## G32 2009 H1N1 Fatalities: The New Mexico Experience

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After attending this presentation, attendees will be able to describe the clinical and epidemiologic features associated with H1N1 fatalities, recognize the spectrum of histologic features that can be seen in H1N1 fatalities gain a familiarity with laboratory diagnostic options in cases of suspected H1N1, and recognize the importance of the autopsy in tracking the epidemiology of infectious disease.

This presentation will impact the forensic science community by raising awareness of which subgroups have greater H1N1 influenza mortality risk, and therefore may benefit from early antiviral treatment. It will also illustrate that H1N1 fatalities with a relatively rapid disease course may have far subtler respiratory histologic findings than those of previously published studies.

**Hypothesis:** New Mexico is an ethnically and racially diverse state with a large Native American population, among others. It is hypothesized that this population heterogeneity may predict a similar diversity of clinical and pathologic findings in 2009 New Mexico H1N1 fatalities.

**Methods:** A retrospective review of hospital, laboratory, field investigative, and autopsy reports of all H1N1 positive influenza fatalities reported to the New Mexico Department of Health in 2009 was performed. In those cases in which autopsies were performed, all available microscopic slide sections were independently reviewed by a study pathologist. All respiratory sections were additionally reviewed by a study pathologist with pulmonary pathology expertise.

**Results:** There were 52 H1N1 deaths reported to the New Mexico Department of Health in 2009: of these, 14 were autopsied. In two autopsied cases, H1N1 infection was determined to not be the cause of death. These cases were excluded from further study. In 3 out of 12 autopsied cases, the diagnosis of H1N1 influenza was made via antemortem studies, while in 9 out of 12 cases it was made at autopsy via reverse-transcriptase PCR on nasopharyngeal specimens +/- viral

nasopharyngeal/lung cultures. The most common respiratory histologic findings were alveolar edema (75%), interstitial inflammation (100%), bronchitis/bronchiolitis (83.3%), tracheitis (87.5%), and bronchopneumonia (66.7%). Of the total autopsied and non-autopsied fatalities, race/ethnicity was 42% Hispanic, 36% Caucasian, and 22% Native American. Ages ranged from 2 months – 89 years, with peaks in the 40 (18%) and 50 (26%) year decades.

**Conclusions:** This study highlights the importance of the autopsy in tracking the epidemiology of infectious disease: in 9/12 (75%) cases, H1N1 influenza was not known to be the cause of death until after autopsy. Most other studies of H1N1 pulmonary histopathology report diffuse alveolar damage (DAD) in the majority of autopsied fatalities (74%-100%). In this series, only 2 out of 12 (16.7%) cases manifested DAD. Also, the majority had a relatively rapid disease course: time from onset of symptoms to death in autopsied cases ranged from 1-12 d (avg
3.5 d) vs. the other largest published series' range of 2-44 d (median 7 d). These findings may indicate that New Mexico H1N1 influenza fatalities generally did not survive long enough to develop the more classic pulmonary manifestations. Native Americans comprised 2 out of 12 (16.7%) of autopsied fatalities and 9out of 38 (23.7%) of non-autopsied fatalities. As the overall New Mexico population is only 9.6% Native American, Native Americans are disproportionately represented among the 2009 NM H1N1 fatalities.

**H1N1, Influenza, Autopsy**

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