

Report on Invasive Group A Streptococcal Infections in Ireland, Jan 2010-Apr 2015

May 2015 (data extracted from CIDR on 1st May 2015)

KEY POINTS

- There has been a **decrease** in the number of iGAS cases notified to HPSC since October 2014. An increase in iGAS cases had been observed previously from May 2012 up to the latter part of 2014
- Between 1st January and 30th April 2015, there were 33 patients with iGAS, or iGAS cases (0.72 cases per 100,000 population), nationally. This compares with 74 cases (1.61 per 100,000 population; a **decrease** of 55%) and 61 cases (1.33 per 100,000 population; a **decrease** of 45%) for the equivalent periods in 2014 and 2013, respectively. The number of iGAS cases appears to have returned to the levels seen in earlier years (2011, 34; 2012, 38)
- In 2014, there were 164 iGAS cases (3.57 cases per 100,000 population), nationally. This compares with 168 cases (3.66 per 100,000 population; a **slight decrease** of 2.4%) and 122 cases (2.66 per 100,000 population; an increase of 34%) in 2013 and 2012, respectively. In 2014, the number of iGAS cases appeared to level off towards the end of the year
- In 2014, the peak incidence of iGAS occurred in children up to 9 years and in adults aged 65 years and over
- The number and proportion of patients with STSS decreased in 2014 (n=21, or 16%) compared to 2013 (n=32, or 23%)
- In 2014, 10% (10 of 102 cases for which outcome was reported) of iGAS cases died, with iGAS identified as the main or contributory cause of death, which is a decrease from 2013 when 15% (16 of 108) of cases died
- Typing of iGAS isolates show that emm-type 3 overtook emm-type 1 as the dominant emm-type (36% and 16% of isolates typed, respectively) in 2014

BACKGROUND

Invasive Group A Streptococcal (iGAS; *Streptococcus pyogenes*) infections are acute, frequently life-threatening infections. Three clinical syndromes are recognised:

- Streptococcal Toxic Shock Syndrome (STSS), which is characterised by hypotension and two or more of the following: renal impairment; coagulopathy; liver dysfunction; adult respiratory distress syndrome; generalised erythematous rash that may desquamate; soft tissue necrosis (necrotising fasciitis, myositis, gangrene)
- Necrotising fasciitis
- Bacteraemia with or without an identifiable focus of infection, such as meningitis, pneumonia, cellulitis, peritonitis, puerperal sepsis, septic arthritis, myositis or an identifiable focus of infection without bacteraemia, STSS or necrotising fasciitis

iGAS infections have been notifiable in Ireland via the Computerised Infectious Diseases Reporting (CIDR) system since January 2004, enhanced surveillance of iGAS infections has been undertaken on a voluntary basis since January 2005, and an epidemiological typing service for iGAS isolates has been available since January 2012.

Increases in iGAS incidence are known to occur on a cyclical basis and are often clonal in nature. The increase in iGAS observed in Ireland between 2012 and 2013 may be due to a natural cycle in the incidence of iGAS.

NOTIFICATION DATA

The number of iGAS cases notified to HPSC has decreased since October 2014 (Table 1) with the cumulative monthly number of cases appearing to level off in the last quarter of the year (Figure 1). An increase in iGAS cases had been observed previously from May 2012 up to the latter part of 2014.

Between 1st January and 30th April 2014, there were 33 patients with iGAS, or iGAS cases (0.72 cases per 100,000 population), reported nationally. This compares with 74 cases (1.61 per 100,000 population) for the equivalent period in 2014, a decrease of 55%, and 61 cases (1.33 per 100,000 population) for 2013, a decrease of 45%. The number of iGAS cases appears to have returned to the levels seen in 2012 (n=38) and 2011 (n=34).

In 2014, there were 164 iGAS cases (3.57 cases per 100,000 population) of iGAS nationally (Table 2) compared with 168 cases (3.66 per 100,000 population) in 2012 (a slight decrease of 2.4%) and 67 cases (1.46 per 100,000 population) and 2011 (an increase of 38%). In 2014, the number of iGAS cases appeared to level off in the last quarter of the year (Figure 1).

The highest monthly number of cases reported since surveillance began in 2004 was in May 2013 (n=26), followed by March 2014 (Table 1; data from 2010 only). Most cases of iGAS in Ireland occur during the earlier part of the year, i.e. from January to July, which is particularly apparent from the 2012-2014 data.

The highest age-specific rates of iGAS infection occur in the very young and older age groups (Figure 2). In 2014, the proportion of cases in paediatric (<18 years) and older age groups (≥ 65 years) were at their highest levels and together accounted for 63% of all cases.

ENHANCED SURVEILLANCE: STSS AND NECROTISING FASCIITIS

Of the 164 cases reported in 2014, data on clinical presentation were provided for 132 cases (80%) (Table 2). Of these 132 cases, 21 patients (16%) had STSS, of whom 6 died within one week of diagnosis, with iGAS identified as the main or contributory cause of death. This represents a reduction in STSS cases from 2013 when 32 patients (23%) had STSS, of whom 10 died.

In 2014, 7 patients (5%) had necrotising fasciitis compared with 10 (7%) in 2013. Since 2010, the proportion of patients presenting with necrotising fasciitis has remained stable at 5-7%.

OUTCOMES

Seven-day outcomes were reported for 102 cases in 2014 (Table 2). Ten patients (10%) died, with iGAS identified as the main or contributory cause of death. This represents a decrease compared to 2013 when 16 patients (of 106 cases, 15%) died.

TYPING DATA

Since January 2012, the Epidemiology and Molecular Biology Unit (EMBU) at the Children's University Hospital (CUH), Temple Street, has provided a typing service for iGAS isolates (Table 2). Isolates from 130 patients with iGAS were typed in 2014 (79% of the total reported). Of these, 47 (36%) were emm-type 3 which replaced emm-type 1 (21, or 16%) as the dominant emm-type in circulation. In 2013, both emm-types were dominant (24% and 29%, respectively), while in 2012 almost 50% of isolates belonged to emm-type 1.

Notes regarding the surveillance of invasive group A streptococcal infection

Laboratories

1. All cases of iGAS diagnosed are notified in a timely manner to the relevant Department of Public Health
2. All iGAS isolates are submitted to EMBU at the Children's University Hospital, Temple Street for typing
3. Data on antimicrobial resistance profiles of iGAS isolates are reported via the EARS-Net
4. An enhanced surveillance form is completed for each notification of iGAS. The latest version of the form is available at: <http://www.hpsc.ie/hpsc/A-Z/Other/GroupAStreptococcalDiseaseGAS/SurveillanceForms/>

Departments of Public Health

1. All iGAS cases notified are inputted to CIDR
2. Enhanced data should be inputted to CIDR for all iGAS events where information is available

Table 1. iGAS cases notified by month and year, January 2010-April 2015

Month	YEAR					
	2010	2011	2012	2013	2014	2015
Jan	9	9	12	15	18	5
Feb	5	9	10	13	12	11
Mar	4	10	5	16	23	6
Apr	6	6	11	17	21	11
May	5	3	21	26	20	
Jun	12	11	19	13	13	
Jul	6	3	15	18	21	
Aug	5	6	9	13	14	
Sep	4	2	1	8	9	
Oct	6	1	7	10	2	
Nov	2	4	4	12	8	
Dec	4	3	8	7	3	
Total	68	67	122	168	164	33

>20 cases notified
 16-20 cases notified

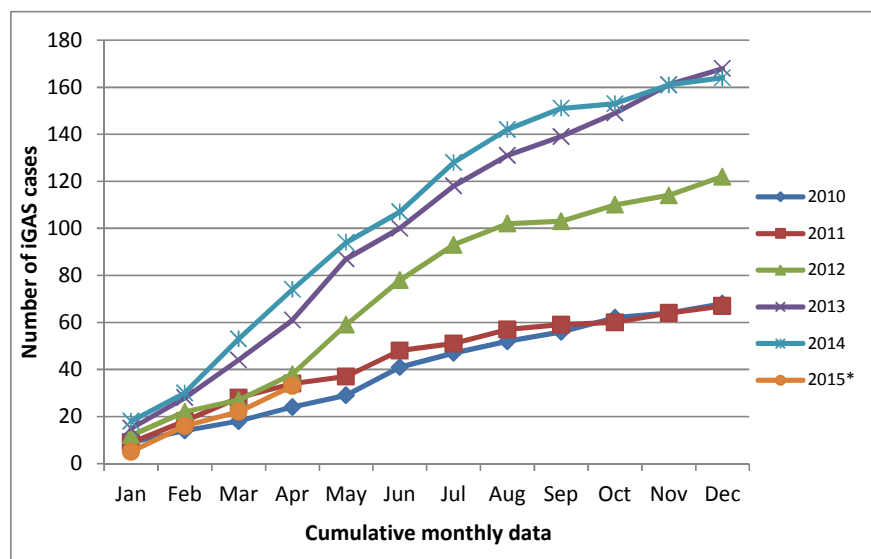


Figure 1: Cumulative monthly number of iGAS cases notified by year, January 2010-April 2015

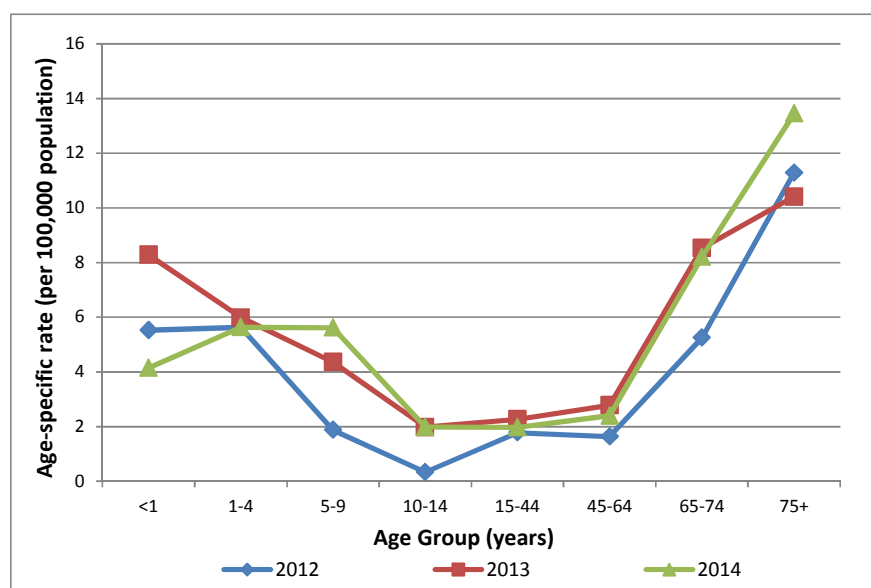


Figure 2. Age-specific rates of iGAS infection by year, 2012-2014

Table 2. Characteristics of iGAS cases in Ireland, January 2010- April 2015

	YEAR					
	2010	2011	2012	2013	2014	2015*
Notifications						
Total iGAS cases notified	68	67	122	168	164	33
iGAS incidence rate per 100,000 population	1.48	1.46	2.66	3.66	3.57	0.72
Cases for which Enhanced data provided** (%)	61 (90%)	60 (90%)	106 (87%)	156 (93%)	150 (91%)	29 (88%)
Patient Demographics						
Male (%)	36 (53%)	28 (42%)	59 (48%)	95 (57%)	94 (57%)	21 (64%)
M:F ratio	1.13:1	0.72:1	0.94:1	1.30:1	1.34:1	1.75:1
Mean age	49	43	44	41	44	48
Median age	49	39	42	40	44	47
Age range	0-97	0-97	0-92	0-93	0-99	1-99
Paediatric cases (aged <18 years) (%)	10 (15%)	15 (22%)	28 (23%)	45 (27%)	47 (29%)	5 (15%)
Older cases (aged 65+ years) (%)	22 (32%)	22 (33%)	42 (34%)	50 (30%)	56 (34%)	12 (36%)
Clinical Presentation†						
Data on Clinical Presentation (%)	60 (88%)	58 (87%)	103 (84%)	142 (85%)	132 (80%)	27 (82%)
Streptococcal Toxic Shock-like Syndrome (STSS) without NF (%)	7 (12%)	4 (7%)	22 (21%)	28 (20%)	18 (14%)	1 (2%)
Necrotising fasciitis (NF) without STSS (%)	2 (3%)	1 (2%)	2 (2%)	6 (4%)	4 (3%)	0 (0%)
STSS and NF (%)	2 (3%)	2 (3%)	4 (4%)	4 (3%)	3 (2%)	0 (0%)
Bacteraemia with focal presentations (%)	27 (45%)	30 (52%)	42 (41%)	45 (32%)	43 (33%)	8 (30%)
Bacteraemia with no focal presentations (%)	21 (35%)	15 (26%)	21 (20%)	36 (25%)	34 (26%)	9 (33%)
Other focal presentations with no bacteraemia (%)	1 (2%)	6 (10%)	11 (11%)	23 (16%)	30 (23%)	9 (33%)
Bacteraemia (%)	55 (92%)	52 (90%)	80 (78%)	107 (75%)	95 (72%)	18 (67%)
Other focal presentations:						
Cellulitis (%)	22 (37%)	24 (41%)	41 (40%)	45 (32%)	58 (44%)	11 (41%)
STSS (%)	9 (15%)	6 (10%)	26 (25%)	32 (23%)	21 (16%)	1 (4%)
Pneumonia (%)	10 (17%)	8 (14%)	17 (17%)	24 (17%)	14 (11%)	3 (11%)
Septic arthritis (%)	2 (3%)	2 (3%)	7 (7%)	10 (7%)	11 (8%)	1 (4%)
Necrotising fasciitis (%)	4 (7%)	3 (5%)	6 (6%)	10 (7%)	7 (5%)	0 (0%)
Myositis (%)	2 (3%)	0 (0%)	4 (4%)	3 (2%)	6 (5%)	0 (0%)
Puerperal sepsis (%)	4 (7%)	5 (9%)	6 (6%)	6 (4%)	4 (3%)	3 (11%)
Erysipelas (%)	0 (0%)	0 (0%)	3 (3%)	3 (2%)	2 (2%)	1 (4%)
Peritonitis (%)	1 (2%)	3 (5%)	1 (1%)	4 (3%)	1 (1%)	1 (4%)
Meningitis (%)	2 (3%)	1 (2%)	3 (3%)	3 (2%)	0 (0%)	2 (7%)
Risk Factor‡						
Data on Risk Factors (%)	49 (72%)	49 (73%)	96 (79%)	138 (82%)	126 (77%)	22 (67%)
Skin lesions/wounds (%)	16 (33%)	20 (41%)	34 (35%)	56 (41%)	50 (40%)	8 (36%)
Diabetes (%)	8 (16%)	7 (14%)	5 (5%)	16 (12%)	11 (9%)	2 (9%)
Malignancy (%)	6 (12%)	6 (12%)	10 (10%)	23 (17%)	10 (8%)	1 (5%)
Varicella (%)	2 (4%)	2 (4%)	9 (9%)	5 (4%)	7 (6%)	0 (0%)
Steroid use (%)	2 (4%)	1 (2%)	8 (8%)	11 (8%)	6 (5%)	1 (5%)
Alcoholism (%)	3 (6%)	1 (2%)	5 (5%)	6 (4%)	5 (4%)	1 (5%)
Injecting drug user (%)	6 (12%)	3 (6%)	6 (6%)	5 (4%)	5 (4%)	0 (0%)
Childbirth (%)	4 (8%)	5 (10%)	6 (6%)	6 (4%)	4 (3%)	3 (14%)
Non-steroid anti-inflammatory drug use (%)	6 (12%)	1 (2%)	2 (2%)	4 (3%)	2 (2%)	0 (0%)
No identified risk factor (%)	12 (24%)	12 (24%)	24 (25%)	47 (34%)	47 (37%)	6 (27%)
Outcome at 7 days						
Data on outcome at 7 days (%)	43 (63%)	43 (64%)	65 (53%)	108 (64%)	102 (62%)	22 (67%)
RIP/GAS main cause or contributory (%)	4 (9%)	5 (12%)	8 (12%)	16 (15%)	10 (10%)	2 (9%)
STSS cases: Data on outcome at 7 days (%)	8 (89%)	5 (83%)	17 (65%)	26 (81%)	17 (81%)	0 (0%)
STSS cases: RIP/GAS main cause or contributory (%)	2 (25%)	1 (20%)	6 (35%)	10 (38%)	6 (35%)	0 (0%)
Severity						
Data on Admission to ITU (%)	57 (84%)	57 (85%)	99 (81%)	153 (91%)	144 (88%)	28 (85%)
Admitted to ITU (%)	14 (25%)	11 (19%)	40 (40%)	44 (29%)	36 (25%)	7 (25%)
Data on Surgical Intervention (%)	49 (72%)	45 (67%)	86 (70%)	136 (81%)	127 (77%)	25 (76%)
Surgical Intervention Required (%)	12 (24%)	8 (18%)	26 (30%)	39 (29%)	41 (32%)	3 (12%)
Typing						
iGAS isolates that were typed (%)			109 (89%)	140 (83%)	130 (79%)	25 (76%)
Emm-1 (%)			53 (49%)	41 (29%)	21 (16%)	6 (18%)
Emm-3 (%)			4 (4%)	33 (24%)	47 (36%)	0 (0%)
Emm-12 (%)			11 (10%)	4 (3%)	6 (5%)	3 (9%)
Emm-28 (%)			8 (7%)	8 (6%)	12 (9%)	5 (15%)
Emm-89 (%)			4 (4%)	13 (9%)	8 (6%)	2 (6%)
Other emm-types (%)			29 (27%)	41 (29%)	36 (28%)	7 (21%)

* 2015 data: January-April; Enhanced surveillance data and typing data may be incomplete

** Degree of completion of enhanced surveillance forms varies from case to case: information may not be available on all

†Note: A patient may have more than one clinical presentation or risk factor

Changes to previous reports are highlighted in **red**

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