National Antimicrobial Resistance Monitoring System For Enteric Bacteria

Table 1. Population size and number of isolates received and tested, by site, 2000

Site	Pop. Size*		Non-Typhi *Salmonella*		*Salmonella* Typhi		*Shigella*		*E. coli* O157		*Campylobacter* **	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
California [1]	3,169,290	(3)	55	(4)	11	(6)	9	(2)	10	(2)	45	(14)
Colorado	4,301,261	(4)	66	(5)	2	(1.1)	25	(5)	24	(6)	32	(10)
Connecticut	3,405,565	(3)	47	(3)	8	(4)	7	(1.5)	25	(6)	45	(14)
Florida	15,982,378	(15)	60	(4)	8	(4)	4	(0.9)	15	(4)		
Georgia	8,186,453	(8)	186	(13)	9	(5)	22	(5)	34	(8)	51	(16)
Kansas	2,688,418	(2)	36	(3)	1	(0.6)	14	(3)	5	(1.2)		
Los Angeles [2]	9,519,338	(9)	111	(8)	29	(16)	18	(4)	7	(1.7)		
Maryland	5,296,486	(5)	122	(9)	0	(0)	27	(6)	35	(9)	2	(0.6)
Massachusetts	6,349,097	(6)	55	(4)	14	(8)	10	(2)	9	(2)		
Minnesota	4,919,479	(5)	59	(4)	3	(1.7)	83	(18)	46	(11)	51	(16)
New Jersey	8,414,350	(8)	116	(8)	23	(13)	53	(12)	34	(8)		
New York City [3]	8,008,278	(7)	131	(9)	57	(32)	63	(14)	16	(4)		
New York State [4]	10,968,179	(10)	126	(9)	4	(2)	28	(6)	63	(15)	48	(15)
Oregon	3,421,399	(3)	34	(2)	4	(2)	9	(2)	24	(6)	25	(8)
Tennessee	5,689.283	(5)	76	(5)	3	(1.7)	33	(7)	11	(3)	25	(8)
Washington	5,894,121	(5)	75	(5)	0	(0)	41	(9)	42	(10)		
West Virginia	1,808,344	(2)	23	(1.6)	1	(0.6)	5	(1.1)	7	(1.7)		
Totals	108,021,719	(100)	1378	(100)	177	(100)	451	(100)	407	(100)	324	(100)

* County population 2000, U.S. Census Bureau, post-census estimates
** *Campylobacter* isolates are submitted only from FoodNet sites, population size of FoodNet sites is 29.5 million persons (see http://www.cdc.gov/foodnet/)
(1) Alameda, Contra Costa, and San Francisco counties
(2) Los Angeles County
(3) Five boroughs of New York City (Bronx, Brooklyn, Manhattan, Queens, Staten Island)
(4) Excluding New York City

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Table 2. Antimicrobial agents used for susceptibility testing for *Salmonella*, *Shigella*, *E. coli* O157, and *Campylobacter* isolates, 2000

Antimicrobial Agent	Antimicrobial Agent Concentration Range (μg/ml)	Breakpoints [R]	[I]	[S]
Amikacin	4 - 32	≥ 64	32	≤ 16
Amoxicillin – Clavulanic Acid	0.5/0.25 – 32/16	≥ 32	16	≤ 8
Ampicillin	2 – 32	≥ 32	16	≤ 8
Apramycin**	2 – 32	≥ 64	16	≤ 8
Azithromycin	0.016 – 256*	≥ 2	0.5-1	≤ 0.25
Cefoxitin	4-32	≥ 32	16	≤8
Ceftiofur**	0.5 – 16	≥ 8	4	≤ 2
Ceftriaxone	0.25 – 64	≥ 64	32	≤ 8
Cephalothin	1 – 32	≥ 32	16	≤ 8
Chloramphenicol	4 – 32 0.016 – 256*	≥ 32	16	≤ 8
Ciprofloxacin	0.015 – 4 0.002 – 32*	≥ 4	2	≤ 1
Clindamycin	0.016 – 256*	≥ 4	1-2	≤ 0.5
Erythromycin	0.016 – 256*	≥ 8	1-4	≤ 0.5
Gentamicin	0.25 – 16 0.016 – 256*	≥ 16	8	≤ 4
Kanamycin	16 – 64	≥ 64	32	≤ 16
Nalidixic Acid	4 – 256 0.047 – 256*	≥ 32		≤ 16
Streptomycin	32 – 256	≥ 64		≤ 32
Sulfamethoxazole	128 – 512	≥ 512		≤ 256
Tetracycline	4 – 32 0.016 – 256*	≥ 16	8	≤ 4
Trimethoprim - Sulfamethoxazole	0.12/2.4 – 4/76	≥ 4/76		≤ 2/38

* Campylobacter antimicrobial agents and concentration ranges used
** No NCCLS interpretive standards for this antimicrobial agent

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Table 3. Antimicrobial resistance of *Salmonella, Shigella,* and *E. coli* O157 isolates, 2000

Antimicrobial Agent	Non-Typhi *Salmonella* (N=1378)		*Salmonella* Typhi (N=177)		*Shigella* (N=451)		*E. coli* O157 (N=407)	
	N	**%**	**N**	**%**	N	%	**N**	**%**
Amikacin	0	(0)	2	(1.1)	1	(0.2)	0	(0)
Amoxicillin – Clavulanic Acid	54	(4)	0	(0)	10	(2)	4	(1.0)
Ampicillin	219	(16)	16	(9)	356	(79)	11	(3)
Apramycin	2	(0.1)	2	(1.1)	1	(0.2)	0	(0)
Cefoxitin	43	(3)	3	(1.7)	2	(0.4)	4	(1.0)
Ceftiofur	44	(3)	1	(0.6)	0	(0)	4	(1.0)
Ceftriaxone	18	(1.3)	0	(0)	0	(0)	0	(0)
Cephalothin	54	(4)	2	(1.1)	36	(8)	5	(1.2)
Chloramphenicol	138	(10)	19	(11)	63	(14)	15	(4)
Ciprofloxacin	5	(0.4)	0	(0)	0	(0)	0	(0)
Gentamicin	37	(3)	1	(0.6)	1	(0.2)	2	(0.5)
Kanamycin	77	(6)	1	(0.6)	6	(1.3)	4	(1.0)
Nalidixic Acid	34	(2)	41	(23)	5	(1.1)	2	(0.5)
Streptomycin	223	(16)	18	(11)	258	(57)	21	(5)
Sulfamethoxazole	235	(17)	21	(12)	252	(56)	24	(6)
Tetracycline	256	(19)	19	(11)	202	(45)	29	(7)
Trimethoprim - Sulfamethoxazole	29	(2)	16	(9)	239	(53)	3	(0.7)

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Table 4a. Additional resistance by antimicrobial agent for non-Typhi *Salmonella*, 2000

Resistance to: N (%)	Amika	Amo-Cl	Ampic	Apram	Cefox	Cefti	Ceftr	Cepha	Chlor	Cipro	Genta	Kanam	Naldx	Strep	Sulfa	Tetra	Tri-Su
Amikacin [Amika] 0 (0)	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%
Amox-Clav [Amo-Cl] 54 (3.9)	0 0%	54 100%	54 100%	0 0%	43 79.6%	44 81.5%	18 33.3%	45 83.3%	44 81.5%	1 1.8%	7 13.0%	16 29.6%	3 5.6%	47 87.0%	48 88.9%	46 85.2%	14 25.9%
Ampicillin [Ampic] 219 (15.9)	0 0%	54 24.6%	219 100%	2 0.9%	43 19.6%	44 20.1%	18 8.2%	54 24.6%	130 59.4%	2 0.9%	17 7.8%	56 25.6%	11 5.0%	163 74.4%	173 79.0%	171 78.1%	21 9.6%
Apramycin [Apram] 2 (0.1)	0 0%	0 0%	2 100%	2 100%	0 0%	0 0%	0 0%	0 0%	1 50.0%	0 0%	2 100%	1 50.0%	1 50.0%	1 50.0%	2 100%	2 100%	1 50.0%
Cefoxitin [Cefox] 43 (3.1)	0 0%	43 100%	43 100%	0 0%	43 100%	43 100%	18 41.9%	43 100%	36 83.7%	0 0%	6 13.9%	12 27.9%	1 2.3%	37 86.0%	37 86.0%	37 86.0%	11 25.6%
Ceftiofur [Cefti] 44 (3.2)	0 0%	44 100%	44 100%	0 0%	43 97.7%	44 100%	18 40.9%	44 100%	36 81.8%	0 0%	6 13.6%	12 27.3%	1 2.3%	38 86.4%	38 86.4%	38 86.4%	11 25.0%
Ceftriaxone [Ceftr] 18 (1.3)	0 0%	18 100%	18 100%	0 0%	18 100%	18 100%	18 100%	18 100%	17 94.4%	0 0%	0 0%	7 38.9%	0 0%	18 100%	18 100%	18 100%	8 44.4%
Cephalothin [Cepha] 54 (3.9)	0 0%	45 83.3%	54 100%	0 0%	43 79.6%	44 81.5%	18 33.3%	54 100%	37 68.5%	0 0%	8 14.8%	17 31.5%	2 3.7%	41 75.9%	41 75.9%	41 75.9%	13 24.1%
Chloramphenicol [Chlor] 138 (10.0)	0 0%	44 31.9%	130 94.2%	1 0.7%	36 26.1%	36 26.1%	17 12.3%	37 26.8%	138 100%	1 0.7%	8 5.8%	22 15.9%	6 4.3%	129 93.5%	135 97.8%	136 98.5%	15 10.9%
Ciprofloxacin [Cipro] 5 (0.4)	0 0%	1 20.0%	2 40.0%	0 0%	0 0%	0 0%	0 0%	0 0%	1 20.0%	5 100%	1 20.0%	2 40.0%	5 100%	2 40.0%	3 60.0%	3 60.0%	3 60.0%
Gentamicin [Genta] 37 (2.7)	0 0%	7 18.9%	17 45.9%	2 5.4%	6 16.2%	6 16.2%	0 0%	8 21.6%	8 21.6%	1 2.7%	37 100%	10 27.0%	7 18.9%	29 78.4%	33 89.2%	18 48.6%	5 13.5%
Kanamycin [Kanam] 77 (5.6)	0 0%	16 20.8%	56 72.7%	1 1.3%	12 15.6%	12 15.6%	7 9.1%	17 22.1%	22 28.6%	2 2.6%	10 13.0%	77 100%	7 9.1%	57 74.0%	57 74.0%	69 89.6%	13 16.9%
Nalidixic Acid [Naldx] 34 (2.5)	0 0%	3 8.8%	11 32.3%	1 2.9%	1 2.9%	1 2.9%	0 0%	2 5.9%	6 17.6%	5 14.7%	7 20.6%	7 20.6%	34 100%	10 29.4%	12 35.3%	13 38.2%	9 26.5%
Streptomycin [Strep] 223 (16.2)	0 0%	47 21.1%	163 73.1%	1 0.4%	37 16.6%	38 17.0%	18 8.1%	41 18.4%	129 57.8%	2 0.9%	29 13.0%	57 25.6%	10 4.5%	223 100%	189 84.8%	198 88.8%	19 8.5%
Sulfamethoxazole [Sulfa] 235 (17.0)	0 0%	48 20.4%	173 73.6%	2 0.8%	37 15.7%	38 16.2%	18 7.6%	41 17.4%	135 57.4%	3 1.3%	33 14.0%	57 24.2%	12 5.1%	189 80.4%	235 100%	196 83.4%	28 11.9%
Tetracycline [Tetra] 256 (18.6)	0 0%	46 18.0%	171 66.8%	2 0.8%	37 14.4%	38 14.8%	18 7.0%	41 16.0%	136 53.1%	3 1.2%	18 7.0%	69 27.0%	13 5.1%	198 77.3%	196 76.6%	256 100%	22 8.6%
Trimeth-Sulfa [Tri-Su] 29 (2.1)	0 0%	14 48.3%	21 72.4%	1 3.4%	11 37.9%	11 37.9%	8 27.6%	13 44.8%	15 51.7%	3 10.3%	5 17.2%	13 44.8%	9 31.0%	19 65.5%	28 96.5%	22 75.9%	29 100%

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Table 4b. Additional resistance by antimicrobial agent for *Salmonella* Typhi, 2000

Resistance to: N (%)	Amika	Amo-Cl	Ampic	Apram	Cefox	Cefti	Ceftr	Cepha	Chlor	Cipro	Genta	Kanam	Naldx	Strep	Sulfa	Tetra	Tri-Su
Amikacin [Amika] 2 (1.1)	2 100%	0 0%	0 0%	2 100%	2 100%	1 50.0%	0 0%	0 0%	0 0%	0 0%	1 50.0%	1 50.0%	2 100%	2 100%	1 50.0%	2 100%	0 0%
Amox-Clav [Amo-Cl] 0 (0)	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%
Ampicillin [Ampic] 16 (9.0)	0 0%	0 0%	16 100%	0 0%	0 0%	0 0%	0 0%	2 12.5%	16 100%	0 0%	0 0%	0 0%	13 81.2%	16 100%	16 100%	14 87.5%	16 100%
Apramycin [Apram] 2 (1.1)	2 100%	0 0%	0 0%	2 100%	2 100%	1 50.0%	0 0%	0 0%	0 0%	0 0%	1 50.0%	1 50.0%	2 100%	2 100%	1 50.0%	2 100%	0 0%
Cefoxitin [Cefox] 3 (1.7)	2 66.7%	0 0%	0 0%	2 66.7%	3 100%	1 33.3%	0 0%	0 0%	0 0%	0 0%	1 33.3%	1 33.3%	2 66.7%	2 66.7%	1 33.3%	2 66.7%	0 0%
Ceftiofur [Cefti] 1 (0.6)	1 100%	0 0%	0 0%	1 100%	1 100%	1 100%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	1 100%	1 100%	1 100%	1 100%	0 0%
Ceftriaxone [Ceftr] 0 (0)	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%
Cephalothin [Cepha] 2 (1.1)	0 0%	0 0%	2 100%	0 0%	0 0%	0 0%	0 0%	2 100%	2 100%	0 0%	0 0%	0 0%	2 100%	2 100%	2 100%	2 100%	2 100%
Chloramphenicol [Chlor] 19 (10.7)	0 0%	0 0%	16 84.2%	0 0%	0 0%	0 0%	0 0%	2 10.5%	19 100%	0 0%	0 0%	0 0%	14 73.7%	16 84.2%	17 89.5%	16 84.2%	16 84.2%
Ciprofloxacin [Cipro] 0 (0)	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%
Gentamicin [Genta] 1 (0.6)	1 100%	0 0%	0 0%	1 100%	1 100%	0 0%	0 0%	0 0%	0 0%	0 0%	1 100%	1 100%	1 100%	1 100%	0 0%	1 100%	0 0%
Kanamycin [Kanam] 1 (0.6)	1 100%	0 0%	0 0%	1 100%	1 100%	0 0%	0 0%	0 0%	0 0%	0 0%	1 100%	1 100%	1 100%	1 100%	0 0%	1 100%	0 0%
Nalidixic Acid [Naldx] 41 (23.2)	2 4.9%	0 0%	13 31.7%	2 4.9%	2 4.9%	1 2.4%	0 0%	2 4.8%	14 34.1%	0 0%	1 2.4%	1 2.4%	41 100%	15 36.6%	14 34.1%	16 39.0%	13 31.7%
Streptomycin [Strep] 18 (10.2)	2 11.1%	0 0%	16 88.9%	2 11.1%	2 11.1%	1 5.6%	0 0%	2 11.1%	1 88.9%	0 0%	1 5.6%	1 5.6%	15 83.3%	18 100%	17 94.4%	16 88.9%	16 88.9%
Sulfamethoxazole [Sulfa] 21 (11.9)	1 4.7%	0 0%	16 76.2%	1 4.8%	1 4.8%	1 4.8%	0 0%	2 9.5%	17 80.9%	0 0%	0 0%	0 0%	14 66.7%	17 80.9%	21 100%	15 71.4%	16 76.2%
Tetracycline [Tetra] 19 (10.7)	2 10.5%	0 0%	14 73.7%	2 10.5%	2 10.5%	1 5.3%	0 0%	2 10.5%	16 84.2%	0 0%	1 5.3%	1 5.3%	16 84.2%	16 84.2%	15 78.9%	19 100%	14 73.7%
Trimeth-Sulfa [Tri-Su] 16 (9.0)	0 0%	0 0%	16 100%	0 0%	0 0%	0 0%	0 0%	2 12.5%	16 100%	0 0%	0 0%	0 0%	13 81.2%	16 100%	16 100%	14 87.5%	16 100%

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Table 4c. Additional resistance by antimicrobial agent for *Shigella*, 2000

Resistance to: N (%)	Amika	Amo-Cl	Ampic	Apram	Cefti	Ceftr	Cepha	Chlor	Cipro	Genta	Kanam	Naldx	Strep	Sulfa	Tetra	Tri-Su
Amikacin [Amika] 1 (0.2)	1 100%	0 0%	0 0%	1 100%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	1 100%	1 100%	1 100%	0 0%	1 100%
Amox-Clav [Amo-Cl] 10 (2.2)	0 0%	10 100%	10 100%	0 0%	0 0%	0 0%	7 70.0%	3 30.0%	0 0%	0 0%	2 20.0%	0 0%	7 70.0%	4 40.0%	7 70.0%	5 50.0%
Ampicillin [Ampic] 356 (78.9)	0 0%	10 2.8%	356 100%	0 0%	0 0%	0 0%	34 9.5%	62 17.4%	0 0%	1 0.3%	4 1.1%	0 0%	215 60.4%	206 57.9%	146 41.0%	200 56.2%
Apramycin [Apram] 1 (0.2)	1 100%	0 0%	0 0%	1 100%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	1 100%	1 100%	1 100%	0 0%	1 100%
Cefoxitin [Cefox] 2 (0.4)	1 50.0%	1 50.0%	1 50.0%	1 50.0%	0 0%	0 0%	1 50.0%	0 0%	0 0%	0 0%	1 50.0%	1 50.0%	1 50.0%	1 50.0%	1 50.0%	1 50.0%
Ceftiofur [Cefti] 0 (0)	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%
Ceftriaxone [Ceftr] 0 (0)	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%
Cephalothin [Cepha] 36 (8.0)	0 0%	7 19.4%	34 94.4%	0 0%	0 0%	0 0%	36 100%	1 2.8%	0 0%	1 2.8%	4 11.1%	0 0%	20 55.5%	20 55.5%	21 58.3%	20 55.5%
Chloramphenicol [Chlor] 63 (14.0)	0 0%	3 4.8%	62 98.4%	0 0%	0 0%	0 0%	1 1.6%	63 100%	0 0%	0 0%	0 0%	0 0%	42 66.7%	37 58.7%	61 96.8%	31 49.2%
Ciprofloxacin [Cipro] 0 (0)	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%
Gentamicin [Genta] 1 (0.2)	0 0%	0 0%	1 100%	0 0%	0 0%	0 0%	1 100%	0 0%	0 0%	1 100%	0 0%	0 0%	1 100%	1 100%	1 100%	1 100%
Kanamycin [Kanam] 6 (1.3)	0 0%	2 33.3%	4 66.7%	0 0%	0 0%	0 0%	4 66.7%	0 0%	0 0%	0 0%	6 100%	0 0%	0 0%	2 33.3%	5 83.3%	1 16.7%
Nalidixic Acid [Naldx] 5 (1.1)	1 20.0%	0 0%	0 0%	1 20.0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	5 100%	5 100%	5 100%	4 80.0%	5 100%
Streptomycin [Strep] 258 (57.2)	1 0.4%	7 2.7%	215 83.3%	1 0.4%	0 0%	0 0%	20 7.7%	42 16.3%	0 0%	1 0.4%	0 0%	5 1.9%	258 100%	232 89.9%	160 62.0%	231 89.5%
Sulfamethoxazole [Sulfa] 252 (55.9)	1 0.4%	4 1.6%	206 81.7%	1 0.4%	0 0%	0 0%	20 7.9%	37 14.7%	0 0%	1 0.4%	2 0.8%	5 2.0%	232 92.1%	252 100%	157 62.3%	231 91.7%
Tetracycline [Tetra] 202 (44.8)	0 0%	7 3.5%	146 72.3%	0 0%	0 0%	0 0%	21 10.4%	61 30.2%	0 0%	1 0.5%	5 2.5%	4 2.0%	160 79.2%	157 77.7%	202 100%	148 73.3%
Trimeth-Sulfa [Tri-Su] 239 (53.0)	1 0.4%	5 2.1%	200 83.7%	1 0.4%	0 0%	0 0%	20 8.4%	31 13.0%	0 0%	1 0.4%	1 0.4%	5 2.1%	231 96.6%	231 96.6%	148 61.9%	239 100%

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Table 4d. Additional resistance by antimicrobial agent for *E. coli* O157, 2000

Resistance to: N (%)	Amika	Amo-Cl	Ampic	Apram	Cefox	Cefti	Ceftr	Cepha	Chlor	Cipro	Genta	Kanam	Naldx	Strep	Sulfa	Tetra	Tri-Su
Amikacin [Amika] 0 (0)	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%
Amox-Clav [Amo-Cl] 4 (1.0)	0 0%	4 100%	4 100%	0 0%	4 100%	4 100%	0 0%	4 100%	4 100%	0 0%	0 0%	0 0%	0 0%	4 100%	4 100%	4 100%	0 0%
Ampicillin [Ampic] 11 (2.7)	0 0%	4 36.4%	11 100%	0 0%	4 36.4%	4 36.4%	0 0%	4 36.4%	6 54.5%	0 0%	1 9.1%	2 18.2%	0 0%	9 81.8%	7 63.6%	7 63.6%	2 18.2%
Apramycin [Apram] 0 (0)	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%
Cefoxitin [Cefox] 4 (1.0)	0 0%	4 100%	4 100%	0 0%	4 100%	4 100%	0 0%	4 100%	4 100%	0 0%	0 0%	0 0%	0 0%	4 100%	4 100%	4 100%	0 0%
Ceftiofur [Cefti] 4 (1.0)	0 0%	4 100%	4 100%	0 0%	4 100%	4 100%	0 0%	4 100%	4 100%	0 0%	0 0%	0 0%	0 0%	4 100%	4 100%	4 100%	0 0%
Ceftriaxone [Ceftr] 0 (0)	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%
Cephalothin [Cepha] 5 (1.2)	0 0%	4 80.0%	4 80.0%	0 0%	4 80.0%	4 80.0%	0 0%	5 100%	4 80.0%	0 0%	0 0%	0 0%	0 0%	4 80.0%	4 80.0%	4 80.0%	0 0%
Chloramphenicol [Chlor] 15 (3.7)	0 0%	4 26.7%	6 40.0%	0 0%	4 26.7%	4 26.7%	0 0%	4 26.7%	15 100%	0 0%	1 6.7%	1 6.7%	0 0%	14 93.3%	14 93.3%	14 93.3%	1 6.7%
Ciprofloxacin [Cipro] 0 (0)	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%
Gentamycin [Genta] 2 (0.5)	0 0%	0 0%	1 50.0%	0 0%	0 0%	0 0%	0 0%	0 0%	1 50.0%	0 0%	2 100%	0 0%	0 0%	1 50.0%	2 100%	1 50.0%	1 50.0%
Kanamycin [Kanam] 4 (1.0)	0 0%	0 0%	2 50.0%	0 0%	0 0%	0 0%	0 0%	0 0%	1 25.0%	0 0%	0 0%	4 100%	0 0%	3 75.0%	1 25.0%	3 75.0%	1 25.0%
Nalidixic Acid [Naldx] 2 (0.5)	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	2 100%	0 0%	0 0%	0 0%	0 0%
Streptomycin [Strep] 21 (5.2)	0 0%	4 19.0%	9 42.9%	0 0%	4 19.0%	4 19.0%	0 0%	4 19.0%	14 66.7%	0 0%	1 4.8%	3 14.3%	0 0%	21 100%	16 76.2%	17 80.9%	3 14.3%
Sulfamethoxazole [Sulfa] 24 (5.9)	0 0%	4 16.7%	7 29.2%	0 0%	4 16.7%	4 16.7%	0 0%	4 16.7%	14 58.3%	0 0%	2 8.3%	1 4.2%	0 0%	16 66.7%	24 100%	21 87.5%	3 12.5%
Tetracycline [Tetra] 29 (7.1)	0 0%	4 13.8%	7 24.1%	0 0%	4 13.8%	4 13.8%	0 0%	4 13.8%	14 48.3%	0 0%	1 3.4%	3 10.3%	0 0%	17 58.6%	21 72.4%	29 100%	3 10.3%
Trimeth-Sulfa [Tri-Su] 3 (0.7)	0 0%	0 0%	2 66.7%	0 0%	0 0%	0 0%	0 0%	0 0%	1 33.3%	0 0%	1 33.3%	1 33.3%	0 0%	3 100%	3 100%	3 100%	3 100%

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Table 4e. Additional resistance by antimicrobial agent for *Campylobacter*, 2000

Resistance to: N (%)	Azith	Chlor	Cipro	Clind	Eryth	Genta	Naldx	Tetra
Azithromycin [Azith] 7 (2.2)	7 100%	0 0%	3 42.9%	4 57.1%	5 71.4%	0 0%	3 42.9%	2 28.6%
Chloramphenicol [Chlor] 0 (0)	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%	0 100%
Ciprofloxacin [Cipro] 46 (14.2)	3 6.5%	0 0%	46 100%	3 6.5%	3 6.5%	1 2.2%	46 100%	22 47.8%
Clindamycin [Clind] 4 (1.2)	4 100%	0 0%	3 75.0%	4 100%	4 100%	0 0%	3 75.0%	1 25.0%
Erythromycin [Eryth] 5 (1.5)	5 100%	0 0%	3 60.0%	4 80.0%	5 100%	0 0%	3 60.0%	1 20.0%
Gentamicin [Genta] 1 (0.3)	0 0%	0 0%	1 100%	0 0%	0 0%	1 100%	1 100%	1 100%
Nalidixic Acid [Naldx] 54 (16.7)	3 5.6%	0 0%	46 85.2%	3 5.6%	3 5.6%	1 1.8%	54 100%	24 44.4%
Tetracycline [Tetra] 122 (37.6)	2 1.6%	0 0%	22 18.0%	1 0.8%	1 0.8%	1 0.8%	24 19.7%	121 100%

Table 5. Comparison of ceftriaxone Sensititre and E-test results among non-Typhi *Salmonella* isolates with a decreased susceptibility to ceftriaxone (MIC ≥ 16 μg/ml), by Sensititre 2000

Isolate	Sensititre MIC (μg/ml)	I/R*	E-test MIC (μg/ml)	I/R*
1	32	I	>256	R
2	32	I	>256	R
3	32	I	>256	R
4	32	I	>256	R
5	16	I	>256	R
6	32	I	192	R
7	32	I	128	R
8	32	I	128	R
9	32	I	96	R
10	32	I	96	R
11	16	I	96	R
12	16	I	96	R
13	32	I	64	R
14	32	I	64	R
15	32	I	64	R
16	16	I	64	R
17	16	I	64	R
18	16	I	64	R
19	16	I	48	I
20	16	I	32	I
21	16	I	32	I
22	32	I	24	I

*I = Intermediate (MIC 16-32 μg/ml); R = Resistant (MIC ≥ 64 μg/ml)

Table 6. Top fifteen non-Typhi *Salmonella* Serotypes, 2000

Serotype	N	%
Enteritidis	319	23.2
Typhimurium	303	22.0
Newport	124	9.0
Heidelberg	79	5.7
Javiana	44	3.2
Thompson	35	2.5
Montevideo	31	2.2
Muenchen	27	2.0
St. Paul	26	1.9
Hadar	25	1.8
Oranienburg	25	1.8
Infantis	24	1.7
Braenderup	23	1.7
Agona	16	1.2
Java	13	0.9
Not Serotyped	46	3.3
All Others	218	15.8
Total	**1378**	**100**

Table 7. Frequency of pansusceptibility* among the 15 most commonly isolated non-Typhi *Salmonella* serotypes, 2000

Serotype	Total Isolates		Pansusceptible Isolates	
	#	% of *Salmonella*	#	% of Serotype
Oranienburg	25	1.8	25	100
Javiana	44	3.2	43	97.7
Montevideo	31	2.2	30	96.8
Muenchen	27	2.0	26	96.3
Braenderup	23	1.7	22	95.6
Java	13	0.9	12	92.3
Enteritidis	319	23.2	284	89.0
Thompson	35	2.5	31	88.6
Infantis	24	1.7	21	87.5
St. Paul	26	1.9	22	84.6
Newport	124	9.0	94	75.8
Heidelberg	79	5.7	50	63.3
Typhimurium	303	22.0	150	49.5
Agona	16	1.2	5	31.2
Hadar	25	1.8	5	20.0

***Pansusceptible to 15 antimicrobial agents tested, 1996-2000: amoxicillin-clavulanic acid, ampicillin, apramycin, ceftiofur, ceftriaxone, cephalothin, chloramphenicol, ciprofloxacin, gentamicin, kanamycin, nalidixic acid, streptomycin, sulfamethoxazole, tetracycline, trimethoprim-sulfamethoxazole**

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Table 8. Frequency of resistance and multidrug* resistance among top 15 non-Typhi *Salmonella* serotypes, 2000

Serotype	Total		Number resistant to ≥ 1 antimicrobial		Number resistant to ≥ 2 antimicrobials		Number resistant to ≥ 5 antimicrobials		Number resistant to ≥ 8 antimicrobials	
	N	%	N	%	N	%	N	%	N	%
Enteritidis	319	24.0	35	11.0	9	2.8	0	0	0	0
Typhimurium	303	22.7	153	50.5	143	47.2	108	35.6	9	3.0
Newport	124	9.3	30	24.2	28	22.6	28	22.6	27	21.8
Heidelberg	79	5.9	29	36.7	22	27.8	3	3.8	1	1.3
Javiana	44	3.3	1	2.3	1	2.3	1	2.3	0	0
Thompson	35	2.6	4	11.4	2	5.7	0	0	0	0
Montevideo	31	2.3	1	3.2	1	3.2	0	0	0	0
Muenchen	27	2.0	1	3.7	0	0	0	0	0	0
St. Paul	26	1.9	4	15.4	3	11.5	0	0	0	0
Hadar	25	1.9	20	80.0	15	60.0	1	4.0	0	0
Oranienburg	25	1.9	0	0	0	0	0	0	0	0
Infantis	24	1.8	3	12.5	2	8.3	0	0	0	0
Braenderup	23	1.7	1	4.3	0	0	0	0	0	0
Agona	16	1.2	11	68.7	9	56.2	1	6.2	1	6.2
Java	13	1.0	1	7.7	1	7.7	1	7.7	0	0
Other Serotypes	218	15.8	46	21.1	35	16.0	11	5.0	3	1.4
Total Serotyped	1332	100.0	340	25.5	271	20.3	154	11.6	41	3.0
Not Serotyped	46	NA	13	28.3	13	28.3	5	10.9	0	0

***Multidrug resistant to antimicrobial agents tested, 1996-2000: amoxicillin-clavulanic acid, ampicillin, apramycin, ceftiofur, ceftriaxone, cephalothin, chloramphenicol, ciprofloxacin, gentamicin, kanamycin, nalidixic acid, streptomycin, sulfamethoxazole, tetracycline, trimethoprim-sulfamethoxazole**

Table 9a. Frequency of multidrug* resistance among the most common non-Typhi *Salmonella* serotypes in each site, 2000

Site	Most Common Serotypes	Total		Number resistant to ≥ 1 antimicrobial		Number resistant to ≥ 2 antimicrobials		Number resistant to ≥ 5 antimicrobials		Number resistant to ≥ 8 antimicrobials	
		N	%	N	%	N	%	N	%	N	%
California	Enteritidis	12	21.8	1	8.3	0	0	0	0	0	0
	Typhimurium	12	21.8	8	66.7	7	58.3	5	41.7	0	0
	Heidelberg	7	12.7	3	42.8	2	28.6	0	0	0	0
	Saint Paul	3	5.4	0	0	0	0	0	0	0	0
	Hadar	2	3.6	2	100.0	1	50.0	0	0	0	0
	Javiana	2	3.6	0	0	0	0	0	0	0	0
	Newport	2	3.6	1	50.0	1	50.0	1	50.0	1	50.0
	Thompson	2	3.6	0	0	0	0	0	0	0	0
	Other	13	23.6	1	7.7	1	7.7	0	0	0	0
	Total	**55**	**100.0**	**16**	**29.1**	**12**	**21.8**	**6**	**10.1**	**1**	**1.8**
Colorado	Enteritidis	20	30.3	3	15.0	1	5.0	0	0	0	0
	Typhimurium	17	25.7	11	64.7	10	58.8	6	35.3	0	0
	Heidelberg	5	7.6	3	60.0	3	60.0	0	0	0	0
	Montevideo	5	7.6	0	0	0	0	0	0	0	0
	Newport	5	7.6	2	40.0	2	40.0	2	40.0	2	40.0
	Other	14	21.2	6	42.8	5	35.7	0	0	0	0
	Total	**66**	**100.0**	**25**	**37.8**	**21**	**31.8**	**8**	**12.1**	**2**	**3.0**

*Multidrug resistant to antimicrobial agents tested, 1996-2000: amoxicillin-clavulanic acid, ampicillin, apramycin, ceftiofur, ceftriaxone, cephalothin, chloramphenicol, ciprofloxacin, gentamicin, kanamycin, nalidixic acid, streptomycin, sulfamethoxazole, tetracycline, trimethoprim-sulfamethoxazole

Table 9b. Frequency of multidrug* resistance among the most common non-Typhi *Salmonella* serotypes in each site, 2000

Site	Most Common Serotypes	Total		Number resistant to ≥ 1 antimicrobial		Number resistant to ≥ 2 antimicrobials		Number resistant to ≥ 5 antimicrobials		Number resistant to ≥ 8 antimicrobials	
		N	%	N	%	N	%	N	%	N	%
Connecticut	Enteritidis	13	27.7	1	7.7	1	7.7	0	0	0	0
	Typhimurium	10	21.3	5	50.0	5	50.0	5	50.0	1	10.0
	Muenchen	4	8.5	0	0	0	0	0	0	0	0
	Heidelberg	3	6.4	1	33.3	0	0	0	0	0	0
	Newport	3	6.4	2	66.7	2	66.7	2	66.7	2	66.7
	Virchow	3	6.4	1	33.3	0	0	0	0	0	0
	Other	11	23.4	3	27.3	1	9.1	1	9.1	0	0
	Total	**47**	**100.0**	**13**	**27.6**	**9**	**19.1**	**8**	**17.0**	**3**	**6.4**
Florida	Javiana	14	23.3	0	0	0	0	0	0	0	0
	Newport	13	21.7	0	0	0	0	0	0	0	0
	Typhimurium	12	20.0	6	50.0	5	41.7	3	25.0	0	0
	Flint	4	6.7	0	0	0	0	0	0	0	0
	Enteritidis	2	3.3	1	50.0	0	0	0	0	0	0
	Manhattan	2	3.3	0	0	0	0	0	0	0	0
	Montevideo	2	3.3	0	0	0	0	0	0	0	0
	Oranienburg	2	3.3	0	0	0	0	0	0	0	0
	Other	9	15.0	1	11.1	1	11.1	1	11.1	0	0
	Total	**60**	**100.0**	**8**	**13.3**	**6**	**10.0**	**4**	**6.7**	**0**	**0**

*Multidrug resistant to antimicrobial agents tested, 1996-2000: amoxicillin-clavulanic acid, ampicillin, apramycin, ceftiofur, ceftriaxone, cephalothin, chloramphenicol, ciprofloxacin, gentamicin, kanamycin, nalidixic acid, streptomycin, sulfamethoxazole, tetracycline, trimethoprim-sulfamethoxazole

Table 9c. Frequency of multidrug* resistance among the most common non-Typhi *Salmonella* serotypes in each site, 2000

Site	Most Common Serotypes	Total		Number resistant to ≥ 1 antimicrobial		Number resistant to ≥ 2 antimicrobials		Number resistant to ≥ 5 antimicrobials		Number resistant to ≥ 8 antimicrobials	
		N	%	N	%	N	%	N	%	N	%
Georgia	Typhimurium	45	24.2	22	48.9	19	42.2	13	28.9	0	0
	Newport	27	14.5	1	3.7	1	3.7	1	3.7	1	3.7
	Javiana	17	9.1	0	0	0	0	0	0	0	0
	Enteritidis	15	8.1	2	13.3	1	6.7	0	0	0	0
	Infantis	9	4.8	1	11.1	1	11.1	0	0	0	0
	Other	67	36.0	5	7.5	5	7.5	1	1.5	1	1.5
	Not Serotyped	6	3.2	1	16.7	1	16.7	0	0	0	0
	Total	**186**	**100.0**	**32**	**17.2**	**28**	**15.0**	**15**	**8.1**	**2**	**1.1**
Kansas	Typhimurium	13	36.1	3	23.1	3	23.1	3	23.1	2	15.4
	Newport	6	16.7	4	66.7	4	66.7	4	66.7	4	66.7
	Enteritidis	3	8.3	0	0	0	0	0	0	0	0
	Agona	2	5.5	1	50.0	1	50.0	1	50.0	1	50.0
	Other	8	22.2	0	0	0	0	0	0	0	0
	Not Serotyped	4	11.1	1	25.0	1	25.0	1	25.0	0	0
	Total	**36**	**100.0**	**9**	**25.0**	**9**	**25.0**	**9**	**25.0**	**7**	**19.4**

*Multidrug resistant to antimicrobial agents tested, 1996-2000: amoxicillin-clavulanic acid, ampicillin, apramycin, ceftiofur, ceftriaxone, cephalothin, chloramphenicol, ciprofloxacin, gentamicin, kanamycin, nalidixic acid, streptomycin, sulfamethoxazole, tetracycline, trimethoprim-sulfamethoxazole

Table 9d. Frequency of multidrug* resistance among the most common non-Typhi *Salmonella* serotypes in each site, 2000

Site	Most Common Serotypes	Total		Number resistant to ≥ 1 antimicrobial		Number resistant to ≥ 2 antimicrobials		Number resistant to ≥ 5 antimicrobials		Number resistant to ≥ 8 antimicrobials	
		N	%	N	%	N	%	N	%	N	%
Los Angeles County	Enteritidis	25	22.5	0	0	0	0	0	0	0	0
	Typhimurium	20	18.0	9	45.0	9	45.0	6	30.0	1	5.0
	Newport	9	8.1	5	55.5	3	33.3	3	33.3	3	33.3
	Thompson	5	4.5	0	0	0	0	0	0	0	0
	Berta	4	3.6	4	100.0	3	75.0	0	0	0	0
	Montevideo	4	3.6	1	25.0	1	25.0	0	0	0	0
	Oranienburg	4	3.6	0	0	0	0	0	0	0	0
	Other	37	33.3	10	27.0	7	18.9	3	8.1	1	2.7
	Not Serotyped	3	2.7	3	100.0	3	100.0	2	66.7	0	0
	Total	**111**	**100.0**	**32**	**28.8**	**26**	**23.4**	**14**	**12.6**	**5**	**4.5**
Maryland	Enteritidis	19	34.5	2	10.5	1	5.3	0	0	0	0
	Typhimurium	8	14.5	5	62.5	4	50.0	4	50.0	0	0
	Heidelberg	3	5.4	1	33.3	1	33.3	0	0	0	0
	Javiana	3	5.4	0	0	0	0	0	0	0	0
	Newport	3	5.4	0	0	0	0	0	0	0	0
	Other	16	29.1	4	25.0	3	18.7	0	0	0	0
	Not Serotyped	3	5.4	0	0	0	0	0	0	0	0
	Total	**55**	**100.0**	**12**	**21.8**	**9**	**16.4**	**4**	**7.3**	**0**	**0**

*Multidrug resistant to antimicrobial agents tested, 1996-2000: amoxicillin-clavulanic acid, ampicillin, apramycin, ceftiofur, ceftriaxone, cephalothin, chloramphenicol, ciprofloxacin, gentamicin, kanamycin, nalidixic acid, streptomycin, sulfamethoxazole, tetracycline, trimethoprim-sulfamethoxazole

Table 9e. Frequency of multidrug* resistance among the most common non-Typhi *Salmonella* serotypes in each site, 2000

Site	Most Common Serotypes	Total		Number resistant to ≥ 1 antimicrobial		Number resistant to ≥ 2 antimicrobials		Number resistant to ≥ 5 antimicrobials		Number resistant to ≥ 8 antimicrobials	
		N	%	N	%	N	%	N	%	N	%
Massachusetts	Enteritidis	30	24.6	1	3.3	0	0	0	0	0	0
	Typhimurium	26	21.3	10	38.5	10	38.5	9	34.6	2	7.7
	Heidelberg	11	9.0	4	36.4	2	18.2	0	0	0	0
	Newport	9	7.4	4	44.4	4	44.4	4	44.4	4	44.4
	Thompson	8	6.6	0	0	0	0	0	0	0	0
	Other	36	29.5	11	30.5	7	19.4	3	8.3	0	0
	Not Serotyped	2	1.6	0	0	0	0	0	0	0	0
	Total	**122**	**100.0**	**30**	**24.6**	**23**	**18.8**	**16**	**13.1**	**6**	**4.9**
Minnesota	Typhimurium	23	39.0	7	30.4	6	26.1	5	21.7	0	0
	Enteritidis	11	18.6	1	9.1	0	0	0	0	0	0
	Newport	4	6.8	2	50.0	2	50.0	2	50.0	1	25.0
	Agona	2	3.4	1	50.0	1	50.0	0	0	0	0
	Java	2	3.4	0	0	0	0	0	0	0	0
	Muenchen	2	3.4	0	0	0	0	0	0	0	0
	Senftenberg	2	3.4	0	0	0	0	0	0	0	0
	Thompson	2	3.4	0	0	0	0	0	0	0	0
	Other	9	15.2	2	22.2	2	22.2	0	0	0	0
	Not Serotyped	2	3.4	0	0	0	0	0	0	0	0
	Total	**59**	**100.0**	**13**	**22.0**	**11**	**18.6**	**7**	**12.1**	**1**	**1.7**

*Multidrug resistant to antimicrobial agents tested, 1996-2000: amoxicillin-clavulanic acid, ampicillin, apramycin, ceftiofur, ceftriaxone, cephalothin, chloramphenicol, ciprofloxacin, gentamicin, kanamycin, nalidixic acid, streptomycin, sulfamethoxazole, tetracycline, trimethoprim-sulfamethoxazole

Table 9f. Frequency of multidrug* resistance among the most common non-Typhi *Salmonella* serotypes in each site, 2000

Site	Most Common Serotypes	Total		Number resistant to ≥ 1 antimicrobial		Number resistant to ≥ 2 antimicrobials		Number resistant to ≥ 5 antimicrobials		Number resistant to ≥ 8 antimicrobials	
		N	%	N	%	N	%	N	%	N	%
New Jersey	Enteritidis	47	40.5	4	8.5	0	0	0	0	0	0
	Typhimurium	28	24.1	16	57.1	16	57.1	12	42.8	0	0
	Newport	6	5.2	1	16.7	1	16.7	1	16.7	1	16.7
	Heidelberg	5	4.3	3	60.0	3	60.0	1	20.0	0	0
	Berta	2	1.7	1	50.0	1	50.0	0	0	0	0
	Litchfield	2	1.7	0	0	0	0	0	0	0	0
	Oranienburg	2	1.7	0	0	0	0	0	0	0	0
	Poona	2	1.7	0	0	0	0	0	0	0	0
	Other	17	14.6	4	23.5	2	11.8	1	5.9	0	0
	Not Serotyped	5	4.3	3	60.0	3	60.0	0	0	0	0
	Total	**116**	**100.0**	**32**	**27.6**	**26**	**22.4**	**13**	**11.2**	**1**	**0.9**

*Multidrug resistant to antimicrobial agents tested, 1996-2000: amoxicillin-clavulanic acid, ampicillin, apramycin, ceftiofur, ceftriaxone, cephalothin, chloramphenicol, ciprofloxacin, gentamicin, kanamycin, nalidixic acid, streptomycin, sulfamethoxazole, tetracycline, trimethoprim-sulfamethoxazole

Table 9g. Frequency of multidrug* resistance among the most common non-Typhi *Salmonella* serotypes in each site, 2000

Site	Most Common Serotypes	Total		Number resistant to ≥ 1 antimicrobial		Number resistant to ≥ 2 antimicrobials		Number resistant to ≥ 5 antimicrobials		Number resistant to ≥ 8 antimicrobials	
		N	%	N	%	N	%	N	%	N	%
New York City	Enteritidis	60	45.8	16	26.7	4	6.7	0	0	0	0
	Typhimurium	21	16.0	15	71.4	15	71.4	13	61.9	0	0
	Heidelberg	6	4.6	2	33.3	2	33.3	0	0	0	0
	Infantis	4	3.0	0	0	0	0	0	0	0	0
	Saint Paul	4	3.0	1	25.0	1	25.0	0	0	0	0
	Thompson	4	3.0	2	50.0	1	25.0	0	0	0	0
	Other	29	22.1	5	17.2	4	13.8	0	0	0	0
	Not Serotyped	3	2.3	1	33.3	1	33.3	1	33.3	0	0
	Total	**131**	**100.0**	**42**	**32.1**	**28**	**21.4**	**14**	**10.7**	**0**	**0**
New York State	Enteritidis	34	27.0	3	8.8	1	2.9	0	0	0	0
	Typhimurium	25	19.8	8	32.0	7	28.0	6	24.0	0	0
	Heidelberg	9	7.1	3	33.3	1	11.1	1	11.1	0	0
	Hadar	6	4.8	6	100.0	5	83.3	0	0	0	0
	Infantis	5	4.0	1	20.0	1	20.0	1	20.0	0	0
	Other	39	30.9	7	17.9	5	12.8	3	7.7	2	5.1
	Not Serotyped	8	6.3	2	25.0	2	25.0	0	0	0	0
	Total	**126**	**100.0**	**30**	**23.8**	**22**	**17.5**	**11**	**8.7**	**2**	**1.6**

*Multidrug resistant to antimicrobial agents tested, 1996-2000: amoxicillin-clavulanic acid, ampicillin, apramycin, ceftiofur, ceftriaxone, cephalothin, chloramphenicol, ciprofloxacin, gentamicin, kanamycin, nalidixic acid, streptomycin, sulfamethoxazole, tetracycline, trimethoprim-sulfamethoxazole

Table 9h. Frequency of multidrug* resistance among the most common non-Typhi *Salmonella* serotypes in each site, 2000

Site	Most Common Serotypes	Total		Number resistant to ≥ 1 antimicrobial		Number resistant to ≥ 2 antimicrobials		Number resistant to ≥ 5 antimicrobials		Number resistant to ≥ 8 antimicrobials	
		N	%	N	%	N	%	N	%	N	%
Oregon	Enteritidis	7	20.6	0	0	0	0	0	0	0	0
	Typhimurium	5	14.7	3	60.0	3	60.0	2	40.0	0	0
	Montevideo	3	8.8	0	0	0	0	0	0	0	0
	Newport	3	8.8	0	0	0	0	0	0	0	0
	Saint Paul	3	8.8	1	33.3	1	33.3	0	0	0	0
	Other	12	35.3	5	41.7	4	33.3	0	0	0	0
	Not Serotyped	1	2.9	0	0	0	0	0	0	0	0
	Total	**34**	**100.0**	**9**	**26.5**	**8**	**23.5**	**2**	**5.9**	**0**	**0**
Tennessee	Newport	20	26.3	5	25.0	5	25.0	5	25.0	5	25.0
	Typhimurium	11	14.5	7	63.6	7	63.6	7	63.6	0	0
	Heidelberg	8	10.5	4	50.0	3	37.5	1	12.5	1	12.5
	Enteritidis	6	7.9	0	0	0	0	0	0	0	0
	Other	23	30.3	3	13.0	2	8.7	0	0	0	0
	Not Serotyped	8	10.5	1	12.5	1	12.5	0	0	0	0
	Total	**76**	**100.0**	**20**	**26.3**	**18**	**23.7**	**13**	**17.1**	**6**	**7.9**

*Multidrug resistant to antimicrobial agents tested, 1996-2000: amoxicillin-clavulanic acid, ampicillin, apramycin, ceftiofur, ceftriaxone, cephalothin, chloramphenicol, ciprofloxacin, gentamicin, kanamycin, nalidixic acid, streptomycin, sulfamethoxazole, tetracycline, trimethoprim-sulfamethoxazole

Table 9i. Frequency of multidrug* resistance among the most common non-Typhi *Salmonella* serotypes in each site, 2000

Site	Most Common Serotypes	Total		Number resistant to ≥ 1 antimicrobial		Number resistant to ≥ 2 antimicrobials		Number resistant to ≥ 5 antimicrobials		Number resistant to ≥ 8 antimicrobials	
		N	%	N	%	N	%	N	%	N	%
Washington	Typhimurium	23	30.7	17	73.9	16	69.6	12	52.2	3	13.0
	Enteritidis	11	14.7	0	0	0	0	0	0	0	0
	Heidelberg	7	9.3	1	14.3	1	14.3	0	0	0	0
	Newport	6	8.0	1	16.7	1	16.7	1	16.7	1	16.7
	Saint Paul	4	5.3	1	25.0	0	0	0	0	0	0
	Other	23	30.7	5	21.7	5	21.7	2	8.7	0	0
	Not Serotyped	1	1.3	1	100.0	1	100.0	1	100.0	0	0
	Total	**75**	**100.0**	**26**	**34.7**	**24**	**32.0**	**16**	**21.3**	**4**	**5.3**
West Virginia	Enteritidis	4	17.4	0	0	0	0	0	0	0	0
	Typhimurium	4	17.4	1	25.0	1	25.0	1	25.0	0	0
	Heidelberg	3	13.0	1	33.3	1	33.3	1	33.3	0	0
	Newport	3	13.0	1	33.3	1	33.3	1	33.3	1	33.3
	Hadar	2	8.7	1	50.0	1	50.0	0	0	0	0
	Other	7	30.4	0	0	0	0	0	0	0	0
	Total	**23**	**100.0**	**4**	**17.4**	**4**	**17.4**	**3**	**13.0**	**1**	**4.3**

*Multidrug resistant to antimicrobial agents tested, 1996-2000: amoxicillin-clavulanic acid, ampicillin, apramycin, ceftiofur, ceftriaxone, cephalothin, chloramphenicol, ciprofloxacin, gentamicin, kanamycin, nalidixic acid, streptomycin, sulfamethoxazole, tetracycline, trimethoprim-sulfamethoxazole

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Table 10. *S*. Typhimurium isolates with at least ACSSuT*, ACKSSuT**, or AKSSuT*** resistance patterns, by site, 2000

Site	# non-Typhi *Salmonella* isolates tested	*Salmonella* Typhimurium		ACSSuT Typhimurium		ACKSSuT Typhimurium		AKSSuT Typhimurium	
		N	%	N	%	N	%	N	%
California	55	12	21.8	3	25.0	0	0	2	16.7
Colorado	66	17	25.8	4	23.5	0	0	2	11.8
Connecticut	47	10	21.3	5	50.0	1	10.0	1	10.0
Florida	60	12	20.0	3	25.0	0	0	0	0
Georgia	186	45	24.2	11	24.4	1	2.2	3	6.7
Kansas	36	13	36.1	2	15.4	2	15.4	3	23.1
Los Angeles	111	20	18.0	4	20.0	0	0	2	10.0
Maryland	55	8	14.5	3	37.5	0	0	0	0
Massachusetts	122	26	21.3	6	23.1	1	3.8	3	11.5
Minnesota	59	23	39.0	4	17.4	0	0	0	0
New Jersey	116	28	24.1	8	28.6	1	3.6	3	10.7
New York City	131	21	16.0	11	52.4	0	0	0	0
New York State	126	25	19.8	4	16.0	0	0	1	4.0
Oregon	34	5	14.7	2	40.0	0	0	0	0
Tennessee	76	11	14.5	6	54.4	1	9.1	2	18.2
Washington	75	23	30.7	7	30.4	1	4.3	6	26.1
West Virginia	23	4	17.4	1	25.0	0	0	0	0
Totals	**1378**	**303**	**22.0**	**84**	**27.7**	**8**	**2.6**	**28**	**9.2**

*ACSSuT=Ampicillin, Chloramphenicol, Streptomycin, Sulfamethoxazole, Tetracycline
**ACKSSuT=Ampicillin, Chloramphenicol, Kanamycin, Streptomycin, Sulfamethoxazole, Tetracycline
***AKSSuT= Ampicillin, Kanamycin, Streptomycin, Sulfamethoxazole, Tetracycline

Table 11. Additional antimicrobial resistance for *S*. Typhimurium isolates with at least ACSSuT, ACKSSuT***, or AKSSuT**** resistance patterns, 2000**

Antimicrobial	ACSSuT (N=84)		ACKSSuT (N=8)		AKSSuT (N=28)	
	N	%	N	%	N	%
Amoxicillin-Clavulanic Acid	12	14.3	4	50.0	6	21.4
Apramycin	1	1.2	1	12.5	1	3.6
Cefoxitin	6	7.1	2	25.0	3	10.7
Ceftiofur	6	7.1	2	25.0	3	10.7
Ceftriaxone	2	2.4	1	12.5	2	7.1
Cephalothin	7	8.3	3	37.5	4	14.3
Chloramphenicol	*NA		*NA		8	28.6
Gentamicin	2	2.4	2	25.0	4	14.3
Kanamycin	8	9.5	*NA		*NA	
Nalidixic Acid	1	1.2	1	12.5	2	7.1
Trimethoprim-Sulfamethoxazole	5	5.9	2	25.0	4	14.3

*NA: Not Applicable
**ACSSuT=Ampicillin, Chloramphenicol, Streptomycin, Sulfamethoxazole, Tetracycline
***ACKSSuT=Ampicillin, Chloramphenicol, Kanamycin, Streptomycin, Sulfamethoxazole, Tetracycline
****AKSSuT=Ampicillin, Kanamycin, Streptomycin, Sulfamethoxazole, Tetracycline

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Table 12. *S*. Newport isolates with at least ACSSuT*, ACKSSuT**, or AKSSuT*** resistance patterns, by site, 2000

Site	# non-Typhi *Salmonella* isolates tested	*Salmonella* Newport		ACSSuT Newport		ACKSSuT Newport		AKSSuT Newport	
		N	%	N	%	N	%	N	%
California	55	2	3.6	1	50.0	0	0	0	0
Colorado	66	5	7.6	2	40.0	0	0	0	0
Connecticut	47	3	6.4	2	66.7	0	0	0	0
Florida	60	13	21.7	0	0	0	0	0	0
Georgia	186	27	14.5	1	3.7	0	0	0	0
Kansas	36	6	16.7	4	66.7	3	50.0	3	50.0
Los Angeles	111	9	8.1	3	33.3	1	11.1	1	11.1
Maryland	55	3	5.4	0	0	0	0	0	0
Massachusetts	122	9	7.4	4	44.4	1	11.1	1	11.1
Minnesota	59	4	6.8	2	50.0	0	0	0	0
New Jersey	116	6	5.2	1	16.7	0	0	0	0
New York City	131	1	0.8	0	0	0	0	0	0
New York State	126	4	3.2	1	25.0	0	0	0	0
Oregon	34	3	8.8	0	0	0	0	0	0
Tennessee	76	20	26.3	5	25.0	1	5.0	1	5.0
Washington	75	6	8.0	1	16.7	0	0	0	0
West Virginia	23	3	13.0	1	33.3	0	0	0	0
Totals	**1378**	**124**	**9.0**	**28**	**22.6**	**6**	**4.8**	**6**	**4.8**

*ACSSuT=Ampicillin, Chloramphenicol, Streptomycin, Sulfamethoxazole, Tetracycline
**ACKSSuT=Ampicillin, Chloramphenicol, Kanamycin, Streptomycin, Sulfamethoxazole, Tetracycline
***AKSSuT= Ampicillin, Kanamycin, Streptomycin, Sulfamethoxazole, Tetracycline

Table 13. Additional antimicrobial resistance for *S*. Newport isolates with at least ACSSuT, ACKSSuT***, or AKSSuT**** resistance patterns, 2000**

Antimicrobial	ACSSuT (N=28)		ACKSSuT (N=6)		AKSSuT (N=6)	
	N	%	N	%	N	%
Amoxicillin-Clavulanic Acid	27	96.4	6	100.0	6	100.0
Apramycin	0	0	0	0	0	0
Cefoxitin	27	96.4	6	100.0	6	100.0
Ceftiofur	27	96.4	6	100.0	6	100.0
Ceftriaxone	14	50.0	4	66.7	4	66.7
Cephalothin	27	96.4	6	100.0	6	100.0
Chloramphenicol	*NA		*NA		6	100.0
Gentamicin	3	10.7	1	16.7	1	16.7
Kanamycin	6	21.4	*NA		*NA	
Nalidixic Acid	0	0	0	0	0	0
Trimethoprim-Sulfamethoxazole	5	17.9	3	50.0	3	50.0

*NA: Not Applicable
**ACSSuT=Ampicillin, Chloramphenicol, Streptomycin, Sulfamethoxazole, Tetracycline
***ACKSSuT=Ampicillin, Chloramphenicol, Kanamycin, Streptomycin, Sulfamethoxazole, Tetracycline
****AKSSuT=Ampicillin, Kanamycin, Streptomycin, Sulfamethoxazole, Tetracycline

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Table 14. Clinical source of non-Typhi *Salmonella* isolates, 2000

	Blood		Stool		Other		Unknown		Total	
Isolate	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
S. Enteritidis	24	7.5	269	84.1	13	4.0	13	4.0	319	23.2
S. Typhimurium	17	5.6	265	87.5	14	4.6	7	2.3	303	22.0
S. Typhimurium -- ACSSuT	8	9.5			3	3.6	3	3.6	84	6.1
S. Typhimurium -- AKSSuT	2	7.1	70		1	3.6	0	0	28	2.0
All other *S*. Typhimurium	7	3.6	83.3		10	5.2	4	2.1	191	13.8
			25							
			89.2							
			170							
			89.1							
S. Newport	1	0.8	115	92.7	7	5.6	1	0.8	124	9.0
S. Newport -- ACSSuT	1	3.6			1	3.6	0	0	28	2.0
S. Newport -- AKSSuT	0	0	26		0	0	0	0	6	0.4
All other *S*. Newport	0	0	92.9		6	6.7	1	1.1	90	6.5
			6	100						
			83							
			92.2							
S. Heidelberg	15	19.0	51	64.6	11	13.9	2	2.5	79	5.7
S. Heidelberg -- ACSSuT	0	0			0	0	0	0	1	0.1
All other *S*. Heidelberg	15	19.2	1	100	11	14.1	2	2.6	78	5.6
			50							
			64.1							
S. Javiana	1	2.3	41	93.3	1	2.3	1	2.3	44	3.2
S. Thompson	2	5.7	29	82.9	2	5.7	2	5.7	35	2.5
S. Montevideo	1	3.2	26	83.9	2	6.5	2	6.5	31	2.2
S. Muenchen	0	0	24	88.9	2	7.4	1	3.7	27	2.0
S. St. Paul	1	3.8	24	92.3	1	3.8	0	0	26	1.9
S. Hadar	0	0	25	100	0	0	0	0	25	1.8
S. Oranienburg	3	12.0	19	76.0	3	12.0	0	0	25	1.8
S. Infantis	1	4.2	19	79.2	3	12.2	1	4.2	24	1.7
S. Braenderup	0	0	20	87.0	2	8.7	1	4.3	23	1.7
S. Agona	2	12.5	14	87.5	0	0	0	0	16	1.2
S. Agona -- ACSSuT	0	0			0	0	0	0	1	0.1
All other *S*. Agona	2	13.3	1	100	0	0	0	0	15	1.1
			13							
			86.7							

S. Java	0	0	12 92.3		1	7.7	0	0	13	0.9
S. Java -- ACSSuT	0	0			0	0	0	0	1	0.1
All other *S*. Java	0	0	1 11 91.7	100	1	8.3	0	0	12	0.8
Other *Salmonella*	20	7.6	216 81.8		23	8.7	5	1.9	264	19.1
Total	**88**	**6.4**	**1169** **84.8**		**85**	**6.2**	**36**	**2.6**	**1378**	**100.0**

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Table 15. Proportion of non-Typhi *Salmonella*, submitted by site, with reduced susceptibility to ciprofloxacin (MIC ≥ 0.25 µg/ml), 2000

Site	# isolates with reduced susceptibility	# non-Typhi *Salmonella* isolates tested	% with reduced susceptibility	Serotype
California	1	55	1.8	Enteritidis (1)
Colorado	0	66	0	
Connecticut	0	47	0	
Florida	1	60	1.7	Senftenberg (1)*
Georgia	1	186	0.5	Senftenberg (1)*
Kansas	1	36	2.8	Typhimurium (1)
Los Angeles	5	111	4.5	Berta (3), Blockley (1), Virchow (1)
Maryland	1	55	1.8	Blockley (1)
Massachusetts	4	122	3.3	Paratyphi (2), Indiana (1)*, Typhimurium (1)
Minnesota	0	59	0	
New Jersey	0	116	0	
New York City	0	131	0	
New York State	1	126	0.8	Muenster (1)
Oregon	2	34	5.9	Schwarzengrund (2)*
Tennessee	0	76	0	
Washington	3	75	4.0	Schwarzengrund (1), Hadar (1), Virchow (1)
West Virginia	0	23	0	
Total	**20**	**1378**	**1.4**	**Berta (3), Schwarzengrund (3), Blockley (2), Paratyphi (2), Senftenberg (2), Typhimurium (2), Virchow (2), Enteritidis (1), Hadar (1), Indiana (1), Muenster (1)**

*These isolates were also resistant to ciprofloxacin.

Table 16. Proportion of non-Typhi *Salmonella*, submitted by site, with reduced susceptibility to ceftriaxone (MIC ≥ 16 µg/ml), 2000

Site	# isolates with reduced susceptibility	# non-Typhi *Salmonella* isolates tested	% with reduced susceptibility	Serotype
California	0	55	0	
Colorado	2	66	3.0	Newport (2)*
Connecticut	1	47	2.1	Newport (1)*
Florida	0	60	0	
Georgia	1	186	0.5	Newport (1)*
Kansas	5	36	13.9	Newport (3)*, Agona (1)*, Typhimurium (1)*
Los Angeles	2	111	1.8	Newport (1)*, Typhimurium (1)*
Maryland	0	55	0	
Massachusetts	2	122	1.6	Newport (2)*
Minnesota	1	59	1.7	Newport (1)*
New Jersey	0	116	0	
New York City	2	131	1.5	Typhimurium (2)
New York State	2	126	1.6	Newport (1)*, Typhimurium (1)
Oregon	0	34	0	
Tennessee	1	76	1.3	Newport (1)*
Washington	2	75	2.7	Newport (1), Typhimurium (1)*
West Virginia	1	23	4.3	Newport (1)*
Total	**22**	**1378**	**1.6**	**Newport (15), Typhimurium (6), Agona (1),**

*These isolates were also resistant to ceftriaxone.

Table 17. Frequency of *Shigella* species, 2000

Species	N	%
sonnei	367	81.4
flexneri	75	16.6
boydii	7	1.5
not identified	2	0.4
Total	**451**	**100.0**

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Table 18. Antimicrobial resistance of *Shigella* isolates, 2000

Antibiotic	All *Shigella* (N=451)		*Shigella sonnei* (N=367)		*Shigella flexneri* (N=75)		*Shigella boydii* (N=7)	
	# Resistant	% Resistant	# Resistant	% Resistant	# Resistant	% Resistant	# Resistant	% Resistant
Amikacin	1	0.2	1	0.3	0	0	0	0
Amoxicillin – Clavulanic Acid	10	2.2	7	1.9	3	4.0	0	0
Ampicillin	356	78.9	295	80.4	58	77.3	1	14.3
Apramycin	1	0.2	1	0.3	0	0	0	0
Cefoxitin	2	0.4	2	0.5	0	0	0	0
Ceftiofur	0	0	0	0	0	0	0	0
Ceftriaxone	0	0	0	0	0	0	0	0
Cephalothin	36	8.0	32	8.7	2	2.7	0	0
Chloramphenicol	63	14.0	10	2.7	52	69.3	1	14.3
Ciprofloxacin	0	0	0	0	0	0	0	0
Gentamicin	1	0.2	1	0.3	0	0	0	0
Kanamycin	6	1.3	6	1.6	0	0	0	0
Nalidixic Acid	5	1.1	5	1.4	0	0	0	0
Streptomycin	258	57.2	206	56.1	46	61.3	4	57.1
Sulfamethoxazole	252	55.9	206	56.1	40	53.3	4	57.1
Tetracycline	202	44.8	126	34.3	69	92.0	5	71.4
Trimethoprim - Sulfamethoxazole	239	53.0	202	55.0	32	42.7	3	42.9

Table 19. Frequency of *Campylobacter* species, 2000

Species	N	%
jejuni	306	94.4
coli	12	3.7
upsaliensis	3	0.9
fetus	2	0.6
lari	1	0.3
Total	**324**	**100.0**

Table 20. Antimicrobial resistance of *Campylobacter* isolates, 2000

Antibiotic	All *Campylobacter* (N=324)		*Campylobacter jejuni* (N=306)		*Campylobacter coli* (N=12)	
	# Resistant	% Resistant	# Resistant	% Resistant	# Resistant	% Resistant
Azithromycin	7	2.2	6	2.0	1	8.3
Chloramphenicol	0	0	0	0	0	0
Ciprofloxacin	46	14.2	43	14.0	3	25.0
Clindamycin	4	1.2	3	1.0	1	8.3
Erythromycin	5	1.5	4	1.3	1	8.3
Gentamicin	1	0.3	0	0	1	8.3
Nalidixic Acid	54	16.7	49	16.0	3	25.0
Tetracycline	122	37.6	118	38.6	3	25.0

Table 21a. Antimicrobial resistance of *Campylobacter jejuni* isolates, by site, 2000

Site	Antibiotic	*Campylobacter jejuni* (N=306)	
		#Resistant	% Resistant within state
California (N=41)	Azithromycin	0	0
	Chloramphenicol	0	0
	Ciprofloxacin	7	17.1
	Clindamycin	0	0
	Erythromycin	0	0
	Gentamicin	0	0
	Nalidixic Acid	7	17.1
	Tetracycline	13	31.7
Colorado (N=28)	Azithromycin	0	0
	Chloramphenicol	0	0
	Ciprofloxacin	0	0
	Clindamycin	0	0
	Erythromycin	0	0
	Gentamicin	0	0
	Nalidixic Acid	0	0
	Tetracycline	8	28.6
Connecticut (N=45)	Azithromycin	2	4.4
	Chloramphenicol	0	0
	Ciprofloxacin	4	8.9
	Clindamycin	0	0
	Erythromycin	1	2.2
	Gentamicin	0	0
	Nalidixic Acid	5	11.1
	Tetracycline	17	37.8

Table 21b. Antimicrobial resistance of *Campylobacter jejuni* isolates, by site, 2000

Site	Antibiotic	*Campylobacter jejuni* (N=306)	
		#Resistant	% Resistant within state
Georgia (N=47)	Azithromycin	2	4.3
	Chloramphenicol	0	0
	Ciprofloxacin	10	21.3
	Clindamycin	2	4.3
	Erythromycin	2	4.3
	Gentamicin	0	0
	Nalidixic Acid	11	23.4
	Tetracycline	21	44.7
Maryland (N=2)	Azithromycin	0	0
	Chloramphenicol	0	0
	Ciprofloxacin	1	50.0
	Clindamycin	0	0
	Erythromycin	0	0
	Gentamicin	0	0
	Nalidixic Acid	1	50.0
	Tetracycline	2	100.0
Minnesota (N=49)	Azithromycin	2	4.1
	Chloramphenicol	0	0
	Ciprofloxacin	12	24.5
	Clindamycin	1	2.0
	Erythromycin	1	2.0
	Gentamicin	0	0
	Nalidixic Acid	13	26.5
	Tetracycline	25	51.0

Table 21c. Antimicrobial resistance of *Campylobacter jejuni* isolates, by site, 2000

Site	Antibiotic	*Campylobacter jejuni* (N=306)	
		#Resistant	% Resistant within state
New York State (N=46)	Azithromycin	0	0
	Chloramphenicol	0	0
	Ciprofloxacin	3	6.5
	Clindamycin	0	0
	Erythromycin	0	0
	Gentamicin	0	0
	Nalidixic Acid	4	8.7
	Tetracycline	17	37.0
Oregon (N=25)	Azithromycin	0	0
	Chloramphenicol	0	0
	Ciprofloxacin	5	20.0
	Clindamycin	0	0
	Erythromycin	0	0
	Gentamicin	0	0
	Nalidixic Acid	6	24.0
	Tetracycline	8	32.0
Tennessee (N=23)	Azithromycin	0	0
	Chloramphenicol	0	0
	Ciprofloxacin	1	4.3
	Clindamycin	0	0
	Erythromycin	0	0
	Gentamicin	0	0
	Nalidixic Acid	2	8.7
	Tetracycline	6	26.1

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Table 22. Frequency of Resistance and Multidrug* Resistance Among *Salmonella* Typhi, *Shigella*, *E. coli* O157, and *Campylobacter* isolates, 2000

Isolate	Total		Number resistant to ≥ 1 antimicrobial		Number resistant to ≥ 2 antimicrobials		Number resistant to ≥ 5 antimicrobials		Number resistant to ≥ 8 antimicrobials	
	N	%	N	%	N	%	N	%	N	%
Salmonella Typhi	177	100.0	50	28.2	21	11.9	18	10.2	2	1.1
Shigella	451	100.0	418	92.7	302	67.0	122	27.0	0	0
sonnei	367	81.4	339	92.4	233	63.5	90	24.5	0	0
flexneri	75	16.6	72	96.0	62	82.7	30	40.0	0	0
E. coli O157	407	100.0	40	9.8	27	6.6	7	1.7	4	1.0
Campylobacter	324	100.0	155	47.8	51	15.7	3	0.9	0	0
jejuni	306	94.4	149	48.7	47	15.3	2	0.6	0	0
coli	12	3.7	4	33.3	3	25.0	1	8.3	0	0

***Multidrug resistance for *Salmonella*, *Shigella*, *E. coli* O157 to antimicrobials tested 1996-2000: amoxicillin-clavulanic acid, ampicillin, apramycin, ceftiofur, ceftriaxone, cephalothin, chloramphenicol, ciprofloxacin, gentamicin, kanamycin, nalidixic acid, streptomycin, sulfamethoxazole, tetracycline, trimethoprim-sulfamethoxazole; Multidrug resistance for *Campylobacter* to antimicrobials tested 1997-2000**

Table 23a. Summary: Antimicrobial resistance of *Salmonella* isolates, 1996-2000

Salmonella, Non-Typhi	1996	1997	1998	1999	2000
Salmonella isolates	1326	1301	1466	1499	1378
Isolates resistant to ≥ 1 antimicrobial agents*	37% (493)	34% (443)	27% (397)	26% (390)	26% (353)
Isolates resistant to ≥ 2 antimicrobial agents*	31% (404)	27% (345)	24% (346)	21% (317)	21% (284)
Isolates resistant to ≥ 5 antimicrobial agents*	12% (163)	14% (182)	14% (207)	12% (176)	12% (165)
Isolates resistant to ≥ 8 antimicrobial agents*	0.3% (4)	1.2% (16)	1.5% (22)	2% (31)	3% (41)
Serotyped *Salmonella*	93% (1231)	93% (1215)	96% (1411)	97% (1461)	97% (1332)
Serotyped *Salmonella* which are Enteritidis	29% (357)	25% (301)	17% (245)	18% (269)	24% (319)
S. Enteritidis isolates resistant to ≥ 1 antimicrobial agents*	31% (110)	26% (78)	12% (30)	16% (44)	11% (35)
Serotyped *Salmonella* which are Typhimurium**	25% (306)	27% (326)	27% (380)	25% (362)	23% (303)
S. Typhimurium isolates resistant to ≥ 1 antimicrobial agents*	64% (196)	62% (202)	53% (200)	49% (179)	50% (153)
S. Typhimurium with at least ACSSuT resistance pattern	34% (103)	35% (115)	32% (120)	28% (102)	28% (84)
Salmonella isolates that were at least Typhimurium ACSSuT	8% (103)	9% (115)	8% (120)	7% (102)	6% (84)
S. Typhimurium with at least AKSSuT resistance pattern	9% (27)	13% (41)	12% (46)	11% (39)	9% (28)
Salmonella isolates that were at least Typhimurium AKSSuT	2% (27)	3% (41)	3% (46)	3% (39)	2% (28)
S. Typhimurium with at least ACKSSuT resistance pattern	4% (13)	3% (9)	4% (17)	3% (12)	3% (8)

* Using only antimicrobial agents (n=15) tested in all five years

** Includes *S*. Typhimurium and *S*. Typhimurium variant Copenhagen

Table 23a. Summary: Antimicrobial resistance of *Salmonella* isolates, 1996-2000

Salmonella, Non-Typhi	1996	1997	1998	1999	2000
Salmonella isolates that were at least Typhimurium ACKSSuT	1.0% (13)	0.7% (9)	1.2% (17)	0.8% (12)	0.6% (8)
S. Typhimurium isolates with at least ACSSuT or AKSSuT	42% (130)	48% (156)	44% (166)	39% (141)	37% (112)
Serotyped *Salmonella* which are Newport	4% (51)	4% (48)	5% (78)	7% (99)	9% (124)
S. Newport isolates resistant to ≥ 1 antimicrobial agents*	18% (9)	12% (6)	5% (4)	24% (23)	24% (30)
S. Newport with at least ACSSuT resistance pattern	6% (3)	4% (2)	1.3% (1)	17% (17)	23% (28)
Salmonella isolates that were at least Newport ACSSuT	0.2% (3)	0.2% (2)	0.1% (1)	1.2% (17)	2% (28)
S. Newport with at least AKSSuT resistance pattern	2% (1)	0% (0)	0% (0)	1.0% (1)	5% (6)
Salmonella isolates that were at least Newport AKSSuT	0.1% (1)	0% (0)	0% (0)	0.1% (1)	0.4% (6)
S. Newport with at least ACKSSuT resistance pattern	2% (1)	0% (0)	0% (0)	1.0% (1)	5% (6)
Salmonella isolates that were at least Newport ACKSSuT	0.1% (1)	0% (0)	0% (0)	0.1% (1)	0.4% (6)
S. Newport isolates with at least ACSSuT or AKSSuT ACKSSuT	8% (4)	4% (2)	1.3% (1)	18% (18)	27% (34)
Ciprofloxacin (MIC ≥ 0.25)	0.4% (5)	0.5% (7)	0.7% (10)	1.0% (15)	1.4% (20)
Ciprofloxacin (MIC ≥ 4)	0% (0)	0% (0)	0.1% (1)	0.1% (1)	0.4% (5)
Ceftriaxone (MIC ≥ 16) (Sensititre)	0.1% (1)	0.4% (5)	0.7% (10)	1.9% (28)	1.6% (22)
Ceftriaxone (MIC ≥ 64) (E-test)	0.1% (1)	0.4% (5)	0.7% (10)	1.9% (28)	1.3% (18)
Nalidixic Acid (MIC ≥ 32)	0.4% (5)	0.8% (11)	1.4% (20)	1.1% (16)	2% (34)

* Using only antimicrobial agents (n=15) tested in all five years

** Includes *S.* Typhimurium and *S.* Typhimurium variant Copenhagen

Table 23a. Summary: Antimicrobial resistance of *Salmonella* isolates, 1996-2000

Salmonella, Non-Typhi	1996	1997	1998	1999	2000
Amikacin (MIC ≥ 64)	Not Tested	0% (0)	0% (0)	0% (0)	0% (0)
Amoxicillin-Clavulanic Acid (MIC ≥ 32)	1.5% (20)	1.5% (19)	1.6% (24)	2% (36)	4% (54)
Ampicillin (MIC ≥ 32)	21% (279)	18% (241)	16% (241)	16% (234)	16% (219)
Apramycin (MIC ≥ 64)	0% (0)	0% (0)	0% (0)	0.3% (5)	0.1% (2)
Ceftiofur (MIC ≥ 8)	4% (53)	3% (44)	0.9% (14)	2% (31)	3% (44)
Cephalothin (MIC ≥ 32)	3% (47)	3% (43)	2% (33)	4% (55)	4% (54)
Chloramphenicol (MIC ≥ 32)	11% (141)	10% (131)	10% (145)	9% (138)	10% (138)
Gentamicin (MIC ≥ 16)	5% (64)	3% (38)	3% (42)	2% (34)	3% (37)
Kanamycin (MIC ≥ 64)	5% (65)	5% (66)	6% (84)	4% (66)	6% (77)
Streptomycin (MIC ≥ 64)	21% (275)	22% (282)	19% (273)	17% (254)	16% (223)
Sulfamethoxazole (MIC ≥ 512)	23% (305)	25% (328)	19% (283)	18% (272)	17% (235)
Tetracycline (MIC ≥ 16)	24% (321)	22% (283)	20% (295)	19% (292)	19% (256)
Trimethoprim-Sulfamethoxazole (MIC ≥ 4/76)	4% (51)	1.8% (24)	2% (34)	2% (31)	2% (29)

* Using only antimicrobial agents (n=15) tested in all five years

** Includes *S*. Typhimurium and *S*. Typhimurium variant Copenhagen

Table 23b. Summary: Antimicrobial resistance of *E. coli* O157 isolates, 1996-2000

E. coli O157	1996	1997	1998	1999	2000
E. coli O157 isolates	201	161	313	292	407
Isolates resistant to ≥ 1 antimicrobial agents*	21% (42)	12% (20)	7% (23)	10% (30)	10% (40)
Isolates resistant to ≥ 2 antimicrobial agents*	8% (15)	7% (11)	5% (17)	4% (12)	7% (27)
Amikacin (MIC ≥ 64)	Not Tested	0% (0)	0% (0)	0% (0)	0% (0)
Amoxicillin-Clavulanic Acid (MIC ≥ 32)	0% (0)	0% (0)	0% (0)	0.3% (1)	1.0% (4)
Ampicillin (MIC ≥ 32)	1.5% (3)	0% (0)	3% (8)	1.4% (4)	3% (11)
Apramycin (MIC ≥ 64)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)
Ceftiofur (MIC ≥ 8)	5% (10)	0% (0)	0% (0)	0% (0)	1.0% (4)
Ceftriaxone (MIC ≥ 16) (Sensititre)	0% (0)	0% (0)	0% (0)	0% (0)	0.2% (1)
Ceftriaxone (MIC ≥ 64) (E-test)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)
Cephalothin (MIC ≥ 32)	3% (6)	4% (6)	0% (0)	0.7% (2)	1.2% (5)
Chloramphenicol (MIC ≥ 32)	0.5% (1)	0% (0)	0.3% (1)	0% (0)	4% (15)
Ciprofloxacin (MIC ≥ 4)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)
Gentamicin (MIC ≥ 16)	0% (0)	0% (0)	0% (0)	0.3% (1)	0.5% (2)
Kanamycin (MIC ≥ 64)	0% (0)	0% (0)	0.3% (1)	0.7% (2)	1.0% (4)
Nalidixic Acid (MIC ≥ 32)	0% (0)	0% (0)	0% (0)	0.7% (2)	0.5% (2)
Streptomycin (MIC ≥ 64)	2% (4)	2% (4)	1.9% (6)	3% (8)	5% (21)
Sulfamethoxazole (MIC ≥ 512)	14% (28)	11% (17)	6% (18)	8% (24)	6% (24)
Tetracycline (MIC ≥ 16)	5% (10)	3% (5)	4% (14)	3% (10)	7% (29)
Trimethoprim-Sulfamethoxazole (MIC ≥ 4/76)	0% (0)	0% (0)	0.6% (2)	1.4% (4)	0.7% (3)

* Using only antimicrobial agents (n=15) tested in all five years

Table 23c. Summary: Antimicrobial resistance of *Campylobacter* isolates, 1997-2000

Campylobacter	1997	1998	1999	2000
Campylobacter jejuni isolates	209	330	295	306
Isolates resistant to ≥ 1 antimicrobial agents***	59% (124)	55% (181)	54% (158)	49% (149)
Isolates resistant to ≥ 2 antimicrobial agents***	26% (55)	16% (54)	19% (57)	15% (47)
Ciprofloxacin (MIC ≥ 0.25)	38% (79)	22% (74)	22% (64)	20% (60)
Ciprofloxacin (MIC ≥ 4)	13% (27)	13% (44)	18% (52)	14% (43)
Nalidixic Acid (MIC ≥ 32)	23% (49)	15% (50)	20% (59)	16% (49)
Erythromycin (MIC ≥ 8)	8% (16)	3% (9)	2% (6)	1.3% (4)
Azithromycin (MIC ≥ 2)	Not Tested	1.8% (6)	3% (8)	2% (6)
Chloramphenicol (MIC ≥ 32)	6% (12)	0.6% (2)	0.3% (1)	0% (0)
Clindamycin (MIC ≥ 4)	6% (12)	0.9% (3)	1.0% (3)	1.0% (3)
Gentamicin(MIC ≥ 16)	Not Tested	0% (0)	0% (0)	0% (0)
Tetracycline(MIC ≥ 16)	48% (100)	46% (153)	46% (135)	39% (118)

*** Using only *Campylobacter* antimicrobial agents (n=6) tested in all four years

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Table 23c. Summary: Antimicrobial resistance of *Campylobacter* isolates, 1997-2000

Campylobacter	1997	1998	1999	2000
Campylobacter coli isolates	4	9	20	12
Isolates resistant to ≥ 1 antimicrobial agents***	75% (3)	55% (5)	50% (10)	33% (4)
Isolates resistant to ≥ 2 antimicrobial agents***	25% (1)	33% (3)	35% (7)	25% (3)
Ciprofloxacin (MIC ≥ 0.25)	50% (2)	44% (4)	35% (7)	25% (3)
Ciprofloxacin (MIC ≥ 4)	0% (0)	11% (1)	30% (6)	25% (3)
Nalidixic Acid (MIC ≥ 32)	25% (1)	55% (5)	30% (6)	25% (3)
Erythromycin (MIC ≥ 8)	0% (0)	11% (1)	10% (2)	8% (1)
Azithromycin (MIC ≥ 2)	Not Tested	11% (1)	10% (2)	8% (1)
Chloramphenicol (MIC ≥ 32)	25% (1)	22% (2)	0% (0)	0% (0)
Clindamycin (MIC ≥ 4)	0% (0)	11% (1)	10% (2)	8% (1)
Gentamicin (MIC ≥ 16)	Not Tested	0% (0)	0% (0)	8% (1)
Tetracycline (MIC ≥ 16)	75% (3)	44% (4)	30% (6)	25% (3)

*** Using only *Campylobacter* antimicrobial agents (n=6) tested in all four years

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Table 24a. Summary: Multidrug* resistance of non-Typhi *Salmonella* isolates, 1996-2000

Non-Typhi *Salmonella*

Year	# isolates tested	Number resistant to ≥ 1 antimicrobial		Number resistant to ≥ 2 antimicrobials		Number resistant to ≥ 5 antimicrobials		Resistant to at least ACSSuT**		Resistant to at least AKSSuT**		Resistant to ceftriaxone (MIC≥64 µg/ml)		Decreased susceptibility to ciprofloxacin (MIC≥.25 µg/ml)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1996	1326	493	37	404	31	163	12	117	9	31	2	1	0.07	5	0.4
1997	1301	443	34	345	27	182	14	125	10	46	4	5	0.4	7	0.5
1998	1466	397	27	346	24	207	14	130	9	50	3	10	0.7	10	0.7
1999	1499	390	26	317	21	176	12	125	8	44	3	28	1.9	15	1.0
2000	1378	353	26	284	21	165	12	122	9	44	3	18	1.3	20	1.4

Salmonella Enteritidis

Year	# isolates tested	Number resistant to ≥ 1 antimicrobial		Number resistant to ≥ 2 antimicrobials		Number resistant to ≥ 5 antimicrobials		Resistant to at least ACSSuT**		Resistant to at least AKSSuT**		Resistant to ceftriaxone (MIC≥64 µg/ml)		Decreased susceptibility to ciprofloxacin (MIC≥.25 µg/ml)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1996	357	110	31	84	23	13	4	1	0.3	0	0	0	0	3	0.8
1997	301	78	26	37	12	17	6	1	0.3	1	0.3	0	0	2	0.7
1998	245	30	12	16	7	0	0	0	0	0	0	0	0	2	0.8
1999	269	44	16	26	10	2	0.7	2	0.7	0	0	1	0.4	6	2.2
2000	319	35	11	9	3	0	0	0	0	0	0	0	0	1	0.3

* Using only antimicrobial agents (n=15) tested in all five years
**ACSSuT=Ampicillin, Chloramphenicol, Streptomycin, Sulfamethoxazole, and Tetracycline; AKSSuT= Ampicillin, Kanamycin, Streptomycin, Sulfamethoxazole, and Tetracycline

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Table 24b. Summary: Multidrug* resistance of non-Typhi *Salmonella* isolates, 1996-2000

Salmonella Typhimurium

Year	# isolates tested	Number resistant to ≥ 1 antimicrobial		Number resistant to ≥ 2 antimicrobials		Number resistant to ≥ 5 antimicrobials		Resistant to at least ACSSuT**		Resistant to at least AKSSuT**		Resistant to ceftriaxone (MIC≥64 µg/ml)		Decreased susceptibility to ciprofloxacin (MIC≥.25 µg/ml)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1996	306	196	64	177	58	125	41	103	34	27	9	0	0	1	0.3
1997	326	202	62	188	58	154	47	115	35	41	13	5	1.5	1	0.3
1998	380	200	53	193	51	159	42	120	32	46	12	7	1.8	1	0.3
1999	362	179	49	166	46	129	36	102	28	39	11	6	1.7	1	0.3
2000	303	153	50	143	47	108	36	84	28	28	9	3	0.9	2	0.7

Salmonella Newport

Year	# isolates tested	Number resistant to ≥ 1 antimicrobial		Number resistant to ≥ 2 antimicrobials		Number resistant to ≥ 5 antimicrobials		Resistant to at least ACSSuT**		Resistant to at least AKSSuT**		Resistant to Ceftriaxone (MIC≥64 µg/ml)		Decreased susceptibility to Ciprofloxacin (MIC≥.25 µg/ml)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
1996	51	9	18	4	8	3	6	3	6	1	2	0	0	0	0
1997	48	6	12	3	6	2	4	2	4	0	0	0	0	0	0
1998	78	4	5	2	3	2	3	1	1.3	0	0	1	1.3	0	0
1999	99	23	24	17	17	17	17	17	17	1	1.0	17	17	0	0
2000	124	30	24	28	23	28	23	28	23	6	5	14	11	0	0

* Using only antimicrobial agents (n=15) tested in all five years
**ACSSuT=Ampicillin, Chloramphenicol, Streptomycin, Sulfamethoxazole, and Tetracycline; AKSSuT= Ampicillin, Kanamycin, Streptomycin, Sulfamethoxazole, and Tetracycline