

# *Salmonella*

*Annual Summary*  
**2004**



Department of Health and Human Services  
Centers for Disease Control and Prevention  
National Center for Infectious Diseases  
Division of Bacterial and Mycotic Diseases  
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## National *Salmonella* Surveillance System Annual Summary, 2004

This issue of the Annual Summary of the National *Salmonella* Surveillance System presents surveillance data on reported laboratory-confirmed *Salmonella* isolates in the United States for the year 2004. The National *Salmonella* Surveillance System collects reports of isolates of *Salmonella* from human sources from the United States. This information is reported through the Public Health Laboratory Information System (PHLIS), an electronic reporting system, by the State Public Health Laboratory Directors and State and Territorial Epidemiologists to the Foodborne and Diarrheal Diseases Branch (FDDB) and the Biostatistics Office (BSO) of the Division of Bacterial and Mycotic Diseases in the National Center for Infectious Diseases.

The National *Salmonella* Surveillance System is based on data collected by state and territorial public health laboratories. *Salmonella* isolates are submitted to the state public health laboratory by clinical diagnostic laboratories. The state and territorial laboratories confirm the isolates as *Salmonella*, perform serotyping according to the Kauffmann-White scheme, and submit the data for reporting through PHLIS. Unusual or difficult isolates are forwarded to the National *Salmonella* 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 through PHLIS.

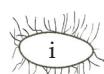
The capture of isolates in the National *Salmonella* Surveillance System is considered to be fairly complete. However, some *Salmonella* isolates may not be forwarded to public health laboratories, and therefore are not ascertained. In addition, irrespective of the surveillance system, many cases of Salmonellosis are not confirmed and 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 the necessary diagnostics tests. The results of surveillance reported herein should be considered a fraction of all *Salmonella* infections.. In addition, not every state submitted data in 2004.

The National *Salmonella* Surveillance System database is dynamic; the number of isolates reported for previous years may change according to the addition or correction of isolate reports. For example, the number of human *Salmonella* isolates published in the 2003 Annual Summary for 2003 was 33,747. Since publication of the 2003 annual summary, several states provided *Salmonella* isolate reports for 2003, thereby increasing the yearly total for 2003 to 37,442 as depicted in Table 3 of this report.

Integrated surveillance system software development in several states and at the Centers for Disease Control and Prevention has interrupted the normal use of the PHLIS system such that some *Salmonella* surveillance reports are delayed or obtained in a variety of formats outside of the PHLIS system. We encourage our reporting partners to use the PHLIS reporting system if serotype specific *Salmonella* reports cannot be transmitted to CDC via new integrated surveillance systems. If PHLIS reporting is impossible, please contact the PHLIS Help Desk (404-639-3365) to arrange alternative data submission pathways.

The number of isolates reported by geographical area (e.g. state) represents the area where laboratory confirmation and serotyping was performed. In some instances, the reporting area is not the same as the area of residence of the person from whom the isolate was obtained. For *Salmonella* serotype Typhi, only the first isolation in a year for each person is counted. For non-Typhi serotypes, only the first isolation within a thirty day period for each person is counted, provided that the serotype and clinical source (e.g. stool or blood) are the same.

The data presented for *Salmonella* isolates from animals and related sources (i.e. environment and feeds) are gathered from isolates submitted to the U.S. Department of Agriculture, Animal and Plant Health Inspection Services, National Veterinary Services Laboratories (USDA/APHIS/NVSL) for serotyping. These isolates are submitted by animal disease diagnostic laboratories and the USDA, Food Safety and Inspection Service (FSIS) laboratories throughout the United States. Data from other United States laboratories that serotype *Salmonella* from animals and related sources and submit isolates to the NVSL are also included in this report. *Salmonella* serotyping results from clinical cases of animal disease are designated as "clinical" and shown in Table 6. Serotyping results from herd and flock monitoring and surveillance, feed sample testing, environmental testing, research projects, and isolates from USDA, FSIS food testing programs are designated as "nonclinical" (Table 7). Samples from non-human sources are tested for *Salmonella* for a variety of purposes and are obtained in a variety of ways. The sampling is therefore neither complete nor random and undoubtedly has sampling biases. Any interpretation of data should consider these limitations.



The Statistical Outbreak Detection Algorithm (SODA), developed by BSO and FDDB, is a statistical algorithm based on the National *Salmonella* Surveillance System. It is designed to detect unusual clusters of isolates of *Salmonella* infection. SODA compares current *Salmonella* isolates reported through PHLIS by serotype to a 5-year historical baseline for that serotype and week 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 at telephone number (404) 639-3365.

## **Changes to the National *Salmonella* Surveillance System**

In 2002, the National *Salmonella* Surveillance System implemented several changes in nomenclature and in surveillance practices. i) In order to improve the comparability of United States surveillance data with data from other countries, serotypes are now designated according to the Kauffmann-White Scheme (see below). ii) Reporting of *Salmonella* serotype I 4,[5],12:i:- (see discussion of this serotype below) was inconsistent in the past due to variability in the nomenclature used to report this serotype. This resulted in many isolates of this serotype being reported as "Group B" or "Subspecies I". Beginning with the 2002 data, the submitted designation for this serotype was converted to the standard formula whenever possible. iii) Many non-subspecies I serotypes were not listed in the surveillance summaries in the past; instead, these isolates were reported by O group or subspecies only. Beginning with the 2002 surveillance data, all serotype formulas that were submitted to the national surveillance system, regardless of subspecies, were incorporated into the surveillance database. iv) Similarly, most "variants" of serotypes (monophasic, nonmotile or rough isolates) were not listed by their variant formulas in the past; instead, these isolates were reported by O group or subspecies only. Beginning with the 2002 surveillance data, all serotype variants that were submitted to the national surveillance system were converted to standard serotype formulas whenever possible and incorporated into the surveillance database. Since the 2003 *Salmonella* Surveillance Summary was published, we have updated the nomenclature for many isolates that were submitted in 1995 through 2003 when possible using additional information submitted to PHLIS. We hope that the changes in nomenclature and surveillance practices will improve the accuracy of the surveillance data and enhance the detection of newly emerging serotypes. However, these changes should be kept in mind when comparing 1995 to 2003 data to other years. Increases in the number of isolates of specific serotypes, e.g. *Salmonella* serotype I 4,[5],12:i:-, may in part reflect improved surveillance.

In order to improve the utility of partial serotype data, we are changing the way that isolates that are not fully serotyped are designated and reported in PHLIS. In the past, these isolates were reported primarily by serogroup. While serogroups A through E are composed mainly of subspecies I serotypes, many of the other O serogroups are represented in several different subspecies. Most of the serogroups higher than E include serotypes from more than one subspecies, and nearly half (15 of 37) include serotypes from five different subspecies. Reporting isolates by serogroup alone combines unrelated isolates of different subspecies in the same serogroup category. Thus, we would like to move away from the "serogroup" categories. When full serotype information is not available, isolates are identified first by subspecies, then O serogroup and any additional serotype antigens. All available serotype information should be submitted to PHLIS (subspecies, O serogroup, O antigens, H antigens, whether one or two H antigens are detected, rough or mucoid status if appropriate). Partially serotyped isolates are listed in Table 3a.

## **Annual Summary Highlights for 2004**

### Human Sources

A total of 35,661 *Salmonella* isolates were reported from participating public health laboratories in 2004. Forty-nine states and the District of Columbia reported isolates; Florida, Montana and the District of Columbia reported partial serotype information. This represents a 5% decrease compared with 1994 and a 5% decrease compared to 2003 (3%). The national rate of reported *Salmonella* isolates in 2004 was 12.1 per 100,000 based on 2004 census population figures for the United States.

Similar to other years, *Salmonella* was isolated most frequently from children under 5 years of age, accounting for 27% of isolates (Table 2). About 10% of isolates came from persons in each of the second through fifth decades of life, with declining numbers thereafter. The distribution of isolates between the sexes was different, with a greater number of isolates from male infants and children and fewer isolates from male adults and older persons (Table 2).

The twenty most common serotypes of *Salmonella* in 2004 are listed in Table 1. These represent 75% of all *Salmonella* isolates. Of the top twenty serotypes, the two most common serotypes, *S. Typhimurium* and *S. Enteritidis*, had substantial decreases in numbers from 1994-2004; the largest percent decrease in numbers compared with 1994 were *S. Hadar* and *S. Enteritidis* (Table 8). A dramatic increase in *S. Mississippi* (267% from 1994 to 2004) mainly occurred before 1999. *S. Javiana*, *S. Paratyphi B* var. L(+) tartrate+ (formerly *S. Java*) and *S. Newport* had important increases in numbers from 1994 to 2004 (228%, 106% and 99% respectively). In 2004, serotypes *S. Berta* and *S. Anatum* increased in rank to be included in the top twenty serotypes, whereas *S. Bareilly* and *S. Stanley* dropped from the top twenty serotypes compared with 2003.

*Salmonella* serotype I 4,[5],12:i:- was introduced as the 18th most common serotype in 2002 and has increased in rank to 7th in 2004. This serotype was first tracked in the National *Salmonella* Surveillance database in 1998, though many isolates may have been classified as only "Subspecies I" or "Group B" before then. Since the 2003 *Salmonella* Surveillance Summary was published, we examined the 1995 to 2003 surveillance data and were able to reclassify isolates submitted in these years as I 4,[5],12:i:- based on additional data submitted with individual isolates. Efforts to correctly classify this serotype are responsible for at least some of its increase that has been documented in recent years. It is unknown how many isolates reported as "Subspecies I, Group B" could be this serotype (Table 3a). In 1998, this serotype was the fourth most commonly identified in Spain; genetic analysis of the Spanish isolates revealed a close relationship to *S. Typhimurium* (1). Many U.S. isolates of this serotype were characterized by pulsed field gel electrophoresis (PFGE) and the patterns submitted to PulseNet, the National Molecular Subtyping Network for Foodborne Disease Surveillance. The PFGE patterns for most *S. I 4,[5],12:i-* isolates were closely related to *S. Typhimurium* PFGE patterns, indicating that they are most likely variants of *S. Typhimurium*.

The three most common serotypes of *Salmonella* in 2004 (*Typhimurium*, *Enteritidis*, and *Newport*) accounted for 43% of isolates. Compared with 1994, the frequency rank of *S. Typhimurium* and *S. Enteritidis* in 2004 remained first and second respectively, though in 1994-1996 their rank was temporarily reversed (Figure 4). A large proportion of *S. Typhimurium* isolates were resistant to multiple antimicrobial drugs; in 2002, 21.1% of *S. Typhimurium* isolates characterized in the National Antimicrobial Resistance Monitoring System (NARMS) were resistant to one or more drugs and 30% had a five-drug resistance pattern characteristic of a commonly recognized phage type, DT104 (2). Similarly, *S. Newport* has emerged as a major multidrug-resistant pathogen. In 2002, 53 (23%) of 239 *S. Newport* isolates submitted to NARMS were resistant to at least nine of 17 antimicrobial agents tested, including extended spectrum cephalosporins (2,3). Similar to other years, there were marked regional differences in the frequency of *Salmonella* isolates among serotypes. The rate of isolations by region has been followed closely for *S. Enteritidis* as a means of assessing the impact of egg safety regulations and industry improvements. As indicated in Figure 2, *S. Enteritidis* rates of isolation had been relatively high in New England, Mid Atlantic and Pacific regions, but have shown significant decreases since 1995. Though New England had an increase in *S. Enteritidis* in 2000 and 2001 compared to 1999, the isolation rate has decreased since 2001.

#### Non-human Sources

Data on *Salmonella* isolates obtained from non-human sources can help identify possible sources of human illness. *S. Typhimurium*, the most common serotype in humans, is identified most commonly from clinical samples from bovine sources, and from non-clinical samples from chicken sources. *S. Enteritidis* and *S. Heidelberg*, the second and fourth most common serotype in humans, respectively, are identified most commonly from clinical and non-clinical chicken sources (Table 6 and 7).

#### **Adoption of the Kauffmann-White Scheme for designation of *Salmonella* serotypes**

*Salmonella* serotyping has been the cornerstone for epidemiological surveillance and outbreak investigations for this important pathogen. The National *Salmonella* Surveillance System has tracked *Salmonella* isolates by serotype since 1968. New subtyping methods have come and gone, but serotyping continues to provide essential subtype information for *Salmonella*. For example, PulseNet, our state-of-the-art genotyping system for *Salmonella*, relies on accurate serotype information as the "first-tier" subtype information. PFGE pattern determination, by itself, does not replace serotyping, but rather subdivides within serotype.

The Kauffmann-White Scheme for designation of *Salmonella* serotypes is maintained by the WHO Collaborating Centre for Reference and Research on *Salmonella* at the Institut Pasteur and is used by most of the world. Up until 2002, the CDC used a slightly different version of the scheme, the "Modified Kauffmann-White Scheme". A unified format for

serotype designation is essential for accurate surveillance via PulseNet, Global SalmSurv, and other international networks. Therefore, to improve the accuracy of our surveillance data and to make us in-step with the rest of world with respect to *Salmonella* serotype designation, the CDC adopted the Kauffmann-White Scheme on January 1, 2003.

The adoption of the Kauffmann-White Scheme affected only a few of the more common serotypes. The primary differences between the two schemes are:

i) *Salmonella* are divided into six subspecies that can be differentiated by biochemical and genetic tests. Under the Kauffmann-White Scheme, subspecies I serotypes are named; subspecies II through VI serotypes are identified by formula. The Modified Kauffmann-White Scheme used names for those subspecies II through VI serotypes that were designated before 1968 and formulas for those serotypes identified after 1968. With the adoption of the Kauffmann-White scheme, all named serotypes are subspecies I; serotypes from all other subspecies are designated by formula. In 2002, there were four named serotypes among the top 100 serotypes that did not belong to subspecies I and were effected by this change.

- *S. Marina* is now designated as *S. IV 48:g,z51:-*
- *S. Flint* is now designated as *S. IV 50:z4,z23:-*
- *S. Kralendyk* is now designated as *S. IV 6,7:z4,z24:-*
- *S. Chameleon* is now designated as *S. IV 16:z4,z32:-*

ii) Under the Kauffmann-White Scheme, serogroups E2 and E3 were combined with serogroup E1. This reflects the fact that the antigenic changes in serogroups E2 and E3 are the result of lysogenic conversion by bacteriophages and thus represent minor variants of serogroup E1 serotypes. The Modified Kauffmann-White Scheme used separate serotype names for these variants. Two serotypes in the top 100 in 2002 that were affected by the merging of serogroups E2 and E3 with serogroup E1.

- *S. Newington* is now *S. Anatum* variety (var.) 15+
- *S. Newbrunswick* is now *S. Give* var. 15+.

iii) Under the Kauffmann-White Scheme, two biotypes of *S. Paratyphi B* are recognized; they are differentiated primarily by the ability to ferment tartrate. *S. Paratyphi B* is tartrate negative and is associated with more severe, typhoid fever-like disease. *S. Paratyphi B* var. L-tartrate + (also referred to as "*S. Paratyphi* var. Java") is tartrate positive and commonly associated with gastroenteritis. *S. Paratyphi B* var. L-tartrate + was known as "*S. Java*" in the Modified Kauffmann-White Scheme. The two biovars of *S. Paratyphi B* have been a source of confusion in the past because they have the same antigenic formula (I 1,4,[5],12:b:1,2), and are differentiated only by biotype. It is essential that the tartrate test be performed to accurately identify and report the two biotypes.

The *Salmonella* serotypes in this summary that were reported under different designations in the 2001 and earlier United States surveillance data are listed on the next page.

**Table of obsolete *Salmonella* Serotype names and their current designations**

Serotype	Obsolete Name	Serotype	Obsolete Name
Amager var. 15+	Tuebingen	II 4,12,[27]:z:e,n,x	Nordenham
Amsterdam var. 15+	Drypool	II 4,12:l,w:e,n,x	Kilwa
Anatum var. 15+	Newington	II 3,10:g,t:-	Islington
Anatum var. 15+, 34+	Minneapolis	II 3,10:m,t:e,n,x	Stikland
Butantan var. 15+	Rosenthal	II 6,7:l,z28:1,5:[z42]	Heilbron
Choleraesuis var. Decatur	Decatur	II 6,7:z39:1,5,7	Gilbert
Duisburg	Salinatis	II 9,12:d:e,n,x	Rhodesiense
Finkenwerder	Heves	II 9,12:g,m,[s],t:[1,5,7]:[z42]	Hamburg
Gallinarum	Pullorum	II 9,12:g,s,t:e,n,x	Neasden
Give var. 15+	Newbrunswick	II 9,12:l,w:e,n,x	Daressalaam
Give var. 15+, 34+	Menhaden	II 9,12:z39:1,7	Wynberg
Lexington var. 15+	Manila	II 9,46:g,[m],[s],t:[e,n,x]	Duivenhoks
Lexington var. 15+, 34+	Illinois	II 35:z29:e,n,x	Utbremen
Lille var. 14+	Bornum	II 40:c:e,n,x,z15	Suarez
Livingstone var. 14+	Eimsbuettel	II 40:z4,z24:z39	Degania
London var. 15+	Portsmouth	II 41:z10:1,2	Negev
Meleagridis var. 15+	Cambridge	II 41:z10:z6	Lichtenberg
Muenster var. 15+	Newhaw	II 42:b:e,n,x,z15	Uphill
Muenster var. 15+, 34+	Arkansas	II 42:g,t:-	Fremantle
Nyborg	Selandia	II 47:b:1,5	Phoenix
Ohio var. 14+	Nienstedten	II 47:d:z39	Quimbamba
Oranienburg var. 14+	Thielallee	II 48:d:1,2	Etosha
Orion var. 15+	Binza	II 48:d:z6	Hagenbeck
Orion var. 15+, 34+	Thomasville	II 48:g,m,t:-	Erlangen
Paratyphi B var. L(+) tarrate+	Java	II 48:k:z39	Sakaraha
Typhimurium var. 5-	Typhimurium var. Copenhagen	II 60:g,m,t:z6	Setubal
Uganda var. 15+	Kinshasa	IV 6,7:z4,z23:-	Rotenberg
Weltevreden var. 15+	Lanka	IV 6,7:z4,z24:-	Kralendyk
Westhampton var. 15+	Halmstad	IV 11:z4,z23:-	Parera
II 11:g,[m],s,t:z39	Grabouw	IV 16:z4,z23:-	Ochsenzoll
II 11:m,t:e,n,x	Lincoln	IV 16:z4,z32:-	Chameleon
II 13,22:g,m,t:[1,5]	Limbe	IV 21:z4,z23:-	Soesterberg
II 13,22:z29:1,5	Clifton	IV 40:z4,z32:-	Bern
II 13,23:a:z42	Tygerberg	IV 43:z36,z38:-	Volksdorf
II 13,23:b:[1,5]:z42	Acres	IV 43:z4,z23:-	Houten
II 13,23:g,m,[s],t:[e,n,x]	Luanshya	IV 43:z4,z32:-	Tuindorp
II 13,23:z:1,5	Nachshonim	IV 44:z4,z32:-	Lohbruegge
II 16:l,w:z6	Noordhoek	IV 48:g,z51:-	Marina
II 16:z4,z23:-	Haddon	IV 50:g,z51:-	Wassenaar
II 17:g,t:-	Bleadon	IV 50:z4,z23:-	Flint
II 17:g,t:[e,n,x,z15]	Bleadon	IV 50:z4,z32:-	Bonaire
II 21:z10:[z6]	Wandsbek	IV 51:z4,z23:-	Harmelen
II 4,12,[27]:b:[e,n,x]	Sofia	<i>S. bongori</i> ser. 48:z35:-	Bongor
II 4,12,[27]:e,n,x:1,[5],7	Makumira		

## Overview of *Salmonella* Serotype Designation

### 1) *Salmonella* Taxonomy

The genus *Salmonella* divided into two species, *Salmonella enterica* and *Salmonella bongori*.

*Salmonella enterica* is further subdivided into 6 subspecies that are designated by names or Roman numerals. The Roman numerals are simpler and more commonly used. Subspecies IIIa and IIIb were historically considered a separate genus, *Arizonae*, and are still sometimes referred to by this name. Despite their common history, subspecies IIIb is more closely related to the other *Salmonella* subspecies than to subspecies IIIa, so the two should be considered distinct entities.

Salmonella enterica subspecies	
I	<i>enterica</i>
II	<i>salamae</i>
IIIa	<i>arizonae</i>
IIIb	<i>diarizonae</i>
IV	<i>houtenae</i>
VI	<i>indica</i>

*Salmonella bongori* was originally designated *S. enterica* subspecies V. It has since been determined to be a separate species of *Salmonella*. However, for simplicity and convenience, these strains are commonly referred to as “subspecies V” for the purpose of serotype designation.

### 2) *Salmonella* Serotype Antigens

*Salmonella* serotype is based on the immunoreactivity of two surface structures, O and H antigen.

O antigen is a carbohydrate antigen (also called a polysaccharide) that is the outermost component of lipopolysaccharide (LPS). It is a polymer of O subunits; each O subunit is typically composed of four to six sugars depending on the O antigen. Variation in O antigen results from variation in the sugar components of the O subunit, from variation in the nature of the covalent bond between the sugars of the subunit, and from variation in the nature of the linkage between the O subunits that form the O antigen polymer.

O antigens are designated by numbers and are divided into O serogroups or O groups. O groups are designated by the primary O factor(s) that are associated with the group. Many of the common O groups were originally designated by letter and are still commonly referred to by letter (e.g., *S. Typhimurium* belongs to Group O:4 or Group B, *S. Enteritidis* belongs to group O:9 or Group D1; *S. Paratyphi A* belongs to Group O:2 or Group A).

Additional O factors are associated with some O groups and are often variably present or variably expressed. The O groups and the additional O antigens that may be present in serotypes of that group are listed in the table below. When multiple O factors are present, they are listed sequentially and separated by commas.

H antigen is the filamentous portion of the bacterial flagella; H antigen is made up of protein subunits called flagellin. The ends of flagellin are conserved and give the flagella its characteristic filament structure. The antigenically variable portion of flagellin is the middle region, which is surface-exposed. *Salmonella* is unique among the enteric bacteria in that it can express two different flagellin antigens. Typically, this is coordinated so that only one antigen is expressed at time in a single bacterial cell. The two antigens are referred as Phase 1 and Phase 2. “Monophasic” isolates are those that express only a single flagellin type. These occur naturally for some serotypes (e.g., *S. Enteritidis*, *S. Typhi*, and most subspecies IIIa and IV serotypes are monophasic), or can occur through the inactivation of the gene encoding the Phase 1 or Phase 2 antigen.

The H antigens of *Salmonella* are listed in the table below. Some antigens are composed of multiple factors, which are separated by commas; for example, the second phase antigen of *S. Typhimurium* is composed of factors 1 and 2, which is

represented as "1,2". Related antigens are grouped into **complexes**.

### 3) *Salmonella* Serotype Identification

*Salmonella* serotypes are typically identified in a cascade of tests. First, an isolate is identified and the subspecies is determined, typically by biochemical testing. O antigens and H antigens are detected in independent agglutination assays using antisera that react with groups of related antigens or a single antigen. Both H antigens can sometimes be detected in a single culture, particularly for older strains or for isolates that have been passed multiple times. When only one H antigen is detected, the isolate is inoculated onto the top of a tube of **phase reversal media**, a semisolid media containing antisera to the H antigen that has already been identified. Organisms expressing the previously detected H antigen are immobilized by the added antisera and grow only at the top of the tube. Organisms expressing the second H antigen are able to move away from the top of tube, evidenced by growth throughout the tube. The second H antigen is then determined using organisms recovered from the bottom of the phase reversal media.

### 4) *Salmonella* Serotype Designation

*Salmonella* serotypes are designated according to the conventions of the Kauffmann-White Scheme. All *Salmonella* serotypes can be designated by a formula. Additionally, subspecies I serotypes are given a name (e.g., Typhimurium, Enteritidis, Typhi, etc). Before 1968, all serotypes were given names; as a result, some serotypes of subspecies II and IV were originally designated by name. Some of the obsolete names can still be found in the literature (e.g., *Salmonella* IV 48:g,z51:- was formerly known as *Salmonella* Marina); but, subspecies II through VI serotype should be designated by formula only.

The typical format for a serotype formula is:

Subspecies [space] O antigens [colon] Phase 1 H antigen [colon] Phase 2 H antigen

#### Examples:

I 4,5,12:i:1,2 (*S. enterica* serotype Typhimurium or *Salmonella* Typhimurium)  
I 4,12:i:1,2 (*S. enterica* serotype Typhimurium or *Salmonella* Typhimurium)  
I 9,12:g,m:- (*S. enterica* serotype Enteritidis or *Salmonella* Enteritidis)  
II 47:b:1,5 (*S. enterica* serotype II 47:b:1,5 or *Salmonella* II 47:b:1,5)  
IV 48:g,z51:- (*S. enterica* serotype IV 48:g,z51:- or *Salmonella* IV 48:g,z51:-)  
IIIb 65:(k):z (*S. enterica* serotype IIIb 65:(k):z or *Salmonella* IIIb 65:(k):z)

#### Other conventions:

- Some O and H factors are variably present. This is indicated in the generic serotype formula by underline when the variable factor is known to be encoded on a bacteriophage (e.g., O factor 1; only described for O antigens) or by square brackets (e.g., O factor [5] or H antigen [1,2]) when it is not. For an individual isolate, if the variable factor is detected it is included in the formula without additional notation. If the variable factor is not detected, it is not listed in the formula.
- Some O and H factors are variably expressed. Weakly recognized antigens are indicated by parentheses; e.g., O antigen (6),14 or H antigen (k).
- In monophasic isolates, the absence of an H antigen is indicated by a minus sign ("–") for the particular phase.
- Variants of serotypes that do not express all the recognized antigens characteristic of a particular serotype are not uncommon. This is a particular issue for subspecies I serotypes, where a serotype name cannot be designated without the detection of all the antigens specified in the Kauffmann-White scheme for that serotype. Isolates missing one or more antigens are designated by a formula. For example:
  - i. Monophasic variants are variants of typically diphasic serotypes that lack the expression of either the flagellar Phase 1 or Phase 2 antigen; these are indicated by a minus sign ("–") in place of the missing phase; e.g., monophasic variants of *S. Typhimurium* that lack the second phase H antigen 1,2 are

designated as S. I 4,5,12:i:- or S. I 4,12:i:-; monophasic variants of S. Typhimurium that lack the first phase H antigen i are designated as S. I 4,5,12:-:1,2 or S. I 4,12:-:1,2.

- ii. Nonmotile variants express no H antigens and are indicated by minus signs in both phases or by "nonmotile" in place of the H antigens; e.g., S. I 4,5,12:nonmotile or S. I 4,5,12:--.
- iii. Rough variants are isolates that do not express O antigen. This is indicated by "Rough" in place of the O antigen in the antigenic formula; e.g., I Rough:i:1,2.
- iv. Mucoid variants express a capsule that prevents immunologic detection of the O antigen. They are indicated by "Mucoid" in place of the O antigen in the antigenic formula; e.g., I Mucoid:i:1,2.
- Rarely, isolates express a third H antigen that is noted by a colon followed by the antigen after the Phase 2 H antigen (e.g., S. II 9,12:g,m,[s],t:1,5,7:z42)

## 5) *Salmonella* Serotype Statistics

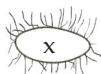
There were 2541 *Salmonella* serotypes as of 2002; approximately 60% belong to subspecies I. In the US, approximately 99% of reported human isolates belong to subspecies I. The "top 10" serotypes account for approximately 74% of all isolates reported in the US; the "top 100" serotypes account for about 98% of all isolates. Among the top 100 serotypes, only S. IV 48:g,z51:- (formerly S. Marina), S. IV 50:z4,z23:- (formerly S. Flint), S. IV 6,7:4,z24:- (formerly S. Kralendyk), and S. IV 16:z4,z32:- (formerly S. Chameleon) are not subspecies I. Among the non-subspecies I isolates, subspecies IV isolates are the most common, followed by subspecies IIIb, IIIa, and II. Subspecies VI and *S. bongori* isolates are very rare.

*Salmonella* O serogroups and associated O antigens

O Group (number designation)	O Group (letter designation)	Antigens present in all serotypes	Additional antigens that may be present in some serotypes
2	A	2,12	1
4	B	4,12	1; 5; 27
7	C1	6,7	14; (Vi)
8	C2	8	6; 20
9	D1	9,12	1; (Vi)
9,46	D2	9,46	none
9,46,27	D3	9,12,46,27	1
3,10	E1	3,10	15; 15,34
1,3,19	E4	1,3,19	10; 15
11	F	11	none
13	G	13	1; 22; 23
6,14	H	6,14	1; 24; 25
16	I	16	none
17	J	17	none
18	K	18	6; 14
21	L	21	none
28	M	28	none
30	N	30	none
35	O	35	none
38	P	38	none
39	Q	39	none
40	R	40	1
41	S	41	none
42	T	42	1
43	U	43	none
44	V	44	1
45	W	45	none
47	X	47	1
48	Y	48	none
50	Z	50	none
51		51	1
52		52	none
53		53	1
54 (provisional)		54	21; 3; 3,15; 4,12; 8,20; 6,7
55		55	none
56		56	none
57		57	none
58		58	none
59		59	1
60		60	none
61		61	none
62		62	none
63		63	none
65		65	none
66		66	none
67		67	none

## H (flagellar) antigens of *Salmonella*

1 complex:	1,2	Other antigens (not part of a complex):	a
	1,5		b
	1,6		c
	1,7		d
	1,2,5		e,h
	1,2,7		i
	1,5,7		k
	1,6,7		(k)
EN complex:	e,n,x		r
	e,n,x,z15		r,i
	e,n,z15		y
G complex:	f,g		z
	f,g,m,t		z6
	f,g,s		z10
	f,g,t		z29
	g,m		z35
	g,m,p,s		z36
	g,m,q		z36,z38
	g,m,s		z38
	g,m,s,t		z39
	g,m,t		z41
	g,p		z42
	g,p,s		z44
	g,p,u		z47
	g,q		z50
	g,s,q		z52
	g,s,t		z53
	g,t		z54
	g,z51		z55
	g,z62		z56
	g,z63		z57
	g,z85		z60
	m,p,t,u		z61
	m,t		z64
L complex:	l,v		z65
	l,w		z67
	l,z13		z68
	l,z13,z28		z69
	l,z28		z71
Z4 complex:	z4,z23		z81
	z4,z23,z32		z83
	z4,z24		z87
	z4,z32		z88



## Acknowledgements

Thanks to all the State Public Health laboratories and epidemiologists who participate in this surveillance.

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## Suggested Reading

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Judicial Commission (2005). The type species of the genus *Salmonella* Lignieres 1900 is *Salmonella enterica* (ex Kauffmann and Edwards 1952) Le Minor and Popoff 1987, with the type strain LT2T, and conservation of the epithet *enterica* in *Salmonella enterica* over all earlier epithets that may be applied to this species. Opinion 80. Int J Syst Evol Microbiol 55:519-520.

These websites contain an excellent overview of the history and current status of *Salmonella* taxonomy and nomenclature:

<http://www.bacterio.cict.fr/salmonellanom.html>  
<http://www.bacterio.cict.fr/s/salmonella.html>

**TABLE 1**

**The Top 20 most frequently reported *Salmonella* serotypes  
from Human sources reported to CDC in 2004**

Human 2004			
Rank	Serotype	Reported	Percent
1	S. Typhimurium *	6842	19.2
2	S. Enteritidis	5012	14.1
3	S. Newport	3325	9.3
4	S. Javiana	1772	5.0
5	S. Heidelberg	1757	4.9
6	S. Montevideo	870	2.4
7	S. I 4,[5],12:i:-	739	2.1
8	S. Muenchen	739	2.1
9	S. Saintpaul	692	1.9
10	S. Braenderup	684	1.9
11	S. Infantis	588	1.6
12	S. Mississippi	558	1.6
13	S. Oranienburg	495	1.4
14	S. Thompson	493	1.4
15	S. Berta	409	1.1
16	S. Agona	406	1.1
17	S. Paratyphi B var. L(+) tartrate+	354	1.0
18	S. Typhi	306	0.9
19	S. Hadar	277	0.8
20	S. Anatum	250	0.7
	<b>Sub Total</b>	<b>26568</b>	<b>74.5</b>
	All Other Serotyped	5651	15.8
	Unknown	2053	5.8
	Partially serotyped isolates	1328	3.7
	Rough or nonmotile isolates	61	0.2
	<b>Sub Total</b>	<b>9093</b>	<b>25.5</b>
	<b>Total</b>	<b>35661</b>	<b>100</b>
NOTE:			
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* Typhimurium includes var. 5- (Formerly var. Copenhagen)			

**TABLE 1a**

**The Top 20 most frequently reported *Salmonella* serotypes from  
Clinical and Non-Clinical Nonhuman sources reported to CDC and NVSL in 2004**

Clinical Nonhuman 2004			
Rank	Serotype	Reported	Percent
1	S. Typhimurium *	1558	23.7
2	S. Newport	1067	16.3
3	S. Agona	267	4.1
4	S. Heidelberg	215	3.3
5	S. Choleraesuis **	213	3.2
6	S. Derby	207	3.2
7	S. I 4,[5],12:i:-	154	2.3
8	S. Infantis	148	2.3
9	S. Dublin	139	2.1
10	S. Senftenberg	138	2.1
11	S. Montevideo	136	2.1
12	S. Uganda	134	2.0
13	S. Muenster	128	2.0
14	S. Anatum	126	1.9
15	S. Reading	91	1.4
16	S. Kentucky	89	1.4
17	S. Muenchen	89	1.4
18	S. Enteritidis	63	1.0
19	S. Mbandaka	53	0.8
20	S. Cerro	52	0.8
Sub Total		<b>5067</b>	<b>77.2</b>
All Other Serotyped		1413	21.5
Rough or nonmotile isolates		82	1.2
Sub Total		<b>1495</b>	<b>22.8</b>
Total		<b>6562</b>	<b>100</b>

## NOTE:

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\* Typhimurium includes var. 5- (Formerly var. Copenhagen)

\*\* Choleraesuis includes var. Decatur and Kunzendorf

Non-Clinical Nonhuman 2004			
Rank	Serotype	Reported	Percent
1	S. Typhimurium *	672	13.0
2	S. Heidelberg	526	10.2
3	S. Senftenberg	508	9.9
4	S. Hadar	413	8.0
5	S. Kentucky	292	5.7
6	S. Derby	211	4.1
7	S. Newport	187	3.6
8	S. Enteritidis	175	3.4
9	S. Agona	170	3.3
10	S. Montevideo	142	2.8
11	S. Muenster	124	2.4
12	S. Cerro	114	2.2
13	S. Mbandaka	110	2.1
14	S. Schwarzengrund	110	2.1
15	S. Worthington	97	1.9
16	S. Reading	78	1.5
17	S. Inverness	74	1.4
18	S. I 4,[5],12:i:-	60	1.2
19	S. Anatum	53	1.0
20	S. Dublin	52	1.0
Sub Total		<b>4168</b>	<b>80.9</b>
All Other Serotyped		957	18.6
Rough or nonmotile isolates		25	0.5
Sub Total		<b>982</b>	<b>19.1</b>
Total		<b>5150</b>	<b>100</b>

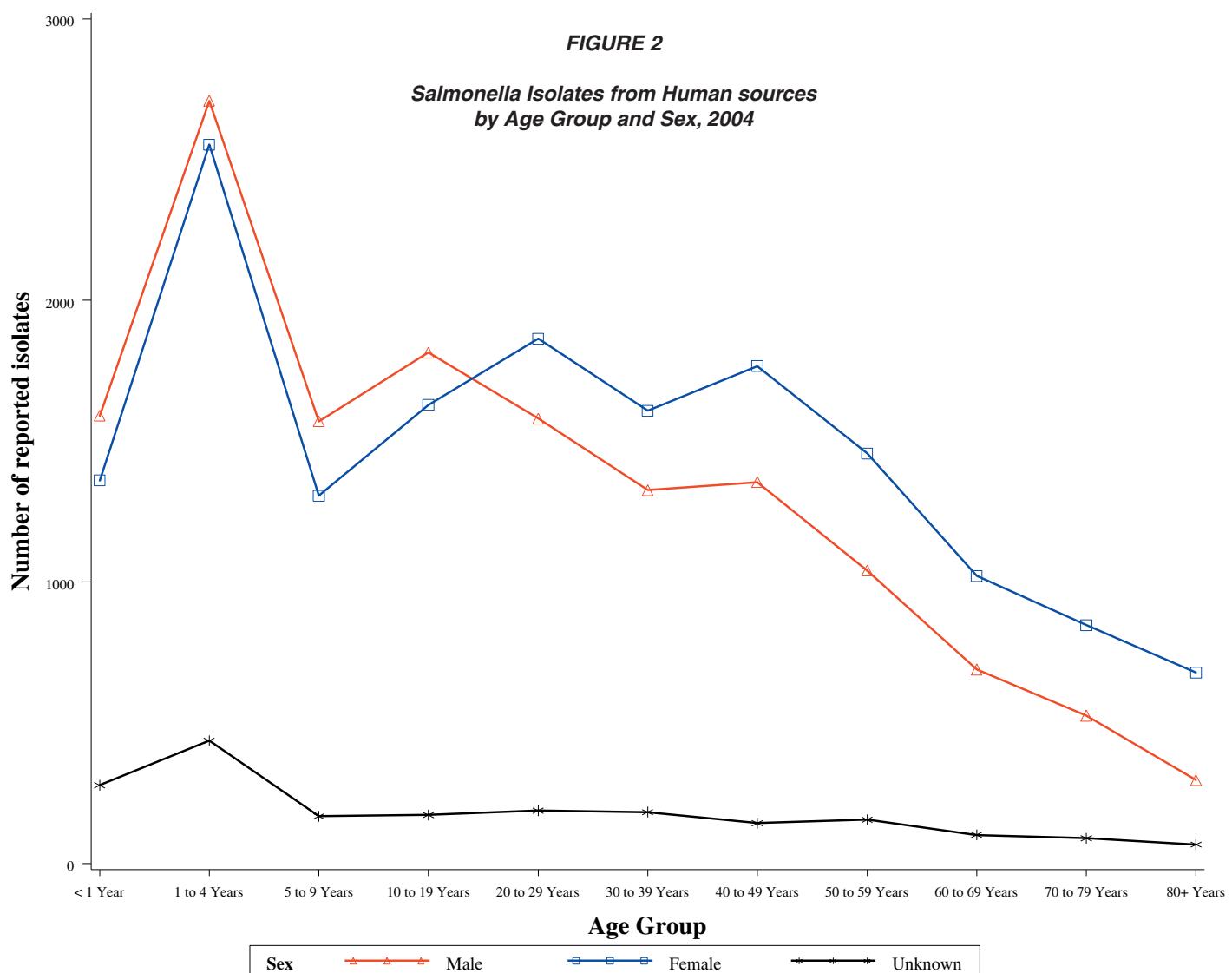
## NOTE:

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\* Typhimurium includes var. 5- (Formerly var. Copenhagen)

**TABLE 2**  
*Salmonella isolates from Human sources  
 by Age Group and Sex, 2004*

Age Group	Sex			Total
	Female	Male	Unknown	
< 1 Year	1361	1591	279	3231
1 to 4 Years	2553	2709	437	5699
5 to 9 Years	1307	1571	168	3046
10 to 19 Years	1629	1815	173	3617
20 to 29 Years	1864	1581	188	3633
30 to 39 Years	1608	1327	183	3118
40 to 49 Years	1767	1355	144	3266
50 to 59 Years	1457	1041	156	2654
60 to 69 Years	1022	690	102	1814
70 to 79 Years	847	526	90	1463
80+ Years	679	297	68	1044
Unknown Age	800	796	1480	3076
	16894	15299	3468	35661



**TABLE 3**  
**Salmonella isolates from Human sources**  
**by Serotype and Year, 1994-2004**

Serotype	Year											Total
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
S. Aarhus	6		6	16	9	6	7	2	7	9	3	71
S. Aba							4			1		5
S. Abadina									2			2
S. Abaetetuba	10	10	17	8	7	7	5	4	3	1	1	73
S. Aberdeen	1	5	2	3	4	4	13	5	3	3	6	49
S. Abony	7	9	2	3	6	4	1	11	9	9	10	71
S. Abortusequi				1								1
S. Adelaide	110	98	88	70	73	95	42	81	66	60	76	859
S. Adime										1		1
S. Aequatoria				1		1					5	7
S. Aflao			1			1						2
S. Africana					2	6					1	9
S. Afula											1	1
S. Agama	4	3	2	2	2	2	1	1	5	4	2	28
S. Agbeni	3	5	1	3		1	13	5	4	7	72	114
S. Agege			1									1
S. Ago		1		1	1		1					4
S. Agodi									1			1
S. Agona	753	683	606	740	991	528	406	372	340	523	406	6348
S. Agoueve	2	2	4	3	6	2	2	3	6	2	2	34
S. Ahuza			1				2					3
S. Ajiboo				2	2		2		2	1	1	10
S. Alabama	1	1	2	2	2	4	1	1	3		3	20
S. Alachua	70	53	39	18	14	22	20	9	16	10	28	299
S. Alagbon											1	1
S. Alamo		1			1							2
S. Albany	29	49	26	21	23	17	18	17	15	17	34	266
S. Albert	2	1	1									4
S. Albuquerque									1			1
S. Allandale					1		1	1			1	4
S. Allerton											1	1
S. Altona	1		1	1		1	4	3	3		2	16
S. Amager		6	1	8	3	4	7	1	2	3	15	50
S. Amager var. 15+											3	3
S. Amsterdam	4	11	2	9	5	6	2	5	7	6	3	60
S. Amsterdam var. 15+	4	8	5	7	4	5	1	5	3		1	43
S. Anatum	146	174	271	208	138	157	177	188	217	177	250	2103
S. Anatum var. 15+	13	17	16	20	25	23	8	4	4	10	11	151
S. Anatum var. 15+, 34+			1						1			2
S. Anecho		2	5	2	2	1			5	2		21
S. Ank	1		2									3
S. Annedal			1					1				2
S. Antsalova	1	2	1		2		3		1		1	11
S. Apapa				2		2	4	8	10	3	12	41
S. Apeyeme						1	1				1	3

**TABLE 3**  
***Salmonella isolates from Human sources***  
**by Serotype and Year, 1994-2004**

Serotype	Year											Total
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
S. Aqua		3	2	1			2	1		1	2	12
S. Aragua			1	1	1		1					4
S. Arapahoe									1			1
S. Arechavaleta	4	6	6	9	4	3	9	3	6	3	14	67
S. Assen						1	1		1			3
S. Athinai					1							1
S. Ati										2		2
S. Augustenborg				2				1				3
S. Austin								1				1
S. Australia								3				3
S. Avignon	1											1
S. Avonmouth									1			1
S. Azteca						1						1
S. Babelsberg							1				2	3
S. Baguirmi								1				1
S. Bahati			1									1
S. Bahrenfeld				1								1
S. Baildon	1	14	5	5	73	77	4	2	14	12	7	214
S. Ball			2					1				3
S. Banalia								1				1
S. Banana			1	1	1		1	1		3		8
S. Banco					2							2
S. Bandia											1	1
S. Bardo	8	1	28	10	10	13	20	16	49	42	32	229
S. Bareilly	83	109	115	112	153	171	182	206	183	240	232	1786
S. Barranquilla			1			1		3	1	3	3	12
S. Bassa										1		1
S. Bassadji								1			1	2
S. Beaudesert							1			1		2
S. Belem						1				1		2
S. Benfica		2	1		1	1		1				6
S. Benin	1		1									2
S. Bere	2	1	2	8	1			1		1		16
S. Bergen						1	2			1		4
S. Berkeley					1							1
S. Berta	399	367	118	87	123	143	312	334	300	201	409	2793
S. Binningen											1	1
S. Birkenhead	2		2	7	4		2	2		4	5	28
S. Bispebjerg			1	1						1		3
S. Blegdam	6		2	4	3	1	2	2	3	2	8	33
S. Blijdorp			1							1		2
S. Blockley	76	55	51	62	61	54	28	33	38	67	83	608
S. Blukwa			1	1								2
S. Bochum					5	1		3		1		10
S. Bolton							1					1

**TABLE 3**  
***Salmonella isolates from Human sources***  
**by Serotype and Year, 1994-2004**

Serotype	Year											Total
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
S. Bonames							1			1		2
S. Bonariensis		5	3	3	6	4	3	6	6	4	3	43
S. Bonn	7	4	1		1		1	2			2	18
S. Borbeck		1					1					2
S. Bournemouth									1	2	1	4
S. Bousso					1							1
S. Bovismorbificans	40	25	41	47	64	35	55	83	74	69	110	643
S. Bracknell									1			1
S. Bradford	35	12	1	3	1		2	1	2	3	1	61
S. Braenderup	426	588	531	559	497	529	531	396	389	553	684	5683
S. Brancaster					1					1		2
S. Brandenburg	259	284	181	168	132	117	84	106	140	116	80	1667
S. Brazil		1	1	1		2				2	2	9
S. Brazos				1		1						2
S. Brazzaville										1		1
S. Bredeney	44	57	47	51	112	44	25	79	41	56	27	583
S. Brezany	1							4	2	1		8
S. Brikama			1									1
S. Bristol				1								1
S. Bron	2	2	1					1			3	9
S. Bronx	1			2	2			1				6
S. Brooklyn					1					1		2
S. Broughton		2				1						3
S. Brunei											3	3
S. Bsilla								1	1		3	5
S. Budapest		1										1
S. Bukavu				1			1			1		3
S. Bukuru											1	1
S. Burundi		1										1
S. Butantan						1			1			2
S. Butantan var. 15+							1					1
S. Buzu	1	3		5	4	1				1		15
S. Calabar					1	1						2
S. California	2	1	1	9	3	1		1		5	1	24
S. Camberwell					1							1
S. Canada			1				1		1	1	1	5
S. Cannstatt				1	1		1	1	3	1		8
S. Caracas				3		1			1			5
S. Carmel		1	1			1	1	8	9		9	30
S. Carno						1						1
S. Carrau	9	12	30	6	3	12	6	5	3	7	8	101
S. Cerro	62	74	55	60	52	56	52	31	39	28	19	528
S. Cerro var. 14+										3	3	6
S. Ceyco								1	1			2
S. Chailey		6	4	12	9	3	3		1	1	3	42

**TABLE 3**  
***Salmonella isolates from Human sources***  
**by Serotype and Year, 1994-2004**

Serotype	Year											Total
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
S. Champaign	1	1										2
S. Chandans	1								3		1	5
S. Charity							1					1
S. Charlottenburg			1									1
S. Chester	21	34	26	36	24	29	23	24	23	51	15	306
S. Chicago	1				1				1	1		4
S. Chichiri								1		1		2
S. Chincol					1	2	2			1		6
S. Chingola				1				1				2
S. Choleraesuis	53	50	41	25	22	25	10	8	11	13	16	274
S. Choleraesuis var. Decatur	1				2			1	3		1	8
S. Choleraesuis var. Kunzendorf	18	25	26	24	13	9	10	5	8	6	9	153
S. Clackamas	1	1	1	3		3	1		6	4	1	21
S. Claibornei					1	1		1			1	4
S. Clerkenwell								1				1
S. Cleveland											1	1
S. Cochise							1					1
S. Coeln	2	2	7	4	5	2	3	3	3	2	3	36
S. Colindale	5	2	7	1	4	2	3	2	5	8	3	42
S. Colorado	1	1	1	1	2	2				1		9
S. Concord	1	4	5	2	2	3		2	1	3	4	27
S. Corvallis		1	1	1	1	1	1		1	3	4	14
S. Cotham	1					2	1		3	6	5	18
S. Cremieu				1			2	1				4
S. Cubana	61	44	34	36	72	42	31	26	21	24	18	409
S. Cuckmere											1	1
S. Cullingworth			1				1					2
S. Curacao	1					1	2	1				5
S. Daarle											1	1
S. Dahomey										1		1
S. Dahra						2	1	1	1	1		6
S. Damman											1	1
S. Daytona	3	3	4	6	3	4	3	4	4	10	10	54
S. Denver	2	5	2	3	1	1	1	1	2	5	1	24
S. Derby	144	213	143	152	171	174	188	121	169	125	137	1737
S. Derkile							1					1
S. Dessau				1				1				2
S. Diguil			4	2	1				2	1		10
S. Diourbel							1					1
S. Djelfa						1						1
S. Djugu	4	1	2	2	1	1	1			2		14
S. Doba	1	1										2
S. Doel			2									2
S. Doncaster										1		1
S. Doullassame				1	1							2

**TABLE 3**  
***Salmonella isolates from Human sources***  
**by Serotype and Year, 1994-2004**

Serotype	Year											Total
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
S. Drogana	1	3										4
S. Dublin	65	81	85	61	78	66	94	76	83	65	73	827
S. Duesseldorf	12	13	6	6	15	5	1	2		8	9	77
S. Dugbe	1						1					2
S. Duisburg	1	5	3			1	1	2	2	2		17
S. Dunkwa								1				1
S. Durban	11	3	8	8	10	3	4	5	1	3	16	72
S. Durham	5	6	4	2		1	3	3	4	4	3	35
S. Duval		1		1	1				1		1	5
S. Ealing	8	25	26	8	6	6	9	16	10	12	13	139
S. Eastbourne	13	10	13	3	8	7	10	6	18	18	8	114
S. Ebrie					1	3	2	1	1			8
S. Echa										1		1
S. Edinburg	3	4			1	6	2	1	5	20	27	69
S. Ekpoi							1		1			2
S. Elisabethville											1	1
S. Elokaté										1		1
S. Elomrane						3	1	1	1	1	3	10
S. Emek	3	6	5	7	7	8	5	2	2	11	6	62
S. Entebbe	2		8	4		1				1	1	17
S. Enteritidis	9866	10201	9570	7924	6030	5343	6487	5634	5145	4914	5012	76126
S. Enugu		1	1	1								3
S. Epicrates									1			1
S. Eppendorf	1					2	2				1	6
S. Escanaba				3					1			4
S. Essen	3		2	3	2	3	4	1		1	2	21
S. Etterbeek				1								1
S. Falkensee	1	2		1						1		5
S. Fallowfield				3								3
S. Fann									1			1
S. Farmsen	3	2	2	6	4	3		1	1	1	1	24
S. Farsta									4		1	5
S. Fayed		1				6	3	4		1		15
S. Ferruch										1		1
S. Fillmore									1			1
S. Finkenwerder						1						1
S. Fischerkietz					1	1						2
S. Fischerstrasse							1		1			2
S. Fitzroy											1	1
S. Florida	3	2	7	11	8	1	2	4	2	3	1	44
S. Fluntern			1		3			2	2	5	8	21
S. Fortlamy		2										2
S. Freefalls		2										2
S. Freetown							1		6	2	9	
S. Freiburg									1			1

**TABLE 3**  
***Salmonella isolates from Human sources***  
**by Serotype and Year, 1994-2004**

Serotype	Year											Total
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
S. Fresno	1	1						3	1			6
S. Friedenau				1					1	1		3
S. Friedrichsfelde											2	2
S. Frintrop			1									1
S. Fulica				1								1
S. Fyris			2		1							3
S. Gabon					1	1			1			3
S. Galiema										1	1	2
S. Galil		1		1				2				4
S. Gallinarum			2	1	1	1		1	3	2		11
S. Gamaba					1							1
S. Gambia		1		2								3
S. Gaminara	38	45	44	47	61	52	51	58	44	86	134	660
S. Garba			1					1				2
S. Gatow		1			2		1	1	1			6
S. Gatuni	3	1	2		1	1	1	3		2	3	17
S. Georgia	1	2			2			4	3	2	2	16
S. Gera											1	1
S. Give	95	101	114	118	92	98	86	75	55	93	102	1029
S. Give var. 15+	3	20	22	26	36	23	9	9	5	7	5	165
S. Give var. 15+, 34+	2	5	14	1					1			23
S. Glasgow								1				1
S. Glidji			1									1
S. Glostrup	13	31	13	5	10	7	6	6	2	2	2	97
S. Gloucester	3	2	2	2								9
S. Gnesta											1	1
S. Godesberg		1	1									2
S. Goteborg				1								1
S. Goettingen				1	1	1	3		2	1	2	11
S. Goldcoast		1		1	1	1					1	5
S. Goma									1			1
S. Gombe											1	1
S. Groenekan								1				1
S. Grumpensis	1	3			1	2	1	1		1		10
S. Guildford						1						1
S. Guinea			1								1	2
S. Gustavia							1	1				2
S. Haardt	10	16	6	5	2	3	4	4	3	52	29	134
S. Hadar	1001	814	658	643	544	516	354	307	333	280	277	5727
S. Hadejia						1						1
S. Haifa	2	2	3	4	3	6	11	4	6	3	5	49
S. Halle						1						1
S. Handen			1									1
S. Hannover											1	1
S. Harburg				1					1	1		3

**TABLE 3**  
***Salmonella isolates from Human sources***  
**by Serotype and Year, 1994-2004**

Serotype	Year											Total
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
S. Harleystreet					1							1
S. Harrisonburg												1
S. Hartford	90	164	89	110	175	140	150	158	198	188	189	1651
S. Hatfield				1		1				1		3
S. Hato	1	1				1	2	5	1	1	2	14
S. Havana	38	57	59	47	77	46	26	19	28	29	32	458
S. Hayindogo					1			1	1			3
S. Heerlen	1											1
S. Heidelberg	1825	2095	1998	2104	1900	1816	1772	1895	1985	1845	1757	20992
S. Hemingford											1	1
S. Heron				1								1
S. Herston								1	1	2	2	6
S. Hessarek										1		1
S. Hidalgo	1			1								1
S. Hiduiddify	1					3	1	1		1	2	9
S. Hillegersberg									1	1		2
S. Hillingdon			1									1
S. Hindmarsh		2	1	1	3		3	4	2	5	12	33
S. Hoghton											1	1
S. Holcomb			1	2		1		3	4	1		12
S. Homosassa			1		2							3
S. Horsham			2			3				1		6
S. Hull	1	3						1	1	2		8
S. Hvittingfoss	14	15	44	26	29	38	34	30	44	32	34	340
S. Ibadan	24	46	33	42	39	27	17	9	10	17	5	269
S. Idikan	2		11	4	1		2		1	1		22
S. Ilala				1							1	2
S. Ilugun			3									3
S. Imo			1									1
S. Inchpark	1					1						2
S. India			1									1
S. Indiana	25	24	28	11	7	14	9	13	24	43	18	216
S. Infantis	520	521	503	651	600	596	613	441	472	570	588	6075
S. Inganda							1	4		2	1	8
S. Inpraw										1		1
S. Inverness	21	37	20	26	32	24	22	24	30	30	49	315
S. Ipswich		1	1			1						3
S. Irchel		1										1
S. Ireneae						1				1		2
S. Irumu	45	31	18	13	15	6	6	9	2	9	13	167
S. Isangi	1	3	1	1	5	2		3	1	4	3	24
S. Israel										2	1	3
S. Istanbul	7	10	9	8	7	25	15	27	33	15	61	217
S. Isuge									1			1
S. Itami	1		1	2	8	7	12	50	3	8	7	99

**TABLE 3**  
***Salmonella isolates from Human sources***  
**by Serotype and Year, 1994-2004**

Serotype	Year											Total
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
S. Ituri	2	4	2	1	5	3	2	7	1		1	28
S. Jaffna	2											2
S. Jamaica	2	6		2	1	2						13
S. Jangwani	3	10	7	4	5	6	7	2	3		4	51
S. Javiana	540	758	749	675	1168	1197	1204	1068	1201	1718	1772	12050
S. Jedburgh				1								1
S. Jerusalem								1	1	1		3
S. Joal			1						2	2	4	9
S. Jodhpur					1				1		1	3
S. Johannesburg	48	74	45	45	32	44	31	35	20	17	40	431
S. Jos						1						1
S. Jubilee				1							1	2
S. Kaapstad			1				1	1		2	1	6
S. Kaduna	1											1
S. Kalamu								1				1
S. Kalina								1				1
S. Kambole					1					1		2
S. Kande								1	3			4
S. Kandla									1			1
S. Kanifing				1								1
S. Kaolack			1									1
S. Kapemba											1	1
S. Kedougou		4			1	2	3	1	1		3	15
S. Kentucky	42	80	78	60	58	71	48	64	69	59	56	685
S. Kiambu	6	14	17	14	13	40	24	27	41	84	31	311
S. Kibusi			3									3
S. Kimuenza	2								1			3
S. Kingabwa	1	1		2		2		3	11	4	7	31
S. Kingston	1			3	1			2	1		1	9
S. Kinondoni			1	1	1	1			1			5
S. Kintambo	19	21	19	14	20	8	3	5	9	10	16	144
S. Kirkee				1		1						2
S. Kisangani		2										2
S. Kisarawe				2	2			1	2		1	8
S. Kitenge		1										1
S. Kivu						2						2
S. Kodjovi	1											1
S. Koessen			1									1
S. Koketime			1									1
S. Kokoli					1							1
S. Kokomlemle	2	2	2	3	1	1	2	4	2	1	2	22
S. Konstanz								2		1		3
S. Kottbus	22	49	9	11	2	5	15	73	19	7	8	220
S. Kotu											1	1
S. Kralingen						1	1					2

**TABLE 3**  
***Salmonella isolates from Human sources***  
**by Serotype and Year, 1994-2004**

Serotype	Year											Total
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
S. Krefeld	3	3	2	1		1	1		2	1		14
S. Kristianstad							1	1				2
S. Kua	1	2	1	1	1	2	1	2		3	2	16
S. Kumasi	1											1
S. Kunduchi					1							1
S. Kuru	1											1
S. Labadi	1	2			1							4
S. Lagos	1	2	1	1				1	1	1	2	10
S. Lamberhurst					1		1					2
S. Lamin					1							1
S. Landau				1				1				2
S. Landwasser					1	2		1				4
S. Langensalza			1		1							2
S. Lansing						1					2	3
S. Larocheille	4	4	4	1	6	4	2		8	4	6	43
S. Lattenkamp								1				1
S. Lawndale			1									1
S. Leeuwarden								2		1		3
S. Leopoldville								1				1
S. Lexington	3	1	2	1			1	5	1		5	19
S. Lexington var. 15+	1					1						2
S. Lexington var. 15+, 34+			1									1
S. Lika										4		4
S. Lille	1			3		1	1		1		1	8
S. Lille var. 14+							1					1
S. Limete			1	6	1			1				9
S. Lindenburg	6	9	5	3	10	5	7	3	2	3	2	55
S. Lindern									1			1
S. Lindi			1									1
S. Litchfield	93	115	158	105	119	135	119	140	125	168	155	1432
S. Liverpool		2	3	3		2	1			1	3	15
S. Livingstone	16	13	18	6	5	4	6	8	9	2	3	90
S. Livingstone var. 14+						1						1
S. Llandoff										1		1
S. Loanda				1			1	1		1	2	6
S. Lockleaze	3	2			1	1			1			8
S. Lomalinda	15	15	24	12	16	8	9	5	25	12	15	156
S. Lome	2		2	2				2		1		9
S. Lomita	1	2	5	3	3		2	4	2	6	4	32
S. London	15	36	23	33	28	41	26	24	22	45	28	321
S. London var. 15+	3	1	1	4	2	1						12
S. Losangeles				1								1
S. Loubomo								1				1
S. Louga										1		1
S. Lovelace	1				1							2

**TABLE 3**  
***Salmonella isolates from Human sources***  
**by Serotype and Year, 1994-2004**

Serotype	Year											Total
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
S. Lowestoft										1		1
S. Luciana	4		1	3	3	6	8	2	6	4	4	41
S. Luke	2											2
S. Madelia	5	8	21	7	12	12	16	3	4	6	6	100
S. Magwa					1	1						2
S. Maiduguri					1							1
S. Malstatt			2				1	1				4
S. Mampeza			1									1
S. Manchester						1	1	1		1		4
S. Mango						1						1
S. Manhattan	92	72	101	99	73	78	72	50	89	53	80	859
S. Mapo		1								1		2
S. Maracaibo									2			2
S. Marburg										1		1
S. Marshall								1				1
S. Maryland				1	1							2
S. Massenya										1		1
S. Matadi	20	10	27	9	4	2	9	3	5	4	2	95
S. Matopeni					2			1				3
S. Maumee							1				1	2
S. Mbandaka	118	154	223	189	147	231	157	163	171	173	164	1890
S. Meekatharra								1				1
S. Meleagridis	12	30	207	43	39	14	13	19	6	14	8	405
S. Meleagridis var. 15+		1				1						2
S. Memphis			1	1		1					2	5
S. Menden						1						1
S. Mendoza	1				1	3	1		2		1	17
S. Menston					1				2		2	5
S. Mgulani			2			2				1		5
S. Miami	126	74	52	76	99	95	81	68	130	66	103	970
S. Michigan	3	8	1		2	2	1	1		2	6	26
S. Mikawasima	1	7		2		4	6	3	5	4	1	33
S. Milwaukee								4				4
S. Mim											1	1
S. Minnesota	13	36	28	26	17	23	21	18	35	25	34	276
S. Mississippi	152	199	180	205	314	248	286	336	315	451	558	3244
S. Mkamba											1	1
S. Moero		2										2
S. Molade	1				1	1		4		2		9
S. Mono	1	1			1			2		2		7
S. Mons			2						1			3
S. Monschauai	9	9	11	10	3	5	5	7	5	13	21	98
S. Montevideo	631	685	1227	718	829	851	841	630	729	890	870	8901
S. Morehead	1	2										3
S. Morocco									1			1

**TABLE 3**  
***Salmonella isolates from Human sources***  
**by Serotype and Year, 1994-2004**

Serotype	Year											Total
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
S. Morotai				1							1	2
S. Moscow			1		4			1				6
S. Moualine								1				1
S. Moundou						1						1
S. Mountpleasant		1		1	1			1		1		5
S. Mowanjum	1		2									3
S. Mpouto	1			1								2
S. Muenchen	559	754	595	543	639	1332	642	586	603	795	739	7787
S. Muenster	100	87	96	73	68	65	113	64	49	70	59	844
S. Muenster var. 15+		4	1	1	1			1	1	9	2	20
S. Muenster var. 15+, 34+				1	2	4	2		1			10
S. Mundonobo							1					1
S. Nagoya	1			1					1	1		4
S. Namibia			1									1
S. Napoli			1			2	2		1		1	7
S. Narashino		1	1	1								3
S. Nchanga					1		1			2		4
S. Ndolo								1				1
S. Nessziona				4			1	2			1	8
S. Neukoelln											1	1
S. Newlands			1									1
S. Newmexico	2			1			4	2	2	10	3	24
S. Newport	1673	2566	1985	1584	2273	2618	3074	3168	4251	4000	3325	30517
S. Newrochelle		2	1	1	1	1						6
S. Newyork			3	4		1						8
S. Ngili	1								2			3
S. Ngor						2						2
S. Nieukerk										1		1
S. Nigeria			1				1			1	2	5
S. Nikolaifleet								1				1
S. Nima	1	1	4	1	5	1	5	6	13	2	5	44
S. Nitra			3			1		1		2		7
S. Nola			1	1				1				3
S. Norwich	98	51	52	56	67	74	69	96	106	121	106	896
S. Nottingham	3	3	3	5	2		4	2	1	11	1	35
S. Nyanza									1		1	2
S. Nyborg										1		1
S. Oakland	4	1	4			1	1	1	1	3		16
S. Obogu									2			2
S. Oerlikon	1											1
S. Offa									1			1
S. Ohio	101	105	67	100	79	78	85	64	58	49	74	860
S. Ohio var. 14+	2							1				3
S. Ohlstedt											1	1
S. Okatie			1	1						4		6

**TABLE 3**  
***Salmonella isolates from Human sources***  
**by Serotype and Year, 1994-2004**

Serotype	Year											Total
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
S. Oldenburg					1	1			1	1		4
S. Ondersteport		1	2			1	2	1	2	2		11
S. Onireke	1	1										2
S. Ontario						1						1
S. Oranienburg	602	595	690	623	693	616	563	598	607	589	495	6671
S. Oranienburg var. 14+									2	11	2	15
S. Orientalis		2	6		1	2	5		1	8	2	27
S. Orion	1	1	6	3	1		3	3		5	3	26
S. Orion var. 15+	2	1			1	1		2	1		1	9
S. Orion var. 15+, 34+	2	1	1	2	2	4	2	1			1	16
S. Oritamerin							1	3	1		3	8
S. Oslo	14	13	31	25	31	28	20	23	19	21	25	250
S. Othmarschen	4	2	6	6	7	20	27	14	17	17	23	143
S. Ouakam	2	4			1			1		1		9
S. Oudwijk					1			1				2
S. Overschie		3	4	3	3	2	1	1	1	2		20
S. Oxford											1	1
S. Oyonnax							1					1
S. Pakistan			2	4		6	3	5	5	4	5	34
S. Panama	163	173	148	144	119	132	158	162	153	184	150	1686
S. Papua		1		1				1				3
S. Paratyphi A	79	86	86	72	84	77	93	86	107	110	145	1025
S. Paratyphi B	228	241	298	159	189	172	120	180	124	215	239	2165
S. Paratyphi B var. L(+) tartrate+	172	268	289	184	248	316	468	467	442	342	354	3550
S. Paratyphi C	2	2	1	1		1		1			2	10
S. Patience				1					1			2
S. Penarth							1	1				2
S. Pensacola	3	11	4	7	5	8	10	8	8	2	4	70
S. Pharr						1						1
S. Planckendael				1								1
S. Plymouth		1	1									2
S. Poano	6	2	5				2		8	9	6	38
S. Pomona	6	23	29	43	20	28	26	38	61	68	70	412
S. Poona	376	531	415	294	346	249	337	331	283	211	234	3607
S. Portland											1	1
S. Potsdam	6	5	3	10	6	9	2	6	4	9	4	64
S. Praha	3	1				1	1			1		7
S. Putten	1	8	6	5	9	3	2	9	4	12	4	63
S. Quebec					1							1
S. Quiniela	2			1	1						2	6
S. Ramatgan	1					1						2
S. Raus	1	2	3		3	3						12
S. Reading	257	197	131	167	81	97	95	53	81	90	74	1323
S. Rechovot								1		1		2
S. Redlands			1	1						1		3

**TABLE 3**  
**Salmonella isolates from Human sources**  
**by Serotype and Year, 1994-2004**

Serotype	Year											Total
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
S. Regent		2										2
S. Remo		1	2		1	2		3			1	10
S. Richmond	3	7	6	7	4	2	7	6	11	6	6	65
S. Ridge					1			3	1			5
S. Riggil								1				1
S. Riogrande		1				1						2
S. Rissen	10	4	5	9	6	6	10	4	7	7	7	75
S. Rittersbach									1	1		2
S. Romanby		5	5	4	1	6	5	1	1	1	1	30
S. Roodepoort				1	2	2	1	1	2	6	3	18
S. Rostock			1					2				3
S. Rottnest						1						1
S. Rubislaw	77	83	71	81	88	98	76	66	83	103	104	930
S. Ruiru						1		1				2
S. Ruzizi						1			1			2
S. Saarbruecken					1				1			2
S. Saboya					1							1
S. Saintemarie											1	1
S. Saintpaul	479	467	562	436	479	472	548	471	548	838	692	5992
S. Salford							1					1
S. Sandiego	82	117	56	59	55	104	142	115	148	126	110	1114
S. Sandow	2											2
S. Sangalkam											1	1
S. Sangera	2	1							1			4
S. Sanjuan						2	3					5
S. Sanktgeorg								1				1
S. Santiago		1	1			1				2	1	6
S. Sao			1									1
S. Sapele									1			1
S. Saphra	6	11	11	41	16	13	14	11	4	12	4	143
S. Sarajane					1							1
S. Schleissheim	1	5	9	6	8	6	7	4	7	8	3	64
S. Schoeneberg				1				1				2
S. Schwarzengrund	167	162	157	144	124	155	113	104	99	181	147	1553
S. Schwerin				1								1
S. Sculcoates					1							1
S. Seegefeld							1					1
S. Sekondi									1			1
S. Selby										1		1
S. Sendai		1			2	1	1		1			6
S. Senegal							1	2	1	1		5
S. Senftenberg	130	91	167	180	143	120	148	143	128	99	101	1450
S. Seremban			1	1			1	1	1		2	7
S. Serrekunda					1							1
S. Shamba				1								1

**TABLE 3**  
***Salmonella isolates from Human sources***  
**by Serotype and Year, 1994-2004**

Serotype	Year											Total
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
S. Shangani			1									1
S. Sharon		1										1
S. Sherbrooke							1					1
S. Shipley											2	2
S. Shubra	3	9	2	3	4	7	5	3	7	3	2	48
S. Simi		2							1			3
S. Singapore	4	4	12	3	12	4	6	1	2	2	10	60
S. Sinstorf	1	9	4	8	1	3	3	7		2	1	39
S. Skansen		1			1							2
S. Soahanina	1	1		1			1					4
S. Soerenga	1		6	1		2	2	3	1	1	3	20
S. Somone	1		5	3	1	1		1	3			15
S. Soumbedioune	4											4
S. Southampton						1	1					2
S. Southbank			1									1
S. Spalentor											2	2
S. Stachus			1	3		2	1				1	8
S. Stanley	217	481	200	164	193	172	239	173	177	227	189	2432
S. Stanleyville	5	51	26	24	16	11	33	18	18	3	6	211
S. Stellingen	1	2		3	1					1	1	9
S. Stendal		1										1
S. Sterrenbos	1	1										2
S. Stockholm						4	2					6
S. Stoneferry										1	1	2
S. Stormont										1		1
S. Strasbourg			1					1				3
S. Suberu				1	1					1		3
S. Sueeldorf						1				2	1	4
S. Sundsvall	5	17	25	47	7	4	4	4	7	11	6	137
S. Sya							1					1
S. Szentes									1			1
S. Tafo						1						1
S. Takoradi		1	4	5	4	4			1	6	5	30
S. Taksony			5	1								6
S. Tallahassee	2	6	5	18	8	5	3	2	4	8	3	64
S. Tamale	1		2									3
S. Tambacounda		3		1	1	1	1					7
S. Tampico						2			1			3
S. Tananarive		1										1
S. Tanger		1						1		2		4
S. Teddington									1			1
S. Teko					1							1
S. Tel Aviv		1			1		1					3
S. Tel el kebir	8	4	13	12	26	16	14	11	11	21	29	165
S. Teltow										1		1

**TABLE 3**  
***Salmonella isolates from Human sources***  
**by Serotype and Year, 1994-2004**

Serotype	Year											Total
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
S. Tennessee	156	112	96	31	63	29	24	33	36	42	54	676
S. Texas			1									1
S. Thies						1						1
S. Thompson	549	625	586	696	571	607	609	514	442	509	493	6201
S. Thompson var. 14+											1	1
S. Tienba					1							1
S. Tilene	1	4	7	2		1	2		2	4		23
S. Tokoin		3					4			2		9
S. Toowong				1								1
S. Tornow								2		2	3	7
S. Toucra	2	3	3				1		2	2	3	16
S. Trachau				1						1		2
S. Travis				1		1		1			2	5
S. Treforest								2				2
S. Tripoli											2	2
S. Troy					1							1
S. Tsevie	1	1	1					2				5
S. Tshiongwe	3	2	4				2		2	2	1	16
S. Tucson	2	2	1	3		1			1		1	11
S. Typhi	507	442	440	349	382	352	399	344	293	362	306	4176
S. Typhimurium	7972	9147	9001	8291	8101	7126	6495	6061	6312	5905	5859	80270
S. Typhimurium var. 5-	393	555	499	827	718	926	933	979	828	865	983	8506
S. Typhisuis				3				1			2	6
S. Tyresoe			1								1	2
S. Uccle				1	3		2			1		7
S. Uganda	19	28	63	51	44	58	55	97	61	59	45	580
S. Uganda var. 15+	2	4	7	6	1	3	4	1	3	2	1	34
S. Ughelli							1					1
S. Ullevi				1								1
S. Umhlali							1					1
S. Uppsala		1	1		1		1				1	5
S. Urbana	63	72	60	57	46	56	38	53	41	60	59	605
S. Uzaramo	1	6			3	1	2	1		3	5	22
S. Valdosta										2		2
S. Vancouver	3	1										4
S. Vejle		2		2	1	1		1	1	2	4	14
S. Vejle var. 15+										1		1
S. Veneziana								1				1
S. Victoria	3	1	3	2	1			1	1			12
S. Vietnam		1										1
S. Vilvoorde		1	2	1								4
S. Virchow	54	60	67	71	64	70	104	80	61	78	79	788
S. Virginia		7	7	2		10	1	5	4	3	10	49
S. Vitkin								1				1
S. Volkmarsdorf											1	1

**TABLE 3**  
***Salmonella isolates from Human sources***  
**by Serotype and Year, 1994-2004**

Serotype	Year											Total
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
S. Vrdi		1										1
S. Wa			1			1						2
S. Wagenia							1			1		2
S. Wandsworth	5	14	6	5		9	12	3	5	6	2	67
S. Wangata	1	1		1	1		2		1		3	10
S. Waral	1	1		1					1	2		6
S. Warnow									2	1		3
S. Washington	1	2	1	3		1				1		9
S. Waycross	2		4	4	2	2	5	4	1	2	2	28
S. Wayne		2	1	1								4
S. Welikade	1			1	1	1		3	1		1	9
S. Weltevreden	86	89	86	106	67	54	59	89	65	71	94	866
S. Weltevreden var. 15+	3				1	1	1	3			2	11
S. Wentworth											4	4
S. Wernigerode					3			1				4
S. Weslaco	1	1			2	1				1		6
S. Westerstede						1						1
S. Westhampton	2	3	6	5	3	2		3	5	8	6	43
S. Westhampton var. 15+	3		1			2						6
S. Weston										1		1
S. Westphalia	1											1
S. Wichita	1									1		2
S. Widemarsh			3	2		1			2	4	1	13
S. Wien	3	1				1	1	3				9
S. Wil			1			1					1	3
S. Willamette											1	1
S. Willemstad		1		1								2
S. Winneba						1			1		1	3
S. Wippa	2											2
S. Wisbech			2									2
S. Woodinville									2		2	2
S. Worthington	44	50	58	48	38	28	28	29	27	17	34	401
S. Yarrabah			1									1
S. Yeerongpilly			1									1
S. Yehuda										1		1
S. Yoruba					1				1	1		3
S. Yovokome						1				1		2
S. Yendum									1			1
S. Zaiman		1					1					2
S. Zanzibar	3	2	2	2	1	1			2			13
S. Zerifin										3		3
S. I 1,3,19:-:1,7					1							1
S. I 3,10:e,h:-							5	6	2			13
S. I 3,10:l,v:-									1			1
S. I 3,10:l,z13:-							2	3				5

**TABLE 3**  
**Salmonella isolates from Human sources**  
**by Serotype and Year, 1994-2004**

Serotype	Year											Total
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
S. I 3,10:r:-							2					2
S. I 3,15,34:l,v:-									1			1
S. I 3,15:l,z13:-										1		1
S. I 4,12:-:1,7									1			1
S. I 4,[5],12:-:1,2			2	7	1	2	3	3	4	3	3	28
S. I 4,[5],12:-:1,5		1										1
S. I 4,[5],12:b:-	5	8	17	5	8	8	4	12	24	50	141	
S. I 4,[5],12:d:-			1				3	5				9
S. I 4,[5],12:e,h:-				2		2			2	2		8
S. I 4,[5],12:i:-	45	96	189	176	138	233	260	296	548	739	2720	
S. I 4,[5],12:r:-	3	2	3				1	1	4	17	31	
S. I 4,[5],12:z:-				1								1
S. I 6,14,24:e,h:-										1		1
S. I 6,14,25:b:-		1									2	3
S. I 6,7:-:1,2								1				1
S. I 6,7:-:1,5	1	12	1	2	2	3	4	9	31	16	81	
S. I 6,7:-:1,6									1			1
S. I 6,7:b:-							1				1	2
S. I 6,7:c:-				1							1	2
S. I 6,7:e,h:-		3						2	1			6
S. I 6,7:k:-	2		6	2	1	1	3	2	5	3	25	
S. I 6,7:l,v:-								2				2
S. I 6,7:l,w:-							2	1				3
S. I 6,7:l,w:z33						1						1
S. I 6,7:r:-										1	1	
S. I 6,7:z10:-		2	2									4
S. I 6,7:z4,z23:-								1				1
S. I 6,8:-:1,2				1	1	1	1			1		5
S. I 6,8:-:1,5						2		1				3
S. I 6,8:-:e,n,x										1		1
S. I 6,8:d:-		1	1		2	1		3	1	1	10	
S. I 6,8:e,h:-			2	1			1		2	3	9	
S. I 6,8:i:-						2						2
S. I 6,8:z10:-	1							1				2
S. I 9,12:-:1,5		2				1	2	5	1	1	12	
S. I 9,12:a:-								1				1
S. I 9,12:l,v:-	1			1				3	1			6
S. I 9,12:l,z28:-	5	5	8	4	6	9	6	12	15	1	71	
S. I 11:e,h:-										1		1
S. I 11:r:-									2			2
S. I 13,22:-:1,6						1						1
S. I 13,22:b:-							1	2				3
S. I 13,23:-:1,5										1	1	
S. I 13,23:b:-	1	1							4	3	9	
S. I 13,23:i:-					1			1				2

**TABLE 3**  
**Salmonella isolates from Human sources**  
**by Serotype and Year, 1994-2004**

Serotype	Year											Total
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
S. I 16:d:-							1					1
S. I 16:e,h:-										1		1
S. I 16:l,v:-					3							3
S. I 38:k:-				1							1	2
S. I 40:-e,n,x											2	2
S. I 45:b,z33						1						1
S. I 47:z4,z23:-							1				1	2
S. II 3,10:g,t:-	1											1
S. II 3,10:m,t:e,n,x	1											1
S. II 4,12,[27]:b:[e,n,x]				2	1			1		1	1	6
S. II 4,12,[27]:e,n,x:1,[5],7	1											1
S. II 4,12,[27]:z:e,n,x						1						1
S. II 4,12:-1,6											1	1
S. II 4,12:a:-								1				1
S. II 4,12:l,w:e,n,x	11	4	2		1	3	4					25
S. II 6,7:l,z28:1,5:[z42]					1							1
S. II 6,7:m,t:-										1		1
S. II 6,7:z39:1,5,7										1		1
S. II 9,12:b:-											1	1
S. II 9,12:d:e,n,x										1		1
S. II 9,12:g,m,[s],t:[1,5,7]:[z42]		4		1		1		5	1	2		14
S. II 9,12:g,s,t:e,n,x									1			1
S. II 9,12:l,w:e,n,x									1			1
S. II 9,12:l,z28:1,5							1					1
S. II 9,12:m,t:e,n,x				1								1
S. II 9,12:z39:1,7							2					2
S. II 9,46:g,[m],[s],t:[e,n,x]						1						1
S. II 9,46:m,t:e,n,x										1		1
S. II 11:g,[m],s,t:z39								1				1
S. II 11:m,t:e,n,x							1					1
S. II 13,22:g,m,t:[1,5]	1	1	1									3
S. II 13,22:z29:1,5									1	3		4
S. II 13,23:a:z42		2	1									3
S. II 13,23:b:[1,5]:z42			1									1
S. II 13,23:g,m,[s],t:[e,n,x]						1			1			2
S. II 13,23:z:1,5			1				1					2
S. II 16:l,w:z6		1										1
S. II 16:z35:e,n,x										1		1
S. II 16:z4,z23:-		1										1
S. II 17:g,t:-							2					2
S. II 17:g,t:[e,n,x,z15]						1		1				2
S. II 21:b:1,5										3		3
S. II 21:z10:[z6]						1	2					3
S. II 30:l,z28:z6										1		1
S. II 35:g,m,s,t:-								1				1

**TABLE 3**  
**Salmonella isolates from Human sources**  
**by Serotype and Year, 1994-2004**

Serotype	Year											Total
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
S. II 35:z29:e,n,x										1		1
S. II 40:c:e,n,x,z15							1					1
S. II 40:m,t:-									1			1
S. II 40:z4,z24:z39		1				1				1		3
S. II 41:z10:1,2	1	1										2
S. II 41:z10:z6						1			1			2
S. II 42:b:e,n,x,z15			1						1			2
S. II 42:g,t:-		1										1
S. II 43:b:-			1									1
S. II 47:b:1,5	3	9	9	5	4	6	6	2		5	1	50
S. II 47:d:1,5				1								1
S. II 47:d:z39		3					2		4			9
S. II 48:a:z39				1								1
S. II 48:a:z6								2	2	1		5
S. II 48:b:z6		2								1		3
S. II 48:d:1,2											1	1
S. II 48:d:z6		1	1	1		1	3		4		1	12
S. II 48:g,m,t:-						1						1
S. II 48:k:z39					1				1			2
S. II 48:z81:z39										1	2	3
S. II 50:b:z6		2	1	1	4	1	1	2	4	4	2	22
S. II 58:d:z6				1			1	1			1	4
S. II 58:l,z13,z28:z6		1	1	2	2						1	7
S. II 60:g,m,t:z6				1								1
S. IIIa 17:z4,z23:-									1			1
S. IIIa 18:z4,z23:-									1	7	4	12
S. IIIa 18:z4,z32:-			1							2		3
S. IIIa 21:g,z51:-				1			1		1			3
S. IIIa 35:z29:-											1	1
S. IIIa 40:g,z51:-							1			2		3
S. IIIa 40:z4,z23:-					1		1	1				3
S. IIIa 41:z4,z23:-		1	1	3			1		4	2	11	23
S. IIIa 42:z4,z23:-				1								1
S. IIIa 43:z29:-								1				1
S. IIIa 44:z4,z23:-					13		5				1	19
S. IIIa 44:z4,z24:-										1		1
S. IIIa 45:z4,z24:-									1			1
S. IIIa 47:g,z51:-					1							1
S. IIIa 47:z4,z23:-			2	3								5
S. IIIa 48:g,z51:-		2		1		3	4	2	7	4	3	26
S. IIIa 48:z29:-									1			1
S. IIIa 48:z36:-								1				1
S. IIIa 48:z4,z23:-		1		2					2			5
S. IIIa 48:z4,z24:-			1	1		1	2	2		3		10
S. IIIa 48:z4,z32:-					1							1

**TABLE 3**  
***Salmonella isolates from Human sources***  
**by Serotype and Year, 1994-2004**

Serotype	Year											Total
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
S. IIIa 51:z4,z23:-				1	1	1			1		2	6
S. IIIa 51:z4,z24:-										1		1
S. IIIa 53:g,z51:-			1			1						2
S. IIIa 53:z4,z23,z32:-						4	2					6
S. IIIa 53:z4,z23:-			1		2						1	4
S. IIIa 53:z4,z24:-								1				1
S. IIIa 56:z4,z23:-			1			1						2
S. IIIa 59:z29:-										1		1
S. IIIa 59:z36:-										1		1
S. IIIa 59:z4,z23:-			1									1
S. IIIa 62:z4,z23:-									1			1
S. IIIb 16:z10:e,n,x,z15			1	1		1	1	2	2	1	9	
S. IIIb 16:z10:e,n,z15					1							1
S. IIIb 17:l,v:e,n,x,z15										1		1
S. IIIb 17:z10:e,n,x,z15									1		1	2
S. IIIb 18:l,[v],[z13]:z											1	1
S. IIIb 18:l,v:z											3	3
S. IIIb 35:l,v:z35		1	2					1		1		5
S. IIIb 35:r:e,n,x,z15			1									1
S. IIIb 38:(k):z35						1		1	2			4
S. IIIb 38:k:z53		2										2
S. IIIb 38:l,v:z53			1			1	1					3
S. IIIb 47:k:e,n,x,z15			1									1
S. IIIb 47:k:z35			1	1	1	1			2		1	7
S. IIIb 47:k:z53				1								1
S. IIIb 47:r:z53										1		1
S. IIIb 48:c:z						1		1		2		4
S. IIIb 48:i:z		1	4	3		1	3	2	1	2	3	20
S. IIIb 48:r:z											1	1
S. IIIb 48:z52:z			1				1			1	1	4
S. IIIb 50:k:e,n,x,z15					1							1
S. IIIb 50:k:z						1	1	1		4	6	3
S. IIIb 50:k:z53									1			1
S. IIIb 50:l,v:z35											1	1
S. IIIb 50:r:-								1				1
S. IIIb 50:r:z				1					2	1	3	7
S. IIIb 50:r:z35		1										1
S. IIIb 50:z52:z35									1	1	1	3
S. IIIb 50:z52:z53				1								1
S. IIIb 50:z:z52					2			1	1	1		5
S. IIIb 53:k:e,n,x,z15					1							1
S. IIIb 53:k:z										1		1
S. IIIb 58:z52:z35					1						1	2

**TABLE 3**  
**Salmonella isolates from Human sources**  
**by Serotype and Year, 1994-2004**

Serotype	Year											Total
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
S. IIIb 60:r:z			1	2	1	1	1		1	2	1	10
S. IIIb 60:r:z53				1								1
S. IIIb 60:z52:z53								1				1
S. IIIb 61:(k):z53								1				1
S. IIIb 61:-1,5,[7]				1			2	1		2	1	7
S. IIIb 61:c:-										1		1
S. IIIb 61:c:z35		2	1		2			2	1	2	1	11
S. IIIb 61:i:z		1		1					1	1		4
S. IIIb 61:i:z53					1							1
S. IIIb 61:k:1,5			5	1			2					8
S. IIIb 61:k:1,5,(7)						4		3		1		8
S. IIIb 61:k:z35		1										1
S. IIIb 61:l,[v],[z13]:-									1			1
S. IIIb 61:l,[v],[z13]:1,5,[7]				1	2	3			17	2	2	27
S. IIIb 61:l,[v],[z13]:z35										3	1	4
S. IIIb 61:l,v:1,5,7				3								3
S. IIIb 61:r:z								1			1	2
S. IIIb 61:r:z53					1			2	1	1		5
S. IIIb 61:z52:z53					1					1	1	3
S. IIIb 65:(k):z	1	1	3		1							6
S. IIIb 65:i:e,n,x,z15				1								1
S. IIIb 65:l,v:z35	1											1
S. IIIb 65:l,v:z53				2								2
S. IV 6,7:g,z51:-		1										1
S. IV 6,7:z4,z23:-	1	1	2	3	1		2	1		1		12
S. IV 6,7:z4,z24:-	3	10	16	4	14	4	15	7	9	8	2	92
S. IV 11:z4,z23:-	4	7	7	2	4	2		2	1	1		30
S. IV 16:z4,z23:-	1			2		1						4
S. IV 16:z4,z32:-	9	12	11	8	8	6	13	20	11	4	3	105
S. IV 18:z36,z38:-				1								1
S. IV 21:g,z51:-									1			1
S. IV 21:z4,z23:-							1					1
S. IV 38:z4,z23:-				1								1
S. IV 38:z4,z23:-							1					1
S. IV 40:g,z51:-		1										1
S. IV 40:z4,z32:-						2	2					4
S. IV 43:g,z51:-		1										1
S. IV 43:g,z36,z38:-	1		2				1				1	5
S. IV 43:z4,z23:-	7	3	21	1	6	10	3	5		3	7	66
S. IV 43:z4,z32:-		1	1	2	1				2			7
S. IV 44:z36,[z38]:-		1							4	2	1	8
S. IV 44:z36:-								1				1
S. IV 44:z4,z23:-		5	8	6	7	17	4	5	15	14	7	88
S. IV 44:z4,z24:-					3		1	1			2	7
S. IV 44:z4,z32:-		2	4			2	1		3		1	13

**TABLE 3**  
***Salmonella isolates from Human sources***  
***by Serotype and Year, 1994-2004***

Serotype	Year											Total
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
S. IV 45:g,z51:-		9	8	10	3	1	4	5	1	8	8	57
S. IV 48:g,z51:-	53	77	84	41	48	46	46	46	42	30	13	526
S. IV 48:z4,z23:-										2		2
S. IV 48:z4,z32:-							1	1		1	1	4
S. IV 50:g,z51:-	19	29	18	15	6	14	6	16	23	9	9	164
S. IV 50:z4,z23:-	32	39	34	43	56	64	59	14	7	6	7	361
S. IV 50:z4,z32:-		1	1		1							3
S. IV 51:z4,z23:-					1							1
<i>S. bongori</i> ser. 44:z39:-				1								1
<i>S. bongori</i> ser. 48:z35:-	1	2	1				1				1	6
<i>S. bongori</i> ser. 66:z81:-											1	1
Partially serotyped isolates	1488	1250	1161	696	829	914	1013	1288	1244	1362	1328	12573
Rough or nonmotile isolates		24	36	25	35	4	14	21	48	52	61	320
Unknown	1468	941	667	361	497	385	634	573	2530	3610	2053	13719
Total	37507	41222	39035	34607	33971	32826	33555	31876	34911	37442	35661	392613

**TABLE 3a**  
***Salmonella* partially serotyped isolates from Human sources  
by Serotype and Year, 1994-2004**

Serotype	Year												Total
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004		
Group 51			1					2					3
Group 52			2										2
Group 53	2	1	5	1	1		1	1	1				13
Group 54		1											1
Group 56			3					1					4
Group 58		2		1		1	1	1		1			7
Group 59	2												2
Group 60	3	1	4	1	1		1						11
Group 62						1							1
Group 63						1							1
Group 65	1	1	1					1	1	1			6
Group F	6	3	5	2	6		2	46	7	1	10		88
Group G	34	72	41	8	17	17	18	30	22	1	11		271
Group H	2	1	2		1	2	5		5	1			19
Group I	10	5	5	2	40	44	4	5	2	2	1		120
Group J		1	1			1		8	2	1			14
Group K	2	3	5	1	3	4	3	4	4	2			31
Group L	3	2			1		1	2	1				10
Group M								1	3		4		8
Group N			1		1			1	2				5
Group O	3	2	3		1	4	1	5	6		1		26
Group P	4	3	1	1	1		2	1	3	1	1		18
Group Q				1	1	2							4
Group R	1	2	3		2	1	8	6	3	1	1		28
Group S	5	4	4	2	1	1	3	5		1			26
Group T			1										1
Group U	2	2	3	1			1						9
Group V	6	11	19	17	5	5	2	9	10	5	4		93
Group W	24	8	13	1	2	2		4	4	1	2		61
Group X	1	1	5	3		3		1					14
Group Y	14	10	10	4	4	10	8	13	11	5	1		90
Group Z	18	14	14	8	3	10	17	99	72	4	18		277
Subspecies I	23	26	18	10	45	77	76	43	53	99	158		628
Subspecies I, Group A	7	4	3	1	2	4		2	4	4	1		32
Subspecies I, Group B	566	537	474	293	394	366	503	430	561	447	404		4975
Subspecies I, Group C1	136	104	107	88	77	135	87	108	112	160	142		1256
Subspecies I, Group C2	200	109	102	62	47	46	36	103	87	213	151		1156
Subspecies I, Group D1	254	168	170	105	106	79	95	199	140	257	269		1842
Subspecies I, Group D2		1	3	1		1	1		1	1	3		12
Subspecies I, Group E1	21	20	23	15	15	17	39	55	24	39	35		303
Subspecies I, Group E4	3		2	2	1	2		1		9	6		26
Subspecies I, Group O:30									1				1
Subspecies I, Group O:35									1				1
Subspecies I, Group O:48										2			2
Subspecies II	9	7	21	7	4	5	8	10	5	2	5		83

**TABLE 3a**  
***Salmonella* partially serotyped isolates from Human sources**  
**by Serotype and Year, 1994-2004**

Serotype	Year												Total
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004		
Subspecies IIIa	21	18	11	5	12	16	11	16	11	17	24		162
Subspecies IIIa, Group O:13											1		1
Subspecies IIIa, Group O:63									1				1
Subspecies IIIa/IIIb	60	36	31	22	13	19	36	41	40	32	25		355
Subspecies IIIb	21	24	13	9	6	9	18	6	21	26	18		171
Subspecies IIIb, Group O:35										1			1
Subspecies IIIb, Group O:38										1			1
Subspecies IIIb, Group O:47										1			1
Subspecies IIIb, Group O:57									1				1
Subspecies IIIb, Group O:61	11	17	10			4	2	5	2				51
Subspecies IV	13	28	20	21	16	25	22	23	19	23	33		243
Subspecies IV, Group O:11									1				1
Subspecies VI		1	1										2
Subspeices IIIb				1									1
Total	1488	1250	1161	696	829	914	1013	1288	1244	1362	1328		12573

**TABLE 4**  
***Salmonella isolates from Human sources***  
**by Serotype, Geographic Region and State, 2004**

Region=New England

Serotype	State						Total
	Connecticut	Maine	Massachusetts	New Hampshire	Rhode Island	Vermont	
S. Aberdeen			1	1			2
S. Abony	1						1
S. Adelaide	3		2				5
S. Agbeni	4		27	1	1		33
S. Agona	13		16	2	1	5	37
S. Alachua						1	1
S. Alagbon	1						1
S. Albany			1				1
S. Amsterdam				1			1
S. Amsterdam var. 15+			1				1
S. Anatum	1		15	2	1		19
S. Aqua				1			1
S. Bareilly	2		9	3	1		15
S. Berta	2		11		4		17
S. Blegdam			1				1
S. Blockley	3		6				9
S. Bonariensis	2						2
S. Bovismorbificans			1		1		2
S. Bradford			1				1
S. Braenderup	6	2	41	5	1	3	58
S. Brandenburg			1				1
S. Bredeney			2				2
S. Cerro					1		1
S. Chailey			1				1
S. Choleraesuis var. Kunzendorf	1		3				4
S. Claibornei			1				1
S. Coeln	1						1
S. Corvallis			2				2
S. Cubana	2		2				4
S. Daarle					1		1
S. Derby	2		3				5
S. Djugu						1	1
S. Dublin	1		1				2
S. Durban			4			2	6
S. Durham	1						1
S. Edinburg			1				1
S. Enteritidis	114	1	177	19	20	8	339
S. Eppendorf				1			1
S. Fluntern	2		1				3
S. Gaminara	1		6		3		10
S. Gatuni					1		1
S. Give	2		2				4
S. Give var. 15+				1			1
S. Glostrup			1				1

**TABLE 4**  
***Salmonella isolates from Human sources***  
**by Serotype, Geographic Region and State, 2004**

Region=New England

Serotype	State							Total
	Connecticut	Maine	Massachusetts	New Hampshire	Rhode Island	Vermont		
S. Goettingen			1					1
S. Haardt	1		1		1			3
S. Hadar	6		19	2	1	2		30
S. Haifa	3							3
S. Hartford	1	1	28	10		1		41
S. Heidelberg	17	3	57	7	7	1		92
S. Hemingford				1				1
S. Hvittingfoss			1					1
S. Indiana						1		1
S. Infantis	4		18		6	1		29
S. Irumu	1							1
S. Istanbul			1		1			2
S. Javiana	13		31	5	4	1		54
S. Kentucky	1							1
S. Kiambu			4					4
S. Kottbus			1	1				2
S. Litchfield	7		12	2	2	1		24
S. Livingstone					1			1
S. Lomalinda			1					1
S. London			1					1
S. Madelia			1					1
S. Manhattan	1		2					3
S. Mbandaka	2		4		1			7
S. Meleagridis				1				1
S. Miami	3		12	1	3			19
S. Mississippi	2		5	1	1			9
S. Monschau			2					2
S. Montevideo	8		30	1	2			41
S. Muenchen	5	1	19		5	1		31
S. Muenster			1	1				2
S. Muenster var. 15+			1					1
S. Newport	27	1	59	9	13	5		114
S. Norwich	1		1					2
S. Oranienburg	6		20	4	3			33
S. Orientalis			1					1
S. Orion			1					1
S. Oslo			1			1		2
S. Panama	6		5					11
S. Paratyphi A	3		9	1				13
S. Paratyphi B	3		3			1		7
S. Paratyphi B var. L(+) tartrate+	4		13		1			18
S. Pensacola			1					1
S. Pomona	4		1					5
S. Poona	2		11		4			17

**TABLE 4**  
***Salmonella isolates from Human sources***  
**by Serotype, Geographic Region and State, 2004**

Region=New England

Serotype	State							Total
	Connecticut	Maine	Massachusetts	New Hampshire	Rhode Island	Vermont		
S. Putten			1					1
S. Reading			4				1	5
S. Richmond			1					1
S. Rissen			1					1
S. Rubislaw			3					3
S. Saintpaul	10		19	6	1	2		38
S. Sandiego	1		4	2				7
S. Schwarzengrund	3		3					6
S. Senftenberg	1		3					4
S. Shubra					1			1
S. Stanley	7		5	1	1			14
S. Stanleyville			2					2
S. Takoradi			1		1			2
S. Tennessee			2					2
S. Thompson	9	1	19	2	1	3		35
S. Typhi	7		16		1			24
S. Typhimurium	100	2	143	15	17	8		285
S. Typhimurium var. 5-		1	89	6	17			113
S. Uganda			2		3	1		6
S. Urbana	2		3					5
S. Virchow	3		4		1	1		9
S. Wangata			1					1
S. Weltevreden	1		5					6
S. Worthington	2							2
S. I 4,[5],12:-;1,2			1					1
S. I 4,[5],12:b:-	4							4
S. I 4,[5],12:i:-	26		68	13	11	5		123
S. I 4,[5],12:r:-			2					2
S. I 6,7:r:-	1							1
S. I 13,23:b:-			1					1
S. II 48:d;z6			1					1
S. IIIa 41:z4,z23:-			1					1
S. IIIa 44:z4,z23:-			1					1
S. IIIB 16:z10:e,n,x,z15			1					1
S. IIIB 18:l,[v],[z13]:z			1					1
S. IIIB 47:k;z35				1				1
S. IIIB 48:i:z			1					1
S. IIIB 50:k:z				1				1
S. IIIB 58:z52:z35	1							1
S. IIIB 60:r:e,n,x,z15			1					1
S. IV 6,7:z4,z24:-			1					1
S. IV 43:z4,z23:-			1					1
S. IV 44:z4,z23:-	1							1
S. IV 44:z4,z32:-					1			1

**TABLE 4**  
***Salmonella isolates from Human sources***  
***by Serotype, Geographic Region and State, 2004***

Region=New England

Serotype	State						Total
	Connecticut	Maine	Massachusetts	New Hampshire	Rhode Island	Vermont	
S. IV 45:g,z51:-				1			1
S. IV 50:z4,z23:-				1			1
Partially serotyped isolates	2		4		2		8
Rough or nonmotile isolates	6		6		2		14
Unknown	10		1	7	1	2	21
<i>Total</i>	<b>493</b>	<b>13</b>	<b>1143</b>	<b>140</b>	<b>153</b>	<b>59</b>	<b>2001</b>

**TABLE 4**  
***Salmonella isolates from Human sources  
by Serotype, Geographic Region and State, 2004***

Region=Mid Atlantic

Serotype	States			
	New Jersey	New York	Pennsylvania	Total
S. Aberdeen			1	1
S. Abony		4		4
S. Adelaide		11	9	20
S. Africana		1		1
S. Agama		1		1
S. Agbeni	2	15	7	24
S. Agona	17	40	20	77
S. Alachua	2		4	6
S. Albany	1	3		4
S. Allerton		1		1
S. Amsterdam		1		1
S. Anatum	5	39	13	57
S. Anatum var. 15+	2			2
S. Apapa			1	1
S. Arechavaleta		2		2
S. Ati			2	2
S. Bailldon	1	1		2
S. Bardo	1			1
S. Bareilly	2	14	7	23
S. Berta	76	116	32	224
S. Bledgdam	1			1
S. Blockley	13	23	2	38
S. Bonn		1		1
S. Bovismorbificans		3	2	5
S. Braenderup	33	27	37	97
S. Brandenburg		10	1	11
S. Bredeney	1	5		6
S. Bron	3			3
S. Canada		1		1
S. Carmel			2	2
S. Carrau			1	1
S. Cerro		1		1
S. Chailey			1	1
S. Chester	3			3
S. Choleraesuis		7		7
S. Choleraesuis var. Decatur		1		1
S. Choleraesuis var. Kunzendorf			2	2
S. Corvallis	1			1
S. Cubana	1	1	1	3
S. Cuckmere		1		1
S. Daytona		2		2
S. Derby	5	10	6	21
S. Dublin	1	10		11
S. Durban		2		2

**TABLE 4**  
***Salmonella isolates from Human sources***  
***by Serotype, Geographic Region and State, 2004***

Region=Mid Atlantic

Serotype	States			
	New Jersey	New York	Pennsylvania	Total
S. Ealing			2	2
S. Eastbourne		2		2
S. Edinburg		1		1
S. Emek			4	4
S. Enteritidis	170	646	477	1293
S. Essen		1		1
S. Fluntern			1	1
S. Freetown		1		1
S. Friedrichsfelde			2	2
S. Gaminara	1	10	5	16
S. Gatuni	2			2
S. Give	2	5		7
S. Give var. 15+			1	1
S. Haardt	1	22		23
S. Hadar	8	39	22	69
S. Hartford		9	2	11
S. Havana	1	1		2
S. Heidelberg	47	267	70	384
S. Herston		1	1	2
S. Hindmarsh		5		5
S. Hoghton			1	1
S. Hvittingfoss		6	1	7
S. Ibadan	1			1
S. Indiana		2	4	6
S. Infantis	12	45	15	72
S. Inganda		1		1
S. Inverness	1		2	3
S. Irumu		3		3
S. Isangi		1	2	3
S. Israel		1		1
S. Istanbul	4	49		53
S. Javiana	26	46	280	352
S. Johannesburg		15		15
S. Jubilee		1		1
S. Kaapstad	1			1
S. Kedougou	1	2		3
S. Kentucky	1	11	1	13
S. Kiambu	2	3	3	8
S. Kingston		1		1
S. Kintambo		3	1	4
S. Kua		1		1
S. Lansing		2		2
S. Litchfield	6	5	10	21
S. Lomalinda			4	4

**TABLE 4**  
***Salmonella isolates from Human sources  
by Serotype, Geographic Region and State, 2004***

Region=Mid Atlantic

Serotype	States				
	New Jersey	New York	Pennsylvania	Total	
S. London	1	2		3	
S. Madelia	1		1	2	
S. Manhattan	1	3		4	
S. Mbandaka	2	18	5	25	
S. Meleagridis		2		2	
S. Mendoza		1		1	
S. Miami	3	7	4	14	
S. Michigan			2	2	
S. Minnesota	2	4		6	
S. Mississippi		11	4	15	
S. Monschau	1		4	5	
S. Montevideo	15	77	49	141	
S. Muenchen	12	49	24	85	
S. Muenster	7	6	4	17	
S. Newport	56	196	138	390	
S. Norwich	4		2	6	
S. Nyanza		1		1	
S. Ohio	2	3	3	8	
S. Ohlstedt		1		1	
S. Oranienburg	13	18	28	59	
S. Orion var. 15+, 34+	1			1	
S. Oslo	3	1		4	
S. Othmarschen		9		9	
S. Pakistan	1			1	
S. Panama	2	25	3	30	
S. Paratyphi A	12	29	7	48	
S. Paratyphi B	1	3	10	14	
S. Paratyphi B var. L(+) tartrate+	12	32	29	73	
S. Paratyphi C		2		2	
S. Pomona	3	16	3	22	
S. Poona	9	34	10	53	
S. Reading		4		4	
S. Rubislaw	2	6		8	
S. Saintpaul	18	85	46	149	
S. Sandiego	1	13	7	21	
S. Schwarzengrund	5	46	2	53	
S. Selby		1		1	
S. Senftenberg	2	6	12	20	
S. Seremban		2		2	
S. Singapore		1		1	
S. Soerenga			2	2	
S. Stanley	7	26	6	39	
S. Stanleyville		1		1	
S. Sueeldorf	1			1	

**TABLE 4**  
***Salmonella isolates from Human sources***  
**by Serotype, Geographic Region and State, 2004**

Region=Mid Atlantic

Serotype	States				
	New Jersey	New York	Pennsylvania	Total	
S. Sundsvall			5	5	
S. Tallahassee			1	1	
S. Telelkebir	2	1	2	5	
S. Tennessee	1	7		8	
S. Thompson	5	45	40	90	
S. Tornow		1		1	
S. Travis		2		2	
S. Typhi	15	53	26	94	
S. Typhimurium	103	574	476	1153	
S. Typhimurium var. 5-	81			81	
S. Uganda	1	7	1	9	
S. Urbana		7	4	11	
S. Vejle	1			1	
S. Virchow	2	10		12	
S. Virginia		2		2	
S. Weltevreden	1	4	3	8	
S. Wentworth			4	4	
S. Winneba		1		1	
S. Worthington		6	1	7	
S. Zerifin			2	2	
S. I 4,[5],12:b:-	5	13		18	
S. I 4,[5],12:i:-	44	148		192	
S. I 4,[5],12:r:-		10		10	
S. I 6,7:-:1,5	1	9		10	
S. I 6,7:c:-		1		1	
S. I 6,8:d:-	1			1	
S. I 6,8:e,h:-	3			3	
S. II 4,12,[27]:b:[e,n,x]	1			1	
S. II 50:b:z6			1	1	
S. IIIa 41:z4,z23:-		1		1	
S. IIIb 61:c:z35	1			1	
S. IV 16:z4,z32:-	1			1	
S. IV 48:g,z51:-			1	1	
S. IV 48:z4,z32:-	1			1	
S. IV 50:g,z51:-			3	3	
S. IV 50:z4,z23:-	2			2	
Partially serotyped isolates	2	13	23	38	
Rough or nonmotile isolates	2	4		6	
Unknown		29	6	35	
<b>Total</b>	<b>934</b>	<b>3251</b>	<b>2066</b>	<b>6251</b>	

**TABLE 4**  
***Salmonella isolates from Human sources***  
**by Serotype, Geographic Region and State, 2004**

Region=East North Central

Serotype	States					Total
	Illinois	Indiana	Michigan	Ohio	Wisconsin	
S. Adelaide	8	3	3		2	16
S. Agbeni	1	2		1	1	5
S. Agona	33	6	15	7	7	68
S. Ajiobo				1		1
S. Alachua				2		2
S. Albany	1					1
S. Altona				1		1
S. Anatum	20	3	7	9	2	41
S. Antsalova	1					1
S. Apapa					1	1
S. Apeyeme				1		1
S. Arechavaleta		1	5			6
S. Babelsberg				2		2
S. Bandia			1			1
S. Bareilly	1	4	2	10		17
S. Berta	22	6	10	5	10	53
S. Blockley	1		3	2	4	10
S. Bonariensis					1	1
S. Bovismorbificans	5	3	3	2	1	14
S. Braenderup	90	10	10	44	13	167
S. Brandenburg	4		2	1	3	10
S. Bredeney	4			1		5
S. Brunei			2			2
S. Bsilla				1		1
S. California				1		1
S. Carmel	5					5
S. Cerro	3		1			4
S. Chailey	1					1
S. Chester			2			2
S. Choleraesuis	1					1
S. Choleraesuis var. Kunzendorf				1	1	2
S. Cleveland					1	1
S. Coeln				1		1
S. Colindale	1	1				2
S. Corvallis					1	1
S. Cotham					1	1
S. Cubana	1			1		2
S. Derby	15	2	1	5	3	26
S. Dublin	2	1	2		3	8
S. Duesseldorf				1		1
S. Durban	3					3
S. Ealing		1				1
S. Edinburg		2				2
S. Elomrane				2		2
S. Enteritidis	253	137	182	246	175	993

**TABLE 4**  
***Salmonella isolates from Human sources***  
**by Serotype, Geographic Region and State, 2004**

Region=East North Central

Serotype	States					Total
	Illinois	Indiana	Michigan	Ohio	Wisconsin	
S. Farmsen					1	1
S. Farsta				1		1
S. Fluntern	1					1
S. Gaminara		3	2	1	3	9
S. Give	5	1	2	8	2	18
S. Give var. 15+				1		1
S. Glostrup			1			1
S. Gombe				1		1
S. Haardt	1					1
S. Hadar	17	3	6	4	5	35
S. Haifa				1		1
S. Hartford	8	10	9	13	11	51
S. Hato		1				1
S. Havana	3	1	1	1		6
S. Heidelberg	81	35	53	62	12	243
S. Hindmarsh					4	4
S. Hvittingfoss	2	1		2	1	6
S. Indiana			1	1		2
S. Infantis	105	7	12	9	19	152
S. Inverness	1				1	2
S. Irumu			1			1
S. Istanbul					2	2
S. Ituri			1			1
S. Javiana	22	8	18	47	8	103
S. Johannesburg		1		1		2
S. Kapemba				1		1
S. Kentucky	2	1	1		3	7
S. Kiambu					1	1
S. Kingabwa			1			1
S. Kintambo		1	3	4		8
S. Kisarawe		1				1
S. Kottbus	1					1
S. Lexington				1		1
S. Lindenburg					1	1
S. Litchfield	9	5	8	7	4	33
S. Livingstone					1	1
S. Lomita	1					1
S. London	4			2		6
S. Madelia					1	1
S. Manhattan	4	3	2	1	2	12
S. Matadi				1		1
S. Mbandaka	8	4	3	3	3	21
S. Memphis					1	1
S. Mendoza				6		6
S. Miami	3	3	1	2	6	15

**TABLE 4**  
***Salmonella isolates from Human sources***  
**by Serotype, Geographic Region and State, 2004**

Region=East North Central

Serotype	States					Total
	Illinois	Indiana	Michigan	Ohio	Wisconsin	
S. Minnesota	2			2	1	5
S. Mississippi	4	1		1		6
S. Monschau					1	1
S. Montevideo	51	7	9	22	15	104
S. Morotai				1		1
S. Muenchen	35	3	7	15	12	72
S. Muenster	1	2	3		6	12
S. Muenster var. 15+		1				1
S. Napoli	1					1
S. Neukoelln					1	1
S. Newmexico					1	1
S. Newport	104	41	70	97	79	391
S. Nima		1				1
S. Norwich	4	1	3			8
S. Ohio	17	1	1	2		21
S. Oranienburg	28	8	19	17	5	77
S. Oritamerin					1	1
S. Oslo		1		1		2
S. Othmarschen					4	4
S. Panama	5		3	3	2	13
S. Paratyphi A	4	3	4	6	1	18
S. Paratyphi B	19		14	12	18	63
S. Paratyphi B var. L(+) tartrate+		13		31	9	53
S. Poano			1	2		3
S. Pomona	4	1	1	5	5	16
S. Poona	13	5	4	4	6	32
S. Potsdam	2					2
S. Putten					1	1
S. Reading	8	1	2	3	5	19
S. Richmond	1			1		2
S. Romanby					1	1
S. Rubislaw	3		1	1	2	7
S. Saintpaul	52	10	22	16	15	115
S. Sandiego	16	3	2	7	3	31
S. Schwarzengrund	6		3	3	1	13
S. Senftenberg		2		1	3	6
S. Singapore	1		1			2
S. Sinstorf				1		1
S. Stanley	9	1	10	9	3	32
S. Stanleyville	1					1
S. Stoneferry				1		1
S. Takoradi					1	1
S. Telelkebir	1	1	1	1	1	5
S. Tennessee	5	1	1	6		13
S. Thompson	50	7	11	19	8	95

**TABLE 4**  
***Salmonella isolates from Human sources***  
**by Serotype, Geographic Region and State, 2004**

Region=East North Central

Serotype	States					Total
	Illinois	Indiana	Michigan	Ohio	Wisconsin	
S. Thompson var. 14+				1		1
S. Tornow					2	2
S. Tucson				1		1
S. Typhi	23	1	10	7	3	44
S. Typhimurium	353	102	141	214	129	939
S. Typhimurium var. 5-		32		37	16	85
S. Typhisuis				1		1
S. Uganda	2	1	3		1	7
S. Urbana	4	1	1	5	2	13
S. Uzaramo		1	2	1		4
S. Virchow	12	1	4	5	3	25
S. Wandsworth				1		1
S. Weltevreden	3	1		2	2	8
S. Westhampton				1		1
S. Worthington	6	2		1		9
S. Zerifin			1			1
S. I 4,[5],12:-:1,2					1	1
S. I 4,[5],12:b:-					1	1
S. I 4,[5],12:i:-	75	17		59	2	153
S. I 4,[5],12:r:-					1	1
S. I 6,14,25:b:-				2		2
S. I 40:-e,n,x				2		2
S. II 9,46:m,t,e,n,x				1		1
S. II 58:l,z13,z28:z6				1		1
S. IIIa 41:z4,z23:-		1		2		3
S. IIIa 51:z4,z23:-				1		1
S. IIIb 17:z10:e,n,x,z15	1					1
S. IIIb 50:k:z				1		1
S. IIIb 50:l,v:z35				1		1
S. IIIb 50:z52:z35					1	1
S. IIIb 60:r:z				1		1
S. IIIb 61:-:1,5,[7]					1	1
S. IIIb 61:l,[v],[z13]:1,5,[7]				1	1	2
S. IIIb 61:l,[v],[z13]:z35				1		1
S. IV 6,7:z4,z24:-				1		1
S. IV 44:z4,z23:-	1			2		3
S. IV 44:z4,z24:-	1	1				2
S. IV 45:g,z51:-				2		2
S. IV 48:g,z51:-	2			2		4
S. IV 50:g,z51:-		2				2
S. IV 50:z4,z23:-	1			1		2
Partially serotyped isolates	1		24	9	6	40
Rough or nonmotile isolates		2		7	4	13
Unknown	31	5	54	26	40	156
<b>Total</b>	<b>1717</b>	<b>556</b>	<b>810</b>	<b>1219</b>	<b>749</b>	<b>5051</b>

**TABLE 4**  
***Salmonella isolates from Human sources***  
**by Serotype, Geographic Region and State, 2004**

Region=West North Central

Serotype	States							Total
	Iowa	Kansas	Minnesota	Missouri	Nebraska	North Dakota	South Dakota	
S. Abony				1				1
S. Adelaide		2	3	6				11
S. Agbeni				1				1
S. Agona	7	3	14	10	2			36
S. Albany		1		2				3
S. Amager			1					1
S. Anatum	3	2	4	6				15
S. Apapa					1			1
S. Baildon	1							1
S. Bardo	1		1					2
S. Bareilly	1	2		13				16
S. Barranquilla	1							1
S. Berta			3	4	1		4	12
S. Binningen					1			1
S. Blockley	4		2					6
S. Bournemouth				1				1
S. Bovismorbificans				1				1
S. Braenderup	15	8	4	9		1	5	42
S. Brandenburg				3	1			4
S. Bredeney	1	1	2	1		1		6
S. Chester	1							1
S. Choleraesuis			2	3				5
S. Choleraesuis var. Kunzendorf	1							1
S. Colindale			1					1
S. Cotham			1					1
S. Cubana			1					1
S. Derby	1		6	8	1		4	20
S. Dublin		1						1
S. Durban				1				1
S. Ealing		1		1		1		3
S. Eastbourne			1	1	1			3
S. Edinburg			2	1		1		4
S. Emek				1				1
S. Enteritidis	63	29	115	89	21	3	27	347
S. Essen			1					1
S. Galiema					1			1
S. Gaminara		1		1				2
S. Georgia				1				1
S. Give	1			1				2
S. Gnesta	1							1
S. Hadar	4	2	2	3	1		1	13
S. Hartford	2	2	2	1	2			9
S. Havana			1	7				8
S. Heidelberg	45	14	35	42	3	3	5	147

**TABLE 4**  
***Salmonella isolates from Human sources***  
**by Serotype, Geographic Region and State, 2004**

Region=West North Central

Serotype	States							Total
	Iowa	Kansas	Minnesota	Missouri	Nebraska	North Dakota	South Dakota	
S. Hindmarsh					2			2
S. Hvittingfoss			1		1			2
S. Infantis	18	10	7	21	2		1	59
S. Irumu			1					1
S. Istanbul			1					1
S. Javiana	4	4	8	28			4	48
S. Jodhpur		1						1
S. Johannesburg	1							1
S. Kentucky				1				1
S. Kiambu			1	2				3
S. Kintambo	1							1
S. Litchfield	2		1	2		1		6
S. Lomalinda			1					1
S. Lomita					1			1
S. London							1	1
S. Manhattan	2	1		1				4
S. Mbandaka		2	3	4	1			10
S. Memphis			1					1
S. Miami	1	1	1	1				4
S. Minnesota	2	1	1					4
S. Mississippi			1	7				8
S. Montevideo	9	13	14	13	4	1	4	58
S. Muenchen	6	3	9	9	2	7	6	42
S. Muenster		1	1					2
S. Newmexico		1						1
S. Newport	24	24	62	87	8	6	10	221
S. Nima				1				1
S. Norwich		6		8				14
S. Ohio	2	3	1	2				8
S. Oranienburg	13	4	16	13	7	2	5	60
S. Othmarschen				1				1
S. Oxford			1					1
S. Pakistan	1							1
S. Panama	1	1	1	4	2			9
S. Paratyphi A	3		2	2				7
S. Paratyphi B				1	2	1	3	7
S. Paratyphi B var. L(+) tartrate+	6	4	13	20	2			45
S. Poano			1					1
S. Pomona		1		1				2
S. Poona	1		3	3	1	1	1	10
S. Potsdam				1				1
S. Reading	1	1	3	3		1	1	10
S. Rubislaw		2		1				3
S. Saintpaul	7	2	19	11	2	2	1	44

**TABLE 4**  
***Salmonella isolates from Human sources***  
**by Serotype, Geographic Region and State, 2004**

Region=West North Central

Serotype	States							Total
	Iowa	Kansas	Minnesota	Missouri	Nebraska	North Dakota	South Dakota	
S. Sandiego			1	2		1		4
S. Schwarzengrund			5	1				6
S. Senftenberg	1		1	3				5
S. Stanley			10	2	2			14
S. Telelkebir		1		1				2
S. Tennessee	1	1	2	2			1	7
S. Thompson	8	7	16	36	1	1	1	70
S. Tripoli			1			1		2
S. Typhi			8	1				9
S. Typhimurium	78	67	111	260	33	11	71	631
S. Typhimurium var. 5-	46	7	43		14			110
S. Uganda		2	4					6
S. Urbana	1		1	1				3
S. Virchow	2		3	3				8
S. Welikade			1					1
S. Weltevreden			3	1				4
S. Worthington	1			1				2
S. I 4,[5],12:-:1,2			1					1
S. I 4,[5],12:i:-	22		20	25				67
S. I 4,[5],12:r:-	1							1
S. I 9,12:i,z28:-				1				1
S. II 30:l,z28:z6		1						1
S. II 50:b:z6			1					1
S. IIIa 41:z4,z23:-			1	1				2
S. IIIb 48:z52:z				1				1
S. IIIb 60:r:e,n,x,z15				2				2
S. IV 43:z4,z23:-				2				2
S. IV 44:z36,[z38]:-				1				1
S. IV 44:z4,z23:-	1							1
S. IV 45:g,z51:-							1	1
S. IV 48:g,z51:-	1			1				2
S. IV 50:g,z51:-		1		1				2
Partially serotyped isolates	3	37	2	9	8	2		61
Rough or nonmotile isolates			3	1				4
Unknown	1	1	12		41	5		60
<b>Total</b>	<b>425</b>	<b>280</b>	<b>628</b>	<b>826</b>	<b>172</b>	<b>51</b>	<b>159</b>	<b>2541</b>

**TABLE 4**  
***Salmonella isolates from Human sources  
by Serotype, Geographic Region and State, 2004***

Region=South Atlantic

Serotype	States										Total
	Delaware	District of Columbia	Florida	Georgia	Maryland	North Carolina	South Carolina	Virginia	West Virginia		
S. Aarhus			1								1
S. Aberdeen			1						1		2
S. Abony								1			1
S. Adelaide	1			3	1	1		1			7
S. Aequatoria				5							5
S. Agama								1			1
S. Agbeni	1			1				2			4
S. Agona	1			5	3	6	3	13	3		34
S. Alabama				2							2
S. Alachua	2			1	1			2			6
S. Albany								1			1
S. Allandale				1							1
S. Amager				1							1
S. Amager var. 15+								1			1
S. Amsterdam									1		1
S. Anatum	1			3	1	1	4	5	1		16
S. Anatum var. 15+					1			2			3
S. Apapa				2							2
S. Baildon			1	1						1	3
S. Bardo				1	24						25
S. Bareilly				19	2	8	3	13	1		46
S. Berta			1	6	4	8	7	15	4		45
S. Blockley					1	1					2
S. Bovismorbificans				5	3	1	7	2			18
S. Braenderup	8			62	13	10	7	42	7		149
S. Brandenburg				5			3	1	1		10
S. Brazil				1							1
S. Brunei		1									1
S. Carmel								1			1
S. Carrau				1		2	3				6
S. Cerro				1	1			1			3
S. Chester				1							1
S. Coeln					1						1
S. Cubana							2	1			3
S. Daytona				4						1	5
S. Derby			1	10	1	1		1			14
S. Dublin						2					2
S. Durban				1							1
S. Durham					2						2
S. Duval									1		1
S. Ealing				1				2			3
S. Edinburg	3			1	4						8
S. Enteritidis	24		6	137	212	85	72	127	30		693

**TABLE 4**  
***Salmonella isolates from Human sources***  
**by Serotype, Geographic Region and State, 2004**

Region=South Atlantic

Serotype	States										Total
	Delaware	District of Columbia	Florida	Georgia	Maryland	North Carolina	South Carolina	Virginia	West Virginia		
S. Fitzroy					1						1
S. Florida								1			1
S. Freetown				1							1
S. Gaminara	1			16	4	4	8	1			34
S. Give	1			2		2	1	2			8
S. Goettingen				1							1
S. Goldcoast	1										1
S. Haardt								1			1
S. Hadar	2			7	11	4	1	8			33
S. Harrisonburg									1		1
S. Hartford				15	3	1	5	7	2		33
S. Hato					1						1
S. Havana				1							1
S. Heidelberg	9		3	75	25	34	19	44	8		217
S. Hvittingfoss								1			1
S. Ilala				1							1
S. Indiana				1							1
S. Infantis	1			25	10	3	4	13			56
S. Inverness				14	1	10					25
S. Irumu						5					5
S. Jangwani								1			1
S. Javiana	8		9	333	64	122	109	87	41		773
S. Joal							3		1		4
S. Johannesburg				6	5	1		1			13
S. Kentucky				1		4		3			8
S. Kiambu	2			2							4
S. Kingabwa								1			1
S. Kottbus					1						1
S. Lagos				2							2
S. Larocheille				3							3
S. Lexington									2		2
S. Lille				1							1
S. Lindenburg									1		1
S. Litchfield				12	1	4	1	5			23
S. Liverpool	1										1
S. Loanda						1					1
S. Lomita									1		1
S. London				3			2	1	2		8
S. Luciana				2			1				3
S. Manhattan				18			3	1			22
S. Maumee				1							1
S. Mbandaka				6	1		3	2	2		14
S. Meleagridis				1							1

**TABLE 4**  
***Salmonella isolates from Human sources  
by Serotype, Geographic Region and State, 2004***

Region=South Atlantic

Serotype	States										Total
	Delaware	District of Columbia	Florida	Georgia	Maryland	North Carolina	South Carolina	Virginia	West Virginia		
S. Miami	1		2	15		2	7	11			38
S. Mim								1			1
S. Minnesota				4	1	1		1			7
S. Mississippi	1		2	146	2	25	38	6	2		222
S. Monschau				2	4			2			8
S. Montevideo	1			82	7	14	15	14	10		143
S. Muenchen			2	98	7	29	43	15	2		196
S. Muenster				1	2			3			6
S. Newport	25		13	368	34	185	163	123	10		921
S. Nima			1								1
S. Norwich	1			3	3	1	1	7			16
S. Ohio				1		1	1	2			5
S. Oranienburg				14	6	5	4	10			39
S. Orientalis								1			1
S. Orion var. 15+											1
S. Oritamerin				1						1	2
S. Oslo										1	1
S. Othmarschen				1						5	6
S. Panama				4	18			6			28
S. Paratyphi A		1	1	9	2	1		7			21
S. Paratyphi B				37	1			3			41
S. Paratyphi B var. L(+) tartrate+	1		1	1	5	5	4	16	2		35
S. Pensacola								1			1
S. Poano					1						1
S. Pomona				2		1		1			4
S. Poona	3		2	9	2		5	5			26
S. Reading				3	5				1	1	10
S. Rissen				1							1
S. Roodepoort					1						1
S. Rubislaw				13		3	2				18
S. Saintpaul	3		5	46	15	12	11	19	2		113
S. Sandiego			1	2	3	1	3	1			11
S. Sangakkam								1			1
S. Schwarzengrund				8		8		5			21
S. Senftenberg			8	11				5			24
S. Shipley					2						2
S. Singapore					2						2
S. Spalendor							2				2
S. Stanley	1		1	4	8	2	4	5	1		26
S. Stanleyville								1			1
S. Tallahassee				2							2
S. Telelkebir				4			1				5
S. Tennessee				2				1			3

**TABLE 4**  
***Salmonella isolates from Human sources***  
**by Serotype, Geographic Region and State, 2004**

Region=South Atlantic

Serotype	States									Total
	Delaware	District of Columbia	Florida	Georgia	Maryland	North Carolina	South Carolina	Virginia	West Virginia	
S. Thompson				8	7	1	3	16		35
S. Toucra								1		1
S. Typhi	1		6	2	24		1	11	1	46
S. Typhimurium	16		11	203	75	155	138	307	34	939
S. Typhimurium var. 5-				171	74					245
S. Typhisuis				1						1
S. Uganda				1				1		2
S. Uganda var. 15+								1		1
S. Uppsala							1			1
S. Urbana	1				1			6	1	9
S. Valdosta				2						2
S. Vejle				3						3
S. Virchow					2			2		4
S. Virginia				1	1					2
S. Weltevreden					1			4		5
S. Weltevreden var. 15+	1									1
S. Worthington	1			6			1			8
S. I 4,[5],12:b:-					13			1		14
S. I 4,[5],12:i:-	5			3	32				4	44
S. I 4,[5],12:r:-	1									1
S. I 6,7:-:1,5					5					5
S. I 6,7:b:-					1					1
S. I 6,7:k:-					3					3
S. I 11:e,h:-					1					1
S. I 13,23:b:-					1					1
S. II 9,12:b:-					1					1
S. IIIa 48:g,z51:-				1	1					2
S. IIIb 18:l,v:z					3					3
S. IIIb 60:r,e,n,x,z15					1					1
S. IV 16:z4,z32:-					1					1
S. IV 44:z4,z23:-	1									1
S. IV 50:z4,z23:-	1		1							2
S. bongori ser. 48:z35:-							1			1
Partially serotyped isolates		5	622	102		3	6	42	12	792
Rough or nonmotile isolates					3			1		4
Unknown		1	170	2	1	16	42	2	2	236
<b>Total</b>	<b>132</b>	<b>8</b>	<b>872</b>	<b>2231</b>	<b>788</b>	<b>790</b>	<b>771</b>	<b>1084</b>	<b>202</b>	<b>6878</b>

**TABLE 4**  
***Salmonella isolates from Human sources***  
**by Serotype, Geographic Region and State, 2004**

Region=East South Central

Serotype	States				Total
	Alabama	Kentucky	Mississippi	Tennessee	
S. Adelaide	1				1
S. Agbeni	1				1
S. Agona	2	2		5	9
S. Alabama				1	1
S. Alachua			3	1	4
S. Anatum	4	3		5	12
S. Anatum var. 15+	1			2	3
S. Apapa		1			1
S. Aqua			1		1
S. Baildon				1	1
S. Bareilly	4	18	8	26	56
S. Barranquilla			1	1	2
S. Berta		10		2	12
S. Blockley	1	1			2
S. Bovismorbificans				2	2
S. Braenderup	10	6	1	8	25
S. Brandenburg	1	2	1	1	5
S. Brazil	1				1
S. Bsilla	2				2
S. Cerro var. 14+				2	2
S. Cubana			2		2
S. Daytona	1			1	2
S. Derby	5	1	5	5	16
S. Djugu			1		1
S. Enteritidis	46	41	41	63	191
S. Fluntern				1	1
S. Gaminara	1		12	1	14
S. Give	5		6	2	13
S. Hadar		5	1	8	14
S. Hartford	7	5	1	16	29
S. Heidelberg	39	22	14	36	111
S. Hvittingfoss		1			1
S. Indiana		2		1	3
S. Infantis	9	6		7	22
S. Inverness	4		11		15
S. Itami	3				3
S. Jangwani				1	1
S. Javiana	63	7	85	32	187
S. Johannesburg				1	1
S. Kentucky			1		1
S. Kiambu				1	1
S. Kotu			1		1
S. Kua	1				1
S. Litchfield	4	1	2	1	8
S. Lomita				1	1

**TABLE 4**  
***Salmonella isolates from Human sources***  
**by Serotype, Geographic Region and State, 2004**

Region=East South Central

Serotype	States				Total
	Alabama	Kentucky	Mississippi	Tennessee	
S. London		1			1
S. Manhattan			2	1	3
S. Mbandaka	6	8		3	17
S. Mendoza		1			1
S. Miami	4		1	2	7
S. Minnesota				1	1
S. Mississippi	29	4	90	21	144
S. Mkamba			1		1
S. Monschau		1		2	3
S. Montevideo	27	7	34	13	81
S. Muenchen	52	7	42	13	114
S. Muenster	1				1
S. Newmexico				1	1
S. Newport	77	28	108	102	315
S. Nigeria			2		2
S. Nima	1				1
S. Norwich	1		11	16	28
S. Ohio		2		1	3
S. Oranienburg	1	6	6	14	27
S. Oranienburg var. 14+			1		1
S. Oslo	1				1
S. Othmarschen	1				1
S. Panama		3		2	5
S. Paratyphi A	1				1
S. Paratyphi B		1	5		6
S. Paratyphi B var. L(+) tartrate+	7	9	15	3	34
S. Pomona	3	1			4
S. Poona	8	4		2	14
S. Remo		1			1
S. Richmond				1	1
S. Rissen			2	1	3
S. Rubislaw	3	3	18	2	26
S. Saintpaul	11	6	4	15	36
S. Sandiego	1	1	2	3	7
S. Schleissheim		3			3
S. Schwarzengrund	1	2		6	9
S. Senftenberg	1			1	2
S. Stanley	3				3
S. Telelkebir	1				1
S. Tennessee				3	3
S. Thompson	3	10	2	8	23
S. Typhi	1	3		4	8
S. Typhimurium	131	80	113	140	464
S. Typhimurium var. 5-		31	29	45	105
S. Uganda				1	1

**TABLE 4**  
***Salmonella isolates from Human sources***  
**by Serotype, Geographic Region and State, 2004**

Region=East South Central

Serotype	States				Total
	Alabama	Kentucky	Mississippi	Tennessee	
S. Urbana	1	2			3
S. Virchow		1		1	2
S. Virginia			2	3	5
S. Worthington				2	2
S. I 4,[5],12:b:-				11	11
S. I 4,[5],12:i:-	23		13	47	83
S. I 4,[5],12:r:-	1				1
S. I 13,23:-:1,5			1		1
S. I 38:k:-			1		1
S. I 47:z4,z23:-	1				1
S. IIIa 41:z4,z23:-	1				1
S. IIIa 48:g,z51:-				1	1
S. IIIa 51:z4,z23:-			1		1
S. IIIa 53:z4,z23:-	1				1
S. IIIB 48:r:z			1		1
S. IIIB 50:k:z	1				1
S. IV 16:z4,z32:-		1			1
S. IV 44:z4,z23:-				1	1
S. IV 45:g,z51:-				2	2
S. IV 50:g,z51:-	1				1
Partially serotyped isolates	6	5	1	27	39
Rough or nonmotile isolates			2		2
Unknown	4	26	10	145	185
<b>Total</b>	<b>632</b>	<b>392</b>	<b>718</b>	<b>902</b>	<b>2644</b>

**TABLE 4**  
***Salmonella isolates from Human sources***  
**by Serotype, Geographic Region and State, 2004**

Region=West South Central

Serotype	States				Total
	Arkansas	Louisiana	Oklahoma	Texas	
S. Adelaid	1	1		1	3
S. Agona		3	3	16	22
S. Alachua				1	1
S. Anatum		7	3	13	23
S. Arechavaleta			6		6
S. Bareilly	16	13	9	3	41
S. Berta			2	1	3
S. Blockley		1	1	2	4
S. Bovismorbificans		2		3	5
S. Braenderup	4	36	15	7	62
S. Brandenburg		1		1	2
S. Bredeney	1		1		2
S. Bukuru				1	1
S. Derby	1	2	1	1	5
S. Duesseldorf				7	7
S. Elisabethville				1	1
S. Enteritidis	15	31	26	48	120
S. Gaminara		30		5	35
S. Georgia				1	1
S. Give		30		5	35
S. Give var. 15+	1				1
S. Hadar	1	3			4
S. Hannover				1	1
S. Hartford	1	2	3	1	7
S. Havana				1	1
S. Heidelberg	21	28	13	18	80
S. Hvittingfoss		5		2	7
S. Ibadan				3	3
S. Infantis	6	8	8	15	37
S. Inverness		3		1	4
S. Javiana	55	76	9	25	165
S. Kentucky		1			1
S. Kiambu			2	1	3
S. Larochelle	3				3
S. Litchfield		5	4	2	11
S. London		1			1
S. Madelia				1	1
S. Manhattan		2		1	3
S. Mbandaka	2	2	2	2	8
S. Miami		2			2
S. Mississippi	15	125		10	150
S. Montevideo	6	64	3	21	94
S. Muenchen		74	3	5	82
S. Newport	146	263	54	55	518
S. Norwich	13	6	9		28

**TABLE 4**  
***Salmonella isolates from Human sources  
by Serotype, Geographic Region and State, 2004***

Region=West South Central

Serotype	States				Total
	Arkansas	Louisiana	Oklahoma	Texas	
S. Ohio	1	1	1		3
S. Oranienburg		12	3	15	30
S. Othmarschen	1				1
S. Panama	1		1		2
S. Paratyphi A		1		2	3
S. Paratyphi B		7		3	10
S. Paratyphi B var. L(+) tartrate+	1	5	16	5	27
S. Pensacola		1			1
S. Pomona				1	1
S. Poona		2	4	4	10
S. Quiniela		2			2
S. Rubislaw	4	28	2	3	37
S. Saintpaul	4	7	4	7	22
S. Sandiego			2	2	4
S. Saphra		3			3
S. Schwarzengrund		1			1
S. Senftenberg		2			2
S. Shubra			1		1
S. Stanley		2		2	4
S. Telekебир				1	1
S. Tennessee		1	1	1	3
S. Thompson	4	11	4	5	24
S. Typhi	1				1
S. Typhimurium	92	72	88	87	339
S. Tyrosoe			1		1
S. Uganda			2		2
S. Urbana		5			5
S. Virchow		3			3
S. Weltevreden				1	1
S. Worthington			1		1
S. I 4,[5],12:i:-		19			19
Partially serotyped isolates		8	34	109	151
Rough or nonmotile isolates		3			3
Unknown	37			1237	1274
<b>Total</b>	<b>454</b>	<b>1023</b>	<b>342</b>	<b>1767</b>	<b>3586</b>

**TABLE 4**  
***Salmonella isolates from Human sources***  
**by Serotype, Geographic Region and State, 2004**

Region=Mountain

Serotype	States							Total
	Arizona	Colorado	Idaho	Montana	Nevada	New Mexico	Utah	
S. Aarhus					1			1
S. Abaetetuba			1					1
S. Abony							1	1
S. Adelaide	2	1						3
S. Agbeni	1	1						2
S. Agona	15	9	2		2	9	3	40
S. Alachua	3							3
S. Albany	1	1	1			1	1	5
S. Amager var. 15+		1	1					2
S. Anatum	5	4	4		1	4	2	20
S. Anatum var. 15+	1	1						2
S. Apapa					1			1
S. Bareilly		2				1		3
S. Bassadji		1						1
S. Berta			1		16			17
S. Blockley	1	3				1	1	6
S. Bovismorbificans	6	1			1	1	1	10
S. Braenderup	4	8				1	2	15
S. Brandenburg	2					1		3
S. Bredeney	3					1	1	5
S. Carrau		1						1
S. Cerro						1		1
S. Cerro var. 14+		1						1
S. Chester		3			1		1	5
S. Choleraesuis	1						1	2
S. Cotham	2							2
S. Cubana		1						1
S. Derby	6	3						9
S. Dublin	12				2	2		16
S. Ealing	1	1						2
S. Eastbourne	1					1	1	3
S. Edinburg	4	1			2			7
S. Elomrane	1							1
S. Enteritidis	77	103	33		13	18	54	298
S. Fluntern				1			1	2
S. Gaminara	2	3				1		6
S. Give	2							2
S. Hadar	1	1				2	3	7
S. Hartford		2						2
S. Havana	1	1			1	1		4
S. Heidelberg	40	27	6		10	8	12	103
S. Hindmarsh			1					1
S. Hvittingfoss						1		1
S. Indiana	1							1

**TABLE 4**  
***Salmonella isolates from Human sources***  
**by Serotype, Geographic Region and State, 2004**

Region=Mountain

Serotype	States							Total
	Arizona	Colorado	Idaho	Montana	Nevada	New Mexico	Utah	
S. Infantis	13	9	2		1	7	10	42
S. Itami							1	1
S. Javiana	5	7	3		2	22	1	40
S. Johannesburg		1						1
S. Kentucky		2	1			3	1	7
S. Kiambu	2				1			3
S. Kintambo		2				1		3
S. Kottbus	1							1
S. Litchfield	2						2	4
S. Liverpool			2					2
S. Loanda		1						1
S. Lomalinda	2				1			3
S. Madelia	1							1
S. Manhattan		3						3
S. Mbandaka	7	16	1			8	1	33
S. Meleagridis	1	1						2
S. Miami							1	1
S. Michigan	1							1
S. Mikawasima	1							1
S. Minnesota	1	1			1			3
S. Mississippi	1	1				1		3
S. Monschau		1						1
S. Montevideo	27	13	3		6	8	11	68
S. Muenchen	12	10	1		2	17	4	46
S. Muenster		2	1			1	2	6
S. Nessziona		1						1
S. Newport	53	31	23		8	26	22	163
S. Nima		1						1
S. Norwich	1							1
S. Ohio		2						2
S. Oranienburg	46	17	2		2	12	5	84
S. Panama	28	6	2				1	37
S. Paratyphi A	6	4			1			11
S. Paratyphi B	2	6	1			4	1	14
S. Paratyphi B var. L(+) tartrate+	12	6	1		2		6	27
S. Pomona	2	1				1	1	5
S. Poona	28	8			1	1	1	39
S. Reading	6	1	2		1			10
S. Roodepoort		1						1
S. Saintemarie	1							1
S. Saintpaul	21	11	5		5	6	2	50
S. Sandiego	5	2					3	10
S. Schwarzengrund	3		1		3	3		10
S. Senftenberg	3	4			3		2	12

**TABLE 4**  
***Salmonella isolates from Human sources***  
**by Serotype, Geographic Region and State, 2004**

Region=Mountain

Serotype	States							Total
	Arizona	Colorado	Idaho	Montana	Nevada	New Mexico	Utah	
S. Singapore						1		1
S. Soerenga	1							1
S. Stanley	3	2	8				1	14
S. Stellingen					1			1
S. Sundsvall	1							1
S. Takoradi							1	1
S. Telelkebir	2						1	3
S. Tennessee	1	1				1		3
S. Thompson	5	8	1		2	2	2	20
S. Tshiongwe		1						1
S. Typhi	2	3			3		1	9
S. Typhimurium	97	100	26	1	23	40	70	357
S. Typhimurium var. 5-	14	24	9			18		65
S. Uganda						1		1
S. Urbana	1	3			1			5
S. Uzaramo							1	1
S. Virchow		3	1					4
S. Wandsworth							1	1
S. Waycross		2						2
S. Weltevreden	2				1			3
S. Weltevreden var. 15+							1	1
S. Westhampton						1		1
S. Wil		1						1
S. Worthington	1	1						2
S. I 4,[5],12:b:-	1				1			2
S. I 4,[5],12:i:-	15	1	5		3			24
S. I 13,23:b:-	1							1
S. II 47:b:1,5	1							1
S. II 48:d:1,2							1	1
S. II 48:z81:z39	2							2
S. II 58:d:z6	1							1
S. IIIa 18:z4,z23:-	4							4
S. IIIa 35:z29:-	1							1
S. IIIa 41:z4,z23:-	2				1			3
S. IIIb 48:i:z					1			1
S. IIIb 50:r:z	2	1						3
S. IIIb 61:r:z			1					1
S. IV 43:z36,z38:-		1						1
S. IV 43:z4,z23:-		1				1		2
S. IV 45:g,z51:-		2						2
S. IV 48:g,z51:-		2	1				2	5
S. IV 50:g,z51:-	1							1
S. bongori ser. 66:z81:-							1	1
Partially serotyped isolates	2	8	2	105	6	18		141

**TABLE 4**  
***Salmonella isolates from Human sources***  
**by Serotype, Geographic Region and State, 2004**

Region=Mountain

Serotype	States							Total
	Arizona	Colorado	Idaho	Montana	Nevada	New Mexico	Utah	
Rough or nonmotile isolates	9							9
Unknown		3			57	1	3	64
Total	662	521	155	107	191	260	249	2145

**TABLE 4**  
***Salmonella isolates from Human sources***  
***by Serotype, Geographic Region and State, 2004***

Region=Pacific

Serotype	States					Total
	Alaska	California	Hawaii	Oregon	Washington	
S. Aarhus					1	1
S. Aberdeen			1			1
S. Abony	1				1	2
S. Adelaide		8		1	1	10
S. Afula					1	1
S. Agbeni		1		1		2
S. Agona		60	3	7	13	83
S. Agoueve		2				2
S. Alachua		4	1			5
S. Albany		13	4	2		19
S. Altona			1			1
S. Amager		1	9	3		13
S. Anatum		37		5	5	47
S. Anatum var. 15+				1		1
S. Apapa		5				5
S. Bardo		4				4
S. Bareilly		12			3	15
S. Berta		22	4			26
S. Birkenhead		1	4			5
S. Blegdam		6				6
S. Blockley		5			1	6
S. Bonn		1				1
S. Bovismorbificans		13		16	24	53
S. Braenderup	2	59		2	6	69
S. Brandenburg		29	4		1	34
S. Bredeney					1	1
S. Carmel		1				1
S. Cerro		9				9
S. Chandans					1	1
S. Chester		2			1	3
S. Choleraesuis		1				1
S. Clackamas				1		1
S. Concord		4				4
S. Cotham					1	1
S. Cubana					2	2
S. Damman					1	1
S. Daytona					1	1
S. Denver					1	1
S. Derby	1	16	1		3	21
S. Dublin		24	1	3	5	33
S. Duesseldorf			1			1
S. Durban		1			2	3
S. Ealing		1		1		2
S. Edinburg		2		1	1	4
S. Emek		1				1

**TABLE 4**  
***Salmonella isolates from Human sources***  
**by Serotype, Geographic Region and State, 2004**

Region=Pacific

Serotype	States					Total
	Alaska	California	Hawaii	Oregon	Washington	
S. Entebbe					1	1
S. Enteritidis	5	550	21	58	104	738
S. Gaminara		5		1	2	8
S. Give	1	4	6		2	13
S. Give var. 15+				1		1
S. Guinea					1	1
S. Haardt				1		1
S. Hadar	4	56	1	3	8	72
S. Haifa		1				1
S. Hartford		5			1	6
S. Havana		6		2	2	10
S. Heidelberg	8	256	14	37	65	380
S. Hidalgo		1				1
S. Hvittingfoss		7			1	8
S. Ibadan				1		1
S. Indiana		3			1	4
S. Infantis		95	4	9	11	119
S. Irumu		2				2
S. Istanbul		3				3
S. Itami		3				3
S. Jangwani		1		1		2
S. Javiana		34		1	15	50
S. Johannesburg		3			4	7
S. Kentucky		12			5	17
S. Kiambu		3		1		4
S. Kingabwa		3			2	5
S. Kokomlemle		2				2
S. Kottbus		2			1	3
S. Lexington		1	1			2
S. Litchfield	1	20		2	2	25
S. Livingstone		1				1
S. Lomalinda		6				6
S. London		7				7
S. Luciana		1				1
S. Manhattan		19	6		1	26
S. Matadi		1				1
S. Mbandaka		26		1	2	29
S. Meleagridis		1			1	2
S. Miami		2			1	3
S. Michigan		2		1		3
S. Minnesota		7			1	8
S. Mississippi		1				1
S. Monschau		1				1
S. Montevideo	2	90	15	15	18	140
S. Muenchen		41	16	7	7	71

**TABLE 4**  
***Salmonella isolates from Human sources***  
**by Serotype, Geographic Region and State, 2004**

Region=Pacific

Serotype	States					Total
	Alaska	California	Hawaii	Oregon	Washington	
S. Muenster		11		2		13
S. Newport	3	211	29	12	37	292
S. Norwich		3				3
S. Nottingham		1				1
S. Ohio		9	1		14	24
S. Oranienburg		63	6	7	10	86
S. Oranienburg var. 14+					1	1
S. Orion					2	2
S. Oslo		5	6	2	2	15
S. Othmarschen	1					1
S. Pakistan		3				3
S. Panama		10	3	1	1	15
S. Paratyphi A		17	1		5	23
S. Paratyphi B		68	6		3	77
S. Paratyphi B var. L(+) tartrate+	1		4	17	20	42
S. Pensacola			1			1
S. Poano				1		1
S. Pomona		10	1			11
S. Poona	1	23	1	4	4	33
S. Portland					1	1
S. Potsdam		1				1
S. Putten		1	1			2
S. Reading		12		3	1	16
S. Richmond		2				2
S. Rissen		2				2
S. Roodepoort					1	1
S. Rubislaw		1			1	2
S. Saintpaul	3	78	1	14	29	125
S. Sandiego		12		1	2	15
S. Santiago		1				1
S. Saphra		1				1
S. Schwarzengrund		20	5	1	2	28
S. Senftenberg		20	3	2	1	26
S. Singapore		1	1	1	1	4
S. Stachus			1			1
S. Stanley	2	24	5	2	10	43
S. Stanleyville	1					1
S. Strasbourg		1				1
S. Takoradi					1	1
S. Telekebir		7				7
S. Tennessee		9	1	1	1	12
S. Thompson		76	7	1	17	101
S. Toucra	1	1				2
S. Typhi		55	8	1	7	71
S. Typhimurium	11	454	82	60	145	752

**TABLE 4**  
***Salmonella isolates from Human sources***  
**by Serotype, Geographic Region and State, 2004**

Region=Pacific

Serotype	States					Total
	Alaska	California	Hawaii	Oregon	Washington	
S. Typhimurium var. 5-		160		19		179
S. Uganda		11				11
S. Urbana		4			1	5
S. Virchow		12				12
S. Virginia			1			1
S. Volkmarasdorf				1		1
S. Wangata		1			1	2
S. Weltevreden		8	47		4	59
S. Westhampton					4	4
S. Widemarsh		1				1
S. Willamette				1		1
S. Worthington		1				1
S. I 4,[5],12:i:-	3		7	20	4	34
S. I 4,[5],12:r:-			1			1
S. I 6,7:-:1,5				1		1
S. I 9,12:-:1,5				1		1
S. II 4,12:-:1,6					1	1
S. II 16:z35:e,n,x				1		1
S. IIIb 48:i:z				1		1
S. IIIb 61:z52:z53				1		1
S. IV 43:z4,z23:-			2			2
S. IV 48:g,z51:-					1	1
Partially serotyped isolates			8		50	58
Rough or nonmotile isolates			3	3		6
Unknown		17			5	22
<b>Total</b>	<b>52</b>	<b>3057</b>	<b>361</b>	<b>368</b>	<b>726</b>	<b>4564</b>

**TABLE 5**  
***Salmonella isolates from Human sources***  
**by Serotype and Geographic Region, 2004**

Serotype	Region									Total
	New England	Mid Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	
S. Aarhus					1			1	1	3
S. Abaetetuba								1		1
S. Aberdeen	2	1			2				1	6
S. Abony	1	4		1	1			1	2	10
S. Adelaide	5	20	16	11	7	1	3	3	10	76
S. Aequatoria					5					5
S. Africana		1								1
S. Afula									1	1
S. Agama		1			1					2
S. Agbeni	33	24	5	1	4	1		2	2	72
S. Agona	37	77	68	36	34	9	22	40	83	406
S. Agoueve									2	2
S. Ajiobo			1							1
S. Alabama					2	1				3
S. Alachua	1	6	2		6	4	1	3	5	28
S. Alagbon	1									1
S. Albany	1	4	1	3	1			5	19	34
S. Allandale					1					1
S. Allerton		1								1
S. Altona			1						1	2
S. Amager				1	1				13	15
S. Amager var. 15+					1			2		3
S. Amsterdam	1	1			1					3
S. Amsterdam var. 15+	1									1
S. Anatum	19	57	41	15	16	12	23	20	47	250
S. Anatum var. 15+		2			3	3		2	1	11
S. Antsalova			1							1
S. Apapa		1	1	1	2	1		1	5	12
S. Apeyeme			1							1
S. Aqua	1					1				2
S. Arechavaleta		2	6				6			14
S. Ati		2								2
S. Babelsberg			2							2
S. Baildon		2		1	3	1				7
S. Bandia			1							1
S. Bardo		1		2	25				4	32
S. Bareilly	15	23	17	16	46	56	41	3	15	232
S. Barranquilla				1		2				3
S. Bassadji								1		1
S. Berta	17	224	53	12	45	12	3	17	26	409
S. Binningen					1					1
S. Birkenhead									5	5
S. Bledgdam	1	1							6	8
S. Blockley	9	38	10	6	2	2	4	6	6	83
S. Bonariensis	2		1							3

**TABLE 5**  
***Salmonella* isolates from Human sources  
by Serotype and Geographic Region, 2004**

Serotype	Region									Total
	New England	Mid Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	
S. Bonn		1							1	2
S. Bournemouth				1						1
S. Bovismorbificans	2	5	14	1	18	2	5	10	53	110
S. Bradford	1									1
S. Braenderup	58	97	167	42	149	25	62	15	69	684
S. Brandenburg	1	11	10	4	10	5	2	3	34	80
S. Brazil					1	1				2
S. Bredeney	2	6	5	6			2	5	1	27
S. Bron		3								3
S. Brunei			2		1					3
S. Bsilla			1			2				3
S. Bukuru							1			1
S. California			1							1
S. Canada		1								1
S. Carmel		2	5		1				1	9
S. Carrau		1			6			1		8
S. Cerro	1	1	4		3			1	9	19
S. Cerro var. 14+						2		1		3
S. Chailey	1	1	1							3
S. Chandans									1	1
S. Chester		3	2	1	1			5	3	15
S. Choleraesuis		7	1	5				2	1	16
S. Choleraesuis var. Decatur		1								1
S. Choleraesuis var. Kunzendorf	4	2	2	1						9
S. Clackamas									1	1
S. Claibornei	1									1
S. Cleveland			1							1
S. Coeln	1		1		1					3
S. Colindale			2	1						3
S. Concord									4	4
S. Corvallis	2	1	1							4
S. Cotham			1	1				2	1	5
S. Cubana	4	3	2	1	3	2		1	2	18
S. Cuckmere		1								1
S. Daarle	1									1
S. Damman									1	1
S. Daytona		2			5	2			1	10
S. Denver									1	1
S. Derby	5	21	26	20	14	16	5	9	21	137
S. Djugu	1					1				2
S. Dublin	2	11	8	1	2			16	33	73
S. Duesseldorf			1				7		1	9
S. Durban	6	2	3	1	1			3		16
S. Durham	1				2					3
S. Duval					1					1

TABLE 5

***Salmonella isolates from Human sources  
by Serotype and Geographic Region, 2004***

Serotype	Region									Total
	New England	Mid Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	
S. Ealing		2	1	3	3			2	2	13
S. Eastbourne		2		3				3		8
S. Edinburg	1	1	2	4	8			7	4	27
S. Elisabethville							1			1
S. Elomrane			2					1		3
S. Emek		4		1					1	6
S. Entebbe									1	1
S. Enteritidis	339	1293	993	347	693	191	120	298	738	5012
S. Eppendorf	1									1
S. Essen		1		1						2
S. Farmsen			1							1
S. Farsta			1							1
S. Fitzroy					1					1
S. Florida					1					1
S. Fluntern	3	1	1			1		2		8
S. Freetown			1		1					2
S. Friedrichsfelde		2								2
S. Galiema				1						1
S. Gaminara	10	16	9	2	34	14	35	6	8	134
S. Gatuni	1	2								3
S. Georgia				1			1			2
S. Give	4	7	18	2	8	13	35	2	13	102
S. Give var. 15+	1	1	1				1		1	5
S. Glostrup	1		1							2
S. Gnesta				1						1
S. Goettingen	1				1					2
S. Goldcoast					1					1
S. Gombe			1							1
S. Guinea									1	1
S. Haardt	3	23	1		1				1	29
S. Hadar	30	69	35	13	33	14	4	7	72	277
S. Haifa	3		1						1	5
S. Hannover							1			1
S. Harrisonburg					1					1
S. Hartford	41	11	51	9	33	29	7	2	6	189
S. Hato				1		1				2
S. Havana		2	6	8	1		1	4	10	32
S. Heidelberg	92	384	243	147	217	111	80	103	380	1757
S. Hemingford	1									1
S. Herston		2								2
S. Hidalgo									1	1
S. Hindmarsh		5	4	2				1		12
S. Hoghton		1								1
S. Hvittingfoss	1	7	6	2	1	1	7	1	8	34
S. Ibadan		1					3		1	5

TABLE 5

***Salmonella isolates from Human sources  
by Serotype and Geographic Region, 2004***

Serotype	Region									Total
	New England	Mid Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	
S. Iilala					1					1
S. Indiana	1	6	2		1	3		1	4	18
S. Infantis	29	72	152	59	56	22	37	42	119	588
S. Inganda		1								1
S. Inverness		3	2		25	15	4			49
S. Irumu	1	3	1	1	5				2	13
S. Isangi		3								3
S. Israel		1								1
S. Istanbul	2	53	2	1					3	61
S. Itami						3		1	3	7
S. Ituri			1							1
S. Jangwani					1	1			2	4
S. Javiana	54	352	103	48	773	187	165	40	50	1772
S. Joal					4					4
S. Jodhpur				1						1
S. Johannesburg		15	2	1	13	1		1	7	40
S. Jubilee		1								1
S. Kaapstad		1								1
S. Kapemba			1							1
S. Kedougou		3								3
S. Kentucky	1	13	7	1	8	1	1	7	17	56
S. Kiambu	4	8	1	3	4	1	3	3	4	31
S. Kingabwa			1		1				5	7
S. Kingston		1								1
S. Kintambo		4	8	1				3		16
S. Kisarawe			1							1
S. Kokomlemle									2	2
S. Kottbus	2		1		1			1	3	8
S. Kotu						1				1
S. Kua		1				1				2
S. Lagos					2					2
S. Lansing		2								2
S. Larocheille					3		3			6
S. Lexington			1		2				2	5
S. Lille					1					1
S. Lindenburg			1		1					2
S. Litchfield	24	21	33	6	23	8	11	4	25	155
S. Liverpool					1			2		3
S. Livingstone	1		1						1	3
S. Loanda					1			1		2
S. Lomalinda	1	4		1				3	6	15
S. Lomita			1	1	1	1				4
S. London	1	3	6	1	8	1	1		7	28
S. Luciana					3				1	4
S. Madelia	1	2	1				1	1		6

**TABLE 5**  
***Salmonella isolates from Human sources***  
**by Serotype and Geographic Region, 2004**

Serotype	Region									Total
	New England	Mid Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	
S. Manhattan	3	4	12	4	22	3	3	3	26	80
S. Matadi			1						1	2
S. Maumee					1					1
S. Mbandaka	7	25	21	10	14	17	8	33	29	164
S. Meleagridis	1	2			1			2	2	8
S. Memphis			1	1						2
S. Mendoza		1	6			1				8
S. Miami	19	14	15	4	38	7	2	1	3	103
S. Michigan		2						1	3	6
S. Mikawasima								1		1
S. Mim					1					1
S. Minnesota		6	5	4	7	1		3	8	34
S. Mississippi	9	15	6	8	222	144	150	3	1	558
S. Mkamba						1				1
S. Monschau	2	5	1		8	3		1	1	21
S. Montevideo	41	141	104	58	143	81	94	68	140	870
S. Morotai			1							1
S. Muenchen	31	85	72	42	196	114	82	46	71	739
S. Muenster	2	17	12	2	6	1		6	13	59
S. Muenster var. 15+	1		1							2
S. Napoli			1							1
S. Nessziona								1		1
S. Neukoelln			1							1
S. Newmexico			1	1		1				3
S. Newport	114	390	391	221	921	315	518	163	292	3325
S. Nigeria						2				2
S. Nima			1	1	1	1		1		5
S. Norwich	2	6	8	14	16	28	28	1	3	106
S. Nottingham										1
S. Nyanza	1									1
S. Ohio		8	21	8	5	3	3	2	24	74
S. Ohlstedt		1								1
S. Oranienburg	33	59	77	60	39	27	30	84	86	495
S. Oranienburg var. 14+						1			1	2
S. Orientalis	1				1					2
S. Orion	1								2	3
S. Orion var. 15+					1					1
S. Orion var. 15+, 34+		1								1
S. Oritamerin			1		2					3
S. Oslo	2	4	2		1	1			15	25
S. Othmarschen		9	4	1	6	1	1		1	23
S. Oxford				1						1
S. Pakistan		1		1					3	5
S. Panama	11	30	13	9	28	5	2	37	15	150
S. Paratyphi A	13	48	18	7	21	1	3	11	23	145

**TABLE 5**  
***Salmonella isolates from Human sources***  
**by Serotype and Geographic Region, 2004**

Serotype	Region									Total
	New England	Mid Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	
S. Paratyphi B	7	14	63	7	41	6	10	14	77	239
S. Paratyphi B var. L(+) tartrate+	18	73	53	45	35	34	27	27	42	354
S. Paratyphi C		2								2
S. Pensacola	1				1		1		1	4
S. Poano			3	1	1				1	6
S. Pomona	5	22	16	2	4	4	1	5	11	70
S. Poona	17	53	32	10	26	14	10	39	33	234
S. Portland									1	1
S. Potsdam			2	1					1	4
S. Putten	1		1						2	4
S. Quiniela							2			2
S. Reading	5	4	19	10	10			10	16	74
S. Remo						1				1
S. Richmond	1		2			1			2	6
S. Rissen	1				1	3			2	7
S. Romanby			1							1
S. Roodepoort					1			1	1	3
S. Rubislaw	3	8	7	3	18	26	37		2	104
S. Saintemarie								1		1
S. Saintpaul	38	149	115	44	113	36	22	50	125	692
S. Sandiego	7	21	31	4	11	7	4	10	15	110
S. Sangalkam					1					1
S. Santiago									1	1
S. Saphra							3		1	4
S. Schleissheim						3				3
S. Schwarzengrund	6	53	13	6	21	9	1	10	28	147
S. Selby		1								1
S. Senftenberg	4	20	6	5	24	2	2	12	26	101
S. Seremban		2								2
S. Shipley					2					2
S. Shubra	1						1			2
S. Singapore		1	2		2			1	4	10
S. Sinstorf			1							1
S. Soerenga		2						1		3
S. Spalentor					2					2
S. Stachus									1	1
S. Stanley	14	39	32	14	26	3	4	14	43	189
S. Stanleyville	2	1	1		1				1	6
S. Stellingen								1		1
S. Stoneferry			1							1
S. Strasbourg									1	1
S. Suelldorf		1								1
S. Sundsvall		5						1		6
S. Takoradi	2		1					1	1	5
S. Tallahassee		1			2					3

**TABLE 5**  
***Salmonella isolates from Human sources***  
**by Serotype and Geographic Region, 2004**

Serotype	Region									Total
	New England	Mid Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	
S. Telkelebir		5	5	2	5	1	1	3	7	29
S. Tennessee	2	8	13	7	3	3	3	3	12	54
S. Thompson	35	90	95	70	35	23	24	20	101	493
S. Thompson var. 14+			1							1
S. Tornow		1	2							3
S. Toucra					1				2	3
S. Travis		2								2
S. Tripoli				2						2
S. Tshiongwe								1		1
S. Tucson			1							1
S. Typhi	24	94	44	9	46	8	1	9	71	306
S. Typhimurium	285	1153	939	631	939	464	339	357	752	5859
S. Typhimurium var. 5-	113	81	85	110	245	105		65	179	983
S. Typhisuis			1		1					2
S. Tyresoe							1			1
S. Uganda	6	9	7	6	2	1	2	1	11	45
S. Uganda var. 15+					1					1
S. Uppsala					1					1
S. Urbana	5	11	13	3	9	3	5	5	5	59
S. Uzaramo			4					1		5
S. Valdosta					2					2
S. Vejle		1			3					4
S. Virchow	9	12	25	8	4	2	3	4	12	79
S. Virginia		2			2	5			1	10
S. Volkmarssdorf									1	1
S. Wandsworth			1					1		2
S. Wangata	1								2	3
S. Waycross							2			2
S. Welikade				1						1
S. Weltevreden	6	8	8	4	5		1	3	59	94
S. Weltevreden var. 15+					1			1		2
S. Wentworth		4								4
S. Westhampton			1					1	4	6
S. Widemarsh									1	1
S. Wil								1		1
S. Willamette									1	1
S. Winneba		1								1
S. Worthington	2	7	9	2	8	2	1	2	1	34
S. Zerifin		2	1							3
S. I 4,[5],12:-:1,2	1		1	1						3
S. I 4,[5],12:b:-	4	18	1		14	11		2		50
S. I 4,[5],12:i:-	123	192	153	67	44	83	19	24	34	739
S. I 4,[5],12:r:-	2	10	1	1	1	1			1	17
S. I 6,14,25:b:-			2							2
S. I 6,7:-:1,5			10		5				1	16

**TABLE 5**  
***Salmonella* isolates from Human sources  
by Serotype and Geographic Region, 2004**

Serotype	Region									Total
	New England	Mid Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	
S. I 6,7:b:-					1					1
S. I 6,7:c:-		1								1
S. I 6,7:k:-					3					3
S. I 6,7:r:-	1									1
S. I 6,8:d:-		1								1
S. I 6,8:e,h:-		3								3
S. I 9,12:-:1,5									1	1
S. I 9,12:l,z28:-				1						1
S. I 11:e,h:-					1					1
S. I 13,23:-:1,5						1				1
S. I 13,23:b:-	1				1			1		3
S. I 38:k:-						1				1
S. I 40:-:e,n,x			2							2
S. I 47:z4,z23:-						1				1
S. II 4,12,[27]:b:[e,n,x]		1								1
S. II 4,12:-:1,6									1	1
S. II 9,12:b:-					1					1
S. II 9,46:m,t,e,n,x			1							1
S. II 16:z35:e,n,x									1	1
S. II 30:l,z28:z6				1						1
S. II 47:b:1,5							1			1
S. II 48:d:1,2								1		1
S. II 48:d:z6	1									1
S. II 48:z81:z39								2		2
S. II 50:b:z6		1		1						2
S. II 58:d:z6								1		1
S. II 58:l,z13,z28:z6			1							1
S. IIIa 18:z4,z23:-								4		4
S. IIIa 35:z29:-								1		1
S. IIIa 41:z4,z23:-	1	1	3	2		1		3		11
S. IIIa 44:z4,z23:-	1									1
S. IIIa 48:g,z51:-					2	1				3
S. IIIa 51:z4,z23:-			1			1				2
S. IIIa 53:z4,z23:-						1				1
S. IIIb 16:z10:e,n,x,z15	1									1
S. IIIb 17:z10:e,n,x,z15			1							1
S. IIIb 18:l,[v],[z13]:z	1									1
S. IIIb 18:l,v:z					3					3
S. IIIb 47:k:z35	1									1
S. IIIb 48:i:z	1							1	1	3
S. IIIb 48:r:z						1				1
S. IIIb 48:z52:z				1						1
S. IIIb 50:k:z	1		1			1				3
S. IIIb 50:l,v:z35			1							1
S. IIIb 50:r:z							3			3

TABLE 5

***Salmonella isolates from Human sources  
by Serotype and Geographic Region, 2004***

Serotype	Region									Total
	New England	Mid Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	
S. IIIb 50:z52:z35			1							1
S. IIIb 58:z52:z35	1									1
S. IIIb 60:r:e,n,x,z15	1			2	1					4
S. IIIb 60:r:z			1							1
S. IIIb 61:-1,5,[7]			1							1
S. IIIb 61:c:z35		1								1
S. IIIb 61:l,[v],[z13]:1,5,[7]			2							2
S. IIIb 61:[v],[z13]:z35			1							1
S. IIIb 61:r:z								1		1
S. IIIb 61:z52:z53									1	1
S. IV 6,7:z4,z24:-	1		1							2
S. IV 16:z4,z32:-		1			1	1				3
S. IV 43:z36,z38:-								1		1
S. IV 43:z4,z23:-	1			2				2	2	7
S. IV 44:z36,[z38]:-				1						1
S. IV 44:z4,z23:-	1		3	1	1	1				7
S. IV 44:z4,z24:-			2							2
S. IV 44:z4,z32:-	1									1
S. IV 45:g,z51:-	1		2	1		2		2		8
S. IV 48:g,z51:-		1	4	2				5	1	13
S. IV 48:z4,z32:-		1								1
S. IV 50:g,z51:-		3	2	2		1		1		9
S. IV 50:z4,z23:-	1	2	2		2					7
S. bongori ser. 48:z35:-					1					1
S. bongori ser. 66:z81:-								1		1
Partially serotyped isolates	8	38	40	61	792	39	151	141	58	1328
Rough or nonmotile isolates	14	6	13	4	4	2	3	9	6	61
Unknown	21	35	156	60	236	185	1274	64	22	2053
Total	2001	6251	5051	2541	6878	2644	3586	2145	4564	35661

**TABLE 6**  
**Clinical *Salmonella* isolates from Nonhuman sources**  
**Reported to CDC and NSVL by Serotype and Source, 2004**

Serotype	Clinical Nonhuman Source									Total
	Bovine	Chicken	Equine	Other Birds / Wild Animals	Other Domestic Animals/Environment	Porcine	Reptile	Turkey	All Others	
S. Adelaide	1	1								2
S. Agona	130	3	37	7	20	66		4		267
S. Agoueve				1						1
S. Alachua							2			2
S. Albany		1		1		1		2		5
S. Amsterdam var. 15+	1									1
S. Anatum	41		18	3	16	41		6	1	126
S. Anatum var. 15+	8		9			2	2			21
S. Apapa							1			1
S. Aqua							10			10
S. Arechavaleta	2									2
S. Baildon				1						1
S. Banana						1				1
S. Bardo	25		6		2		1			34
S. Bareilly	5		2		1		5			13
S. Beaudesert							1			1
S. Bere						1				1
S. Berta		1	1	1				7		10
S. Blockley	1			1			1			3
S. Bovismorbificans	18		2	2	1	7				30
S. Braenderup	4		7	8	1	3	6			29
S. Brandenburg	3		8	2		22				35
S. Bredeney	3			1	1	7		13		25
S. Cannstatt					21					21
S. Carrau			1		1					2
S. Cerro	40	2		1	1	5	2		1	52
S. Charity							1			1
S. Choleraesuis						3				3
S. Choleraesuis var. Kunzendorf	2						208			210
S. Cubana	13			2	22	3		1		41
S. Derby	8			3		196				207
S. Dublin	135				4					139
S. Ealing				1						1
S. Elisabethville							1			1
S. Enteritidis	9	16	9	14	7	5	2	1		63
S. Fluntern							1			1
S. Fresno							1			1
S. Gallinarum		30		9						39
S. Gaminara			1		1		3			5
S. Gera						1				1
S. Give	16		4	1		8	1			30
S. Give var. 15+	11		6	1	4				1	23
S. Hadar	1	1		6	16	1	2	14		41
S. Hartford	2		10	1	2					15

**TABLE 6**  
**Clinical *Salmonella* isolates from Nonhuman sources**  
**Reported to CDC and NSVL by Serotype and Source, 2004**

Serotype	Clinical Nonhuman Source									Total
	Bovine	Chicken	Equine	Other Birds / Wild Animals	Other Domestic Animals/Environment	Porcine	Reptile	Turkey	All Others	
S. Havana	17	1		3	10	7	1			39
S. Heidelberg	13	30	1	2	4	95		68	2	215
S. Hvittingfoss							2			2
S. Idikan	2									2
S. Indiana				5				2		7
S. Infantis	50		7	7	13	70			1	148
S. Inverness			1	1						2
S. Istanbul		2								2
S. Ituri					1					1
S. Javiana			6		3					9
S. Johannesburg	1	1	1	3	2	8	1	3		20
S. Kentucky	50	21	6	5	5	2				89
S. Kiambu	3	6	1		1					11
S. Kingabwa					1					1
S. Kisarawe							4			4
S. Kottbus							1			1
S. Krefeld						11				11
S. Labadi							1			1
S. Lexington			1							1
S. Lille					2					2
S. Litchfield			10	2		1				13
S. Livingstone	3	3		3	1	6				16
S. Lome							1			1
S. London	4		1			13				18
S. Manhattan			1			4				5
S. Mbandaka	21	5	8	1	1	14	1		2	53
S. Meleagridis	41				9					50
S. Miami			3							3
S. Minnesota	6			1	1	1			1	10
S. Mississippi			5	1						6
S. Molade					1					1
S. Montevideo	74	7	7	7	9	3	4	25		136
S. Muenchen	22		12	11	5	22	17			89
S. Muenster	102	1	11	6	3	4		1		128
S. Muenster var. 15+, 34+		1								1
S. Mundonobo							1			1
S. Newport	710	1	151	19	107	41	23	7	8	1067
S. Norwich	3		8							11
S. Nyanza					4					4
S. Offa							1			1
S. Ohio	11		4		2	27		1		45
S. Ohlstedt							1			1
S. Ondersteopoort							1			1
S. Oranienburg	12		22	3	8	2	4			51

TABLE 6

**Clinical *Salmonella* isolates from Nonhuman sources  
Reported to CDC and NSVL by Serotype and Source, 2004**

Serotype	Clinical Nonhuman Source									Total
	Bovine	Chicken	Equine	Other Birds / Wild Animals	Other Domestic Animals/Environment	Porcine	Reptile	Turkey	All Others	
S. Orientalis								2		2
S. Orion			1				2			3
S. Orion var. 15+							1			1
S. Orion var. 15+, 34+	1			1						2
S. Oslo				1						1
S. Ouakam						2				2
S. Panama	2			1			5			8
S. Paratyphi B var. L(+) tartrate+	2		23				2			27
S. Pensacola					1					1
S. Pomona	2			1			1			4
S. Poona				4		1				5
S. Putten						3				3
S. Reading	33		39	6	3	4		5	1	91
S. Rubislaw			7	2			2		1	12
S. Saintpaul	3	1	9	12	1	6	2	6	1	41
S. Sandiego					1		2			3
S. Sanjuan							5			5
S. Schwarzengrund		3	2	1	3	19		2	1	31
S. Senegal							1			1
S. Senftenberg	10	7	5	7	39	10	1	59		138
S. Stanley	3									3
S. Tallahassee			1	3						4
S. Tennessee	2			13	2	2	1	1		21
S. Thompson	9	1	13	1	1	5	2			32
S. Tucson			1							1
S. Typhimurium	146	11	257	59	95	87		12	1	668
S. Typhimurium var. 5-	225	3	32	59	46	514	3	5	3	890
S. Uganda	94		24	2	4	10				134
S. Uganda var. 15+						1				1
S. Urbana				1			2			3
S. Weltevreden				1						1
S. Weslaco			1							1
S. Westhampton				1				3		4
S. Worthington			6	1	2	23	1			33
S. I 11:r:-					2					2
S. I 3,10:-:1,6						1				1
S. I 3,10:l,z13:-	1									1
S. I 3,15:-:1,6					1					1
S. I 4,12:l,v:-								1		1
S. I 4,[5],12:-:1,2							1			1
S. I 4,[5],12:d:-	1			1	1					3
S. I 4,[5],12:i:-	59		33	39	8	14	1			154
S. I 4,[5],12:r:-	1				1	7		2		11
S. I 47:z24,z23:-			1							1

**TABLE 6**  
**Clinical *Salmonella* isolates from Nonhuman sources**  
**Reported to CDC and NSVL by Serotype and Source, 2004**

Serotype	Clinical Nonhuman Source									Total
	Bovine	Chicken	Equine	Other Birds / Wild Animals	Other Domestic Animals/Environment	Porcine	Reptile	Turkey	All Others	
S. I 6:7:e,h:-	1									1
S. I 6:7:l,w:-						1				1
S. I 6:7:r:-						2				2
S. I 6:7:z10:-						1				1
S. I 6:8:d:-	1									1
S. I 6:8:e,h:-	4									4
S. I 9,12:-:1,5			2							2
S. II 40:z4,z24:z39					1					1
S. II 47:a:1,5							1			1
S. II 48:a:z6					1					1
S. II 48:d:z6					21					21
S. II 58:l,z13,z28:z6				1						1
S. II 6,7:(g),m,[s],t:1,5							1			1
S. IIIa 13,23:z4,z23,[z32]:-	1						1			2
S. IIIa 18:z4,z23:-				6				6		12
S. IIIa 18:z4,z32:-		2		1			1	4		8
S. IIIa 21:z29:-							3			3
S. IIIa 40:z4,z23:-					1					1
S. IIIa 41:z4,z23:-			1		1		6		1	9
S. IIIa 42:z4,z24:-							2			2
S. IIIa 44:z4,z23:-							9			9
S. IIIa 45:z29:-				1						1
S. IIIa 47:z4,z23:-					1					1
S. IIIa 48:g,z51:-				1						1
S. IIIa 48:z4,z24:-							4			4
S. IIIa 51:g,z51:-			1							1
S. IIIa 51:z4,z23:-							3			3
S. IIIa 53:z4,z23,z32:-							1			1
S. IIIa 53:z4,z23:-			1	1	1					3
S. IIIa 56:z4,z23:-							11			11
S. IIIa [1],13,23:g,z51:-							1			1
S. IIIb (6),14:z10:z							5			5
S. IIIb 16:z10:e,n,x,z15				1			4			5
S. IIIb 17:z10:e,n,x,z15							5			5
S. IIIb 18:l,v:z							12			12
S. IIIb 21:l,v:z							1			1
S. IIIb 35:i:z35							13			13
S. IIIb 35:l,v:z35							1			1
S. IIIb 38:(k):z35			1				24	1		26
S. IIIb 43:r:z53							1			1
S. IIIb 43:z52:z53							1			1
S. IIIb 47:k:z35				1			9			10
S. IIIb 47:k:z53							1			1
S. IIIb 47:r:z53							3			3

**TABLE 6**  
**Clinical *Salmonella* isolates from Nonhuman sources**  
**Reported to CDC and NSVL by Serotype and Source, 2004**

Serotype	Clinical Nonhuman Source									Total
	Bovine	Chicken	Equine	Other Birds / Wild Animals	Other Domestic Animals/Environment	Porcine	Reptile	Turkey	All Others	
S. IIIb 48:i:z							15			15
S. IIIb 48:i:z35							1			1
S. IIIb 48:k:1,5,(7)							3			3
S. IIIb 48:l,v:1,5,(7)							1			1
S. IIIb 48:z52:z							4			4
S. IIIb 50:k:z			1	1	1					3
S. IIIb 50:k:z53								1		1
S. IIIb 50:r:-							1			1
S. IIIb 50:r:z			1				12			13
S. IIIb 50:r:z53							1			1
S. IIIb 50:z52:z35							1			1
S. IIIb 50:z52:z53							1			1
S. IIIb 53:k:z							1			1
S. IIIb 53:l,v:e,n,x,z15							4			4
S. IIIb 53:z10:z35							1			1
S. IIIb 58:r:e,n,x,z15							2			2
S. IIIb 58:z52:z35							17			17
S. IIIb 60:r:e,n,x,z15							1			1
S. IIIb 61:c:z35							1		1	2
S. IIIb 61:i:z							1			1
S. IIIb 61:i:z35							3			3
S. IIIb 61:l,[v],[z13]:z35							1			1
S. IIIb 61:r:1,5,7					18	1				19
S. IIIb 61:r:z53							1			1
S. IIIb 65:l,v:z							4			4
S. IIIb 65:l,v:z35							1			1
S. IIIb 65:z10:e,n,x,z15							4			4
S. IIIb 65:z52:z35							2			2
S. IV 11:z4,z23:-							2			2
S. IV 16:z4,z32:-			1		1		2			4
S. IV 18:z36,z38:-							4			4
S. IV 40:z4,z32:-					1					1
S. IV 44:z36,[z38]:-					1					1
S. IV 44:z4,z24:-							1			1
S. IV 44:z4,z32:-							3			3
S. IV 45:g,z51:-							4			4
S. IV 48:g,z51:-	1								1	2
S. IV 50:g,z51:-							1			1
S. IV 50:z4,z23:-					2					2
Rough or nonmotile isolates	31	2	1	1	1	40	3	1	2	82
Total	2257	164	857	375	578	1668	369	264	30	6562

TABLE 7

**Non-Clinical *Salmonella* isolates from Nonhuman sources  
Reported to CDC and NSVL by Serotype and Source, 2004**

Serotype	Non-Clinical Nonhuman Source											
	Bovine	Chicken	Equine	Feed/Feed Supplements	Other Birds / Wild Animals	Other Domestic Animals/Environment	Porcine	Reptile	Turkey	All Others	Total	
S. Adelaide									1		1	
S. Agona		44			1	28	3		84	10	170	
S. Alabama		3									3	
S. Alachua		6									6	
S. Albany		4							8		12	
S. Altona		1									1	
S. Amager		24			2						26	
S. Amsterdam		3									3	
S. Amsterdam var. 15+		5								1	6	
S. Anatum	2	11				3	9		18	10	53	
S. Anatum var. 15+						7				1	8	
S. Banana		4									4	
S. Bardo	3	1				2				1	7	
S. Bareilly	2	9				1					12	
S. Barranquilla		1									1	
S. Bere		2							1		3	
S. Berta		7							27		34	
S. Bovismorbificans	1	2					8		4		15	
S. Braenderup		42							1	1	44	
S. Brandenburg									3		3	
S. Bredeney		8							28		36	
S. Carrau										1	1	
S. Cerro	108	5							1		114	
S. Choleraesuis var. Kunzendorf							2		8	12	22	
S. Cubana	1	14							15	2	32	
S. Denver										1	1	
S. Derby		5				1	178		22	5	211	
S. Dublin	1				7					44	52	
S. Duesseldorf									1		1	
S. Enteritidis		122			6	1			2	44	175	
S. Gera					1						1	
S. Give	3	1					15		3		22	
S. Godesberg		1									1	
S. Haardt						1					1	
S. Hadar	1	22			1	1			382	6	413	
S. Hartford	2	1									3	
S. Havana	1	12				7			2		22	
S. Heidelberg		356			12	2	24		121	11	526	
S. Infantis		29				5	6		7	3	50	
S. Inverness	74										74	
S. Istanbul		1							4		5	
S. Javiana						4		1	4	1	10	
S. Johannesburg		8							2		10	
S. Kentucky	4	252			1	9			23	3	292	

**TABLE 7**  
**Non-Clinical *Salmonella* isolates from Nonhuman sources**  
**Reported to CDC and NSVL by Serotype and Source, 2004**

Serotype	Non-Clinical Nonhuman Source											
	Bovine	Chicken	Equine	Feed/Feed Supplements	Other Birds / Wild Animals	Other Domestic Animals/Environment	Porcine	Reptile	Turkey	All Others	Total	
S. Kiambu		15				1					16	
S. Kisarawe										1	1	
S. Kralingen		2							1		3	
S. Larochelle					1						1	
S. Lexington		1									1	
S. Lexington var. 15+					1						1	
S. Lille		5			1	1			2	2	11	
S. Litchfield		2									2	
S. Liverpool									2		2	
S. Livingstone		2				1				2	5	
S. London									5		5	
S. Manhattan	1							6	1		8	
S. Mbandaka	1	39				16	23		28	3	110	
S. Meleagridis	3	2				1	1			9	16	
S. Minnesota		5				1					6	
S. Molade		1									1	
S. Montevideo	1	57		2	27	10	3		38	4	142	
S. Muenchen	1	26				5			6	1	39	
S. Muenster		9							115		124	
S. Muenster var. 15+, 34+		4									4	
S. Newport	32	18	28		20	33	6	1	11	38	187	
S. Norwich		5									5	
S. Ohio	4	12				1			7		24	
S. Ona										1	1	
S. Oranienburg		16			1	1			2	20	40	
S. Orion		9							4		13	
S. Orion var. 15+		7				1					8	
S. Orion var. 15+, 34+									15		15	
S. Ouakam		11									11	
S. Panama						1					1	
S. Paratyphi B var. L(+) tartrate+	1	3									4	
S. Pensacola									4		4	
S. Pomona		2									2	
S. Poona		1								1	2	
S. Putten		6				2					8	
S. Reading					5		2		69	2	78	
S. Rubislaw	1	1				1					3	
S. Saintpaul					5				36		41	
S. Sandiego		1									1	
S. Schwarzengrund		30				6			70	4	110	
S. Senftenberg	1	144		2		1	5		352	3	508	
S. Soerenga		1									1	
S. Taksomy		13									13	
S. Tennessee	2	6			2				8		18	

**TABLE 7**  
**Non-Clinical *Salmonella* isolates from Nonhuman sources**  
**Reported to CDC and NSVL by Serotype and Source, 2004**

Serotype	Non-Clinical Nonhuman Source											
	Bovine	Chicken	Equine	Feed/Feed Supplements	Other Birds / Wild Animals	Other Domestic Animals/Environment	Porcine	Reptile	Turkey	All Others	Total	
S. Thompson	1	33				2			6	2	44	
S. Typhimurium	21	79	2		3	33	16		4	179	337	
S. Typhimurium var. 5-	34	37			2	11	52		20	179	335	
S. Uganda		9				1			4		14	
S. Uganda var. 15+		3									3	
S. Urbana					2				16		18	
S. Weltevreden					1					1	2	
S. Westhampton		2							20		22	
S. Westhampton var. 15+		1									1	
S. Worthington		27					14		53	3	97	
S. I 3:10:e,h:-										2		2
S. I 3:15:-:1,6						1						1
S. I 4,[5],12:-:1,2		2										2
S. I 4,[5],12:i:-		47			1	9	1			2	60	
S. I 4,[5],12:r:-		16								1		17
S. I 47:z4,z23:-		1										1
S. I 6,7:-:1,5	1											1
S. I 6,7:-:e,n,z15		1										1
S. I 6,7:b:-		3										3
S. I 6,7:k:-		5										5
S. I 6,7:z10:-		5				1			1		7	
S. I 6,8:d:-											1	1
S. I 6,8:e,h:-										1		1
S. I 6,8:r:-								2				2
S. I 8,20:-:z6		5										5
S. I 8,20:i:-		2										2
S. II 48:d:z6						6				3		9
S. IIIa 18:z4,z32:-					1	2			12			15
S. IIIa 41:z4,z23:-										1		1
S. IIIa 42:z4,z24:-										1		1
S. IIIa 44:z4,z23:-											1	1
S. IIIa 53:z4,z23:-		1				3			2	1		7
S. IIIb (6),14:z10:z						2						2
S. IIIb 38:(k):z35	1							1		1		3
S. IIIb 38:l,v:z53										2		2
S. IIIb 42:(k):z35						1						1
S. IIIb 48:i:z									5			5
S. IIIb 48:z52:z										1		1
S. IIIb 50:r:z										1		1
S. IIIb 61:l,v:1,5,7					1							1
S. IIIb 61:r:z53										1		1
S. IV 11:z4,z23:-								2				2
S. IV 40:g,z51:-	4											4
S. IV 43:z4,z32:-										1		1

**TABLE 7**  
***Non-Clinical Salmonella isolates from Nonhuman sources***  
***Reported to CDC and NSVL by Serotype and Source, 2004***

Serotype	Non-Clinical Nonhuman Source										
	Bovine	Chicken	Equine	Feed/Feed Supplements	Other Birds / Wild Animals	Other Domestic Animals/Environment	Porcine	Reptile	Turkey	All Others	
Rough or nonmotile isolates	1	15							8	1	25
<b>Total</b>	<b>313</b>	<b>1754</b>	<b>33</b>	<b>4</b>	<b>105</b>	<b>227</b>	<b>376</b>	<b>5</b>	<b>1703</b>	<b>630</b>	<b>5150</b>

**TABLE 8**

**The Top 20 most frequently reported *Salmonella* serotypes from Human sources**  
**Percent Change in reported isolates**

Rank			Serotype	Reported Isolates			Percent Change		
1994	1999	2004		1994	1999	2004	1994-1999	1999-2004	1994-2004
2	1	1	S. Typhimurium *	8365	8052	6842	-4	-15	-18
1	2	2	S. Enteritidis	9866	5343	5012	-46	-6	-49
4	3	3	S. Newport	1673	2618	3325	56	27	99
11	6	4	S. Javiana	540	1197	1772	122	48	228
3	4	5	S. Heidelberg	1825	1816	1757	-0	-3	-4
7	7	6	S. Montevideo	631	851	870	35	2	38
	28	7	S. I 4,[5],12:i:-		138	739		436	
9	5	8	S. Muenchen	559	1332	739	138	-45	32
14	14	9	S. Saintpaul	479	472	692	-1	47	44
15	11	10	S. Braenderup	426	529	684	24	29	61
12	10	11	S. Infantis	520	596	588	15	-1	13
26	18	12	S. Mississippi	152	248	558	63	125	267
8	8	13	S. Oranienburg	602	616	495	2	-20	-18
10	9	14	S. Thompson	549	607	493	11	-19	-10
16	26	15	S. Berta	399	143	409	-64	186	3
6	12	16	S. Agona	753	528	406	-30	-23	-46
22	16	17	S. Paratyphi B var. L(+) tartrate+	172	316	354	84	12	106
13	15	18	S. Typhi	507	352	306	-31	-13	-40
5	13	19	S. Hadar	1001	516	277	-48	-46	-72
27	24	20	S. Anatum	146	157	250	8	59	71

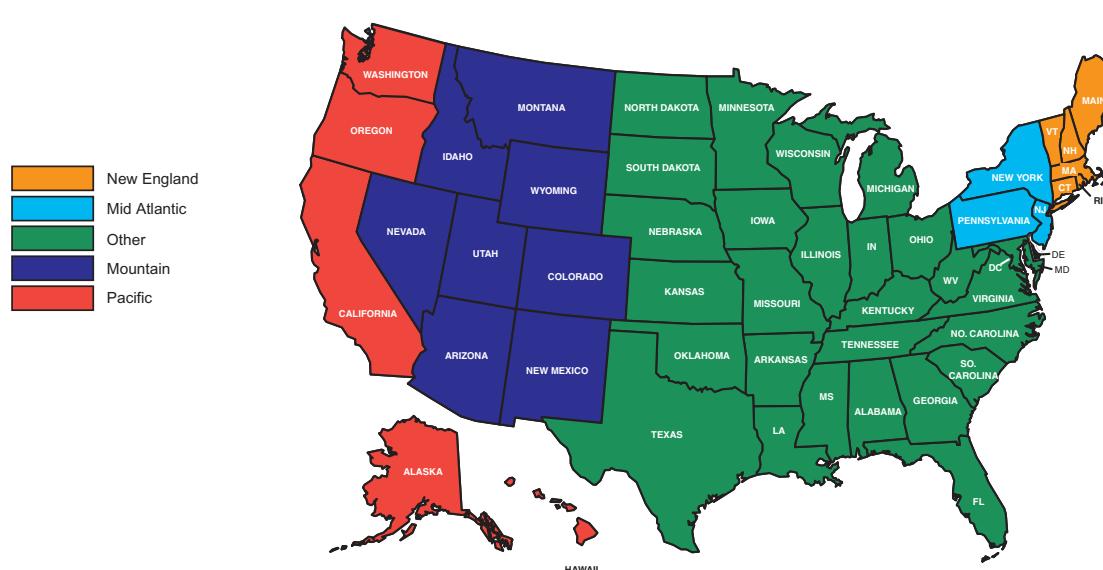
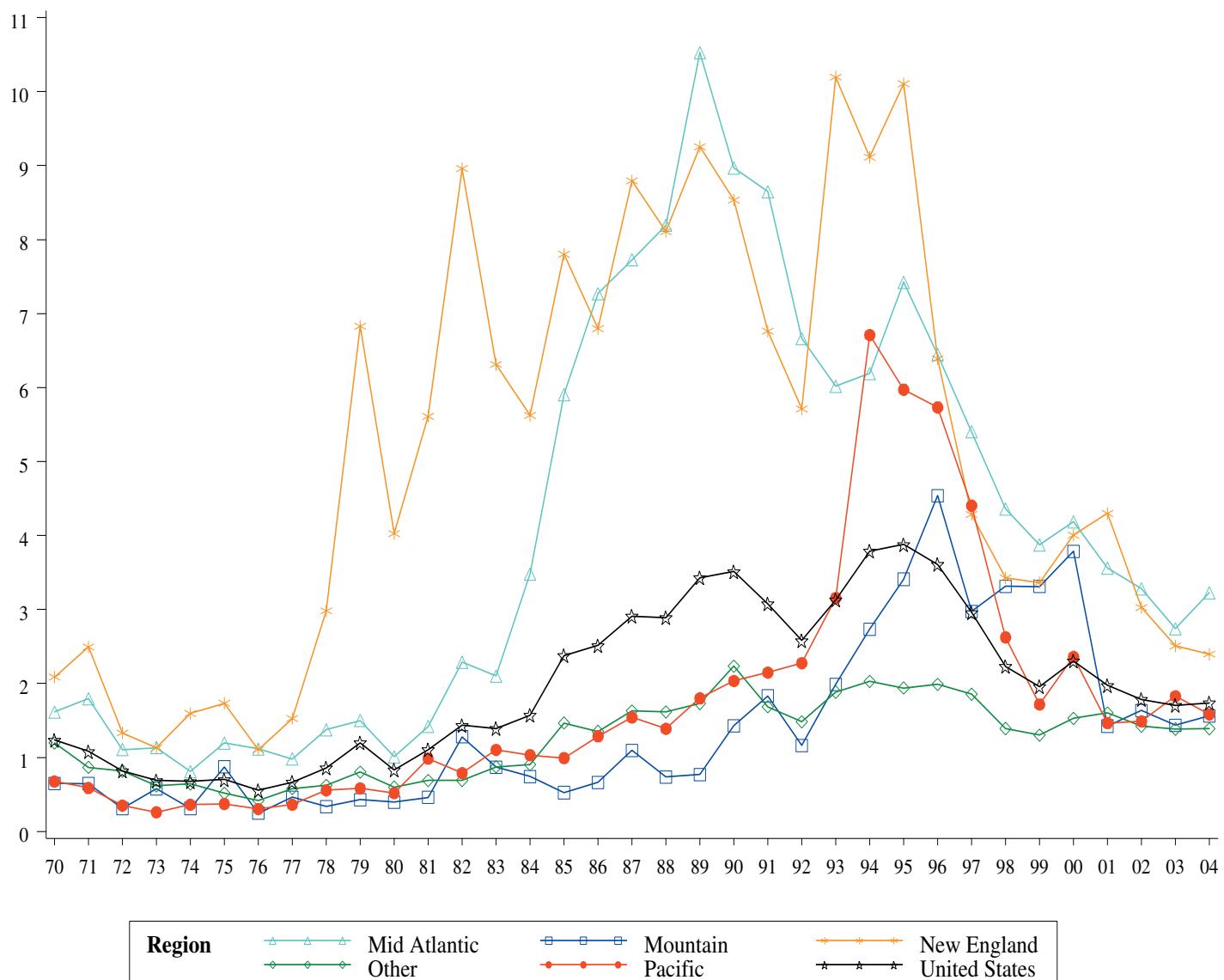
NOTE:

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\* Typhimurium includes var. 5- (Formerly var. Copenhagen)

**Figure 3**

**S. Enteritidis isolation rates per 100,000 population by region: 1970-2004**



**Figure 4**

**Top 4 *Salmonella* Serotype isolation rates in the United States per 100,000 population: 1970-2004**

