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Conference report

Rotavirus landscape in Africa—Towards prevention and control: A report of the 8th African rotavirus symposium, Livingstone, Zambia

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ABSTRACT

The 8th African Rotavirus Symposium was held in Livingstone, Zambia from the 12–13 June 2014. Over 130 delegates from 35 countries – 28 from African nations – participated in this symposium, which included scientists, clinicians, immunisation managers, public health officials, policymakers and vaccine manufacturers. The theme for the symposium was Rotavirus Landscape in Africa—Towards Prevention and Control. At the time of the symposium, a total of 21 African countries had introduced the rotavirus vaccine into their national immunisation schedules. This meeting was particularly timely and relevant to review early data on vaccine adoption and impact from these countries.

The concluding panel discussion proposed several recommendations for areas of focus moving forward in rotavirus advocacy and research.

1. Introduction

The Centre for Infectious Disease Research in Zambia (CIDRZ), a Zambian non-profit organisation working with the Zambian Government, hosted the 8th African Rotavirus Symposium on the 12th and 13th June 2014 in Livingstone, Zambia under the theme "Rotavirus Landscape in Africa—Towards Prevention and Control."

The African Rotavirus Symposium is a biennial gathering of leading rotavirus researchers and scientists from across Africa to address on-going research results, to review current global epidemiological trends and share impact data. With the increasing number of countries introducing rotavirus immunisations, the 8th symposium was an important opportunity to highlight progress made on vaccine introduction in Africa and to provide a platform for networking for research, academia, and lessons sharing (Fig. 1).

The symposium was officiated by the Honourable Minister of Community Development, Mother and Child Health in Zambia, and was attended by 134 delegates from 35 countries—28 from Africa. A total of 70 oral plenary and 65 poster presentations were made on topics ranging from disease burden and rotavirus epidemiology, strain diversity and emerging surveillance results from African countries, current and future vaccines, vaccine introduction and impact studies, and global perspectives with interest to Africa.

1.1. Disease burden and rotavirus epidemiology

In the keynote address, Dr Roger Glass described the mass influx of national rotavirus vaccine introductions throughout the African region as an experiment that presents both opportunities and challenges. He provided a detailed discourse on the history of African Rotavirus Network, which began as a small grant to support a few African researchers in surveillance and rotavirus research. Dr Glass discussed the fact that through GAVI, the Vaccine Alliance, most low- and middle-income countries (LMIC) can now afford vaccines. He charged researchers to address key unknown issues such as performance of these live oral vaccines in routine programmatic use in LMIC, factors likely to drive a positive impact, whether vaccines will demonstrate herd immunity, and whether immunisation of infants in their first year will result in sustained protection up to the second and third years of life [1–5]. He further charged that reporting on emerging strains demanded intensified surveillance, although it is reassuring that clinical trials and post-licensure data from other settings show good evidence of protection against a range of strains with both rotavirus vaccines.

Dr Jason Mwenda from WHO-AFRO discussed "Rotavirus in Africa: Burden and Epidemiology, Building the Evidence Base", highlighting the importance of an effective disease surveillance system, which provides evidence for governments to plan to respond to diseases that are of public health importance. Surveillance data can and does drive to introduce rotavirus vaccines. Currently, WHO-AFRO has 43 sentinel sites in 30 countries that actively collect data (in a standardised way) on rotavirus disease across the African region [6]. The overall results for Africa from WHO-AFRO show that 40.3% of diarrhoeal stools tested positive for rotavirus (19,110 out of 53,898 samples tested between 2008 and 2013) [7]. The surveillance system is also able to track strains that are circulating within the region and are able to identify which countries have the highest burden. The epidemiology of the rotavirus disease is such that it occurs throughout the year, but is seasonal in some countries, generally peaking during the cool, dry months and accounting for approximately 37% of deaths attributable to diarrhoea and 5% of all deaths in children younger than 5 years [8]. As a result of the surveillance programme data and other available data, 21 countries have introduced rotavirus vaccines by June 2014. Of the 21 that have introduced rotavirus vaccination nationwide, 17 have been supported by GAVI resulting in a total of 14,462,496 vaccinations as of June 2014. Dr Mwenda further stressed the need to monitor the impact of vaccine introduction on disease

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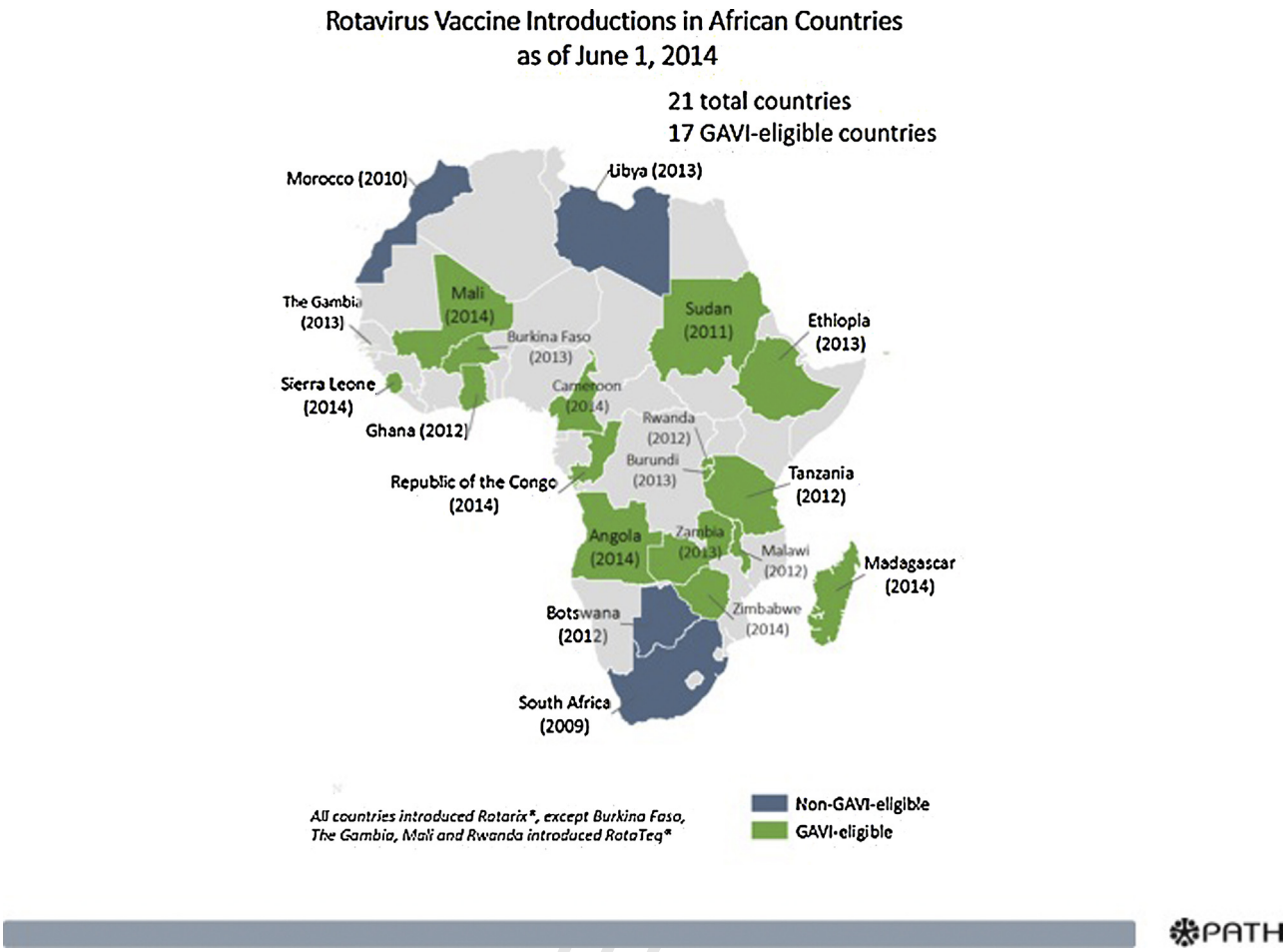

Fig. 1. Rotavirus vaccine introductions in African Countries as of June 1, 2014.

epidemiology, strain diversity, and vaccine effectiveness and concluded by noting that while we may be off the Millennium Development Goal (MDG) mark, we can still make a lot of effort towards improving the health of children on the continent.

Drs. Milagritos Tapia and Inacio Mandomando discussed country specific findings from the Global Enteric Multicenter Study (GEMS) in Mali and Mozambique, respectively, which helped these governments consider introduction of rotavirus vaccines; Mali introduced rotavirus vaccine in 2014 and Mozambique has applied to GAVI for support to introduce rotavirus vaccine in 2016 [9]. They highlighted that GEMS is a model for an effective surveillance system that can be adopted for surveillance of other diseases, stating that it based on comprehensive review of aetiology (using molecular biology techniques), and then using the data to determine the attributable fraction for each causative pathogen. Another aspect to the GEMS approach was the use of active community surveillance of diarrhoea, involving community health workers. The data resulted in identifying rotavirus and cryptosporidium as key agents in diarrhoeal disease in children, among others. The last speaker for this session was Dr Sammy Khagayi, who demonstrated how using the Health Demographic Surveillance System (HDSS) led to rotavirus vaccine introduction in Kenya—a case for using local data in making national health decisions [10].

1.2. Strain diversity and emerging surveillance results from African countries

Dr Mapaseka Seheri started the session presenting a seven-year analysis (2007–2013) on data from the University of Limpopo/MRC Diarrhoeal Pathogens Research Unit on rotavirus strain diversity in the African region before widespread vaccine introduction. She reported that a total of rotavirus positive specimens from 26 countries throughout Africa were successfully genotyped 4166 rotavirus positive specimens from 26 countries throughout Africa were successfully genotyped in this period. The six predominant rotavirus genotypes circulating were G1P[8] (17.4%), G9P[8] (11.5%), G2P[4] (10.5%), G2P[6] (5.3%), G1P[6] (4.9%) and G12P[8] (4.6%). Mixed infections of the G and P genotypes (16.7%) and partially typed strains (6.9%) were also observed. Sequencing analyses showed nucleotide and deduced amino acid sequence identity of 94–99% when compared with corresponding GenBank rotavirus strains [11]. An increase in detection of uncommon strains such as G12 and G8 was reported in many African countries in 2012 and 2013. Mixed genotype infections, either P or G types, and partially typed G or P were detected frequently in many African countries, representing 16.7% and 6.9%, respectively.

Dr Jelle Matthijnssens presented on how different African rotaviruses compared to globally circulating strains from a complete genome point of view. He noted that Africa has a high prevalence of G8 and G6, and that out of the 122 human genotypes from Africa (Ghana, Mali and Kenya), which were sequenced, the G/P genotypes observed were: G1, G2, G3, G8, G9, G10 and G12 in combination with P[1], P[4], P[6] or P[8]. The majority of the strains possessed the DS-1-like or the Wa-like genotype constellation, and few strains were found to possess both genotypes (DS-1 and Wa-like) [12]. He concluded by noting that the genotype constellation of the vast majority of rotavirus strains circulating in Africa and Asia during the clinical trials were indistinguishable from other

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