SLO Public Health Laboratory Bulletin

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Surveillance – 101

Viewers of televised shows with a law enforcement theme often see the use of surveillance applied to monitoring activity patterns of a probable law breaker. Public Health depends of surveillance techniques of a different kind—especially in regard to communicable disease. Individual or multiple cases of illness may not paint a clear picture of disease activity. Often, laboratories supply the missing link by providing solid evidence that a particular pathogen is the culprit. When a laboratory—either clinical or public health-- is engaged to provide this data, the activity is known as laboratory surveillance. Here are some questions for consideration on this topic:

What is the purpose of surveillance? In the event of an increase in illness caused by a particular agent—such as ***Bordetella pertussis*** - as we have seen in recent months, surveillance data enables Public Health officials to provide guidance to the medical community, schools, and communities at large on the current situation and how to prevent spread. Such guidance may include recommendations on interventions such as vaccinations or updates on effective treatment These interventions and efforts to prevent transmission of illness must be based on the best data – hard data. Can physicians' clinical diagnoses suffice? It's certainly possible, but take the example of respiratory illnesses with similar symptoms that may be due to one of many viruses, bacteria or fungi. Each may require a special approach and when the agent's identity is unknown, it is difficult to be precise about recommendations for treatment or prevention of spread.

Can the expected positive predictive value (PPV) of a particular laboratory test support surveillance? Yes, but a PPV is subject to many variables such as the stage of illness among those tested and the number tested. During a communicable disease epidemic a number of well people may get tested due to media attention, thereby artificially lowering the PPV. This may also occur if individuals are repeatedly tested. Does required lab reporting help? Yes, the lab report naturally helps to define a case, and especially when the health care provider also reports the same case. But despite mandates passive surveillance systems—based on case reports –are often subject to incomplete reporting. Physicians or the laboratory neglects or forgets to send the report to public health. Many studies have shown that fewer than half of all reportable cases of disease are actually reported when manual passive reporting is the method. Active surveillance – the application of public health staff calling or visiting health care providers and reviewing patient data - often doubles the number of cases found.

Can we use something other than patient testing? Yes, at times testing the vector of illness is very useful in guiding public health decisions. Testing trapped mosquitoes for West Nile Virus by PCR has been demonstrated to predict the hazard of mosquito-bite transmission of West Nile fever in peak times of transmission. Testing wild animal carcasses for rabies virus, or agents of plague and tularemia can be valuable laboratory surveillance measures for estimating the risk of contracting these infections.

Accurate and precise laboratory testing coupled with timely reporting allows public health professionals to surveil the big picture—to determine if disease rates are truly going, down or remaining steady—thus allowing expert guidance to be formulated that keeps a pathogen in its place.

What else does a public health laboratory do besides Pertussis Testing?

The SLO Public Health laboratory has begun seasonal influenza surveillance testing using the newest CDC-developed reverse-transcription real-time PCR assay. Except for a single detection of a seasonal type H3N2 virus all specimens from influenza-like illness (ILI) patients have been negative so far this fall.