

Escherichia coli O104:H4 from 2011 European Outbreak and Strain from South Korea

To the Editor: Beginning in early May 2011, an outbreak caused by Shiga toxin-producing *Escherichia coli* O104:H4 was reported in Germany and other countries in Europe. In this outbreak, the number of hemolytic uremic syndrome (HUS) cases has been unusually high (1). As of June 9, 2011, a total of 722 cases of HUS, 19 deaths, and 2,745 cases of enterohemorrhagic *E. coli* (EHEC) infection were reported (2).

A case of HUS caused by *E. coli* O104:H4 was first reported in South Korea in 2004 (3). Because infections caused by *E. coli* O104:H4 have been reported rarely, interest has arisen in the *E. coli* O104:H4 strain from South Korea. We characterized the *E. coli* O104:H4 strain isolated in South Korea (EC0417119) in 2004 and compared it with the *E. coli* O104:H4 strain associated with the current EHEC outbreak in Europe.

The serotype EC0417119, isolated from a patient with HUS in 2004, was reconfirmed as *E. coli* O104:H4. The strain was positive for *stx1* and *stx2* by PCR (4) but negative for *aggR* by PCR (5). In the antimicrobial drug susceptibility

test using VITEK 2 AST-N169 test kit (bioMérieux, Marcy L'Etoile, France), the strain was resistant to ampicillin, ampicillin/sulbactam, and trimethoprim/sulfamethoxazole but susceptible to ceftriaxone, cefotaxime, nalidixic acid, and tetracycline.

We also performed pulsed-field gel electrophoresis (PFGE) for EC0417119, according to the PulseNet standard protocol (6), and compared its PFGE profile with that of the current outbreak strain *E. coli* O104:H4, which was obtained from the PulseNet Asia Pacific network. PFGE profiles resolved by either *XbaI* or *BlnI* did not match each other. The percentage similarity of *XbaI*- and *BlnI*-digested PFGE profiles of the 2 isolates was 75% and 66.7%, respectively, as shown in the Figure.

Infections with the EHEC O104 strain were reported several times worldwide. In Europe, such occurrence was rare, and before the current outbreak, the EHEC O104:H4 strain was documented only once in South Korea. For this reason, it was logical to examine the possible relatedness of the EC0417119 strain and the strain causing the current outbreak. However, the EC0417119 strain has many different characteristics compared with the current outbreak strain: not possessing enteroaggregative *E. coli* determinant, not producing extended-spectrum β -lactamases, and not showing indistinguishable PFGE

patterns. In conclusion, there is no evidence that the *E. coli* O104:H4 strain isolated in South Korea in 2004 is related to the strain that has caused the massive and unprecedented EHEC outbreak in Europe.

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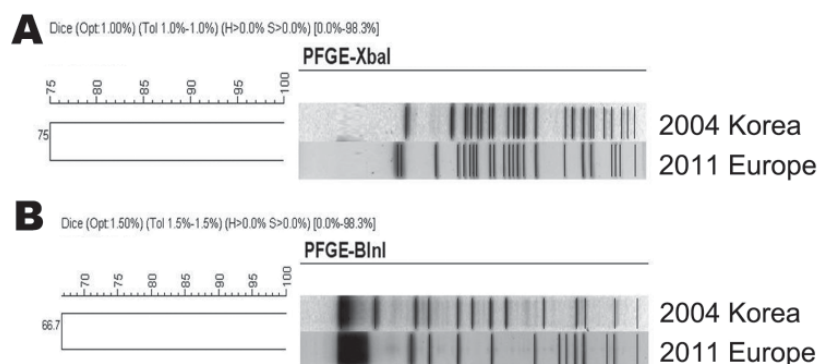


Figure. Clustering of A) *XbaI*- and B) *BlnI*-digested DNA fragments by pulsed-field gel electrophoresis (PFGE) for *Escherichia coli* O104:H4 2011 outbreak strain in Europe and isolate obtained in South Korea in 2004.

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Respiratory Illness in Households of School-Dismissed Students during Pandemic (H1N1) 2009

To the Editor: In response to the emergence of pandemic (H1N1) 2009 virus (1), the Centers for Disease Control and Prevention (CDC) issued interim guidance for preventing spread of the pandemic virus in schools. Initial guidance recommended that dismissal of students be considered for schools with confirmed cases of pandemic (H1N1) 2009 infection. The guidance was subsequently revised to recommend monitoring for respiratory illness and exclusion of ill students until they were noninfectious, rather than dismissal.

In Chicago, Illinois, USA, the first cases of pandemic (H1N1) 2009 infection were identified on April 28, 2009, of which 1 occurred in an elementary school student (2). In accordance with CDC guidance at the time, the school (school A) was closed for 1 week, April 29–May 5, 2009. CDC and the Chicago Department of Public Health investigated respiratory illnesses among students and their households during the period surrounding the school closure.

A telephone survey of students' households was conducted during

May 15–20, 2009 (3). One adult member of each household was asked whether any household members had been "sick with cold or flu symptoms or fever" since April 12. Age, date of illness onset, and symptoms and signs (fever, cough, sore throat, rhinorrhea or nasal congestion [runny or stuffy nose]) were recorded. Acute respiratory illness was defined as ≥ 1 symptom or sign from the list provided. Influenza-like illness was defined as fever plus cough or sore throat. Reports were excluded if onset date was before April 12 or unknown. Descriptive analysis was performed, and household attack rates were calculated. Dates of onset were used to evaluate timing of illness in relation to school closure and possible transmission within households. The investigation was approved as nonresearch by CDC.

Of 609 eligible households, 439 (72%) had a working telephone number, of which 170 (39%) completed the survey. Thirty-nine (23%) households, representing 181 persons, reported 58 illnesses that met the acute respiratory illness definition, of which 37 (64%) also met the influenza-like illness definition.

Median age was 10 years (range <1–48 years). Of 57 household members for whom age and student status were recorded, 42 (74%) were students at school A. Thirty-four (60%) reported onset of symptoms before or on the day of school dismissal (Figure).

Household attack rates ranged from 10% to 100% (median 25%). Five (13%) households reporting illness had no ill students who attended school A. In 4 of 11 households reporting ≥ 2 illnesses, students became ill before nonstudent household members. In the remaining 7 households, onset dates did not suggest student-to-nonstudent transmission.

Even though the school was closed almost immediately after the first pandemic (H1N1) 2009 case was confirmed in a student, onset of $\approx 60\%$ of reported illnesses occurred before or on the day of school dismissal, suggesting that unrecognized transmission was already occurring in the school or community. These results are supported by data on confirmed cases of pandemic (H1N1) 2009 in Chicago, which suggest that community transmission was high during the survey period (2). Our results also indicated that at least some

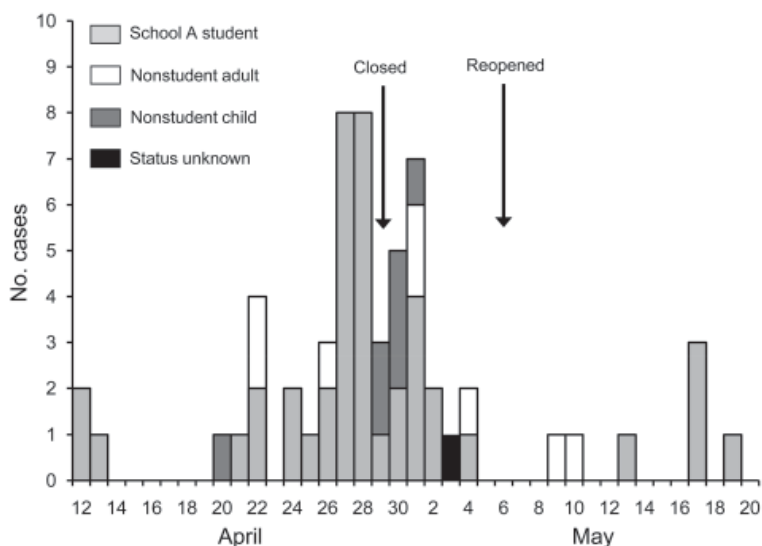


Figure. Respiratory illness in households of school-dismissed students during the pandemic (H1N1) 2009 outbreak, Chicago, Illinois, USA, 2009. Arrows indicate dates when school A closed and reopened.