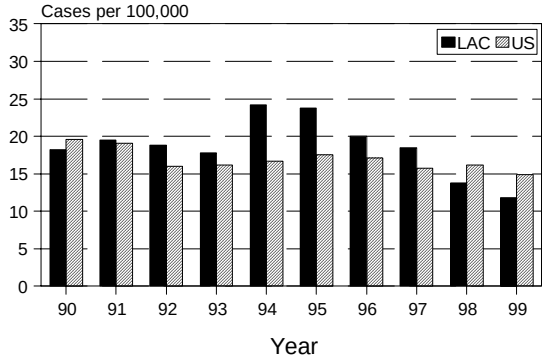
SALMONELLOSIS

CRUDE DATA	
Number of Cases	1,087
Annual Incidence[a]	
LA County	11.90
California [b]	12.65
United States [b]	14.90
Age at Onset	
Mean	27
Median	23
Range	<1-98 yrs
Case Fatality	
LA County	0.6%
United States	N/A

Figure 77

Salmonellosis
Incidence Rates by Year
LAC and US, 1990-1999



[a] Cases per 100,000 population.

[b] National Electronic Telecommunications System for Surveillance

ETIOLOGY

Salmonellosis is caused by the bacterium *Salmonella enterica*, of which there are at least 2,463 serotypes.

DISEASE ABSTRACT

The 1999 salmonellosis crude rate dropped13% compared to 1998. Although *Salmonella* serotype Enteritidis (SE) has remained the most common since *S.* Typhimurium in 1994 (accounting for 26% of all reported 1999 *Salmonella* infections), it decreased 17% in 1999. Table 8 shows the 10 most frequent *Salmonella* serotypes (excluding *S.* Typhi) isolated from Los Angeles County (LAC) residents in 1999. SE was the etiologic agent identified in 7 of 21 salmonellosis outbreaks in 1999.

STRATIFIED DATA

Trends: The incidence of reported salmonellosis cases in 1999 dropped to 11.9 cases per 100,000 population, a decrease of 13%. This represents the lowest rate in LAC in the past 10 years (Figure 77). Despite a 17% decrease in SE cases in 1999, SE still makes up 26% of all *Salmonella* isolates. An increase in cases occurred in the following serotypes due to outbreaks: *S*. Thompson, *S*. Hadar, *S*. Muenchen, *S*. Braenderup.

Seasonality: In 1999, a peak was seen during mid-summer and continued through fall. The peak was earlier than the usual seasonal increase in reported cases due to two large outbreaks occurring in July. (Figure 78).

Age: As in past years, the highest age-specific rates of infection occurred among infants (56.3 per 100,000 population) followed by 1- to 4-year-olds (36.5 per 100,000) (Figure 79).

Figure 78

Salmonellosis
Cases by Month of Onset
Los Angeles County, 1999

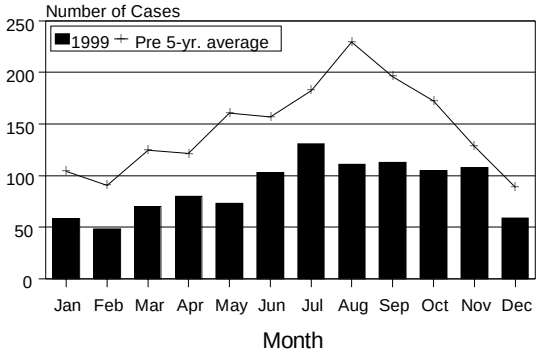
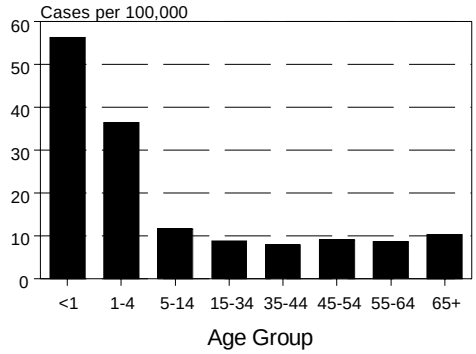


Figure 79

Salmonellosis
Incidence Rates by Age Group
Los Angeles County, 1999



Sex: The male-to-female rate ratio was 1:1.1.

Race/Ethnicity: The highest age-adjusted rate was in Whites (13.7 cases per 100,000 population), followed by Hispanics (10.8), Blacks (9.3) and Asians (7.8) (Figure 80). Many of the outbreaks occurring in 1999 involved Whites and Hispanics.

Location: Torrance Health District had the highest incidence rate per 100,000 population (21.2). Harbor had the second highest rate (18.3), followed by Compton (14.1).

Table 8. Top 10 *Salmonella* Serotypes
Los Angeles County, 1998-1999

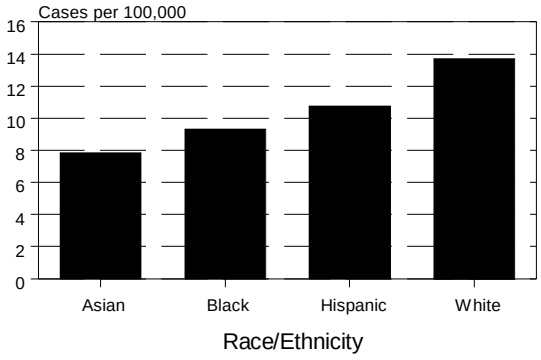
	1998 N[a]=1294		1999 N[a]=1239		Percent
Serotype	**No.**	**Percent**	**No.**	**Percent**	**Change**
S. Enteritidis	408	31.5	326	26.3	-17
S. Typhimurium[b]	235	18.2	169	13.6	-25
S. Thompson	25	1.9	71	5.7	+200
S. Heidelberg	90	7.0	59	4.8	-31
S. Newport	49	3.8	46	3.7	-3
S. Hadar	20	1.5	46	3.7	+147
S. Muenchen	10	0.8	44	3.6	+350
S. Montevideo	41	3.2	41	3.3	+3
S. Oranienburg	25	2.9	37	3.0	+3
S. Braenderup	10	0.8	33	2.7	+238

[a]Denominator (N)=total isolates serotyped.
[b]Includes var. Copenhagen and degraded form.

PREVENTION

Figure 80

Salmonellosis
Age-adjusted Rates by Race/Ethnicity
Los Angeles County, 1999



Each report of salmonellosis is investigated and preventive measures are recommended. Review of investigation reports shows that many persons engage in high-risk food handling behaviors, such as consumption of raw or undercooked eggs and meats, not washing hands and/or cutting boards after handling raw poultry or meat, and not maintaining food at proper temperature to prevent bacterial growth. These investigations demonstrate a need for public education on proper handling and preparation of animal-derived foods, especially eggs, as well as health education targeted at specific racial/ethnic groups. In addition, because fresh produce has been recognized as a source of salmonellosis, washing of fresh fruits and vegetables prior to consumption is advised. Six outbreaks in 1999 were associated with fresh produce.

COMMENTS

The reason for the declining rate of salmonellosis is unknown; rates for other enteric diseases have dropped as well. During 1999 there were 21 reported outbreaks of salmonellosis in LAC, the second largest number of outbreaks in 16 years (Table 9). Outbreak-related cases accounted for 6% of all culture-confirmed salmonellosis cases in 1999. SE was the etiologic agent identified in 7 of the 21 outbreaks, a change in the trend since 1994 in which SE has been the agent in the majority of outbreaks. However, SE was the agent in 34% (72 of 209) of the total laboratory confirmed outbreak-related cases, and 52% (177 of 339) of total number of ill persons associated with salmonellosis outbreaks (Table 9). Three separate SE outbreaks occurred on the same college campus within a two-month period. In four of the seven SE outbreaks, eggs or poultry were the suspected source. Decreases in sporadic cases of SE infections parallel an overall decrease in SE incidence in Southern California. Since 1995, fresh produce, most notably alfalfa sprouts, has increasingly been recognized in the US as a source of salmonellosis. In 6 of the 21 outbreaks in 1999, fresh produce was suspected of being the source. For the statewide or multi-state outbreaks, the case numbers in Table 10 represent the LAC cases.

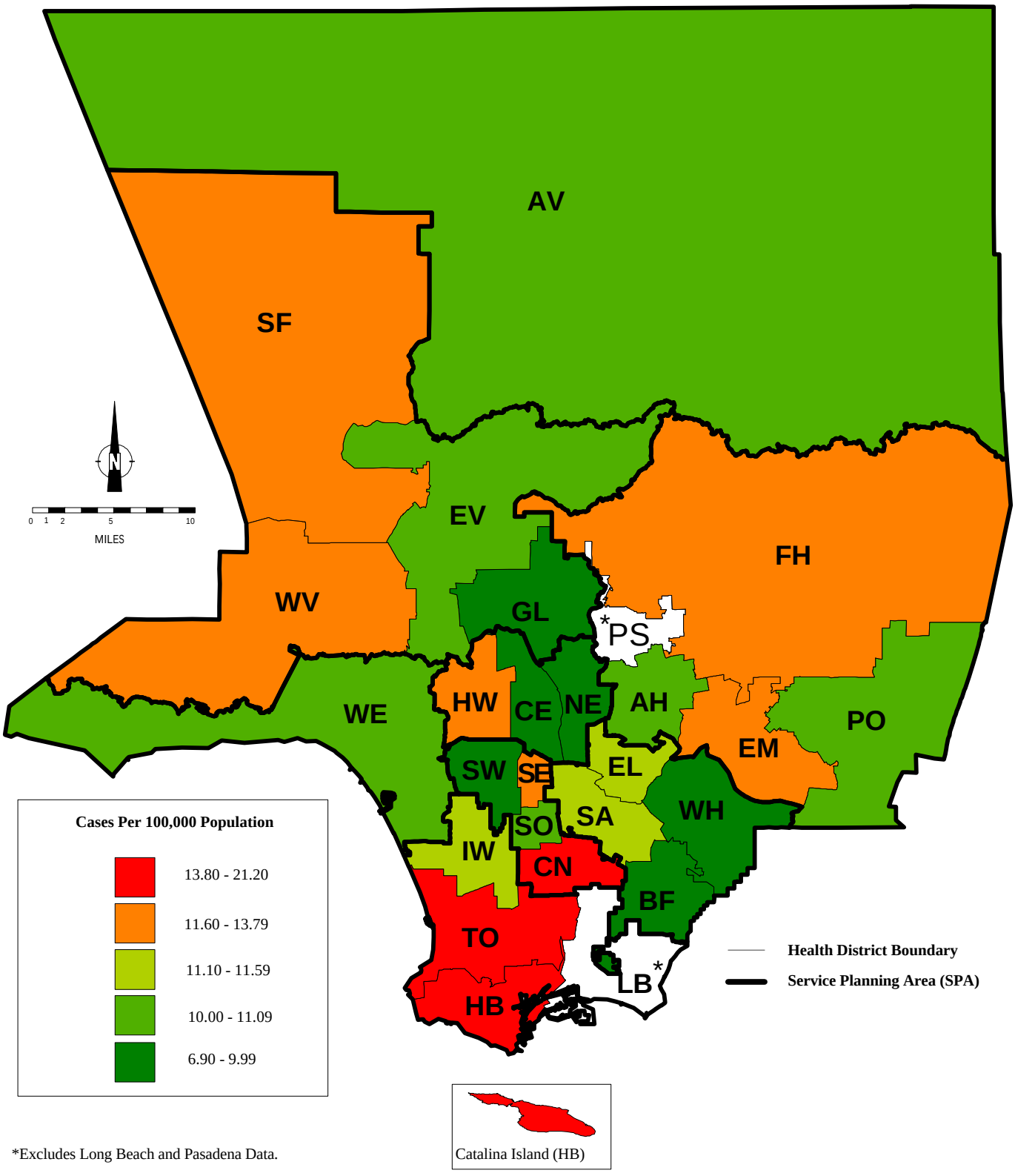
Salmonellosis diagnosed just prior to death was a contributing cause of death for seven persons who expired. All seven had underlying health problems. All were hospitalized with symptoms which probably were caused by salmonellosis; seven had sepsis, and two had acute diarrhea.

Table 9. Salmonellosis Outbreaks in Los Angeles County, 1999

Onset Month	Outbreak Setting	Total #Ill	Culture Positive	Serotype	Suspect Vehicle	Suspect Source
January	Preschool	4	3	SH	Person-to-Person	Unknown
January	Restaurant	3	3	SE	Egg Dishes	Shell Eggs
January	Restaurant	2	2	SE	Chile Relleno	Shell Eggs
March	Restaurant	41	33	ST	Condiment Mix	Cilantro
March	Restaurant chain	3	3	ST	Cilantro	Cilantro
March	Various Restaurants	17	17	ST	Various	Cilantro
March	Various	17	17	SB	Unknown	Unknown
May	Private Home	7	3	SB	Chicken Dish	Chicken
May	Preschool	4	4	SS	Person-to-Person	Unknown
June	Various	10	10	SM	Unpasteurized Orange Juice	Unpasteurized Orange Juice
July	College Campus	29	6	SE	Egg Dishes	Shell Eggs
July	College Campus	100	36	SE	Salad Bar items	Foodhandler
July	San Fernando Valley	7	7	SJ	Person-to-Person	Unknown
August	Private Home - Babysitting Group	5	5	STVC	Person-to-Person	Unknown
August	Private Home	7	1	SHa	Chicken dish	Chicken
September	College Campus	34	19	SE	Unknown	Unknown
October	Private Home	15	9	SSP	Fruit Salad	Cross Contamination
October	Restaurant	2	2	SE	Sushi	Unknown
November	Family Party	7	4	SE	Chicken Dish	Chicken
November	Various	14	14	SM	Alfalfa Sprouts	Alfalfa Sprouts
November	Various	11	11	SN	Mango	Mango
		339	209			

SB = *Salmonella* Braenderup
SE = *Salmonella* Enteritidis
SHa =*Salmonella* Hadar
SH = *Salmonella* Heidelberg
SJ = *Salmonella* Java
SM = *Salmonella* Muenchen
SN = *Salmonella* Newport
SSP = *Salmonella* Saintpaul
SS = *Salmonella* Stanley
ST = *Salmonella* Thompson
STVC = *Salmonella* Typhimurium var Copenhagen

MAP 10. Salmonellosis
Rates by Health District, Los Angeles County, 1999*



*Excludes Long Beach and Pasadena Data.