In September 2006, Shizuoka City experienced two outbreaks of enterohemorrhagic Escherichia coli (EHEC) infections, one involving a nursery school and the other a primary school.

Outbreak 1: On September 5, a health center was informed of a case of EHEC O26 (VT1). The patient was attending a nursery school. On September 6, another case of EHEC O26 (VT1) was reported from the same nursery school. The nursery school had 212 children and 44 staff members. The children were classed according to ages, 0 to 1 year, 2 years, 3 years, 4 years, and 5 years. The health center’s investigation revealed about 10 children in the nursery school who had diarrhea or loose bowels. The first case was noted on August 23 and the last case was on September 6. The peak was August 31. A total of 18 children were symptomatically infected. They were all 0- to 1-year-old children (Fig. 1).

The Shizuoka City Institute of Environmental Sciences and Public Health collected a total of 184 stool specimens (including two specimens from the 1-year-old children above) from the nursery school children and the nursery school staff and, where possible, from children’s family members. Six swab specimens of the nursery facility were collected in addition. EHEC O26 (VT1) was isolated from a total of 18 children (15 1-year-old children and one child each in the 0-, 2-, and 3-year age groups) and from one family member of a child. The staff stools and facility swabs were all negative. On further investigation of 44 additional family members’ stools, 11 were found positive for EHEC O26 (VT1). Thus, the EHEC O26 (VT1) positive cases totaled 30. The patients’ excretion of the bacteria was followed until it became negative. The longest excretion period exceeded 1 month.

The isolates were all EHEC O26:H11, VT1-positive. The pulsed-field gel electrophoresis (PFGE) of XbaI-digested chromosomal DNA (lanes 1-5, Fig. 2) showed an identical pattern in all isolates except one, which was differed from...
Outbreak 1: A total of 12 stool specimens from the affected children were positive for EHEC O111:H– (VT1 and 2), while no isolates were obtained from the others by only one band (lane 4). For isolates obtained from patients who continued excreting more than 1 month, the PFGE pattern remained unchanged.

The infection route was not clear. Most of the affected 0-year-old and 1-year-old children were bathed in a baby bath or in a portable pool, respectively, while the less affected older children used a swimming pool. The food material used for preparing children’s lunches was the same.

Outbreak 2: On September 19 and 20, three cases of EHEC O111 (VT1 and 2) were reported to the health center. The patients were in the fifth grade in the same primary school. Several other children in the same grade classes were found to have abdominal pain and diarrhea. No children in the other grade classes were affected.

The fifth grade children had an outdoor school for 3 days starting from September 6. On September 7, the children visited two dairy farms in two separate groups. Children of only one group were affected. The incidence peaked on September 12 - 13.

The Shizuoka City Institute of Environmental Sciences and Public Health examined total 126 stool specimens from children who participated in the outdoor school, their teachers, and 17 family members of the symptomatically infected children. With this study, EHEC O111 was isolated from two additional symptomatically infected children. The family members of the infected children were all negative for the bacteria. The regional health center investigated the facility where the children spent the 3 days and two dairy farms which children visited. No EHEC O111 (VT1 and 2) could be isolated from these places.

The isolates were all EHEC O111:H– (VT1 and 2). The PFGE pattern of \(Xba\)I digests of the chromosomal DNA (Fig. 2, lanes 6-10) were identical except for one (lane 8), which differed from the others by only one band. These findings strongly suggest that the outbreak was caused by a single infection source, presumably one of the dairy farms.

We thank Dr Hiroshi Yoshikura, Emeritus Researcher, National Institute of Infectious Diseases for advice on preparing the manuscript.