Results: The epidemic-curve showed a propagating pattern, with most cases being detected during or subsequent to ICU admission. Cases had longer mean hospital (27.8 days vs 11.9 days) and ICU stays (31.0 days vs 7.3 days) than controls. The crude in-hospital mortality of cases was significantly higher than controls (OR 13.02; 95% CI: 2.98 – 56.76). The final model showed co-morbid disease (Charlson Score) (AOR 1.68; 95% CI: 1.21 – 2.33); mechanical ventilation (AOR 1.35; 95% CI: 1.02 – 1.16) and receipt of piperacillin-tazobactam (AOR 1.33; 95% CI: 1.11 – 1.61) to be significant predictors for invasive disease. Invasive disease was strongly associated with mortality (AOR 9.62; 95% CI: 2.16 – 42.93).

Conclusion: NDM-1 invasive disease is associated with significant mortality. Underlying co-morbidity, presence of invasive medical devices and exposure to antibiotics are important risk factors for NDM-1 invasive disease.

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Molecular characterization of T. pallidum subsp. pertenue, the etiologic agent of yaws

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Background: A diagnosis of yaws is usually based on clinico-epidemiological findings, and serological tests that are also used for syphilis. However, serological tests cannot distinguish between veneral syphilis and the endemic treponematoses (yaws and bejel). We sought to evaluate a diagnostic PCR that can specifically detect and differentiate between the three T. pallidum subspecies and determine if the mutations associated with azithromycin resistance (AzR) in subsp. pallidum (syphilis) are present in subsp. pertenue strains, and characterize strains using the syphilis molecular typing system.

Methods & Materials: 176 children aged 6-14 years with clinically suspected yaws skin lesions on Tanna island, Vanuatu, were enrolled in the study as part of preparation for a WHO-supported provincial yaws elimination campaign of azithromycin mass drug administration (MDA). Lesion swabs were taken, suspended in AssayAssure transport medium and stored at -70°C until tested by a real-time diagnostic PCR and another PCR to detect the mutations (A2058G and A2059G) associated with AzR. Eleven subsp. pertenue laboratory strains from Indonesia and Africa and two syphilis strains (one with AzR mutations) were included as controls. Serum samples were tested by TPPA and RPR. PCR-positive lesion samples were subtyped using the T. pallidum (syphilis) typing method.

Results: Of the 176 serum samples, 63 were positive by both TPPA and RPR suggesting yaws infection. 27 of 176 lesions were positive by PCR with corresponding RPR titers ranging from R1 to R128. One sample was TPPA/RPR negative but PCR positive. None of the lesion samples tested positive for AzR point mutations. Four strain subtypes (5b11, 5c11, 5b12, 5c12) were observed among 21 typeable samples from Vanuatu while 8 subtypes (4c11, 5a12, 6c11, 6c12, 7a12, 8a12, 8c11, 12b9) were found among the 11 laboratory strains.

Conclusion: Detection of T. pallidum subsp. pertenue-specific DNA from skin lesions was associated with dual treponemal/non-treponemal seropositivity in 26 of 27 symptomatic yaws cases. In