



## VIBRIOSIS

CRUDE DATA	
Number of Cases	18
Annual Incidence <sup>a</sup>	
LA County <sup>b</sup>	18
California <sup>c</sup>	0.28
United States <sup>c</sup>	0.19
Age at Diagnosis	
Mean	46
Median	46
Range	10-91

<sup>a</sup>Cases per 100,000 population.

<sup>b</sup>Rates calculated based on less than 19 cases or events are considered unreliable.

<sup>c</sup>Calculated from Final 2008 Reports of Nationally Notifiable Infectious Disease. MMWR 58(31);856-857;859-869.

### DESCRIPTION

Vibriosis is an infection caused by comma-shaped, Gram-negative bacteria of the genus *Vibrio*. Vibriosis most commonly presents as acute diarrhea, but may also occur as wound infection or septicemia. Vibriosis is transmitted by ingesting food or water contaminated with *Vibrio*, or by contact between open wounds and contaminated water. The most common species that cause vibriosis are *V. parahæmolyticus*, *V. alginolyticus*, *V. vulnificus* and *V. cholerae*.

Two serotypes of a *V. cholerae* may cause cholera, an acute life-threatening, diarrheal illness. The infection may be mild or without symptoms, but sometimes it can be severe. Approximately one in 20 infected persons has severe disease characterized by profuse watery diarrhea, vomiting, and leg cramps. In these persons, rapid loss of body fluids leads to dehydration and shock. Without treatment, death can occur within hours. The disease can spread rapidly in areas with inadequate treatment of sewage and drinking water.

Vibriosis is commonly associated with consumption of raw or undercooked seafood, particularly oysters. Many vibriosis patients also have recent history of travel to developing countries.

### 2008 TRENDS AND HIGHLIGHTS

- Vibriosis incidence remains too low to extract reliable rate data.
- In 2008, whites comprised majority (67%) of all vibriosis cases (Figure 3). There was an increase in the number of vibriosis cases among whites compared to 2007. In contrast, the reported number of Hispanic infected with vibriosis in 2008 was lower than in previous years. The number of cases among Asians and blacks remains consistently low to absent (Figure 6).
- Vibriosis in Los Angeles County generally is more common in Service Planning Area (SPA) 5 and 8, both of which are coastal (see Figure 4).
- Typically vibriosis cases peak during the summer months of June through August. However, there was a notably low number of cases in the summer of 2008, with a shift in cases peaking in September and October (Figure 5).
- Five cases of vibriosis occurred among women, while 13 cases occurred among men. This is consistent with past years, and reflects the greater likelihood of recreation water exposure and raw seafood consumption among men compared to women.



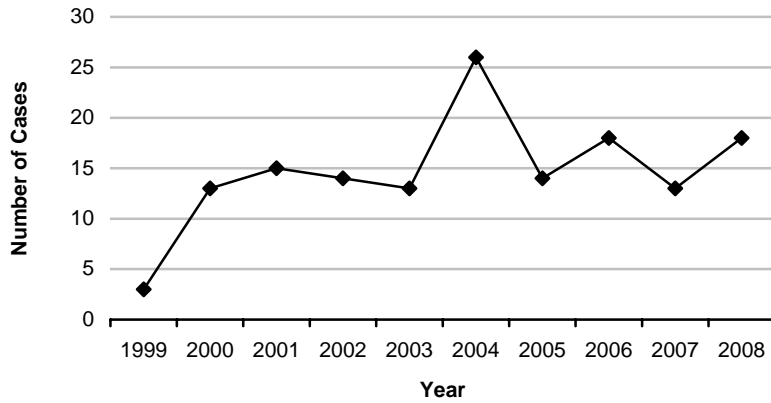
**Reported Vibriosis Cases and Rates\* per 100,000 by Age Group, Race/Ethnicity, and SPA  
Los Angeles County, 2004-2008**

	2004 (N=26)			2005 (N=14)			2006 (N=18)			2007 (N=13)			2008 (N=18)		
	No.	(%)	Rate/ 100,000	No.	(%)	Rate/ 100,000	No.	(%)	Rate/ 100,000	No.	(%)	Rate/ 100,000	No.	(%)	Rate/ 100,000
<b>Age Group</b>															
<1	1	3.8	0.7	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
1-4	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
5-14	0	0.0	0.0	1	7.1	0.1	1	5.6	0.1	1	7.7	0.1	2	11.1	0.1
15-34	8	30.8	0.3	3	21.4	0.1	5	27.8	0.2	4	30.8	0.1	3	16.7	0.1
35-44	4	15.4	0.3	4	28.6	0.3	3	16.7	0.2	2	15.4	0.1	3	16.7	0.2
45-54	1	3.8	0.1	3	21.4	0.2	3	16.7	0.2	1	7.7	0.1	3	16.7	0.2
55-64	4	15.4	0.5	2	14.3	0.2	3	16.7	0.3	3	23.1	0.3	5	27.8	0.5
65+	8	30.8	0.8	1	7.1	0.1	3	16.7	0.3	2	15.4	0.2	2	11.1	0.2
Unknown	0	0.0		0	0.0		0	0.0		0	0.0		0	0.0	
<b>Race/Ethnicity</b>															
Asian	1	3.8	0.1	1	7.1	0.1	2	11.1	0.2	2	15.4	0.2	2	11.1	0.2
Black	2	7.7	0.2	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
Hispanic	12	46.2	0.3	7	50.0	0.2	4	22.2	0.1	6	46.2	0.1	4	22.2	0.1
White	9	34.6	0.3	4	28.6	0.1	12	66.7	0.4	2	15.4	0.1	12	66.7	0.4
Other	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
Unknown	2	7.7		2	14.3		0	0.0		3	23.1		0	0.0	
<b>SPA</b>															
1	1	3.8	0.3	2	14.3	0.6	0	0.0	0.0	0	0.0	0.0	1	5.6	0.3
2	5	19.2	0.2	3	21.4	0.1	2	11.1	0.1	1	7.7	0.0	4	22.2	0.2
3	2	7.7	0.1	1	7.1	0.1	0	0.0	0.0	1	7.7	0.1	3	16.7	0.2
4	5	19.2	0.4	1	7.1	0.1	3	16.7	0.2	4	30.8	0.3	0	0.0	0.0
5	3	11.5	0.5	3	21.4	0.5	6	33.3	0.9	1	7.7	0.2	3	16.7	0.5
6	4	15.4	0.4	2	14.3	0.2	0	0.0	0.0	1	7.7	0.1	1	5.6	0.1
7	2	7.7	0.1	1	7.1	0.1	6	33.3	0.4	1	7.7	0.1	0	0.0	0.0
8	3	11.5	0.3	1	7.1	0.1	1	5.6	0.1	4	30.8	0.4	5	27.8	0.4
Unknown	1	3.8		0	0.0		0	0.0		0	0.0		1	5.6	

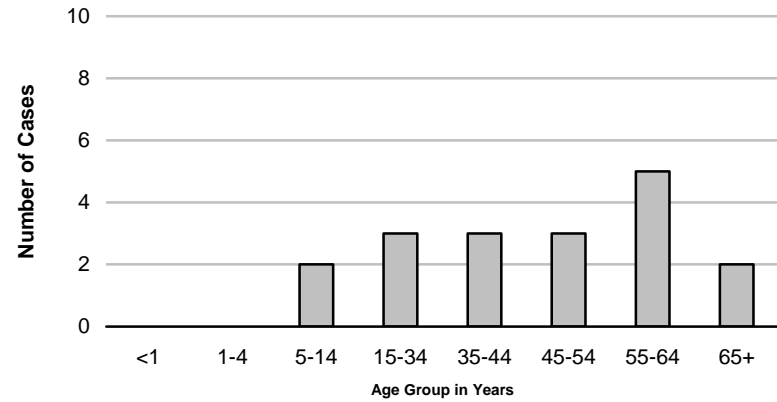
\*Rates calculated based on less than 19 cases or events are considered unreliable.



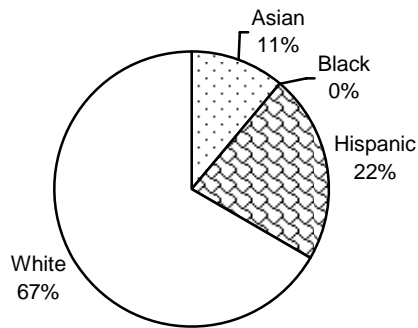
**Figure 1. Reported Cases of Vibriosis  
LAC, 1999-2008**



**Figure 2. Reported Cases of Vibriosis by Age Group  
LAC, 2008 (N=18)**



**Figure 3. Percent Cases of Vibriosis by Race/Ethnicity  
LAC, 2008**



**Figure 4. Reported Cases of Vibriosis by SPA  
LAC, 2008 (N=18)**

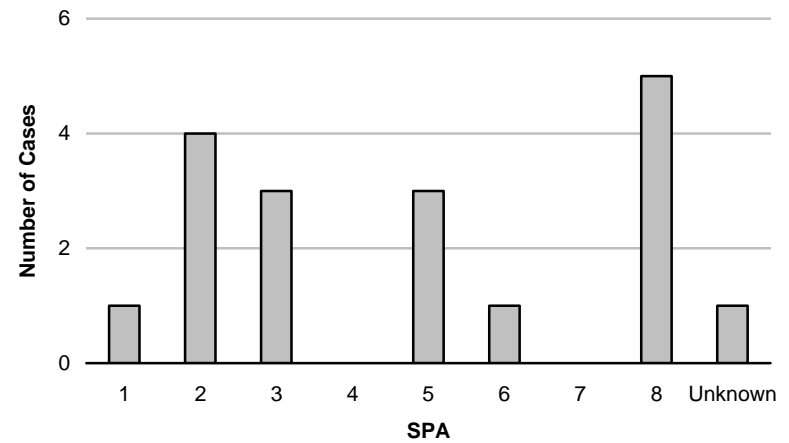




Figure 5. Reported Vibriosis Cases by Month of Onset  
LAC, 2008

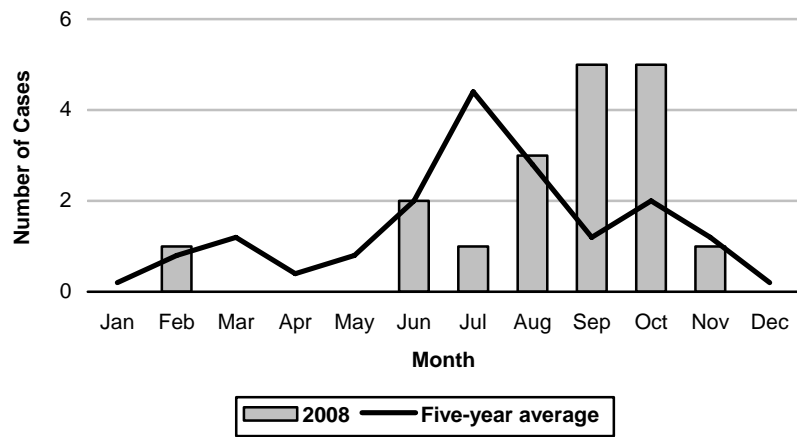
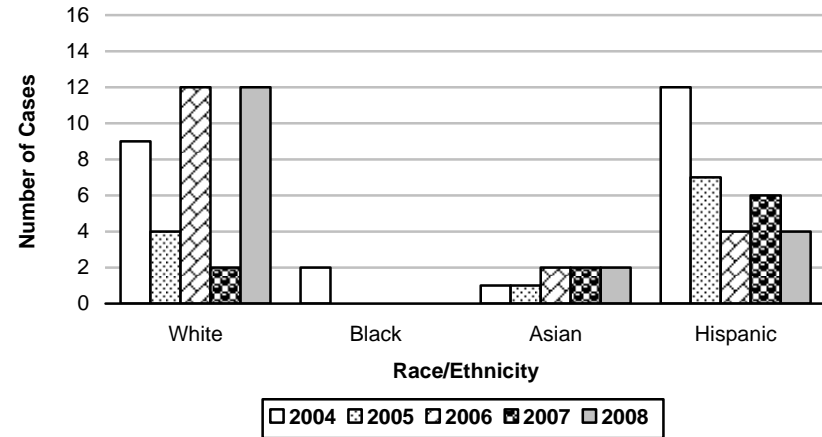


Figure 6. Reported Cases of Vibriosis by Race/Ethnicity  
LAC, 2004-2008





## VIBRIOSIS

CRUDE DATA	
Number of Cases	14
Annual Incidence <sup>a</sup>	
LA County	0.15
United States	0.20
Age at Diagnosis	
Mean	44
Median	43
Range	14–86 years

<sup>a</sup> Cases per 100,000 population.

### DESCRIPTION

The genus *Vibrio* consists of Gram-negative, curved, motile rods, and contains about a dozen species known to cause human illness. Transmission is most often through ingestion via a foodborne route, but also from contact between broken skin and contaminated water. Presenting symptoms vary by species and mode of transmission. The *Vibrio* species of greatest public health importance in the US are: *V. vulnificus* which causes a primary septicemia and is often associated with oysters harvested in the Gulf of Mexico, and *V. parahæmolyticus*, which presents as gastrointestinal illness. Cholera, a potentially fatal diarrheal disease caused by *V. cholerae* serotypes O1 and O139, is rarely imported into the US.

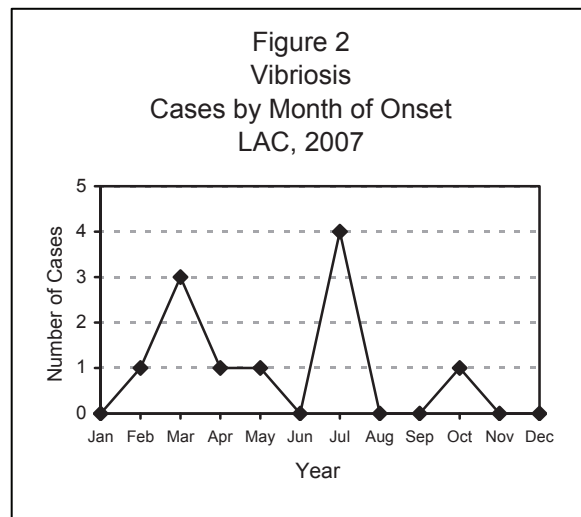
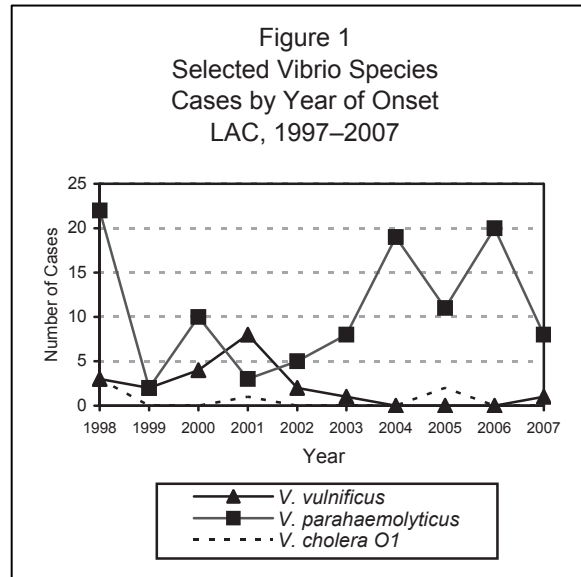
### DISEASE ABSTRACT

- Thirteen cases of vibriosis were reported in 2007, a significant decrease from 33 cases reported in 2006. None was fatal.
- There were four cases of *V. alginolyticus* infections, two of which were related to recreational water exposures, one of which was a work-related injury, and one case whose risk factors could not be identified. There was one case of *V. cholerae* non-O1/non-O139 sepsis; risk factors were undetermined. There was one case of *V. vulnificus* in a man who had eaten seafood. No cases of toxigenic *V. cholerae* O1/O139 were reported in 2007.

### STRATIFIED DATA

**Seasonality:** Among reported vibriosis cases with distinct onset dates, the majority (62%, n=8) occurred between June and October (Figure 2). *Vibrio* infections typically increase during the summer months when ocean temperatures rise, allowing the bacteria to flourish.

**Age:** *Vibrio* cases were all adults except for one juvenile who was 11 years old. The average age of cases was 44 years, median age was 36 years (Table 1).





**Severity:** For vibriosis cases with distinct onset and resolution dates (n=16), duration of illness averaged 8 days (range 1-43). Five cases required hospitalization.

**Table 1. Vibrio Cases by Species, Race, Age and Sex—LAC, 2007**

Species	No. of cases	Race (no. of cases)	Mean Age, years (range)	Sex Ratio M:F
<i>V. parahæmolyticus</i>	8	Asian (3), Hispanic(5), white (12), black (0)	45 (14-86)	0.81:1
<i>V. cholerae</i> non-O1/O139	1	Asian (1)	79 (79)	0:1
<i>V. alginolyticus</i>	4	Hispanic (2), white (2)	54.5 (54-55)	2:0
<i>V. vulnificus</i>	1	Hispanic (1)	69 (69)	1:0
<i>V. furnissii</i>	0	n/a	n/a	0:0

#### Species-specific Risk Factors:

##### ***Vibrio parahæmolyticus***

**Eight cases of *V. parahæmolyticus* were reported during 2007.** All 8 were identified through stool culture. Four reported eating seafood recently, with three specifying raw oysters.

##### ***Vibrio cholerae* non-O1/O139**

One case of non-toxigenic *V. cholerae* gastroenteritis was reported in 2007. Its risk factors could not be determined. The case denied eating raw seafood, and had not travelled internationally in years.

##### ***Vibrio alginolyticus***

Two *V. alginolyticus* infections were wound infections, one of which was caused by a work injury. The other wound infection was in a man suffering from complications due to diabetes. Two *V. alginolyticus* infections were in girls who had recreational seawater exposure.

#### COMMENTS

In LAC, risk of *Vibrio* infection can be reduced by not eating raw fish and shellfish. In 2007, there was a dramatic reduction in *V. parahæmolyticus* cases from the previous year. This is probably a result of close oversight by oyster harvesters in Washington State, following the *V. parahæmolyticus* outbreak in 2006. Adult men may be more at risk for *Vibrio* infections because of their tendency to engage in behaviors exposing them to seawater and untreated water (such as surfing or river rafting) or to eat raw or partially cooked seafood, especially oysters. However in 2007 males and females were equally to cite recreational water exposures as a risk factor for their infections.

There was a higher number of *V. alginolyticus* cases in 2007 than in the previous three years. The two cases that occurred in females were related to recreational water exposure. Warmer summer temperatures may be affecting the growth of *Vibrio alginolyticus* in the water.

#### ADDITIONAL RESOURCES

Mouzin, E., Mascola, L., Tormey, M.P. & Dassey, D.E. (1997). Prevention of *Vibrio vulnificus* infections. Assessment of regulatory educational strategies. *Journal of American Medical Association*, 278(7), 576-578. Retrieved November 10, 2008, from the JAMA Web site: <http://jama.ama-assn.org/cgi/content/abstract/278/7/576>

More information on Centers for Disease Control and Prevention — [http://www.cdc.gov/nczved/dfbmd/disease\\_listing/vibriov\\_gi.html](http://www.cdc.gov/nczved/dfbmd/disease_listing/vibriov_gi.html)

## VIBRIOSIS

CRUDE DATA	
Number of Cases	24
Annual Incidence <sup>a</sup>	
LA County	0.19
United States	N/A
Age at Diagnosis	
Mean	46
Median	43
Range	14–86 years

<sup>a</sup> Cases per 100,000 population.

### DESCRIPTION

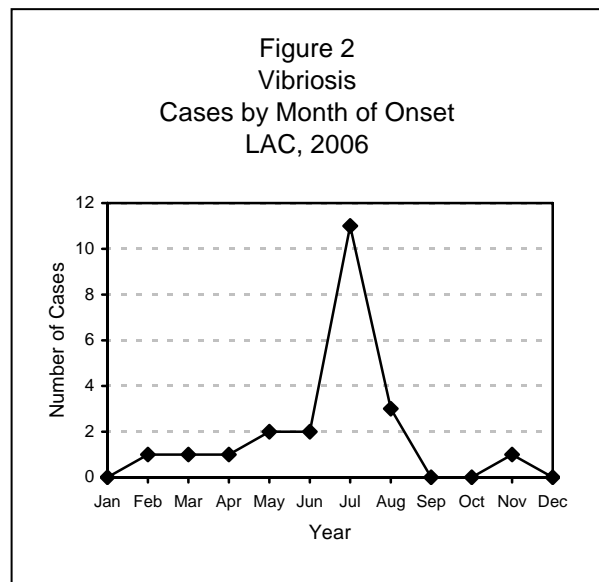
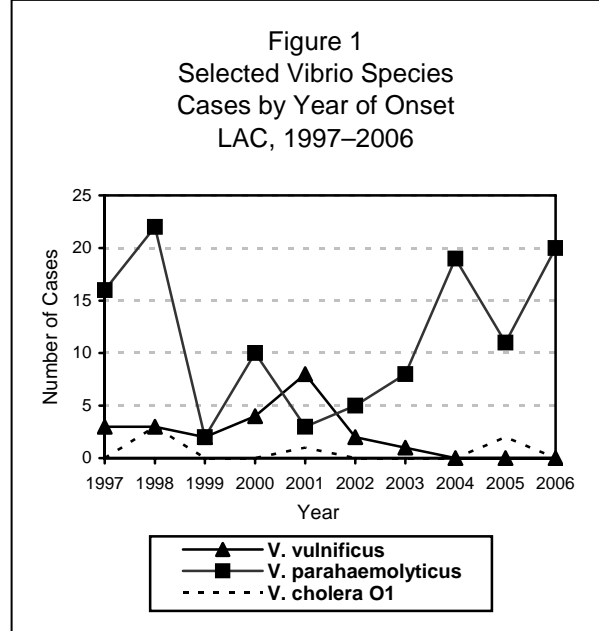
The genus *Vibrio* consists of Gram-negative, curved, motile rods, and contains about a dozen species known to cause human illness. Transmission is most often through ingestion via a foodborne route, but also from contact between broken skin and contaminated water. Presenting symptoms vary by species and mode of transmission. The *Vibrio* species of greatest public health importance in the US are: *V. vulnificus* which causes a primary septicemia and is often associated with oysters harvested in the Gulf of Mexico, and *V. parahaemolyticus*, which presents as gastrointestinal illness. Cholera, a potentially fatal diarrheal disease caused by *V. cholerae* serotypes O1 and O139, is rarely imported into the US.

### DISEASE ABSTRACT

- Twenty-four cases of vibriosis were reported in 2006, an increase from 14 cases reported in 2005.
- No fatal cases of vibriosis were reported in 2006.
- No cases of *V. vulnificus* or toxigenic *V. cholerae* O1/O139 were reported in 2006. There were two cases of *V. alginolyticus* infections related to surfing injuries and one case of *V. furnissii* infection in a leg wound.

### STRATIFIED DATA

**Trends:** Over the last 10 years, case reports of *Vibrio* infections peaked in 1998 with 36 cases (7 cases were part of an outbreak). Reported cases of *V. vulnificus* remained zero since 2004, a substantial decline compared to the 10-year peak of eight cases occurring during in 2001 (Figure 1). *V. cholerae* non-O1/non-O139 cases declined from two cases in 2005, down to one case in 2006.



**Seasonality:** Among reported vibriosis cases with distinct onset dates, the majority (64%, n=16) occurred between June and October (Figure 2). *Vibrio* infections typically increase during the summer months when ocean temperatures rise, allowing the bacteria to flourish.

**Age:** *Vibrio* cases were all adults except for one juvenile who was 14 years old. The average age of cases was 46 years (Table 1).

**Sex:** Slightly over half of the cases were male (52%, n=13, Table 1).

**Race/Ethnicity:** Reported cases were most often Non-Latino white (54%, n=14, Table 1), which is consistent with 2005. Latinos historically constituted a more significant proportion of all vibriosis cases.

**Severity:** For vibriosis cases with distinct onset and resolution dates (n=16), duration of illness averaged 8 days (range 1-43). Five cases required hospitalization.

Species	No. of cases	Race (no. of cases)	Mean Age, years (range)	Sex Ratio M:F
<i>V. parahaemolyticus</i>	20	Asian (3), Latino (5), White (12), Black (0)	45 (14-86)	0.81:1
<i>V. cholerae</i> non-O1/O139	1	Latino (1)	67 (67)	0:1
<i>V. alginolyticus</i>	2	White (2)	54.5 (54-55)	2:0
<i>V. furnissii</i>	1	Latino (1)	61 (61)	1:0

#### Species-specific Risk Factors:

##### *Vibrio parahaemolyticus*

Twenty cases of *V. parahaemolyticus* were reported during 2006. All 20 were identified through stool culture. Seventeen reported eating seafood recently, with 12 specifying raw oysters. Of these 12, 11 were linked to contaminated oysters harvested in Puget Sound, WA.

##### *Vibrio cholerae* non-O1/O139

One case of non-toxigenic *V. cholerae* gastroenteritis was reported in 2006. It was related to travel to Mexico.

##### *Vibrio alginolyticus*

Both *V. alginolyticus* infections were wound infections. The patients had been exposed to seawater via surfing injuries in separate incidents.

#### COMMENTS

In LAC, risk of *Vibrio* infection can be prevented or reduced by avoiding eating raw fish and shellfish. In 2006 there were no cases of *V. vulnificus* infection. This continued absence of cases is most likely due to a state-mandated oyster ban that took effect in 2003 banning Gulf Coast Oysters harvested between April 1<sup>st</sup> and October 31<sup>st</sup>. Oysters from Gulf Coast waters during warm months pose a higher risk for *V. vulnificus* contamination. Adult men may be more at risk for *Vibrio* infections because of their tendency to engage in behaviors exposing them to seawater and untreated water (such as surfing or river rafting) or to eat raw or partially cooked seafood, especially oysters.

#### ADDITIONAL RESOURCES

Mouzin E, Mascola L, Tormey MP, Dassey DE. Prevention of *Vibrio vulnificus* infections. Assessment of regulatory educational strategies. JAMA 1997; 278(7):576–578. Abstract available at: [www.jama.ama-assn.org/cgi/content/abstract/278/7/576](http://www.jama.ama-assn.org/cgi/content/abstract/278/7/576)

Disease information regarding *Vibrio vulnificus* is available from the CDC at:  
[www.cdc.gov/ncidod/dbmd/diseaseinfo/vibriovulnificus\\_g.htm](http://www.cdc.gov/ncidod/dbmd/diseaseinfo/vibriovulnificus_g.htm)

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## VIBRIOSIS

CRUDE DATA	
Number of Cases	14
Annual Incidence <sup>a</sup>	
LA County	0.15
United States	N/A
Age at Diagnosis	
Mean	42
Median	39.5
Range	12–85 years
Case Fatality	
LA County	0%
United States	varies by species

<sup>a</sup> Cases per 100,000 population.

### DESCRIPTION

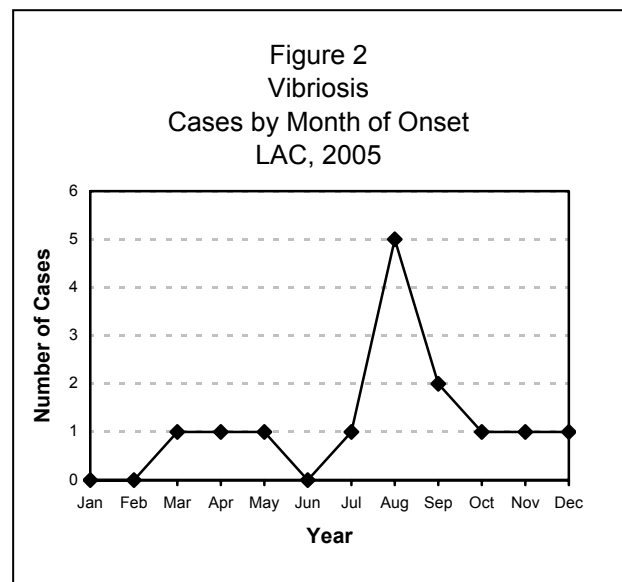
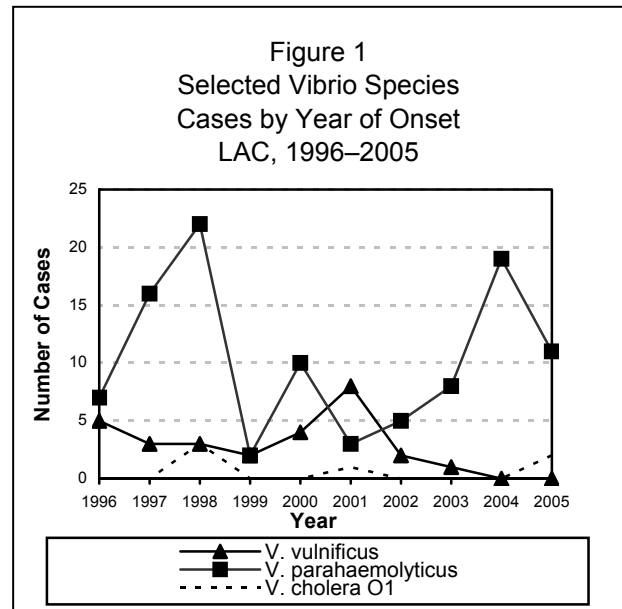
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### DISEASE ABSTRACT

- Fourteen cases of vibriosis were reported in 2005, a decrease from N=26 cases reported in 2004.
- No fatal cases of vibriosis were reported in 2005.
- No cases of *V. vulnificus* or toxigenic *V. cholerae* O1/O139 were reported in 2005.

### STRATIFIED DATA

**Trends:** Over the last 10 years, case reports of *Vibrio* infections peaked in 1998 with 36 cases (7 cases were part of an outbreak). Reported cases of *V. vulnificus* held steady at zero in 2004, a substantial decline compared to the 10-year peak of eight cases occurring during in 2001 (Figure 1). *V. cholerae* non-





O1/non-O139 cases increased from zero in 2004 to two cases in 2005 after a peak of 3 cases in 1998 and 1 in 2001.

**Seasonality:** Among reported vibriosis cases with distinct onset dates, the majority (77%, n=14) occurred between June and October (Figure 2). *Vibrio* infections typically increase during the warmer summer months.

**Age:** *Vibrio* cases were all adults except for two juveniles ages 12 and 17. The average age of cases was 42 years (Table 1).

**Sex:** Over half of the cases were female (57%, n=8, Table 1).

**Race/Ethnicity:** Reported cases were most often Latino (52% n=12, Table 1), similar to last year.

**Severity:** For vibriosis cases with distinct onset and resolution dates (n=12), duration of illness averaged 4.5 days (range 2-8). Four cases required hospitalization.

**Table 1. *Vibrio* Cases by Species, Race, Age and Sex—LAC, 2005**

Species	No. of cases	Race (no. of cases)	Mean Age, years (range)	Sex Ratio M:F
<i>V. parahaemolyticus</i>	11	Asian (1), Latino (5), White (4), Black (1)	49 (24-79)	2.8:1
<i>V. cholerae</i> non-O1/O139	2	Latino (2)	31.5 (12-51)	0:2
<i>V. alginolyticus</i>	1	White (1)	42 (26-44)	1:0

**Species-specific Risk Factors:**

**- *Vibrio parahaemolyticus***

Eleven cases of *V. parahaemolyticus* were reported during 2005. All eleven were identified through stool culture. Seven reported eating seafood recently, with three specifying raw oysters.

**- *Vibrio cholerae* non-O1/O139**

Two cases of non-toxicogenic *V. cholerae* gastroenteritis were reported in 2005. Both were related to travel to Mexico.

**- *Vibrio alginolyticus***

The only *V. alginolyticus* infection was a wound infection. The patient had been exposed to seawater.

**COMMENTS**

In LAC, risk of *Vibrio* infection can be prevented or reduced by avoiding eating raw fish and shellfish. For the first time in ten years, there were no cases of *V. vulnificus* infection. This decrease is most likely due to a state-mandated oyster ban that took effect in 2003 banning Gulf Coast Oysters harvested between April 1<sup>st</sup> and October 31<sup>st</sup>. Oysters from Gulf Coast waters during warm months pose a higher risk for *V. vulnificus* contamination. Adult males may be more at risk for *Vibrio* infections because of their tendency to engage in behaviors exposing them to seawater or to eat raw or partially cooked seafood, especially oysters.

**ADDITIONAL RESOURCES**

Mouzin E, Mascola L, Tormey M, Dassey DE. Prevention of *Vibrio vulnificus* infections. Assessment of regulatory educational strategies. JAMA 1997; 278(7):576–578. Abstract available at: [www.jama.ama-assn.org/cgi/content/abstract/278/7/576](http://www.jama.ama-assn.org/cgi/content/abstract/278/7/576)



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Disease information regarding *Vibrio vulnificus* is available from the CDC at:  
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## VIBRIOSIS

CRUDE DATA	
Number of Cases	26
Annual Incidence <sup>a</sup>	
LA County	0.27
United States	N/A
Age at Diagnosis	
Mean	48
Median	44
Range	1–79 years
Case Fatality	
LA County	0%
United States	varies by species

<sup>a</sup> Cases per 100,000 population.

### DESCRIPTION

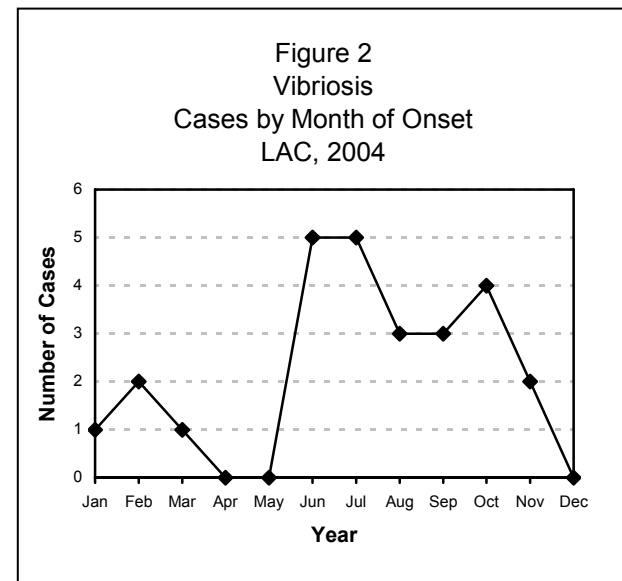
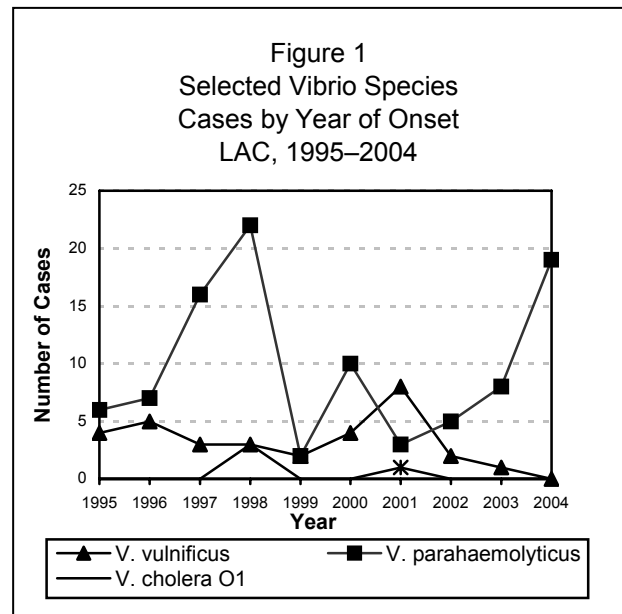
The genus *Vibrio* consists of gram-negative, curved, motile rods, and contains about a dozen species known to cause human illness. Transmission is most often through ingestion of the bacteria via a foodborne route, but also from contact of non-intact skin with seawater. Presenting symptoms vary by infecting species and mode of transmission. The vibrio species of greatest public health importance are: *V. vulnificus* which presents as a primary septicemia and is often associated with oysters harvested in the Gulf of Mexico, and *V. cholerae* O1 which is most often travel associated. Both *V. cholerae* O1 and *V. parahaemolyticus* present as a gastrointestinal illness.

### DISEASE ABSTRACT

- Twenty-six cases of *Vibrio* infections were reported in 2004, an increase of 100% from the previous year (N=13).
- No fatal cases of vibriosis were reported in 2004.
- No cases of *V. vulnificus* or *V. cholerae* O1 were reported.

### STRATIFIED DATA

**Trends:** Over the last 10 years, case reports of *Vibrio* infections peaked in 1998 with 36 cases (7 cases were part of an outbreak). Reported cases of *V. vulnificus* decreased to zero in 2004, a substantial





decline compared the 10-year peak of eight cases occurring during in 2001 (Figure 1). *V. cholerae* 01 cases also decreased to zero after a peak of 3 cases in 1998 and 1 in 2001.

**Seasonality:** Among reported vibriosis cases with distinct onset dates, the majority (77%, n=20) occurred between June and October (Figure 2). *Vibrio* infections typically increase during the warmer summer months.

**Age:** *Vibrio* cases were all adults except for a child one year old (Table 1).

**Sex:** Over two-thirds of the cases were male (69%, n=18, Table 1), whereas last year 93% were male.

**Race/Ethnicity:** Reported cases were most often Latino (52% n=12, Table 1) similar to 50% from last year.

**Severity:** For vibriosis cases with data of distinct onsets and resolution dates (n=12), duration of illness averaged 4.5 days (range 2-8). Four *vibrio* cases required hospitalization for their infection.

**Table 1. *Vibrio* Cases by Species, Race, Age and Sex—LAC, 2004**

Species	No. of cases	Race (no. of cases)	Mean Age, years (range)	Sex Ratio M:F
<i>V. parahaemolyticus</i>	19	Asian (1), Latino (11), White (6), Unknown (1)	49 (24-79)	2.8:1
<i>V. cholerae</i> non-O1	3	Black (1), Latino (1), White (1)	48 (1-75)	0:3
<i>V. alginolyticus</i>	3	Black (1), Unknown (2)	42 (26-44)	3:0
<i>V. fluvialis</i>	1	White (1)	57	1:0

#### Species-specific Risk Factors:

##### - *Vibrio parahaemolyticus*

Nineteen cases of *V. parahaemolyticus* were reported during 2004, an increase from the previous year's total (n=8). All nineteen were identified through stool culture; 3 required hospitalization. Risk factor information indicated that 7 ate raw seafood, 2 had cooked seafood, 2 had international travel with seafood consumption, 1 had ocean exposure and 7 not interviewed due to incorrect addresses and phone numbers.

##### - *Vibrio cholerae* non-01

Three cases of *V. cholerae* non-01 were reported in 2004. Two cases were related to travel in other countries; one ate seafood in the Philippines and one was a baby recently adopted from Haiti. The third case had no identifiable exposure; no travel, seafood or ocean exposure.

##### - *Vibrio alginolyticus*

All three of *V. alginolyticus* infections were wound associated; one in an ear and two in toes. One case had ocean exposure and two were unable to be located and interviewed.

#### COMMENTS

The increase in cases of *V. parahaemolyticus* coincides with an overall increase in the state of California. The reason for the increase is unknown, but could be related to warm ocean water temperatures during the year. In LAC, risk of vibriosis infection can be prevented or reduced by avoiding raw fish and shellfish. Infection with *V. vulnificus* is a particular risk for persons with pre-existing liver disease, frequently leading to soft tissue invasion, limb amputation, and a high case fatality. For the first time in the past ten years, the number of *V. vulnificus* cases decreased to zero in 2004 from a 10-year peak of 8 in 2001. This decrease is most likely due to an oyster ban that took effect in 2003 banning Gulf Coast Oysters harvested between April 1<sup>st</sup> and October 31<sup>st</sup>. The oysters grown in the Gulf Coast waters during warm months pose a higher risk for *V. vulnificus* infection. Adult males may be more at risk for *Vibrio* infections



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because of their tendency to engage in behaviors exposing them to seawater contamination or higher levels of raw or partially cooked seafood consumption, especially oysters.

ADDITIONAL RESOURCES

Mouzin E, Mascola L, Tormey M, Dassey DE. Prevention of *Vibrio vulnificus* infections. Assessment of regulatory educational strategies. *JAMA* 1997; 278(7):576–578. Abstract available at: [www.jama.ama-assn.org/cgi/content/abstract/278/7/576](http://www.jama.ama-assn.org/cgi/content/abstract/278/7/576)

Disease information regarding *Vibrio vulnificus* is available from the CDC at:  
[www.cdc.gov/ncidod/dbmd/diseaseinfo/vibriovulnificus\\_g.htm](http://www.cdc.gov/ncidod/dbmd/diseaseinfo/vibriovulnificus_g.htm)

Disease information regarding *Vibrio parahaemolyticus* is available from the CDC at:  
[www.cdc.gov/ncidod/dbmd/diseaseinfo/vibrioparahaemolyticus\\_g.htm](http://www.cdc.gov/ncidod/dbmd/diseaseinfo/vibrioparahaemolyticus_g.htm)



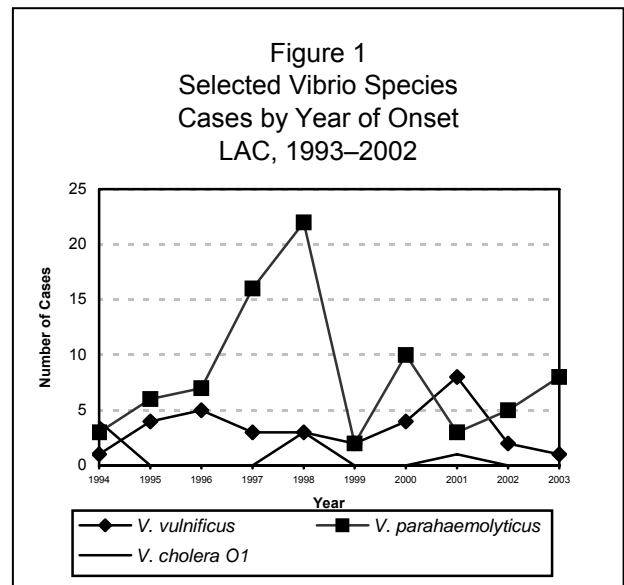
## VIBRIOSIS

CRUDE DATA	
Number of Cases	13
Annual Incidence <sup>a</sup>	
LA County	--- <sup>b</sup>
United States	N/A
Age at Diagnosis	
Mean	43
Median	38
Range	31–65 years
Case Fatality	
LA County	7.7%
United States	varies by species

<sup>a</sup> Cases per 100,000 population.

<sup>b</sup> Rates based on less than 20 observations are unreliable.

<sup>c</sup> Deaths from *V. vulnificus* (n=2) had a 100% case fatality.

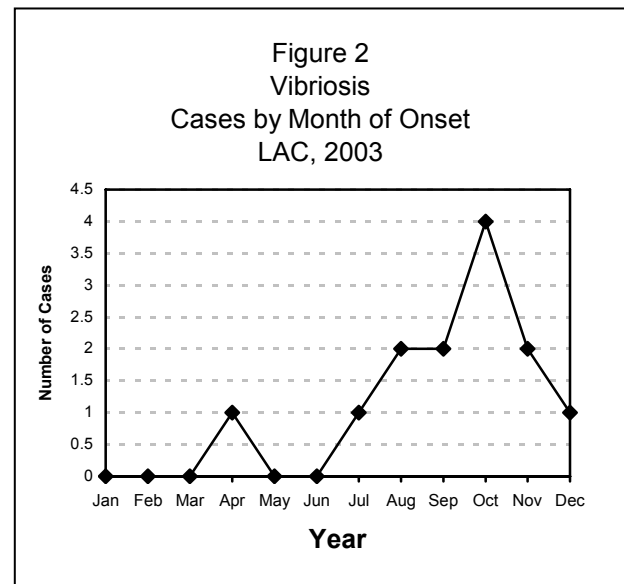


### DESCRIPTION

The genus *Vibrio* consists of gram-negative, curved, motile rods, and contains about a dozen species known to cause human illness. Transmission is most often through ingestion of the bacteria via a foodborne route, but also from contact of non-intact skin with seawater. Presenting symptoms vary by infecting species and mode of transmission. The vibrio species of greatest public health importance are: *V. vulnificus* which presents as a primary septicemia and is often associated with oysters harvested in the Gulf of Mexico, and *V. cholerae* O1 which is most often travel associated. Both *V. cholerae* O1 and *V. parahaemolyticus* present as a gastrointestinal illness.

### DISEASE ABSTRACT

- Thirteen cases of *Vibrio* species were reported in 2003, similar to the previous year (N=14).
- One fatal case of *Vibrio vulnificus* was reported in 2003, with a history of oyster consumption.



### STRATIFIED DATA

**Trends:** Over the last 10 years, case numbers of *Vibrio* infections peaked in 1998 with 36 reports. Reported cases of *Vibrio vulnificus* decreased to 1 case in 2003, a substantial decline compared the 10-year peak of eight cases occurring during in 2001 (Figure 1).



**Seasonality:** Among reported vibriosis cases with distinct onset dates, the majority (77%, n=10) occurred between August and November (Figure 2) a little later than usual. *Vibrio* infections typically increase during the warmer summer months.

**Age:** *Vibrio* cases were all adults (Table 1).

**Sex:** Over two-thirds of the cases were male (69%, n=9, Table 1).

**Race/Ethnicity:** Reported cases were most often Latino (54% n=7, Table 1).

**Severity:** For surviving vibriosis cases with data of distinct onsets and resolution dates (n=9), duration of illness averaged 4 days (range 1–9). Two vibrio cases required hospitalization for their infection. One fatal *Vibrio* case was reported due to *V. vulnificus*.

**Table 1. *Vibrio* Cases by Species, Race, Age and Sex—LAC, 2003**

Species	No. of cases	Race (no. of cases)	Mean Age, years (range)	Sex Ratio M:F
<i>V. vulnificus</i>	1	Latino (1)	55	1:0
<i>V. parahaemolyticus</i>	8	Latino (3), Asian (4), White (1)	37 (31–48)	1:1
<i>V. cholerae</i> non-O1	2	Latino (2)	55 (45–65)	2:1
<i>V. other species*</i>	2	Latino (1), Unknown (1)	47 (38–56)	2:0

\* other species include *V. fluvialis* and *V. alginolyticus*

#### Species-specific Risk Factors:

##### - *Vibrio vulnificus*

The number of *V. vulnificus* cases decreased to 1 in 2003 from a 10-year peak of 8 in 2001. The case in 2003 was fatal. Risk factor data indicated the case had seafood exposure, specifically raw oyster consumption. The case in 2003 fit the LAC *V. vulnificus* profile of being an adult Latino male with pre-existing liver disease. Investigation of *V. vulnificus* can be hampered since cases may be too ill to give a reliable history.

##### - *Vibrio parahaemolyticus*

Eight cases of *V. parahaemolyticus* were reported during 2003, an increase from the previous year's total (n=5). All eight were identified through stool culture, one required hospitalization. Four of the cases were part of an outbreak associated with a Dim Sum restaurant; all remembered eating shrimp. Out of the other four cases, two recalled raw oyster consumption and one ate raw shrimp.

#### COMMENTS

In LAC, risk from vibrioses can be prevented or reduced by avoiding seawater contamination of food (especially raw fish and shellfish) or drink. Infection with *V. vulnificus* is a particular risk for persons with pre-existing liver disease, frequently leading to soft tissue invasion, limb amputation, and a high case fatality. Adult males may be more at risk for *Vibrio* infections because of their tendency to engage in behaviors exposing them to seawater contamination or higher levels of raw or partially cooked seafood consumption, especially oysters.



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## ADDITIONAL RESOURCES

Mouzin E, Mascola L, Tormey M, Dassey DE. Prevention of *Vibrio vulnificus* infections. Assessment of regulatory educational strategies. JAMA 1997; 278(7):576–578. Abstract available at: [www.jama.ama-assn.org/cgi/content/abstract/278/7/576](http://www.jama.ama-assn.org/cgi/content/abstract/278/7/576)

Disease information regarding *Vibrio vulnificus* is available from the CDC at:  
[www.cdc.gov/ncidod/dbmd/diseaseinfo/vibriovulnificus\\_g.htm](http://www.cdc.gov/ncidod/dbmd/diseaseinfo/vibriovulnificus_g.htm)

Disease information regarding *Vibrio parahaemolyticus* is available from the CDC at:  
[www.cdc.gov/ncidod/dbmd/diseaseinfo/vibrioparahaemolyticus\\_g.htm](http://www.cdc.gov/ncidod/dbmd/diseaseinfo/vibrioparahaemolyticus_g.htm)



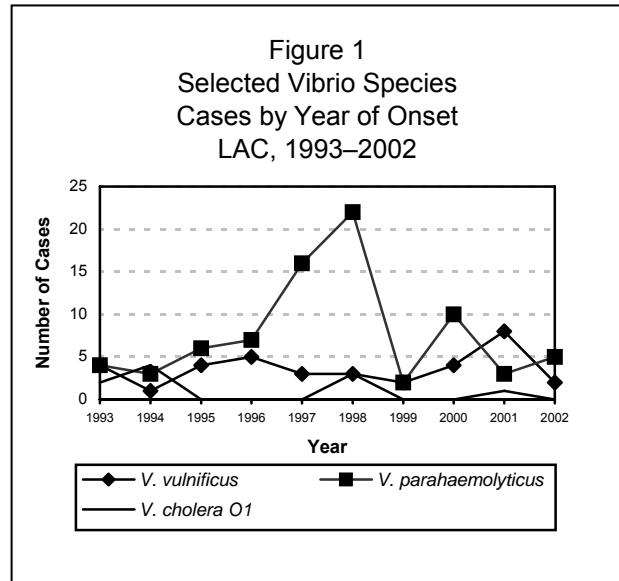
## VIBRIOSIS

CRUDE DATA	
Number of Cases	14
Annual Incidence <sup>a</sup>	
LA County	--- <sup>b</sup>
United States	N/A
Age at Diagnosis	
Mean	44
Median	45
Range	7–71 years
Case Fatality	
LA County	14.0% <sup>c</sup>
United States	varies by species

<sup>a</sup> Cases per 100,000 population.

<sup>b</sup> Rates based on less than 20 observations are unreliable.

<sup>c</sup> Deaths from *V. vulnificus* (n=2) had a 100% case fatality.



### DESCRIPTION

The genus *Vibrio* consists of Gram-negative, curved, motile rods, and contains about a dozen species known to cause human illness. Transmission is most often through ingestion of the organism via foodborne route, but also from contact of non-intact skin with seawater. Presenting symptoms vary by infecting species and mode of transmission. The vibrio species of greatest public health importance are: *V. vulnificus* which presents as a primary septicemia and is often associated with oysters harvested in the Gulf of Mexico, and *V. cholerae* O1 which is most often travel associated. Both *V. cholerae* O1 and *V. parahaemolyticus* present as a gastrointestinal illness.

### DISEASE ABSTRACT

- Fourteen cases of *Vibrio* species were reported in 2002—similar to the previous year (N=15).
- Two cases of *Vibrio vulnificus* were reported in 2002, both with oyster consumption history and both fatal.

### STRATIFIED DATA

**Trends:** Over the last 10 years, case numbers of *Vibrio* infections peaked in 1998 with 36 reports. Reported cases of *Vibrio vulnificus* decreased to two cases in 2002, a substantial decline compared the 10-year peak of eight cases occurring during in 2001.

**Seasonality:** Among reported vibriosis cases with distinct onset dates, the majority (85%, n=11) occurred between May and September. Historically, cases of vibrio infections increase during the warmer summer months.

**Age:** *Vibrio* cases were predominately adults (Table 1). Two cases of *V. alginolyticus* associated ear infection were reported in a 7 and a 21 year old.



**Sex:** All but one case was male (93%, n=13, Table 1).

**Race/ethnicity:** Reported cases were most often Latino (50% n=7, Table 1).

**Severity:** For surviving vibriosis cases with data of distinct onsets and resolution dates (n=7), duration of illness averaged 6 days (range 3–10). Five vibrio required hospitalization for their infection. Two fatal *Vibrio* cases were reported, both due to *V. vulnificus*.

**Table 1: Vibrio Cases by Species, Race, Age and Sex—LAC, 2002**

Species	No. of cases	Race (no. of cases)	Mean Age, years (range)	Sex Ratio M:F
<i>V. vulnificus</i>	2	Latino (2)	45 (44–45)	2:0
<i>V. parahaemolyticus</i>	5	Latino (3), Asian (1), White (1)	51 (33–36)	5:0
<i>V. cholerae</i> non-O1	2	Latino (1), Asian (1)	41 (40–41)	1:1
<i>V. other species*</i>	5	Latino (1), Asian (2), White (1), Unknown (1)	37 (7–71)	5:0

\* Other species include *V. alginolyticus* (n=4) and *V. mimicus* (n=1).

#### Species-specific risk factors:

##### - *Vibrio vulnificus*

The number of *V. vulnificus* cases decreased to two in 2002 from a 10-year peak of 8 in 2001. Both 2002 cases were fatal. Risk factor data indicated both cases had seafood exposure, specifically raw oyster consumption. Both cases in 2002 fit the Los Angeles County *V. vulnificus* profile of being adult Latino males with pre-existing liver disease. Investigation of *V. vulnificus* can be hampered since cases may be too ill to give a reliable history.

##### - *Vibrio parahaemolyticus*

Five cases of *V. parahaemolyticus* were reported during 2002, an increase from the previous year's total (n=3). All five were identified through stool culture, one required hospitalization. From the three cases with reliable epidemiologic history, all recounted a food history of oyster consumption and two cited a travel history outside of the US.

#### PREVENTION

In LAC, risk from vibrioses can be prevented or reduced by avoiding seawater contamination of wounds or consumption of high-risk food items, especially oysters.

#### COMMENTS

In LAC, risk from vibrioses can be prevented or reduced by avoiding seawater contamination of food (especially raw fish and shellfish) or drink. Infection with *V. vulnificus* is a particular risk for persons with pre-existing liver disease, frequently leading to soft tissue invasion, limb amputation, and a high case fatality. Adult males may be more at risk for *Vibrio* infections because of their tendency to engage in behaviors exposing them to seawater contamination or higher levels of raw or partially cooked seafood consumption, especially oysters.

#### ADDITIONAL RESOURCES

Mouzin E, Mascola L, Tormey M, Dassey DE. Prevention of *Vibrio vulnificus* infections. Assessment of regulatory educational strategies. *JAMA* 1997; 278(7):576–578. Abstract available at: [www.jama.ama-assn.org/cgi/content/abstract/278/7/576](http://www.jama.ama-assn.org/cgi/content/abstract/278/7/576)

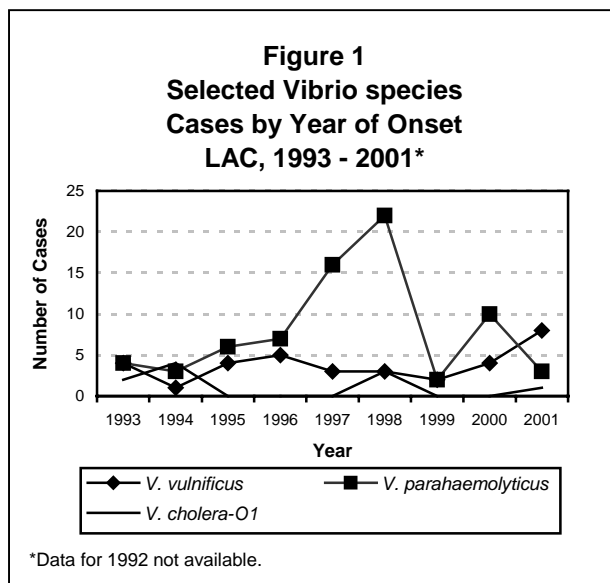


Disease information regarding *Vibrio vulnificus* is available from the CDC at:  
[www.cdc.gov/ncidod/dbmd/diseaseinfo/vibriovulnificus\\_g.htm](http://www.cdc.gov/ncidod/dbmd/diseaseinfo/vibriovulnificus_g.htm)

Disease information regarding *Vibrio parahaemolyticus* is available from the CDC at:  
[www.cdc.gov/ncidod/dbmd/diseaseinfo/vibrioparahaemolyticus\\_g.htm](http://www.cdc.gov/ncidod/dbmd/diseaseinfo/vibrioparahaemolyticus_g.htm)

## VIBRIOSIS

CRUDE DATA	
Number of Cases	15
Annual Incidence <sup>a</sup>	
LA County	N/A <sup>b</sup>
United States	N/A <sup>b</sup>
Age at Diagnosis	
Mean	42
Median	48
Range	16-64 years
Case Fatality	
LA County	4.0% <sup>c</sup>
United States	varies by species



<sup>a</sup> Cases per 100,000 population.

<sup>b</sup> Not calculated. Rates based on less than 20 observations are unreliable.

<sup>c</sup> Deaths from *V. vulnificus* - this species had a 50% case fatality.

### DESCRIPTION

The genus *Vibrio* consists of gram-negative, curved, motile rods, and contains about a dozen species known to cause illness in man. Transmission is most often through ingestion of the organism via foodborne route, but also from contact with seawater—as in a break in the skin. Presenting symptoms vary by infecting species and mode of transmission. Cholera vaccine was once available in the US, but had not been recommended, due to limited protectiveness and potential for side effects. It is no longer available in the US. The vibrio species of greatest public health importance are: *V. vulnificus*, presenting as a primary septicemia and are often associated with oysters harvested in the Gulf of Mexico; *V. cholerae*- O1, most often travel associated; and *V. parahaemolyticus* usually seafood associated, both presenting as a gastrointestinal illness.

### DISEASE ABSTRACT

- Fifteen cases of *Vibrio* species were reported in 2001, compared to the 18 cases the previous year.
- Eight cases of *Vibrio vulnificus* were reported, four died.

### STRATIFIED DATA

**Trends:** Looking at the last ten years, case numbers of *Vibrio* infections peaked in 1998 with 36 reports. The reported cases of *Vibrio vulnificus* peaked in 2001, the highest number in a 10 year period.

**Seasonality:** Seventy- three percent (11/15) of *Vibrio* cases occurred in May and September. Historically, cases of vibrio infections increase during the warmer summer months.

**Age:** All cases were adults (Table 1).

**Sex:** Males cases were predominant across *Vibrio* species, especially for *Vibrio vulnificus*, (Table 1).

**Race/ethnicity:** Reported cases were most often in Latinos (Table 1).

**Severity:** Four fatal *Vibrio* cases were reported, all *V. vulnificus*.

**Table 1: *Vibrio* Cases by Species, Race, Age and Sex – LAC, 2001**

<b>Species</b>	<b>Race</b>	<b>Mean Age (range)</b>	<b>Sex Ratio M:F</b>
<i>V. parahaemolyticus</i> (n=3)	Latino (1), Asian (1), Unknown (1)	48 years (31 - 59)	2:1
<i>V. cholerae</i> - O1 (n=1)	Latino (1)	27 years	1:0
<i>V. vulnificus</i> (N=8)	Latino (8)	51 years (36 - 64)	8:0
<i>V. other species*</i> (n=3)	Latino (1), Asian (2)	32 years (16 - 58)	2:1

\* Other species = *V. alginolyticus* (1), *V. mimicus* (1) and *V. fluvialis* (1).

#### **Species specific risk factors:**

##### **- *Vibrio vulnificus***

Food history risk factor data was available on 6 of the 8 cases. All 6 of these cases reported seafood exposure and four could be specifically linked to Gulf Coast oyster consumption. All cases of *V. vulnificus* were in adult Latino males. Pre-existing medical risk factor data was documented in seven cases - six with liver disease, one diabetic. One individual had unknown prior medical history. Investigation of *V. vulnificus* can be hampered by lack of history, as cases may be too ill to give a reliable epidemiological history.

##### **- *Vibrio cholerae* – O1**

The single reported case of *V. cholerae* - O1 was cryptic and the case denied any risk factor data. In addition, the organism was isolated from blood rather than the usual stool culture.

#### **COMMENTS**

In LAC, risk from vibrioses can be prevented or reduced by avoiding seawater contamination of food (especially raw fish and shellfish) or drink. Infection with *V. vulnificus* is a particular risk for persons with pre-existing liver disease, frequently leading to soft tissue invasion, limb amputation, and a high case fatality. Adult males may be more at risk for *Vibrio* infections because of their tendency to engage in behaviors exposing them to seawater contamination or higher levels of raw or partially cooked seafood consumption, especially oysters.

## **PREVENTION**

In LAC, risk from vibrioses can be prevented or reduced by avoiding seawater contamination of food (especially raw fish and shellfish) or drink.

General information on Vibrio infections can be found on web sites sponsored by the LAC Health Department, FDA and CDC.

Recent publication on *V. vulnificus* in Los Angeles: Mouzin E, Mascola L, Tormey M, et al.: Prevention of *Vibrio vulnificus* infections. Assessment of regulatory educational strategies. JAMA 1997 Aug 20; 278(7):576-578.