



REDDINET[®] TOOL FOR SITUATIONAL AWARENESS: SAN FERNANDO VALLEY WILDFIRES

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INTRODUCTION

During October of 2008, the Marek and Sesnon wildfires scorched nearly 15,000 acres of land and spread throughout the San Fernando Valley destroying fifteen residences and sixty three non-residential buildings [1]. ReddiNet[®] is a biosurveillance project which polls 65 participating hospitals throughout Los Angeles County on a daily basis to assess Emergency Department (ED) volume data. In order to gauge the burden of ED visits attributable to the wildfires, a special polling question was created and distributed to select ReddiNet[®]-participating hospitals within close proximity to the wildfire locations.

METHODS

On three consecutive days after the beginning of the wildfires, fifteen hospitals within geographic proximity were asked to additionally report the “Number of ED patients complaining of upper respiratory problems resulting from exposure to smoke/fire related particles”. The questions were open to responses for one week from the date of posting, and no advanced warning or notification was given prior to posting of the additional question.

RESULTS

Data were received from 8 of the 15 hospitals (53.3%) (Table 1). Results from the eight hospitals show wildfire-related ED visits ranging anywhere from 0 to 10 per hospital, with a total of 20 visits observed overall for October 13. In contrast, visits for October 14 only totaled 7, with 6 hospitals reporting no visits, and two hospitals reporting more than 3 visits each. Only one hospital reported seeing any wildfire-related ED visits on the third day. The average number of wildfire-related ED visits seen on the first day was 2.5 per hospital (Table 2). This number dropped to less than one for the second and third days, collectively, which suggests that the burden of wildfire-related ED visits occur early, most likely due to sudden changes in air quality, especially for chronic respiratory or asthmatic sufferers, and larger initial exposure population (pre-evacuation). The total number of visits reported for all three days was 28. This, however, is likely an underestimate, given that there were a few hospitals in closer proximity to the wildfires than those reporting wildfire-related ED visits which did not respond to the poll.

Hospital	Oct. 13	Oct. 14	Oct. 15	Total Visits
A	10	0	0	10
B	0	0	0	0
C	1	0	1	2
D	4	4	0	8
E	4	0	0	4
F	0	0	0	0
G	1	3	N/A	4
H	0	0	0	0
Total Visits	20	7	1	28



<u>Day (Date)</u>	<u>Avg. per hospital</u>
Monday, October 13, 2008	2.5
Tuesday, October 14, 2008	0.875
Wednesday, October 15, 2008	0.14

Reporting by the eight hospitals was highly consistent, with only one non-reporting hospital on October 15. Timeliness of reporting for October 13 ranged anywhere from 1 to 3 hospital responses per day, with complete reporting within four days. October 14-15 had similar rates of reporting, with the majority of hospitals responding within the first 24 hours (Table 3). The increase in timeliness of reporting between October 13 and those of October 14-15, collectively, may be a reflection of the hospitals' late observance of the additional polling question due to there being no prior training, notification, or warning. Consistency in reporting and thoroughness of responses throughout the exercise demonstrate high reliability by hospitals that choose to participate.

<u>No. of hospitals Reporting (%)</u>	<u>Oct. 13</u>	<u>Oct. 14</u>	<u>Oct. 15</u>
Within 1 day	1 (12.5)	5 (62.5)	5 (71.4)
Within 2 days	2 (37.5)	2 (87.5)	1 (85.7)
Within 3 days	3 (75)		
Within 4 days	2 (100)		
Within 5 days			
Within 6 days		1 (100)	1 (100)
Total	8	8	7*

*Total number of hospitals reporting for Oct. 15 was 7.

DISCUSSION

Currently, no special polling sections exist on the ReddiNet[®] system. As a result, all additional polling questions presented to hospitals appear in the same font, font size, and text as all other daily polling questions. Future improvements may include the development of an additional polling section which will alert users when a special poll is being conducted.

Overall, this exercise provided a baseline for measurement of participation and response to any future special polls administered via the ReddiNet[®] system. Results from the exercise suggest possible increases in participation through regularly administered practice polls. This may breed familiarity for staff members entering data. In addition, improved communication with individual hospital staff responsible for entering polling data (e.g., email lists of key hospital staff) should be established for sufficient hospital notification of special polls or updates. With the stated improvements, the future shows promise for using this instrument to assess near real-time burden of ED visits attributable to large outbreaks, pandemics, and many other local public health emergencies.

REFERENCE

1. "Sesnon Fire" California Department of Forestry and Fire Protection. Updated October 18, 2008 Retrieved February 12, 2009. http://www.fire.ca.gov/index_incidents_sesnon.php.



A CASE OF CONGENITAL RUBELLA IN LOS ANGELES COUNTY

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BACKGROUND

Women who are non-immune to rubella and who become infected with rubella during pregnancy are at risk for delivering an infant with Congenital Rubella Syndrome (CRS). About 85% of infants born to women that were infected with rubella during the first trimester of pregnancy will be affected. Congenital rubella can be a devastating disease with multi-organ involvement and severe congenital defects. Deafness is the most common single manifestation of congenital rubella; however, many infants will also have severe eye defects including cataracts and structural heart disease. These three features are the hallmark of CRS. Neurologic abnormalities, bone lesions, splenomegaly, hepatitis, and thrombocytopenia are also common.

The last major rubella epidemic in the US occurred in 1964-1965, during which there were an estimated 12.5 million cases of rubella infection with about 20,000 cases of CRS [1]. Following rubella vaccine licensure in 1969, the annual incidence of rubella rapidly declined reaching a record low of seven US cases in 2003. In October of 2004, CDC declared rubella to be no longer endemic in the US [1].

In Los Angeles County (LAC), rubella incidence has followed the national trend; the 5-year average incidence of rubella cases in LAC for the years 1992-1996 was only 0.04, equivalent to an average of 3.6 cases per year [2]. During the five-year period of 2003-2007, only one case of rubella was reported in LAC (2005) [3].

Despite the success in eliminating the endemic circulation of rubella in the US, the risk for importation of rubella from parts of the world where rubella continues to circulate is significant.

THE CASE

In November 2008, the Los Angeles County Department of Public Health received a confidential morbidity report on a suspect Congenital Rubella Syndrome (CRS) case from the neonatal department of a local hospital. The infant had a positive IgM serological test result for rubella. Upon interviewing the infectious disease physician who consulted on the case and reviewing the medical records, it became immediately clear that this was, in fact, a case of CRS. The infant was born at 34 weeks gestation, had significant thrombocytopenia requiring a platelet transfusion, bilateral cataracts, a patent ductus arteriosus, an atrial septal defect, an enlarged liver, and bone radiolucencies. Although not known initially, the infant went on to fail a hearing test at the time of hospital discharge. Subsequently, a viral culture from the nasopharynx yielded positive growth of rubella at the State of California Viral and Rickettsial Disease Laboratory.

The mother of the child was a 33 year old licensed health care professional, born in the US, without a history of acute or chronic illness. This infant was the result of her first pregnancy. She initiated prenatal care for this infant during her second trimester, upon returning to the US from a three month extended stay (with her husband) in India that included a two week trip to China. The result of her rubella screening test during her initial prenatal visit was positive (immune).

The mother stated that she became pregnant during the trip. She denied any signs or symptoms of rubella during her trip. (Rubella often presents as a very mild, minimally apparent disease in adults.) She did note that during her time overseas, she worked as a volunteer at an elementary school in a very poor area of Mumbai, India.

The mother believed that she was vaccinated as a child against rubella and this was further supported by a discussion with her mother. However, no immunization records could be found. When she first went to work at a local dental clinic two years ago, she was only required to be vaccinated against hepatitis B. At



that time, she was not assessed for immunity (or vaccination status) against rubella. She received services at a travel medicine clinic prior to her extended overseas trip and again there was no assessment of immunity (or vaccination status) against rubella.

DISCUSSION

Lessons Learned

This CRS case illustrates several important points. First, it's important to remember that exposure to a vaccine preventable disease that is no longer endemic in the US is often just an airplane ride away. With the significant number of US measles outbreaks in 2008, most of which were linked to importation cases, many foreign travelers are now aware of the importance of being protected against measles before embarking on their trip. However, there appears to be less emphasis on ensuring protection against rubella.

Lesson 1: The Centers for Disease Control and Prevention categorizes vaccines for travel into three categories: routine, recommended, and required. All travelers and their families must ensure they are up-to-date on all routine vaccinations. These vaccines are necessary for protection from diseases that are still common in many parts of the world even though they rarely occur in the US (<http://wwwn.cdc.gov/travel/content/Vaccinations.aspx>).

Secondly, documentation of positive rubella immunity during an initial prenatal visit, especially if that visit is made late in the first trimester, does not rule out very recent maternal rubella infection that could put the developing fetus at risk. Most often, the only rubella test that is obtained is a single IgG and that test provides no information about current disease. Unfortunately when an IgM test is also obtained early in pregnancy, the high false-positive rates obtained by many laboratories limits the value of that test as well.

Lesson 2: Although serological testing during the first prenatal visit is important to assess rubella immunity, there can be rare instances where a positive serological test during pregnancy does not eliminate the possibility of an infant being born with congenital rubella. Ideally, women of childbearing age should have their rubella immunity status determined when not pregnant. Consideration should be given to making rubella immunity testing an important part of preconception care.

Thirdly, there is documentation in the medical literature of women who were previously immune to rubella (either by vaccination or natural disease) losing their immunity and subsequently becoming re-infected with rubella and giving birth to an infant with congenital rubella [4,5,6,7]. Vaccine failure probably accounts for some of these occurrences as it has been well documented that persons vaccinated with two of the early rubella vaccines (HPV-77 and Cendehill) had a 50% or greater risk of re-infection with rubella if exposed [8]. The much better performing RA27/3 rubella vaccine was licensed in the US in 1979 and the previously licensed vaccines were withdrawn from the market. If the mother of this CRS infant was, in fact, vaccinated against rubella, she would have been vaccinated in 1976, based on her birth year being 1975. She therefore would have received one of the two poorer performing vaccines. However, because her childhood vaccination records were never found, it is not possible to determine that she was ever vaccinated against rubella.

Lesson 3: Women of childbearing age who were vaccinated before 1979 could benefit from serological testing and subsequent rubella revaccination if the serological test result fails to show rubella immunity.

Fourthly, there were major "missed opportunities" to assess the rubella immunity status of the mother of this CRS case when she entered dental school several years ago as well as when she visited a travel medicine clinic prior to her travels. Furthermore, she only received immunizations against hepatitis B when she began her work at a local dental clinic two years ago. All health care workers are recommended to have immunity against rubella (among other diseases) and immunity is defined as serological evidence of past infection or documentation of vaccination [9]. Since she lacked documentation of vaccination, she should have received serological testing.



Lesson 4: Strict standards for health care worker immunity assessment and immunization for vaccine preventable diseases need to be implemented by all employee health departments that evaluate health care workers. In addition, all travelers and travel medicine service facilities and providers must visit the Centers for Disease Control and Prevention travel health website to ensure that all recommended, required, and routine (i.e., rubella) vaccines have been received prior to travel.

NEXT STEPS

The Los Angeles County Department of Public Health Immunization Program will be sharing this information along with additional “lessons learned” from previous years’ rubella cases with the public, and general medical and travel medicine providers via presentations and published alerts.

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