

Locational Facts

- Beni is a city in northeastern Democratic Republic of Congo, lying immediately west of the Virunga National Park and the Rwenzori Mountains, on the edge of the Ituri Forest.
- The Democratic Republic of the Congo is currently experiencing civil unrest, with Beni suffering an attack from the ISIL on June 3rd, 2019.
- Beni is near Mangina, which is the epicenter of the 2018-2019 Kivu Ebola outbreak.
- The Democratic Republic of the Congo is believed to be the source of Monkeypox.
- There is high biodiversity in the area surrounding Beni, including primates which can harbor infectious zoonotic viruses.



Essential Medicines for Beni, Democratic Republic of the Congo

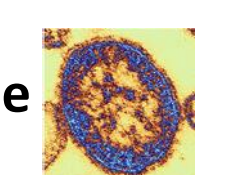

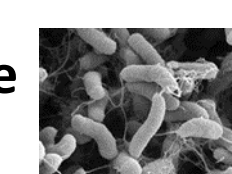





Thomas Falkenhausen, Abbey Warren, Darius Green, and Marlie Kolb

https://en.wikipedia.org/wiki/World_Health_Organization

Abstract

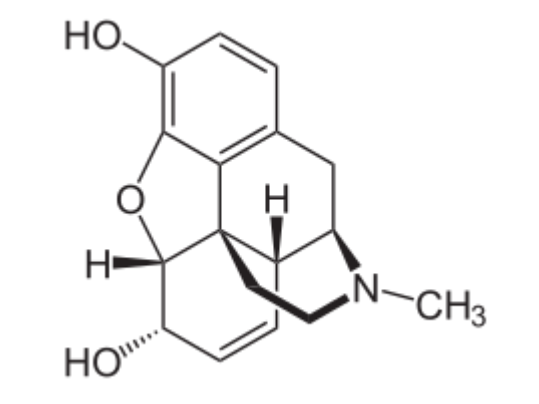
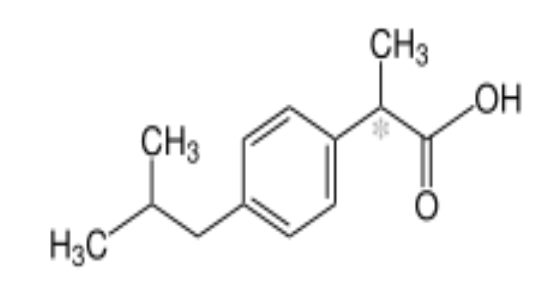
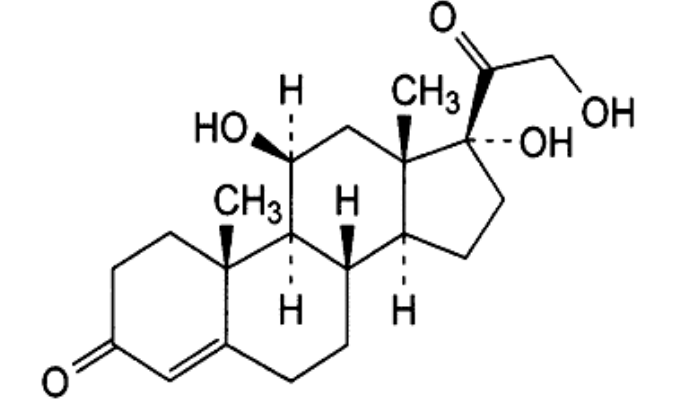
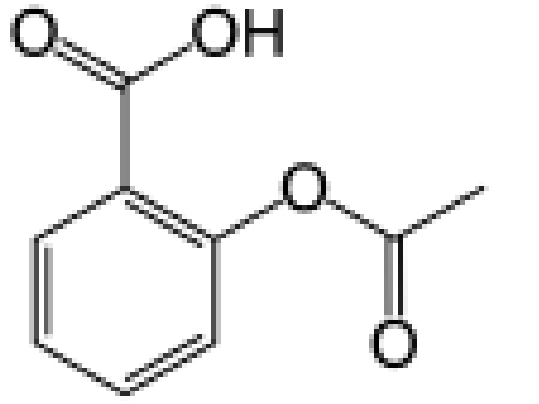
Beni is a city in the northeastern Democratic Republic of the Congo. Currently Congo is suffering from civil unrest, including Beni, which was attacked by the ISIL in 2019. One of the major health issues currently impacting Beni is Ebola. Malaria is also the source of the most deaths in the DRC in a year, with other major illnesses including Cholera, Diphtheria, African Sleeping Sickness, and respiratory illnesses. Due to the geographic location of Beni and its impoverished status, several groups from the WHO's list of essential medicines were thrown out after being deemed a low priority for combating disease in Beni, these categories were Diuretics, Peritoneal Dialysis, Eye Preparations, Diagnostic Agents, Medicines for mental and behavioral health, and medicines for diseases of joints. Using the WHO list of Essential medicines as a base, 50 medications were chosen to combat the major illnesses facing Beni. Along with drugs, vaccines and supportive care and antiseptics were also chosen. Supportive care is an important combative for diarrhea and hemorrhagic fevers, while antiseptics are important to have in a country that could prove lacking in clean medical facilities.

Vaccines and Immunological Medications

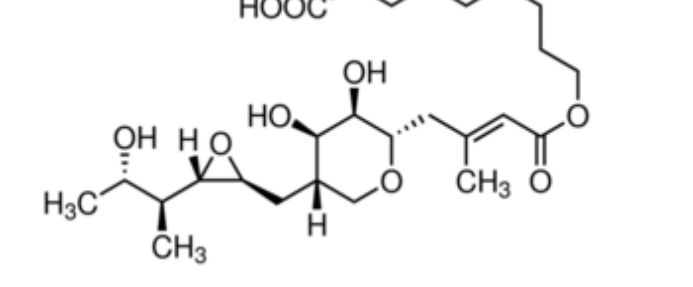
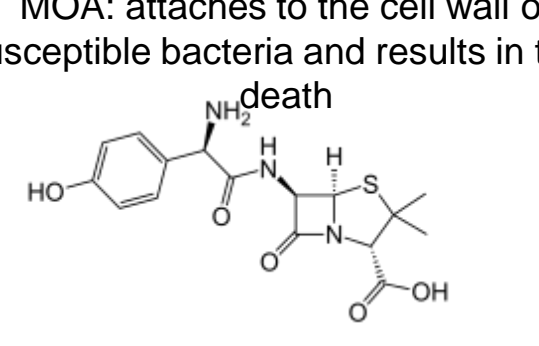
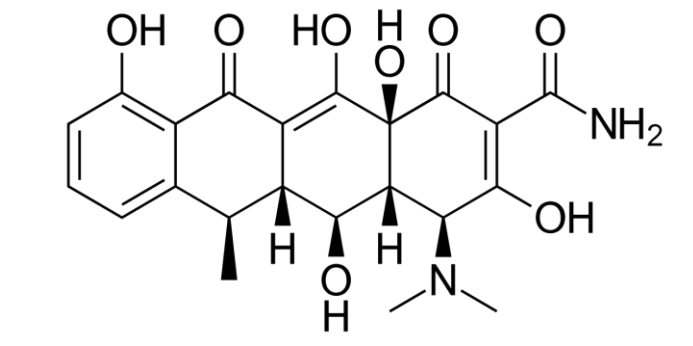
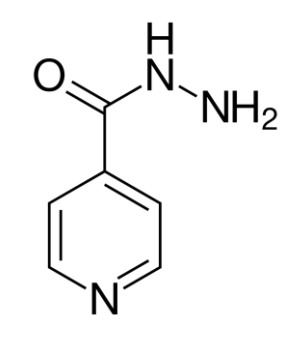
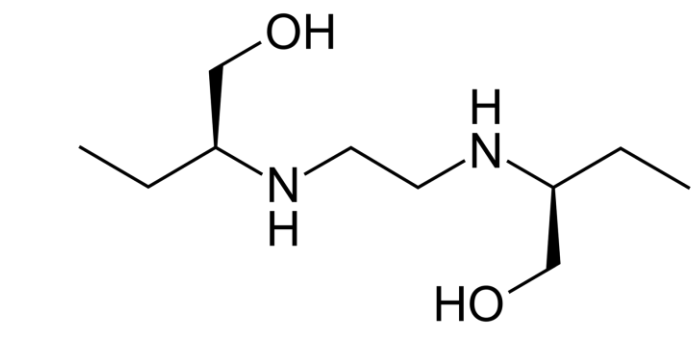
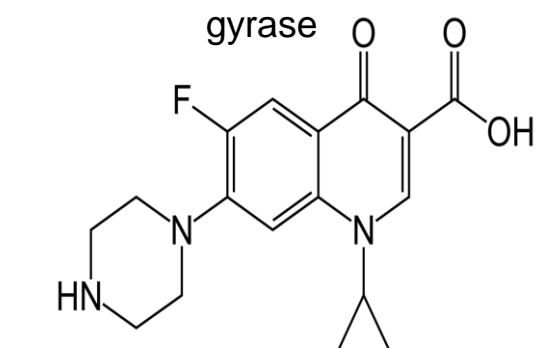
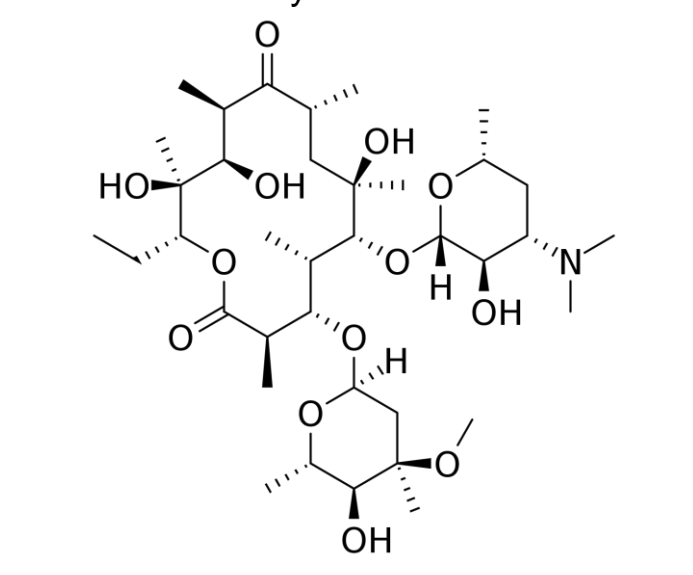
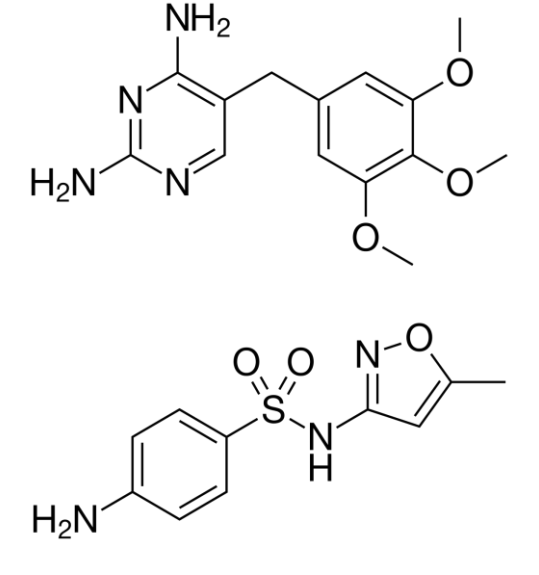
Measles Vaccine 	BCG Vaccine 
Cholera Vaccine 	Yellow Fever Vaccine 
Tetanus Vaccine 	Influenza Vaccine 
Anti-Rabies Immunoglobulin 	Diphtheria Vaccine 

rVSV vectored glycoprotein (VSV-EBOV)
MOA: A vaccine based on the vesicular stomatitis virus which was genetically modified to express a surface glycoprotein of Zaire Ebola virus

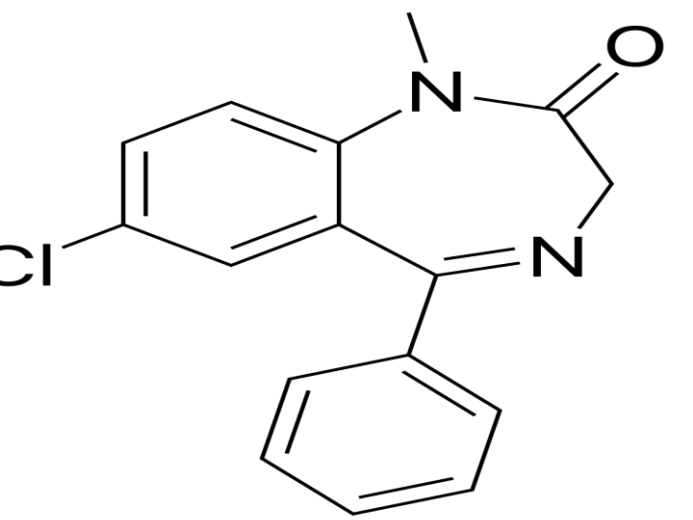
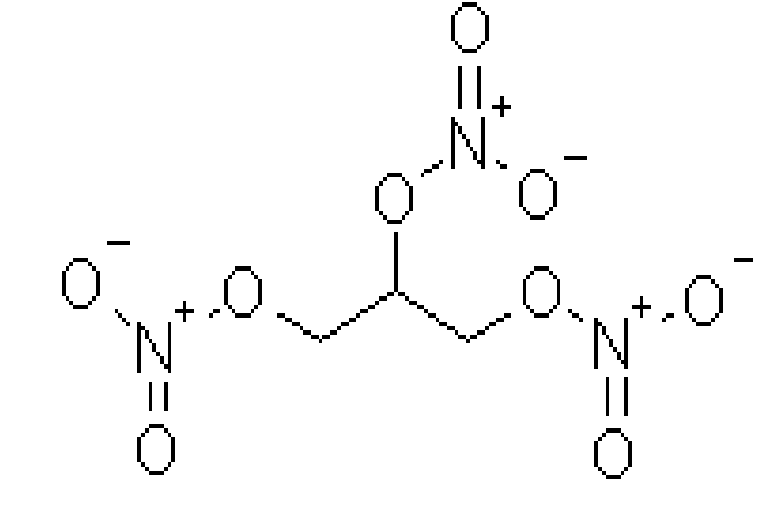
Painkillers & Anti Inflammatory

Morphine MOA: It acts directly on the central nervous system (CNS) to decrease the feeling of pain 	Ibuprofen MOA: COX-1 and COX-2 inhibitor 
Hydrocortisone (Anti Inflammatory) MOA: Stimulates production of glucocorticoids which inhibit the production of inflammatory products 	Aspirin (Pain) MOA: Suppresses prostaglandin and thromboxane production. 

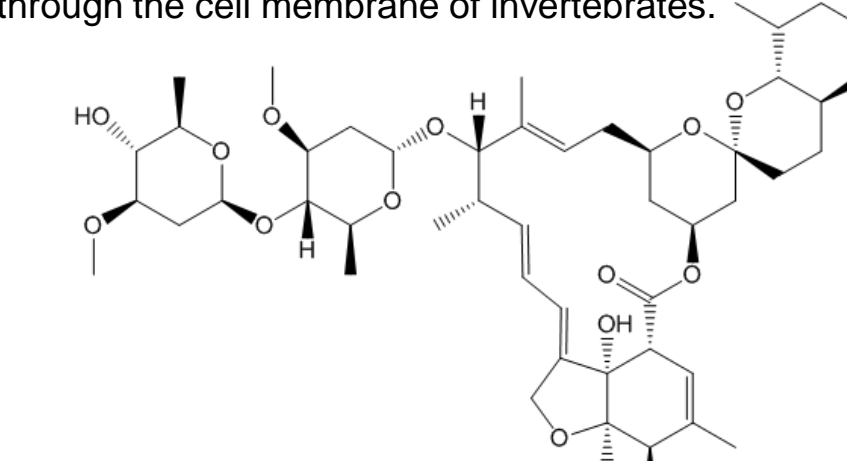
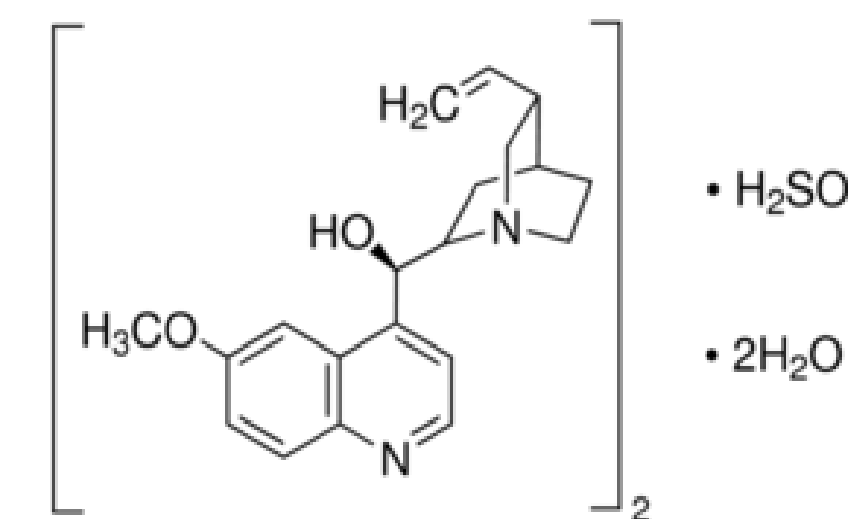
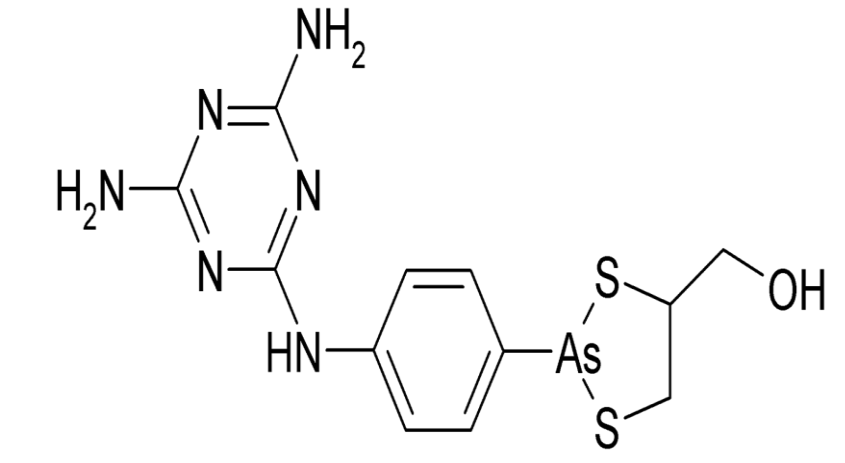
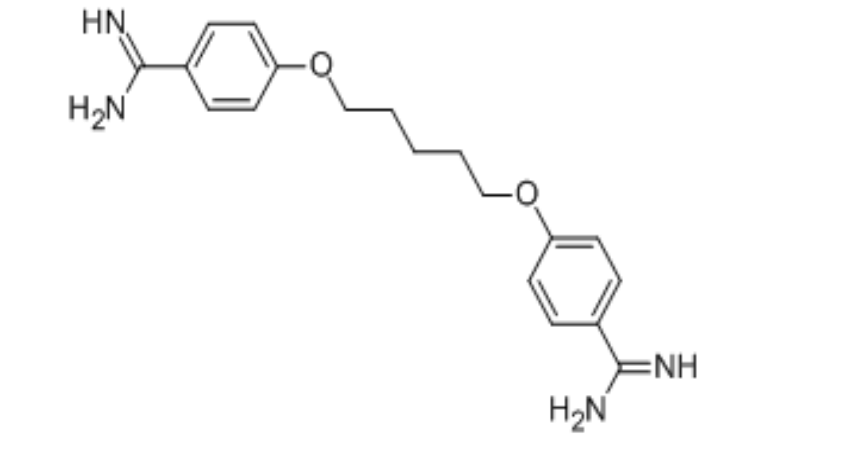
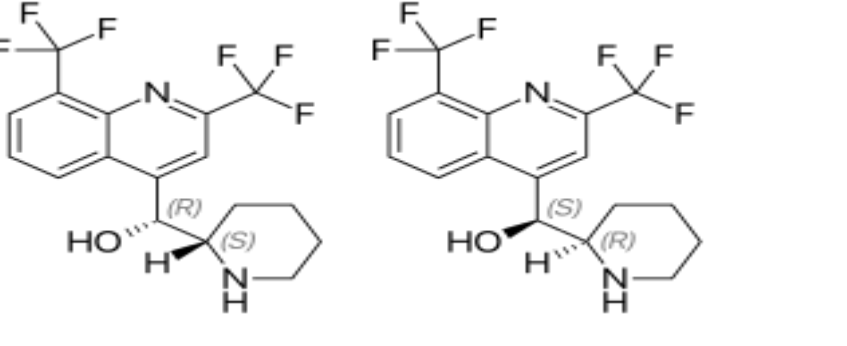
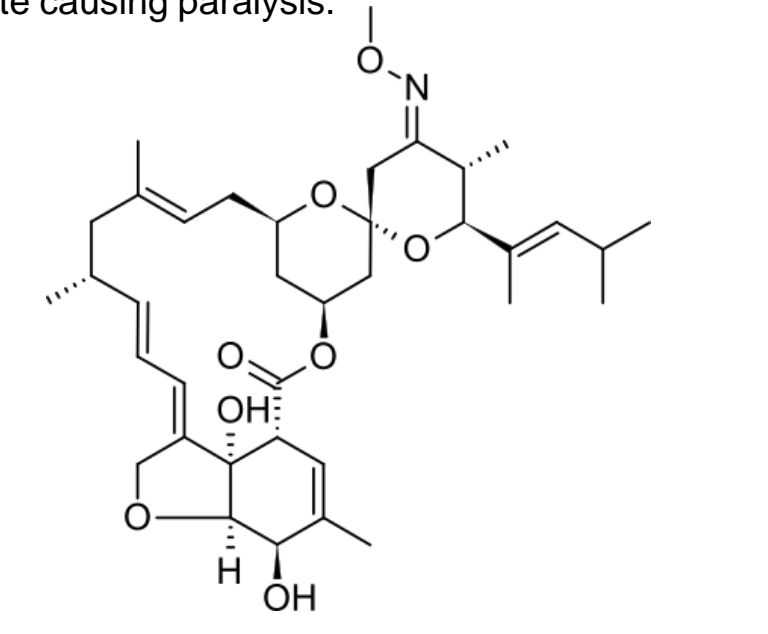
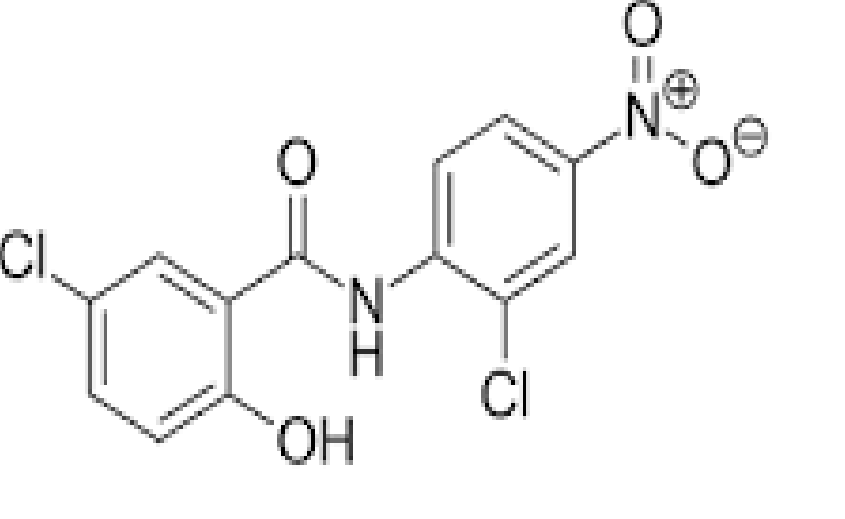
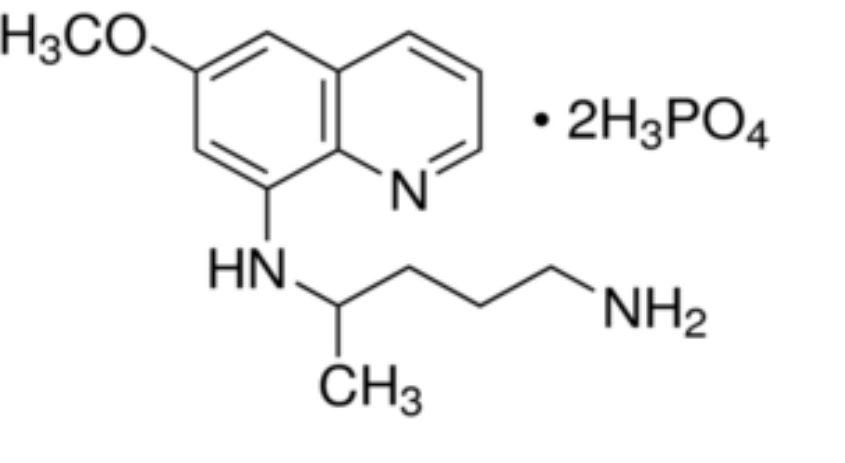
Antibiotics

Mupirocin (Antibiotic) MOA: Reversibly binds to bacterial isoleucyl transfer-RNA (tRNA) synthetase, inhibiting the conversion of tRNA and leucine to isoleucyl tRNA 	Amoxicillin (Antibiotic) MOA: attaches to the cell wall of susceptible bacteria and results in their death 
Doxycycline (Malaria/Bacterial Infections) MOA: Inhibit translation by binding to the 16s subunit of ribosomes. 	Isoniazid (TB) MOA:inhibits the formation of the mycobacterial cell wall 
Ethambutol (TB) MOA: bacteriostatic against actively growing TB bacilli. It works by obstructing the formation of cell wall. 	Ciprofloxacin (Cholera and other bacterial infections) MOA:Inhibits bacterial topoisomerase and gyrase 
Erythromycin (Diphtheria) MOA: Bacteriostatic, binds to 50s subunit of ribosome preventing protein synthesis. 	Bactrim (Bacterial Infection) MOA: Inhibits synthesis of dihydrofolic and tetrahydrofolic acid 

Other Medications

Diazepam (Tetanus) MOA: GABA modulator, enhances inhibitory effects 	Glyceryl Trinitrate (Antiangia for Ischemic heart disease) MOA: Smooth muscle dilator 
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Antiparasitic

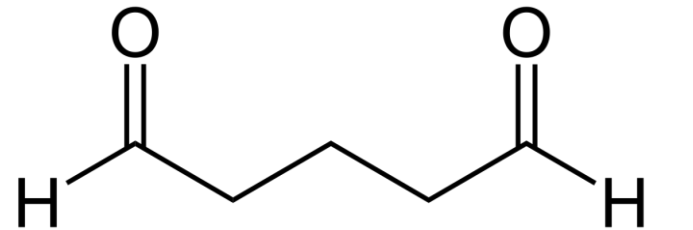
Ivermectin (Scabies) MOA: Causes an influx of Chloride ions through the cell membrane of invertebrates. 	Quaiaquin (Malaria) MOA: Inhibits nucleic acid and protein synthesis and glycolysis. 	Melarsoprol (African Trypanosomes) MOA: Pyruvate kinase and trypanothione reductase inhibitor 	Pentamidine (African Sleeping Sickness and Toxoplasmosis) MOA: DNA, RNA, protein, and phospholipid synthesis inhibitor. 
Mefloquine (Malaria) 	Moxidectin (River Blindness) MOA: Increases Chloride permeability of parasite causing paralysis. 	Nicosamide (Tapeworm) MOA: Inhibits glucose uptake, oxidative phosphorylation, and anaerobic metabolism. 	Primaquine (Malaria) MOA: Gametocidal Drug 

Preventative and Supportive Care

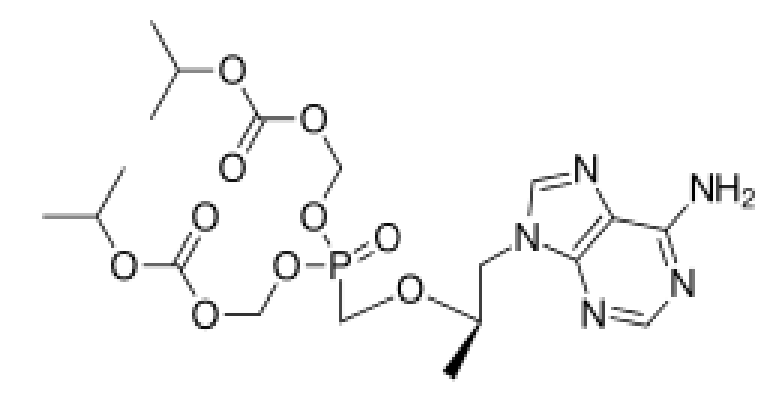
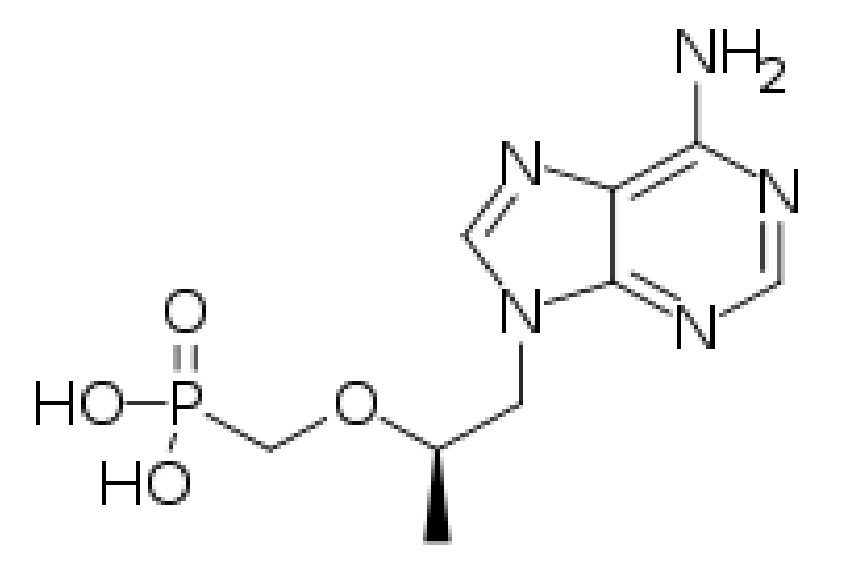
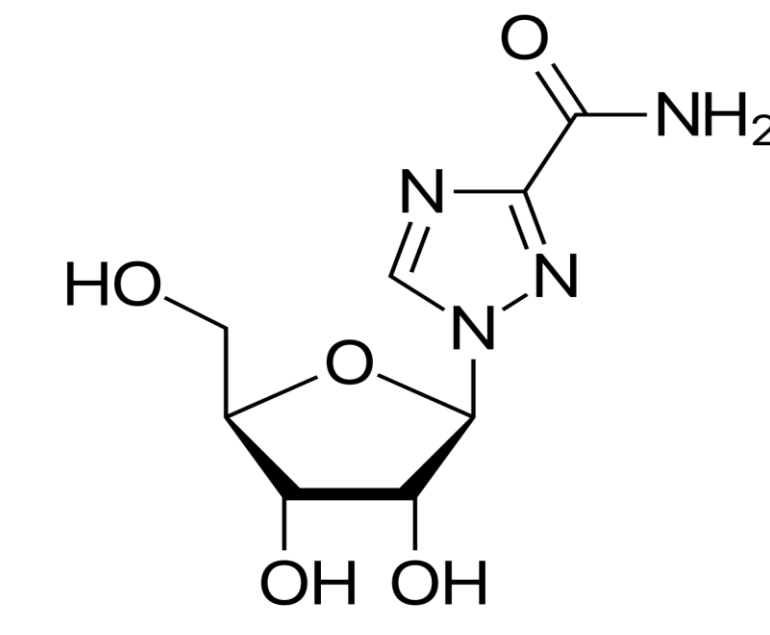
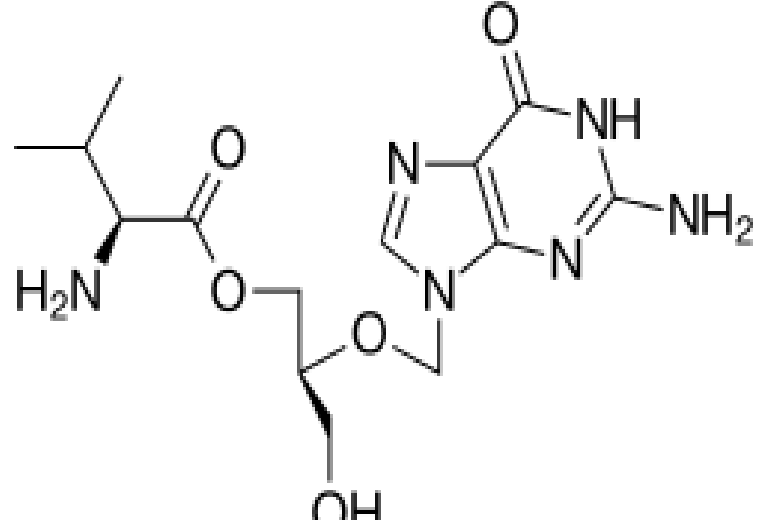
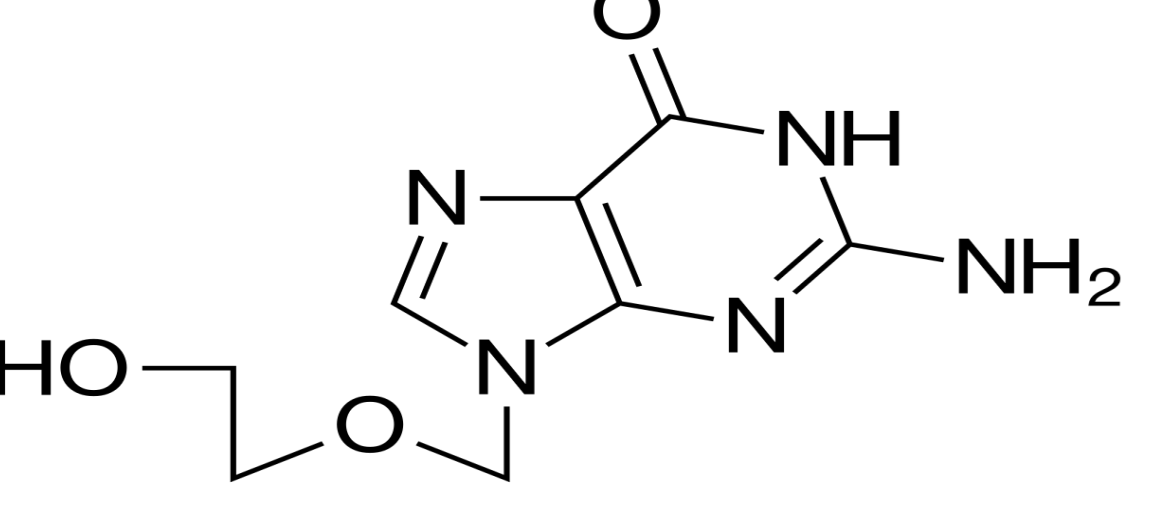
- Retinol (Vitamin A for Measles supportive care)**
- Packed Red Blood Cells**
MOA:For sickle cell blood transfusion
- Whole Blood**
MOA:For hemorrhaging such as from ebola
- Zinc Sulfate (Dehydration/Diarrhea)**
- Oral Rehydration Salts (Dehydration/Diarrhea)**

Antiseptics

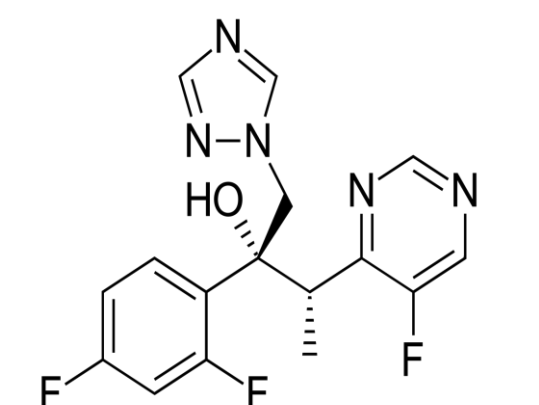
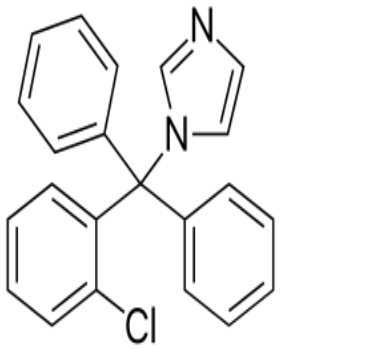
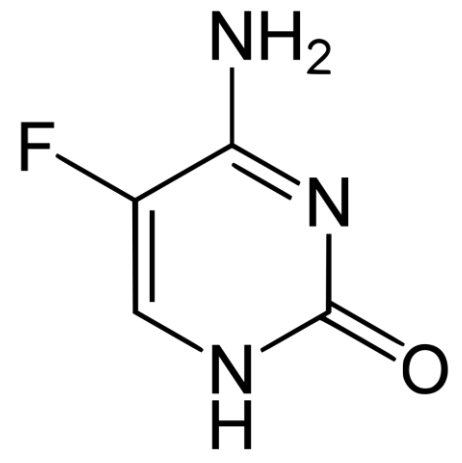
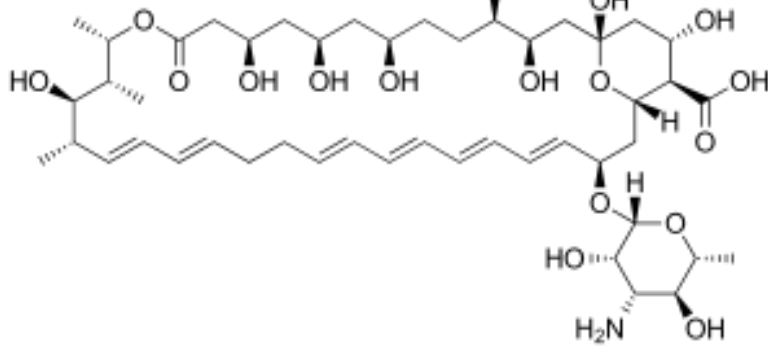
Chlorine releasing compound
Disinfectant

Glutaral (Antiseptic)


Antivirals

Emtricitabine/tenofovir (PREP for HIV) MOA: Reverse transcriptase inhibitor 	Tenofovir disoproxil (HIV) MOA: Reverse transcriptase inhibitor 	Ribavirin (Congo-Crimean Hemorrhagic Fever) MOA: Guanosine Analog 
Valganciclovir (Viral Hemorrhagic Fevers/Hepatitis C/RSV) MOA: Guanosine analog 	Acyclovir (Herpes) MOA: Inhibits DNA polymerase 	

Antifungals

Voriconazole (Antifungal) MOA: binds and inhibits ergosterol synthesis by inhibiting CYP450-dependent 14-alpha sterol demethylase. The inhibition of 14-alpha sterol demethylase results in a depletion of ergosterol in fungal cell membrane. 	Clotrimazole (Antifungal) MOA:It binds to phospholipids in the cell membrane and inhibits the biosynthesis of ergosterol and other sterols required for cell membrane production 
Flucytosine (Antifungal) MOA: Purine and Pyrimidine uptake inhibitor 	Nystatin (Antifungal) MOA:It binds to ergosterol, a major component of the fungal cell membrane. When present in sufficient concentrations, it forms pores in the membrane that lead to K+ leakage, acidification, and death of the fungus. 

Non-essential Drug Groups

These are the WHO groups we decided to exclude.

- Peritoneal Dialysis Solution**
It is an expensive procedure for our rural location. Our location also lacks the necessary equipment for this procedure.
- Eye Preparations**
Non-essential group because a majority of the major diseases do not affect the eye.
- Medicines for mental and behavioral disorders**
Due to the current issues, physical health is prioritized over mental health.
- Medicines for diseases of joints**
NSAIDs can be used for joint pain, so there is not a need for specific joint pain medications.
- Diuretics**
Malnourishment and dehydration are a major concern, so the removal of water is not advised.
- Diagnostic Agents**
It is a first world commodity.