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Health Service Executive

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2015

Annual Report of the National VTEC Reference Laboratory (VTEC NRL)

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2015 VTEC Data- PHL-DML

2015 was another busy year for VTEC in Ireland with the number of VTEC infections increasing again, however the overall increase in 2015 was much smaller than in recent years. The biggest increase was in non-O157- non-O26 VTEC, and a decrease in O157 VTEC was observed. The incidence of VTEC in Ireland in 2015 was 16/100,000. Ireland has the highest rate of VTEC in Europe since 2011.

In 2015, 4561 stool samples or isolates were received at the VTEC Reference Laboratory (VTEC-RL)-Dublin for VTEC screening or confirmation and typing, this is an increase of approx 7% from 2014. 1493/4561(33%) of samples or isolates were VTEC positive, representing 736 clinical VTEC cases. Of these 736 cases 104(14.1%) were positive for the presence of toxin genes by PCR but culture negative. VTEC was isolated from 632(85.9%) of samples, 147(23%) of these were VTEC O157, 242(38%) were VTEC O26 and the remaining 243(39%) were from 47 other VTEC serogroups. When the PCR positive culture negative samples are included there were 20%, 33% and 47% VTEC O157, O26 and others respectively (tables 1-3).

The VTEC-RL continued to use Pulsed Field Gel Electrophoresis (PFGE) as the primary strain typing method. This method has been used successfully for 11 years at VTEC-RL, and has been very useful in outbreak and non-outbreak situations. However, with the emergence of new technologies, PFGE will be replaced by Whole Genome Sequencing (WGS) in the near future. Clients will be notified before the change is made, and guidelines for interpretation of data will be provided.

To facilitate work flow efficiency, we request that urgent samples or large numbers of samples for referral are preceded by a phone call to VTEC-RL and that all samples are accompanied by a completed VTEC-RL request form. Each laboratory should have been sent a customised request form, if you have not received this please e mail phl.dublin@hse.ie and we will send it to you. We also request that as many of the fields as possible are completed, in particular ‘External lab ID’, Name, ‘DOB’ Outbreak code (if relevant) and clinical details (especially if HUS). In addition we require your ‘Technical findings’ including *vtx* PCR result and CP value for those labs screening by PCR. This enables us to streamline our testing protocol and provide you with the fastest turnaround time.

Relevant 2015 Publications

Garvey P, Carroll AM, McNamara E, McKeown PJ.
Verotoxigenic Escherichia coli transmission in Ireland: a review of notified outbreaks, 2004-2012. Epidemiol Infect 2015 Sep 18:1-10.

Carroll AM, Cobban E, McNamara EB. Evaluation of molecular and culture methods to determine the optimum testing strategy for verotoxigenic Escherichia coli from faecal specimens, Diagn Microbiol Infect Dis (2015), http://dx.doi.org/10.1016/j.diagmicrobio.2015.12.011

Garvey P, Carroll A, McNamara E, Charlett A, Danis K, McKeown PJ. Serogroup-specific Seasonality of Verotoxigenic Escherichia coli, Ireland. Emerg Infect Dis. 2016 Apr;22(4):742-4. doi: 10.3201/eid2204.151160

Table 1: PHL-HSE-DML VTEC workload 2004-2015

Year	No. Samples Analysed*	% positive cases	Number of tests
2004	599	8.5	
2005	996	12.3	
2006	1360	11.7	
2007	1468	10.8	
2008	2403	9.3	
2009	3550	6.8	
2010	3283	6.2	
2011	4943	5.5	
2012	6118	8.6	58288
2013	4918	14.6*	51376
2014	4241	17.3*	51511
2015	4561	16.1*	55645

* This is based on 1 positive result/patient, however positivity was 33% for total samples analysed.

Table 2: Summary of VTEC detected, by methodology 2015

Serogroup	*Culture and PCR positive (%)*	*PCR positive, culture negative (%)*	Total positive.
O157	147(100)	0(0)	147
O26	241(96.4)	1(0.4)	242
Other	243(70)	104(30)	347
Total	**631(86)**	**105(14)**	**736**

Table 3: Numbers and incidence of VTEC in ROI 2002-2015

Year	*Numbers of VTEC cases*	Incidence/100000
2002	68	1.7
2003	82	2.1
2004	51	1.4
2005	123	3.0
2006	159	3.7
2007	115	3.9
2008	223	5.3
2009	240	5.7
2010	202	4.8
2011	270	5.9
2012	540	11.8
2013	716	15.2
2014	731	15.9
2015	736	16.0

Table 4: Serogroups and toxin types of VTEC in ROI in 2015

	vtx1	*vtx1+vtx2*	*vtx2*	*Total*
O26	79	152	11	242
O157		33	114	147
O145	1	2	40	43
O Unidentifiable	25	10	25	60
O103	14	2	3	19
O5	9	5		14
O146	10	3		12
O182	9		2	11
O177	3		4	7
O Rough	2	3	2	10
O111	2	3		5
O128ab	1	4	2	7
O78	6		1	7
O84:H2	4			4
O76	2	2		4
O91	1	2	3	6
O105ac			2	2
O108:H2	2			2
O136	1		2	3
O141			2	2
O150		2		2
O156			2	2
O8			3	3
O98	2			2
O128ad			1	1
O103:H33			1	1
O105			1	1
O113		1	1	2
O117	1		2	3
O126			1	1
O130			1	1
O134			1	1
O149	1			1
O165			1	1
O174:H8	1			1
O178:H7	1			1
O185	1			1
O186		1		1
O2			1	1
O22:H14	1			1
O71		1		1
O74:H8		1		1
O87:H2	1			1
OE11362-78			1	1
OE7477-77	1			1
Total	**171**	**225**	**229**	**631**

*PCR positive culture negative specimens that are outside O157, O26, O103, O104, O145, O111

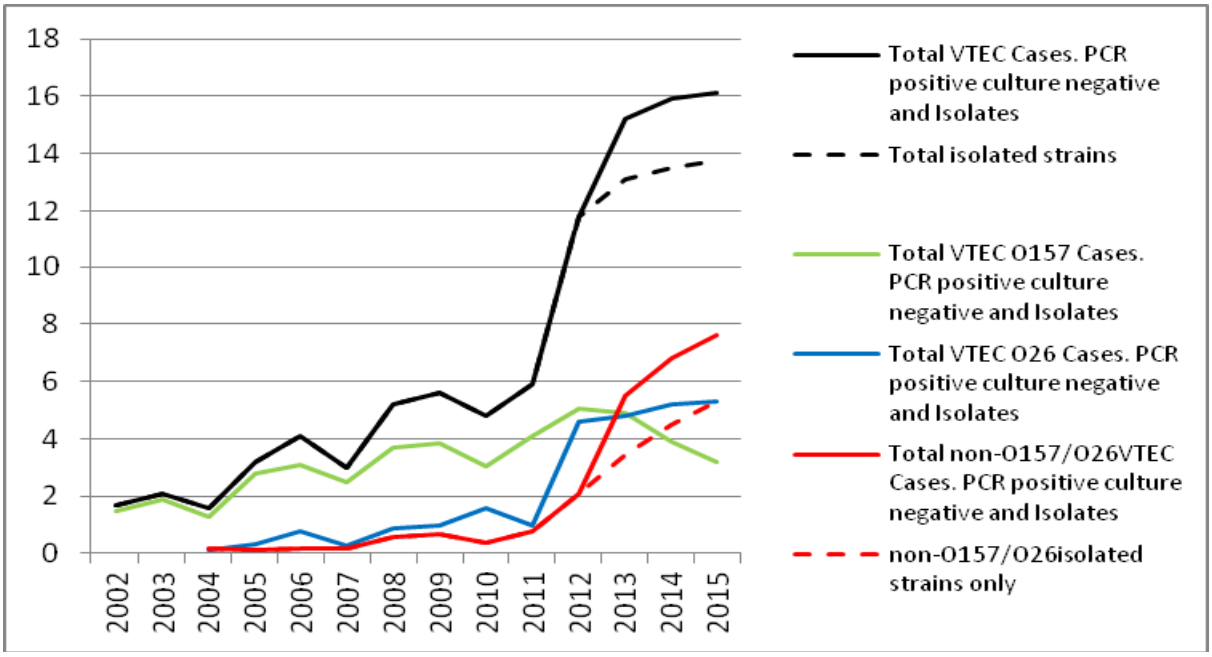

Fig 1: VTEC incidence/100000, 2002-2015

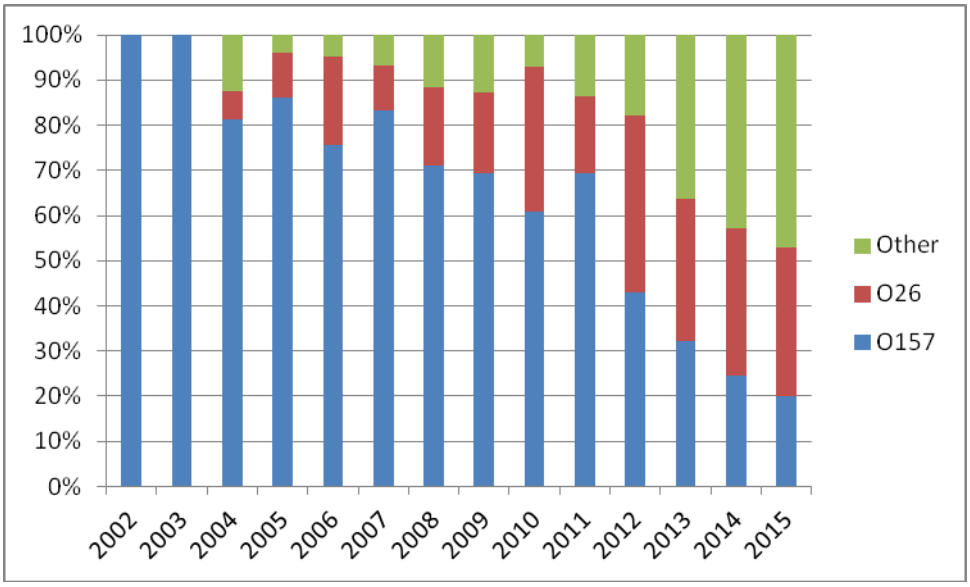

Fig 2: VTEC Serogroups%, 2002-2015

Serogroup	*Culture and PCR positive (%)*	*PCR only positive (%)*	Total
O157	0	0	0
O26	2	0	2
Other	1	4	5
Total	**3**	**4**	**7**

Table 5: Summary of VTEC from Foods 2015

Serogroup	*Culture and PCR positive (%)*	*PCR only positive (%)*	Total
O157	1	0	1
O26	1	0	1
O-Unidentifiable	7	2	9
Total	**9**	**2**	**11**

Table 6: Summary of VTEC from Waters 2015