Janssen Global Public Health & the contribution towards deworming efforts for children

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JNJ Philanthropic organization created in 2013 committed to advancing global health and well-being through focused, innovative approaches toward research & development to treat and prevent neglected diseases and provide sustainable access for our medicines.
The **Millennium Development Goals (MDGs)**: eight international development goals that were officially adopted at the Millennium Summit of the United Nations in 2000.

All 193 United Nations member states and at least 23 international organizations have agreed to achieve these goals by the year 2015. The goals are:

1. **Eradicate extreme poverty and hunger**
2. **Achieve universal primary education**
3. **Promote gender equality and empower women**
4. **Reduce child mortality**
5. **Improve maternal health**
6. **Combat HIV/AIDS, malaria, and other diseases**
7. **Ensure environmental sustainability**
8. **Global partnership for development**

J&J responded to the UN Secretary General’s Call-to-Action for a renewed global effort to advance the Millennium Development Goals. Our comprehensive commitment to maternal and child health aims to increase life expectancy and quality-of-life for as many as 120 million women and children a year.

Focuses on four key impact areas:
- Maternal and infant health
- **Intestinal worms in children**
- Mobile health for mothers
- R&D Innovations for diseases including HIV and TB
Soil Transmitted Helminths

• Approximately 1.4 billion (~25%) of the world’s population is infected with one or more Soil Transmitted Helminths (STH: whipworm, roundworm, hookworm) which are considered neglected tropical diseases

• The burden of disease falls disproportionately on the poor in developing countries, especially children

• More than 850 million children are infected or living in endemic areas

• Chronic effects of worm infestation:
  - Iron-deficiency anemia, dysentery syndrome, impaired growth, intellectual development and school performance
Over 175 different organizations identified with potential link and role in STH control, for deworming and other approaches.

### Academia/research institute
- LSTM
- CDC
- Imperial College London
- Department of Infectious Disease
- University of Washington
- University of Michigan
- Swiss TPH

### Intergovernmental organization (e.g., WHO)
- World Health Organization
- Regional Office for South-East Asia
- World Health Organization
- UNICEF
- WFP

### NGDOs and Advocacy
- Human Rights Watch
- Action
- UW Medicine School of Medicine

### Endemic country governments
- Department of Infectious Disease Epidemiology

![Proportion of children (1-14 years of age) in the country requiring preventive chemotherapy (PCT) for soil-transmitted helminthoses, worldwide, 2011](chart)

### Donor country government
- USAID
- NIH
- NIAID
- National Institutes of Health

### Other donors (e.g., foundations)
- UBS
- Weltweit
- Sabin Foundation
- Europe

### Pharma/drug manufacturer
- GlaxoSmithKline
- Johnson & Johnson
- Merck

### PDP (product development partnerships)
- DNDi

Note: Not comprehensive - illustrative.
Public Health Interventions to Control STH Infections

- Improve sanitation and hygiene
- Availability of clean water
- Health education
- Administration of drug therapy to whole populations via mass drug administration programs (MDA)

**WHO goals:**

- Reduce worm burden in the 10%-15% of children who are most heavily infected in a particular population and to keep it low through repeated treatments

Background: Vermox® (mebendazole)

- Developed by Janssen Pharmaceuticals
  - First approved in 1969
- Listed in *WHO Model List of Essential Medicines for Children*
- Indicated for soil transmitted helminths
- Marketed in 132 countries

- **No global program to assure that children had access to deworming treatment**
Children Without Worms
Sustainable solutions to treat infected children

Partnership founded by J&J in 2005 in collaboration with the Task Force for Global Health dedicated to the treatment of children with STH

- Partner with WHO to collaborate and coordinate the global supply of medicines for intestinal worms
- Facilitate and oversee distribution via mass drug administration in schools
- Provide technical support to endemic countries to expand their delivery capacities

Partnership for Treating and Preventing Intestinal Worms
ChildrenWithoutWorms
Public and Private Partners join to eliminate NTDs

January 30, 2012

London Declaration on Neglected Tropical Diseases

Johnson and Johnson joined the World Health Organization, 12 other pharmaceutical companies, the Bill and Melinda Gates Foundation, the US and UK governments, World Bank and officials from endemic countries to eliminate or control, by the end of the decade, 10 neglected tropical diseases (NTDs) that affect more than a billion people in the world.
Expanded Donation Program

- Commitments for the London Declaration in 2012
  - Donate 200 million doses of Vermox yearly through 2020
- Achieve the WHO coverage target of 75% of all infected or at risk school age children in recipient countries
  - Expand program to 20-30 endemic countries
- Develop partnerships and lay groundwork for institutionalizing adoption of comprehensive solutions to include WASH for sustained impact
- Develop a chewable formulation to expand treatment to pre-school age children (<5) who cannot swallow pills
London Declaration in Action:
Scaled to over 160 Million Doses to 17 countries

Doses shipped by year
(in millions)
Development of a Chewable formulation of Vermox® (mebendazole)
Chewable Development Program: Expand Treatment to Vulnerable Young Children

- Goal: create a formulation that can be tolerated by pre-school age children (<5 yo)
- Expand treatment to ~250mm children who are currently not receiving deworming therapy
- Eliminate the need for potable water for administration
- Reduce choking risk in younger children
Technical and Regulatory Challenges

- Mebendazole consists of three different polymorphs (A, B and C)
  - Only B and C are active
- Poly B was approved by the FDA for original Vermox tablet
- However, Poly C is the preferred polymorph for formulation into a chewable tablet
- FDA required bioequivalence study to prove that low systemic absorption of tablets with Poly C = Poly B
  - No toxicological or safety issues with limited systemic exposure
- Poly C degrades into poly A without appropriate stabilizers
- However, maintenance of stability interfered with rapid dissolution
- Distribution inefficiencies requires long shelf life (>36mo)
New Chewable Tablet

- Rapidly disintegrates into an easy to administer slurry with a few cc of water
  - Pleasant flavor designed to improve tolerability for children
- Will replace solid formulation in current donation program
Regulatory Complexities

• Vermox has been used in treatment and MDA programs for >40 years
  – Billions of treatment courses

• Multiple studies have demonstrated consistent efficacy against most STHs

• Only the 100mg solid dose tablet registered in the US.

• Since the chewable formulation was 500mg, FDA considered the chewable formulation to be a new product (not a line extension) and required a Phase 3 safety and efficacy study
Current Status of the Phase 3 study

- Double-blind, randomized, placebo-controlled
  - 250 patients between 1 and 16 years old
  - 3 sites (Rwanda and Ethiopia)
  - Embedded PK study required to document lack of systemic exposure

- First patient to be enrolled: Q214
  - Top-line results 4Q14

- NDA submission: 2Q15

- FDA Approval: 2Q16
Did you know that kids in North America are forced to sit in class rooms all day. And if they move around, get excited or make too much noise, they are given drugs to keep them quiet. Their main source of exercise is playing video games, and most of their food is fake and full of dangerous chemicals.

That's terrible! We should take up donations for them.
Thank You