

N.meningitidis S.pneumoniae strains isolated by culture were also detected by molecular methods.

Conclusion: Our study indicates that *S.pneumoniae* is the main etiologic agent for meningitis. Molecular methods are effective diagnostic tools for infectious diseases, but culture has another property having the opportunity to do antibiotic susceptibility tests. Some bacteria also doesn't included in the list of commercial molecular tests for meningitis. The utility of molecular diagnostics for pathogen identification combined with conventional culture methods will improve health outcomes of meningitis cases.

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A Laboratory Information Management System (LIMS) for animal health: Experiences of the Istituto Zooprofilattico Sperimentale of Sicily (Italy)



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Background: Livestock diseases are a zoo-economic and public health problem, particularly in case of zoonoses such as brucellosis. Their eradication are an objective of the Veterinary Services. In Italy, this objective was pursued by specific National Recovery and Eradication Plans, providing for control and surveillance measures. This work is carried out by the National Health Service involving activities, figures and structures heterogeneous using several operational information systems. In the past, this complexity has generated confusion in data collection with partial, missing or duplicated information, often inconsistent among different systems. This made it difficult the government, control and reporting activities.

Methods & Materials: Sicily is the region with the highest prevalence of brucellosis in Italy. Brucellosis management in Sicily is currently the more stringent example of cooperation and interoperability among national, regional and local systems. The health data flow starts from Local-Veterinary-Services that use the Animal-Health-System (SANAN), interacting with the National-Livestock-Data-Base, to retrieve all information related to farms and animal master data. Samples, identified by SANAN number, arrive at Istituto Zooprofilattico Sperimentale (IZS) of Sicily where are subject to diagnostic tests. In 2014, standardization of laboratory processes and sample tracking has been increased in IZS Sicily using the LIMS "SILAB-SICILIA" developed by IZS Abruzzo&Molise.

Results: Only typing in SILAB-SICILIA the SANAN number, the loading of all information characterizing the sample is auto-

matically activated. When the results of analysis are entered in SILAB-SICILIA, they are copied in SANAN. At the same time, data are also available to authorized operators by STUD (Diagnostic-Telematic-System) Web application. Monthly, data extracted from SILAB-SICILIA feed the National-Brucellosis-Information-System. Twice a year the data entered in SANAN are submitted to European Commission (2008/940/EC, 2003/886/EC) and feed the annual collection of Zoonoses Information System (SINZOO) which updates EFSA (European-Food-Safety-Authority) database as required by 2003/99/CE directive.

Conclusion: The tight integration among information systems has increased the quality of the data collected in each single database enabling cross-checks and allowing comprehensive reporting. It also enables to satisfy the information debts towards international organizations, provides decision-making tools for the management and governance of the National Health Service and facilitates the planning of activities, their periodic verification and risk analysis.

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Trends of acute watery diarrhea in Lao People's Democratic Republic, 2009-2013



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Background: Diarrheal disease is the second leading cause of death in children under five and account for 1 in 9 child deaths worldwide. In Lao PDR, it is estimated that 12% of the under-five mortality are due to diarrhea with acute watery diarrhea (AWD) introduced as one the national notifiable disease in 2004. Both worldwide and in Lao PDR, rotavirus is the leading cause of acute diarrhea in children under five. We aimed to describe the epidemiology of AWD from 2009 to 2013 in Lao PDR.

Methods & Materials: This was a retrospective study examining data from the national indicator-based surveillance system where health facilities send weekly reports to the national center for laboratory and epidemiology (NCLE). We collected both aggregate data (N=117,277) from LAOEWARN (Lao Early Warning And Responses Network) and case-base data (N=67,750) from line-listing from 2009 to 2013 and performed descriptive analysis using Epi info 7, Excel and ArcView GIS. We also examined the laboratory findings from 231 stool samples tested using rotavirus rapid test in 2013 from 8 diarrhea sentinel sites based in Vientiane capital.

Results: The incidence of AWD increased from 2009 to 2012 and leveled off from 2012 to 2013. We saw a seasonal trend for AWD which peaked during the dry seasons. Bolikhamxay and Sekong

are the provinces with the highest reported cases of AWD. The most affected age group was children under five who were 7–9 times more likely to have AWD than the rest of the population ($P < 0.001$); in under-fives, males are more likely to be brought to healthcare facilities for AWD than females ($P < 0.001$). Finally, in children under-five, we detected rotavirus in 48% of the stool specimen tested at the sentinel sites.

Conclusion: The increased AWD incidence may reflect a true increase in the burden of AWD in the country or an improvement in the sensitivity of the system given LAOEWARN was only introduced in 2008. We recommend integrating hygiene and sanitation health education into nursery school and primary school and exploring risk factors for AWD during dry seasons in order to plan control and prevention strategies.

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Mantle: A free and multilingual software for one health biosurveillance & research



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Background: The One Health approach suggests that humans, animals, and the environment are closely tied together. Human interaction with wildlife and the environment contributes to increased risk for human, plant, and animal infectious disease outbreaks. Despite the movement towards One Health, the software currently available to manage, analyze, and communicate the vast amount of One Health data is grossly inadequate. One Health data are continually growing in size and complexity, and new technologies must be developed to address the magnitude of the problem. Open access and open source software are needed to address these complex One Health problems, and to improve data accessibility, interoperability, and information communication.

Methods & Materials: Mantle will handle tabular data, and other widely used spatial data formats. It will visualize and explore data in useful ways, and allow data to be downloaded as the originally uploaded file or in a customizable format for use in analytical software. Mantle will store metadata—information about a dataset and its contents—using development standards for linked data (e.g., JSON-LD and WCSV, part of the overarching Resource Description Framework). Tapping into the emerging semantic web enables richer interactions with datasets, streamlining many common data tasks.

Results: Policymakers and decision makers will be able to view real-time visualizations of Mantle data feeds in dashboards. Researchers will be able to upload datasets representing the output of models built in other analytical software, which can be shared with policymakers, who can also view and interact with the output of custom-built modeling modules to view timely and meaningful summaries of public health data feeds. Potential use cases for the general public include browsing day-to-day textual and syndromic surveillance information, viewing the predictions of a one-time study, and monitoring the latest calculated epidemic curve in an outbreak or ongoing epidemic.

Conclusion: Mantle will facilitate crosscutting collaborations between disciplines and institutions. Users will be able to create, manage, and join organizations and groups. Groups of users will access and collaborate on collections of datasets, grouped manually or by specified properties. For instance, users interested in Ranavirus can view and contribute to the Global Ranavirus Reporting System, a collaborative effort by scientists worldwide to aggregate observed cases of Ranavirus across species and locations (a Mantle prototype).

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Evaluation of ebola virus disease surveillance system in Tonkolili District, Sierra Leone – 2015



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Background: Ebola Virus Disease (EVD) remains a major public health challenge in West Africa with Sierra Leone recording more than 50% of all confirmed cases. Enhanced surveillance was commenced in December, 2014. We therefore, evaluated the surveillance system to determine the systems attributes and gaps requiring strengthening.

Methods & Materials: Surveillance data for Tonkolili District EVD was reviewed and descriptive analysis was performed using Microsoft Excel. Key informant interviews with the program stakeholders were done. CDC updated guidelines for evaluating public health surveillance was used. Attributes determined include Simplicity, sensitivity, Positive Predictive value.

Results: The system provided information and data on disease trends and outbreak report/rumours. Case definitions were well understood by participants, with willingness to continue by all stakeholders. Standardized data collection tools were in place and data communication was clear with feedback to surveillance units at all levels. The EVD surveillance was not operated within the Integrated Disease Surveillance and Response framework (IDSR). Information technology are updated frequently on suspected cases sent to the laboratory. Data completeness was about 91%, consistency exist but data quality was poor (incompletely filled data and missing data exist). Timeliness of sample getting to the laboratory either same or the following day occurred in 174 (84.9%). Sensitivity of the surveillance system was 88.5%. Predictive value positive was 25.8%. The stability was questionable since the government of Sierra Leone were not fully in charge of the system.

Conclusion: The system could not fully met its objectives. There is a need to channel efforts towards integrating EVD surveillance into the IDSR, improve on data completeness and timeliness. The District Health Management Team needs to take ownership of the surveillance system for sustainability.

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