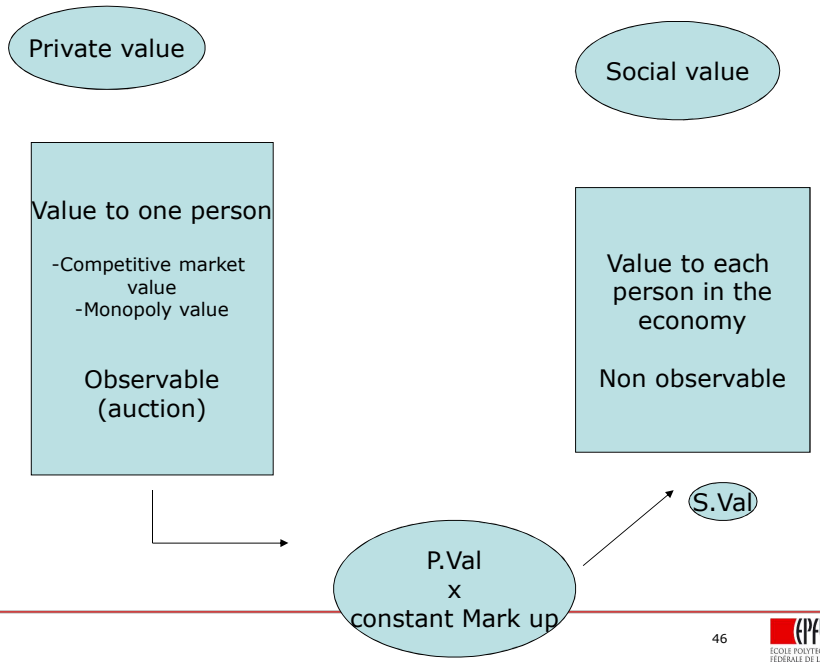
Patent buy out

- Daguerre advertised his process and sought sponsorship, but few seemed interested. He then turned to Francois Arago, a politician, who immediately saw the implications of this process, took his case up, and the French government commissioned a report on the process, to be chaired by Paul Delaroche. On 7 January 1839 an announcement was made of the discovery, but details were not divulged until 19 August when the process was announced publicly, the French government having bought the rights to the process from him, and given it free to the world.
- From the day the announcement was made of this new discovery, the process came to be used widely. The claim was made that the daguerreotype "requires no knowledge of drawing...." and that "anyone may succeed... and perform as well as the author of the invention."

Patent buy out

- The idea: governments, foundations buy patents and put the invention in the public domain so that generic firms can produce and sell the drug at marginal cost
- Problem: how to value the invention to properly compensate the inventor?
  - "the prize" should reflect the social value of the invention
  - This is difficult because most people are not well informed about the value they would obtain from potential new inventions
- However, a few people or firms are likely to be able to obtain at least some information on the monopoly value of patents at reasonable cost
- We are looking for a mechanism through which people reveal their estimates of the monopoly value of the patent, as opposed to mechanisms in which agents reveal their estimates of the social value
  - A standard way of eliciting information on the private value of goods, such as patents, is through an auction

- The market value of patents would be determined through a sealed-bid auction and the government would then offer to buy patents at this private value **times** some constant markup (reflecting the typical ratio : social/private value)
- Based on empirical estimates of the social return to innovation, it is likely that the government should offer to buy patents at a markup of at least twice their estimated private value
  - Clearly, this will be too small for some inventions, too great for others
- Patents bought by the government are then put in the public domain

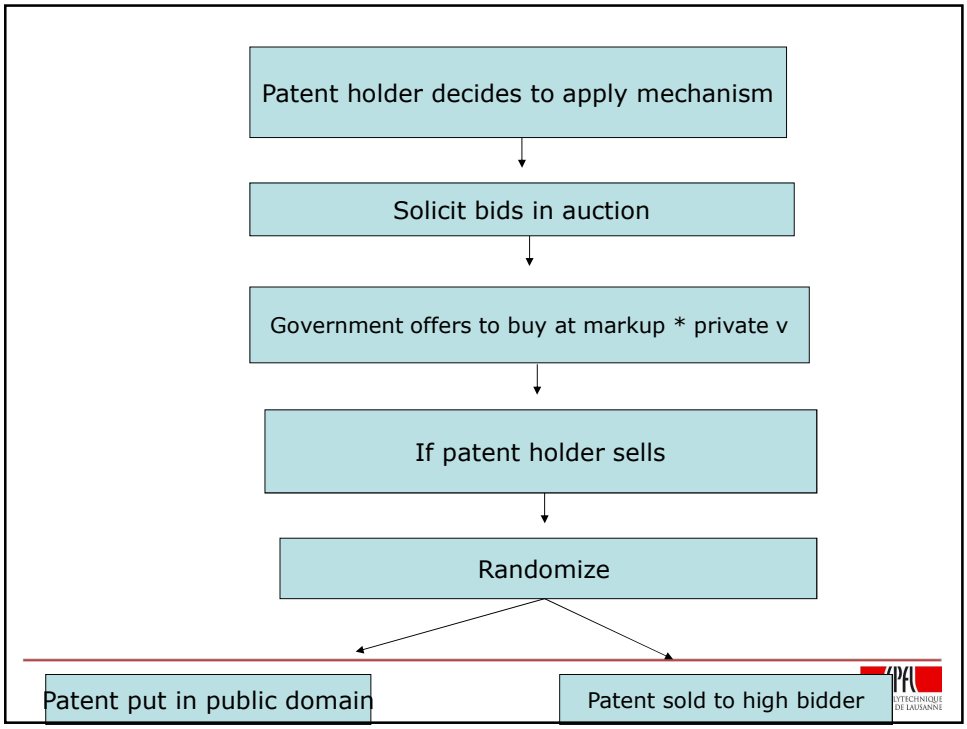


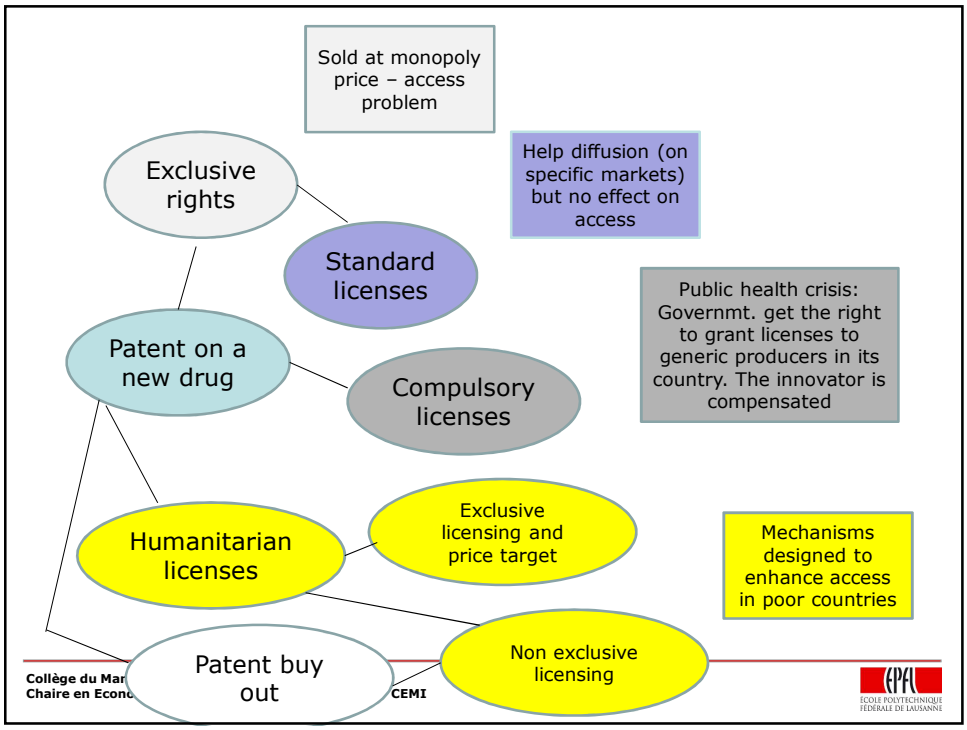
Patent buy out

- Under a sealed bid auction, auction participants will bid their expectation of the patent's value, given their information, conditional on their making the winning bid
- It will be efficient for the government to use information from the entire distribution of bids, rather than only the highest, in estimating the private value
  - There is no reason to throw away the information provided by the other bids in estimating the private value
- The idea is to aggregate the information of all bidders to estimate the private value of the patent

Patent buy out

- A small proportion of patents, chosen randomly, would be sold to the high bidder
  - Thus, the bidders know that there is a substantial probability that they will actually end up buying the patent
  - So firms have incentives to study the patents and estimate their proper price
- In principle, this should ensure that prices paid by the government represent the fair market value of patents, even if it means that some drugs will still be subject to patent monopolies (those who are purchased by private firms)


Patent holder decides to apply mechanism
Solicit bids in auction
Government offers to buy at markup * private v
If patent holder sells
Randomize
Patent put in public domain
Patent sold to high bidder


Sold at monopoly price – access problem
Exclusive rights
Help diffusion (on specific markets) but no effect on access
Standard licenses
Public health crisis: Governmt. get the right to grant licenses to generic producers in its country. The innovator is compensated
Patent on a new drug
Compulsory licenses
Humanitarian licenses
Exclusive licensing and price target
Mechanisms designed to enhance access in poor countries
Patent buy out
Non exclusive licensing
CEMI

Poor countries and health: two problems

- Two kinds of innovative product
  - K1 is an innovative drug for global diseases
  - K2 : products for diseases that predominantly affect the poor
- For K1
  - the issue is not really to build a market or create incentives. Market and incentives already exist. The issue is to use this opportunity to facilitate low price access for the poor
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- For K2
  - the issue is to build markets and create incentives
  - There is a problem of production

K2

- Incentivizing R&D for neglected diseases
  - The problem – evidence
  - Reasons for under-provision
  - Institutional solutions

The neglected diseases problem

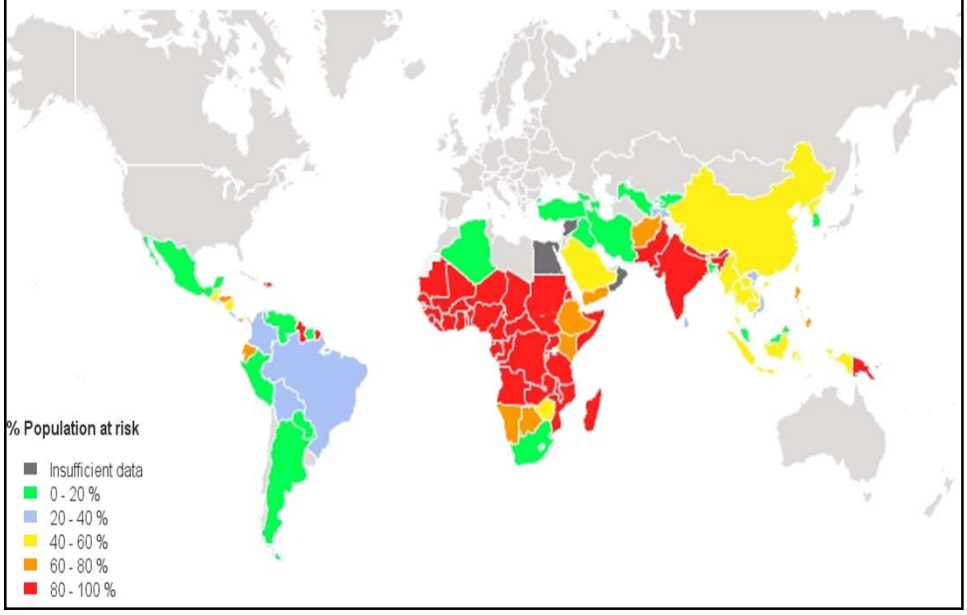
Very few pharmaceutical products have been developed for diseases that have:

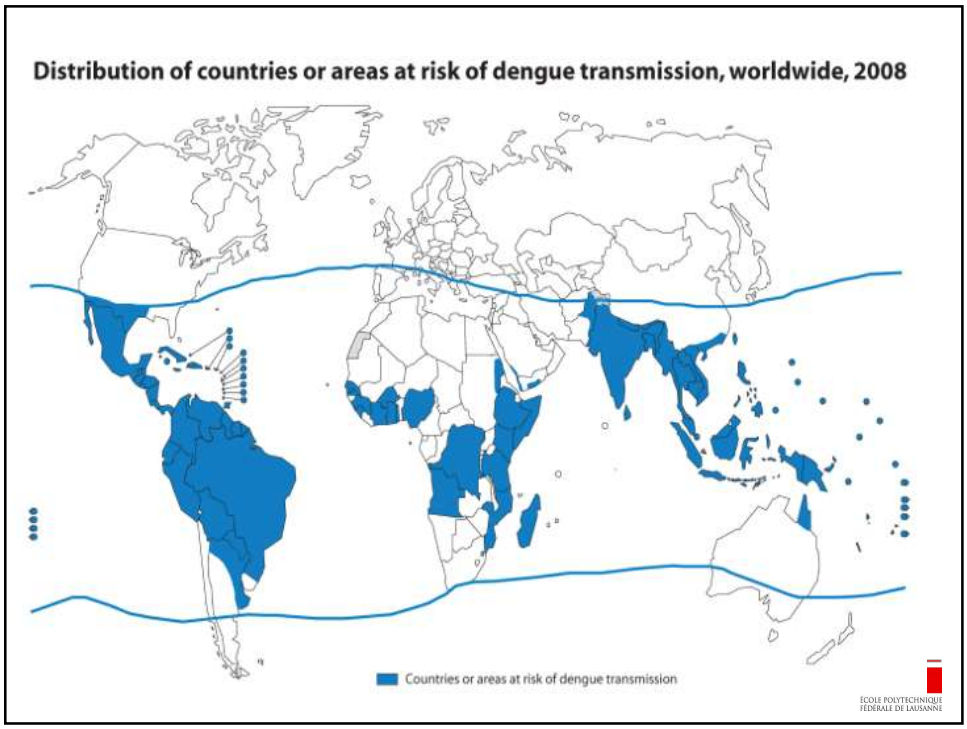
- a large burden in developing countries
- but no or little burden in the developed world

Very large markets of very poor people

malaria	300 million clinical cases/year	1.1 million deaths
tuberculosis		1.9 million deaths
HIV (specific forms)	33 million people infected 95% in LdCs	2.3 million deaths 80% in sub-saharan Africa

Malaria


% Population at risk
Insufficient data
0 - 20 %
20 - 40 %
40 - 60 %
60 - 80 %
80 - 100 %


Distribution of countries or areas at risk of dengue transmission, worldwide, 2008
Countries or areas at risk of dengue transmission
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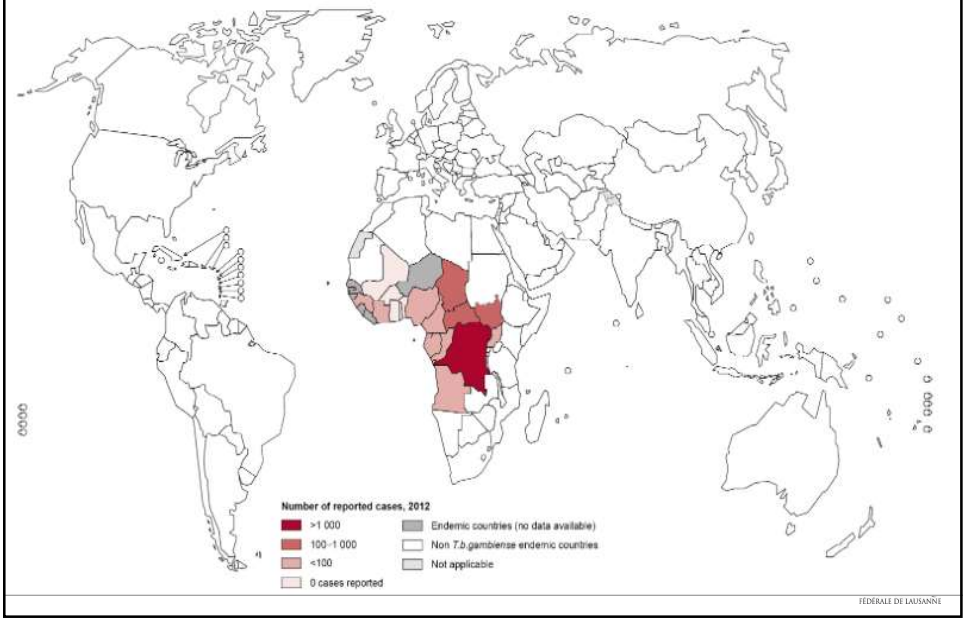
Distribution of human African trypanosomiasis (*T.b.gambiense*), worldwide, 2012



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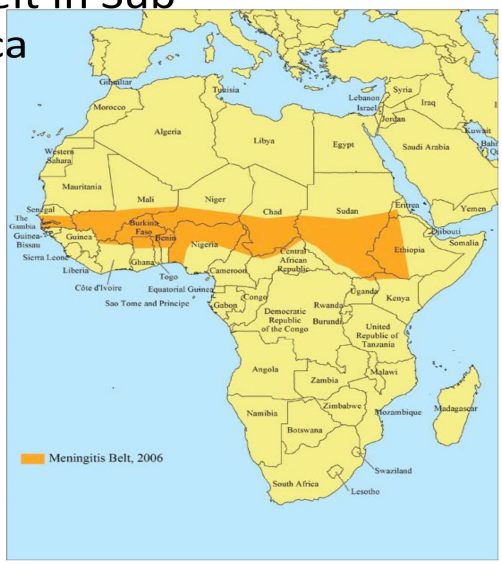
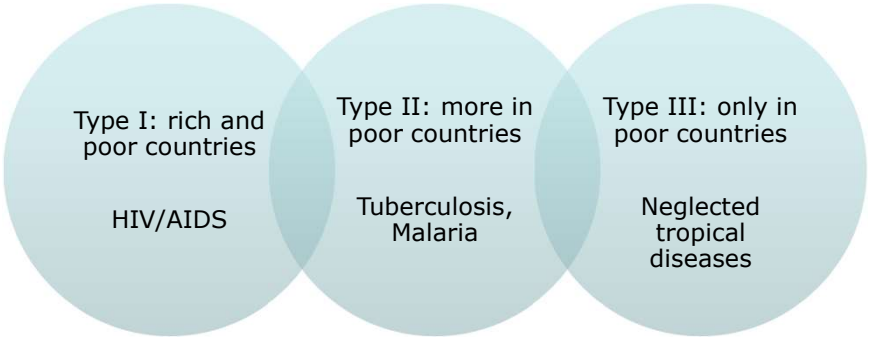
Meningitis belt in Sub-Saharan Africa

- Over 90 percent of global meningococcal disease occurs in the African meningitis belt
- One strain (Group A Nm) accounts for estimated 80% of all meningococcal cases.
- Focal epidemics occur every year.
- Major epidemics occur every 7-14 years.



Disease categories



A very bad history!

- Past and current research on vaccines is negligible relative to the burden of these diseases
- Of the 1,233 drugs licensed between 1975 and 2000, only 13 were for tropical diseases

New drugs developed between 1975-1999

Therapeutic areas	Approved NCEs 1975–99*	Disability-adjusted life-years (DALYs)†			
		Number (×10⁶)	World-wide (%)	High-income countries (%)	Low- and middle-income countries (%)
Central nervous system	211 (15·1%)	159·46	11·5	23·5	10·5
Cardiovascular	179 (12·8%)	143·02	10·3	18·0	9·7
Cytostatics (neoplasms)	111 (8·0%)	84·87	6·1	15·8	5·2
Respiratory (non-infectious)	89 (6·4%)	61·60	4·5	7·4	4·2
Anti-infectives and antiparasitics§	224 (16·1%)	409·08	29·6	4·2	31·8
HIV/AIDS¶	26 (1·9%)	70·93	5·1	0·9	5·5
Tuberculosis‖	3 (0·2%)	28·19	2·0	0·1	2·2
Tropical diseases (total)**	13 (0·9%)	130·35	9·4	0·3	10·2
Malaria	4 (0·3%)	39·27	2·8	0·0	3·1
Other therapeutic categories	579 (41·6%)	524·54	37·94	31·08	38·59
Total	1393 (100%)	1382·56	100	100	100

Source: Trouiller, P., et al. (2002) Drug Development for Neglected Diseases: A Deficient Market and a Public Health Policy Failure. *Lancet*, 359, 2188-94

Disease indications for all new products

	All new products*	NCEs only	DALYs (in thousands)
Neuropsychiatric disorders	134 (16%)	49 (15%)	199 280 (13%)
Cancer	103 (12%)	81 (24%)	79 765 (5%)
Cardiovascular diseases	70 (8%)	29 (9%)	151 377 (10%)
Genitourinary system and sex hormones	55 (7%)	18 (5%)	14 754 (1%)
Digestive diseases	46 (5%)	23 (7%)	42 498 (3%)
Sense organ disorders	37 (4%)	13 (4%)	86 883 (6%)
Neglected diseases	37 (4%)	4 (1%)	159 976 (11%)
Malaria	12 (1%)	3 (1%)	33 976 (2%)
Tuberculosis	7 (1%)	0	34 217 (2%)
Diarrhoeal diseases	7 (1%)	1 (<0·5%)	72 777 (5%)
Neglected tropical diseases	5 (1%)	0	18 325 (1%)
Other neglected diseases	6 (1%)	0	681 (<0·5%)
HIV/AIDS	36 (4%)	12 (4%)	58 513 (4%)
Respiratory diseases (non-infectious)	31 (4%)	7 (2%)	59 039 (4%)
Diabetes mellitus	28 (3%)	9 (3%)	19 705 (1%)
Musculoskeletal diseases	26 (3%)	13 (4%)	30 869 (2%)
Other infectious and parasitic diseases	113 (13%)	23 (7%)	181 441 (12%)
All other diseases†	134 (16%)	55 (16%)	439 159 (29%)
Total	850 (100%)	336 (100%)	1 523 259 (100%)

Data are n (%).
* Includes NCEs, new formulations, fixed-dose combinations, new indications, and vaccines or biologicals.

Compared with worldwide disability-adjusted life-years (2004 DALYs; 2000–11)

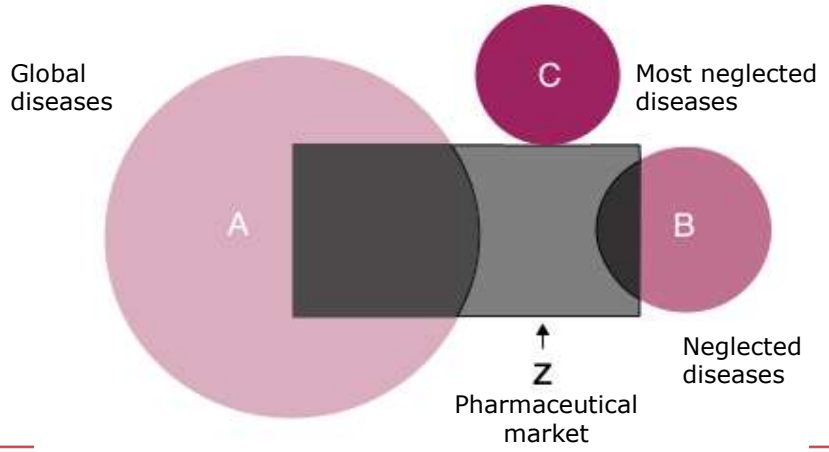
Source: Pedrique et al, 2013. The drug and vaccine landscape for neglected diseases (2000–11): a systematic assessment, The Lancet Global Health, 1: 6

New products approved or recommended 2000-2011

	NCE (n=336)	Other new product (n=420)*	Vaccine or biological (n=94)†	Total (n=850)
Neglected diseases				
Malaria	3 (1%)	9 (2%)	0	12 (1%)
Tuberculosis	0	7 (2%)	0	7 (1%)
Diarrhoeal diseases	1 (<0·5%)	3 (1%)	3 (3%)	7 (1%)‡
Neglected tropical diseases	0	5 (1%)	0	5 (1%)§
Other	0	1 (<0·5%)	5 (5%)	6 (1%)¶
Subtotal	4 (1%)	25 (6%)	8 (9%)	37 (4%)
Other infectious diseases	35 (10%)	48 (11%)	66 (70%)	149 (18%)
All other diseases	297 (88%)	347 (83%)	20 (21%)	664 (78%)

Source: Pedrique et al, 2013. The drug and vaccine landscape for neglected diseases (2000–11): a systematic assessment, The Lancet Global Health, 1: 6

Reasons for underprovision



Source: Médicis Sans Frontières, 2001. A Fatal Imbalance: The Crisis in Research and Development for Neglected Diseases.

Reasons for underprovision

A) Poor markets

TABLE 1.4 WORLD PHARMACEUTICAL MARKET BY REGION (US$ BILLION, EX-MANUFACTURER PRICES)

REGION	2004	2005	GLOBAL SHARE OF SALES 2005 (%)
North America	249.0	268.8	44.4
Europe	169.2	180.4	29.8
Japan	66.1	69.3	11.4
Oceania	7.1	7.7	1.3
CIS[a]	4.2	5.0	0.8
South-east Asia	25.3	28.8	4.6
Latin America	24.4	26.6	4.4
Indian subcontinent	6.6	7.2	1.2
Africa	6.3	6.7	1.1
Middle East	4.7	4.9	0.8
Total world market	**562.9**	**605.4**	**100.0**

[a] Commonwealth of Independent States.

2006

Reasons for underprovision of investments in R&D

- B) Failures in the market for vaccine research : Time inconsistency
- Governments would like to promise that they will pay high prices for new products. However, once a product exist, they will tempted to do everything they can to lower prices.
  - Price discrimination is strongly used on the market for existing vaccines (they are typically sold at cents per unit in LDCs)
  - Governments are in a strong bargaining position
- Companies doubt they would be able to sell new vaccines at prices that would cover R&D costs

Reasons for underprovision of investments in R&D

- C) Vaccines are underconsumed for many reasons:
  - Externalities
  - Beneficiaries are children
  - Consumers prefer to pay for treatment than for prevention
  - Monopoly pricing would exacerbate underconsumption

- Private incentives for research on vaccines for malaria, tuberculosis and strains of HIV common in Africa..
  - markets for travelers and military needs
- .. are a small fraction of the social value of new vaccines
- So that **under current institutions**, potential vaccine developers would have incentives to pass up socially valuable research opportunities

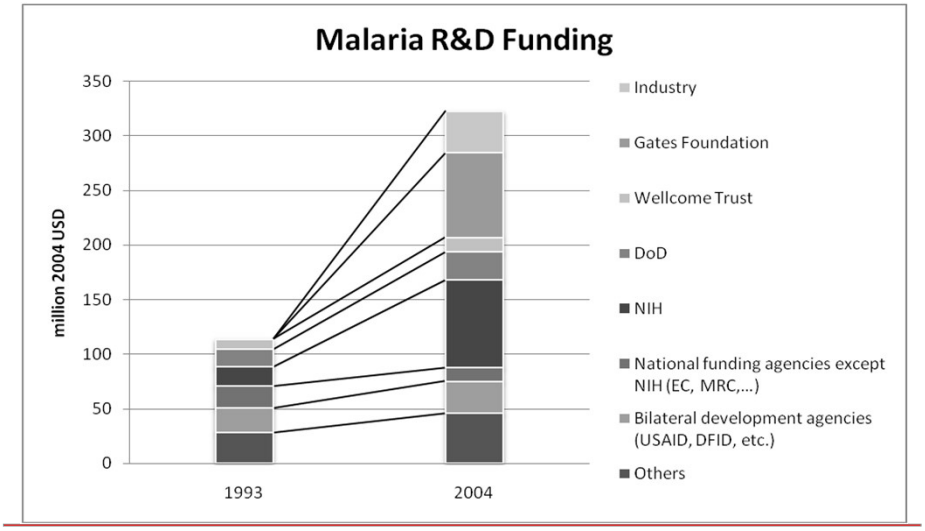
Should we care?

- **Yes**
  - Developing countries cannot develop new pharmaceutical products by themselves without coordination
  - Bad health slows economic growth, need to stop the AIDS pandemic before Africa can grow. Some evidence that countries with malaria grow slower than others (Jeffrey Sachs)
  - Health is special, helping the poor is a moral imperative
- **The good news:** we are at a time of opportunity thanks to…

Bill & Melinda Gates Foundation . . .

Since it started its global health program in 1997, the Gates foundation has invested USD 1.3 billion in R&D for neglected diseases

The effect for malaria…



However, how should the money be spent?

How to spend the money?

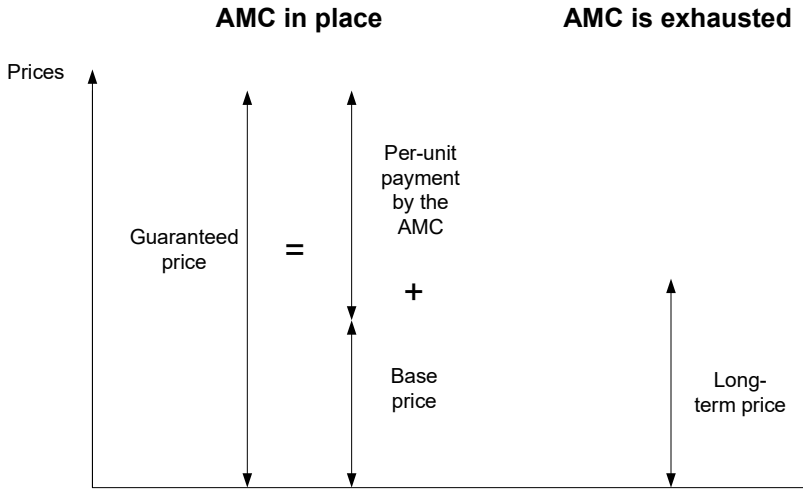
- **Push program** provides funding for R&D through grants, R&D tax credits, work in government labs.
  - Not an effictive solution when the need is not research *per se* but products!
- **Pull program**: Estimating the minimum level of commercial profits and then supplementing LDCs purchasing power with large market pull incentives (promesse d'achat or **advanced market commitment**)
  - The distinction between Pull and Push is between paying for research inputs and paying for research outputs
- Creating conditions for undertaking projects with no (or low) commercial return **(PPPs)**

Advanced market commitments- the big picture

- Donors make a legally binding commitment to buy at high prices the new product
- Solves the time consistency problem
- Works like a prize- the pharmaceutical product has to meet a set of predefined criteria
- Creates a market where none existed before- evidence shows that markets work (to incentivize pharmaceutical companies)

- Advantages of AMC : commitment to purchase a vaccine and make it available to LdCs for modest co-payments
  - This could both provide incentives for developement (there is a market), and ensure that the vaccine will reach those who need them.
  - The government pays nothing unless a vaccine is developed. This creates strong incentives for researchers to 1) carefully select projects; and 2) focus on developing viable vaccines rather than pursuing other goals (No monitoring problem)

Pricing in the AMC

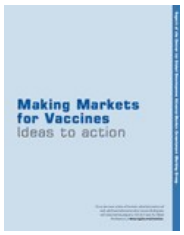


AMC- from ideas to actions (1)

Michael Kremer, an influential Harvard economist, first suggested the idea in 2000

Center for Global Development

An extensive consultation process was organized by an American think tank (2004-2005)



The report of the think tank was followed by work from the World Bank and the Italian government

AMC- from ideas to actions (2)

G8 leaders agrees to launch a pilot AMC in July 2006 at the St Petersburg Summit

AMC ADVANCE MARKET COMMITMENTS for vaccines

GAVI ALLIANCE

In February 2007 the pilot AMC (on pneumococcal vaccine) was launched http://www.vaccineamc.org/

Public-private partnerships (PPPs)

Evidence is striking

- An incredible trend towards significant investments in R&D for neglected diseases
- Commitment to such R&D by for-profit companies that are constrained by shareholders's values should not exist but it does
- What is going on?
- PPPs were a policy experiment that did not have a spelt-out rationale from the perspective of the economics of innovation
  - The only economist who at the time was seriously working on the economics of neglected disease R&D worked on a fundamentally different model (AMC)
- Needs for empirical evaluation and conceptual undertsanding

Reversing the perspective

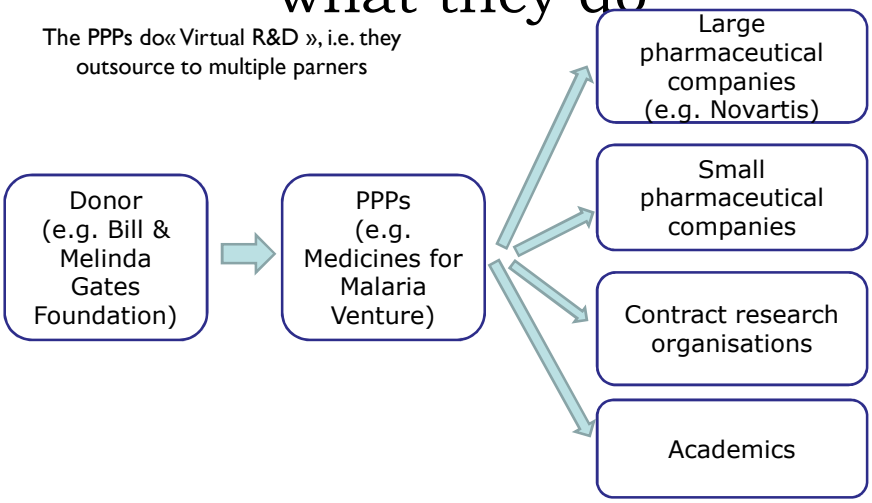
- Making companies working on a non (or low) commercial basis
- In AMC we estimate the minimum level of commercial profits and then supplement LDCs purchasing power with large market incentives,
- The PPP approach recognizes the existence of R&D operations of far smaller (or no) commercial returns and finds mechanisms to incentivize firms
- In such strategy: centrality of cost containment

Ideas behind the PPP model

- Use money from foundations and other donors to:
  - Hire a team of pharmaceutical product development experts from pharmaceutical companies
  - Give them money to do what they would in a for profit firm: project selection, monitoring and abortion, coordination of R&D inputs etc.
  - Use the fact that big pharma wants to polish its image; leverage goodwill from public and private institutions
  - Do virtual R&D through outsourcing to multiple partners

PPPs: what they are and what they do

The PPPs do« Virtual R&D », i.e. they outsource to multiple parners



- MNCs : work on a non commercial basis but long term business consideration: reputation, corporate social responsibility, future market
- Small firms: motivated by far smaller profits than large companies
- PPPs: none of these commitments would be possible without PPPs
  - PPPs provide substantial support, coordinate resources and organizations

The Meningitis Vaccine Project

- Mission: adapt existing Meningitis Vaccines to make them suitable for Meningitis A – a disease prevalent only in sub-Saharan Africa
- Financed through a grant from Gates Foundation
- They developed a new vaccine that 50 million people already received

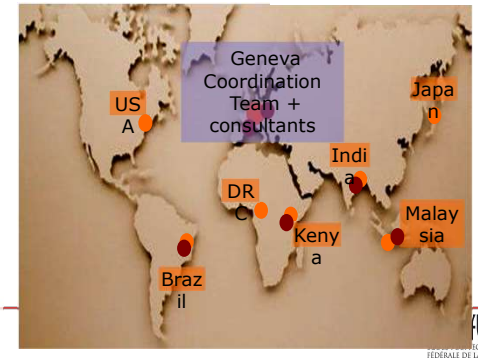
Drug for Neglected Diseases Initiative

- Established in 2003, based in Geneva, Switzerland
- Mission: deliver 11- 13 new treatments by 2018 for leishmaniasis, sleeping sickness, chagas disease, malaria, paediatric HIV, and helminth infections.

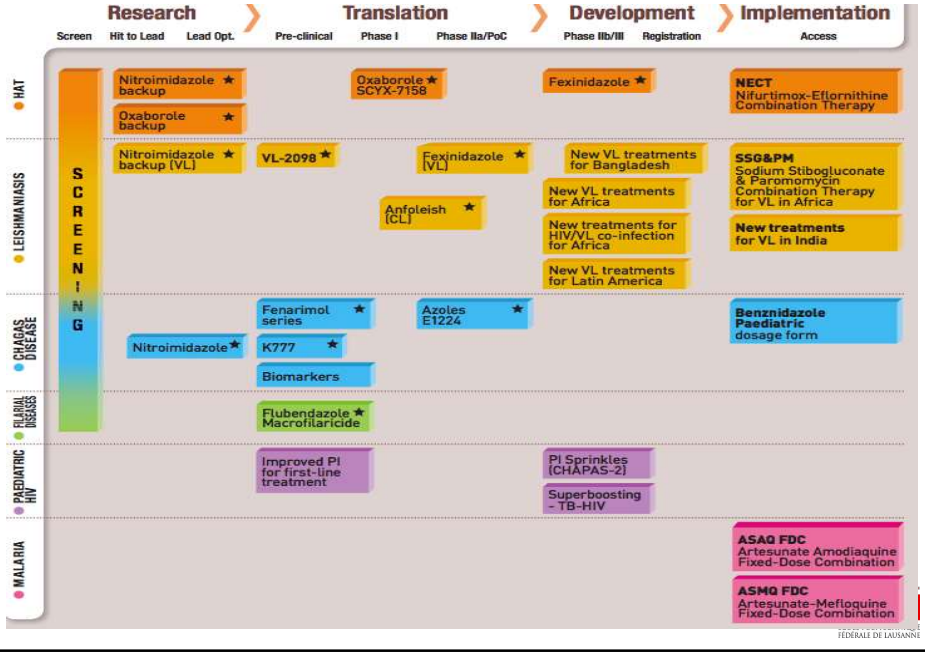
DNDi
Drugs for Neglected Diseases initiative

7 Founding Partners

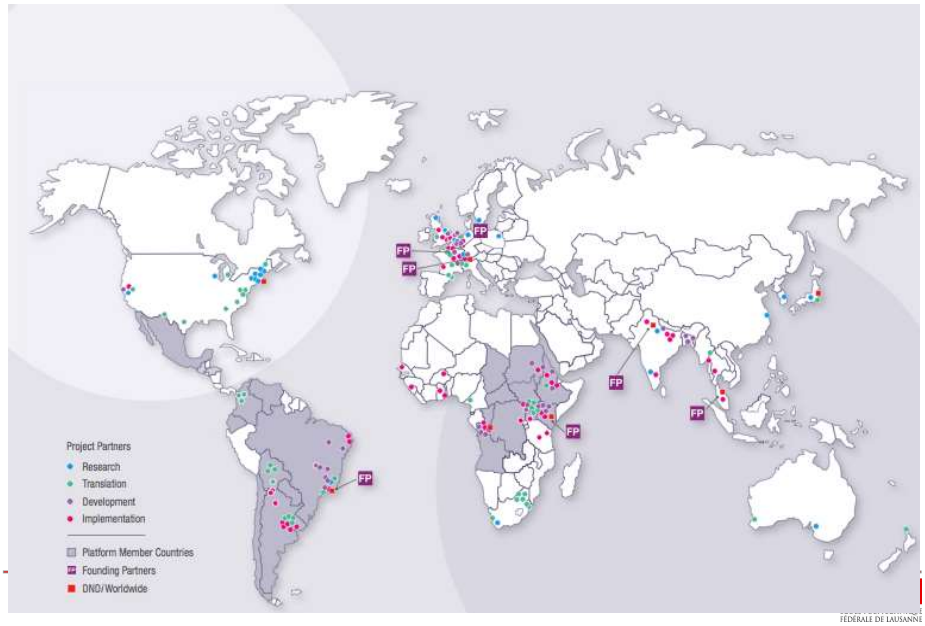
- Indian Council for Medical Research (ICMR)
- Kenya Medical Research Institute (KEMRI)
- Malaysian MOH
- Oswaldo Cruz Foundation Brazil
- Medecins Sans Frontieres (MSF)
- Institut Pasteur France
- WHO/TDR (permanent observer)



DND*i* portfolio 2012



DND*i* Partnerships



But partnerships can be too difficult to form

"We [The Meningitis Vaccine Project] had meetings with the major vaccine manufacturers in Europe and the USA to explore commercial development of a low-priced group A meningococcal conjugate vaccine. Incentives discussed included: a low interest loan for increasing manufacturing plant capacity; underwriting of costs of process development, production of investigational vaccine lots, and organisation of clinical trials. (…)

(…) The main reason for this unwillingness was the opportunity costs of the project"

Jodar et al. (2003) "Meningococcal conjugate vaccine for Africa: a model for development of new vaccines for the poorest countries" *Lancet*

- For the last 4 years, the number of neglected disease drug projects has increased significantly
- More than 100 projects underway in 2007

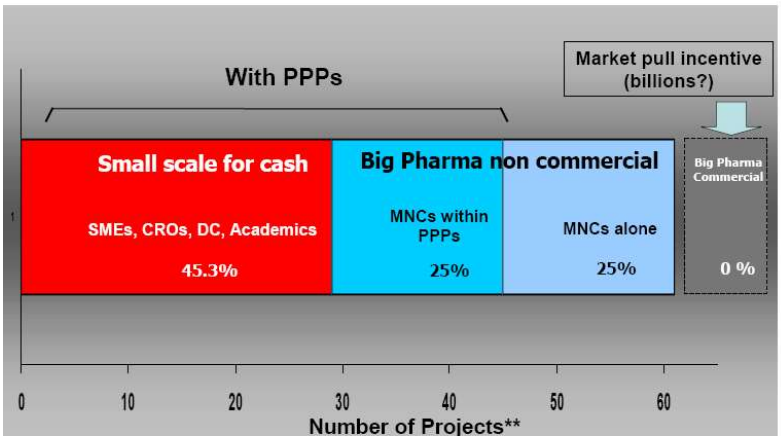
L'ASAQ, la pilule qui bouscule l'industrie pharmaceutique

Le 1er mars sera annoncé le lancement de l'ASAQ, un nouveau médicament contre le paludisme. Vendu 1 dollar la boîte, commercialisé sans brevet, ce traitement contre une maladie qui tue plus d'un million de personnes dans les pays les plus pauvres échappe aux règles habituelles de l'industrie pharmaceutique. Il est le résultat de la coopération entre ONG, fondations privées, universités publiques et agences de l'ONU. Les laboratoires doivent s'adapter et s'associer à ce processus, conséquence de la transformation juridique et politique de la santé en « bien public mondial »

PAGES II ET III

James Mutunga, spécialisé dans la recherche sur les moustiques, à Karatina au centre du Kenya. KIRSTY WIGGLESWORTH/AP

Who does neglected diseases R&D ?



Source: Moran, M (2005) "The new world of neglected disease drug R&D" presentation at WHO open forum on IPR, Innovation and Public Health available at http://www.who.int/intellectualproperty/events/OpenForumMaryMoran.pdf

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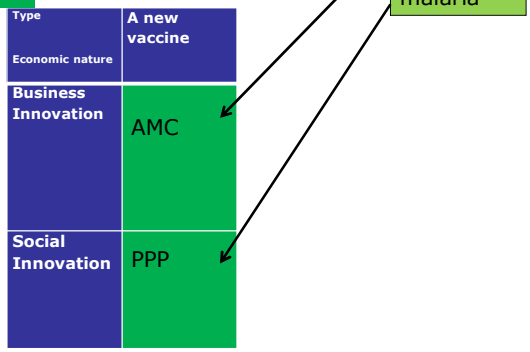
- It is not enough to have « the money ». Designing mechanisms about how to spend it to maximize the efficiency of resource allocation iskey
- AMC- a mechanism designed to create a market that can be considered by *for profit* organizations
  - Not many cases (devil is in details)
- PDPs are a new collaborative form of *non-profit* pharmaceutical R&D in the area of neglected diseases
- PDPs have proven capacity to develop new medical products
- PDPs function as «system integrator», chanelling funding and coordinating multitude of actors in R&D projects

Business or social innovation?

- AMC = artificial creation of a market in order to make an innovation profitable for the private innovator
- PPP = institutional construction to produce an innovation given the fact that it is not profitable for private companies to do it

Type Economic nature	A new vaccine
Business Innovation	
Social Innovation	

There is no technological pre-determination of the economic nature of the innovation
Economic nature of innovation defined by : i) the extent to which market failures are severe and ii) how institutions will help to correct them (restoring private profitability or producing the innovation in spite of low profitability)



Solutions to access & production – the honour of economists

- **Access: improving relationships between IP monopolies and medicine prices**
  - Compulsory licensing
  - Lanjouw solution
  - Humanitarian licensing (role of universities)
  - Patent buy out
- **Production : creating new incentives and/or containing costs**
  - Advanced market commitment
  - Public-private partnerships