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IN THE NEWS

## Respiratory Syncytial Virus

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Since the start of the 2002/2003-influenza season, the number of respiratory syncytial virus (RSV) positive specimens from hospital respiratory specimens referred to the National Virus Reference Laboratory (NVRL) has increased substantially compared to previous seasons (figure 1). The NVRL have been collecting data on RSV positive specimens since September 1988. In Ireland, RSV data from the NVRL provide comprehensive surveillance of RSV infection in infants treated in hospitals and is a good indicator of seasonal patterns. It is inadequate for assessing the burden of disease in adults and elderly people, who are rarely investigated.

During October 2002, 18 RSV positive specimens were detected, the highest number ever recorded for the month of October. Between the 1st and 24th of November 2002, 58 RSV positive specimens have been detected, the highest number ever recorded for the month of November. It is estimated that this RSV epidemic may peak in December. Of the 76 positive RSV cases identified since October 1st 2002, 18.4% (14) were less than 1 month old, 63.2% (48) were between 1 and 6 months, 14.5% (11) were between 7 and 12 months and 3.9% (3) were over 12 months old. Seventy-one percent (54) of positive specimens were detected in the Eastern Regional Health Authority, 19.7% (15) in the North Western Health Board, 6.6% (5) in the Midland Health Board and 2.6% (2) in the Mid-Western Health Board.

RSV is an enveloped non-segmented negative strand RNA virus of the family *Paramyxoviridae*. Since its first isolation in 1956, RSV quickly became recognised as the most important viral agent of serious respiratory disease in the paediatric population worldwide. Over 60% of children have been infected with RSV by their first birthdays and over 80% by 2 years of age. RSV is the single most important cause of hospitalisation for viral respiratory tract disease in infants and young children and is a major cause of nosocomial infection.

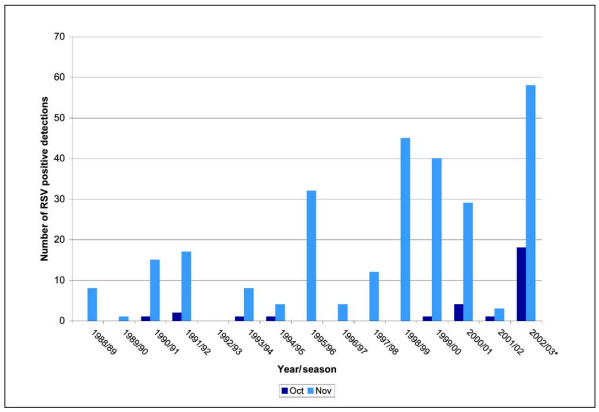


*Figure 1. Number of RSV positive specimens during the months of October and November between 1988 and 2002.*

* Data for November 2002 is from 1st to 24th November 2002

### Clinical features

RSV can infect all age groups, causing upper and lower respiratory tract infections ranging in severity from subclinical infections to pneumonia. For the majority symptoms are mild, similar to the common cold. RSV infection is rarely fatal in children without a severe underlying illness. The risk of serious RSV disease is increased by prematurity, young age, chronic cardiac or lung disease, immunodeficiency or immunosuppression and a family history of allergic disease. However, approximately three quarters of hospitalisations for RSV occur in children who were previously healthy. Re-infection with RSV is common, albeit with reduced disease.

RSV is the major cause of bronchiolitis and one of the major causes of pneumonia during the first few years of life. Bronchiolitis or pneumonia occurs most frequently between the ages of 6 weeks and 9 months, and the peak incidence of lower respiratory tract disease is between the ages of 2 and 7 months, corresponding with diminishing titres of maternal antibodies. The impact of RSV in healthy adults and the elderly is less well quantified than it is for infants, but it is certainly under-diagnosed.

### Transmission

Infection is spread via respiratory secretions, through close contact with infected persons or contact with contaminated surfaces or objects. Spread can also occur when infectious material comes in contact with mucous membranes of the mouth, nose or eyes and through inhalation of droplets generated by a sneeze or cough. RSV has a short incubation period of 3 to 5 days with lower respiratory tract symptoms appearing 1 to 3 days after the onset of rhinorrhoea.

### Seasonality

RSV has a clear seasonality in temperate zones around the world. The sharp winter peak varies little in timing or amplitude, in contrast to the pattern of influenza infections. Epidemics generally start in November or December and last 4 or 5 months. Epidemics are caused by different genotypes circulating at the same time.

### Treatment

There is currently no effective antiviral therapy or approved vaccine for RSV, however, effective passive immunoprophylaxis involving administration of RSV neutralising antibodies is now available for high-risk individuals. Prevention of nosocomial transmission is the mainstay of RSV management in hospitals, with particular emphasis on frequent hand washing. In addition to standard precautions, contact precautions as recommended by the Hospital Infection Control Practices Advisory Committee (HICPAC) in the USA should be implemented. These include single room or cohorting of patients with RSV, and gloves and gown for anyone entering the room. Limitation of visitors and active surveillance for RSV infection among patients and new admissions should also be considered. Further information on RSV is available on the NDSC website www.ndsc.ie


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# Epidemiology of Human Salmonellosis in Ireland, 2001

## Introduction

*Salmonella enterica* is an important human pathogen with over 2,500 distinct serotypes recognised. Most serotypes are zoonotic pathogens associated with foodborne illness in Ireland and worldwide. Salmonella Typhi and Paratyphi are exclusively human pathogens with no animal reservoir. A wide range of domestic and wild animals may act as sources of infection with zoonotic serotypes of *S. enterica.* Secondary spread from human cases of salmonellosis may occur, although chronic carriage of serotypes other than *S*. Typhi and *S*. Paratyphi is rare in humans.

In recent years, two serotypes, namely, *S. enterica* serotype Enteritidis and *S. enterica* serotype Typhimurium have accounted for the majority of cases of human salmonellosis throughout Europe.

Salmonellosis usually presents as an acute enterocolitis, with sudden onset of headache, abdominal pain, diarrhoea, nausea and occasionally vomiting. Fever is almost always present. Dehydration, especially amongst vulnerable populations such as infants, the immunocompromised and the elderly, may be severe. *S.* Typhi and *S*. Paratyphi are associated with a severe systemic life threatening infection (Enteric Fever), but this is very rare in Ireland and mainly travel-associated.

Prevention, surveillance and control of *Salmonella* infections is of major public health importance. Measures have been implemented from farm to fork in an attempt to control spread of this zoonotic agent.

## Materials and Methods

The National Salmonella Reference Laboratory (NSRL) was established in 2000 in the Department of Medical Microbiology, University College Hospital, Galway. This laboratory accepts *S. enterica* isolates from throughout Ireland for serotyping, phage typing and antimicrobial susceptibility testing. Molecular typing is performed selectively in particular to clarify possible relationships between isolates that are suspected to be associated with an outbreak. This report reviews data available from the NSRL, weekly clinical notifications and outbreaks for the year 2001. These data enable us to provide an overview of the epidemiology and burden of disease caused by *Salmonella* infections in Ireland today.

## Results

### NSRL data

*Demographic information*

There were 543 clinical isolates of *S. enterica* referred to NSRL in 2001. The male:female ratio was 1:1. The age groups and sex of those affected are shown in table 1.

*Table 1. Age group and sex of patients from whom clinical isolates of S. enterica (n=543) were referred to NSRL, 2001.*

| Age group (years) | No. of isolates (%) | Male | Female | Unknown |
|---|---|---|---|---|
| 0-4 | 104 (19) | 46 | 49 | 9 |
| 5-14 | 76 (14) | 40 | 36 | 0 |
| 15-24 | 92 (17) | 38 | 53 | 1 |
| 25-34 | 72 (13) | 29 | 37 | 6 |
| 35-44 | 48 (9) | 18 | 29 | 1 |
| 45-54 | 39 (7) | 20 | 19 | 0 |
| 55-64 | 27 (5) | 9 | 17 | 1 |
| 65+ | 41 (8) | 23 | 17 | 1 |
| Not Known | 44 (8) | 21 | 18 | 5 |
| **Total** | **543** | **244** | **275** | **24** |

*Seasonality*

There was a marked seasonality in the number of human cases reported in 2001 with a sharp peak seen in late August (figure 1 ).

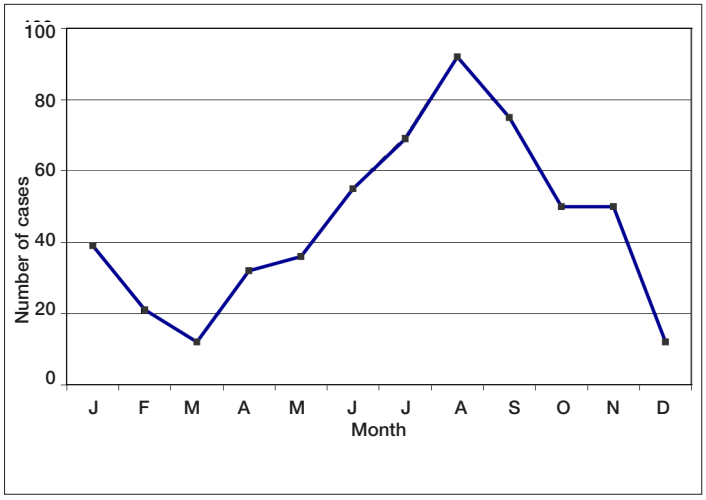


*Figure 1. Isolates of Salmonella enterica referred to NSRL by month, 2001.*

(Note: month refers to the date the isolate was received in the reference laboratory).

*Serotyping, phage typing and antibiotic susceptibility results*

In 2001, *S*. Enteritidis replaced *S.* Typhimurium as the predominant serotype associated with human salmonellosis in Ireland (table 2). The next most commonly isolated serotypes were *S*. Virchow (n = 16) and *S*. Dublin (n = 12). There were nine isolates of *S*. Typhi detected in 2001, all associated with travel abroad.

*Table 2. Serotypes of S. enterica referred to NSRL.*

| Serotype | No. of cases (%) | | | |
|---|---|---|---|---|
| | 1998 | 1999 | 2000 | 2001 |
| S. Enteritidis | 60 (8) | 155 (33) | 239 (36) | 248 (46) |
| S. Typhimurium | 578 (80) | 200 (42) | 286 (43) | 165 (30) |
| S. Bredeney | 15 (2) | 55 (12) | 24 (4) | 11 (2) |
| S. Kentucky | 14 (2) | 12 (3) | 15 (3) | 4 (1) |
| All other serotypes | 54 (7) | 52 (11) | 101 (15) | 115 (21) |
| **Total** | **721** | **474** | **665** | **543** |

*Antimicrobial resistance*

The antimicrobial susceptibilities of the most commonly isolated serotypes in 2001 are presented in table 3. High levels of resistance were found among *S*. Typhimurium isolates, particularly *S*. Typhimurium DT1O4. Many of these isolates were resistant to at least five antimicrobial agents, *viz*. ampicillin, chloramphenicol, streptomycin, sulphonamide and tetracycline (ACSSuT).

*Table 3. Antimicrobial susceptibilities of human Salmonella enterica serotypes isolated in Ireland in 2001.*

| | | % resistance | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Serotype** | **N** | **Amp** | **Chl** | **Strep** | **Sulph** | **Tet** | **Trim** | **Nal** |
| S. Enteritidis | 248 | 7 | 0.4 | 5 | 7 | 12 | 2 | 24 |
| S. Typhimurium | 165 | 65 | 59 | 63 | 65 | 65 | 28 | 2 |
| S. Virchow | 16 | 6 | 0 | 0 | 6 | 6 | 12 | 69 |
| S. Dublin | 12 | 0 | 0 | 8 | 0 | 0 | 0 | 0 |
| S. Bredeney | 11 | 0 | 0 | 18 | 18 | 18 | 0 | 0 |
| S. Heidelburg | 7 | 29 | 0 | 0 | 0 | 0 | 0 | 14 |
| S. Stanley | 4 | 0 | 0 | 75 | 75 | 75 | 25 | 50 |
| S. Kentucky | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## Clinical notification data

Salmonellosis is a notifiable disease. Medical practitioners are legally obliged to report all suspected cases. Information on trends in salmonellosis notifications shows that the crude incidence rate rose in the 1990s to peak in 1998, and has been steadily decreasing since then (figure 2). The total number of notifications in 2001 was 433 compared to 640 in 2000, and 960 in 1999.

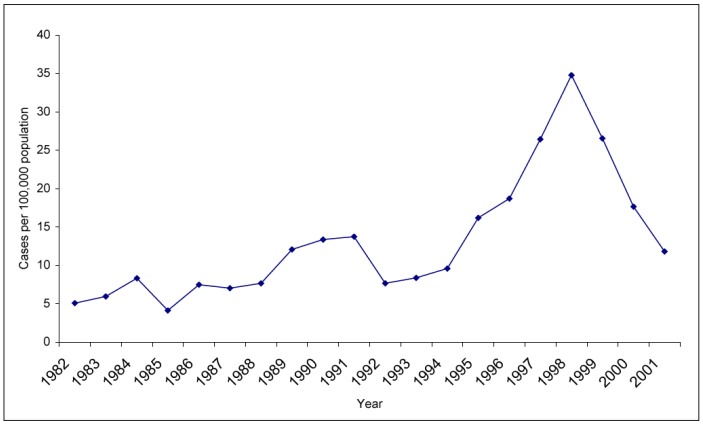


*Figure 2. Crude rate of salmonellosis in Ireland per 100,000 population, 1982-2001.*

## Outbreak surveillance

There were three small clusters/outbreaks of human salmonellosis reported in 2001. In April 2001, two confirmed cases of *S*. Heidelberg occurred in a long stay unit of a hospital. An outbreak of *S*. Enteritidis occurred in a crèche in September 2001 affecting five children and two adults, and in December 2001, there was a cluster of *S*. Typhimurium reported affecting two households. There were two confirmed cases.

In addition, the NSRL identified two clusters of unusual salmonella isolates during 2001. In August, six cases of S. Typhimurium U310 were detected across the country. No common source was found. The second cluster involved five cases of *S*. Enteritidis PT24 (tetracycline resistant) in individuals from a number of locations in the country; again no common source was identified.

## Discussion

*Salmonella* remains an important enteric pathogen and is responsible for a significant burden of human illness as evident from the data presented in this report.

The detailed typing laboratory data being generated by the NSRL are enabling us to monitor salmonella trends more accurately and are providing us with detailed information regarding the epidemiology of this pathogen in Ireland. Data from the NSRL are submitted monthly to the hub of Enter-net, the European surveillance system for salmonellosis and also provide a basis for response to alerts and queries from other European countries related to possible outbreaks of salmonellosis.

Analysis of the serotyping results reveals that in 2001, *S*. Enteritidis was the predominant serotype, followed by *S*. Typhimurium. This was a change from the results of the previous three years and now mirrors the trend seen in the UK and most of the rest of Europe with *S*. Enteritidis being the commonest serotype. Serotyping, phage typing, antibiogram profiling and molecular typing where appropriate has also proved invaluable for tracing of isolates through the food chain and enables outbreaks to be detected in a timely fashion. Analysis of the 2001 NSRL dataset has again emphasised the scale of the problem of antimicrobial resistance amongst *Salmonella* isolates, particularly *S*. Typhimurium DT104. This is now recognised as a global problem and to this end the NDSC Strategy for the Control of Antimicrobial Resistance in Ireland (SARI)[1] is endeavouring to deal with this problem.

The incidence (per 100,000 population) of recognised salmonellosis outbreaks and of sporadic laboratory-confirmed salmonellosis cases associated with *S*. Enteritidis, *S*. Typhimurium or *S*. Kentucky is lower in Ireland than in England, Northern Ireland or Scotland. It is difficult to determine if this reflects a true difference in incidence or a difference in ascertainment.

The incidence rates of laboratory-confirmed human salmonellosis have declined significantly in the past number of years. This has coincided with an overall decrease in the incidence of salmonellosis at EU level. The Department of Agriculture Food and Rural Development Salmonella monitoring programme, the Bord Bia Egg Quality Assurance scheme and education campaigns targeting consumers and catering establishments may all have contributed to this downward trend.

Control of zoonotic agents, including *Salmonella enterica* is a priority at EU level particularly with the advent of the new European Food Safety Authority. The first Irish Zoonosis Report will be published shortly, and for the first time will report trends on zoonoses in Ireland, merging animal, food and clinical data.

**Dr Barbara Foley, Prof Martin Cormican**
**Dr Paul McKeown**

**Acknowledgements**

We wish to sincerely thank the staff at the National Salmonella Reference Laboratory, UCHG for providing the data for this report and also the clinical and food microbiology laboratories that send *Salmonella* isolates to the NSRL for analysis. In addition, we would like to acknowledge the Departments of Public Health and Community Care Areas for providing the clinical notification data, and Dr M Fitzgerald and the public health unit of FSAI for providing outbreak data from the first six months of 2001.

**References**

1. NDSC. A Strategy for the Control of Antimicrobial Resistance in Ireland (SARI). June 2001. ISBN 0-9540177-0-6. Available at: http://www.ndsc.ie

# SARI Update

The Strategy for the Control of Antimicrobial Resistance in Ireland (SARI) was launched in June 2001 and considerable progress has been made in implementing the SARI recommendations. Funding has been made available, €6.9 million to date, from the Department of Health and Children (DoHC). Much of this is being used to correct the shortfall in relevant staff needed to implement SARI, such as laboratory surveillance scientists, infection control nurses, clinical microbiologists and clinical pharmacists.

Most Health Board regions now have a multidisciplinary regional SARI committee, responsible for regional surveillance, antibiotic stewardship and infection control initiatives, along with directing regional SARI funding. The National SARI Committee has been set up by the DoHC and will be responsible for developing national policies, guidelines and strategies.

A number of multidisciplinary SARI working groups have also been set up to develop draft guidelines and recommendations in relation to specific areas of SARI implementation, as detailed in the remainder of this article.

### Antimicrobial Resistance (AMR) Surveillance

The European Antimicrobial Resistance Surveillance System (EARSS) will continue to be a cornerstone in AMR surveillance in Ireland. With increased laboratory participation it will be possible to produce regional, population-based incidence rates for invasive infections reported under EARSS, along with greater data stratification.

Laboratories will need to have three basic requirements in place to support enhanced AMR surveillance:

- Laboratory-based surveillance personnel.
- Electronic collection of AMR data, such as the Computerised Infectious Disease Reporting (CIDR) system.
- Standardised susceptibility testing methodology, such as NCCLS methodology.

It is likely that a nationally agreed core data set will be reported to national level, with additional data gathered at regional level to inform regional needs and initiatives.

Comprehensive AMR data will be available for notifiable pathogens with the introduction of CIDR. Additional pathogens that will probably need to be targeted for AMR surveillance may include multiple-resistant hospital-associated Gram-negative bacilli (*Serratia spp., Pseudomonas spp*. etc) and community-associated pathogens such as *Haemophilus influenzae* and Group *A Streptococcus*. Periodic prevalence surveys will also be needed to monitor AMR in some types of infection, such as community-acquired urinary tract infection (UTI).

### Antibiotic Consumption Surveillance

Prospective analysis and dissemination of GMS community antibiotic prescription data, expressed as defined daily dose (DDD) per 1000 GMS population per day, should begin in the next 2-3 months. The Antibiotic Consumption Surveillance Working Group is examining options for obtaining data on non-GMS community antibiotic prescribing, such as electronic data collection from sentinel community pharmacies.

The commercial company, IMS, will start gathering global drug consumption data from 37 Irish hospital pharmacies in January 2003. This may be used as an interim data source for hospital antibiotic consumption until electronic data collection from hospital pharmacies can be established.

National surveillance systems for antibiotic consumption will be limited to aggregate data. More detailed local prescribing audits will be required, both at hospital and community level, to inform and monitor local antibiotic stewardship initiatives.

### Community Antibiotic Stewardship

The Community Antibiotic Stewardship Surveillance Working Group is considering a number of GP-lead initiatives, including:

- Treatment guidelines for common infections (otitis, pharyngitis, UTI etc.).
- Patient education materials, to be distributed through GP surgeries, pharmacies etc.
- Prescribing tools, such as provisional prescribing, non-antibiotic prescribing etc.

The aim is to develop a multi-disciplinary stewardship model that will include GPs, pharmacists, public health nurses, patients, community leaders etc. Options are being discussed with GP CME tutor representatives, to identify communities where the initial pilot programmes can be tested. Local stewardship initiatives will need to be supported by a more general public information campaign and this is being discussed with the Health Promotion Unit at DoHC.

The working group is also recommending that antibiotic stewardship be included in both undergraduate and postgraduate GP education. This will be discussed with the Association of Undergraduate Departments of General Practice in Ireland (AUDGPI) and GP training bodies.

### Hospital Antibiotic Stewardship

The Hospital Antibiotic Stewardship Working Group is carrying out a survey of hospital stewardship in Ireland, examining areas such as pharmacy staffing, antibiotic policies and stewardship initiatives.

Most hospitals will require at least one pharmacist with part or full-time responsibility for SARI (surveillance and stewardship). This will require clinical pharmacists with specific training in infectious disease pharmacy and the group is examining options for such training in Ireland.

The group is developing a priority list of stewardship requirements and initiatives that will form the basis of a national policy recommendation. Recommendations will be stratified according to priority and will be readily adaptable to different hospital types.

### Infection Control

The Infection Control Working Group is carrying out a survey of hospitals and long-term care institutions to examine what services and support structures are currently available for infection control.

The group has started work on a draft update of the current national MRSA guidelines and are developing draft national guidelines on hand hygiene. Other priorities for future guideline development include control of glycopeptide-resistant enterococci, *Clostridium difficile* infections and other gastrointestinal infections and hospital environmental hygiene.

The group has developed a discussion document on options for surveillance of healthcare-associated infections, such as:

- Surgical site infection surveillance.
- ICU-acquired infection surveillance.
- Central venous catheter-related infection surveillance (via CIDR).
- Periodic prevalence studies.

As with surveillance of AMR and antibiotic consumption it is likely that any surveillance system for healthcare-associated infection will include a core data set for national surveillance, along with a more extensive data set collected as part of local/regional surveillance programmes.

**Dr Robert Cunney, NDSC**

## Salmonella Monthly Report (October 2002):

Strains are allocated to months based on the date of receipt of the isolate from the referring laboratory. These figures are provisional as work may not be finished on particular strains at the time of publication. Data are provided courtesy of Prof Martin Cormican and Dr Geraldine Corbett-Feeney, NSRL.

| Health Board | E | M | MW | NE | NW | SE | S | W | Total |
|---|---|---|---|---|---|---|---|---|---|
| S. Agona | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 2 |
| S. Braenderup | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| S. Brandenburg | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| S. Dublin | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| S. Enteritidis | 13 | 0 | 4 | 1 | 1 | 3 | 7 | 4 | 33 |
| S. Infantis | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| S. Mbandaka | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| S. Panama | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| S. Poona | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| S. Stanley | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| S. Typhimurium | 6 | 0 | 0 | 5 | 0 | 2 | 1 | 1 | 15 |
| S. Virchow | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| Unknown | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| **Total** | **23** | **0** | **5** | **9** | **3** | **6** | **9** | **6** | **61** |

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