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Measles seroprevalence and outbreak in Rwanda: evidence from measles epidemiological surveillance and control

S.E. Kalimba[1,*], J.B. Gahutu[2], M. Gatera[3], B. Karenzi[4], C. Muvunyi Mambo[5], T. Bergström[6]

[1] *University of Rwanda/Rwanda Military Hospital, Kigali, Rwanda*
[2] *University of Rwanda/Butare Teaching Hospital, Huye, Rwanda*
[3] *Vaccine Preventable Disease Division, Kigali, Rwanda*
[4] *Rwanda Military Hospital, Kigali, Rwanda*
[5] *National Reference Laboratory, Kigali, Rwanda*
[6] *Gothenburg University, Gothenburg, Sweden*

Background: Even with large-scale up routine immunization programs, measles remains a public health problem, with outbreaks reported in association with insufficient vaccine coverage especially in countries recovering from a natural disaster or conflict. This study aimed at characterizing Rwandan measles genotypes and compares its seroprevalence to the one from a high income country, Sweden.

Methods & Materials: Performed in two phases; first, a cross-sectional study, on plasma randomly selected from 118 Rwandan patients, 120 Swedish patients and 119 young university Swedish students at Gothenburg University, was carried out to determine measles seroprevalence. The serological assays measured the Optical Density (OD) of IgG-antibodies in a high sensitive ELISA using the *morbillivirus* in-house antigens from the diagnostic laboratory of the University of Gothenburg. Positive results were defined as OD≥0.5.

Second, 544 plasma and 31 nasopharyngeal specimens of suspected measles cases were collected in all provinces of Rwanda from June 2010 to June 2011. Plasma were analysed for measles-specific IgM antibodies titers at the National Reference Laboratory in Kigali using an ELISA (Enzygnost, Siemens, Marburg, Germany) according to the instructions provided by the manufacturer. PCR tests were done at the Uganda Virus Research Institute where viruses were isolated from nasopharyngial samples using vero-SLAM cells, and then the Qiagen OneStep RT-PCR kit was used to perform PCR on the positive isolates.

Results: The seroprevalence rates of measles-specific IgG antibodies were 94.1%, 94.2% and 96.6% in Rwandan, Swedish patients and Swedish students respectively.

From phase 2, out of 544 plasma samples collected, 76 were IgM positive for measles and most outbreak cases located in regions near the border with the Democratic Republic of Congo and Burundi.

For the measles suspected cases, 31 nasopharyngeal samples were collected and 21 were positive on PCR with the predominant genotype being B3.

Conclusion: Measles immunization coverage and seroprevalence was found to be comparable between both the Rwandan and Swedish study populations.The isolated measles strain was B3, which is identical to that found in the most African countries and outbreak reported from Rusizi district.

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Respiratory viruses detected in severe acute respiratory infections and deaths in South Africa: Pathogen or passenger?

O. Helferschee[1,*], M. Pretorius[1], M. Chhagan[2], H. Dawood[3], E. Variava[4], S. Walaza[5], J. Moyes[6], S. Haffjee[7], C. Cohen[6], S. Madhi[8], M. Venter[9]

[1] *National Institute for communcable diseases, Johannesburg, South Africa*
[2] *University of KwaZulu-Natal, Durban, South Africa*
[3] *Grey's Hospital and University of Kwa-Zulu Natal, Pietermaritzburg, South Africa*
[4] *Klerksdorp-Tshepong Hospital, North West Province, South Africa*
[5] *National Institute for Communicable Diseases, Johannesburg, South Africa*
[6] *National Institute for Communicable Diseases, Sandringham, South Africa*
[7] *University of KwaZulu Natal, South Africa;, PieterMaritzburgh, South Africa*
[8] *National Institute for Communicable Diseases (NICD), Johannesburg, South Africa*
[9] *National Institute for communcable diseases & University of Pretoria, Pretoria, South Africa*

Background: Several viral pathogens are detected in patients with acute respiratory infections raising the question of their disease association especially in the presence of HIV. We investigated the prevalence of respiratory viruses for severe acute respiratory illness (SARI) to identify viruses in fatal disease compared to patients with influenza like illness (ILI) and healthy controls in South Africa.

Methods & Materials: Upper respiratory tract specimens from fatal cases were collected through a SARI surveillance programme in South Africa and compared to patients with SARI, ILI or healthy controls. Specimens were tested by multiplex real-time polymerase chain reaction (PCR) for 17 respiratory viruses. Multinomial logistic regression analysis was used to compare SARI and ILI patients to controls.

Results: Of 3907 patients enrolled from 2012-2013, 2125 (54.39%) had SARI, 1325 (22.91%) ILI and 457 (11.70%) were controls of which 36% were < 5 years old. A total of 261 fatal cases were screened for 2012. The most common virus identified in all age groups was rhinovirus followed by adenovirus, KI polyomavirus, influenza A and B and Respiratory Syncytial Virus (RSV). Influenza, RSV, hMPV, and rhinovirus were associated with both ILI and SARI relative to controls. The most frequently detected viruses in the fatal cases were Rhinovirus (17%), Adenovirus (13%), KI Polyomavirus (9%), and RSV (5%). In children <1 that died with single infections, Rhinovirus (16%) and Adenovirus (33%) was detected most while RSV, PIV3, Enterovirus, Bocavirus and polyomavirus WU was each detected in 5% of cases. Rhinovirus, Adenovirus, RSV