

The Drug Pipeline

Patients in developing countries often don't receive the treatment they need.

This is due to 3 important reasons:

1. **Discovery gap:** lack of research concerning tropical diseases
2. **Development gap:** drugs against neglected diseases aren't developed because they don't promise enough profits for companies
3. **Delivery gap:** patent laws make medications too expensive for patients in developing countries

This medical supply pipeline is full of leaks and gaps.

Throw the dice to find out which sickness you have.

1. Chagas disease
2. Tuberculosis
3. Malaria
4. Diabetes
5. Hypertension (High blood pressure)
6. Erectile dysfunction

The board will be tilted accordingly.

Now put your money in and see if your treatment arrives...

1. Chagas disease



An acute Chagas disease infection with swelling of the right eye. Source: CDC.

Chagas disease (also called American trypanosomiasis) is a tropical parasitic disease caused by the *Trypanosoma cruzi*. It is commonly **transmitted to humans** and other mammals by an insect vector, the **blood-sucking bugs** of the subfamily Triatominae. The disease may also be spread through **blood transfusion** and organ transplantation, ingestion of food contaminated with parasites, and **from a mother to her fetus**.

Chagas disease is contracted primarily in the **Americas**, particularly in poor, rural areas of Mexico, Central America, and South America. It is estimated that as many as **8 to 11 million** people in Mexico, Central America, and South America have Chagas disease, most of whom **do not know** they are infected.

There are two approaches to treating Chagas disease, antiparasitic treatment, to **kill the parasite**; and symptomatic treatment, to **manage the symptoms** and signs of infection.

2. Tuberculosis



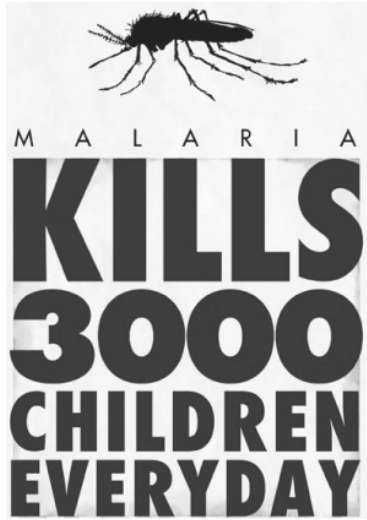
Patient with drug-resistant Tuberculosis gets treatment in Thailand. AP Photo-David Longstreath

Tuberculosis is a common and often deadly infectious disease caused by various strains of **mycobacteria**. It usually attacks the lungs but can also affect other parts of the body. It is **spread through the air** when people who have the disease cough, sneeze, or spit. Most infections in humans result in an asymptomatic, latent infection, and about one in ten latent infections eventually progresses to active disease, which, if left untreated, kills **more than 50% of its victims**.

One third of the world's population is thought to be infected with tuberculosis and new infections occur at a rate of about one per second. The distribution of tuberculosis is not uniform across the globe; about **80%** of the population in many **Asian and African countries** test positive in tuberculin tests, while only **5-10%** of the **US** population test positive.

Multidrug-resistant tuberculosis is resistant to most first-line medications, the use of second-line medications is necessary to cure the patient. However, **the price of these medications is high**; thus poor people in the developing world have no or limited access to these treatments.

3. Malaria



The majority of deaths are of young children in sub-Saharan Africa. Source: handsonblog.org.

There are more than **225 million cases of malaria**, killing around 781,000 people each year (**90% in sub-Saharan Africa**). The majority of deaths are of young children in sub-Saharan Africa.

Malaria transmission can be reduced by **preventing mosquito bites** by distribution of inexpensive mosquito nets and insect repellents, or by mosquito-control measures such as spraying insecticides inside houses. Although many are under development, the challenge of **producing a widely available vaccine** that provides a high level of protection for a sustained period is still to be met.

Malaria is a **mosquito-borne infectious disease** of humans caused by eukaryotic protists of the genus *Plasmodium*. It is widespread in **tropical and subtropical regions**, including much of Sub-Saharan Africa, Asia and the Americas. The disease results from the multiplication of malaria parasites within red blood cells, causing symptoms that typically include fever and headache, in severe cases progressing to coma, and death.

4. Diabetes



Insulin injection. Source : www.dailymail.co.uk

Diabetes mellitus, is a group of metabolic diseases in which a person has **high blood sugar**, either because the body does not produce enough insulin, or because cells do not respond to the insulin that is produced. This high blood sugar produces the classical symptoms of **polyuria** (frequent urination), **polydipsia** (increased thirst) and **polyphagia** (increased hunger).

All forms of diabetes have been treatable since **insulin became available in 1921**, and type 2 diabetes may be controlled with medications.

Several countries established more and less successful **national diabetes programmes** to improve treatment of the disease. In 1980, U.S. biotech company Genentech developed human insulin. The insulin is isolated from genetically altered bacteria, which produce large quantities of insulin. The **purified insulin is distributed to pharmacies** for use by diabetes patients.

5. Hypertension



Taking a patient's blood pressure is one of the most frequent diagnostic task
Source: welchallyn.com

Hypertension or **high blood pressure** is a cardiac chronic medical condition in which the systemic arterial blood pressure is elevated. It is the opposite of hypotension. Hypertension is classified as either primary (essential) or secondary. About 90–95% of cases are termed "primary hypertension", for which no medical cause can be found. The remaining 5–10% of cases are caused by other conditions that affect the kidneys, arteries, heart, or endocrine system.

In 2005, the World Hypertension League initiated a global awareness campaign and dedicated May 17 of each year as **World Hypertension Day (WHD)**. Over the past three years, a lot of national societies have been engaging in WHD and have been innovative in their activities to **get the message to the public**. During this day, in **partnership with their local governments, professional societies, nongovernmental organizations and private industries**, they promoted hypertension awareness among the public through several media and public rallies. The message reached more than **250 million people**.

6. Erectile Dysfunction



Vacuum Therapy (Penis pump). Source : sexual-issues.blogspot.com

Erectile dysfunction (ED, "male impotence") is sexual dysfunction characterized by the inability to develop or maintain an erection of the penis sufficient for satisfactory sexual performance.

Erectile dysfunction affects 15 to 30 million American men.

Advances in suppositories, injectable medications, implants, and vacuum devices have expanded the options for men seeking treatment for ED. These advances have also helped increase the number of men seeking treatment. Gene therapy for ED is now being tested in several centers and may offer a long-lasting therapeutic approach for ED.