early detection of outbreaks, monitoring the spread and progress of outbreaks and determination of high-risk areas for interventions. Due to underreporting, poor surveillance and a weak One-Health approach to surveillance, reports on rabies are often incomplete. We evaluated the rabies surveillance system in Sunyani West District (SWD) to assess whether it is meeting its objectives, assess its system's attributes and usefulness.

Methods and materials: We extracted and reviewed rabies data for the period 2014–2018 from health and veterinary records in the SWD. We interviewed key stakeholders to collect data about the operations and attributes of the system using the CDC's Updated Guidelines for Evaluating Public Health Surveillance Systems. We performed summary descriptive statistics on quantitative data and direct content analysis on qualitative data.

Results: Between 2014–2018, 5.5% (14/254) of dog bites reported to the health facilities in SWD were captured by the veterinary office from which one outbreak was detected. All veterinary staff at SWD (4/4) were involved in rabies surveillance and had knowledge on case definition. Case investigation forms were easy to complete; requiring less than 10 min. Only two follow-ups at one-week interval were required to update case status. Reporting of suspected cases to the next level was real-time and sample submission to the laboratory was within 24 h. A PVP of 12.8% (41/320) was recorded at regional level. Against a 70% vaccination coverage target, the coverage was 5.5% (national), 8.5% (regional) and 7.1% (SWD). Of the cases reviewed, 92.9% (13/14) had reports with none completely filled.

Conclusion: The rabies surveillance system is useful. It meets one of its objectives; early detection of outbreaks. It is simple, timely and sensitive but has poor data quality and not acceptable. We recommend refresher training on data reporting by the Veterinary Services Directorate (VSD) and strengthening the One-Health approach to rabies surveillance by VSD and Ghana Health Services.

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Nasopharyngeal carriage of _Streptococcus pneumoniae_ serotypes among healthy children in North India

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Background: _Streptococcus pneumonia_ (SP) is a major cause of morbidity and mortality among children worldwide. India introduced 13-valent pneumococcal conjugate vaccine (PCV-13) in 2017 in national immunization program in a three dose schedule at 6 weeks, 10 weeks and 9 months. The current study was conducted to isolate SP from nasopharyngeal (NP) swabs of healthy children and assess changes in serotypes among PCV vaccinated and unvaccinated healthy children.

Methods and materials: Cross-sectional study was conducted in Lucknow District, Uttar Pradesh, India from July–August 2019. Recruitment was done from vaccination clinics of four public tertiary care hospitals. Children (2–59 months) who were permanent residents and had no clear illness/hospitalization in past one month were recruited. Single NP specimen was collected. After specimen collection, bacterial culture was done using 5% sheep agar blood plate containing gentamicin. Pneumococcal isolates were identified by optochin sensitivity and bile solubility. Serotyping was done using Quellung Method.

Results: Of 300 children, 56.7% (170/300) were males and 52.0%, (156/300) were 2–11 months of age. Overall SP colonization rate was 37.6% (113/300). Vaccine serotypes isolated were 18 C, 19 A, 19 F, 23F, 3, 4, 6A, 6B, 9V. Among 60% (181/300) PCV vaccinated, SP positivity was 37.5% (68/181) and vaccine serotype were 39.7% (27/68). Among 40% (119/300) non PCV vaccinated children, 37.8% (47/119) had NP colonization positive and PCV-13 serotypes were 37.7% (17/47). Non Vaccine serotypes were 10A, 15A, 15B, 15C, 21, 34, 35B, 22F and similar in vaccinated and unvaccinated children.

Conclusion: About 4 in 10 health children under 5 years of age had NP colonization with SP and around 40% serotypes were covered by PCV13. Our preliminary data suggests that SP colonization rate and serotype isolates were similar in vaccinated and unvaccinated children, however, further work is needed.

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Tuberculosis surveillance system evaluation, Ho Municipality. Volta Region – Ghana, 2019

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Background: Tuberculosis (TB) remains a major cause of morbidity and mortality worldwide with an estimated 10 million new (incident) TB cases in 2017. In Ghana, prevalence was estimated at 356 per 100,000 population and incidence of 160 per 100,000 population, mortality rate of 7.5 per 1000 infected people. The TB surveillance system exists to monitor TB burden in Ho and to improve the clinical outcomes of TB case patients. We evaluated the surveillance system at the Ho Municipality, Volta Region from 2014–2018 to determine its performance, usefulness and assess it system's attributes.

Methods and materials: We extracted and reviewed data from reporting form and DHIMS 2 covering the period 2014–2018. We interviewed stakeholders at Ho Municipality using a semi structured questionnaire for information on case detection and clinical outcomes. We assessed the system attributes using the CDC updated guidelines for evaluating public health systems (2006). Summary descriptive statistics was performed on quantitative data and results were presented in tables and graphs.

Results: Overall, 428 case of pulmonary TB were recorded in Ho Municipality for the evaluation period. The annual incidence of tuberculosis ranged from 1.6/100,000 in 2012 to 62.6/100,000 in 2014. The average case fatality rate was 8.3%. The predictive value positive was 1.2% (63/5876) in 2014 and 3.5% (958/1635) in 2018. Data inconsistency in reporting ledgers 100% (60/60) and DHIMS 40% (24/60).

Conclusion: The TB surveillance system was found to be useful and partially meeting its objectives. The system was complex and acceptable with good data quality. However, there is a need to