The evidence is in: deworming helps meet the Millennium Development Goals

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chistosomes and soil-transmitted helminths have few rivals in terms of prevalence. They occur throughout the developing world, but are most commonly seen in the poorest communities. WHO estimates that around 2 billion people are currently infected. Of these, some 300 million suffer severe and permanent impairments as a result.

While these figures are not reflected in huge numbers of deaths, the consequences for health and development are enormous. Apart from permanent organ damage, worm infections cause anaemia, poor physical growth, poor intellectual development and impaired cognitive function. They do so at a critical time in life: infection reaches maximum intensity in the age range of 5 to 14 years.

**Goal 1: Eradicate extreme poverty and hunger**

Deworming boosts the prospects of school-age children to earn their way out of poverty. The improvements in intellectual development and cognition that follow deworming have been shown to have a substantial impact on professional income later in life. Studies conducted in the USA estimated the benefits of a hookworm-free childhood at around 45% of adult wages. When these estimates are applied to a developing country like Kenya, studies show that deworming could raise per capita income from the present US$ 337 per person to approximately US$ 490 per person. In Japan, successful deworming programmes in the 1950s are considered one reason for the country's subsequent economic boom.

The impact of inadequate nutrient intake is amplified by worm infections, which interfere with nutrient uptake and are a major cause of anaemia. Malnourished children become more malnourished when infected with worms. The effects of deworming are dramatic, as illustrated by a large study conducted in India. Six-monthly deworming was able — within two years — to prevent 82% of the stunting that occurs without intervention; dewormed children showed a 35% greater weight gain.

**Goal 2: Achieve universal primary education**

In 2003, a report to the United States Congress on the world economic situation concluded that in developing countries treatment of schoolchildren with deworming drugs can reduce primary school absenteeism by 25%, leading ultimately to higher wages. This finding agrees with data on United States schoolchildren, which show that deworming could raise per capita income from the present US$ 337 per person to approximately US$ 490 per person.

The evidence is most compelling when viewed at the global level. Of the estimated 562 million school-aged children in the developing world, worm infections are estimated to cause around 16 million cases of mental retardation in primary school children and 200 million years of lost primary schooling.

**Goal 3: Promote gender equality and empower women**

A girl’s best head-start in life is a good education. It is also her best chance of finding employment outside the agricultural sector. Although the gender gap in education is slowly closing in the developing world, the percentage of boys in schools still outnumber those of girls. Deworming programmes, especially when associated with other simple measures such as school meals and take-home rations, have been shown to contribute to school...
enrollment by girls and to improve their drop-out and retention rates. In 2000 a pilot project in Nepal schools, involving deworming tablets, a hot noon meal and food gifts for girls to take home, resulted in a 43% growth in school enrolment by girls. In addition, anaemia vanished.11

**Goals 4, 5: Reduce child mortality, improve maternal health**

Worm infection weakens very young children in ways that increase their vulnerability to infectious diseases. Recent studies conducted in areas where malaria is a major childhood killer show that deworming and the resulting reductions in anaemia improve the chances of surviving severe malaria. The large reductions in wasting malnutrition and anaemia that followed deworming were also observed among 5964 children under 5 years of age in an area of rural Tanzania.20-21

**Goal 6: Combat HIV/AIDS, malaria and other diseases**

While worm infections do not cause the same high mortality as that of AIDS and malaria, they do number among the "other diseases" that impair the health, physical and mental development, and productivity of huge numbers of the poor. In so doing, they anchor large populations in poverty. Reducing worm infections and other ancient companions of poverty builds the very foundation for good health and — in the spirit of the Millennium Development Goals — contributes to human progress. Evidence that worm infections may influence the clinical burden of AIDS and malaria is just beginning to emerge. One recent study indicates that worm infections impair the immune response in ways that could hasten the progression from HIV infection to AIDS.22 The impact of deworming on improved educational outcome also contributes to the "social vaccination" against HIV infection. Another recent study found that malaria attacks were more frequent in persons infected with intestinal worms.23 While these studies need to be confirmed, the role of deworming in building good health during a critical period of life has been amply demonstrated.

**Goal 8: Develop a global partnership for development**

This goal includes a target, to be achieved in cooperation with pharmaceutical companies, of access to affordable, essential drugs in developing countries. For worm infections, many studies have clearly shown that morbidity can be significantly reduced through repeated and regular treatment with single-dose drugs delivered through school health programmes. The drugs are safe, inexpensive and simple to administer, and thus ideally suited for mass administration. Because such huge numbers are affected, the benefits of bringing these drugs to the masses in need is likewise huge. Systematic delivery of deworming drugs in sustainable ways is a pro-poor strategy with great potential for development. That potential is further amplified by its suitability for integration with other mass-treatment programmes for diseases of the poor — onchocerciasis, lymphatic filariasis, blinding trachoma, and the foodborne trematode infections. As these are diseases of the poor, they frequently overlap, thriving under the conditions of poor hygiene and sanitation seen throughout the developing world. The challenge now is to rationalize existing control programmes through integrated approaches that streamline delivery and bring down costs, thus allowing more of the world’s poor to benefit from essential drugs for ancient diseases.