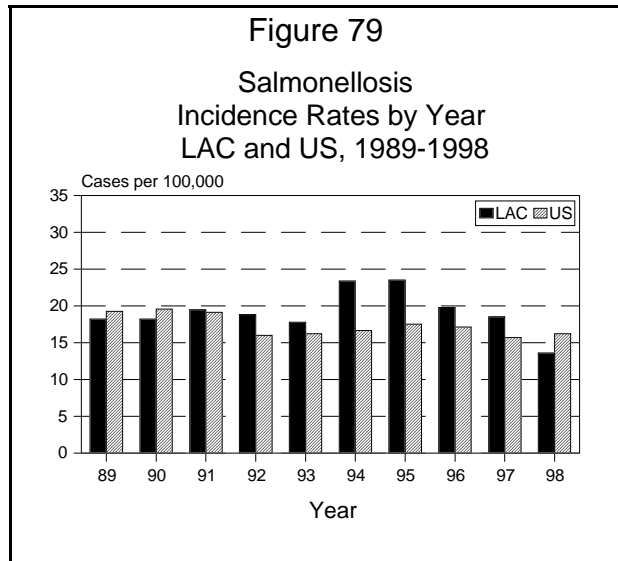


SALMONELLOSIS

CRUDE DATA	
Number of Cases	1,236
Annual Incidence ^a	
LA County	13.6
California	14.5
United States	16.2
Age at Onset	
Mean	24
Median	24
Range	<1-99 yrs
Case Fatality	
LA County	0.4%
United States	N/A



^aCases per 100,000 population.

ETIOLOGY

Salmonellosis is caused by *Salmonella* spp. of bacteria, of which there are over 2,500 serotypes.

DISEASE ABSTRACT

The 1998 salmonellosis crude rate dropped 26% compared to 1997. Although *S. enteritidis* serotype (SE) has remained the most common since *S. typhimurium* in 1994 (accounting for 32% of all reported 1998 *Salmonella* infections), it decreased 18% in 1998. Table 9 shows the 10 most frequently isolated *Salmonella* serotypes (excluding *S. typhi*) submitted to Los Angeles County (LAC) Department of Health Services' Bacteriology Laboratory in 1998. SE was the etiologic agent identified in 15 of 22 *Salmonella* outbreaks in 1998.

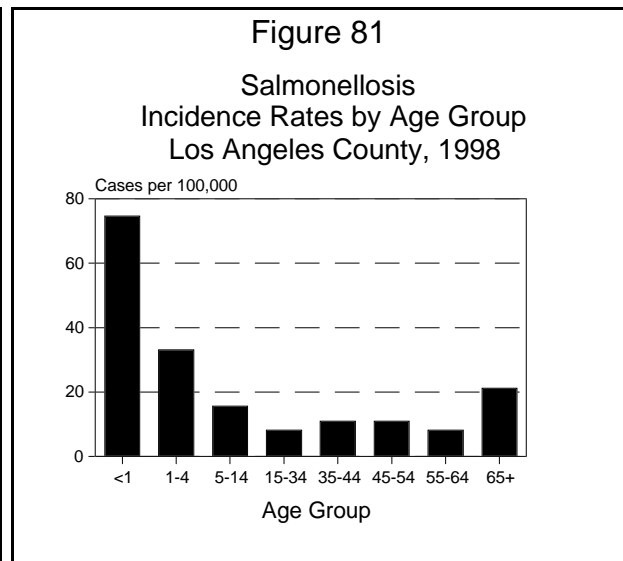
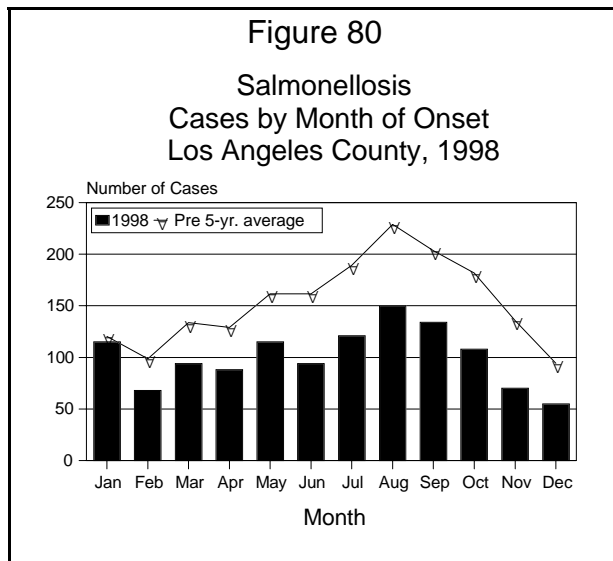
STRATIFIED DATA

Trends: The incidence of reported salmonellosis cases in 1998 dropped to 13.6 cases per 100,000 population, a decrease of 26%. This represents the lowest rate in LAC in the past 10 years (Figure 79). Despite a 18% decrease in SE cases in 1998, SE still makes up 32% of all *Salmonella* isolates.

Seasonality: In 1998, a peak was seen during late summer/early fall, consistent with the usual seasonal increase in reported cases (Figure 80).

Age: As in past years, the highest age-specific rates of infection occurred among infants (75 per 100,000 population) followed by 1- to 4-year-olds (33 per 100,000) (Figure 81).

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



Race/Ethnicity: The highest age-adjusted rate was in Whites (16.4 cases per 100,000 population), followed by Hispanics (13.8), Blacks (12.9) and Asians (8.8) (Figure 82). Many of the outbreaks occurring in 1998 involved Whites and Hispanics.

Location: East Los Angeles Health District had the highest incidence rate per 100,000 population (17.7). Harbor had the second highest rate (16.5), followed by Antelope Valley (16.0). In 1998, five outbreaks each occurred in the jurisdictions covered by Whittier Health Center and Pacoima Health Center.

**Table 9. Top 10 *Salmonella* Serotypes
Los Angeles County, 1997-1998**

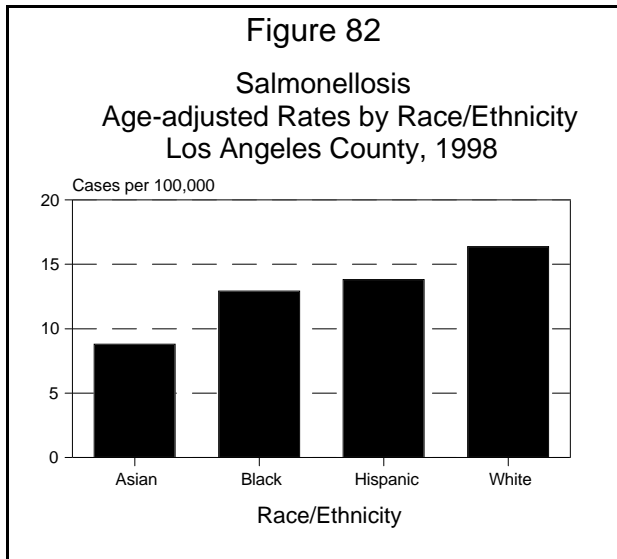
Serotype	1997 N ^a =1949		1998 N ^a =1377		Percent Change
	No.	Percent	No.	Percent	
<i>S. enteritidis</i>	763	39.0	439	31.9	-18
<i>S. typhimurium</i> ^b	293	15.0	247	17.9	+19
<i>S. heidelberg</i>	124	6.4	98	7.1	+11
<i>S. agona</i>	26	1.3	64	4.7	+262
<i>S. newport</i>	37	1.9	52	3.8	+100
<i>S. montevideo</i>	73	3.8	45	3.3	-13
<i>S. infantis</i>	57	2.9	28	2.0	-31
<i>S. oranienberg</i>	44	2.3	27	2.0	-13
<i>S. thompson</i>	31	1.6	26	1.9	+19
<i>S. hadar</i>	43	2.2	23	1.7	-23

^aDenominator (N)=total isolates serotyped.

^bIncludes var. *copenhagen* and degraded form.

REVENTION

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. The 11 commercial food establishment and two health facility-associated salmonellosis outbreaks reported in 1998 show that health education efforts for foodhandlers need to be intensified in the commercial food industry and in long-term care institutions.



COMMENTS

The reason for the declining rate of salmonellosis is unknown; rates for other enteric diseases have dropped as well. During 1998 there were 22 reported outbreaks of salmonellosis in LAC, the largest number of outbreaks in 15 years (Table 10). Outbreak-related cases accounted for 10% of all culture-confirmed salmonellosis cases in 1998. One outbreak was caused by three serotypes, *heidelberg*, *infantis*, and *adelaide* with some persons being infected with two serotypes. Two other outbreaks were caused by *S. heidelberg*. One outbreak each was caused by *newport*, *thompson*, *cubana*, and *havana*. The *cubana* and *havana* outbreaks were part of larger statewide outbreaks caused by alfalfa sprouts. A nation-wide outbreak of *S. agona* associated with toasted oats cereal occurred in 1998; LAC noted an increase in *S. agona* at the same time as the outbreak, but was unable to document an association with the multi-state outbreak. SE was the etiologic agent identified in 15 of the 22 outbreaks, similar to the trend since 1994 in which SE has been the agent in the majority of outbreaks. In 10 of the 15 SE outbreaks, eggs or poultry were the suspected source. Phage type 6a was identified in one SE outbreak; phage type 4 was identified in the other 14 SE outbreaks. 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.

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

Table 10. Salmonellosis Outbreaks in Los Angeles County, 1998

Onset Month	Outbreak Setting	Total #Ill	Culture Positive	Serotype	Suspect Vehicle	Suspect Source
January	Private home	7	3	SE	Macaroni & Cheese, Roast turkey	Eggs, turkey
January	Restaurant	4	3	SE	Stuffing	Eggs
January	Private home	26	9	SE	Lasagna	Eggs
February	Restaurant	14	7	SE	Chicken Enchiladas	Chicken
March	Restaurant	8	6	SE	Various	Foodhandler
March	Private home	6	2	SE	Ice Cream	Eggs
May	None	8	8	SC	Various	Alfalfa sprouts
May	None	5	5	SHa	Various	Alfalfa sprouts
July	Restaurant	6	5	SE	Hamburgers	Unknown
July	Restaurant	16	10	SN	Various	Unknown
July	Private home	4	2	SE	Boiled Chicken	Chicken
August	Bakery	114	17	SH	Cake	Eggs
August	Restaurant	4	1	SE	Chicken Salad	Chicken
August	Restaurant	4	2	SE	Unknown	Unknown
September	Restaurant	6	5	SE	Unknown	Unknown
October	Day Care	3	3	SH	Unknown	Unknown
October	Restaurant	15	3	SE	Turkey Salad	Unknown
October	SNF	17	8	SE	Scrambled Eggs	Eggs
October	SNF	4	4	SE	Undercooked Eggs	Eggs
November	Church	19	3	SE	Chile Rellenos	Eggs
November	Restaurant	17	6	ST	Potato Salad	Chicken
November	Private home	16	10	SA, SI, SH	Various	Turkey
		323	122			

SA = *Salmonella adelaide*
 SC = *Salmonella cubana*
 SE = *Salmonella enteritidis*
 SHa = *Salmonella havana*

SH = *Salmonella heidelberg*
 SI = *Salmonella infantis*
 SN = *Salmonella newport*
 ST = *Salmonella thompson*

MAP 11. Salmonellosis

Rates by Health District, Los Angeles County, 1998*

