Mapping the geographical distribution of yaws

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In 2012, after the publication of a randomised controlled trial showing that a single oral dose of azithromycin was as effective as intramuscular benzathine benzylpenicillin for the treatment of yaws,[1] WHO launched a new, ambitious initiative—the Morges strategy—for the eradication of the disease by 2020.[2] The strategy is to give one round of total community treatment with azithromycin to endemic communities, followed by regular surveys to identify and treat new cases and their contacts.[2] Yaws fulfils the Dahlem workshop criteria for a potentially eradicable disease,[3] since there is an effective single-dose treatment and a simple, affordable serological test to confirm diagnosis, although the possibility of a non-human reservoir has not been entirely excluded.[4] However, the first step in the yaws eradication programme is to map its global epidemiology. In *The Lancet Global Health*, Oriol Mitja and colleagues[5] synthesise all the available data from published prevalence surveys, cases reported to WHO by national programmes and, when these data were not available, from cases reported to them by national programme managers. They find that, during 2010–13, 215 308 (84%) of 256 343 cases of yaws were concentrated in just three countries—Papua New Guinea, Solomon Islands, and Ghana—and that transmission occurred in focal rural communities in a further eight.

As the authors admit, the major limitation of this study is the weakness of routinely reported data. Although a high percentage of all cases of yaws reported to WHO were from Ghana, Papua New Guinea, and Solomon Islands, and only 13 countries report cases, elimination has only been reported in two of the 73 countries in which it was formerly endemic (Ecuador and India).[6] Yaws has not been regarded as a public health priority in most countries since the major eradication campaigns of the 1950s, and in many of them it is no longer a reportable disease. Therefore, under-reporting is probably a major problem.

National yaws surveillance programmes report cases based on clinical diagnosis without serological confirmation, and WHO has distributed an illustrated handbook to improve clinical diagnosis. However, even in experienced hands, clinical diagnosis is unreliable. Studies in Papua New Guinea, Solomon Islands, and Ghana have found that *Haemophilus ducreyi* rather than *Treponema pallidum* was present in the ulcers of many children with a clinical diagnosis of yaws,[7] and a recent study of 90 children with clinical yaws in a rural district of Ghana,[8] from which yaws cases are reported every year, found that none of them had serological evidence of *T pallidum* infection. When diagnosis of yaws is based solely on clinical findings, over-reporting is likely to be a substantial problem, and certification of local elimination will not be possible. Fortunately, a new point-of-care serological test that detects both treponemal and non-treponemal antibodies is both sensitive and specific for the diagnosis of yaws.[9]

Blinding trachoma, another neglected tropical disease, is targeted by WHO for global elimination as a public health problem by 2020. As in the case of yaws, until recently, no recent information on the prevalence of the disease was available in many districts in countries believed to have endemic trachoma. A global mapping project is underway in which the prevalence of active and late-stage trachoma is being measured, using an agreed sampling strategy and diagnostic criteria, in every district in the world that might harbour cases of trachoma.[10] This project is expected to be complete by the end of 2015, and the results will be used to target human and financial resources to districts where interventions are needed. This major project is funded by a grant of £10·6 million from the UK Department for International Development.

A similar global mapping project for yaws would establish the extent and geographical distribution of the disease, and enable national programme managers to focus interventions on communities where transmission continues. Confirmation of the eradication of yaws will be difficult without such a mapping exercise in formerly endemic districts since, without this, unidentified pockets of infections will probably persist. Careful thought will need to be given to the sampling strategy and diagnostic criteria to be used, which will need to include serological confirmation of at least a proportion of cases. As yet, no serological test can distinguish between yaws and syphilis, but most clinical cases of yaws are in children younger than 10 years, in whom syphilis is unlikely. Funds will be needed for a global yaws mapping project but, in the meantime, the

possibility of including yaws in prevalence surveys for trachoma and other neglected tropical diseases that are already funded should be considered.

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