Tidsskriftet Tidsskrift for Den norske legeforening

A pill for many ills

SIGURD ZIEGLER

sigurd.ziegler@tidsskriftet.no
Sigurd Ziegler, doctor and medical editor for the Journal of the Norwegian Medical Association.

How can we reduce school drop-out rates, halve the gender gap in education, increase wages and make children smarter? Try deworming tablets.

Photo: Sturlason

It goes without saying that treating illness is good for a person's health. But it can also be an effective way of helping them to escape from poverty. At least that's what a large study that provided mass deworming treatment to schoolchildren in rural Kenya appears to show (1–3). The children were treated for intestinal worms and schistosomiasis, both of which are on the World Health Organization's list of neglected tropical diseases. Such diseases affect more than one billion people, mostly in socioeconomically deprived communities in the Global South (4). It is included in the UN's Sustainable Development Goals to end these diseases by 2030 (5).

The challenge is that, for many of these conditions, we still lack treatments that are effective, safe and/or easy to distribute. The phenomenal development of vaccines against COVID-19 has shown what the world can achieve when the will is strong enough. But developing new drugs is expensive, and the risk of failure is high. Short courses of treatment for people with limited ability to pay are therefore an unattractive proposition for pharmaceutical companies.

The study in Kenya provides an example of what effective treatment of neglected diseases can achieve. Seventy-five schools with a total of 32 565 pupils were cluster-randomised for mass treatment of parasitic infections, and the treated individuals were followed up into adulthood (1). As the treatment has few side effects, all children were given one tablet every six months against intestinal worms, which affect up to 90 % of individuals in areas with poor sanitation. The children additionally received treatment for schistosomiasis, a trematode infection also known as snail fever.

> ***«After 20 years, the individuals who had been treated for longer as children showed a clear trend towards higher hourly wages and higher consumption»***

The programme was initiated 2–3 years earlier at some schools than others, meaning that one group of children received antiparasitic drugs almost 2.5 years longer on average than their peers. At 10-year follow-up, the local gender gap in exam results had halved, and more girls remained in education beyond primary school in this group than among the other children (2). Better health can leave more time and energy for schoolwork. After 20 years, the individuals who had been treated for longer as children showed a clear trend towards higher hourly wages and higher consumption and were more likely to be involved in non-agricultural work (1). Better school attendance may have given them a stronger network through which to find employment (1, 2).

The treatment was extremely cheap – less than one US dollar per child per school year. But the return on investment in socioeconomic terms was striking: 100 dollars of antiparasitic treatment has been estimated to provide 14 years of additional education and an overall gain of 37 % for society via increased wages and consumption (1). The deworming treatment also had indirect effects: Children who lived in the intervention areas while they were less than one year of age – a critical period for development – had increased cognitive abilities (3). Even though they themselves were not treated, they were probably less likely to become infected.

There has been great progress in the work on neglected diseases, but there is still much left to be done in the run up to 2030 (4). This includes addressing the clear bias in how global resources for medical research are allocated. For example, only 1.5 % of all drugs that entered phase 1 trials in the period 2000–14 were aimed at neglected tropical diseases (6).

> ***«There is a clear bias in how global resources for medical research are allocated»***

The WHO expert group has put forward several possible models to remedy the market failure in the development of these important medicines. One proposal has been to uncouple the cost of research and development from the sales price of the drug by setting up an international fund (7). This fund could award prizes instead of patents for effective drugs against neglected diseases. The drugs can then be manufactured on the open market and sold much more cheaply. This would encourage more research and development spending to be directed towards those areas where it would provide the greatest clinical benefit, and slightly less to be spent on producing ever more competitor drugs with limited added therapeutic value for wealthy markets.

Another measure aimed at closing the gaps in the pharmaceutical market is the Drugs for Neglected Diseases initiative (DNDi). This is a collaboration between public, private, academic and non-profit organisations to conduct preclinical and clinical research into new and better treatments for conditions such as the parasitic disease visceral leishmaniasis (kala-azar), dengue fever and infections caused by antibiotic-resistant bacteria. This work has led to successes such as an oral medication for sleeping sickness, which has replaced the previous lengthy and toxic intravenous treatment (8).

In Norway, this year's annual TV fundraising campaign will raise funds for such interventions via Doctors Without Borders and the DNDi collaboration. This may well be a good investment in more than just health.

REFERENCES

1. Hamory J, Miguel E, Walker M et al. Twenty-year economic impacts of deworming. Proc Natl Acad Sci U S A 2021; 118: e2023185118. [PubMed] [CrossRef]

2. Baird S, Hicks JH, Kremer M et al. Worms at Work: Long-run Impacts of a Child Health Investment. Q J Econ 2016; 131: 1637–80. [PubMed][CrossRef]

3. Ozier O. Exploiting Externalities to Estimate the Long-Term Effects of Early Childhood Deworming. Am Econ J Appl Econ 2018; 10: 235–62. [CrossRef]

4. WHO. Ending the neglect to attain the Sustainable Development Goals: a road map for neglected tropical diseases 2021–2030. https://www.who.int/publications/i/item/9789240010352 Accessed 22.9.2022.

5. United Nations Department of Economic and Social Affairs. Ensure healthy lives and promote well-being for all at all ages. https://sdgs.un.org/goals/goal3 Accessed 22.9.2022.

6. Jain N, Hwang T, Franklin JM et al. Association of the Priority Review Voucher With Neglected Tropical Disease Drug and Vaccine Development. JAMA 2017; 318: 388–9. [PubMed][CrossRef]

7. Årdal C, Iversen JH, Myhr K. Nye modeller for utvikling av legemidler for fattige land. Tidsskr Nor Legeforen 2011; 131: 2016–8. [PubMed][CrossRef]

8. Lindner AK, Lejon V, Chappuis F et al. New WHO guidelines for treatment of gambiense human African trypanosomiasis including fexinidazole: substantial changes for clinical practice. Lancet Infect Dis 2020; 20: e38–46. [PubMed][CrossRef]

Publisert: 12 October 2022. Tidsskr Nor Legeforen. DOI: 10.4045/tidsskr.22.0613