



This report is published weekly on the PHE [website](#). For further information on the surveillance system mentioned in this report, please visit the [Hospital Norovirus Outbreak Reporting System website](#).

Contents: | [Summary](#) | [Reporting caveats](#) | [Hospital Norovirus Outbreak Reporting System](#) | [Laboratory reporting](#) | [Laboratory surveillance update](#) | [Activity in prisons](#) | [Rotavirus](#) | [Acknowledgements](#) | [References](#)

## Summary

**The next report will be published next week on 15 November 2018.**

For national surveillance to be effective, it is essential that laboratories refer representative proportions of positive norovirus and rotavirus samples from gastroenteritis outbreaks to the national reference laboratory (Enteric Virus Unit, PHE Colindale). For hospital outbreaks of suspected or confirmed norovirus, please also ensure these are reported to the Hospital Norovirus Outbreak Reporting System (HNORS) - <http://bioinformatics.phe.org.uk/noroOBK/home.php>.

### Norovirus – routine laboratory reporting (SGSS)

- Since week 27, 2018 there have been 991 laboratory reports of norovirus in England and Wales. Although this is higher than the average number for the same period in the previous 5 seasons from season 2013/14 to season 2017/18 (965), the number of laboratory reports in the early part of each season is low and therefore the percentage difference may fluctuate.

### Norovirus – Hospital Norovirus Outbreak Reporting System (HNORS)

- Reports of suspected and confirmed outbreaks of norovirus in hospitals in England to week 43, 2018 (28 outbreaks) are currently at lower levels than the average number for the same period in the previous 5 seasons from season 2013/14 to season 2017/18 (67 outbreaks).

### Rotavirus – routine laboratory reporting (SGSS)

- Since week 27, 2018, there have been 544 laboratory reports of rotavirus in England and Wales. This is 21 per cent lower than the average for 2013/14 to 2017/18 (686) (the period after vaccine was introduced).
- Following the introduction of the rotavirus vaccine into the routine childhood immunisation schedule in July 2013, the total number of laboratory-confirmed rotavirus infections each season has remained low compared to the pre-vaccine period.

**Data sources**

- Outbreaks of norovirus in hospitals are derived from the Hospital norovirus outbreak reporting system (HNORS).
- Frontline laboratory reports of positive norovirus and rotavirus samples are provided by the Second Generation Surveillance System (SGSS).
- Reports of outbreaks of diarrhoea and vomiting in prisons and other places of detention are provided by the Health and Justice Team, Public Health England.
- Norovirus genotype and GII.4 strain characterisation and other virology data are provided by the Virus Reference Department (VRD) from a national sentinel norovirus typing surveillance programme.

**Interpretation of trends**

- In order to capture the winter peak of activity in one season, for reporting purposes, the norovirus and rotavirus season runs from week 27 in year 1 to week 26 in year 2, i.e. week 27 2016 to week 26 2017, July to June.
- Norovirus activity varies from season-to-season; therefore it is most appropriate to use the 5 season average for comparison with the current season. Due to this variability between norovirus seasons, it is not possible to predict how the current season will progress.
- Norovirus is predominantly a winter pathogen; however, norovirus infections occur in the summer months.
- Data included in this report are provisional and are extracted from live reporting systems therefore numbers may fluctuate. Laboratory testing and reporting practices are known to vary. Data from laboratory reporting and HNORS are subject to a reporting delay and the number reported in the most recent weeks is likely to rise further as laboratory reports are received. Due to these reporting delays, data pertaining to the most recent two weeks are not included.

**Hospital Norovirus Outbreak Reporting System (HNORS)**

- Hospital norovirus outbreak reporting scheme (HNORS) data are for England only. Reporting to HNORS is voluntary and variations may reflect differences in ascertainment or reporting differences by region.
- Not all outbreaks reported to HNORS result in whole ward closure, some closures are restricted to bays only.
- It is important to note that not all suspected cases are tested for norovirus. Where there is an outbreak, a sample of individuals will be tested.

### **Frontline laboratory reporting (SGSS)**

- Laboratory data are for England and Wales, as reported to Public Health England by laboratories in England and Wales, and are specimens taken from faeces and the lower gastrointestinal tract only. Reporting may be subject to differences in regional ascertainment. Reporting region is based on patient's area of residence.
- Most laboratory tests in use do not distinguish vaccine from wild-type rotavirus. In the post-vaccine period, further characterisation of laboratory-confirmed rotavirus infections and considering broader testing of cases among eligible infants for other enteric pathogens are increasingly important to avoid over-attributing rotavirus as a cause of diarrhoea in young children.
- For rotavirus, comparison is made with the 10 season period 2003/04 to 2012/13 prior to the vaccine introduction and the 4 season period 2013/14 to 2016/17 post vaccine introduction.

### **Norovirus genotype and GII.4 strain characterisation (VRD data)**

- Virus genotype and GII.4 strain characterisation data from the reference laboratory are subject to a reporting delay, and the numbers reported in any week may rise further as specimens are referred and additional characterisation data become available.

## Hospital Norovirus Outbreak Reporting System (HNORS) and laboratory reports (SGSS)-England [\[Back to top\]](#)

In weeks 42, 2018 and 43, 2018 (15/10/2018 to 28/10/2018 inclusive) the hospital norovirus outbreak reporting system (HNORS) recorded three outbreaks of suspected norovirus in England, all of which led to ward/bay closures or restrictions to admissions and one of which (33 per cent) was laboratory confirmed as norovirus.

Reports of suspected and confirmed outbreaks of norovirus in hospitals in England are currently at lower levels than the same period in the previous five seasons (2013/14 to 2017/18).

This season (since week 27, 2017) there have been 28 outbreaks reported, 26 of which (93 per cent) resulted in ward/bay closures and 21 (75 per cent) of which were laboratory confirmed as norovirus.

**Table 1: Reports of suspected and confirmed norovirus outbreaks in hospitals (HNORS) and laboratory reports to PHE in England - weeks 42, 2018 and 43, 2018 (15/10/2018 to 28/10/2018)**

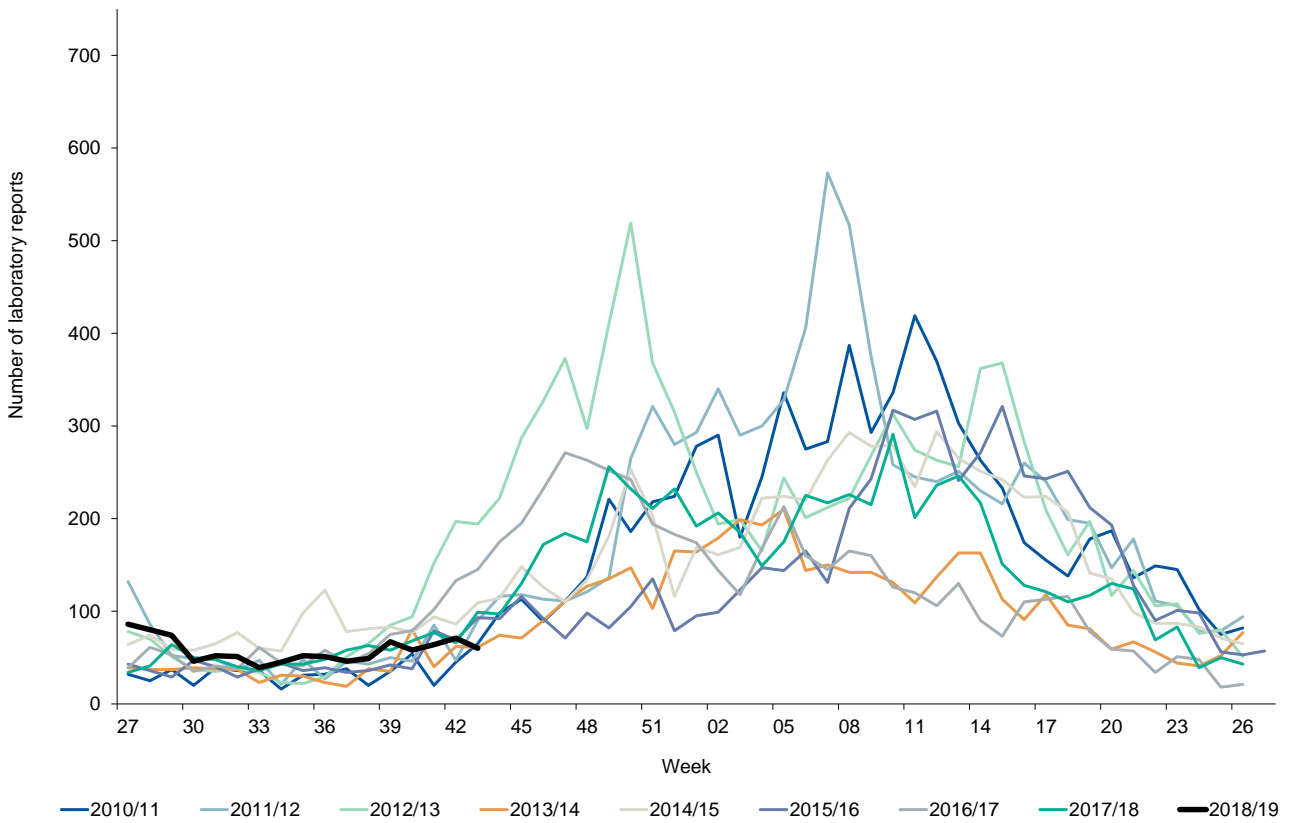
| Public Health England Region | HNORS     |   |                                | Laboratory reports (SGSS)* |
|------------------------------|-----------|---|--------------------------------|----------------------------|
|                              | Outbreaks | Outbreaks resulting in ward/bay closure | Laboratory confirmed outbreaks |                            |
| East of England              |           |   |                                | 16                         |
| East Midlands                |           |   |                                | 11                         |
| London                       |           |   |                                | 17                         |
| North East                   |           |   |                                | 7                          |
| North West                   | 1         | 1                                       | 1                              | 5                          |
| South East                   | 1         | 1                                       |                                | 14                         |
| South West                   | 1         | 1                                       |                                | 26                         |
| West Midlands                |           |   |                                | 9                          |
| Yorkshire and the Humber     |           |   |                                | 25                         |
| <b>Total</b>                 | <b>3</b>  | <b>3</b>                                | <b>1</b>                       | <b>130</b>                 |

\* By patients' area of residence

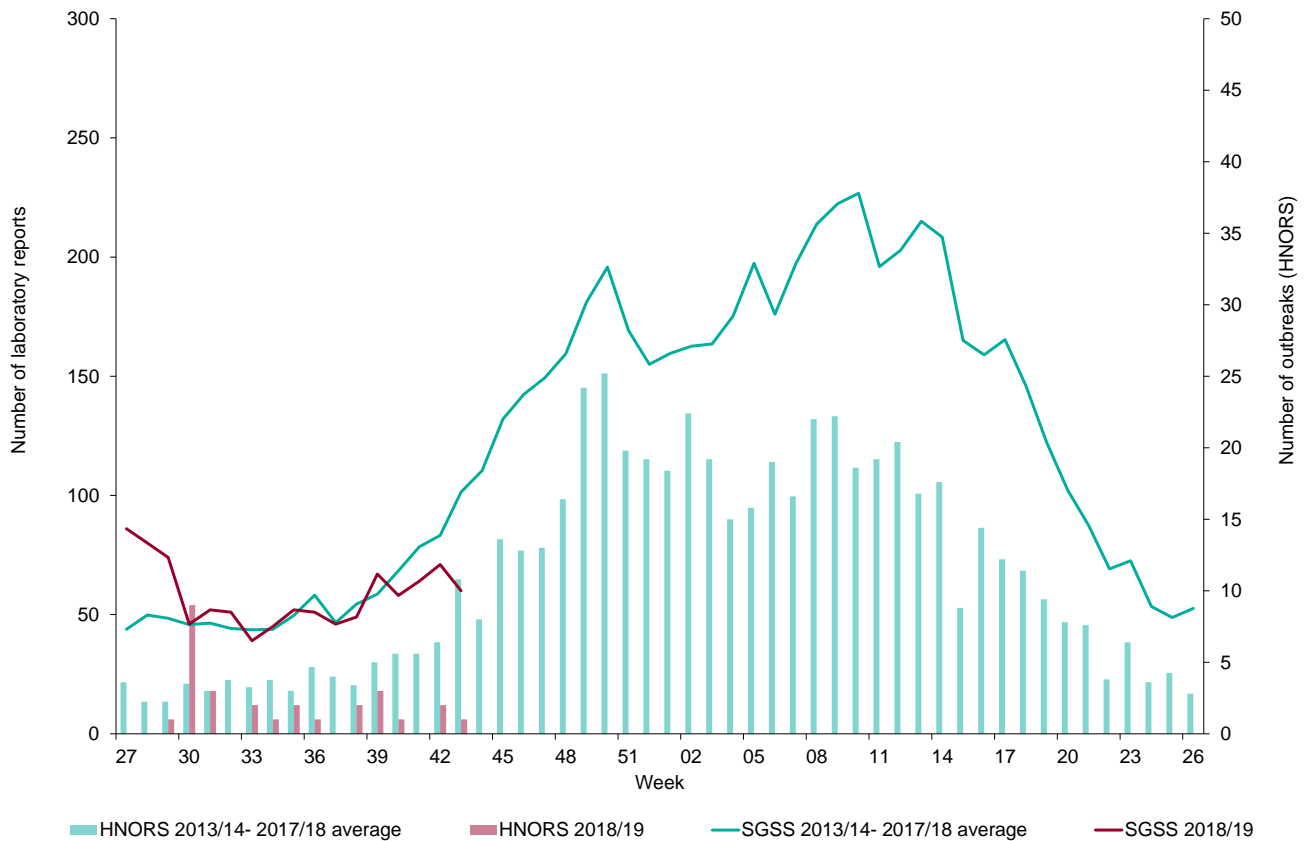
## Norovirus Laboratory Reporting (SGSS) - England and Wales [\[Back to top\]](#)

The number of laboratory reports of norovirus in England and Wales, as reported to Public Health England, in this season (week 27, 2018 to week 43, 2018) is 991. Although this is 3 per cent higher than the average number for the same period in the previous 5 seasons from season 2013/14 to season 2017/18 (965), the number of laboratory reports in the early part of each season is low and therefore the percentage difference may fluctuate. Norovirus activity varies from season to season and no two seasons are the same. The emergence of novel strains of norovirus may result in shifts in seasonality (Allen et al, 2014).

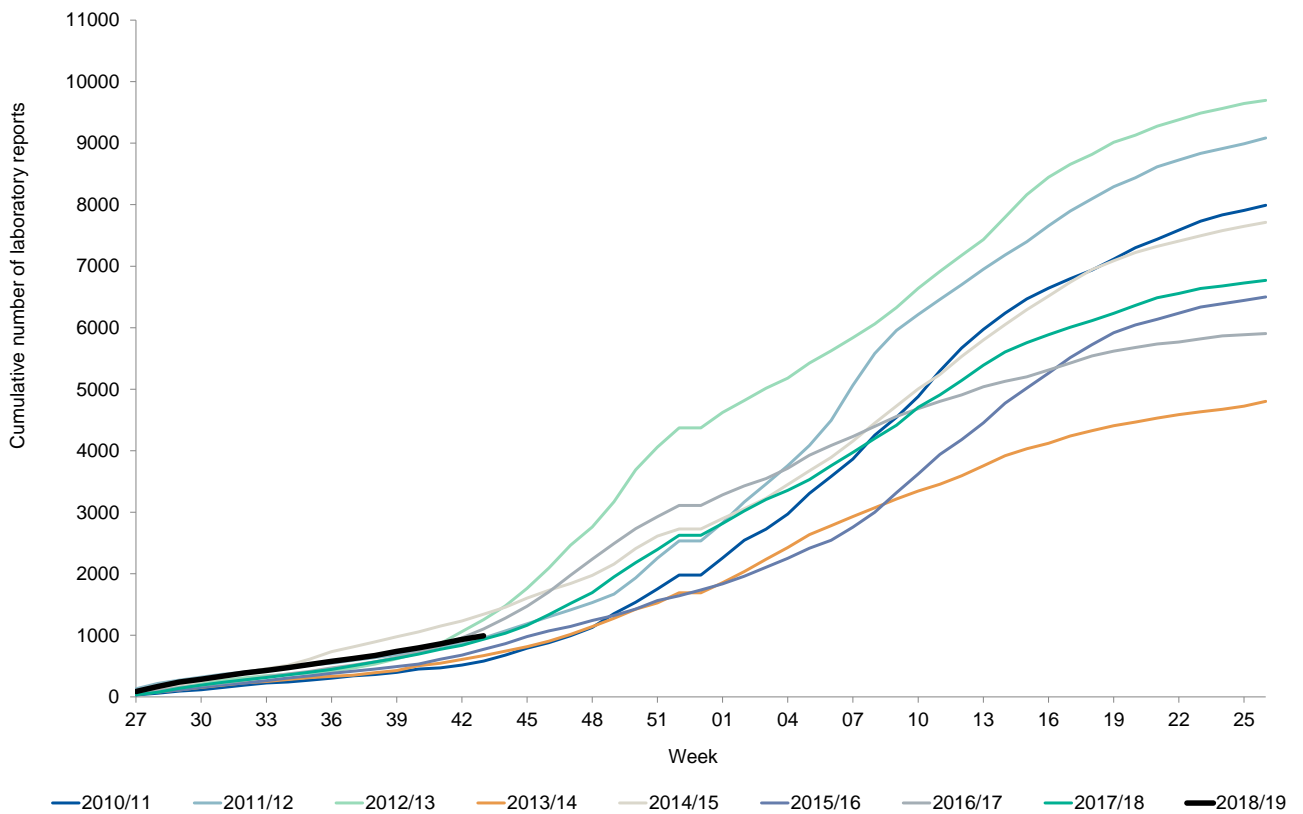
**Figure 1: Seasonal comparison of laboratory reports of norovirus 2010/11-2018/19 (England and Wales)**



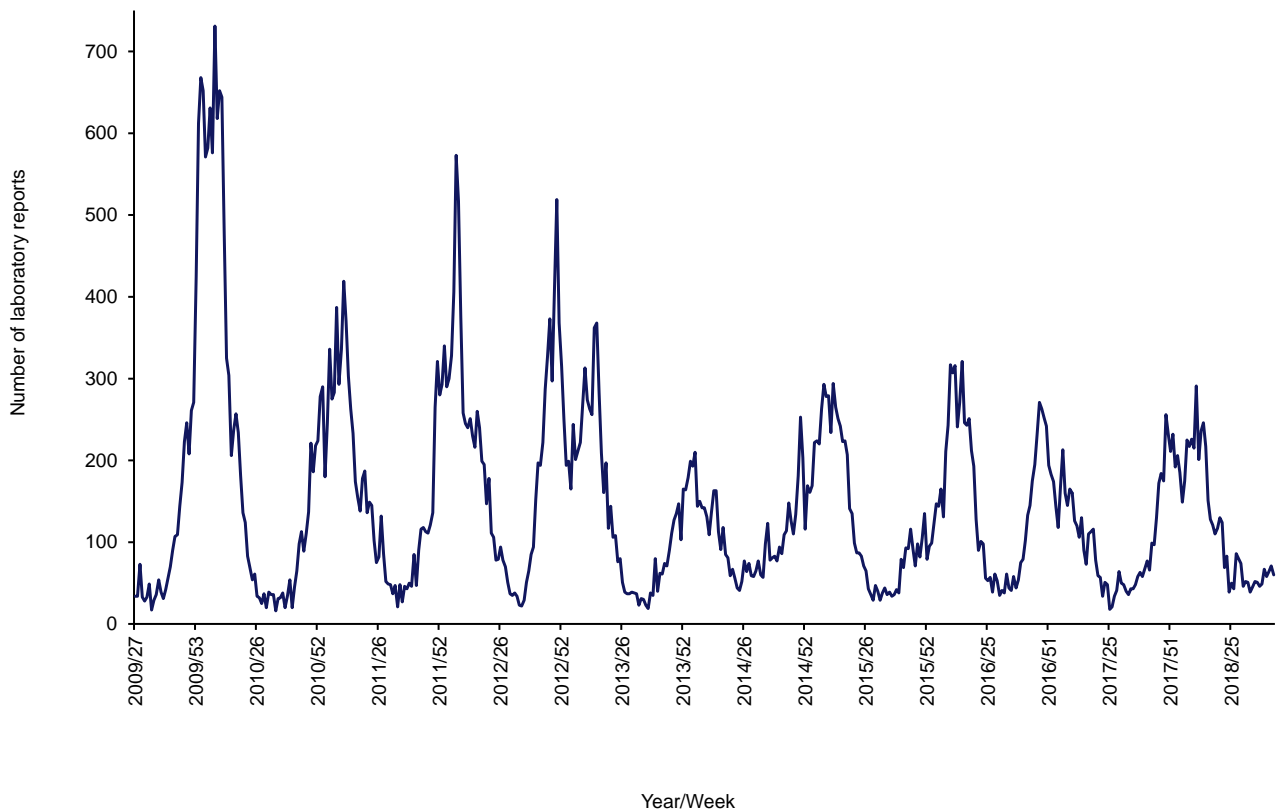
**Figure 2: Laboratory (England and Wales) and hospital outbreak reports (England) by week of occurrence 2018/19 compared to five season average (2013/14-2017/18)**



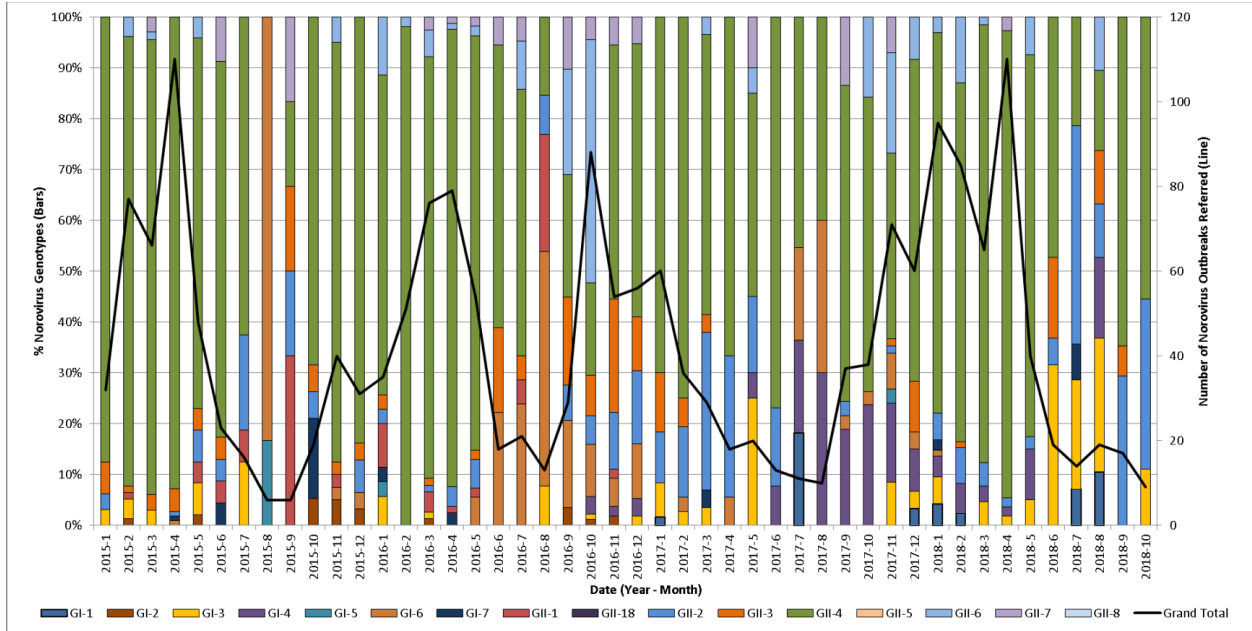
**Figure 3: Cumulative number of laboratory reports of norovirus by season 2010/11-2018/19 (England and Wales)**



**Figure 4: Laboratory reports of norovirus by week 2009-2018 (England and Wales)**

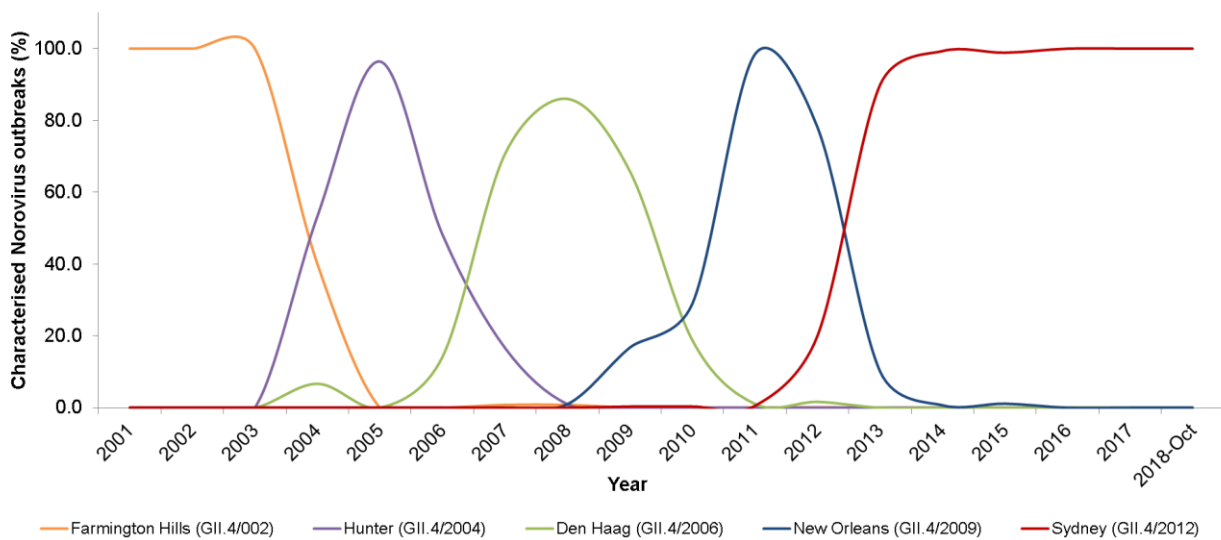


**Figure 5: Norovirus-confirmed outbreaks (all settings, by month) referred to VRD (England and Wales), 2014-2018**



- Noroviruses of the genogroup II – genotype 4 (GII.4) are the most frequently detected in 2018, accounting for 73.7% of characterised samples.
- GII.4 Noroviruses are the most commonly detected for the period 2015-2018.
- GII.4 Noroviruses Sydney2012-like variant are the most frequently detected since 2014.

**Figure 6: GII-4 norovirus strains detected by year 2001-2018 (England and Wales)**



- The Virus Reference Department monitors the genetic diversity of noroviruses belonging to the dominant GII.4 genotype that circulate in England and Wales.

- Since 2001, there have been five major GII.4 strains circulating in England and Wales (and worldwide), which have successively replaced one another. Replacement events are associated with antigenic drift in the virus (Allen et al 2008, 2009, Zakikhany et al 2012).
- Since the winter of 2012/13, the GII.4 strain Norovirus/GII.4/Sydney/2012 has been dominant worldwide, including in England and Wales (Allen, Adams, et al 2014).

### **Activity in prisons and other places of detention (Health and Justice Team) – England** **[Back to top]**

No outbreaks of diarrhoea and vomiting have been reported in prisons in weeks 42, 2018 and 43, 2018.

For guidance on the management of outbreaks in prisons see:

<https://www.gov.uk/government/publications/multi-agency-contingency-plan-for-disease-outbreaks-in-prisons>

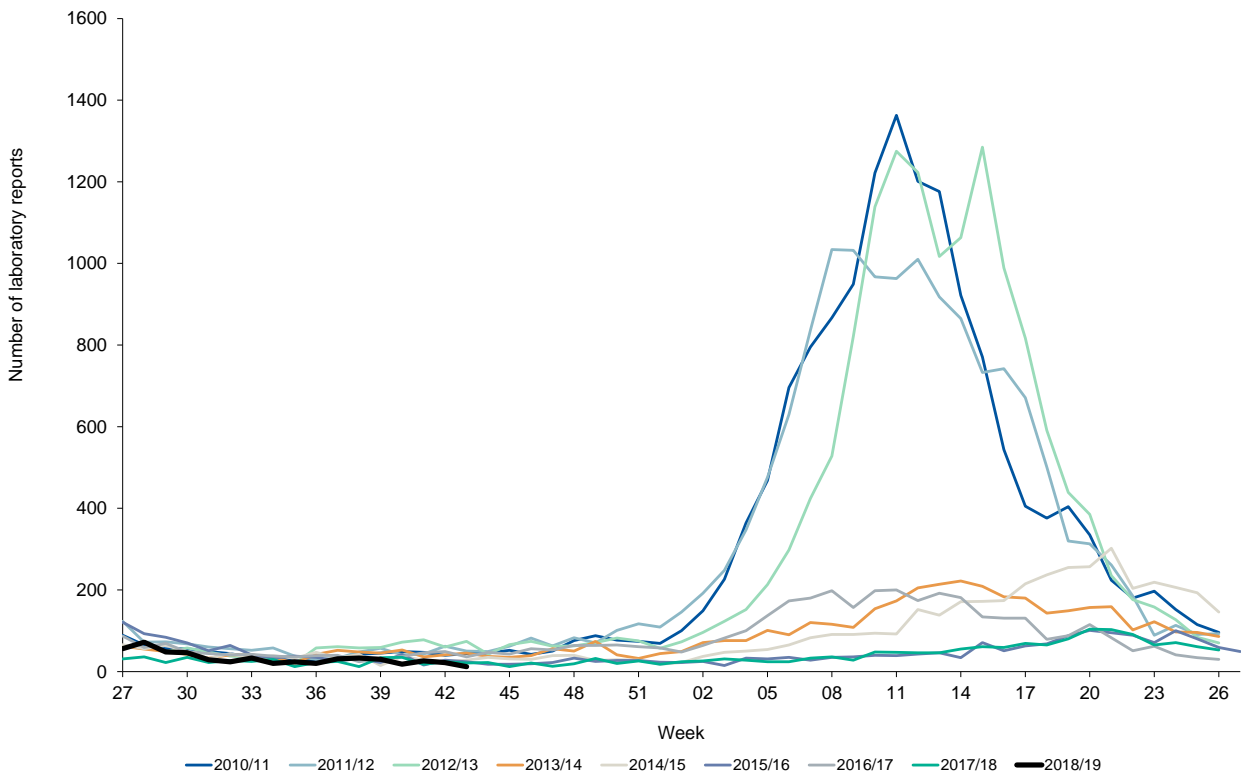
### **Rotavirus Laboratory Reporting (SGSS) - England and Wales** **[Back to top]**

The number of laboratory reports of rotavirus in England and Wales as reported to Public Health England, in this season (week 27, 2018 to week 43, 2018) is 544. This is 21 per cent lower than the five season average (post-vaccine) for the same period in the seasons 2013/14 to 2017/18 (686).

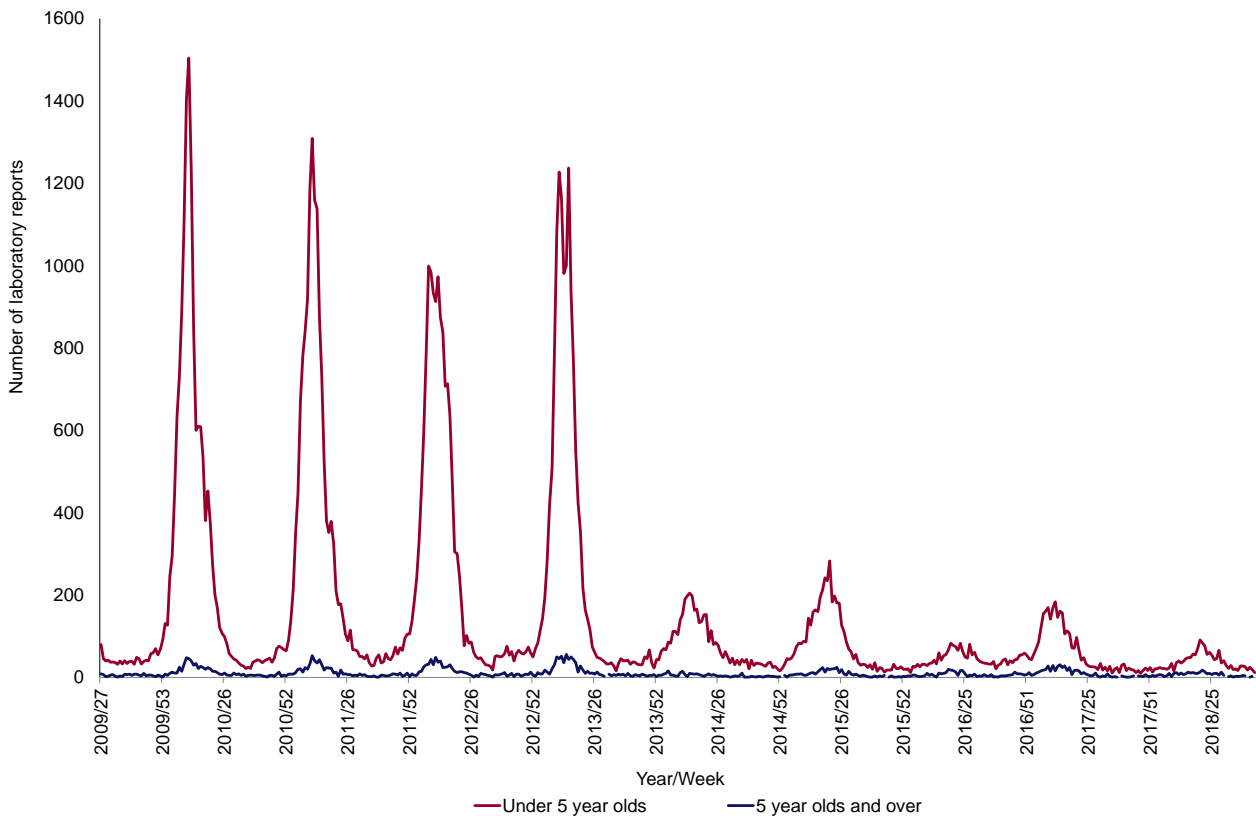
Rotavirus particularly contributes to reported diarrhoea and vomiting illness in children aged under five however in the first season following the introduction of the rotavirus vaccine in July 2013, a 77 per cent decline in laboratory-confirmed rotavirus infections in infants was observed (Atchison et al, 2016). The total number of laboratory-confirmed rotavirus infections each season has since remained low compared to the pre-vaccine period.



**Figure 7: Seasonal comparison of laboratory reports of rotavirus by week 2010/11-2018/19 (England and Wales)**



**Figure 8: Laboratory reports of rotavirus by week and age group 2009-2018 (England and Wales)**



## Acknowledgements

[Back to top]

This report was prepared by the Tuberculosis; Acute Respiratory; Gastrointestinal; Emerging/Zoonotic Infections; and Travel and Migrant Health Division (T.A.R.G.E.T.), Public Health England. We are grateful to all who provided data for this report including infection control staff in hospitals who take the time to contribute data to HNORS, the Virus Reference Department, Public Health England and the Health and Justice Team, Public Health England. Any queries or comments can be directed to [noroOBK@phe.gov.uk](mailto:noroOBK@phe.gov.uk)

## References

[Back to top]

Atchison, C. J., Stowe, J., Andrews, N., Collins, S., Allen, D. J., Nawaz, S., Brown, D., Ramsay, M. E. & Ladhani, S. N. 2016. Rapid Declines in Age Group–Specific Rotavirus Infection and Acute Gastroenteritis Among Vaccinated and Unvaccinated Individuals Within 1 Year of Rotavirus Vaccine Introduction in England and Wales. *The Journal of Infectious Diseases*, 213, 243-249.

Allen DJ, Adams NL, Aladin F, Harris JP, Brown DWG (2014) Emergence of the GII-4 Norovirus Sydney2012 Strain in England, Winter 2012–2013. *PLoS ONE*9(2): e88978. <https://doi.org/10.1371/journal.pone.0088978>

Allen, D. J., Gray, J. J., Gallimore, C. L., Xerry, J. & Iturriza-Gomara, M. 2008. Analysis of amino acid variation in the P2 domain of the GII-4 norovirus VP1 protein reveals putative variant-specific epitopes. *PLoS One*, 3, e1485.

Allen, D. J., Noad, R., Samuel, D., Gray, J. J., Roy, P. & Iturriza-Gomara, m. 2009. Characterisation of a GII-4 norovirus variant-specific surface-exposed site involved in antibody binding. *Virol J*, 6, 150.

Zakikhany, K., Allen, D. J., Brown, D. & Iturriza-Gomara, M. 2012. Molecular evolution of GII-4 Norovirus strains. *PLoS One*, 7, e41625.