EDITORIALS

Scabies and Global Control of Neglected Tropical Diseases

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In 1991, Taplin et al. published a seminal study from Panama showing that mass drug administration of the then newly available permethrin cream dramatically reduced the high rates of endemic scabies in island communities.[1] In this issue of the *Journal*, Romani and colleagues report the results of the Skin Health Intervention Fiji Trial (SHIFT),[2] which confirm the efficacy of mass administration of topical permethrin for scabies control. However, in their elegant randomized study involving island communities in Fiji, they also found that mass administration of oral ivermectin had superior effectiveness for scabies control. This study is timely, because scabies was added to the World Health Organization (WHO) list of neglected tropical diseases in 2013 and is estimated to affect more than 130 million people globally at any time.[3]

The effect of scabies extends beyond itching and sleep disturbance. In many resource-poor settings and especially in tropical regions, scabies is a major underlying cause of high rates of bacterial skin infections and their consequences. Impetigo due to *Streptococcus pyogenes* or *Staphylococcus aureus* (increasingly including community-acquired methicillin-resistant *S. aureus*) confers a predisposition to both septic sequelae (including fatal invasive infections) and the nonsuppurative streptococcal sequelae of glomerulonephritis and potentially of rheumatic heart disease.[4] It is important to note that successful mass drug administration for scabies control has led to substantial decreases in impetigo; in SHIFT, the prevalence of impetigo declined from 24.6% at baseline to 8.0% at 12 months in the group that received mass administration of ivermectin.

The classification of scabies as a neglected tropical disease and the acknowledgment that it is an important communicable disease in resource-poor countries pave the way for support for and coordination of research efforts and development of scabies control programs to be embedded in the expanding framework for the control of neglected tropical diseases.[5,6] However, although the WHO initially classified scabies as a neglected tropical disease, it has not developed a formal program for scabies control, whereas 17 other neglected tropical diseases have road maps extending beyond 2015 that include detailed funding models, research priorities, and elucidation of disease-specific control measures that are based on organism biology, epidemiology, and availability of effective antimicrobial agents.[7]

Mass drug administration is central to global control of some neglected tropical diseases, including mass administration of albendazole and mebendazole for soil-transmitted helminth infections (ascariasis, hookworm infection, and trichuriasis), mass administration of azithromycin for trachoma and yaws, and mass administration of ivermectin for onchocerciasis and lymphatic filariasis. The considerable success of mass drug administration for the control of neglected tropical diseases to date has resulted from strong, coordinated public–private partnerships, with pharmaceutical industries donating billions of treatments and philanthropic foundations, governments in developed countries, and banking institutions providing large investments.[7] There is optimism that the momentum for the control of neglected tropical diseases

that has been built during the 15-year era of the United Nations Millennium Development Goals will be maintained in the post-2015 era of the Sustainable Development Goals; for instance, there is a realistic possibility that trachoma, lymphatic filariasis, and yaws will be eliminated before 2030. However, the inextricable link between neglected tropical diseases and development issues such as housing, sanitation, hygiene, nutrition, education, and maternal health cautions against making unreservedly optimistic predictions about the global effect of mass drug administration. Disruptions in even the most well-planned and well-funded programs occur in the context of regional conflicts,[1] and disastrous health consequences can result from substantial population displacement.

Treatment of only persons with scabies and their contacts is unlikely to lead to scabies control at the community level. SHIFT — together with lessons learned from the past decade of research, planning, and field experience in developing other programs for mass drug administration for control of neglected tropical diseases — will underpin the development of a formal global strategy for scabies control.[5-8]

SHIFT shows that, although the administration of topical permethrin and oral ivermectin may have similar efficacy in individual persons with scabies,[9] the practical aspects of oral therapy translate to superior effectiveness on a large scale. Unhatched scabies eggs are refractory to ivermectin. Approximately 7 to 14 days after the initial dose of ivermectin was administered, a second dose of ivermectin was given only to persons with clinical scabies, but the authors suggest that a more pragmatic approach may be to provide both doses to everyone in the community. The importance of this second dose in the mass administration of ivermectin for scabies control remains to be evaluated, as do the diagnostic and epidemiologic algorithms that determine when to initiate a program of mass drug administration, the time interval between interventions, and when to cease providing the interventions. Issues related to ivermectin use during pregnancy and in small children and the management of crusted scabies require further assessment.[10] Scabies moves with people, and population mobility across regions must be factored into program delivery models to prevent rapid reintroduction of infection.

Ultimately, the success and sustainability of programs for the control and elimination of scabies and other neglected tropical diseases will depend on coordination with and integration into existing clinical and public health programs.

Disclosure forms provided by the author are available with the full text of this article at NEJM.org.

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