Overall, this study provides important guidance on the use of combination therapy and approved drugs in the treatment of the continuing MERS-CoV outbreak.

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Sustaining rotavirus vaccination in Africa: measuring vaccine effectiveness

Diarrhoea is one of the leading killers of children in developing countries worldwide. Rotavirus has been identified as the most common cause of severe diarrhoea in children younger than 5 years, and is responsible for more than 2 000 000 hospital admissions and 450 000 deaths every year.[1] 95% of rotavirus deaths occur in low-income countries in Asia and Africa, with India, Nigeria, Pakistan, Democratic Republic of the Congo, and Ethiopia accounting for 50% of all global deaths. Most countries with a mortality rate exceeding 300 per 100 000 children are in Africa.

Although improvements in hygiene and sanitation coupled with the provision of safe drinking water have helped to reduce diarrhoeal disease, these approaches have been inadequate in preventing the spread of rotaviruses. The efficacies of the two available rotavirus vaccines—Rotarix (GlaxoSmithKline Biologicals, Rixensart, Belgium) and RotaTeq (Merck Vaccines, Whitehouse Station, NJ, USA)—were lower in pre-licensure trials in Africa and Asia (51–64%) than has been reported in high-income countries in Europe and Asia (98%).[2–5] However, because of the large disease burden and the anticipated bigger effect on public health, in 2009 WHO recommended the inclusion of these vaccines in national immunisation programmes, especially in those countries with high child mortality caused by diarrhoea.[6–8] So far, 69 countries worldwide have incorporated rotavirus vaccines into their immunisation programmes.[9] 21 countries in Africa have introduced these vaccines into their Expanded Programme on Immunization (EPI), supported by the GAVI Alliance Accelerated Vaccine Initiative.

However, after the GAVI funding period is complete, these countries will have to pay for the full cost of the vaccine. Sustaining rotavirus vaccination might cease to be a priority and will face competition from other needs for resource allocation from national budgets. Therefore, it is crucial to understand the population effect of routine rotavirus vaccination in countries in Africa, including the potential indirect benefits of vaccination, especially on severe outcomes and deaths from rotavirus and all-cause diarrhoea, and to document savings in health-care costs from vaccination.

Michelle Groome and colleagues' study of the effectiveness of monovalent human rotavirus vaccine against admission to hospital for acute rotavirus diarrhoea in South African children in *The Lancet Infectious Diseases*[10] provides the first evidence-based data from Africa (a region with a very high rotavirus disease burden) for the assessment of the effectiveness


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of one or two doses of rotavirus vaccine in populations that also included children with HIV infection. The results from this case-control study, involving nearly 2000 children, show that the vaccine provides sustained protection during the first 2 years of life (adjusted vaccine effectiveness 57% [95% CI 40–68] for one dose, and 40% [16–57] for two doses) and has similar effectiveness in HIV-exposed children (adjusted vaccine effectiveness 64% [95% CI 34–80]) and HIV-unexposed children (54% [31–69]), which confirms what was noted in controlled field trials in Kenya by Daniel Felken and colleagues.[11] This information should be reassuring to EPI managers and policy makers in regions with a high prevalence of HIV, since it supports the effectiveness of these vaccines in populations with a high HIV burden. Furthermore, this assessment provides important information for other low-income and middle-income countries who are considering introducing the rotavirus vaccine into their EPI schedules. The study also emphasised the problems of recordkeeping in Africa, since about 6% of participants could not produce for examination and confirmation their immunisation status and were therefore excluded from the analysis. This situation might be repeated in similar studies in the African region.

Data from this study and other planned studies to be undertaken in different regions of Africa as the rollout of rotavirus vaccine continues in Africa and other low-income countries in Asia will support and strengthen the case for the continued procurement of rotavirus vaccines beyond GAVI support.

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Mass prophylaxis of tuberculosis through social protection

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Rudolf Virchow knew it. Robert Koch reinforced it. Thomas McKeown substantiated it. Sir Michael Marmot keeps driving it home. If a reminder were needed, it is the following: people tend to underplay the fact that sound and fair social policies are fundamental for good public health.

In *The Lancet Infectious Diseases*, Aaron Reeves and colleagues show that investments in social protection are associated with reduced tuberculosis morbidity and mortality in European Union countries.[1] According to their study, the level and nature of social protection spending has a bearing on tuberculosis burden even in countries with fundamental welfare mechanisms.

National wealth and wealth distribution are strong predictors of tuberculosis burden and trends.[2] Poor countries have much higher rates of tuberculosis than do rich countries, and the poorest and most marginalised in low-income countries are the worst off. Undernutrition and crowded living conditions are direct risk factors for tuberculosis.[3] Underfunded health systems lead to delayed diagnosis and poor treatment results, especially for the most vulnerable groups, perpetuating