Based on the findings of this outbreak investigation, the following recommendations were made:

1. Isolation procedures for suspect measles cases in the emergency room and pediatric out-patient department should be discussed at the next meeting of the Kaohsiung hospital's infection control committee.
2. Surveillance for measles cases in schools should be conducted jointly by education and public health officials. Any case of measles *in* a school should be considered a potential outbreak and susceptible children should be identified and vaccinated immediately. Ideally, schools should keep a record of the immunization status of all students and refer those who are not completely immunized to local health authorities.
3. Vaccine should be transported and stored with temperature monitoring devices. Refrigerators used for vaccine storage should not be used for other purposes (e.g., storing foods and medications). Vaccines which have not been properly stored should be discarded.
4. Health stations should routinely receive copies of birth registration forms and use this information to set monthly immunization targets and calculate coverage rates. Immunization cards should be given to all mothers at the time of delivery, and the cards should be updated with each visit to the health station. County health bureaus should conduct household immunization surveys periodically to verify the immunization rates reported to them by health stations.

References

1. CDC. Measles vaccine efficacy - United States. MMWR 1980;29:470-2.

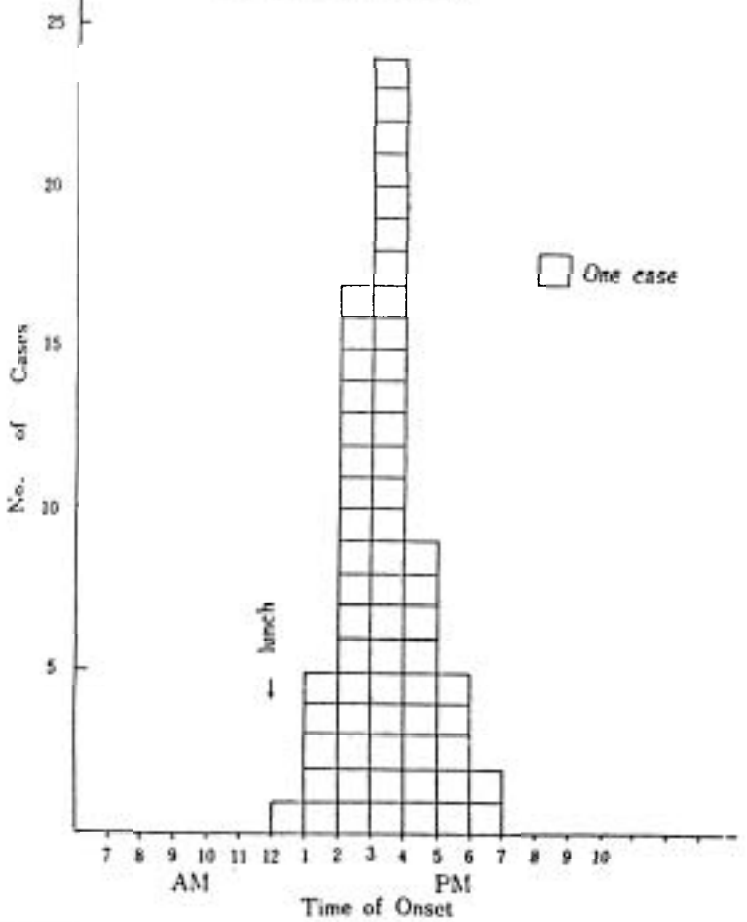
Outbreak of Gastroenteritis in a Vocational School – Yun Lin County

On October 29, 1985, an outbreak of gastroenteritis occurred among students in a vocational school (enrollment 1,364) in Hu-Wei Township, Yun Lin County. Students became ill approximately 3-4 hours after lunch. Questionnaires were sent to all students, and 1,205 (88%) were returned. A total of 79 (7%) students were ill. Twenty-six (33%) were hospitalized. Symptoms included abdominal pain (70%), vomiting (56%), diarrhea (46%), and fever (28%). Stool and vomitus were collected from 16 persons, however, specimens were only tested for *Vibrio, Salmonella* and *Shigella* species. All were negative. Time of onset was available for 63 students; symptoms began 1-6 hours after lunch with a mean of 3.8 hours (Figure 2).

Lunches on October 29 came from several sources: the school cafeteria, students' homes, and 4 private suppliers of box lunches. Seventy-four (94%) of 79 ill students ate box lunches supplied by Company A. The attack rate for students who ate box lunches from Company A was 30%.

To identify the vehicle(s) in this outbreak, food exposure histories were analyzed for students who ate Company A's box lunches. For this analysis, a case of gastroenteritis was defined as a student who had one or more of the following symptoms: abdominal pain, nausea, vomiting, or diarrhea. Sixty-one (25%) of 243 students who ate Company A's lunches met this case definition. Box lunches from Company A contained 8 ingredients: rice, egg, turnip with peanuts, bean curd, pork meat, asparagus, leek flower, and

Figure 2 Cases of gastroenteritis by time of onset Yun Lin County, October 29 1985.



pork liver. Only pork liver was significantly associated with illness: 49 of 142 students exposed compared to 11 of 94 students not exposed to pork liver were ill (history was unavailable for one ill student), chi square = 14.3, $p<.0002$.

Whole fresh pork liver was purchased by a Company A foodhandler from a local market on October 28. The liver was stored overnight in a freezer and placed in water at 6 AM the following morning to thaw. The whole liver was boiled for 1 hour and allowed to cool at room temperature for about 30 minutes. At 8:30 AM, a foodhandler sliced the warm liver into small pieces and placed it into closed styrofoam lunch boxes designed to keep contents warm. The box lunches were delivered to the school about 3-4 hours later and served. Food specimens from the box lunches were collected, however, they were only tested for *Vibrio, Salmonella,* and *Shigella* species. All specimens were negative for these organisms.

Reported by Food Sanitation and Disease Control Sections, Yun Lin County Health Bureau; Food Sanitation Section, Taiwan Provincial Health Department; Bureau of Disease Control, Department of Health, Executive Yuan.

Editorial note: The short incubation period, high proportion of students with abdominal pain and vomiting, and association with a protein-rich vehicle strongly suggests this outbreak was caused by *Staphylococcus aureus* food poisoning. *S aureus* is ubiquitous and can be found on hands and in the nasopharynx. Contamination can occur when foods are handled; slicing and chopping can spread microorganisms throughout the food. Although the temperature inside the box lunches was not measured, it was probably much less than the minimum of 60°C required to inhibit the growth of microorganisms. Holding the sliced liver at a warm temperature(35-45°C) for 3-4 hours would provide ample opportunity for a small innoculum of *S aureus* from the hands or nasopharynx of a foodhandler to multiply and produce enterotoxin. It is unfortunate that although appropriate food and patient specimens were collected, the laboratory did not attempt to isolate the appropriate organisms.

To improve the quality of future foodborne outbreak investigations, county health bureau and laboratory personnel are urged to call the Bureau of Disease Control or Bureau of Food Sanitation immediately upon hearing of any foodborne outbreaks. Patient specimens should be collected using *both* Cary-Blair and peptone water transport media. Food specimens should be collected in individual containers and transported to the laboratory on ice. Laboratory personnel should refrigerate and save all food and patient specimens after routine testing until the epidemiologic investigation is complete. The following telephone number should be used for reporting all communicable disease outbreaks: (02)396-2847.

To strengthen the surveillance system and enrich the content of the *Bulletin*, we welcome accounts of interesting cases, outbreaks, environmental hazards, or other public health problems of current interest. Articles for publication and requests to be placed on the mailing list should be sent to: the Editor, *Epidemiology Bulletin*, Bureau of Disease Control, Department of Health, the Executive Yuan, Republic of China, P. O. Box 91-103 Taipei, Taiwan, R.O.C., TEL: (02) 3962847

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