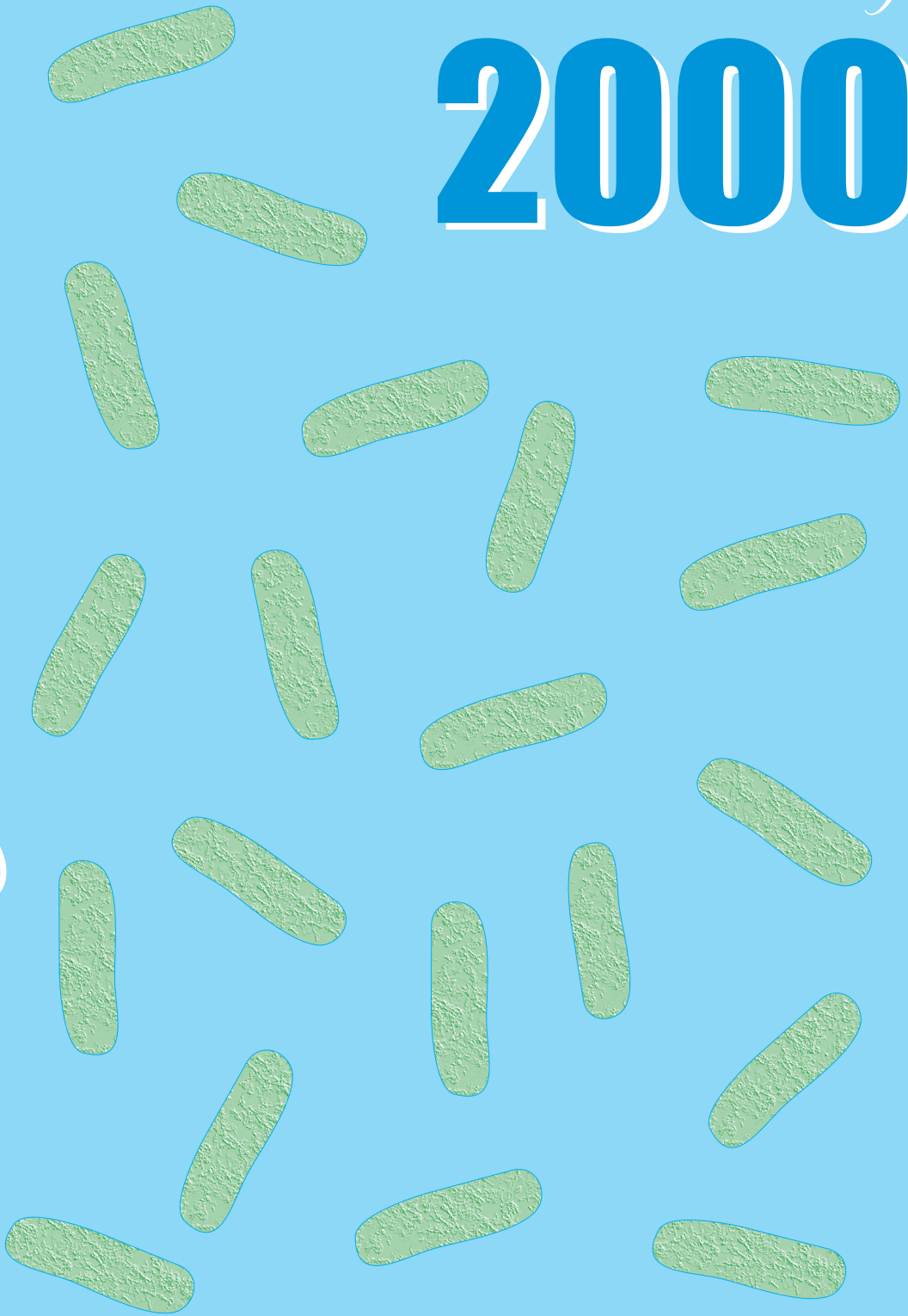


*Annual Summary*

**2000**

*Shigella*



Department of Health and Human Services  
Centers for Disease Control and Prevention  
National Center for Infectious Diseases  
Division of Bacterial and Mycotic Diseases  
Foodborne and Diarrheal Diseases Branch  
Atlanta, GA 30333



## Laboratory-Confirmed *Shigella* Surveillance Annual Summary, 2000

The Annual Summary contains surveillance data on reported laboratory-confirmed *Shigella* isolates in the United States. The National *Shigella* Surveillance System collects reports of isolates of *Shigella* from every state in the United States. This information is reported electronically through the Public Health Laboratory Information System (PHLIS) by the State Public Health Laboratory Directors and State and Territorial Epidemiologists to the Foodborne and Diarrheal Diseases Branch (FDDDB) and the Biostatistics and Information Management Branch (BIMB) of the Division of Bacterial and Mycotic Diseases in the National Center for Infectious Diseases.

The National *Shigella* Surveillance System is based on data collected by state and territorial public health laboratories. *Shigella* isolates are submitted to the state public health laboratory by clinical diagnostic laboratories. The state and territorial laboratories confirm the isolates as *Shigella*, perform subtyping, and submit the data for reporting through PHLIS. Unusual or untypable isolates are forwarded to the National *Shigella* Reference Laboratory at the Centers for Disease Control and Prevention for further characterization or confirmation. These results are reported back to the state laboratory, where they are reported to CDC through PHLIS.

The capture of isolates in the National *Shigella* Surveillance System is considered to be consistent. However, some *Shigella* isolates may not be forwarded or reported to state public health laboratories and therefore are not captured. In addition, irrespective of the surveillance system, many cases of *Shigella* illness are not reported because the ill person does not seek medical care, the health-care provider does not obtain a specimen for diagnosis or the laboratory does not perform culture for *Shigella*. The results of surveillance reported herein are therefore substantial underestimates of the true number of infections.

The number of isolates reported by state represents the state where laboratory confirmation and subtyping were performed. In some instances, the reporting state is not the same as the state of residence of the person from whom the isolate was obtained. For the Annual Summaries, duplicate records are deleted.

There are 4 major subgroups and 43 recognized serotypes of *Shigella*, shown in Table A below.

Table A. Subgroups, Serotypes and Subtypes of *Shigella*

Subgroups	Serotypes and Subtypes
Group A: <i>Shigella dysenteriae</i>	15 serotypes (type 1 produces Shiga toxin)
Group B: <i>Shigella flexneri</i>	8 serotypes and 9 subtypes
Group C: <i>Shigella boydii</i>	19 serotypes
Group D: <i>Shigella sonnei</i>	1 serotype

These subgroups and serotypes are differentiated from one another by their biochemical traits (such as ability to ferment mannitol) and antigenic properties (Table B).

Table B. Classification of *Shigella* subgroups.

Species	Group	Serotypes	Carbohydrate fermentation		
			Glucose	Mannitol	Lactose
<i>S. dysenteriae</i>	A	15	+	-	-
<i>S. flexneri</i>	B	8	+	+	-
<i>S. boydii</i>	C	19	+	+	-
<i>S. sonnei</i>	D	1	+	+	Late

Since there are no recognized environmental or animal reservoirs for *Shigella*, except higher primates, the isolates reported herein are all from infected humans.

This report can be viewed online at [www.cdc.gov/ncidod/dbmd/phlisdata/](http://www.cdc.gov/ncidod/dbmd/phlisdata/). Further information concerning data described in this report can be obtained by contacting the Foodborne and Diarrheal Diseases Branch (404) 639-2206. For further information concerning PHLIS, please contact the Biostatistics and Information Management Branch (404) 639-1364.

The Surveillance Outbreak Detection Algorithm (SODA), developed by BMB and FDDB, is a statistical algorithm based on the National Surveillance Data. It is designed to detect unusual clusters of *Salmonella* and *Shigella* infection. SODA compares current *Salmonella* and *Shigella* isolates reported through PHLIS by subgroup or serotype with a 5 year historical baseline for that subgroup or serotype for the specified time period to detect unusual increases from the baseline. Analyses can be conducted at state, regional, or national levels. Since 1996, SODA has been implemented at CDC and selected state health departments. If you would like more information on SODA, please call the PHLIS Helpdesk (404) 639-3365.

### Annual Highlights for 2000

A total of 12,732 *Shigella* isolates were reported from public health laboratories in 50 states in 2000 (Table 1). This represents a 26% decrease compared with 1990 and a 26% increase from 1999. The national rate of reported *Shigella* isolates in 2000 was 4.5 per 100,000 population based on 2000 census population figures for the United States.

Similar to previous years, *Shigella* was isolated frequently from children under 5 years of age, who accounted for 28.7% of all isolates. About 27.4% of all isolates came from persons aged 5-19 years, and 32.5% from persons aged 20-59, with declining numbers thereafter. The median age of patients by serogroup of the isolate is shown in Table 4. The distribution of *Shigella* isolates between the sexes was similar, with females accounting for 51.5% of persons from whom *Shigella* was isolated. Gender differences were most notable in two age groups, 20-29 and 70-79 years,

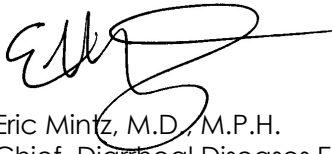
with higher percentages of isolates from females in both age groups, 64% and 64%, respectively. These estimates, however, are not complete since Illinois, Louisiana and Maine do not report age of persons from whom *Shigella* isolates are obtained. Age and sex data were obtained from California for the first time in 2000. The frequency of reported subgroups, and the frequency of reported serotypes within these groups for all *Shigella* isolates are shown in Table 2. Of the 12,732 isolates, 95% were subgrouped. Trends of subgroups remained constant, with *S. sonnei* accounting for the largest percentage of isolates (83.8%), followed by *S. flexneri* (14.3%), *S. boydii* (1.4%) and *S. dysenteriae* (0.5%). *Shigella* isolate serotype trends by year are shown in Table 5. Over the past decade, the number of isolates of *Shigella boydii*, *dysenteriae* and *flexneri* that were not identified as belonging to a specific serotype (and the rate of such unspecified isolates) has declined.

*Shigella* transmission occurs via the fecal-oral route. The majority of *Shigella sonnei* infections in the United States occur in young children and are associated with crowding and poor personal hygiene. Daycare centers have been implicated in many *S. sonnei* outbreaks (1). *S. sonnei* has also been transmitted through unchlorinated wading pools (2), interactive water fountains (3), food items such as parsley (4) and bean dip (5), and men who have sex with men (MSM) (6). Until recently, the dominant subgroup causing illness among MSM was *S. flexneri* (7). However, in a large outbreak among MSM in San Francisco, the dominant serotype was *S. sonnei* (6).

Geographic trends by region for *S. sonnei* isolates from 1986 to 2000 are illustrated in Figure 1. All regions except New England and Mountain and Pacific regions exhibited increases in *S. sonnei* isolates from 1986 to 2000.

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