

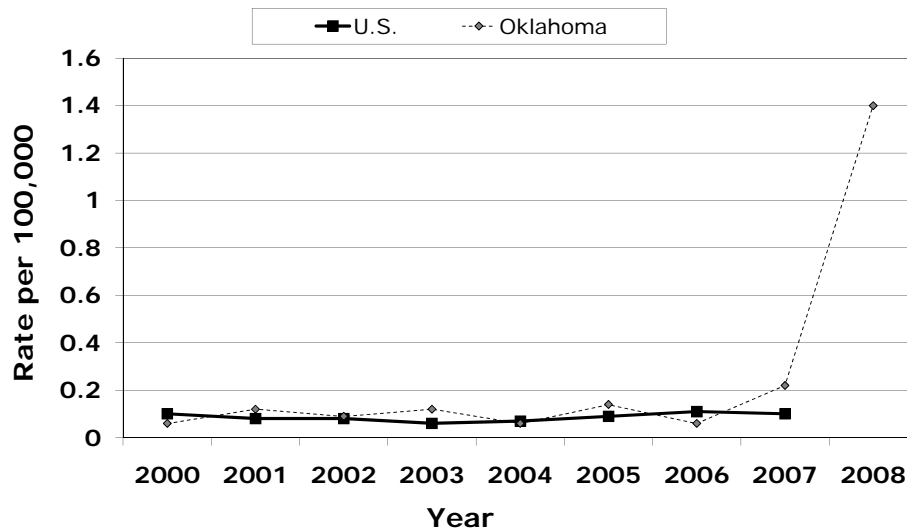
## Hemolytic Uremic Syndrome, post diarrheal

2008 Case Total 51  
2007 Case Total 8

2008 Rate 1.40 per 100,000  
2007 Rate 0.23 per 100,000

Oklahoma experienced a sharp increase in the number of post diarrheal Hemolytic Uremic Syndrome (HUS), cases reported in 2008 compared with previous years. Fifty-one cases were reported correlating to an increase of over 600 percent from 2007. HUS became a reportable condition in Oklahoma in 2001 and since that time two to eight cases have been reported yearly. The increase in the number of 2008 cases can largely be attributed to an *E. coli* O111 outbreak that occurred in northeastern Oklahoma in August and September of 2008. Eleven cases were not attributable to the *E. coli* O111 outbreak thus, if outbreak-related cases were set aside, there was still a 38% increase in the number of 2008 cases as compared to 2007.

### Hemolytic Uremic Syndrome, post diarrheal Incidence Rate by Year, Oklahoma and U.S., 2000 – 2008\*



\*2008 US data not available

In August of 2008, OSDH was notified of an increase in children being admitted to a northeast Oklahoma hospital with severe hemorrhagic diarrhea. Upon investigation, exposure to a popular buffet style restaurant was noted. In all, 341 cases of *E. coli* O111 were identified, of which 70 were hospitalized, and one case died. A HUS case definition was established for outbreak cases. While 40 cases met the CDC case definition for HUS and were thus reported to the CDC and are reflected in this summary, 25 of the cases met a more stringent case definition established for this outbreak, which required thrombocytopenia. A HUS case was identified in one child who had no exposure to the restaurant, but was a sibling to a child who had eaten at the restaurant.

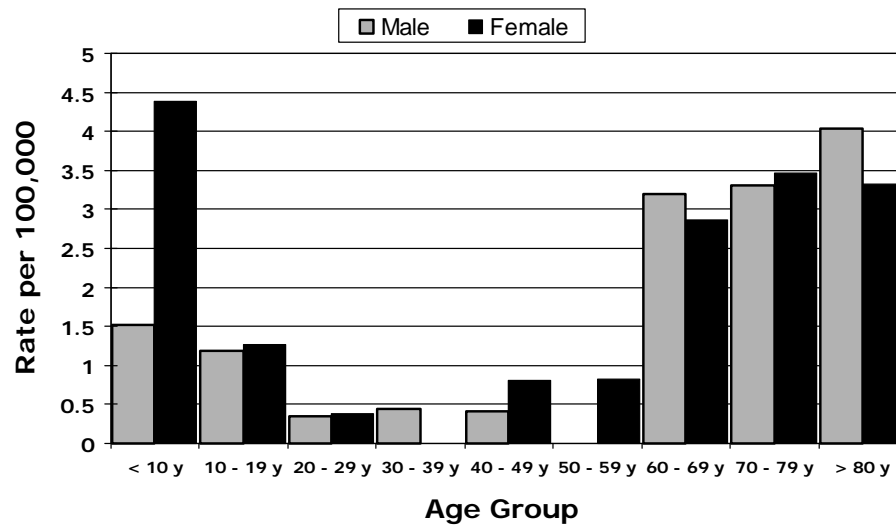
Non-outbreak related cases occurred sporadically across the state with one to two cases in nine counties. One case reported travel during the incubation period to another county; otherwise the ten other cases had no travel history documented during the investigation. Outbreak related cases were residents of ten northeastern Oklahoma counties with Tulsa and Mayes counties having the highest number of cases.

Case-patient ages ranged from one year to 88 years with a median of 45 years. Sixty-one percent of cases were female. The highest incidence occurred in the females under the age of ten with a rate of 4.4 per 100,000 persons. Higher incidence rates were also noted in males and females over the age of 60 years. The higher incidence rates in these groups may be attributed to outbreak-related cases. The analysis of the outbreak showed an increased risk of

developing disease for females as compared to males. Additionally, the rates by age group did not follow the national pattern in that the highest rates were not always in children less than 5 years of age.<sup>1</sup>

The highest incidence rate for race occurred in the Native American population. Seven cases (13.7%) reported Native American for race corresponding to an incidence rate of 2.40 per 100,000. White race was reported by the other 44 cases with an incidence rate of 1.55 per 100,000. Hispanic ethnicity was reported by two cases with a rate 0.72 compared to an incidence rate of 1.25 for Non-Hispanics.

### Rate of Reported Hemolytic Uremic Syndrome, post diarrheal Cases by Age Group and Gender, Oklahoma, 2008



All HUS cases in 2008 were hospitalized. The length of hospitalization ranged from one to 45 days with a median of eleven days. One death was reported in a previously healthy 26-year-old male who was also associated with the outbreak. Identification of HUS is made through evaluation of a combination of laboratory test results. Anemia with microangiopathic changes shown on a peripheral blood smear was documented for 26 (51%) of the cases. Of those with microangiopathic changes, schistocytes were most commonly seen (96.2%) followed by burr cells (42.3%) and then helmet cells (23.1%). Hematuria was reported in 76.5% of cases; likewise, proteinuria was also seen in 76.5% of cases. Additionally, elevated creatinine was documented for 68.6% of cases and thrombocytopenia in 62.8% of cases.

Of the cases not associated with the outbreak, an etiologic agent was identified in four (36%) of the eleven cases, which was *E. coli* O157:H7 with results confirmed by the OSDH PHL. A case control study of ten medical centers in the United States looked at persons with sporadic *E. coli* O157:H7 infections to assess for risk factors associated with development of HUS. The investigators reported that approximately eight percent of *E. coli* O157:H7 cases will progress to HUS.<sup>2</sup> In Oklahoma in 2008, four of 32 (12.5%) *E. coli* O157:H7 cases also developed HUS.

<sup>1</sup> Centers for Disease Control and Prevention. [Summary of notifiable diseases—United States, 2007]. Published July 9, 2009 for MMWR 2007;56(No. 53):10-11,35.

<sup>2</sup> Slutsker L, Ries AA, Maloney K, et al. A nationwide case-control study of *Escherichia coli* O157:H7 infection in the United States. J Infect Dis 1998;177:962-6.