Neglected Tropical Diseases
New challenges for prequalification

Dr Lorenzo Savioli
Director NTD department
Outline of the presentation

- Characteristics of NTDs. Public health interventions
- List of NTDs targeted by WHO and TDR
- Existing partnerships for access and for R&D
- Assessment of current interventions and needs
- Possible way forward for discussion
Group of circa 15 tropical infectious diseases which cause immense suffering:

- life-long disabilities
- impair childhood growth and development
- promote poverty, impair education and economic development
- do not receive attention and funding as do “the big three” (AIDS, TB, malaria)
- Evidence that they increase morbidity and transmission of “the big three”
- The “bottom billion” are most at risk affecting the poorest of the poor in rural and urban areas of low-income countries
The Neglected Tropical Diseases

Diseases of Poverty with High Disease Burden

530,000 Deaths Annually

57 Million DALYs

Deaths

- Neglected Diseases: 20%
- Other infectious diseases: 29%
- HIV/TB/Malaria: 51%

DALYs

- Neglected Diseases: 24%
- Other infectious diseases: 30%
- HIV/TB/Malaria: 46%
Public health interventions

Transmission control

- Integrated Vector Management
- Veterinary Public Health
- Water & Environmental sanitation

Preventive chemotherapy

- Soil-transmitted helminths
- Schistosomiasis
- Lymphatic filariasis
- Onchocerciasis
- Trachoma
- FBTs, cysticercosis, ...

Access to case management, surgery and chronic care

- African trypanosomiasis
- Leishmaniasis
- Dengue
- Chagas Disease
- Rabies
- Buruli ulcer
- Yaws
- Leprosy
- LF
- Schistosomiasis
- Trachoma

Education for behavioural change

Link with other large scale interventions and their delivery channels
Neglected Tropical Diseases

- **Protozoan Infections**
  - Leishmaniasis (VL, CL and MCL)
  - Human African trypanosomiasis (sleeping sickness)
  - Chagas disease

- **Helminth Infections**
  - Soil-transmitted helminth infections
    - Ascariasis-Trichuriasis-Hookworm
  - Lymphatic filariasis (elephantiasis)
  - Onchocerciasis (river blindness)
  - Schistosomiasis
  - Dracunculiasis (guinea-worm disease)
  - Cysticercosis and other zoonotic helminthiasis

- **Viral Infections**
  - Dengue & dengue haemorrhagic fever

- **Bacterial Infections**
  - Leprosy
  - Trachoma
  - Buruli ulcer
Large scale interventions
- Lymphatic filariasis
  - Leprosy
  - Onchocerciasis
  - Schistosomiasis
  - Helminthiasis
  - Fascioliasis
  - Trachoma
  - Yaws

Rapid Impact Interventions
Improving access

Case management and development of new tools
- Human African trypanosomiasis
- Chagas diseases
- Buruli ulcer
- Leishmaniasis

Focused interventions
Improving innovation
Pharmaceutical Donation Programmes

**Merck & Co Inc**
Mectizan for as long as needed for onchocerciasis and filariasis in Africa

**Johnson & Johnson**
Mebendazole for intestinal worms

**Pfizer**
Azithromycin for trachoma 120 million doses

**THROUGH WHO:**

**Novartis**
MDT and clofazimine for leprosy; triclabendazole for fascioliasis

**GlaxoSmithKline**
Albendazole for lymphatic filariasis at least to 2020

**Sanofi Aventis**
Eflornithine and melarsoprol support for sleeping sickness treatment

**Merck KGaA**
Praziquantel for schistosomiasis to 2017

Department of Neglected Tropical Disease Control (NTD)
<table>
<thead>
<tr>
<th>Disease</th>
<th>Currently used drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chagas disease</td>
<td>Nifurtimox, Benznidazole</td>
</tr>
</tbody>
</table>
| Human African trypanosomiasis (Sleeping sickness) | *Early stage*: Pentamidine, Suramin  
*Late stage*: Eflornithine, Melarsoprol, Combination Nifurtimox-eflornithine |
| Leishmaniasis                                | *Visceral L.*: Ambisome, Paromomycin, Miltefosine  
*Cutaneous L.*: Glucantine, SSG                     |
<p>| Cysticercosis, zoonotic helminthiasis        | Praziquantel, Triclabendazole                            |
| Guinea-worm disease                          | -                                                         |
| Lymphatic filariasis                         | Albendazole, Ivermectin, DEC                             |
| Onchocerciasis (River blindness)             | Ivermectin                                               |
| Schistosomiasis                              | Praziquantel                                             |
| Soil-transmitted helminth infections (ascariasis, trichuriasis, hookworm) | Albendazole/Mebendazole, Pyrantel, Levamisole           |
| Buruli ulcer                                 | Rifampicin, Streptomycine, Clarithromycine, Moxifloxacine |
| Leprosy                                      | MDT (Rifampicin, clofazimine, dapsone)                   |
| Trachoma                                     | Tetracycline eye ointment, Azythromycin                  |
| Yaws                                         | Benzathine penicillin                                   |
| Dengue, Dengue haemorrhagic fever            | Need for antiviral drugs                                 |</p>
<table>
<thead>
<tr>
<th>Disease</th>
<th>Diagnostic tool</th>
<th>Paediatric formulation</th>
<th>Increased safety</th>
<th>Reduced treatment cost</th>
<th>Pharmaco-vigilance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chagas disease</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Sleeping sickness</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Leishmaniasis</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Buruli ulcer</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Leprosy</td>
<td>High</td>
<td>Low</td>
<td>-</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Trachoma</td>
<td>Moderate</td>
<td>Low</td>
<td>-</td>
<td>Moderate</td>
<td>Low</td>
</tr>
<tr>
<td>Yaws</td>
<td>Low</td>
<td>High</td>
<td>-</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>Lymphatic filariasis</td>
<td>High</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Onchocerciasis</td>
<td>Moderate</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Schistosomiasis</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>Soil-transmitted helminth infections</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Zoonotic helminthiasis</td>
<td>Moderate</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Guinea-worm disease</td>
<td>None</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Dengue</td>
<td>High</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
The way forward?

- **Protozoan Infections**
  - Leishmaniasis (VL, CL and MCL)
  - Human African trypanosomiasis (sleeping sickness)
  - Chagas disease

- **Helminth Infections**
  - Soil-transmitted helminth infections
    - Ascariasis-Trichuriasis-Hookworm
  - Lymphatic filariasis (elephantiasis)
  - Onchocerciasis (river blindness)
  - Schistosomiasis
  - Dracunculiasis (guinea-worm disease)
  - Cysticercosis and other zoonotic helminthiasis

- **Bacterial Infections**
  - Leprosy
  - Buruli ulcer

PDPs

Industry collaboration
Animal and Human health

Piggy bag TB research
The need for prequalification

- Today, large scale donations are disease specific
- Huge gaps in terms of coverage, and drug needed
- Increase in demand for anthelminthic drugs will reduce global availability of critical raw materials
- Very few generic companies are interested (no market)
- Essential drugs are still not accessible or affordable (DEC, Praziquantel, Mebendazole). Albendazole, Ivermectin, Triclabendazole, Praziquantel are only selectively donated
- Patchy orders and procurement lead to long delay, questionable quality and high prices
Why prequalification of NTD medicines would be important and feasible?

- Hundreds million treatments are administered annually, mostly to children
- Apply unified standards of acceptable quality, safety and efficacy to NTD medicines (branded and generic)
- Evaluate the quality, safety and efficacy of NTD medicines produced (donated or non donated) by brand name and generic companies
- The number of products is limited. The number of producers is limited. The producers of API is even more limited