

of 38,882 inhabitants. Including surrounding areas, approximately 70,000 individuals have access to the Agogo Presbyterian Hospital (APH). The study procedures followed the standardized protocol to ensure comparability of data across African sites and included the conduct of an health-care utilization surveys to adjust the numerator in incidence calculations for frequency of use of the APH. All admitted patients with a history of objective or subjective fever (tympanic fever $\geq 38^{\circ}\text{C}$) and outpatients with objective fever in the past 72 hours were eligible for enrollment. Bacterial diagnoses were conducted using automated blood culture equipment.

Results: From January 2010 to October 2011, 5,134 patients were enrolled. In total, 389 cultures were positive for bacteria, among which 64 were positive for *S. Typhi* (16.5%). The majority (56.5%) of *S. Typhi* infections occurred in children less than 15 years of age. The highest annual incidence for *S. Typhi* was found in the 8–10 years age group (198/100,000). The annual incidence in the 2–<5 and 5–<8 age group was 134/100,000 and 149/100,000, respectively. Non-typhoidal *Salmonella* (NTS) infections occurred in younger children, with the highest annual incidence of >600/100,000 in children under five years of age.

Conclusion: Our study demonstrates that invasive *Salmonella* infections constitute a significant problem in Ghana, which might also be reflected in other parts of sub-Saharan Africa. Introduction of vaccines against invasive *Salmonella* infections for children should be considered.

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Spatio-temporal dispersion of *Aedes taeniorhynchus* in Florida

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Background: *Aedes taeniorhynchus* is normally associated in high numbers with salt marshes along coastal areas in North, Central and South America. It has the potential to be a critical vector of important human and animal arboviruses. St. Louis encephalitis, Everglades, and West Nile viruses have been isolated from it in Florida, and can transmit epizootic strains of Venezuelan equine encephalomyelitis, eastern equine encephalitis, and Rift Valley fever viruses in the lab. To better identify the threat from these viruses we are attempting to better understand the spatio-temporal patterns of *Aedes taeniorhynchus* in Florida.

Methods: Eighteen years of mosquito trap data from Sarasota County, Florida were used for the analyses in this paper. The data, based on systematic mosquito traps, consists of a geographic location coordinates along with mosquito population assessments by species and date. To quantify the spatio-temporal movement of the study species a spatial auto-regressive model was used for analysis. Geographic information system (GIS) software was also used to display and analyze areas with varying population levels.

Results: The highest population numbers for *Aedes taeniorhynchus* are consistent during the typical Florida summer months of elevated rainfall and temperatures in June, July, and

August with July being the peak of the three. Geospatial analysis identified locations that are conducive to consistently high populations of *Aedes taeniorhynchus* and a quantitative approach showed a marked dispersion to the east to inland areas from the Gulf of Mexico coast over time, particularly from those coastal sites with the highest mosquito numbers. Analyses of interannual differences in mosquito populations will be discussed in relation to environmental conditions such as rainfall and tide levels.

Conclusion: Knowledge of the temporal and spatial distribution of populations of potentially important disease carrying mosquito vectors is important for categorizing areas of varying risk for disease transmission. Since *Aedes taeniorhynchus* a coastal species with the capacity to transmit indigenous and exotic arboviruses, and there is a potential for an introduction of exotic diseases into the United States through shipping ports, enhanced surveillance and control measures need to be established.

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Impact of immunization against hepatitis B virus in areas of high endemicity in Brazil

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Background: The Brazilian government implemented immunization against hepatitis B for infants and children in the western Amazon since 1991, and gradually expanded this to other states considered how high HBV endemicity. Since 1998, the HBV vaccine has been incorporated into the immunization schedule for infants as a national policy and, in 2001, this was broadened to include children and adolescents; more recently until 29 years old. The present study is part of an ongoing population-based hepatitis survey, aimed at estimating the prevalence and predictive factors for HBV infection in all the State capitals from South and Southeast and North region of Brazil, some with highly prevalence of hepatitis B.

Methods: This Cross-sectional population-based household investigation was conducted in 2007–2008. The inclusion criterion was individuals aged between 10 and 69 years old living in urban areas of the 14 State capitals in the three study regions with estimate population of 20,541,316. The study population was divided in two age strata (10–19) and (20–69) in each area. A random sample was obtained using a stratified multistage cluster sampling strategy, at census tract, block and household level. Blood samples were collected after the interview and specimens tested for antibodies to hepatitis B core antigen (anti-HBc) using enzyme-linked immunoassay – ELISA (AxSYM, ABBOTT Laboratories) in central public health laboratories. Outcomes indicating HBV infection were

anti-HBc and HBsAg. Univariate and multivariate analyses were performed.

Results: Overall, 10,049 individuals were included; the prevalence of anti-HBc was: South 9,59% (IC 95% 8,46–10,7%); Southeast 6,33% (IC95% 5,32–7,33; North region 10,9% (IC 95% 8,87–12,9). HBsAg positivity was 0,48% (IC 95% 0,21–0,75) in South; Southeast 0,31% (IC95% 0,09–0,53) and 0,63% (IC95% 0,22–1,04) in North region. The results of the final multivariate model showed that, among others, increasing age remained as independent risk factors in three regions.

Conclusion: Our survey classified the South and Southeast region of Brazil as low HBV endemicity areas, as well as North region, world famous as a highly endemicity, demonstrating the impact as vaccination in these three regions. The results of the final multivariate model reinforce the need for extensive HBV vaccine coverage among adolescents to prevent viral infection.

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Epidemiology of human leptospirosis in Mayotte and identification of circulating *Leptospira* isolates

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Background: Leptospirosis is an emerging zoonosis, with high incidence in countries with a tropical climate. The disease is endemic, when reported, in most countries of the Indian Ocean.

Methods: In Mayotte, a French overseas department, located in the northern Mozambique Channel in the Indian Ocean, surveillance of leptospirosis is based on Real-time PCR confirmed autochthonous cases. Isolates of leptospira are sent to the French National Reference Center for Leptospirosis for sero- and genotyping. Surveillance of leptospirosis on the island was progressively reinforced since July 2008.

Results: From 2007 to 2010 period, a total of 196 autochthonous cases of leptospirosis were confirmed in Mayotte, with an overall annual incidence of 25 cases per 100 000. Young adult males are the most highly infected group. Seasonality of leptospirosis on the island is very marked, with cases occurring mainly during the rainy season. The strongest correlation ($r=0.838$) between monthly number of cases and monthly cumulated rainfall is found three months after the peak of rainfall. Risk factors for infections by leptospires in Mayotte are multiple, with exposure of the general population during activities of daily living along with occupational exposure.

Multilocus sequence typing results show that *L. borgpetersenii* constitutes the main agent of leptospirosis in Mayotte (68%). Serogroup Mini, including strains cross reacting with Mini and Hebdomadis, represents the predominant serogroup (70%). Other *Leptospira* serogroups identified were Pyrogenes, Grippotyphosa,

and Pomona. No Icterohaemorrhagiae was detected. Serogroup and genotype distribution differs from what is observed in other countries in the region.

Conclusion: Further studies in humans and animals are needed to learn more on these specificities and allow guiding future actions.

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A measles case study in a traveller: an international challenge

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Background: Although endemic measles transmission has been interrupted in Portugal, importation of this highly infectious virus continues.

In January 2012, one case of measles in an unvaccinated Portuguese 33-year-old-woman, travelling from United Kingdom to Lisbon, resulted in a large number of exposures in the community and in two hospitals health care workers.

Methods: After serological confirmation (positive measles-specific IgM antibody test), the National Health Authorities was immediately informed to get on contact tracing of the airline passengers, the ambulatory healthcare centre and the community contacts.

All hospital providers were individuated, and questioned about previous natural disease or immunisation against measles.

Results: On January 29th, 2012, the patient was evaluated in the ED with fever (39 °C), cough and coryza and sent home with symptomatic medication.

Twenty-four hours later the patient returned to the ED with persistent fever, generalized maculopapular rash and was hospitalized.

Measles diagnosis was suspected and, about 10 hour after admission on ED, she was transferred to a referral hospital.

Among the 44 potentially exposed employees: 25 (56,8%) referred previous measles, 15 (34,1%) reported to have received immunisation, but 7 received just one dose of MMR, and 4 (9,1%) referred not to be vaccinated.

One HIV infected patient shared the room with the index case during the first 16 hours. She was managed as susceptible case and isolated due to high risk of acquisition and development of atypical measles.

All susceptible cases continue on active surveillance. After 10 days, no secondary cases were reported.

We will present complete maps of itineraries, places visited and contacts with index case, in London and Portugal, before hospitalisation.

Conclusion: This case highlights the challenges faced by clinicians with respect to a disease that is receding in memory and importance.

Despite a high community vaccination coverage in Portugal, the risk of measles outbreak should be considered among clusters