



**International surveillance network for  
the enteric infections -  
Salmonella, VTEC O157 and Campylobacter**

Funded by the European Commission – DG SANCO

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**Enter-net Quarterly Salmonella Report January-March 2006/1**

<b>Top 15 serotypes reported in Q1 2006 (Q1 2005)</b>		
<b>Serotype</b>	<b>Freq</b>	<b>%</b>
Typhimurium	3,091 (3,177)	29.8 (30.8)
Enteritidis	2,783 (2,845)	26.8 (27.5)
Virchow	372 (348)	3.6 (3.4)
Saintpaul	219 (188)	2.1 (1.8)
Infantis	174 (174)	1.7 (1.7)
Typhi	170 (138)	1.6 (1.3)
Stanley	165 (137)	1.6 (1.3)
Newport	125 (96)	1.2 (0.9)
Birkenhead	108 (51)	1.0 (0.5)
Paratyphi A	107 (52)	1.0 (0.5)
Oranienberg	106 (59)	1.0 (0.4)
Hadar	94 (107)	0.9 (1.0)
Bovismorbificans	85 (321)	0.8 (3.1)
Agona	78 (140)	0.8 (1.4)
Derby	78 (73)	0.8 (0.7)
Others	2,626 (2,421)	25.2 (23.4)
<b>Total</b>	<b>10,381</b> <b>(10,327)</b>	<b>100</b> <b>(100)</b>

**Table 1**

**Summary**

This report gives details of the number of isolates identified by the national reference laboratories in the 1<sup>st</sup> quarter of 2006 and incorporated in the Enter-net salmonella database. Twenty-three countries have supplied data. The top ten fifteen serotypes reported this quarter are shown in Table One. Table two illustrates Salmonella drug resistance data received for the quarter, and the figure gives details on multi-resistant isolates available. The total number of human salmonella isolates reported this quarter are 10,381 with 6,246 (60.2%) being S. Enteritidis, S. Typhimurium or S. Virchow.

**Quarterly data - major trends.**

Details below refer to the twenty-one countries that have supplied comparable data electronically for 2006 and 2005. The total number of reports in the database shows an increase over the same period in 2005 from 10,327 to 10,381 an increase of 0.5%. S. Enteritidis (2,783, 26.8%) decreased by 2.2%, S. Typhimurium (3,090, 29.8%) decreased by 2.7%, S. Virchow (372, 3.6%) increased by 6.9%. Eight serotypes were identified more than 100 times during the quarter; S. Saintpaul, S. Infantis (174, 1.7%), S. Typhi (170, 1.6%) S. Stanley (165, 1.6%), S. Newport (125, 1.2%), S. Birkenhead (108, 1.0%), S. Paratyphi A (107, 1.0%), S. Oranienburg (106, 1.0%). Sixteen other serotypes were isolated between 50 and 99 times, S. Hadar, S. Bovismorbificans, S. Agona, S. Derby, S. Anatum, S. Java, S. Corvallis, S. Muenchen, S. Montevideo, S. Chester, S. Hvittingfoss, S. Mississippi, S. Waycross, S. Aberdeen, S. Heidelberg and S. Brandenburg (1,086, 10.5%). Fifty-one serotypes were reported between 49 and 10 times totaling 1,130 10.9% and 143 serotypes (358, 3.4%), were reported less than 10 times and 388, 3.7% were untyped. The cases reported are based on the date of receipt in the reference laboratory

May 2006 – All data are provisional

**Antimicrobial susceptibility testing results.**

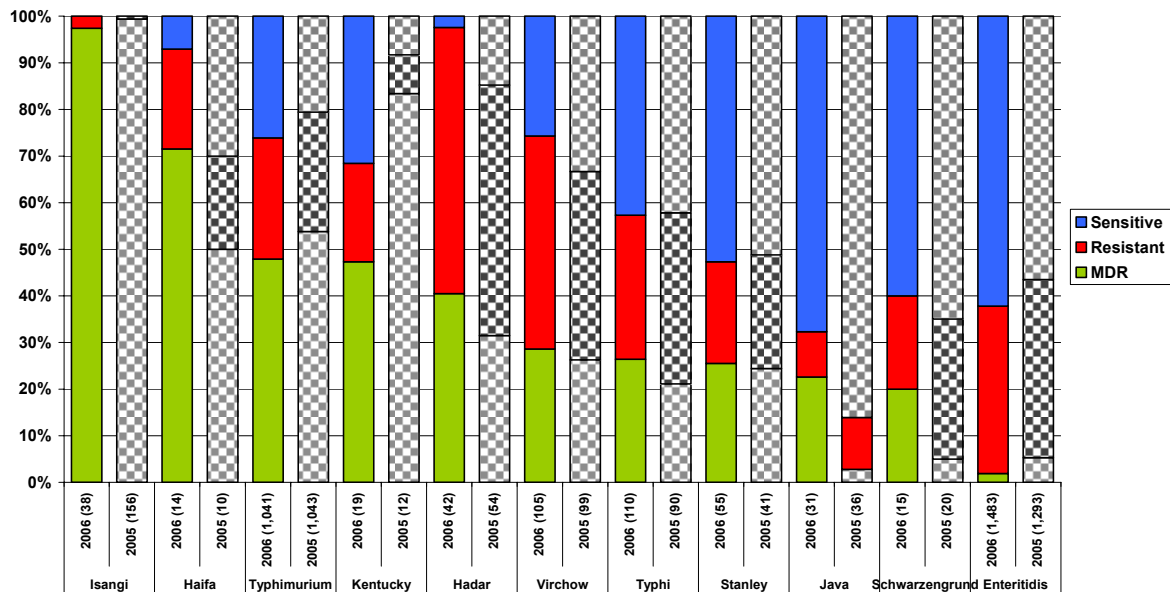
Antimicrobial susceptibility test results were available for 3,994 cases. The majority of these are tested against the panel of 11 antimicrobials recommended by Enter-net, although not all strains are tested against each one. The frequency and percent in the categories resistant, intermediate and sensitive (as defined by each reference laboratory<sup>1</sup>) are given in table 2.

Antimicrobial agent	Resistant Freq (%)	Intermed Freq (%)	Sensitive Freq (%)
Streptomycin	803 (24.2)	131 (4.0)	2,382 (71.8)
Gentamicin	157 (4.4)	64 (1.8)	3,375 (93.8)
Kanamycin	211 (5.9)	25 (0.7)	3,322 (93.4)
Ampicillin	961 (24.1)	31 (0.8)	2,997 (75.1)
Cefotaxime	21 (0.7)	5 (0.2)	2,915 (99.1)
Sulphonamides	1,320 (38.4)	10 (0.3)	2,107 (61.3)
Trimethoprim	566 (14.4)	9 (0.2)	3,350 (85.4)
Chloramphenicol	448 (11.9)	9 (0.2)	3,322 (87.9)
Tetracyclines	940 (26.5)	306 (8.6)	2,305 (64.9)
Nalidixic Acid	714 (20.8)	4 (0.1)	2,714 (79.1)
Ciprofloxacin	70 (1.8)	80 (2.0)	3,762 (96.2)

Table 2

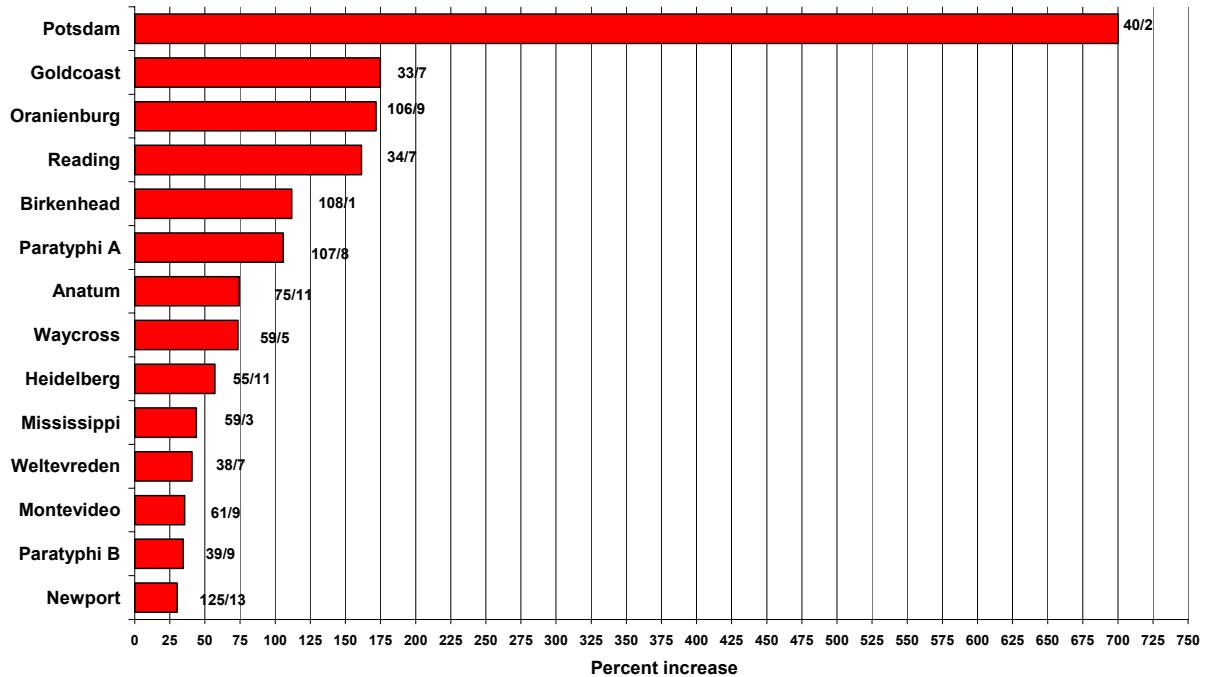
**Multi-drug resistance (MDR);** the figure shows the proportion of each serotype with multiple-resistance (to four or more antimicrobials), resistance 1-3 antimicrobials, and sensitivity with comparative data for the same period of last year. The number of isolates tested each year are also shown. Only those serotypes with 20% or more being MDR are shown, plus *S. Enteritidis*.

**Serotypes with MDR (≥4 antimicrobials), resistance (1-3) and sensitivity by proportion Q1 2006 (Q1 2005)**



<sup>1</sup> E John Threlfall, Ian ST Fisher, Linda R Ward, Helmut Tschäpe and Peter Gerner-Smidt. Harmonisation of antibiotic susceptibility testing for *Salmonella* - results of a study by 18 national reference laboratories within the European Union funded Enter-net group. *Microb Drug Resist* 1999; **5**: 195-200.

**Serotypes with unusual increases Q1 2006 (Q1 2005)  
(number of cases/number of countries reporting)**



**Serotypes with unusual increases.**

**S. Potsdam** – Of the 40 cases reported this quarter there were one male and two females aged 0-11m, three males, four females were 1-5y, one male, one female were 6-14y, 11 males, 15 females were 15-64y and one male, one female were aged 65y+. No cases were travel related.

**S. Goldcoast** – Thirty-three cases reported this quarter. Two males, nine females were 1-5y, one male, one female were 6-14y, six males, seven females were 15-64y and three males, three females were 65y+. Four cases were travel related; they all traveled to Spain.

**S. Oranienburg** – Four males, six females were 0-11m, four males, four females aged 1-5y, one male, three females were 6-14y, 26 males, 39 females were 15-64y and three males, 15 females were 65y+. The female to male ratio was 1.76:1 cf 1.03:1 for all non-typhoidal salmonellas. Four cases were travel related; two to India, one each to Egypt and Mexico.

**S. Reading** – Of the 33 cases reported this quarter there were seven females aged 0-11m, four males, six females aged 1-5y one male, two females were 6-14y, three males, eight females were aged 15-64y and one male, one female were 65y+. There were 2.4 female cases to each male case. Three cases were travel related two traveled to India, one to Yemen.

**S. Paratyphi A** – 102 cases reported this quarter. There were one female aged 1-5y, three males, four females were 6-14y, 54 males, 35 females and five unspecified were 15-64y and two males, one unspecified were 65y+ and one male whose age was unknown. Forty-eight cases were travel related; thirty-two traveled to India, eight to Pakistan, three to Bangladesh, three to Indonesia and one each to Malaysia and Senegal.

**S. Birkenhead** – Of the 108 cases reported this quarter there were 11 males and 10 females aged 0-11m, 10 males, 16 females were 1-5y, seven males, two females were 6-14y, 17 males, 25 females were 15-64y and five males, four females were 65y+. No cases were

related to travel. Cases aged under 5 years represented 43.5% of all cases of this serotype as compared to 31.0% in this age group for non-typhoidal salmonellas.

**S. Anatum** – There were one male, one female aged 0-11m, three males, six females aged 1-5y, three females aged 6-14y, 17 males, 24 females were 15-64y and three males, 15 females were 65y+ and two males whose age was unknown. There were 1.9 female cases for each male case. Twelve cases were related to travel; seven to Thailand, one each to the Philippines, Dominican Republic, Spain, India and Iraq.

**S. Waycross** – Of the 57 cases reported this quarter, there were seven males, 12 females aged 0-11m, 10 males, seven females were 1-5y, four males, three females were 6-14y, five males, five females were 15-64y and one male, three females were 65y+. No cases were travel related. Cases aged under 5 years represented 62.7% of all cases of this serotype as compared to 31.0% in this age group for non-typhoidal salmonellas.

**S. Montevideo** – 59 cases reported this quarter. Two males, four females were 0-11m, three males, 10 females were 1-5y, four males and three females were 6-14y, eight males, 12 females were 15-64y and four males, four females were 65y+, three cases were unspecified. Four cases were travel related; two to Kenya, one to China, one to Thailand.

**S. Weltevreden** – There were three males and five females aged 0-11m, one male, five females aged 1-5y, one female aged 6-14y, 10 males, nine females aged 15-64y and one male, one female aged 65y+. Ten cases were related to travel; five to Thailand, two to Pakistan and one each to Malaysia, the Philippines and Sri Lanka.

**S. Heidelberg** – Of the 55 cases reported this quarter, one male, three females were 0-11m, 10 males, two females were 1-5y, four males, five females were 6-14y, 18 males and five females were 15-64y, one male, five females were 65y+. Fourteen cases were travel related; five to Thailand, three to Tanzania, two to Egypt and one each to Malawi, Cuba, Uganda and Zimbabwe.

**S. Mississippi** – There were three males, one female aged 0-11m, five males, nine females were 1-5y, six males, one female 6-14y, 11 males, 14 females aged 16-64y and two males, six females aged 65y+ and one not known. No cases were related to travel.

**S. Newport** – One hundred and twenty-five cases reported this quarter. There were three males, six females and two not known aged 0-11m, 10 males, five females were 1-5y, four males and one female 6-14y, 29 males and 48 females were 15-64y, three males, 11 females were 65y+ and two males with age unknown. Thirty-seven cases were related to travel; 17 to Brazil, six to India, five to Egypt, three to Thailand, two to Tanzania and one each to Malaysia, Vietnam and Venezuela.

**S. Paratyphi B** – Of the total reported there were three males, five females aged 1-5y, eight males, two females, five with sex unknown were 6-14y, six males, two females and one sex unknown were 15-64y and one male, six females were 65y+. One case was related to travel, country unknown.

This report was prepared by Ian Fisher, Scientific Co-ordinator and Francine Stalham, Administrator, on behalf of the Enter-net participants.