



## VIBRIOSIS

| CRUDE DATA                    |            |
|-------------------------------|------------|
| Number of Cases               | 33         |
| Annual Incidence <sup>a</sup> |            |
| LA County <sup>b</sup>        | 0.34       |
| California <sup>c</sup>       | 0.28       |
| United States <sup>c</sup>    | 0.34       |
| Age at Diagnosis              |            |
| Mean                          | 45.8       |
| Median                        | 46         |
| Range                         | 3–84 years |

<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: CDC. *Notice to Readers: Final 2016 Reports of Nationally Notifiable Infectious Diseases and Conditions Weekly* / January 6, 2018 / 65(52). Available at: [https://www.cdc.gov/mmwr/volumes/65/wr/mm6552md.htm?s\\_cid=mm6552md\\_w](https://www.cdc.gov/mmwr/volumes/65/wr/mm6552md.htm?s_cid=mm6552md_w)

### 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 a wound infection or septicemia. Vibriosis is transmitted by ingesting food or water contaminated with *Vibrio* or by contact between open wounds and contaminated water. Vibriosis is commonly associated with consumption of raw or undercooked seafood, particularly shellfish. However, many vibriosis patients indicated a recent history of travel to developing countries. The most common species that cause vibriosis are *V. parahæmolyticus*, *V. alginolyticus*, *V. vulnificus*, and *V. cholerae*. Two serotypes of *V. cholerae* (O1 and O139) may cause cholera, an acute, life-threatening diarrheal illness. Infection may be mild or without symptoms, but sometimes it can be severe. Approximately 1 in 20 infected persons develop severe disease, characterized by profuse watery diarrhea, vomiting, and leg cramps. In these persons, rapid loss of bodily fluids can lead to dehydration and shock. Without treatment, death can occur within hours. This

disease can spread rapidly in areas with inadequate treatment of sewage and drinking water.

### 2016 TRENDS AND HIGHLIGHTS

- The number of reported vibriosis cases increased annually from 2010 to 2014, and peaked in 2014 with 52 cases (Figure 1).
- SPA 2 had the most confirmed cases of vibriosis in 2016 (Figure 4). In all regions of LAC, consumption of raw oysters or other seafood were significant sources of vibriosis.
- Typically, vibriosis cases peak during June through August (Figure 5) because *Vibrio* flourishes in rising water temperatures.
- One-third of cases (n=11) reported foreign travel. Foreign countries reported included Mexico, El Salvador, Brazil, Caribbean, and the Philippines.
- *V. parahæmolyticus* was the most common etiologic agent isolated (n=14, 42%). More than three-quarters (n=11) of *V. parahæmolyticus* cases reported eating oysters prior to onset.
- There were eight confirmed cases of *V. alginolyticus*. Three of these cases had a history of travel-related recreational water exposure, and three had seafood exposures.
- There was one confirmed case of *V. fluvialis*. This case had a known seafood exposure.
- There were two confirmed cases of *V. cholerae* (*non-O1*, *non-O139*). One of these cases had known travel history to Mexico, and one had an unknown exposure status.
- There was one confirmed case of *V. metschnikovii*. This case had an unknown exposure status.
- There was one confirmed case of *V. mimicus*. This case had an unknown exposure status.
- There was one confirmed case of *V. vulnificus*. This case had an unknown exposure status.
- A small number of cases (n=5, 15%) had a *Vibrio* species that were not identifiable.
- There were two vibriosis deaths in 2016. Both cases were diagnosed with *V. vulnificus*



which is a particularly pathogenic organism with a 50% mortality rate in cases with septicemia (both cases presented to the

hospital in septic shock). Both also had underlying conditions that made them susceptible to complications related to *V. vulnificus* infection.



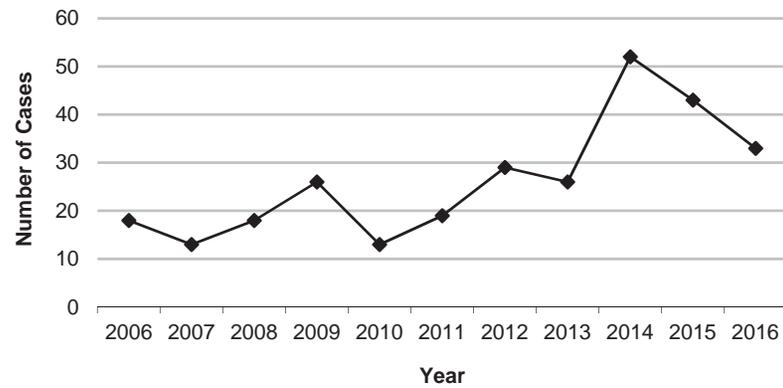
**Reported Vibriosis Cases and Rates\* per 100,000 by Age Group, Race/Ethnicity, and SPA  
LAC, 2012-2016**

|                       | 2012 (N=29) |      |                  | 2013 (N=26) |      |                  | 2014 (N=52) |      |                  | 2015 (N=43) |      |                  | 2016 (N=33) |      |                  |
|-----------------------|-------------|------|------------------|-------------|------|------------------|-------------|------|------------------|-------------|------|------------------|-------------|------|------------------|
|                       | No.         | (%)  | Rate/<br>100,000 |
| <b>Age Group</b>      |             |      |                  |             |      |                  |             |      |                  |             |      |                  |             |      |                  |
| <1                    | 0           | -    | -                | 0           | -    | -                | 0           | -    | -                | 0           | -    | -                | 0           | -    | -                |
| 1-4                   | 0           | -    | -                | 0           | -    | -                | 0           | -    | -                | 0           | -    | -                | 1           | 3.0  | 0.2              |
| 5-14                  | 3           | 10.3 | 0.3              | 3           | 11.5 | 0.2              | 2           | 3.8  | 0.2              | 1           | 2.3  | 0.1              | 2           | 6.1  | 0.2              |
| 15-34                 | 7           | 24.1 | 0.3              | 4           | 15.4 | 0.1              | 18          | 34.6 | 0.6              | 18          | 41.9 | 0.6              | 6           | 18.2 | 0.2              |
| 35-44                 | 4           | 13.8 | 0.3              | 7           | 26.9 | 0.5              | 13          | 25.0 | 1.0              | 7           | 16.3 | 0.5              | 5           | 15.2 | 0.4              |
| 45-54                 | 7           | 24.1 | 0.5              | 6           | 23.1 | 0.5              | 6           | 11.5 | 0.5              | 6           | 14.0 | 0.5              | 9           | 27.3 | 0.7              |
| 55-64                 | 4           | 13.8 | 0.4              | 2           | 7.7  | 0.2              | 7           | 13.5 | 0.7              | 4           | 9.3  | 0.4              | 7           | 21.2 | 0.6              |
| 65+                   | 4           | 13.8 | 0.4              | 4           | 15.4 | 0.4              | 6           | 11.5 | 0.5              | 7           | 16.3 | 0.6              | 3           | 9.0  | 0.2              |
| Unknown               | 0           | -    | -                | 0           | -    | -                | 0           | -    | -                | 0           | -    | -                | 0           | -    | -                |
| <b>Race/Ethnicity</b> |             |      |                  |             |      |                  |             |      |                  |             |      |                  |             |      |                  |
| Asian                 | 2           | 6.9  | 0.2              | 3           | 11.5 | 0.2              | 4           | 7.7  | 0.3              | 2           | 4.7  | 0.1              | 2           | 6.1  | 0.1              |
| Black                 | 1           | 3.4  | 0.1              | 0           | -    | -                | 3           | 5.8  | 0.4              | 1           | 2.3  | 0.1              | 0           | -    | -                |
| Hispanic              | 11          | 37.9 | 0.2              | 6           | 23.1 | 0.1              | 16          | 30.8 | 0.3              | 8           | 18.6 | 0.2              | 9           | 27.3 | 0.2              |
| White                 | 15          | 51.7 | 0.6              | 15          | 57.7 | 0.6              | 12          | 23.1 | 0.5              | 14          | 32.6 | 0.5              | 8           | 24.2 | 0.3              |
| Other                 | 0           | -    | -                | 0           | -    | -                | 0           | -    | -                | 1           | 2.3  | -                | 2           | 6.1  | -                |
| Unknown               | 0           | -    | -                | 2           | 7.7  | -                | 17          | 32.7 | -                | 17          | 39.5 | -                | 12          | 36.3 | -                |
| <b>SPA</b>            |             |      |                  |             |      |                  |             |      |                  |             |      |                  |             |      |                  |
| 1                     | 0           | -    | -                | 0           | -    | -                | 2           | 3.8  | 0.5              | 2           | 4.7  | 0.5              | 2           | 6.1  | 0.5              |
| 2                     | 6           | 20.7 | 0.3              | 7           | 26.9 | 0.3              | 11          | 21.2 | 0.5              | 11          | 25.6 | 0.5              | 9           | 27.3 | 0.4              |
| 3                     | 3           | 10.3 | 0.2              | 3           | 11.5 | 0.2              | 5           | 9.6  | 0.3              | 5           | 11.6 | 0.3              | 4           | 12.1 | 0.2              |
| 4                     | 4           | 13.8 | 0.4              | 5           | 19.2 | 0.4              | 9           | 17.3 | 0.8              | 4           | 9.3  | 0.3              | 5           | 15.2 | 0.4              |
| 5                     | 6           | 20.7 | 0.9              | 5           | 19.2 | 0.8              | 9           | 17.3 | 1.4              | 7           | 16.3 | 1.1              | 6           | 18.2 | 0.9              |
| 6                     | 3           | 10.3 | 0.3              | 2           | 7.7  | 0.2              | 6           | 11.5 | 0.6              | 4           | 9.3  | 0.4              | 4           | 12.1 | 0.4              |
| 7                     | 3           | 10.3 | 0.2              | 0           | -    | -                | 3           | 5.8  | 0.2              | 6           | 14.0 | 0.5              | 0           | -    | -                |
| 8                     | 4           | 13.8 | 0.4              | 4           | 15.4 | 0.4              | 5           | 9.6  | 0.5              | 4           | 9.3  | 0.4              | 3           | 9.0  | 0.3              |
| Unknown               | 0           | -    | -                | 0           | -    | -                | 2           | 3.8  | -                | 0           | -    | -                | 0           | -    | -                |

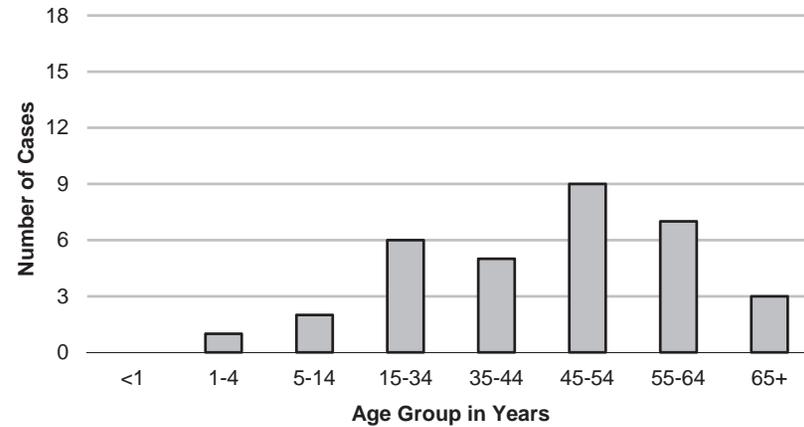
\*Rates calculated based on less than 19 cases or events are considered unreliable.



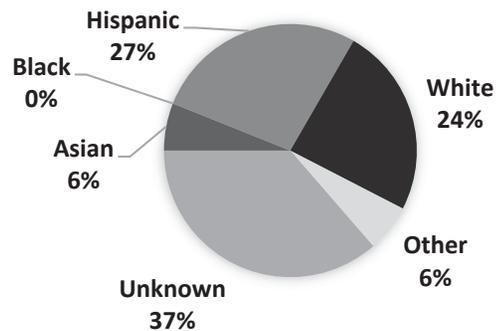
**Figure 1. Reported Cases of Vibriosis  
LAC, 2006-2016**



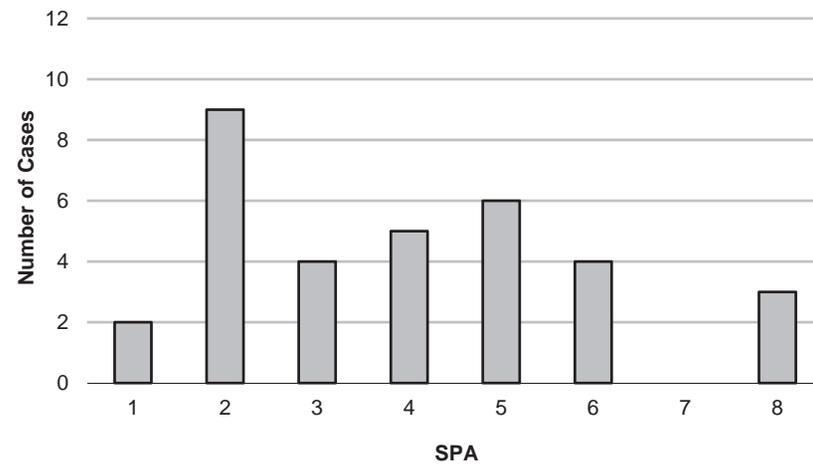
**Figure 2. Reported Cases of Vibriosis by Age Group  
LAC, 2016 (N=33)**



**Figure 3. Percent of Cases of Vibriosis by  
Race/Ethnicity, LAC, 2016 (N=33)**

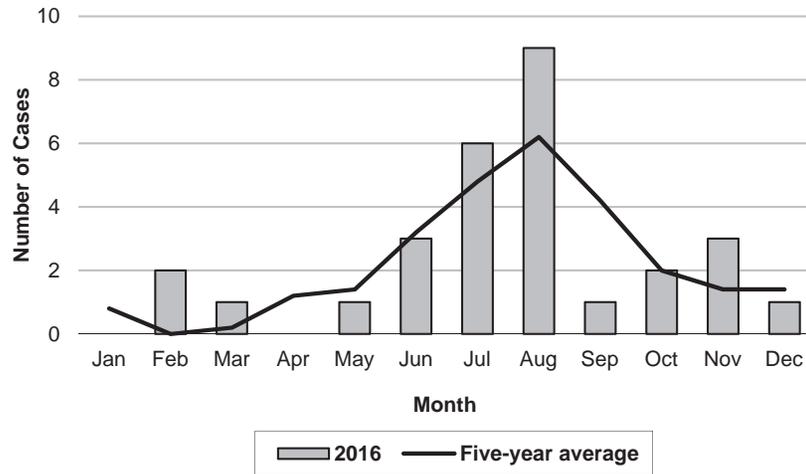


**Figure 4. Reported Cases of Vibriosis by SPA  
LAC, 2016 (N=33)**

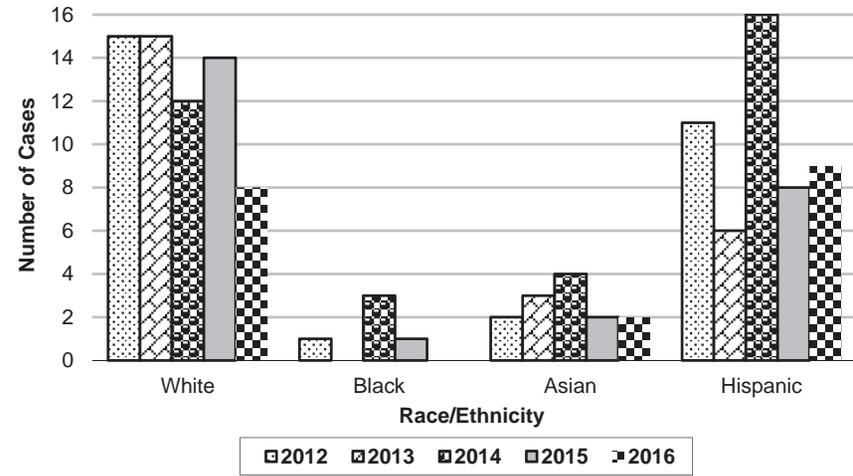




**Figure 5. Reported Vibriosis Cases by Month of Onset  
LAC, 2016 (N=29\*)**



**Figure 6. Reported Cases of Vibriosis by Race/Ethnicity  
LAC, 2012-2016**



\*Onset month not available for 4 cases: 1 asymptomatic, 1 unable to contact, 2 could not identify onset date due to chronic illness.



## VIBRIOSIS

| CRUDE DATA                    |            |
|-------------------------------|------------|
| Number of Cases               | 43         |
| Annual Incidence <sup>a</sup> |            |
| LA County <sup>b</sup>        | 0.45       |
| California <sup>c</sup>       | 0.61       |
| United States <sup>c</sup>    | 0.41       |
| Age at Diagnosis              |            |
| Mean                          | 42         |
| Median                        | 37         |
| Range                         | 8–89 years |

<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: CDC. *Notice to Readers: Final 2015 Reports of Nationally Notifiable Infectious Diseases and Conditions Weekly* / November 25, 2016 / 65(46);1306–1321. Available at: [www.cdc.gov/mmwr/volumes/65/wr/mm6546a9.htm](http://www.cdc.gov/mmwr/volumes/65/wr/mm6546a9.htm)

### 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 a 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 *V. cholerae* (O1 and O139) may cause cholera, an acute, life-threatening diarrheal illness. Infection may be mild or without symptoms, but sometimes it can be severe. Approximately 1 in 20 infected persons develop severe disease characterized by profuse watery diarrhea, vomiting, and leg cramps. In these

persons, rapid loss of bodily fluids can lead to dehydration and shock. Without treatment, death can occur within hours. This 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 shellfish. Many vibriosis patients have had recent history of travel to developing countries.

### 2015 TRENDS AND HIGHLIGHTS

- The number of vibriosis cases reported to LAC increased each year from 2010 to 2014 (13 to a high of 52 cases). The number of cases decreased in 2015 compared to 2014 (Figure 1).
- The majority of vibriosis cases were 15-34 year olds (Figure 2).
- SPA 2 had the most confirmed cases of vibriosis in 2015 (Figure 4). In all regions of LAC, consumption of raw oysters or other seafood were significant sources of vibriosis.
- Typically, vibriosis cases peak during June through August because *Vibrio* flourishes in rising water temperatures (Figure 5).
- *V. parahæmolyticus* was the most common etiologic agent isolated (n=32). Almost one-third (n=10) *V. parahæmolyticus* cases reported eating oysters prior to onset.
- A minority of cases (n=7) reported foreign travel. Foreign countries reported included Mexico and the Philippines.
- There were five confirmed cases of *V. alginolyticus*. The majority of these cases (n=3) had a history of recreational water exposure.
- There were three confirmed cases of *V. fluviali*. All of these cases had unknown exposure.
- A small number of cases (n=3) had a *Vibrio* species that was not identified.
- There were no vibriosis deaths in 2015.



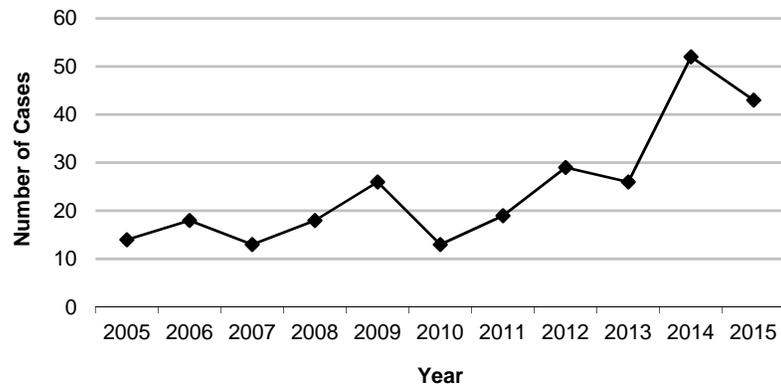
**Reported Vibriosis Cases and Rates\* per 100,000 by Age Group, Race/Ethnicity, and SPA  
LAC, 2011-2015**

|                       | 2011 (N=19) |      |                  | 2012 (N=29) |      |                  | 2013 (N=26) |      |                  | 2014 (N=52) |      |                  | 2015 (N=43) |      |                  |
|-----------------------|-------------|------|------------------|-------------|------|------------------|-------------|------|------------------|-------------|------|------------------|-------------|------|------------------|
|                       | No.         | (%)  | Rate/<br>100,000 |
| <b>Age Group</b>      |             |      |                  |             |      |                  |             |      |                  |             |      |                  |             |      |                  |
| <1                    | 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              |
| 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                  | 1           | 5.3  | 0.1              | 3           | 10.3 | 0.3              | 3           | 11.5 | 0.2              | 2           | 3.8  | 0.2              | 1           | 2.3  | 0.1              |
| 15-34                 | 5           | 26.3 | 0.2              | 7           | 24.1 | 0.3              | 4           | 15.4 | 0.1              | 18          | 34.6 | 0.6              | 18          | 41.9 | 0.6              |
| 35-44                 | 3           | 15.8 | 0.2              | 4           | 13.8 | 0.3              | 7           | 26.9 | 0.5              | 13          | 25.0 | 1.0              | 7           | 16.3 | 0.5              |
| 45-54                 | 5           | 26.3 | 0.4              | 7           | 24.1 | 0.5              | 6           | 23.1 | 0.5              | 6           | 11.5 | 0.5              | 6           | 14.0 | 0.5              |
| 55-64                 | 3           | 15.8 | 0.3              | 4           | 13.8 | 0.4              | 2           | 7.7  | 0.2              | 7           | 13.5 | 0.7              | 4           | 9.3  | 0.4              |
| 65+                   | 2           | 10.5 | 0.2              | 4           | 13.8 | 0.4              | 4           | 15.4 | 0.4              | 6           | 11.5 | 0.5              | 7           | 16.3 | 0.6              |
| Unknown               | 0           | -    | -                | 0           | -    | -                | 0           | -    | -                | 0           | -    | -                | 0           | -    | -                |
| <b>Race/Ethnicity</b> |             |      |                  |             |      |                  |             |      |                  |             |      |                  |             |      |                  |
| Asian                 | 0           | 0.0  | 0.0              | 2           | 6.9  | 0.2              | 3           | 11.5 | 0.2              | 4           | 7.7  | 0.3              | 2           | 4.7  | 0.1              |
| Black                 | 1           | 5.3  | 0.1              | 1           | 3.4  | 0.1              | 0           | 0.0  | 0.0              | 3           | 5.8  | 0.4              | 1           | 2.3  | 0.1              |
| Hispanic              | 8           | 42.1 | 0.2              | 11          | 37.9 | 0.2              | 6           | 23.1 | 0.1              | 16          | 30.8 | 0.3              | 8           | 18.6 | 0.2              |
| White                 | 9           | 47.4 | 0.3              | 15          | 51.7 | 0.6              | 15          | 57.7 | 0.6              | 12          | 23.1 | 0.5              | 14          | 32.6 | 0.5              |
| Other                 | 0           | -    | -                | 0           | -    | -                | 0           | -    | -                | 0           | -    | -                | 1           | 2.3  | -                |
| Unknown               | 1           | 5.3  | -                | 0           | -    | -                | 2           | 7.7  | -                | 17          | 32.7 | -                | 17          | 39.5 | -                |
| <b>SPA</b>            |             |      |                  |             |      |                  |             |      |                  |             |      |                  |             |      |                  |
| 1                     | 0           | 0.0  | 0.0              | 0           | 0.0  | 0.0              | 0           | 0.0  | 0.0              | 2           | 3.8  | 0.5              | 2           | 4.7  | 0.5              |
| 2                     | 4           | 21.1 | 0.2              | 6           | 20.7 | 0.3              | 7           | 26.9 | 0.3              | 11          | 21.2 | 0.5              | 11          | 25.6 | 0.5              |
| 3                     | 2           | 10.5 | 0.1              | 3           | 10.3 | 0.2              | 3           | 11.5 | 0.2              | 5           | 9.6  | 0.3              | 5           | 11.6 | 0.3              |
| 4                     | 4           | 21.1 | 0.3              | 4           | 13.8 | 0.4              | 5           | 19.2 | 0.4              | 9           | 17.3 | 0.8              | 4           | 9.3  | 0.3              |
| 5                     | 1           | 5.3  | 0.2              | 6           | 20.7 | 0.9              | 5           | 19.2 | 0.8              | 9           | 17.3 | 1.4              | 7           | 16.3 | 1.1              |
| 6                     | 3           | 15.8 | 0.3              | 3           | 10.3 | 0.3              | 2           | 7.7  | 0.2              | 6           | 11.5 | 0.6              | 4           | 9.3  | 0.4              |
| 7                     | 2           | 10.5 | 0.1              | 3           | 10.3 | 0.2              | 0           | 0.0  | 0.0              | 3           | 5.8  | 0.2              | 6           | 14.0 | 0.5              |
| 8                     | 2           | 10.5 | 0.2              | 4           | 13.8 | 0.4              | 4           | 15.4 | 0.4              | 5           | 9.6  | 0.5              | 4           | 9.3  | 0.4              |
| Unknown               | 1           | 5.3  | -                | 0           | -    | -                | 0           | -    | -                | 2           | 3.8  | -                | 0           | -    | -                |

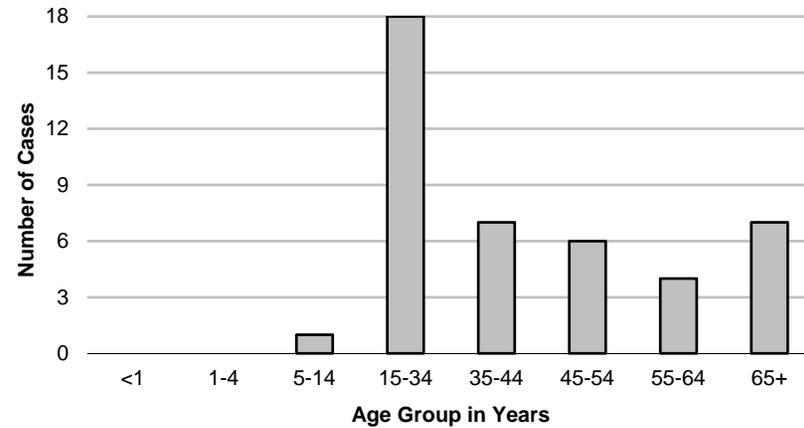
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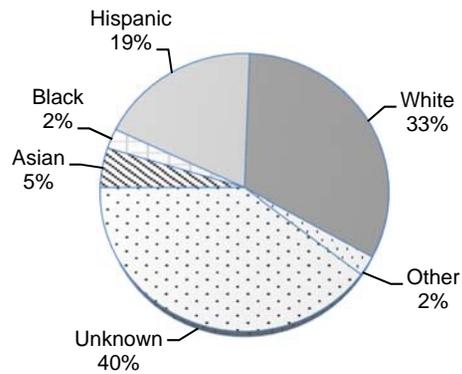
**Figure 1. Reported Cases of Vibriosis  
LAC, 2005-2015**



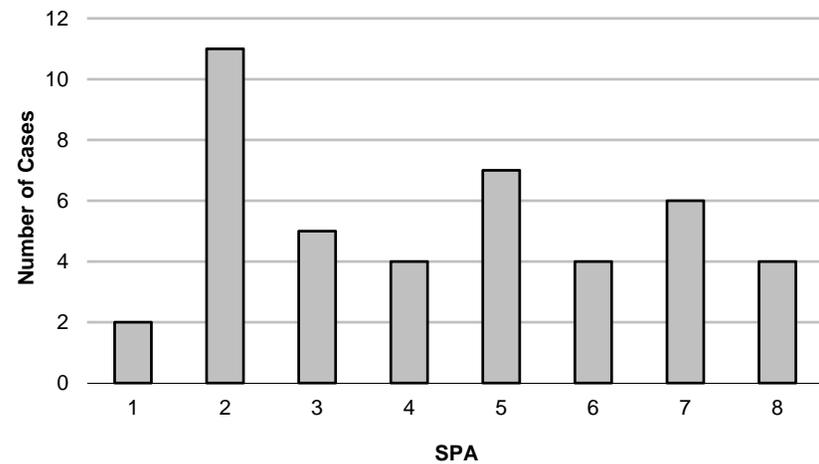
**Figure 2. Reported Cases of Vibriosis by Age Group  
LAC, 2015 (N=43)**



**Figure 3. Percent Cases of Vibriosis by Race/Ethnicity  
LAC, 2015 (N=43)**

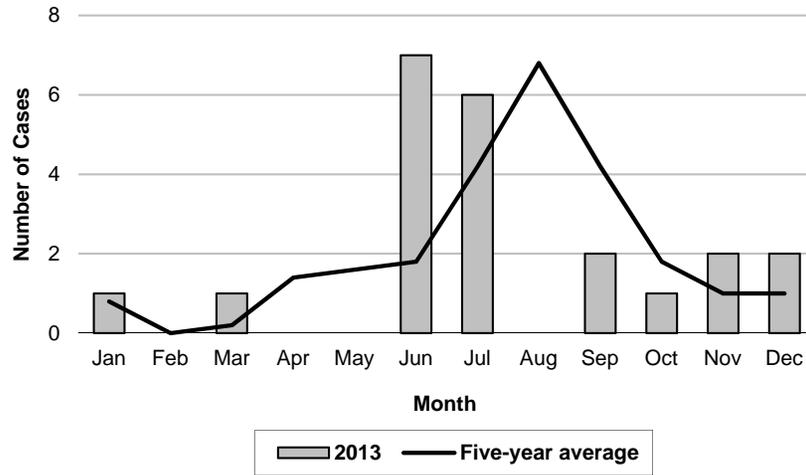


**Figure 4. Reported Cases of Vibriosis by SPA  
LAC, 2015 (N=43)**

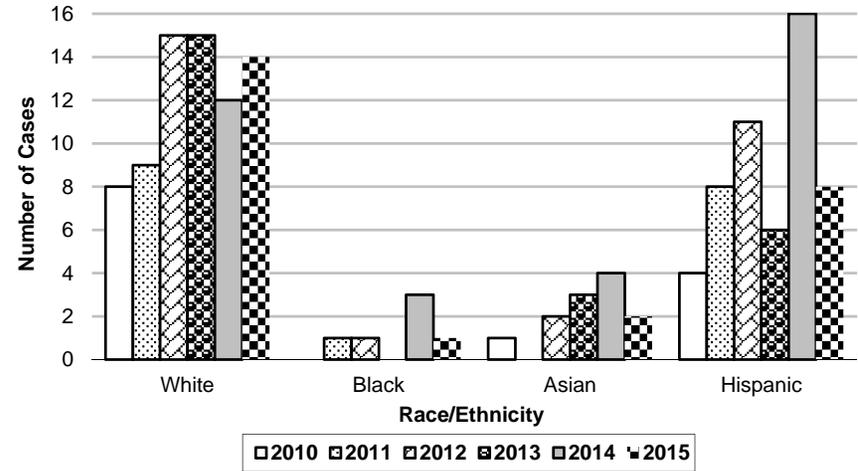




**Figure 5. Reported Vibriosis Cases by Month of Onset  
LAC, 2015 (N=43)**



**Figure 6. Reported Cases of Vibriosis by Race/Ethnicity  
LAC, 2010-2015**





## VIBRIOSIS

| CRUDE DATA                    |            |
|-------------------------------|------------|
| Number of Cases               | 52         |
| Annual Incidence <sup>a</sup> |            |
| LA County <sup>b</sup>        | 0.55       |
| California <sup>b</sup>       | 0.72       |
| United States <sup>b</sup>    | 0.40       |
| Age at Diagnosis              |            |
| Mean                          | 42         |
| Median                        | 37         |
| Range                         | 9–88 years |

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

<sup>b</sup>Calculated from Final 2014 Reports of Nationally Notifiable Infectious Diseases. MMWR 64(36):1019–1033.

### 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 a 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 *V. cholerae*, O1 and O139, may cause cholera, an acute, life-threatening diarrheal illness. The infection may be mild or without symptoms, but sometimes it can be severe. Approximately 1 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. Many vibriosis patients have recent history of travel to developing countries. Vibriosis is commonly associated with consumption of raw or undercooked seafood, particularly shellfish.

### 2014 TRENDS AND HIGHLIGHTS

- The number of Vibriosis cases reported to LAC doubled in 2014, compared to 2013 (Figure 1). This was also the most cases reported to LAC in the past 10 years. This could be due to warmer waters which increases the risk of *V. parahaemolyticus*

infection; 2014 had the warmest summer on record to date.

- The majority of vibriosis cases were aged 15 to 44 years (Figure 2).
- SPA 2 had 11 confirmed cases of vibriosis in 2014 (Figure 4). SPAs 4 and 5 each had 9 confirmed cases. In all of these regions, raw oysters or other seafood were significant sources of vibriosis.
- Typically, vibriosis cases peak during July and August because *Vibrio* flourishes in warmer water temperatures (Figure 5).
- *V. parahæmolyticus* was the most common etiologic agent isolated (n=36). A total of 23 *V. parahæmolyticus* cases reported having eaten raw oysters prior to onset, and 23 cases reported eating other seafood, excluding oysters, but only 4 claimed that the seafood was eaten raw. Nine cases reported foreign travel to Mexico, Europe, Central America, and Turkey. Exposure history could not be determined for three cases.
- There were nine confirmed cases of *V. alginolyticus*. Five cases had a history of recreational water exposure. Exposure history could not be determined for four cases.
- *V. cholerae* non-O1, non-O139 was isolated from two persons.
- There were three confirmed cases of *V. fluvialis*. Two cases had unknown exposure and one case reported eating raw seafood, including oysters. One case of *V. vulnificus* reported travel to Cancun, Mexico.
- One case had a vibrio species that was unable to be identified.
- There were no vibriosis deaths in 2014.



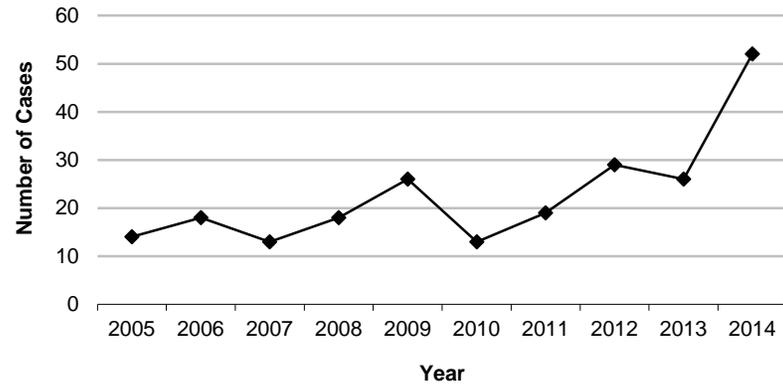
**Reported Vibriosis Cases and Rates\* per 100,000 by Age Group, Race/Ethnicity, and SPA  
Los Angeles County, 2010-2014**

|                       | 2010 (N=13) |      |                  | 2011 (N=19) |      |                  | 2012 (N=27) |      |                  | 2013 (N=26) |      |                  | 2014 (N=52) |      |                  |
|-----------------------|-------------|------|------------------|-------------|------|------------------|-------------|------|------------------|-------------|------|------------------|-------------|------|------------------|
|                       | No.         | (%)  | Rate/<br>100,000 |
| <b>Age Group</b>      |             |      |                  |             |      |                  |             |      |                  |             |      |                  |             |      |                  |
| <1                    | 0           | -    | -                | 0           | -    | -                | 0           | -    | -                | 0           | -    | -                | 0           | -    | -                |
| 1-4                   | 0           | -    | -                | 0           | -    | -                | 0           | -    | -                | 0           | -    | -                | 0           | -    | -                |
| 5-14                  | 2           | 15.4 | 0.2              | 1           | 5.3  | 0.1              | 3           | 11.1 | 0.3              | 3           | 11.5 | 0.2              | 2           | 3.8  | 0.2              |
| 15-34                 | 5           | 38.5 | 0.2              | 5           | 26.3 | 0.2              | 7           | 25.9 | 0.3              | 4           | 15.3 | 0.1              | 18          | 34.6 | 0.6              |
| 35-44                 | 0           | -    | -                | 3           | 15.8 | 0.2              | 4           | 14.8 | 0.3              | 7           | 26.9 | 0.5              | 13          | 25.0 | 1.0              |
| 45-54                 | 3           | 23.1 | 0.2              | 5           | 26.3 | 0.4              | 5           | 18.5 | 0.5              | 6           | 23.0 | 0.5              | 6           | 11.5 | 0.5              |
| 55-64                 | 2           | 15.4 | 0.2              | 3           | 15.8 | 0.3              | 4           | 14.8 | 0.4              | 2           | 7.6  | 0.2              | 7           | 13.5 | 0.7              |
| 65+                   | 1           | 7.7  | 0.1              | 2           | 10.5 | 0.2              | 4           | 14.8 | 0.4              | 4           | 15.3 | 0.4              | 6           | 11.5 | 0.5              |
| Unknown               | 0           | -    | -                | 0           | -    | -                | 0           | -    | -                | 0           | -    | -                | 0           | -    | -                |
| <b>Race/Ethnicity</b> |             |      |                  |             |      |                  |             |      |                  |             |      |                  |             |      |                  |
| Asian                 | 1           | 7.7  | 0.1              | 0           | -    | -                | 2           | 7.4  | 0.2              | 3           | 11.5 | 0.2              | 4           | 7.7  | 0.1              |
| Black                 | 0           | -    | -                | 1           | 5.3  | 0.1              | 1           | 3.7  | 0.1              | 0           | 0.0  | 0.0              | 3           | 5.8  | 0.4              |
| Hispanic              | 4           | 30.8 | 0.1              | 9           | 47.4 | 0.2              | 9           | 33.3 | 0.2              | 6           | 23.1 | 0.1              | 16          | 30.7 | 0.3              |
| White                 | 4           | 30.8 | 0.2              | 9           | 47.4 | 0.3              | 13          | 48.1 | 0.6              | 15          | 57.7 | 0.6              | 12          | 23.1 | 0.5              |
| Other                 | 0           | -    | -                | 0           | -    | -                | 0           | -    | -                | 0           | -    | -                | 0           | -    | -                |
| Unknown               | 4           | 30.8 | -                | 0           | -    | -                | 2           | 7.4  | -                | 2           | 7.6  | -                | 17          | 32.7 | -                |
| <b>SPA</b>            |             |      |                  |             |      |                  |             |      |                  |             |      |                  |             |      |                  |
| 1                     | 0           | -    | -                | 0           | -    | -                | 0           | -    | -                | 0           | -    | -                | 2           | 3.8  | 0.5              |
| 2                     | 1           | 7.7  | -                | 4           | 21.1 | 0.2              | 6           | 22.2 | 0.3              | 7           | 26.9 | 0.3              | 11          | 21.2 | 0.5              |
| 3                     | 2           | 0.0  | 0.4              | 2           | 10.5 | 0.1              | 2           | 7.4  | 0.2              | 3           | 11.5 | 0.2              | 5           | 9.6  | 0.3              |
| 4                     | 2           | 7.7  | 0.2              | 4           | 21.1 | 0.3              | 5           | 18.5 | 0.4              | 5           | 19.2 | 0.4              | 9           | 17.3 | 0.8              |
| 5                     | 4           | 30.8 | 0.6              | 1           | 5.3  | 0.2              | 6           | 22.2 | 0.9              | 5           | 19.2 | 0.8              | 9           | 17.3 | 1.4              |
| 6                     | 2           | 15.4 | 0.2              | 4           | 21.1 | 0.3              | 2           | 7.4  | 0.3              | 2           | 7.7  | 0.2              | 6           | 11.5 | 0.6              |
| 7                     | 1           | 7.7  | 0.1              | 2           | 10.5 | 0.1              | 2           | 7.4  | 0.2              | 0           | 0.0  | 0.0              | 3           | 5.8  | 0.2              |
| 8                     | 3           | 23.1 | 0.3              | 2           | 15.8 | 0.2              | 4           | 14.8 | 0.4              | 4           | 15.4 | 0.4              | 5           | 9.6  | 0.5              |
| Unknown               | 0           | -    | -                | 0           | -    | -                | 0           | -    | -                | 0           | -    | -                | 2           | 3.8  | -                |

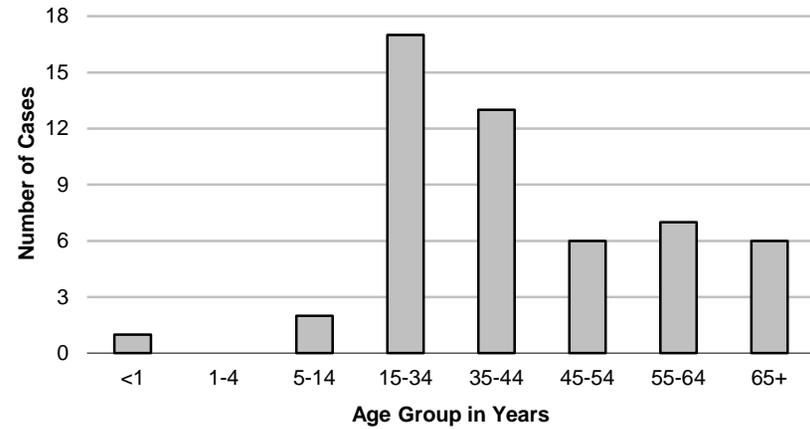
\*Rates calculated based on less than 19 cases or events are considered unreliable.



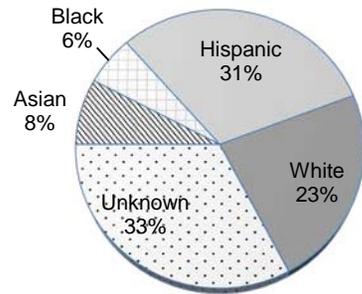
**Figure 1. Reported Cases of Vibriosis  
LAC, 2005-2014**



**Figure 2. Reported Cases of Vibriosis by Age Group  
LAC, 2014 (N=52)**



**Figure 3. Percent Cases of Vibriosis by Race/Ethnicity  
LAC, 2014 (N=52)**



**Figure 4. Reported Cases of Vibriosis by SPA  
LAC, 2014 (N=52)**

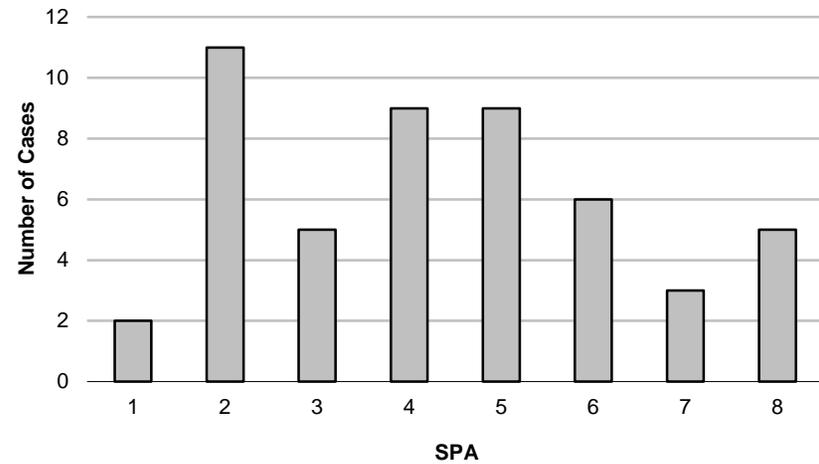




Figure 5. Reported Vibriosis Cases by Month of Onset  
LAC, 2014 (N=52)

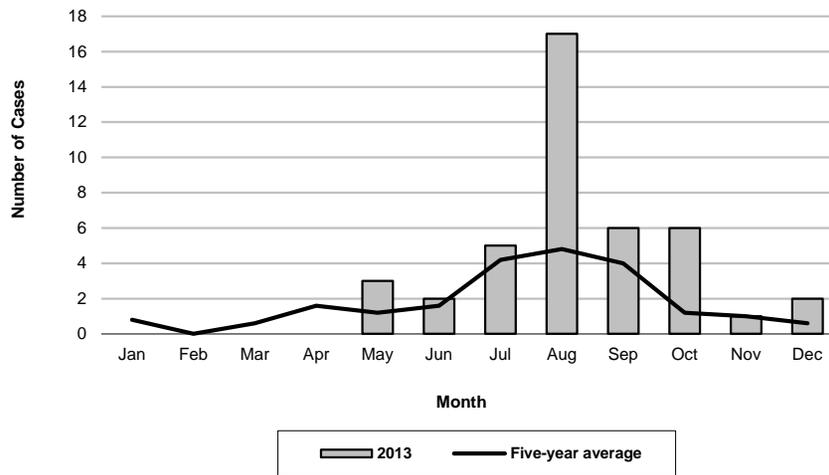
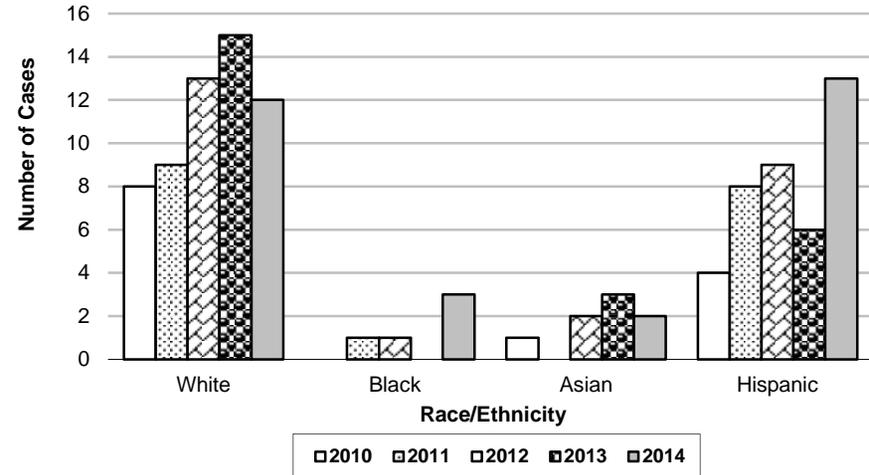
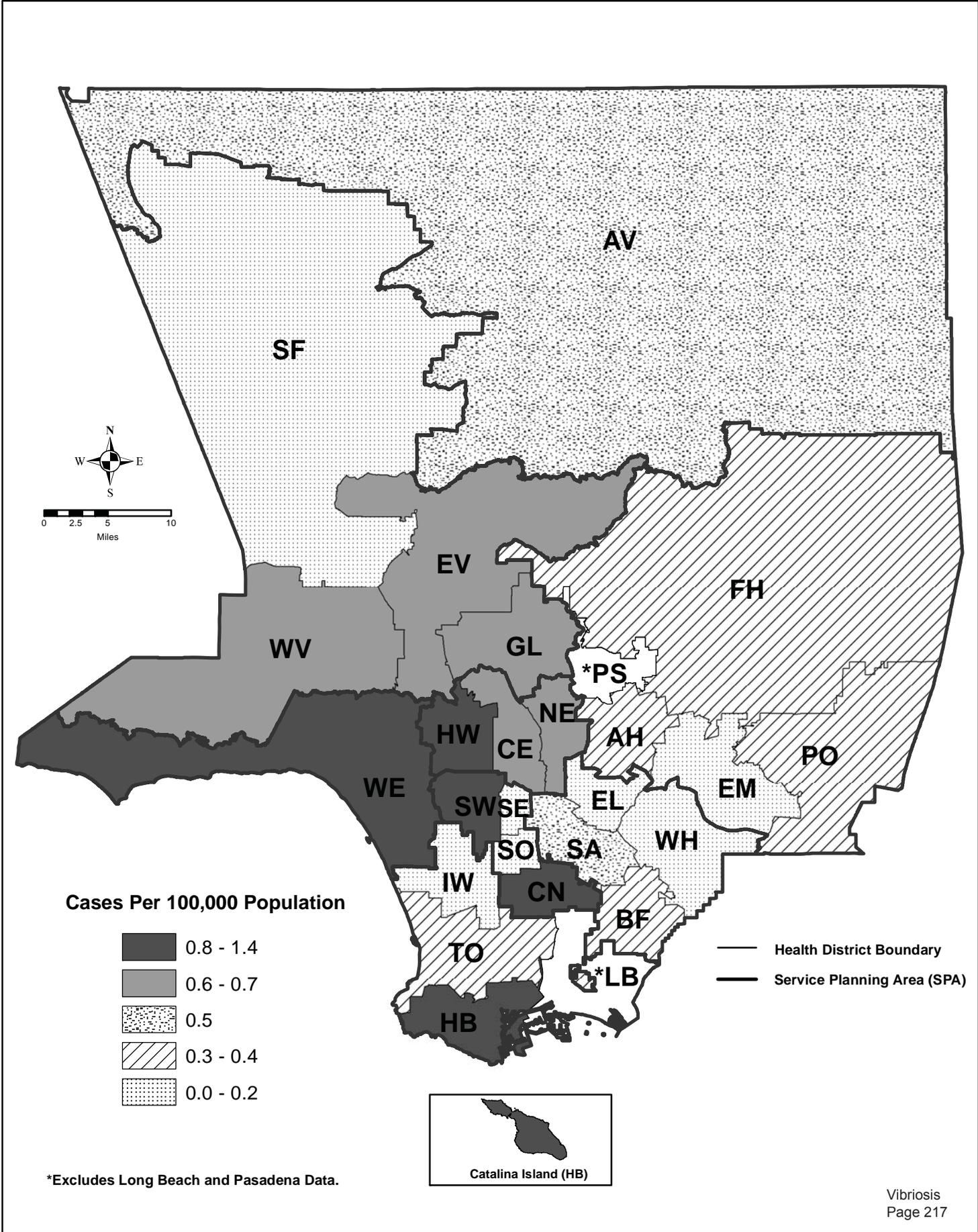


Figure 6. Reported Cases of Vibriosis by Race/Ethnicity  
LAC, 2010-2014\*



\*Does not include cases of unknown ethnicity.

# Map 15. Vibrio Rates by Health District, Los Angeles County, 2014\*





## VIBRIOSIS

| CRUDE DATA                    |       |
|-------------------------------|-------|
| Number of Cases               | 26    |
| Annual Incidence <sup>a</sup> |       |
| LA County <sup>b</sup>        | 0.28  |
| California <sup>c</sup>       | 0.39  |
| United States <sup>c</sup>    | 0.41  |
| Age at Diagnosis              |       |
| Mean                          | 43    |
| Median                        | 43    |
| Range                         | 10-83 |

<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 2013 Reports of Nationally Notifiable Infectious Disease. MMWR 63(32):702-716.

### 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 *V. cholerae* – O1 and O139 -- 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 shellfish. Many vibriosis patients often have recent history of travel to developing countries.

### 2013 TRENDS AND HIGHLIGHTS

- Last year ACDC changed the way it calculates the vibriosis incidence rate for the United States. Prior to 2012, rates were calculated from unadjusted US population data taken from the Census. Because not all states report vibriosis, it was decided to compare rates only to states that list vibriosis as a reportable disease. Thus in 2012 and 2013, rates were adjusted to reflect populations in states reporting vibriosis morbidity, excluding states where vibriosis is not a reportable condition.
- In 2013, non-Hispanic whites comprised the largest proportion of all vibriosis cases (n=15, 58%) (Figure 3).
- SPA 2 had seven confirmed cases of vibriosis in 2013 (Figure 4). SPAs 4 and 5 each had five confirmed cases. In both of these regions, raw oyster or other seafoods were significant sources of vibriosis. SPA 4 had five confirmed cases reporting raw oyster consumption or foreign travel prior to their onset.
- Typically vibriosis cases peak during July and August because *Vibrio* flourishes in rising water temperatures. (Figure 5).
- *V. parahæmolyticus* was the most common etiologic agent isolated (n=15). Eleven *V. parahæmolyticus* cases reported having eaten raw oysters prior to onset. One case who ate raw oysters personally harvested them in Santa Monica Bay. Another case was part of a national cluster associated with oysters from Cape Cod. Ten cases reported eating “seafood,” but only four



claimed that the seafood was eaten raw. Four cases reported foreign travel. Foreign countries included France, the United Kingdom, Haiti, Canada, and Singapore. Exposure history could not be determined for one case.

- There were five confirmed cases of *V. alginolyticus*. Four cases had a history of recreational water exposure. The one case that did not report water exposure had stepped on a nail, and the wound tested positive for *V. alginolyticus*.
- *V. cholerae* non-O1, non-O139 was isolated from two persons. One case reported travel to Taiwan and the other reported recreational water exposure in Arizona.
- There was one confirmed case of each of the following: *V. mimicus*, *V. damsela*, *V. fluvialis*. The *V. mimicus* case had traveled to Guatemala. The *V. damsela* case traveled to Mexico and became injured in the ocean. The exposure of the *V. fluvialis* case was unknown. There was also one case whose specific species of *vibrio* was unknown but had a history of travel to Mexico and eating both seafood and oysters.
- Five cases of vibriosis occurred among women, while 21 cases occurred among men (80.8%). Historically, vibriosis cases have been predominantly male, but in recent years, women have made up a greater proportion of cases. The high proportion of male cases in 2012 (77.8%) and in 2013 appear to be reversing the recent trend.
- There were no vibriosis deaths in 2013.



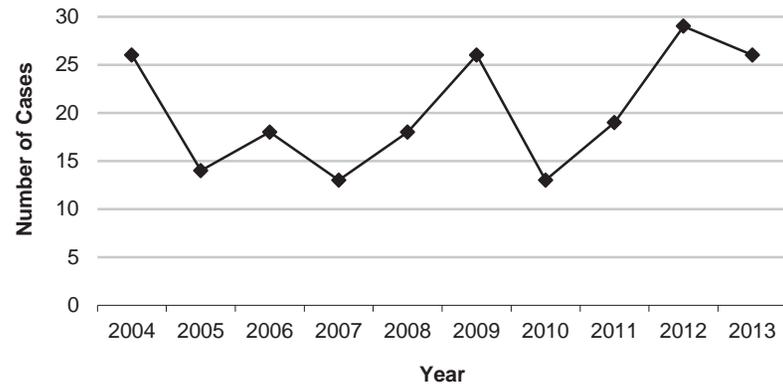
**Reported Vibriosis Cases and Rates\* per 100,000 by Age Group, Race/Ethnicity, and SPA  
Los Angeles County, 2009-2013**

|                       | 2009 (N=26) |      |                  | 2010 (N=13) |      |                  | 2011 (N=19) |      |                  | 2012 (N=27) |      |                  | 2013 (N=26) |      |                  |
|-----------------------|-------------|------|------------------|-------------|------|------------------|-------------|------|------------------|-------------|------|------------------|-------------|------|------------------|
|                       | No.         | (%)  | Rate/<br>100,000 |
| <b>Age Group</b>      |             |      |                  |             |      |                  |             |      |                  |             |      |                  |             |      |                  |
| <1                    | 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              |
| 1-4                   | 1           | 3.8  | 0.2              | 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              | 2           | 15.4 | 0.2              | 1           | 5.3  | 0.1              | 3           | 11.1 | 0.3              | 3           | 11.5 | 0.2              |
| 15-34                 | 11          | 42.3 | 0.4              | 5           | 38.5 | 0.2              | 5           | 26.3 | 0.2              | 7           | 25.9 | 0.3              | 4           | 15.3 | 0.1              |
| 35-44                 | 4           | 15.4 | 0.3              | 0           | 0.0  | 0.0              | 3           | 15.8 | 0.2              | 4           | 14.8 | 0.3              | 7           | 26.9 | 0.5              |
| 45-54                 | 5           | 19.2 | 0.4              | 3           | 23.1 | 0.2              | 5           | 26.3 | 0.4              | 5           | 18.5 | 0.5              | 6           | 23.0 | 0.5              |
| 55-64                 | 3           | 11.5 | 0.3              | 2           | 15.4 | 0.2              | 3           | 15.8 | 0.3              | 4           | 14.8 | 0.4              | 2           | 7.6  | 0.2              |
| 65+                   | 2           | 7.7  | 0.2              | 1           | 7.7  | 0.1              | 2           | 10.5 | 0.2              | 4           | 14.8 | 0.4              | 4           | 15.3 | 0.4              |
| 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           | 7.7  | 0.1              | 0           | 0.0  | 0.0              | 2           | 7.4  | 0.2              | 3           | 11.5 | 0.2              |
| Black                 | 0           | 0.0  | 0.0              | 0           | 0.0  | 0.0              | 1           | 5.3  | 0.1              | 1           | 3.7  | 0.1              | 0           | 0.0  | 0.0              |
| Hispanic              | 8           | 30.8 | 0.2              | 4           | 30.8 | 0.1              | 9           | 47.4 | 0.2              | 9           | 33.3 | 0.2              | 6           | 23.1 | 0.1              |
| White                 | 15          | 57.7 | 0.5              | 4           | 30.8 | 0.2              | 9           | 47.4 | 0.3              | 13          | 48.1 | 0.6              | 15          | 57.7 | 0.6              |
| 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  |                  | 4           | 30.8 |                  | 0           | 0.0  | 0.0              | 2           | 7.4  | --               | 2           | 7.6  | --               |
| <b>SPA</b>            |             |      |                  |             |      |                  |             |      |                  |             |      |                  |             |      |                  |
| 1                     | 2           | 7.7  | 0.5              | 0           | 0.0  | 0.0              | 0           | 0.0  | 0.0              | 0           | 0.0  | 0.4              | 0           | 0.0  | 0.0              |
| 2                     | 6           | 23.1 | 0.3              | 1           | 7.7  | 0.0              | 4           | 21.1 | 0.2              | 6           | 22.2 | 0.3              | 7           | 26.9 | 0.3              |
| 3                     | 3           | 11.5 | 0.2              | 2           | 0.0  | 0.4              | 2           | 10.5 | 0.1              | 2           | 7.4  | 0.2              | 3           | 11.5 | 0.2              |
| 4                     | 4           | 15.4 | 0.4              | 2           | 7.7  | 0.2              | 4           | 21.1 | 0.3              | 5           | 18.5 | 0.4              | 5           | 19.2 | 0.4              |
| 5                     | 5           | 19.2 | 0.8              | 4           | 30.8 | 0.6              | 1           | 5.3  | 0.2              | 6           | 22.2 | 0.9              | 5           | 19.2 | 0.8              |
| 6                     | 0           | 0.0  | 0.0              | 2           | 15.4 | 0.2              | 4           | 21.1 | 0.3              | 2           | 7.4  | 0.3              | 2           | 7.7  | 0.2              |
| 7                     | 2           | 7.7  | 0.2              | 1           | 7.7  | 0.1              | 2           | 10.5 | 0.1              | 2           | 7.4  | 0.2              | 0           | 0.0  | 0.0              |
| 8                     | 3           | 11.5 | 0.3              | 3           | 23.1 | 0.3              | 2           | 15.8 | 0.2              | 4           | 14.8 | 0.4              | 4           | 15.4 | 0.4              |
| Unknown               | 1           | 3.8  |                  |             |      |                  |             |      |                  |             |      |                  |             |      |                  |

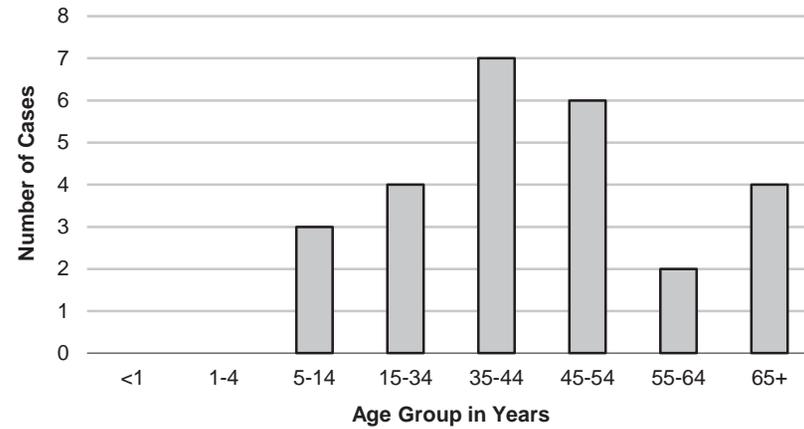
\*Rates calculated based on less than 19 cases or events are considered unreliable.



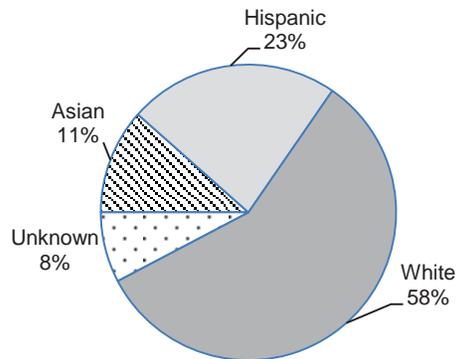
**Figure 1. Reported Cases of Vibriosis  
LAC, 2004-2013**



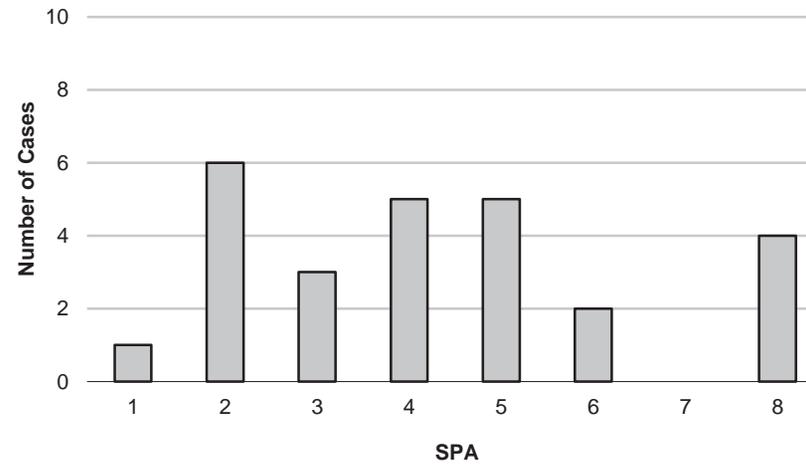
**Figure 2. Reported Cases of Vibriosis by Age Group  
LAC, 2013 (N=26)**



**Figure 3. Percent Cases of Vibriosis by Race/Ethnicity  
LAC, 2013 (N=26)**

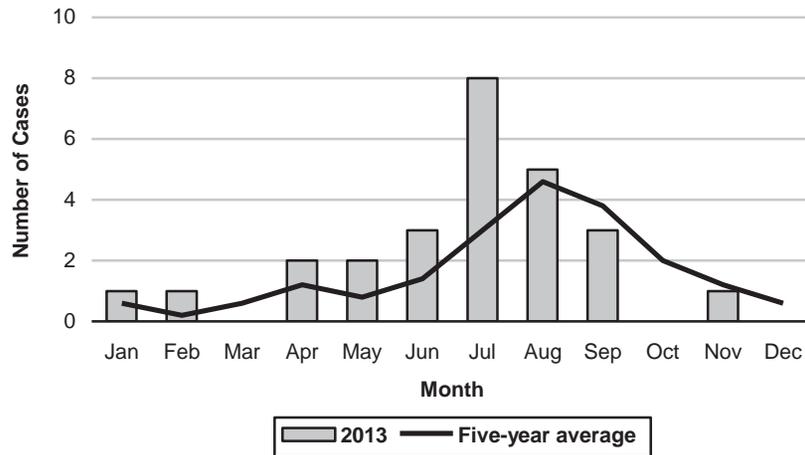


**Figure 4. Reported Cases of Vibriosis by SPA  
LAC, 2013 (N=26)**

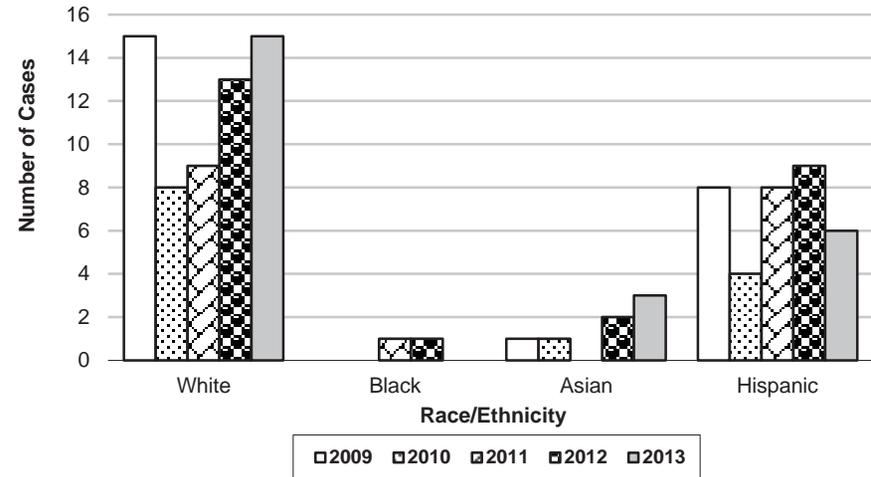




**Figure 5. Reported Vibriosis Cases by Month of Onset  
LAC, 2013 (N=26)**



**Figure 6. Reported Cases of Vibriosis by Race/Ethnicity  
LAC, 2009-2013**







## VIBRIOSIS

| CRUDE DATA                    |       |
|-------------------------------|-------|
| Number of Cases               | 27    |
| Annual Incidence <sup>a</sup> |       |
| LA County <sup>b</sup>        | 0.31  |
| California <sup>c</sup>       | 0.45  |
| United States <sup>c</sup>    | 0.50  |
| Age at Diagnosis              |       |
| Mean                          | 44    |
| Median                        | 46    |
| Range                         | 12-75 |

<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 2012 Reports of Nationally Notifiable Infectious Disease. MMWR 62(33);669-682.

### 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 *V. cholerae* – O1 and O139 -- 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 shellfish. Many vibriosis patients often have recent history of travel to developing countries.

### 2012 TRENDS AND HIGHLIGHTS

- This year ACDC changed the way it calculates incidence rates of vibriosis. Prior to 2012, rates were calculated from unadjusted US population data taken from the Census. This year, rates were adjusted to reflect populations in states reporting vibriosis morbidity, excluding states where vibriosis is not a reportable condition.
- In 2012, non-Hispanic whites comprised the largest proportion of all vibriosis cases (48%) (Figure 3). There were nine cases among Hispanics. There was one confirmed case in a black person, and two confirmed cases among Asians.
- SPA 2 and 5 each had six confirmed cases of vibriosis in 2012 (Figure 4). In both these regions, raw oyster or other seafoods were significant sources of vibriosis. SPA 4 had five confirmed cases reporting raw oyster consumption or foreign travel prior to their onset.
- Typically vibriosis cases peak during July and August because *Vibrio* flourish in rising water temperatures. In 2012, the summer peak in vibriosis cases extended into September (Figure 5).
- *V. parahæmolyticus* was the most common etiologic agent isolated (n=19). Eleven cases reported having eaten raw oysters prior to onset, including one case that ate oysters that were harvested in Mexico by a neighbor. Two cases reported eating "shellfish" and "seafood," but did not specify raw oysters. Two cases reported foreign travel; one case went to Mexico, the other



went to Northern Africa and the Middle East. Exposure history could not be determined in four cases.

- There were four confirmed cases of *V. alginolyticus*: in two boys under 14 years who had separate histories of recreational water exposure, and two men who are avid surfers who frequent Malibu. None of the cases are epidemiologically linked.
- *V. cholerae* non-O1, non-O139 was isolated from one case with a history of alcohol abuse that traveled to Mexico.
- There were two confirmed cases of *V. fluvialis*; one case had traveled to Mexico, the other case had no obvious exposures, but had received a kidney transplant and was on immunosuppressant therapy. *V. furnissii* was isolated from a diabetic man who was being treated for a wound infection.
- No cases of cholera were reported.
- Six cases of vibriosis occurred among women, while 21 cases occurred among men (77.8%). Historically, vibriosis cases have been predominantly male, but in recent years, women have made up a greater proportion of cases. The high proportion of male cases in 2012 appears to be reversing the recent trend.



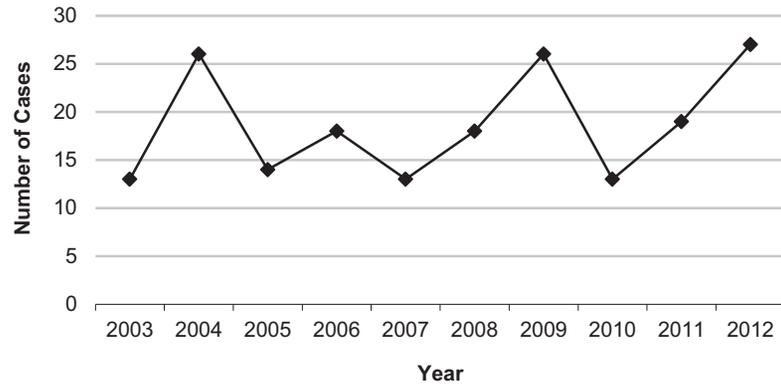
**Reported Vibriosis Cases and Rates\* per 100,000 by Age Group, Race/Ethnicity, and SPA  
Los Angeles County, 2008-2012**

|                       | 2008 (N=18) |      |                  | 2009 (N=26) |      |                  | 2010 (N=13) |      |                  | 2011 (N=19) |      |                  | 2012 (N=27) |      |                  |
|-----------------------|-------------|------|------------------|-------------|------|------------------|-------------|------|------------------|-------------|------|------------------|-------------|------|------------------|
|                       | No.         | (%)  | Rate/<br>100,000 |
| <b>Age Group</b>      |             |      |                  |             |      |                  |             |      |                  |             |      |                  |             |      |                  |
| <1                    | 0           | 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  |                  | 1           | 3.8  | 0.2              | 0           | 0.0  |                  | 0           | 0.0  | 0.0              | 0           | 0.0  | 0.0              |
| 5-14                  | 2           | 11.1 |                  | 0           | 0.0  | 0.0              | 2           | 15.4 |                  | 1           | 5.3  | 0.1              | 3           | 11.1 | 0.3              |
| 15-34                 | 3           | 16.7 |                  | 11          | 42.3 | 0.4              | 5           | 38.5 |                  | 5           | 26.3 | 0.2              | 7           | 25.9 | 0.3              |
| 35-44                 | 3           | 16.7 |                  | 4           | 15.4 | 0.3              | 0           | 0.0  |                  | 3           | 15.8 | 0.2              | 4           | 14.8 | 0.3              |
| 45-54                 | 3           | 16.7 |                  | 5           | 19.2 | 0.4              | 3           | 23.1 |                  | 5           | 26.3 | 0.4              | 5           | 18.5 | 0.5              |
| 55-64                 | 5           | 27.8 |                  | 3           | 11.5 | 0.3              | 2           | 15.4 |                  | 3           | 15.8 | 0.3              | 4           | 14.8 | 0.4              |
| 65+                   | 2           | 11.1 |                  | 2           | 7.7  | 0.2              | 1           | 7.7  |                  | 2           | 10.5 | 0.2              | 4           | 14.8 | 0.4              |
| Unknown               | 0           | 0.0  |                  | 0           | 0.0  |                  | 0           | 0.0  |                  | 0           | 0.0  | 0.0              | 0           | 0.0  |                  |
| <b>Race/Ethnicity</b> |             |      |                  |             |      |                  |             |      |                  |             |      |                  |             |      |                  |
| Asian                 | 2           | 11.1 |                  | 1           | 3.8  | 0.1              | 1           | 7.7  |                  | 0           | 0.0  | 0.0              | 2           | 7.4  | 0.2              |
| Black                 | 0           | 0.0  |                  | 0           | 0.0  | 0.0              | 0           | 0.0  |                  | 1           | 5.3  | 0.1              | 1           | 3.7  | 0.1              |
| Hispanic              | 4           | 22.2 |                  | 8           | 30.8 | 0.1              | 4           | 30.8 |                  | 9           | 47.4 | 0.2              | 9           | 33.3 | 0.2              |
| White                 | 12          | 66.7 |                  | 15          | 57.7 | 0.5              | 4           | 30.8 |                  | 9           | 47.4 | 0.3              | 13          | 48.1 | 0.6              |
| Other                 | 0           | 0.0  |                  | 0           | 0.0  | 0.0              | 0           | 0.0  |                  | 0           | 0.0  | 0.0              | 0           | 0.0  | 0.0              |
| Unknown               | 0           | 0.0  |                  | 2           | 7.7  |                  | 4           | 30.8 |                  | 0           | 0.0  | 0.0              | 2           | 7.4  | --               |
| <b>SPA</b>            |             |      |                  |             |      |                  |             |      |                  |             |      |                  |             |      |                  |
| 1                     | 1           | 5.6  |                  | 2           | 7.7  | 0.5              | 0           | 0.0  |                  | 0           | 0.0  | 0.0              | 0           | 0.0  | 0.4              |
| 2                     | 4           | 22.2 |                  | 6           | 23.1 | 0.3              | 1           | 7.7  |                  | 4           | 21.1 | 0.2              | 6           | 22.2 | 0.3              |
| 3                     | 3           | 16.7 |                  | 3           | 11.5 | 0.2              | 0           | 0.0  |                  | 2           | 10.5 | 0.1              | 2           | 7.4  | 0.2              |
| 4                     | 0           | 0.0  |                  | 4           | 15.4 | 0.3              | 1           | 7.7  |                  | 4           | 21.1 | 0.3              | 5           | 18.5 | 0.4              |
| 5                     | 3           | 16.7 |                  | 5           | 19.2 | 0.8              | 4           | 30.8 |                  | 1           | 5.3  | 0.2              | 6           | 22.2 | 0.9              |
| 6                     | 1           | 5.6  |                  | 0           | 0.0  | 0.0              | 2           | 15.4 |                  | 4           | 21.1 | 0.3              | 2           | 7.4  | 0.3              |
| 7                     | 0           | 0.0  |                  | 2           | 7.7  | 0.1              | 1           | 7.7  |                  | 2           | 10.5 | 0.1              | 2           | 7.4  | 0.2              |
| 8                     | 5           | 27.8 |                  | 3           | 11.5 | 0.3              | 3           | 23.1 |                  | 2           | 15.8 | 0.2              | 4           | 14.8 | 0.4              |
| Unknown               | 1           | 5.6  |                  | 1           | 3.8  |                  |             |      |                  |             |      |                  |             |      |                  |

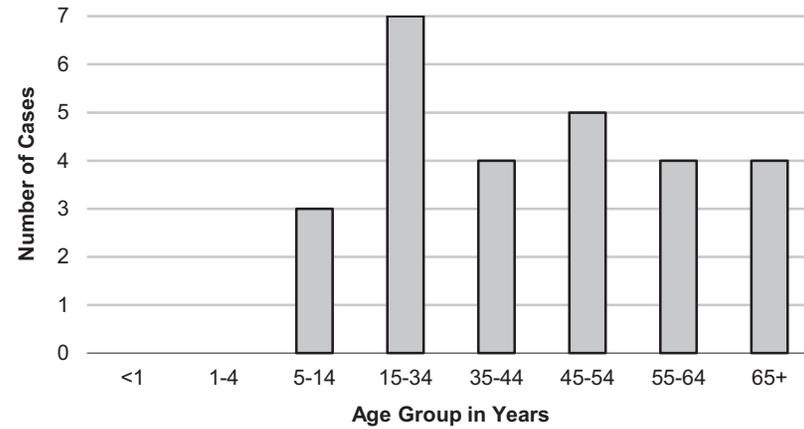
\*Rates calculated based on less than 19 cases or events are considered unreliable.



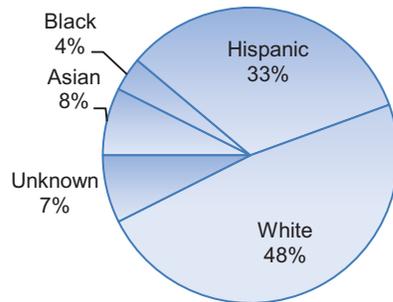
**Figure 1. Reported Cases of Vibriosis  
LAC, 2003-2012**



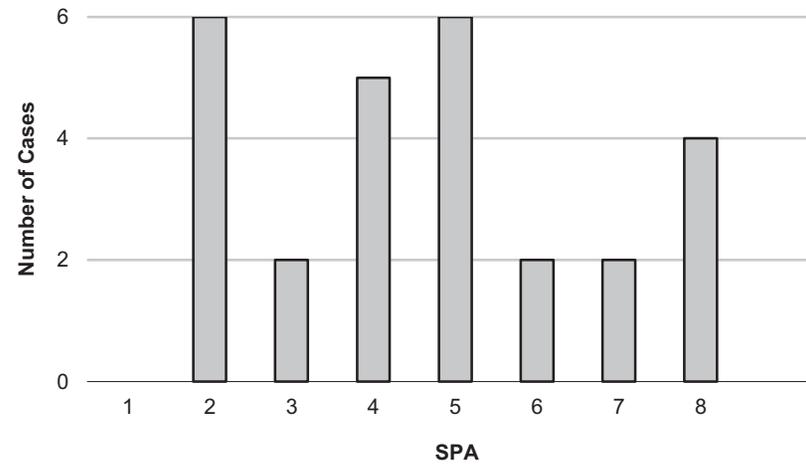
**Figure 2. Reported Cases of Vibriosis by Age Group  
LAC, 2012 (N=27)**



**Figure 3. Percent Cases of Vibriosis by Race/Ethnicity  
LAC, 2012 (N=27)**

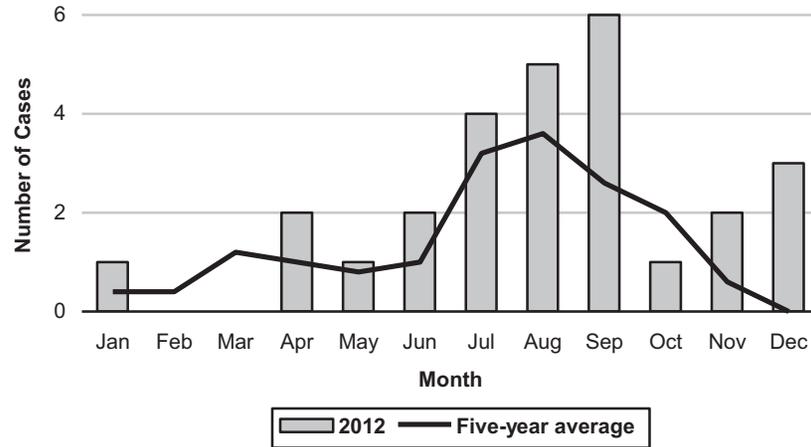


**Figure 4. Reported Cases of Vibriosis by SPA  
LAC, 2012 (N=27)**

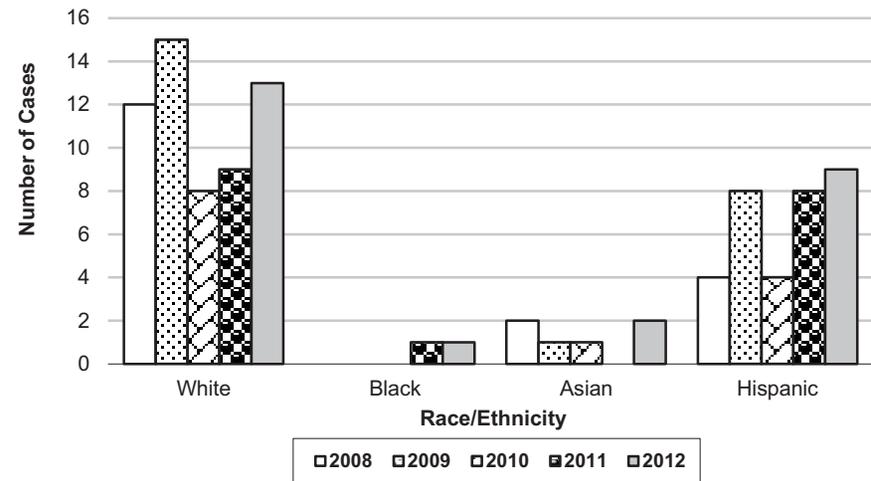




**Figure 5. Reported Vibriosis Cases by Month of Onset LAC, 2012 (N=27)**



**Figure 6. Reported Cases of Vibriosis by Race/Ethnicity LAC, 2008-2012**





## VIBRIOSIS

| CRUDE DATA                    |       |
|-------------------------------|-------|
| Number of Cases               | 19    |
| Annual Incidence <sup>a</sup> |       |
| LA County <sup>b</sup>        | 0.19  |
| California <sup>c</sup>       | 0.27  |
| United States <sup>c</sup>    | 0.27  |
| Age at Diagnosis              |       |
| Mean                          | 44    |
| Median                        | 45    |
| Range                         | 11-85 |

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

<sup>b</sup>Calculated from Final 2011 Reports of Nationally Notifiable Infectious Disease. MMWR 61(32);625-637.

### 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 *V. cholerae* – O1 and O139 -- 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 shellfish. Many vibriosis patients often have recent history of travel to developing countries.

### 2011 TRENDS AND HIGHLIGHTS

- Eleven cases of vibriosis occurred among women, while eight cases occurred among men. Historically, vibriosis cases have predominantly male, but in recent years, women have made up a greater proportion of cases.
- Whites and Hispanics comprised equally large proportions of all vibriosis cases (48% each) (Figure 3). There was one confirmed case in a black person, and no cases among Asians.
- SPA 2, 4 and 6 each had four confirmed cases of vibriosis in 2011. This is a radical change from previous years when vibriosis cases were most likely to reside in SPA 5 or 8 near the coast.
- Typically vibriosis cases peak during July and August. In 2011, the summer peak in vibriosis cases was delayed to August and September, with only one case in July.
- *V. parahæmolyticus* was the most common etiologic agent reported (n=13). There was one confirmed case of *V. alginolyticus* in an elderly man who lived on the coast and walked on the beaches regularly. *V. cholerae* non-O1, non-O139 was isolated from two cases who both reported eating raw seafood while traveling in Mexico.
- No cases of cholera were reported.
- There was one vibriosis fatality in a confirmed case of *V. vulnificus*. The decedent was man with a history of alcohol abuse who ate oysters while visiting Florida.
- There was one case of vibriosis septicemia; *V. cincinnatiensis* was isolated from blood. *V. cincinnatiensis* is exceedingly rare, only reported three times to the CDC since 2001.



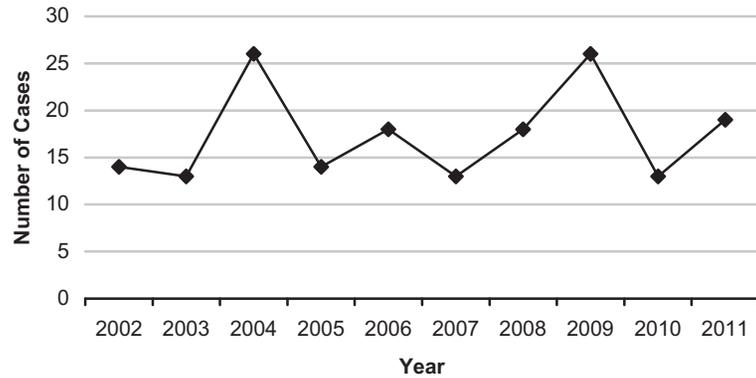
**Reported Vibriosis Cases and Rates\* per 100,000 by Age Group, Race/Ethnicity, and SPA  
Los Angeles County, 2007-2011**

|                       | 2007 (N=13) |      |                  | 2008 (N=18) |      |                  | 2009 (N=26) |      |                  | 2010 (N=13) |      |                  | 2011 (N=19) |      |                  |
|-----------------------|-------------|------|------------------|-------------|------|------------------|-------------|------|------------------|-------------|------|------------------|-------------|------|------------------|
|                       | No.         | (%)  | Rate/<br>100,000 |
| <b>Age Group</b>      |             |      |                  |             |      |                  |             |      |                  |             |      |                  |             |      |                  |
| <1                    | 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              |
| 1-4                   | 0           | 0.0  | 0.0              | 0           | 0.0  | 0.0              | 1           | 3.8  | 0.2              | 0           | 0.0  | 0.0              | 0           | 0.0  | 0.0              |
| 5-14                  | 1           | 7.7  | 0.1              | 2           | 11.1 | 0.1              | 0           | 0.0  | 0.0              | 2           | 15.4 | 0.2              | 1           | 5.3  | 0.1              |
| 15-34                 | 4           | 30.8 | 0.1              | 3           | 16.7 | 0.1              | 11          | 42.3 | 0.4              | 5           | 38.5 | 0.2              | 5           | 26.3 | 0.2              |
| 35-44                 | 2           | 15.4 | 0.1              | 3           | 16.7 | 0.2              | 4           | 15.4 | 0.3              | 0           | 0.0  | 0.0              | 3           | 15.8 | 0.2              |
| 45-54                 | 1           | 7.7  | 0.1              | 3           | 16.7 | 0.2              | 5           | 19.2 | 0.4              | 3           | 23.1 | 0.2              | 5           | 26.3 | 0.4              |
| 55-64                 | 3           | 23.1 | 0.3              | 5           | 27.8 | 0.5              | 3           | 11.5 | 0.3              | 2           | 15.4 | 0.2              | 3           | 15.8 | 0.3              |
| 65+                   | 2           | 15.4 | 0.2              | 2           | 11.1 | 0.2              | 2           | 7.7  | 0.2              | 1           | 7.7  | 0.1              | 2           | 10.5 | 0.2              |
| Unknown               | 0           | 0.0  |                  | 0           | 0.0  |                  | 0           | 0.0  |                  | 0           | 0.0  | 0.0              | 0           | 0.0  | 0.0              |
| <b>Race/Ethnicity</b> |             |      |                  |             |      |                  |             |      |                  |             |      |                  |             |      |                  |
| Asian                 | 2           | 15.4 | 0.2              | 2           | 11.1 | 0.2              | 1           | 3.8  | 0.1              | 1           | 7.7  | 0.1              | 0           | 0.0  | 0.0              |
| Black                 | 0           | 0.0  | 0.0              | 0           | 0.0  | 0.0              | 0           | 0.0  | 0.0              | 0           | 0.0  | 0.0              | 1           | 5.3  | 0.1              |
| Hispanic              | 6           | 46.2 | 0.1              | 4           | 22.2 | 0.1              | 8           | 30.8 | 0.1              | 4           | 30.8 | 0.1              | 9           | 47.4 | 0.2              |
| White                 | 2           | 15.4 | 0.1              | 12          | 66.7 | 0.4              | 15          | 57.7 | 0.5              | 4           | 30.8 | 0.1              | 9           | 47.4 | 0.3              |
| 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               | 3           | 23.1 |                  | 0           | 0.0  |                  | 2           | 7.7  |                  | 4           | 30.8 | --               | 0           | 0.0  | --               |
| <b>SPA</b>            |             |      |                  |             |      |                  |             |      |                  |             |      |                  |             |      |                  |
| 1                     | 0           | 0.0  | 0.0              | 1           | 5.6  | 0.3              | 2           | 7.7  | 0.5              | 0           | 0.0  | 0.0              | 0           | 0.0  | 0.0              |
| 2                     | 1           | 7.7  | 0.0              | 4           | 22.2 | 0.2              | 6           | 23.1 | 0.3              | 1           | 7.7  | 0.0              | 4           | 21.1 | 0.2              |
| 3                     | 1           | 7.7  | 0.1              | 3           | 16.7 | 0.2              | 3           | 11.5 | 0.2              | 0           | 0.0  | 0.0              | 2           | 10.5 | 0.1              |
| 4                     | 4           | 30.8 | 0.3              | 0           | 0.0  | 0.0              | 4           | 15.4 | 0.3              | 1           | 7.7  | 0.1              | 4           | 21.1 | 0.3              |
| 5                     | 1           | 7.7  | 0.2              | 3           | 16.7 | 0.5              | 5           | 19.2 | 0.8              | 4           | 30.8 | 0.6              | 1           | 5.3  | 0.2              |
| 6                     | 1           | 7.7  | 0.1              | 1           | 5.6  | 0.1              | 0           | 0.0  | 0.0              | 2           | 15.4 | 0.2              | 4           | 21.1 | 0.3              |
| 7                     | 1           | 7.7  | 0.1              | 0           | 0.0  | 0.0              | 2           | 7.7  | 0.1              | 1           | 7.7  | 0.1              | 2           | 10.5 | 0.1              |
| 8                     | 4           | 30.8 | 0.4              | 5           | 27.8 | 0.4              | 3           | 11.5 | 0.3              | 3           | 23.1 | 0.3              | 2           | 10.5 | 0.2              |
| Unknown               | 0           | 0.0  |                  | 1           | 5.6  |                  | 1           | 3.8  |                  |             |      |                  |             |      |                  |

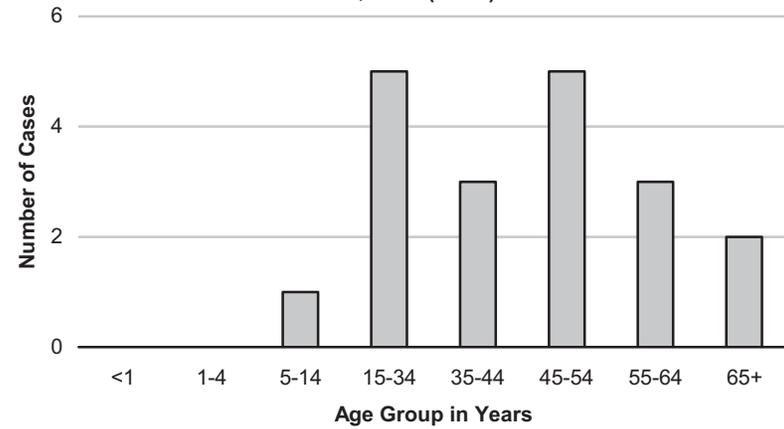
\*Rates calculated based on less than 19 cases or events are considered unreliable.



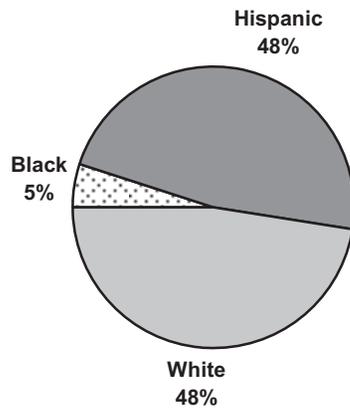
**Figure 1. Reported Cases of Vibriosis  
LAC, 2002-2011**



**Figure 2. Reported Cases of Vibriosis by Age Group  
LAC, 2011 (N=19)**



**Figure 3. Percent Cases of Vibriosis by Race/Ethnicity  
LAC, 2011 (N=19)**



**Figure 4. Reported Cases of Vibriosis by SPA  
LAC, 2011 (N=19)**

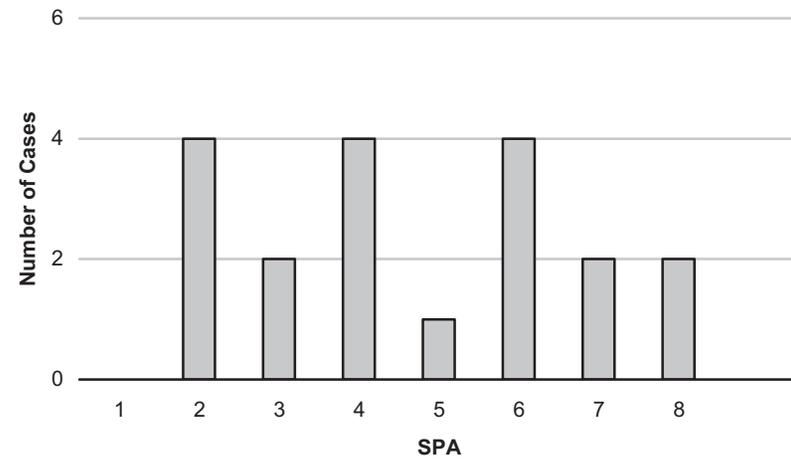




Figure 5. Reported Vibriosis Cases by Month of Onset LAC, 2011 (N=19)

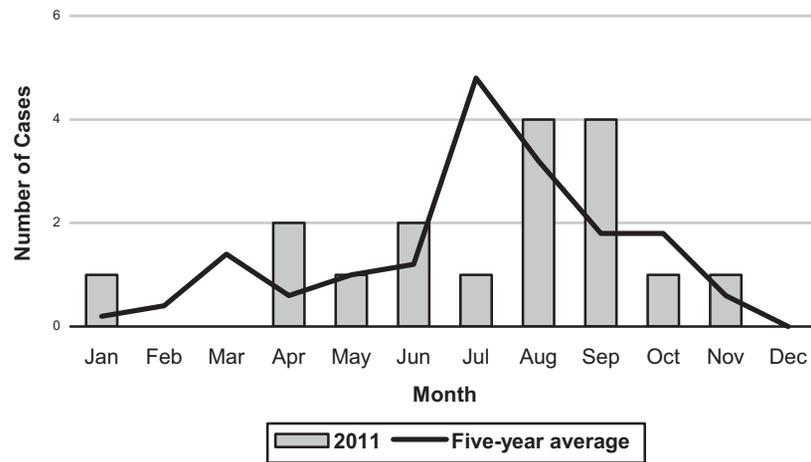
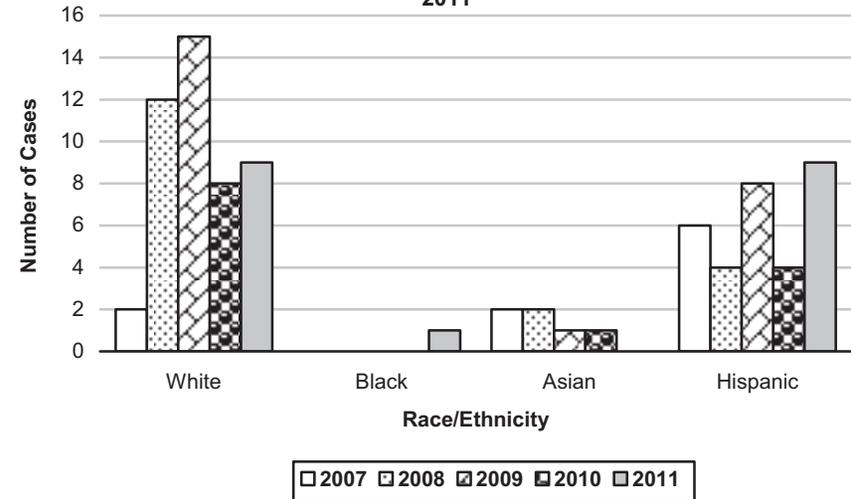


Figure 6. Reported Cases of Vibriosis by Race/Ethnicity LAC, 2007-2011





## VIBRIOSIS

| CRUDE DATA                    |      |
|-------------------------------|------|
| Number of Cases               | 13   |
| Annual Incidence <sup>a</sup> |      |
| LA County <sup>b</sup>        | 0.13 |
| California <sup>c</sup>       | --   |
| United States <sup>c</sup>    | --   |
| Age at Diagnosis              |      |
| Mean                          | 37   |
| Median                        | 31   |
| Range                         | 8-78 |

<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>See Final Summary of Nationally Notifiable Infectious Diseases, United States on MMWR website  
[http://www.cdc.gov/mmwr/mmwr\\_nd/index.html](http://www.cdc.gov/mmwr/mmwr_nd/index.html).

## 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 *V. cholerae* – O1 and O139 -- 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 shellfish. Many vibriosis patients often have recent history of travel to developing countries.

## 2010 TRENDS AND HIGHLIGHTS

- Vibriosis incidence is too low to extract reliable rate data, unlike in 2009 when there were enough cases to generate incidence rates from the year's data.
- In 2010, whites comprised the majority (62%) of all vibriosis cases (Figure 3). The number of cases among Asians and blacks remains consistently low or absent (Figure 6).
- Vibriosis in Los Angeles County generally is more common in Service Planning Areas (SPA) 5 and 8, both of which are coastal (Figure 4). Combined, these SPAs contained more than half of all vibriosis cases (54%).
- Typically vibriosis cases peak during the summer months. Both the 2010 cases and the five-year average of cases reflect this trend.
- *V. parahæmolyticus* was the most common etiologic agent reported (8), *V. alginolyticus* (3) and *V. cholerae* non-O1, non-O139 (2) were isolated from cases. Two *V. alginolyticus* cases had engaged in recreational water activity prior to diagnosis. Sources of *V. cholerae* non-O1, non-O139 were not determined. No case of cholera was reported.
- Six cases of vibriosis occurred among women, while seven cases occurred among men. Men are significantly more likely to contract vibriosis because they more often engage in recreational water activities and eat raw or undercooked seafood.<sup>1</sup> However this year's increase in the proportion of female cases reflects greater raw and undercooked seafood consumption among women.

<sup>1</sup> Altekruze SF, Yang S, Timbo BB, Angulo FJ. A multi-state survey of consumer food-handling and food-consumption practices. *Am J Prev Med.* 1999;16(3):216-21.



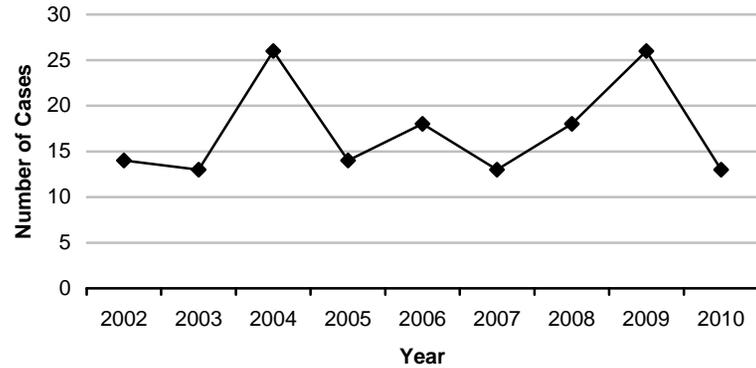
**Reported Vibriosis Cases and Rates\* per 100,000 by Age Group, Race/Ethnicity, and SPA  
 Los Angeles County, 2006-2010**

|                       | 2006 (N=18) |      |                  | 2007 (N=13) |      |                  | 2008 (N=18) |      |                  | 2009 (N=26) |      |                  | 2010 (N=13) |      |                  |
|-----------------------|-------------|------|------------------|-------------|------|------------------|-------------|------|------------------|-------------|------|------------------|-------------|------|------------------|
|                       | No.         | (%)  | Rate/<br>100,000 |
| <b>Age Group</b>      |             |      |                  |             |      |                  |             |      |                  |             |      |                  |             |      |                  |
| <1                    | 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              |
| 1-4                   | 0           | 0.0  | 0.0              | 0           | 0.0  | 0.0              | 0           | 0.0  | 0.0              | 1           | 3.8  | 0.2              | 0           | 0.0  | 0.0              |
| 5-14                  | 1           | 5.6  | 0.1              | 1           | 7.7  | 0.1              | 2           | 11.1 | 0.1              | 0           | 0.0  | 0.0              | 2           | 15.4 | 0.2              |
| 15-34                 | 5           | 27.8 | 0.2              | 4           | 30.8 | 0.1              | 3           | 16.7 | 0.1              | 11          | 42.3 | 0.4              | 5           | 38.5 | 0.2              |
| 35-44                 | 3           | 16.7 | 0.2              | 2           | 15.4 | 0.1              | 3           | 16.7 | 0.2              | 4           | 15.4 | 0.3              | 0           | 0.0  | 0.0              |
| 45-54                 | 3           | 16.7 | 0.2              | 1           | 7.7  | 0.1              | 3           | 16.7 | 0.2              | 5           | 19.2 | 0.4              | 3           | 23.1 | 0.2              |
| 55-64                 | 3           | 16.7 | 0.3              | 3           | 23.1 | 0.3              | 5           | 27.8 | 0.5              | 3           | 11.5 | 0.3              | 2           | 15.4 | 0.2              |
| 65+                   | 3           | 16.7 | 0.3              | 2           | 15.4 | 0.2              | 2           | 11.1 | 0.2              | 2           | 7.7  | 0.2              | 1           | 7.7  | 0.1              |
| Unknown               | 0           | 0.0  |                  | 0           | 0.0  |                  | 0           | 0.0  |                  | 0           | 0.0  |                  | 0           | 0.0  | 0.0              |
| <b>Race/Ethnicity</b> |             |      |                  |             |      |                  |             |      |                  |             |      |                  |             |      |                  |
| Asian                 | 2           | 11.1 | 0.2              | 2           | 15.4 | 0.2              | 2           | 11.1 | 0.2              | 1           | 3.8  | 0.1              | 1           | 7.7  | 0.1              |
| Black                 | 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              |
| Hispanic              | 4           | 22.2 | 0.1              | 6           | 46.2 | 0.1              | 4           | 22.2 | 0.1              | 8           | 30.8 | 0.1              | 4           | 30.8 | 0.1              |
| White                 | 12          | 66.7 | 0.4              | 2           | 15.4 | 0.1              | 12          | 66.7 | 0.4              | 15          | 57.7 | 0.5              | 4           | 30.8 | 0.1              |
| 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               | 0           | 0.0  |                  | 3           | 23.1 |                  | 0           | 0.0  |                  | 2           | 7.7  |                  | 4           | 30.8 | --               |
| <b>SPA</b>            |             |      |                  |             |      |                  |             |      |                  |             |      |                  |             |      |                  |
| 1                     | 0           | 0.0  | 0.0              | 0           | 0.0  | 0.0              | 1           | 5.6  | 0.3              | 2           | 7.7  | 0.5              | 0           | 0.0  | 0.0              |
| 2                     | 2           | 11.1 | 0.1              | 1           | 7.7  | 0.0              | 4           | 22.2 | 0.2              | 6           | 23.1 | 0.3              | 1           | 7.7  | 0.0              |
| 3                     | 0           | 0.0  | 0.0              | 1           | 7.7  | 0.1              | 3           | 16.7 | 0.2              | 3           | 11.5 | 0.2              | 0           | 0.0  | 0.0              |
| 4                     | 3           | 16.7 | 0.2              | 4           | 30.8 | 0.3              | 0           | 0.0  | 0.0              | 4           | 15.4 | 0.3              | 1           | 7.7  | 0.1              |
| 5                     | 6           | 33.3 | 0.9              | 1           | 7.7  | 0.2              | 3           | 16.7 | 0.5              | 5           | 19.2 | 0.8              | 4           | 30.8 | 0.6              |
| 6                     | 0           | 0.0  | 0.0              | 1           | 7.7  | 0.1              | 1           | 5.6  | 0.1              | 0           | 0.0  | 0.0              | 2           | 15.4 | 0.2              |
| 7                     | 6           | 33.3 | 0.4              | 1           | 7.7  | 0.1              | 0           | 0.0  | 0.0              | 2           | 7.7  | 0.1              | 1           | 7.7  | 0.1              |
| 8                     | 1           | 5.6  | 0.1              | 4           | 30.8 | 0.4              | 5           | 27.8 | 0.4              | 3           | 11.5 | 0.3              | 3           | 23.1 | 0.3              |
| Unknown               | 0           | 0.0  |                  | 0           | 0.0  |                  | 1           | 5.6  |                  | 1           | 3.8  |                  |             |      |                  |

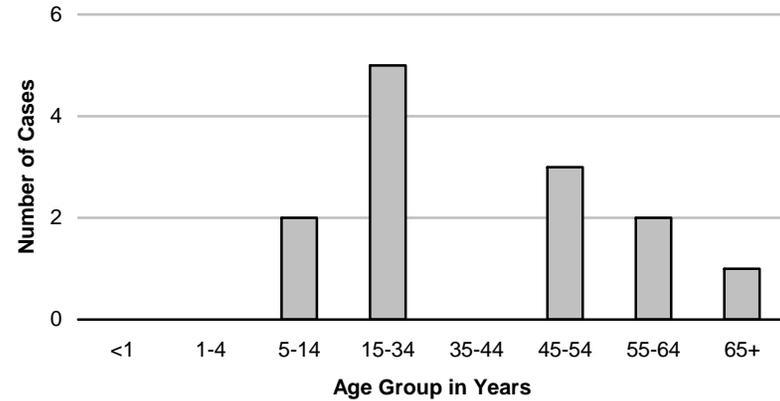
\*Rates calculated based on less than 19 cases or events are considered unreliable.



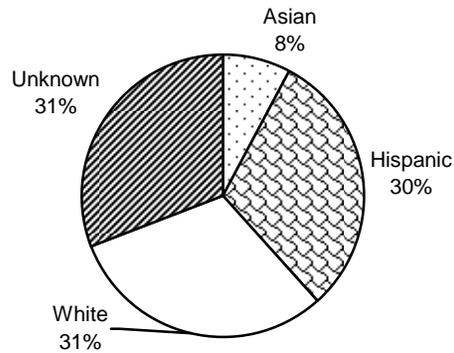
**Figure 1. Reported Cases of Vibriosis  
 LAC, 2002-2010**



**Figure 2. Reported Cases of Vibriosis by Age Group  
 LAC, 2010 (N=13)**



**Figure 3. Percent Cases of Vibriosis by Race/Ethnicity  
 LAC, 2010 (N=13)**



**Figure 4. Reported Cases of Vibriosis by SPA  
 LAC, 2010 (N=13)**

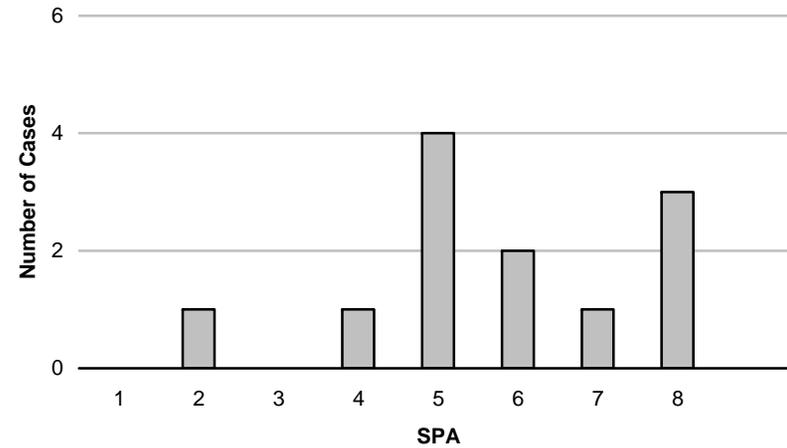




Figure 5. Reported Vibriosis Cases by Month of Onset LAC, 2010 (N=13)

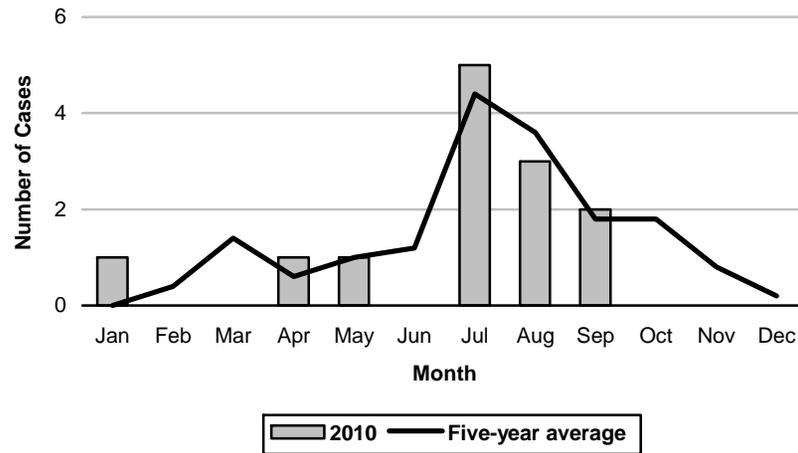
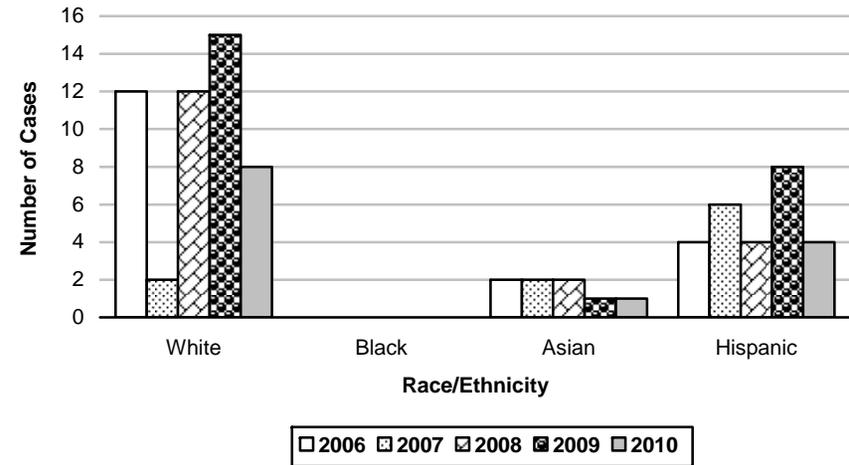


Figure 6. Reported Cases of Vibriosis by Race/Ethnicity LAC, 2006-2010





## VIBRIOSIS

| CRUDE DATA                    |      |
|-------------------------------|------|
| Number of Cases               | 26   |
| Annual Incidence <sup>a</sup> |      |
| LA County <sup>b</sup>        | 0.27 |
| California <sup>c</sup>       | 0.28 |
| United States <sup>c</sup>    | 0.19 |
| Age at Diagnosis              |      |
| Mean                          | 46   |
| Median                        | 46   |
| Range                         | 1-68 |

<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 *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 often have recent history of travel to developing countries.

## 2009 TRENDS AND HIGHLIGHTS

- Vibriosis incidence is usually too low to extract reliable rate data; however in 2009 there were enough cases to generate incidence rates from the year's data.
- In 2009, whites comprised the majority (63%) of all vibriosis cases (Figure 3). The number of cases among Asians and blacks remains consistently low or 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 (Figure 4). In 2009, SPA 2 had more cases than any other SPA, which is unusual. Cases in SPA 2 were mostly wound infections of species other than *V. parahæmolyticus*.
- Typically vibriosis cases peak during the summer months of June through August. A heat wave in the Pacific Northwest in late July resulted in high concentrations of *V. parahæmolyticus* in the seawater, possibly causing an outbreak of vibriosis. There were six outbreak-associated cases in Los Angeles County.
- In addition to *V. parahæmolyticus*, three other *Vibrio* species were isolated from the 2009 vibriosis cases: *V. alginolyticus* (3), *V. cholerae* non-O1, non-139 (2), *V. furnissii* (1).
- Six cases of vibriosis occurred among women, while 20 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.<sup>1</sup>

<sup>1</sup> Alterkruse SF, Yang S, Babagaleh BT, Angulo FJ. A multi-state survey of consumer food-handling and food-consumption practices. *Am J Prev Med.* 1999;16(3):216-221.



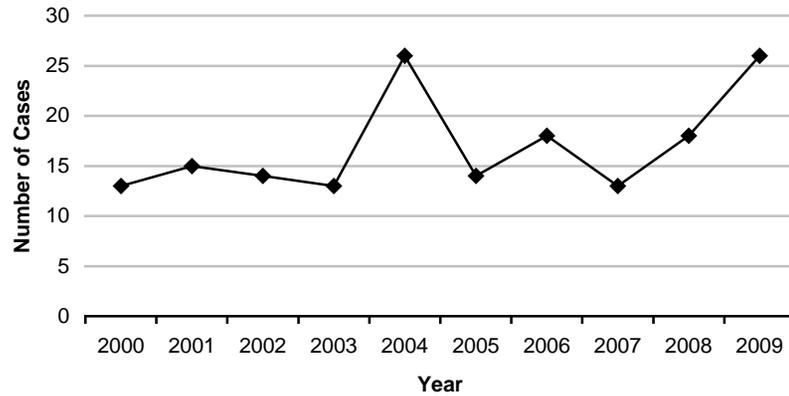
**Reported Vibriosis Cases and Rates\* per 100,000 by Age Group, Race/Ethnicity, and SPA  
Los Angeles County, 2005-2009**

|                       | 2005 (N=14) |      |                  | 2006 (N=18) |      |                  | 2007 (N=13) |      |                  | 2008 (N=18) |      |                  | 2009 (N=26) |      |                  |
|-----------------------|-------------|------|------------------|-------------|------|------------------|-------------|------|------------------|-------------|------|------------------|-------------|------|------------------|
|                       | No.         | (%)  | Rate/<br>100,000 |
| <b>Age Group</b>      |             |      |                  |             |      |                  |             |      |                  |             |      |                  |             |      |                  |
| <1                    | 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              |
| 1-4                   | 0           | 0.0  | 0.0              | 0           | 0.0  | 0.0              | 0           | 0.0  | 0.0              | 0           | 0.0  | 0.0              | 1           | 3.8  | 0.2              |
| 5-14                  | 1           | 7.1  | 0.1              | 1           | 5.6  | 0.1              | 1           | 7.7  | 0.1              | 2           | 11.1 | 0.1              | 0           | 0.0  | 0.0              |
| 15-34                 | 3           | 21.4 | 0.1              | 5           | 27.8 | 0.2              | 4           | 30.8 | 0.1              | 3           | 16.7 | 0.1              | 11          | 42.3 | 0.4              |
| 35-44                 | 4           | 28.6 | 0.3              | 3           | 16.7 | 0.2              | 2           | 15.4 | 0.1              | 3           | 16.7 | 0.2              | 4           | 15.4 | 0.3              |
| 45-54                 | 3           | 21.4 | 0.2              | 3           | 16.7 | 0.2              | 1           | 7.7  | 0.1              | 3           | 16.7 | 0.2              | 5           | 19.2 | 0.4              |
| 55-64                 | 2           | 14.3 | 0.2              | 3           | 16.7 | 0.3              | 3           | 23.1 | 0.3              | 5           | 27.8 | 0.5              | 3           | 11.5 | 0.3              |
| 65+                   | 1           | 7.1  | 0.1              | 3           | 16.7 | 0.3              | 2           | 15.4 | 0.2              | 2           | 11.1 | 0.2              | 2           | 7.7  | 0.2              |
| Unknown               | 0           | 0.0  |                  | 0           | 0.0  |                  | 0           | 0.0  |                  | 0           | 0.0  |                  | 0           | 0.0  |                  |
| <b>Race/Ethnicity</b> |             |      |                  |             |      |                  |             |      |                  |             |      |                  |             |      |                  |
| Asian                 | 1           | 7.1  | 0.1              | 2           | 11.1 | 0.2              | 2           | 15.4 | 0.2              | 2           | 11.1 | 0.2              | 1           | 3.8  | 0.1              |
| Black                 | 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              |
| Hispanic              | 7           | 50.0 | 0.2              | 4           | 22.2 | 0.1              | 6           | 46.2 | 0.1              | 4           | 22.2 | 0.1              | 8           | 30.8 | 0.1              |
| White                 | 4           | 28.6 | 0.1              | 12          | 66.7 | 0.4              | 2           | 15.4 | 0.1              | 12          | 66.7 | 0.4              | 15          | 57.7 | 0.5              |
| 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           | 14.3 |                  | 0           | 0.0  |                  | 3           | 23.1 |                  | 0           | 0.0  |                  | 2           | 7.7  |                  |
| <b>SPA</b>            |             |      |                  |             |      |                  |             |      |                  |             |      |                  |             |      |                  |
| 1                     | 2           | 14.3 | 0.6              | 0           | 0.0  | 0.0              | 0           | 0.0  | 0.0              | 1           | 5.6  | 0.3              | 2           | 7.7  | 0.5              |
| 2                     | 3           | 21.4 | 0.1              | 2           | 11.1 | 0.1              | 1           | 7.7  | 0.0              | 4           | 22.2 | 0.2              | 6           | 23.1 | 0.3              |
| 3                     | 1           | 7.1  | 0.1              | 0           | 0.0  | 0.0              | 1           | 7.7  | 0.1              | 3           | 16.7 | 0.2              | 3           | 11.5 | 0.2              |
| 4                     | 1           | 7.1  | 0.1              | 3           | 16.7 | 0.2              | 4           | 30.8 | 0.3              | 0           | 0.0  | 0.0              | 4           | 15.4 | 0.3              |
| 5                     | 3           | 21.4 | 0.5              | 6           | 33.3 | 0.9              | 1           | 7.7  | 0.2              | 3           | 16.7 | 0.5              | 5           | 19.2 | 0.8              |
| 6                     | 2           | 14.3 | 0.2              | 0           | 0.0  | 0.0              | 1           | 7.7  | 0.1              | 1           | 5.6  | 0.1              | 0           | 0.0  | 0.0              |
| 7                     | 1           | 7.1  | 0.1              | 6           | 33.3 | 0.4              | 1           | 7.7  | 0.1              | 0           | 0.0  | 0.0              | 2           | 7.7  | 0.1              |
| 8                     | 1           | 7.1  | 0.1              | 1           | 5.6  | 0.1              | 4           | 30.8 | 0.4              | 5           | 27.8 | 0.4              | 3           | 11.5 | 0.3              |
| Unknown               | 0           | 0.0  |                  | 0           | 0.0  |                  | 0           | 0.0  |                  | 1           | 5.6  |                  | 1           | 3.8  |                  |

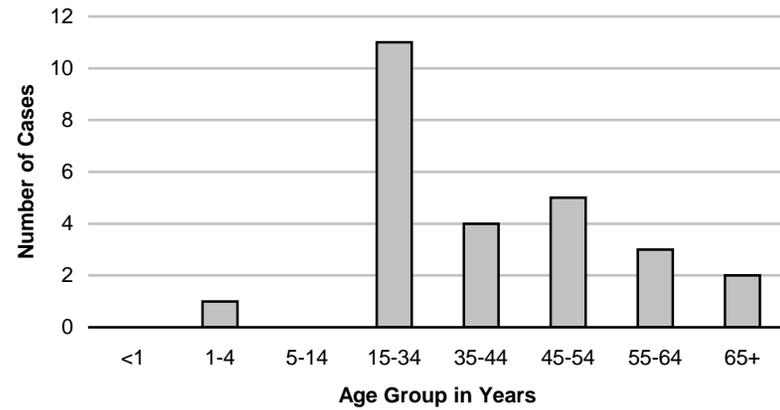
\*Rates calculated based on less than 19 cases or events are considered unreliable.



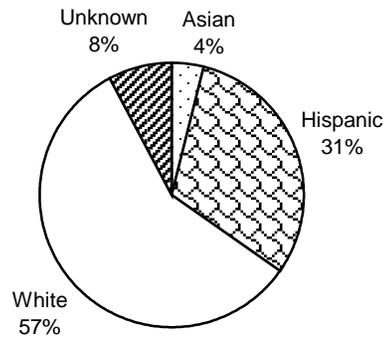
**Figure 1. Reported Cases of Vibriosis  
 LAC, 2000-2009**



**Figure 2. Reported Cases of Vibriosis by Age Group  
 LAC, 2009 (N=26)**



**Figure 3. Percent Cases of Vibriosis by Race/Ethnicity  
 LAC, 2009 (N=26)**



**Figure 4. Reported Cases of Vibriosis by SPA  
 LAC, 2009 (N=26)**

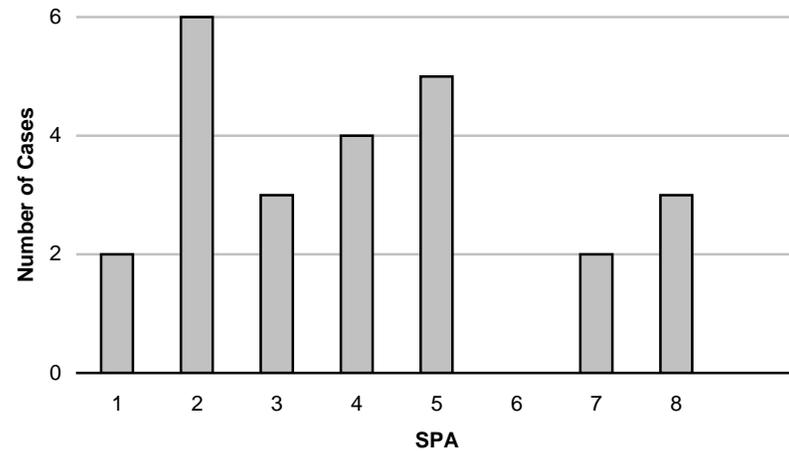




Figure 5. Reported Vibriosis Cases by Month of Onset  
LAC, 2009 (N=26)

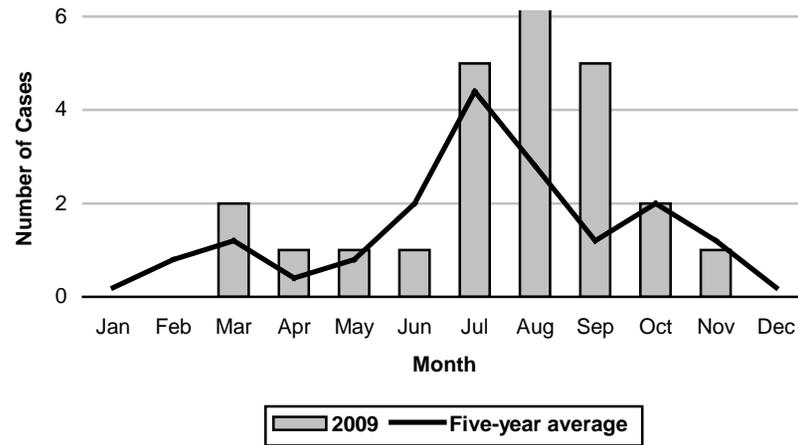
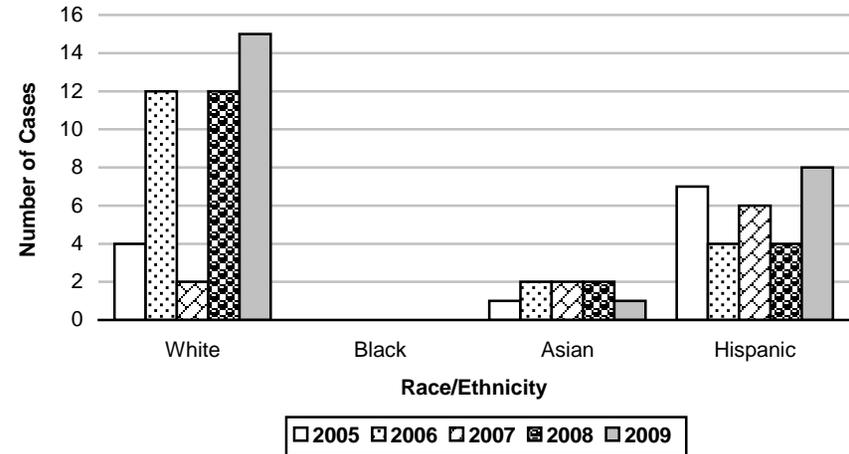


Figure 6. Reported Cases of Vibriosis by Race/Ethnicity  
LAC, 2005-2009





## 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.



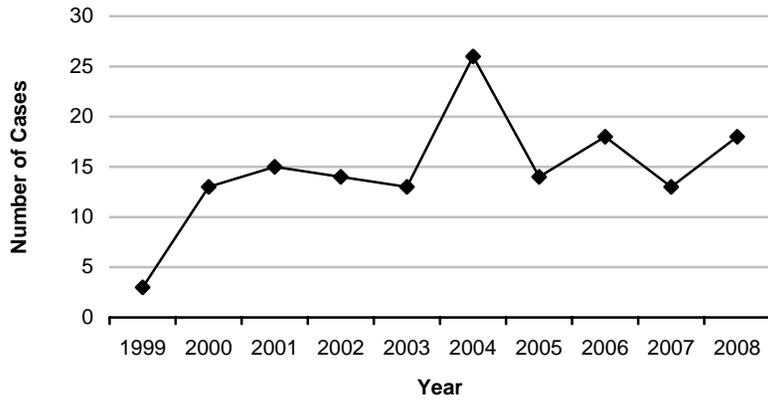
**Reported Vibriosis Cases and Rates\* per 100,000 by Age Group, Race/Ethnicity, and SPA  
 Los Angeles County, 2004-2008**

|                       | 2004 (N=26) |      |                  | 2005 (N=14) |      |                  | 2006 (N=18) |      |                  | 2007 (N=13) |      |                  | 2008 (N=18) |      |                  |
|-----------------------|-------------|------|------------------|-------------|------|------------------|-------------|------|------------------|-------------|------|------------------|-------------|------|------------------|
|                       | No.         | (%)  | Rate/<br>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  |                  |

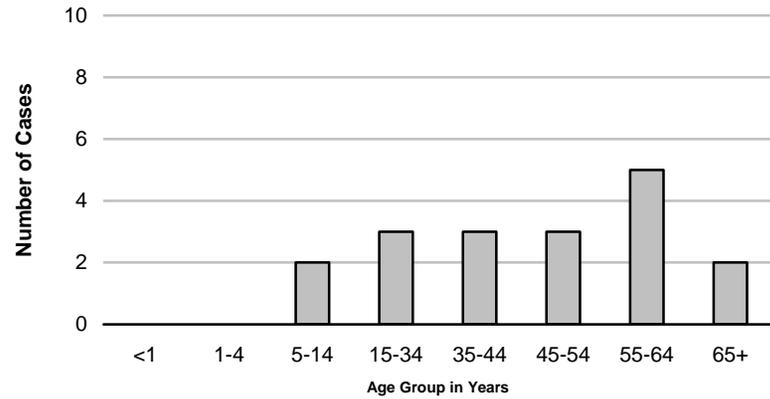
\*Rates calculated based on less than 19 cases or events are considered unreliable.



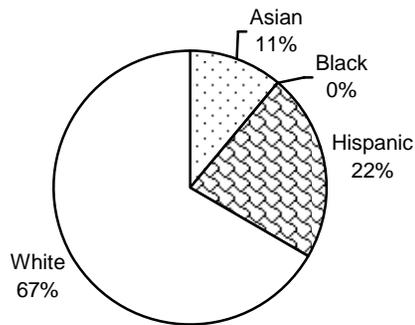
**Figure 1. Reported Cases of Vibriosis  
 LAC, 1999-2008**



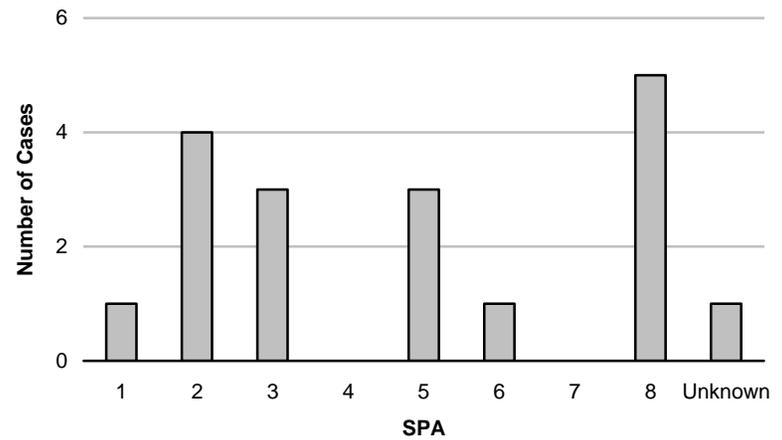
**Figure 2. Reported Cases of Vibriosis by Age Group  
 LAC, 2008 (N=18)**



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

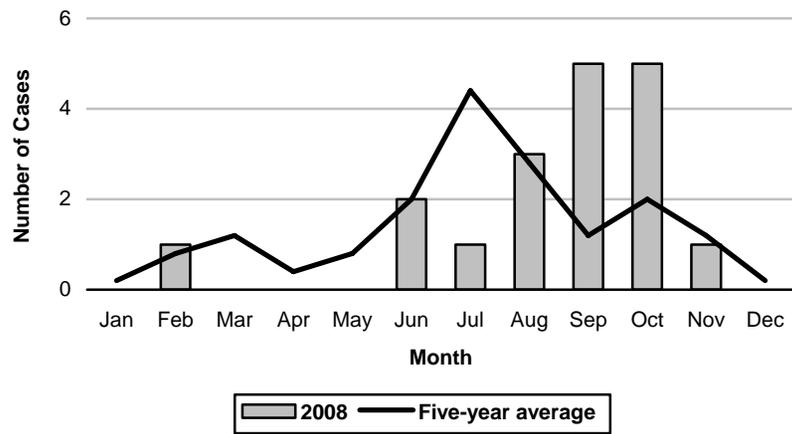


**Figure 4. Reported Cases of Vibriosis by SPA  
 LAC, 2008 (N=18)**

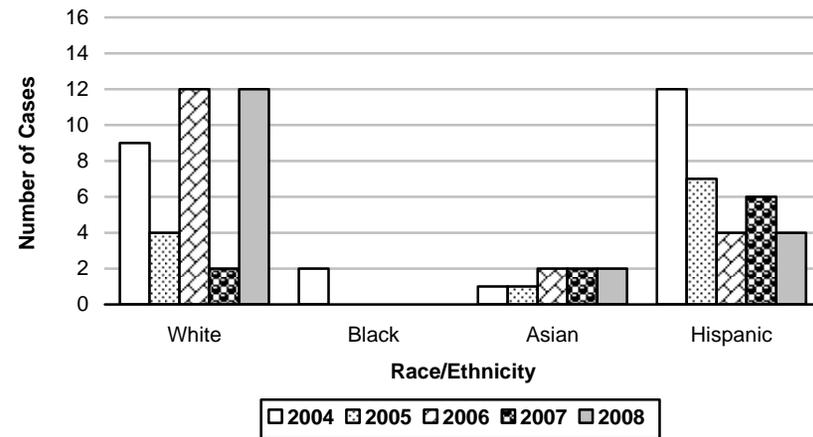




**Figure 5. Reported Vibriosis Cases by Month of Onset  
LAC, 2008**



**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.

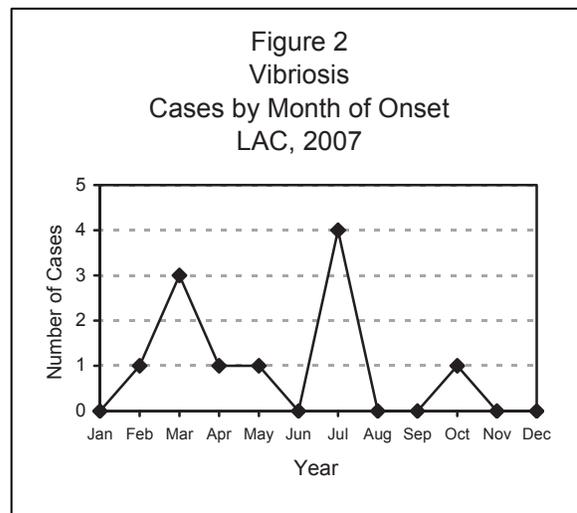
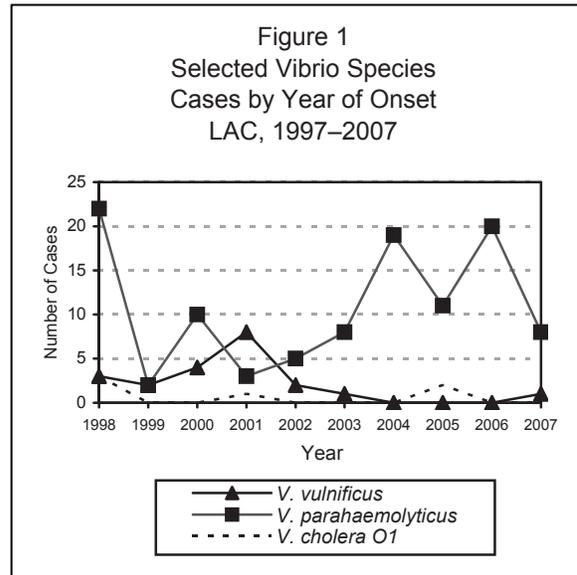
### DISEASE ABSTRACT

- 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

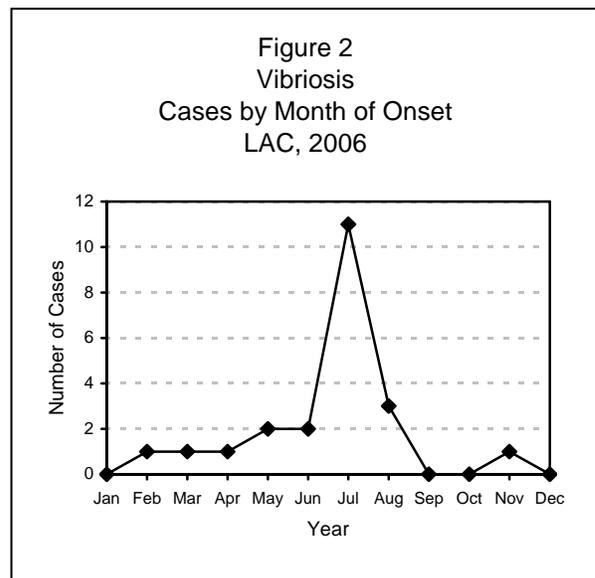
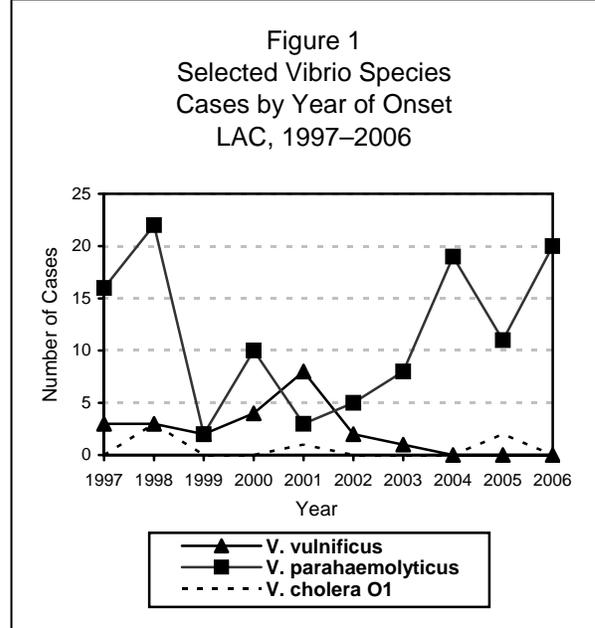
The genus *Vibrio* consists of Gram-negative, curved, motile rods, and contains about a dozen species known to cause human illness. Transmission is most often through ingestion via a foodborne route, but also from contact between broken skin and contaminated water. Presenting symptoms vary by species 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)

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                     | 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

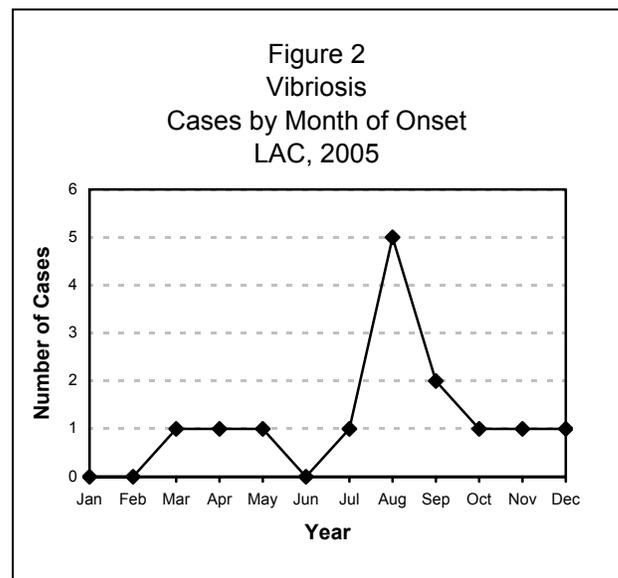
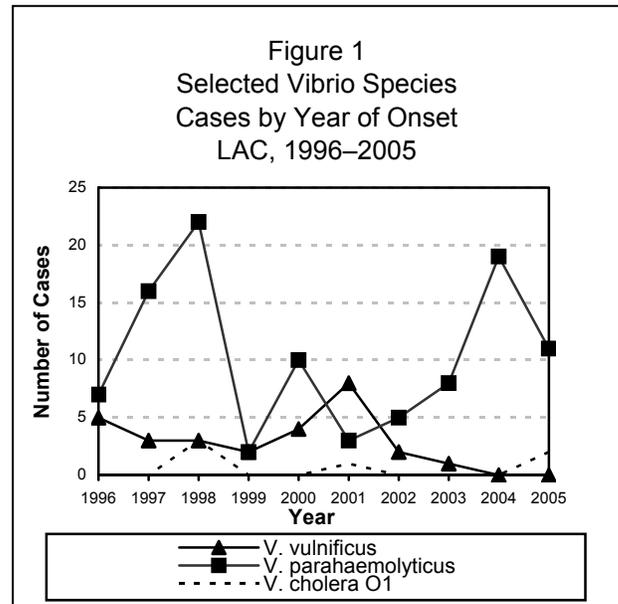
The genus *Vibrio* consists of Gram-negative, curved, motile rods, and contains about a dozen species known to cause human illness. Transmission is most often through ingestion via a foodborne route, but also from contact between broken skin and contaminated water. Presenting symptoms vary by species 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

- 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:  
[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)

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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

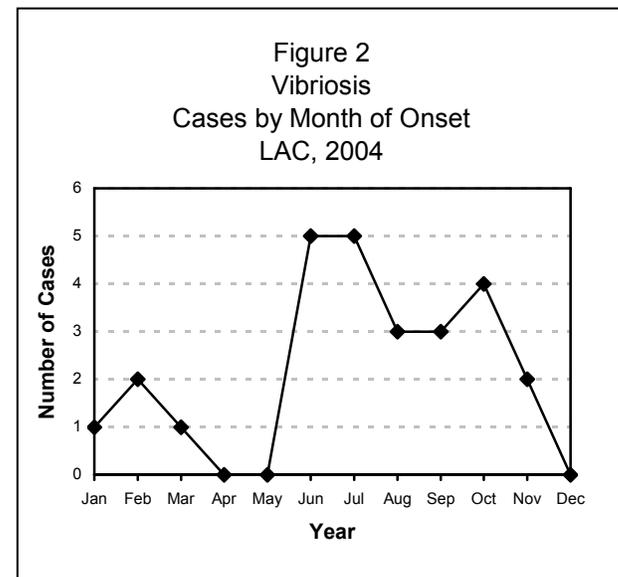
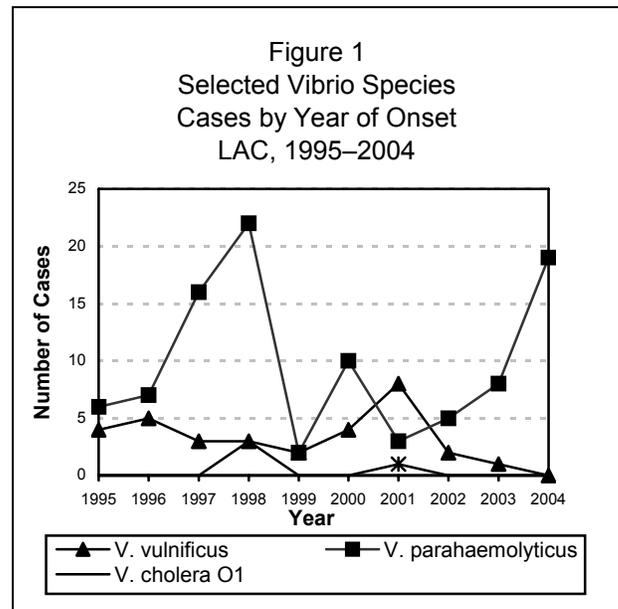
The genus *Vibrio* consists of gram-negative, curved, motile rods, and contains about a dozen species known to cause human illness. Transmission is most often through ingestion of the bacteria via a foodborne route, but also from contact of non-intact skin with seawater. Presenting symptoms vary by infecting 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* O1 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)



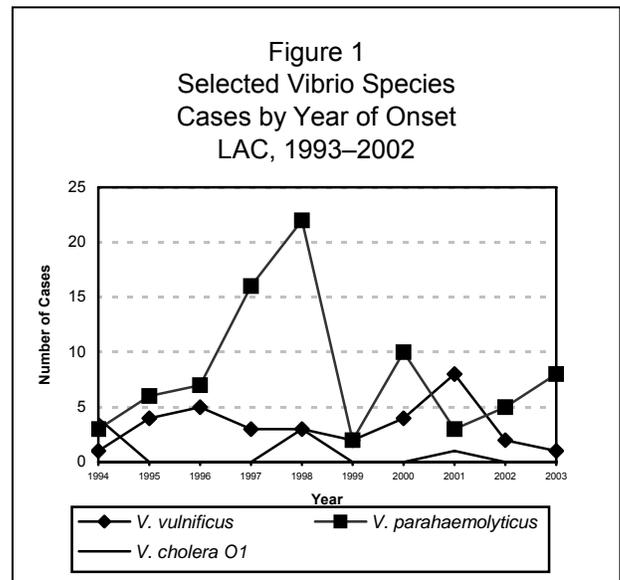
## VIBRIOSIS

| 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.

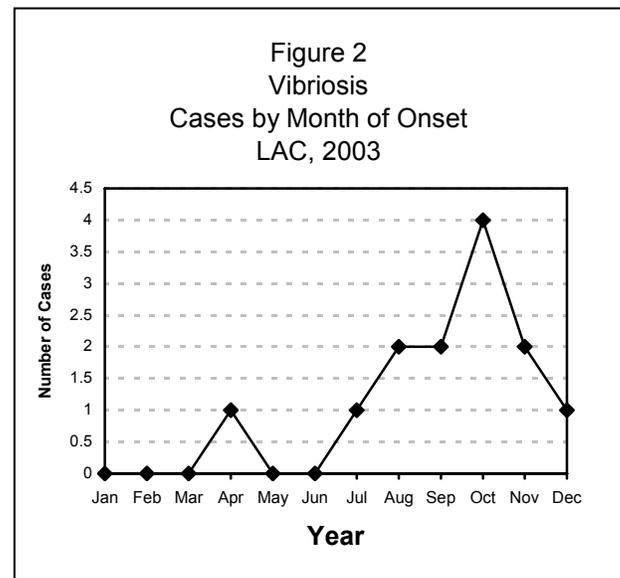


### DESCRIPTION

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)



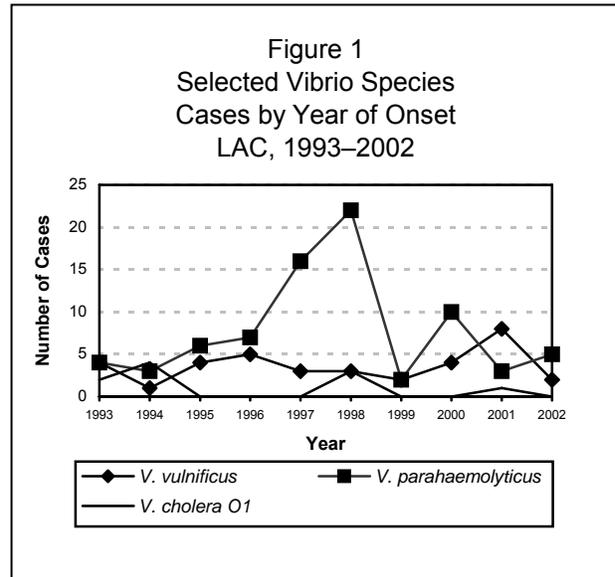
## VIBRIOSIS

| 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)

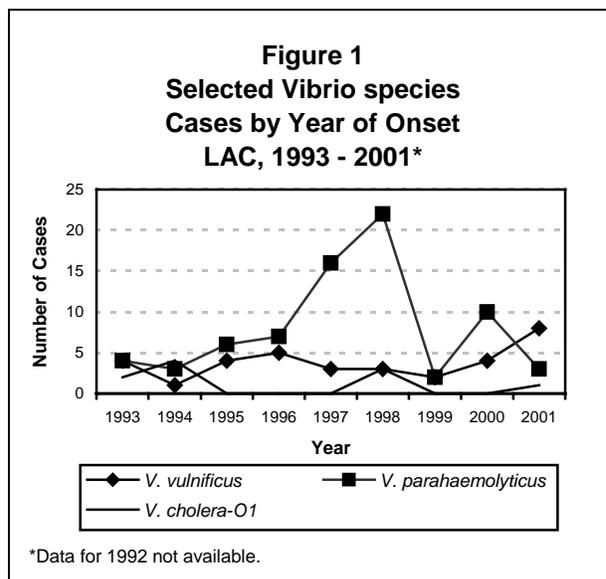


Disease information regarding *Vibrio vulnificus* is available from the CDC at:  
[www.cdc.gov/ncidod/dbmd/diseaseinfo/vibriovulnificus\\_g.htm](http://www.cdc.gov/ncidod/dbmd/diseaseinfo/vibriovulnificus_g.htm)

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<br/>M:F</b> |
|-------------------------------------|---------------------------------------|-------------------------|--------------------------|
| <i>V. parahaemolyticus</i><br>(n=3) | Latino (1), Asian (1),<br>Unknown (1) | 48 years (31 - 59)      | 2:1                      |
| <i>V. cholerae</i> - O1<br>(n=1)    | Latino (1)                            | 27 years                | 1:0                      |
| <i>V. vulnificus</i><br>(N=8)       | Latino (8)                            | 51 years (36 - 64)      | 8:0                      |
| <i>V. other species*</i><br>(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.