

SALMONELLOSIS FROM UNPASTEURIZED ORANGE JUICE

ON JUNE 23, a salmonellosis case was reported in Washington County. The county public health nurse conducted a routine case investigation, and elicited a story that the patient had been among a party of 13 who had eaten brunch at a Portland restaurant on June 13. Other members of the group were reportedly ill. The Health Division joined what became an outbreak investigation. Within four hours most of the party attendees had been interrogated, using a questionnaire incorporating the buffet menu. Of the four attendees who became ill within 2-4 days of eating, all drank orange juice, in contrast to none of 8 attendees who remained well ($P=0.002$). (One person was excluded from analysis.) The orange juice was an unpasteurized product produced by Sun Orchard, Inc., of Tempe, Arizona.

More cases having nothing to do with this restaurant soon appeared. The isolate from the index case was identified as serotype Muenchen by the Public Health Lab—historically an uncommon serotype in Oregon (average, 3-4 cases/year). As we go to press, 54 cases have been confirmed since June 13, and additional *Salmonella* isolates are pending. Confirmed cases of salmonellosis typically represent only 1-5% of the total.¹

Concurrently, epidemiologists at the Seattle/King County Public Health Department and the Washington State Department of Health were looking into an outbreak of *S. Muenchen* infections. Their investigation also implicated Sun Orchard orange juice. On June 25, 1999, these findings were announced in both Oregon and Washington. *S. Muenchen* was subsequently isolated from unopened cartons of the implicated product. The pulsed field gel electrophoresis fingerprint of the isolate from the index case in Oregon matched those from the Washington State cases and from the juice. Sun Orchard juice is distributed in (at least) Arizona, California, Colorado, New

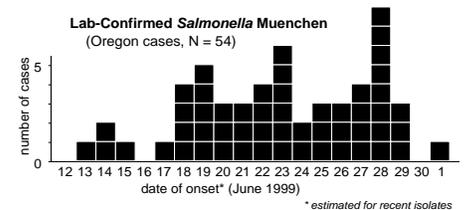
Mexico, Nevada, Oregon, Texas, Utah, Washington, Wisconsin, Alberta and British Columbia under a variety of guises, and Muenchen case reports are pouring in from more and more states. Sold through institutional channels, retail stores and restaurants, the recalled juice was sold in clear plastic gallons, half-gallons, quarts, 16-, 12-, and 8-oz. containers marked “enjoy by” or “pull by” July 7, 1999 or earlier and bearing the following labels: Sun Orchard, Trader Joe's (gallons only), Aloha, Zupan's, Markon, and Voilà.

At this time the source of contamination is unknown. Besides Muenchen, at least 4 other serotypes of *Salmonella* have been cultured from unopened juice bottles, and epidemiologists are reviewing cases of other serotypes for possible connections.

Unpasteurized fruit juices have been increasingly recognized as a source of enteric infections, and in 1998 the FDA began to require warning labels on most such products.* Fresh apple cider in particular has been a recurrent source of *Escherichia coli* O157:H7 infections, cryptosporidiosis, and salmonellosis²⁻⁶; contamination may result from the use of apples that have fallen onto ground contaminated by deer, cattle, or other animals. Although less common, this isn't the first time that O.J. has been implicated. In 1995, a 21-state wave of cases led to the identification of a large salmonellosis outbreak caused by unpasteurized orange juice among visitors to “Theme Park A” near Orlando, Florida.⁷ Several other outbreaks have also been linked to unpasteurized or otherwise contaminated orange juice.⁷ Low pH is not an absolute barrier.

As has been noted many times in these and other pages, fecal contamination of uncooked foodstuffs is common, and consumption of raw produce (including juice) carries with it a risk of bacterial and

* Ironically, Sun Orchard was one of several unpasteurized juice producers that had been exempted from the warning label requirement because of the alternative inactivation procedures that they used.



parasitic infection. Adequate processing (e.g., cooking, irradiation, pasteurization) can all but eliminate these risks.

The risks are higher when drinking juice made from pooled fruit. Assume, for example, that only 1/10,000 oranges are contaminated. If you squeeze and drink the juice of a single orange, then your probability of exposure is just that: 0.0001. If your juice comes from a batch made from 5,000 oranges, however, and we assume that the probability of each being contaminated is independent, your probability of exposure jumps to $(1-0.9999^{4999})$, or 39%. If there are 50,000 oranges in the batch, it's >99%. So the next time you reach for that “all-natural, unprocessed” beverage, ask yourself: “do you feel lucky?”

More information about this outbreak is posted on the OHD web site: <http://www.ohd.hr.state.or.us/cdpe/outbreak/home.htm>

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Infant Mortality Among American Indians

The INFANT MORTALITY rate is one of the most important measures of the health of a population. Although the infant mortality rate has steadily declined in the United States since the early 1900s, the U.S. currently ranks 22nd in the world, behind Japan and a number of European and Scandinavian countries.¹

Within the United States, the rate varies among racial and ethnic populations.² Historically, the infant mortality rate among American Indians and Alaskan Natives* has been high,³ including Indian populations in the Pacific Northwest.⁴ This issue of the *CD Summary*, adapted from a recent MMWR,⁵ explores recent dramatic decreases in infant mortality and sudden infant death syndrome† (SIDS) among Indians in Oregon, Washington and Idaho. To determine current trends, the Northwest Tribal Epidemiology Center—a new epidemiology program located at the Northwest Portland Area Indian Health Board—analyzed vital statistics data for 1985–1996.

Because of the relatively small number of births and infant deaths among Northwest Indians, the data were combined into three 4-year periods. The infant mortality rate for Northwest Indians decreased from 20/1000 infants during 1985–1988 to 8/1000 during 1993–1996 (see table). During the same period, SIDS mortality rates decreased from 9 to 3. Thus, approximately half of the overall reduction in infant mortality was attributable to the decline in

Infant Mortality Among American Indians Idaho, Oregon and Washington 1985-96			
Characteristic	1985-88	1989-93	1993-96
Live-born infants	9,410	10,775	10,350
Infant deaths	188	186	80
SIDS cases	84	71	31
Infant Mortality Rate*	20	17	8
SIDS rate*	9	7	3
Non-SIDS rate*	11	11	5

*Per 1000 live-born infants

SIDS. For the same three time periods, infant mortality rates and SIDS rates also decreased for other races [non-Indians] in Idaho, Oregon, and Washington, although the magnitude of the decline was less. Thus, in less than a decade, the infant mortality rate for Northwest Indians went from about double that of all other races to almost the same.

It is not clear what the most important causes were for the observed decline in SIDS and overall infant mortality among Northwest Indians. This decline is consistent with, but of a greater magnitude than, the substantial decreases in SIDS nationally that have been attributed to the success of the national “Back to Sleep” campaign,⁶ which has promoted supine sleeping position for infants. In the Seattle area, there was some publicity about the importance of infant sleeping position as early as 1992. From 1993–1998 the Portland Area Indian Health Service (covering Idaho, Oregon, and Washington) emphasized Back to Sleep education in each of its facilities. However, the effectiveness of these activities in changing Northwest Indians parents’ practices of putting the child down to sleep in the correct supine position is unknown.

Factors that may have helped reduce the non-SIDS infant mortality rate are even less clear, but may have included specific preventive health activities by Portland Area Indian Health Service staff targeted toward high-risk pregnancies, as well as state-level programs, improvements in access to health care, and improved neonatal care.

More extensive analysis is needed to determine the factors most strongly associated with the dramatic decreases in overall infant mortality and SIDS rates among Northwest Indians during the 1990s. If these factors can be identified, they may be replicable in other population groups that have high infant mortality rates.

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Individual practitioners can obtain bulk copies of SIDS—BACK TO SLEEP brochures (in English and Spanish) by calling Laura at 503/731-4021. Practitioners can also obtain display posters, stickers and take-home reminder cards. Parents and the general public can obtain materials by calling Oregon SafeNet (800/723-3638) or, in the Portland area, 306-5858. Glossy door hangers are also available as a night time reminder to parents when putting their baby to bed.

* here after referred to as “Indians”

† SIDS is defined as “the sudden, unexpected death of an infant for which the cause cannot be determined after a thorough investigation”