Availability, Accessibility and Affordability

The challenge of diseases of poverty

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Some Definitions

Availability

- What is the medical need?
- Is it scientifically viable?
- Will it meet regulatory requirements?

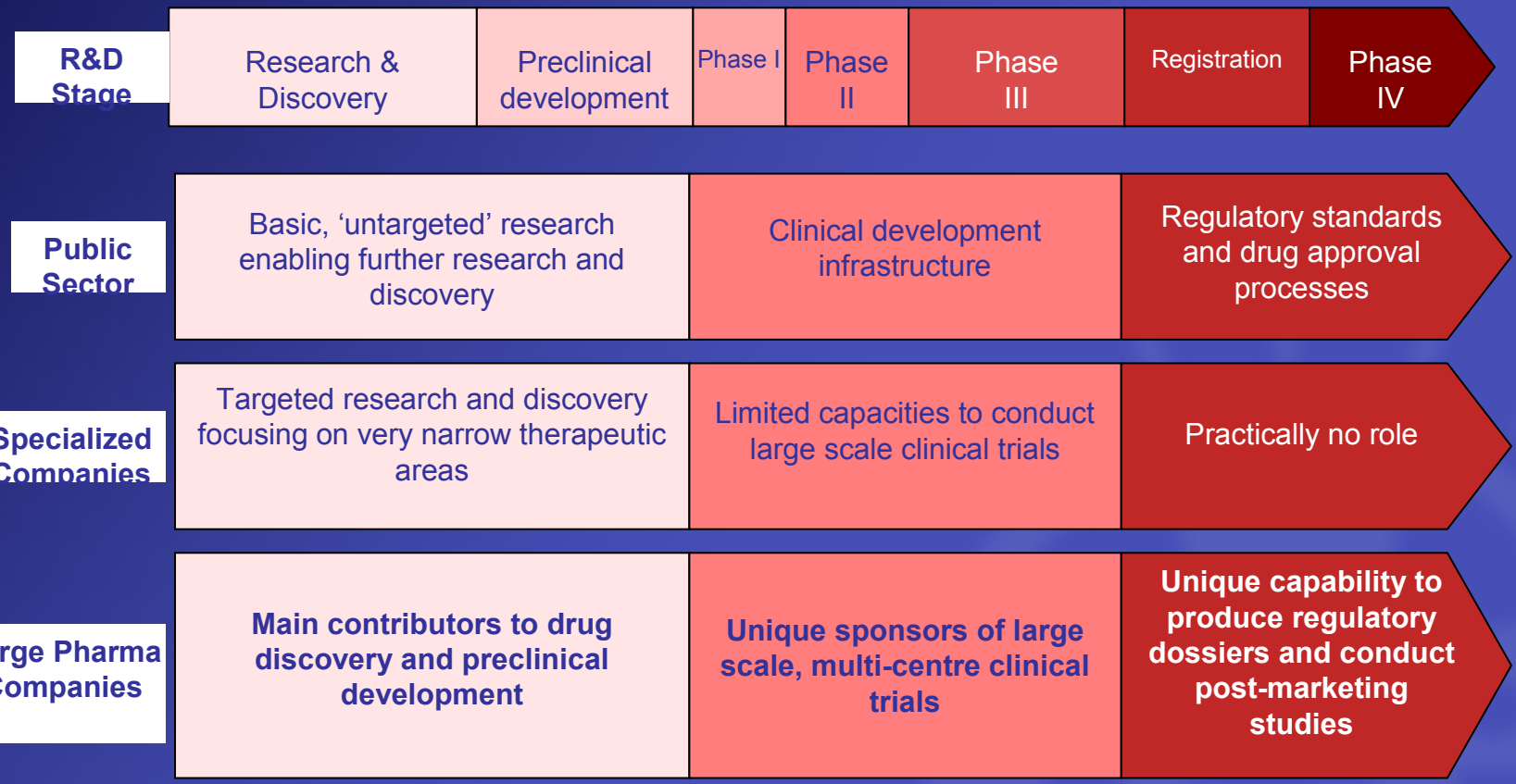
Accessibility

- Can it reach the patients who are in need?
- Can health care professionals administer it?

Affordability

- How will the R&D be funded?
- How will innovation be incentivized?
- Who can purchase and distribute?

Availability



World Health Care Congress Europe 2005

What has the private sector done for us?

Disease	**Health burden (% global deaths/ DALYs)**	**PS contribution to existing treatments**
HIV/AIDS	4.9/5.7	All 21 drugs in 4 classes developed by PS
Respiratory infections	6.9/6.3	All recent & effective antibiotics discovered and developed by PS
Cardiovascular	29.3/9.9	All drugs in 8 classes discovered and developed by PS
Cancer	12.5/5.1	All most effective in 8 classes discovered and developed by PS

Availability

- R&D is high cost/high risk
- 90% of drugs on WHO Essential Drugs List, and most key modern treatments, developed for human use by private sector
- Effect is significant improvements in public health
- Would not have happened without the patent system
- The patent system is a necessary, successful (but not always sufficient) incentive for pharmaceutical innovation

Availability

- >95% of drugs on WHO EML are not patented, but 30% of those who need them do not get them.
- Almost 5 million deaths p.a. are caused by TB, Malaria and diarrhoeal diseases, but drugs to treat them are not patented
- Most antiretrovial drugs for treating AIDS are not patented in most of Africa (and where they are, most are licensed) but the vast majority pf patients who need them do not get them
- India

The evidence from India

- No patents
- Extensive and high quality generics industry
- Patients needing HAART (est.2005) – 710,000
- Patients receiving HAART (June 2004(- 21,000
- Patients lacking access to essential drugs
  - India – 500 – 649 million - 50-65 % population
  - Africa – 267 million - < 50% population

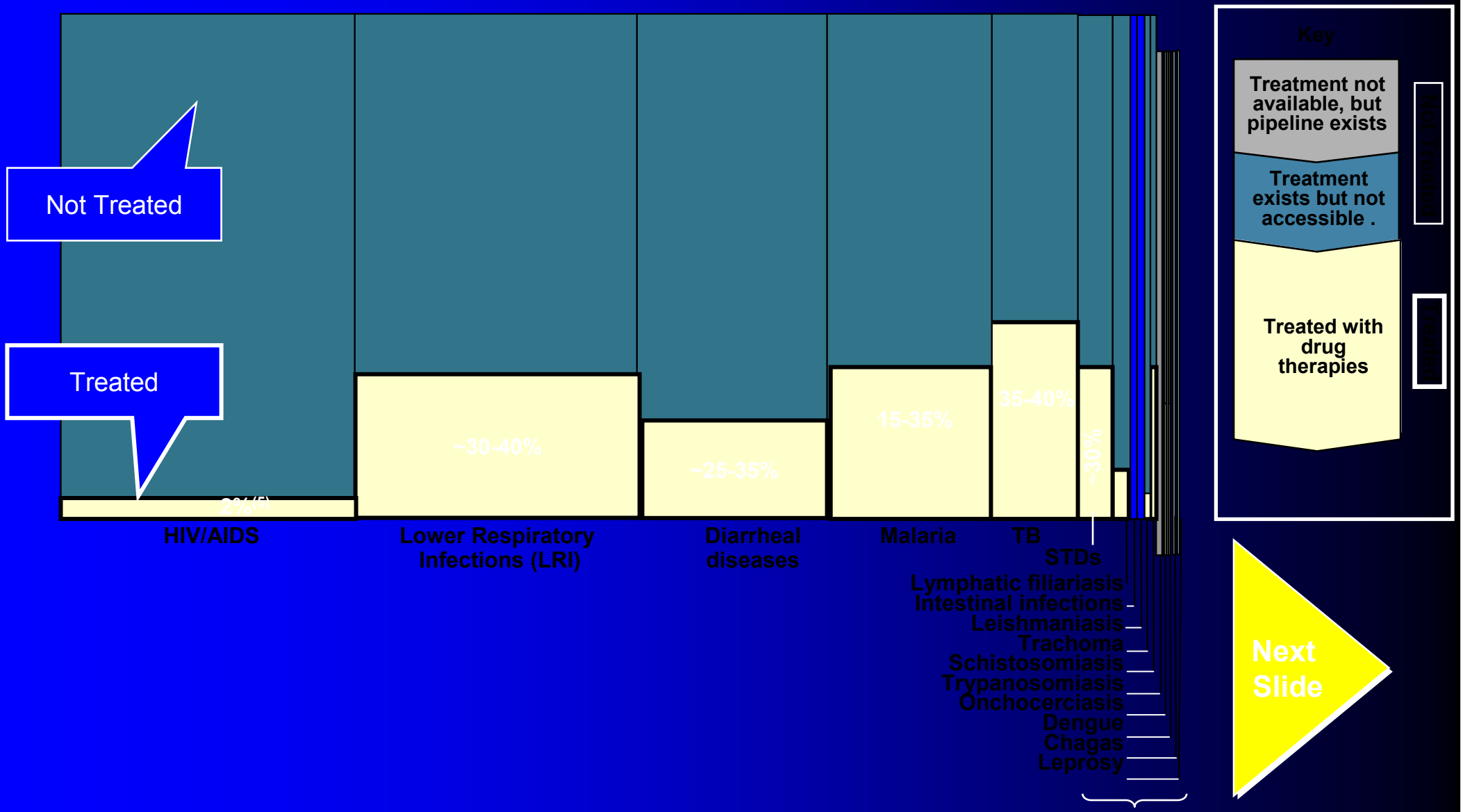
The access crisis

Pathogen/ Disease	New cases pa	Deaths pa	% in developing world
Malaria	30 million	1.1 million	>95
TB	8.8 million	1.7 million	84
Diarrhoeal	200 million	2 million	>95
HIV/AIDS	5.3 million	3 million	>92
Respiratory infection	?	3.8 million	>95

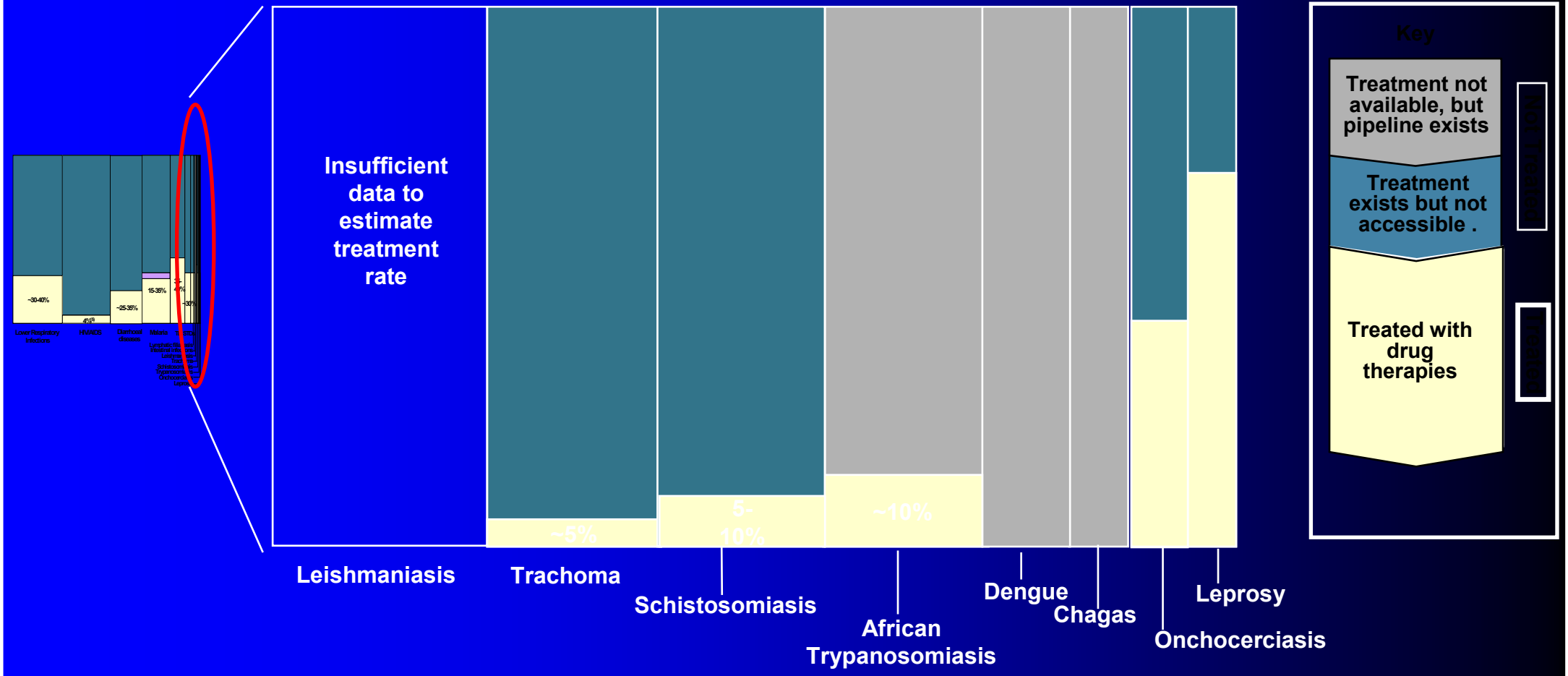
Improving Access

- Political will
  - prioritisation
  - allocation of resource commensurate with need
- Infrastructure development
  - systems
  - human capacity
- Role of PPPs
  - donations
  - clinics

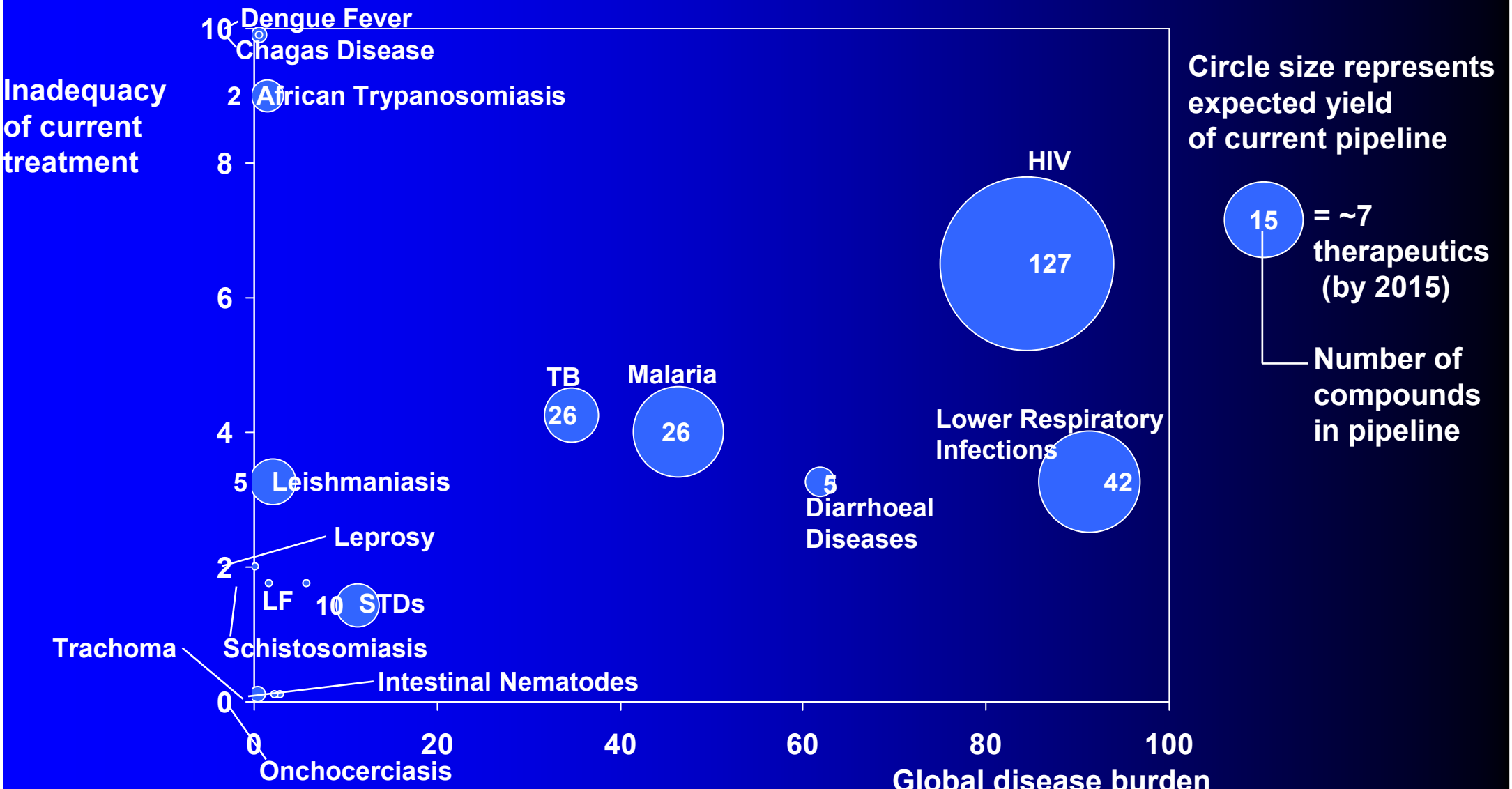
Accessibility Is An Issue



Availability: Meeting Medical Need



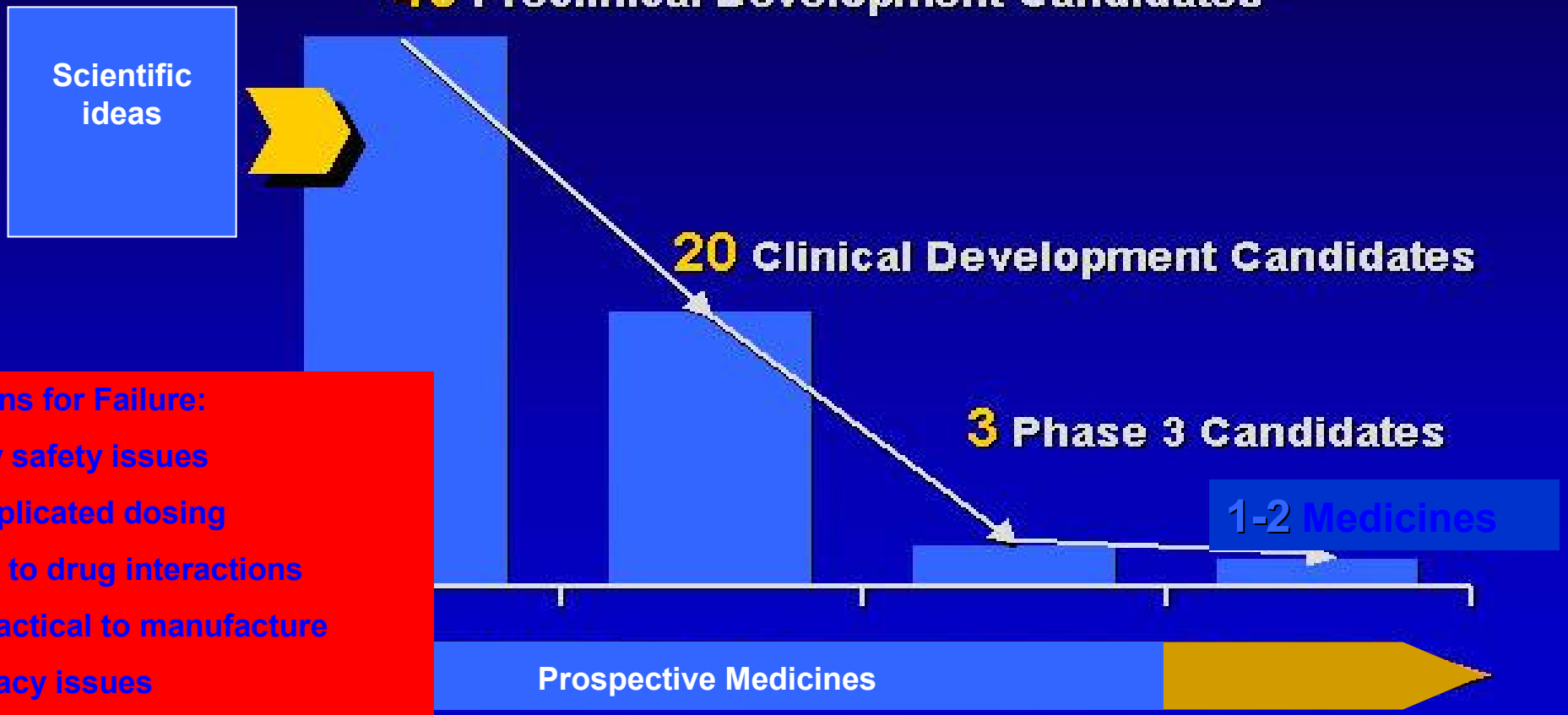
R&D PIPELINE FOR DDW



Source: WHO GBD 2002; MSF/DND Working Group; Pharmaprojects; IOWH; DNDi; Towse

Pharmaceutical R&D - The Challenge

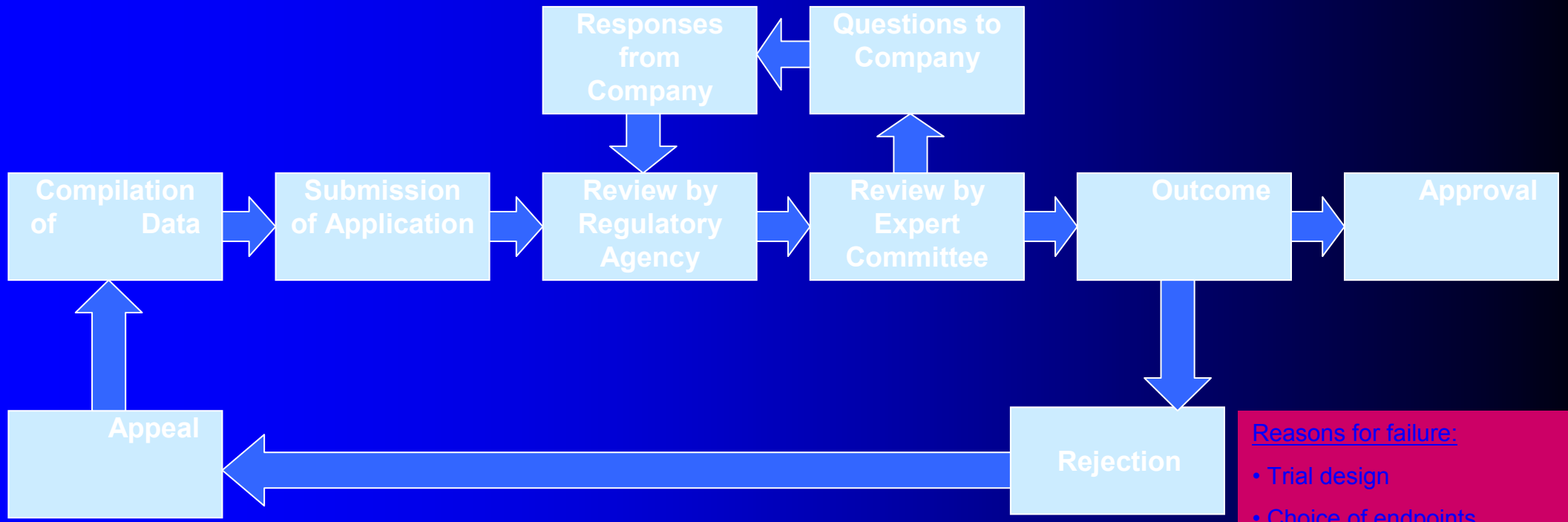
Low Discovery Yields, High Development Failure Rate



Reasons for Failure:

- Early safety issues
- Complicated dosing
- Drug to drug interactions
- Impractical to manufacture
- Efficacy issues
- Side effects
- Lack of medical benefit

Regulatory Approval Process From Submission to Launch Industry Failure Rate around 20%



Reasons for failure:

- Trial design
- Choice of endpoints
- Robustness of data
- Clinical significance of data
- Risk: benefit

EMEA 2004

More incentives for DDW R&D are needed

- Encourage new R&D
- Speed up existing R&D
- Improve regulatory capacity
- Enable faster manufacturing scale up
- Accelerate sustainable access to patients

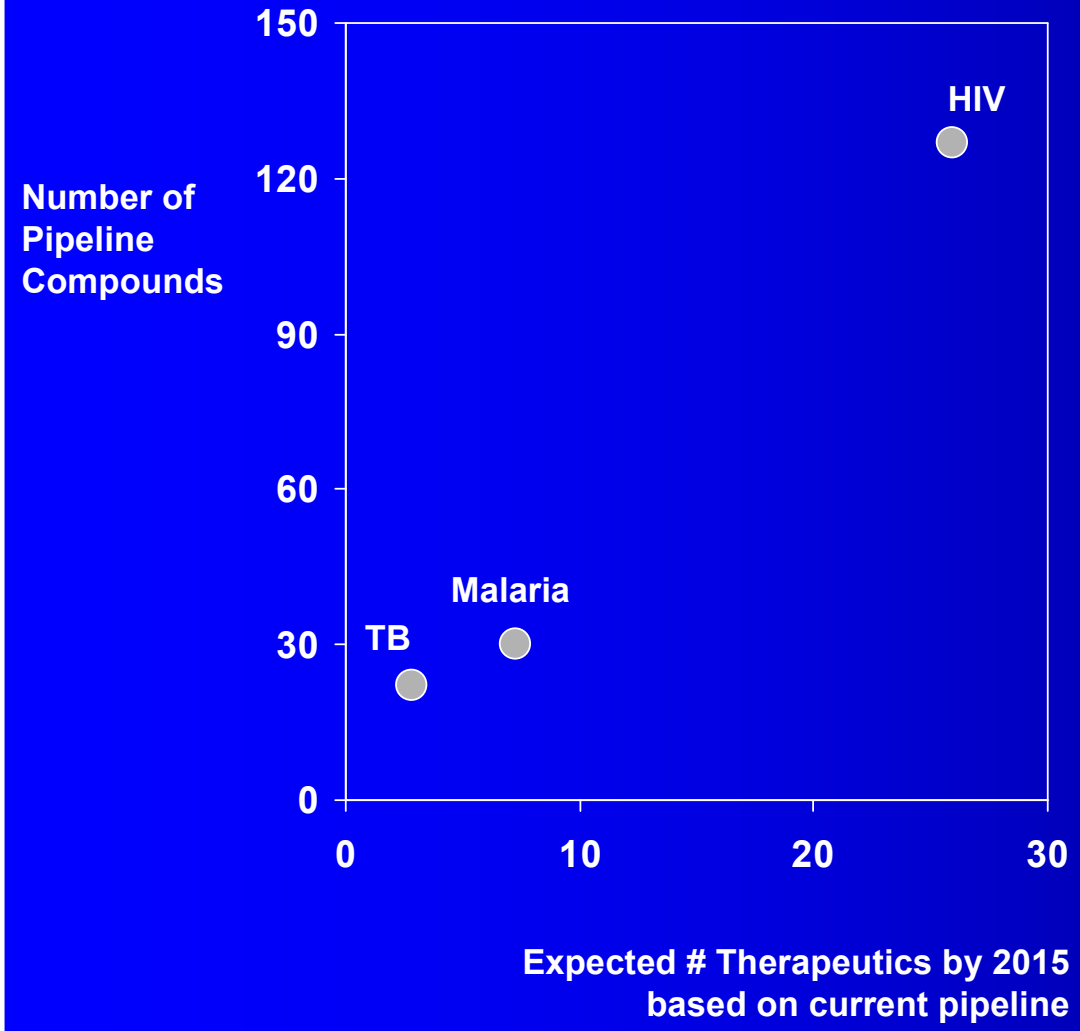
- PUSH – reduce cost, time risk of R&D
- PULL- create markets, reduce unpredictability

Affordability: Mechanisms Are Needed

- **Public-Private Partnerships**
- **Advanced Purchasing Commitments**
- **A Global Fund for Tropical Diseases**
- **Tropical Diseases Drug Act**

Source: “Addressing the Health Needs of the Poorest Populations: Lessons Learned and Remaining Challenges in the Fight Against Neglected Disease.” International Federation of Pharmaceutical Manufacturers Association. October 2004.

WHO 'BIG THREE' HAVE MULTIPLE PIPELINE COMPOUNDS AND COMMITTED RESOURCES ACROSS INDUSTRY AND NON-PROFITS



(1) Includes companies with therapeutics only, not those with vaccines
Source: WHO GBD 2002; MSF/DND Working Group; Pharmaprojects; IOWH; DNDi; Towse

Activities Within Each Disease

- **HIV:**
  - 127 compounds in development from multiple companies
  - hundreds of non-profit programs/ partnerships across industry, NGOs, MLOs, and governments
- **Malaria:**
  - 30 compounds in development from multiple companies and partnerships
  - disease institutes:
    - GSK Tres Cantos Center
  - active PPPs include:
    - Medicines for Malaria Venture
    - Lapdap Antimalarial Product Development
    - Malaria Vaccine Initiative
    - European Malaria Vaccine Initiative
    - Japanese Pharmaceutical, Ministry of Health, WHO Malaria Drug Partnership
- **TB:**
  - 22 compounds in development from multiple companies and partnerships
  - disease institutes:
    - AstraZeneca Bangalore Research Institute
    - Novartis Institute for Tropical Diseases
  - active PPPs include:
    - Global Alliance for TB Drug Development
    - Global TB Vaccine Foundation
    - Foundation for Innovative New Diagnostics

GAPS EXIST WHERE TREATMENT IS POOR, PIPELINES ARE THIN, AND RESOURCES ARE LIMITED

Neglected Diseases	African Trypanosomiasis (HAT)	Chagas Disease	Leishmaniasis	Dengue Fever	Malaria	TB
Disease Burden (in DALYs)	2.1 M	.7 M	2 M	.5 M	45 M	33 M
Current Therapy	Suramin, pentamidine, melarsaprol, eflornithine	Nifurtimox, benznidazole	Miltefosine (new approval), amphotericin B, pentamidine, etc.	None	Multiple- e.g. chlorquine, primaquine, coartem, etc.	DOTS with rifampin, ethambutol, isoniazid, etc.
Limitations	Resistance, serious adverse events, not oral, affordability	Does not treat all stages (only early)	Resistance, compliance, only one oral drug	N.A.	Resistance, affordability, compliance, side effects	Resistance, compliance, side effects
Current Pipeline	Preclinical: 3 Phase I: 1 Phase II: 1 Phase III: 0 Total: 5	Preclinical: 7 Phase I: 0 Phase II: 0 Phase III: 0 Total: 7	Preclinical: 3 Phase I: 0 Phase II: 1 Phase III: 2 Total: 6	Preclinical: 5 Phase I: 2 Phase II: 1 Phase III: 0 Total: 8	Preclinical: 21 Phase I: 1 Phase II: 3 Phase III: 5 Total: 30	Preclinical: 18 Phase I: 2 Phase II: 2 Phase III: 0 Total: 22
PPP	DNDi(1)	DNDi(1), Institute for One World Health	DNDi(1), Institute for One World Health	None	Medicines for Malaria venture, MVI	Global TB alliance, Aeras(2)
Industry Research Institute	None	None	None	Novartis	GSK	AstraZeneca, Novartis, GSK

(1) Drugs for Neglected Diseases Initiative
(2) Global TB Vaccine Foundation

Ideas for Industry R&D Solutions

Form a consortium across industry to deal with truly neglected diseases (i.e. poor/absent therapy, weak pipelines, few committed resources)

Chagas Disease		Dengue Fever
	African Trypanosomiasis	
Leishmaniasis		Schistosomiasis

Leveraging the WHO-Tropical Disease Research Group (TDR) as a third party 'discovery' broker for screening compounds from multiple companies

Building a standalone PPP institute or virtual network across companies for discovery efforts or to develop promising compounds

Creating a noncompetitive market to out-license most promising compounds which are suitable for development to 'non-profit' pharmaceutical development companies (e.g. Institute for One World Health or organizations such as the Bill and Melinda Gates Foundation).

The way forward

- Recognise problems of development and access are complex and multi-faceted
- Avoid simplistic solutions and the ‘blame game’
- Approach in a co-ordinated manner using resources and expertise of key stakeholders
- Recognise vital role of private sector R&D and the need to incentivise it