



PHE National norovirus and rotavirus Report

Summary of surveillance of norovirus and rotavirus

17 October 2019 – Week 42 report (data to week 40)

This report is published on the PHE [website](#). For further information on the surveillance systems 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

This is the first weekly report of the 2019/20 season, the next weekly report will be published on 24 October 2019.

For national surveillance to be effective, it is essential that hospital outbreaks of suspected or confirmed norovirus are reported via the HNORS website and laboratories refer representative proportions of positive norovirus and rotavirus samples from gastroenteritis outbreaks to the national reference laboratory (Enteric Virus Unit, PHE Colindale).

The [HNORS website](#) was relaunched on Monday 07 October after going offline in May 2019; users are encouraged to retrospectively report any outbreaks which may have occurred during this period to ensure ascertainment is consistent with the period prior to HNORS going offline.

No single surveillance system fully captures national changes in norovirus activity, therefore this report presents data from three systems which collectively describes recent trends.

Norovirus – routine laboratory reporting (SGSS)

- Between weeks 38 and 40 of 2019 norovirus activity was higher than the five season average (2014/15 to 2018/19) for the same period, however, the overall level of norovirus activity to week 40 of the 2019/20 season (780 laboratory reports) was comparable to the five season average of the same period (769 laboratory reports).

Norovirus – Hospital Norovirus Outbreak Reporting System (HNORS)

- During weeks 39 and 40 of 2019 reports of suspected and confirmed outbreaks of norovirus in hospitals in England (4 outbreaks) were lower than the five season average (10 outbreaks) for this two week period (2014/15 to 2018/19); overall the number of reported outbreaks during the 2019/20 season (weeks 27 to 40) remains lower (25 outbreaks) than the average number for the same period in the previous five seasons (44 outbreaks).

Rotavirus – routine laboratory reporting (SGSS)

- Since week 27, 2019, there have been 338 laboratory reports of rotavirus in England and Wales. This is 40 per cent lower than the average for 2014/15 to 2018/19 (566) (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.

Reporting caveats

[\[Back to top\]](#)

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 2018 to week 26 2019, 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.
- Between May and October 2019 HNORS was temporarily offline; the reliance on manual data collation may have resulted in a reduction in reporting during this period.

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 case'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 average for the period 2003/04 to 2012/13 prior to the vaccine introduction and the 5 season average for the period 2013/14 to 2017/18 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 39, 2019 and 40, 2019 (23/09/2019 to 06/10/2019 inclusive) there were four outbreaks of suspected norovirus reported to HNORS in England, three of which (75 per cent) led to a ward/bay closure or restrictions to admissions and two of which (50 per cent) were 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 (2014/15 to 2018/19).

This season (since week 27, 2019) there have been 25 outbreaks reported, 18 of which (72 per cent) resulted in ward/bay closures and 11 of which (44 per cent) 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 39, 2019 and 40, 2019 (23/09/2019 to 06/10/2019)

Public Health England Region	HNORS			Laboratory reports (SGSS)*
	Outbreaks	Outbreaks resulting in ward/bay closure	Laboratory confirmed outbreaks	
East of England				10
East Midlands				13
London				16
North East				8
North West				0
South East	1	1	1	9
South West	2	1	1	33
West Midlands	1	1		11
Yorkshire and the Humber				27
Total	4	3	2	127

* By case's 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, 2019 to week 40, 2019) is 780. This is comparable than the average number for the same period in the previous 5 seasons from season 2014/15 to season 2018/19 (769).

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).

At the start of a new season the number of norovirus laboratory reports is low and likely to be variable, therefore comparisons of activity between seasons should be interpreted with caution.

Figure 1: Seasonal comparison of laboratory reports of norovirus 2011/12-2019/20 (England and Wales)

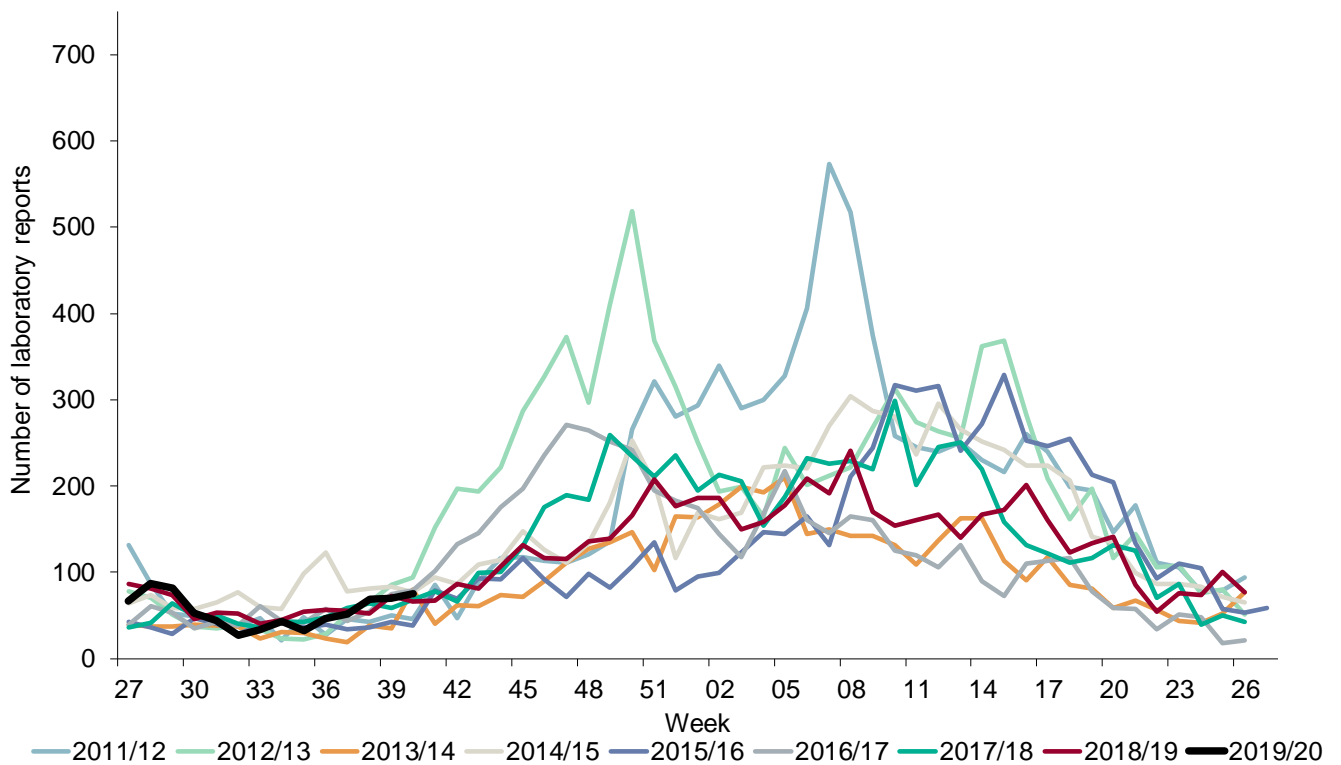


Figure 2: Laboratory (England and Wales) and hospital outbreak reports (England) by week of occurrence 2019/20 compared to the five season average (2014/15-2018/19)

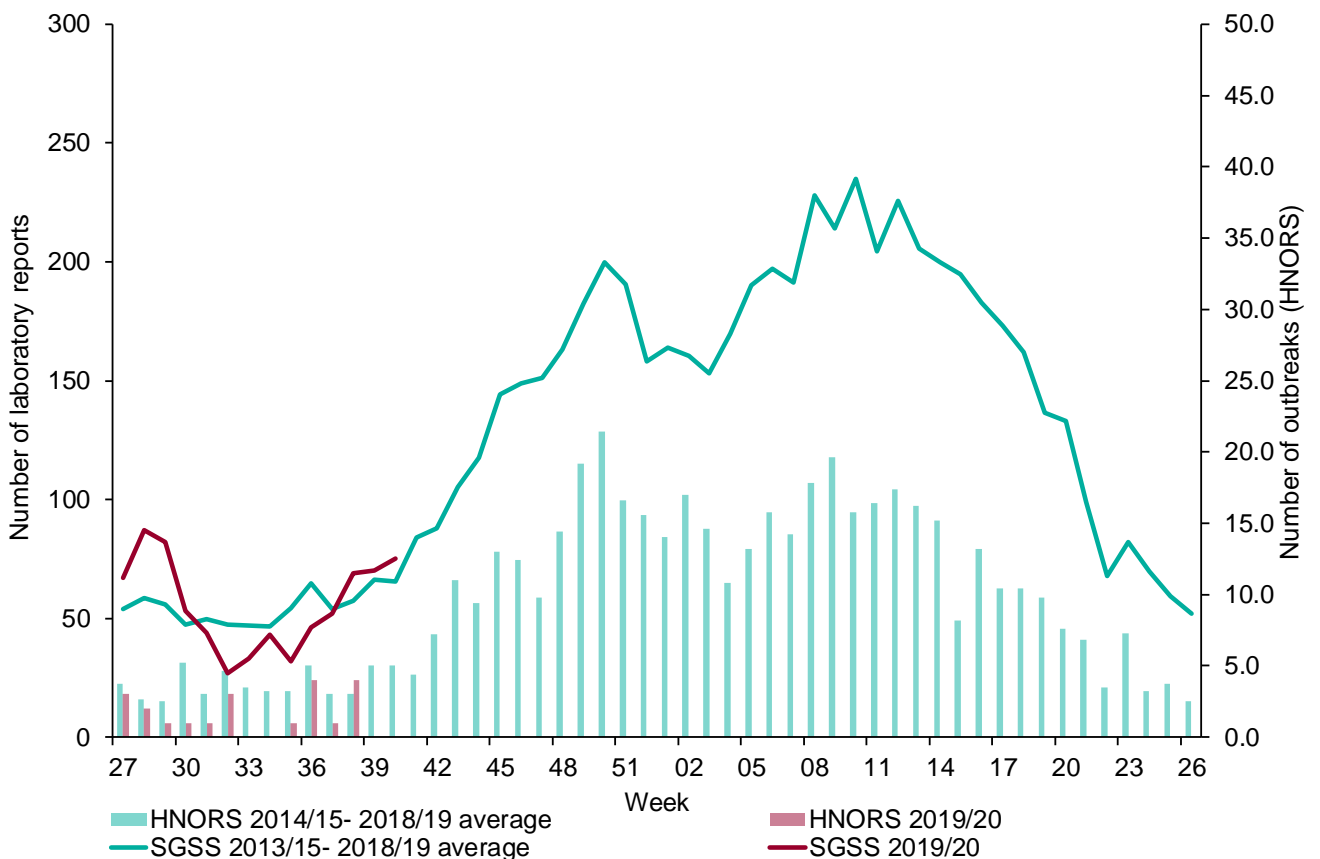


Figure 3: Cumulative number of laboratory reports of norovirus by season 2011/12-2019/20 (England and Wales)

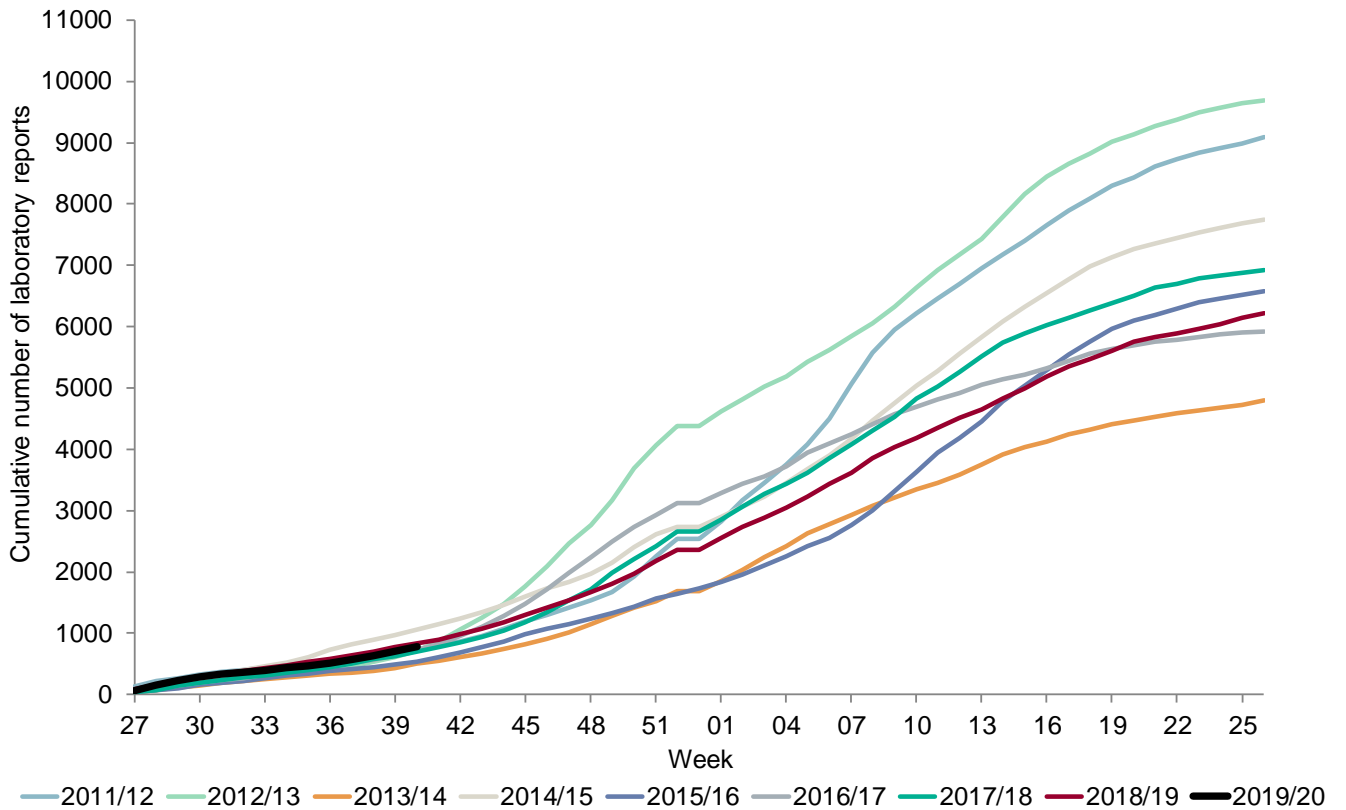


Figure 4: Laboratory reports of norovirus by week 2009-2019 (England and Wales)

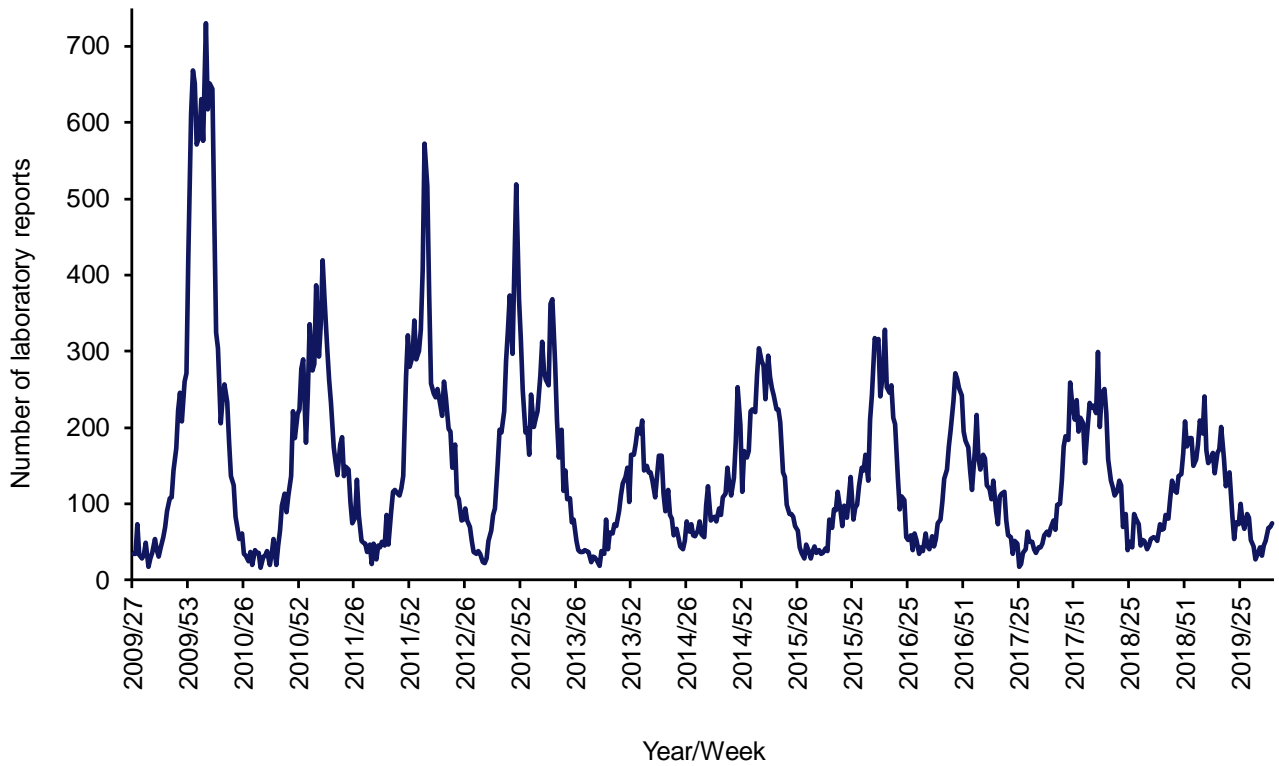
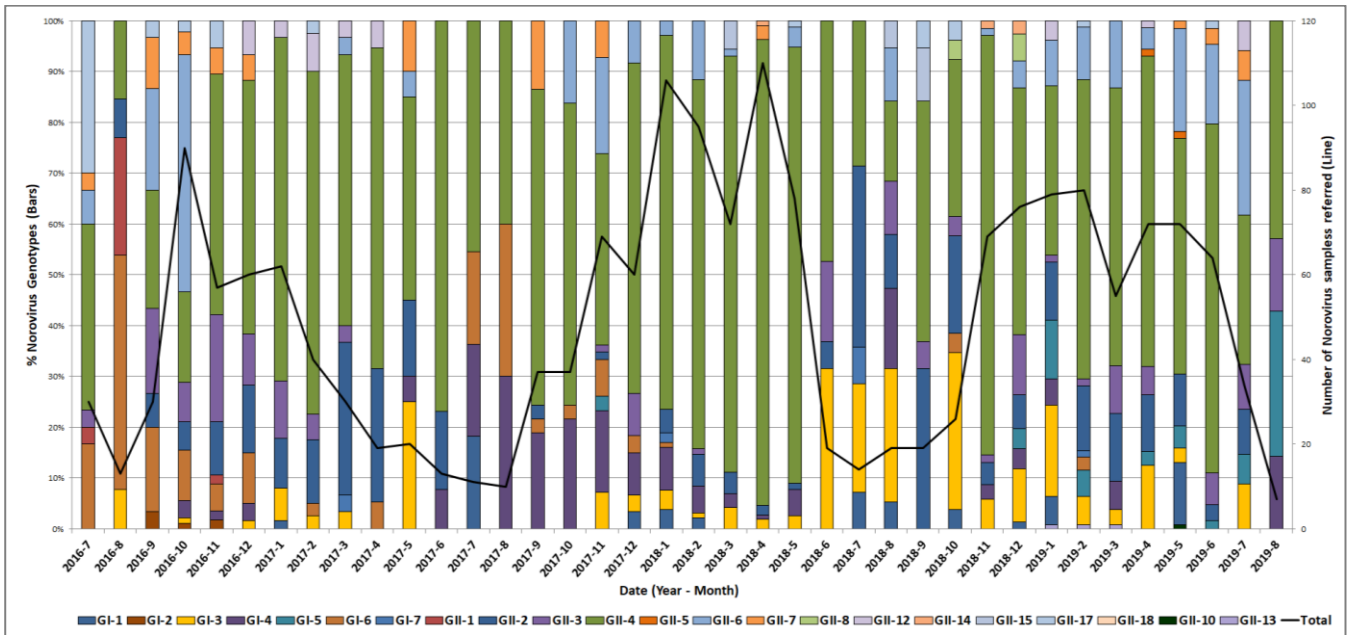
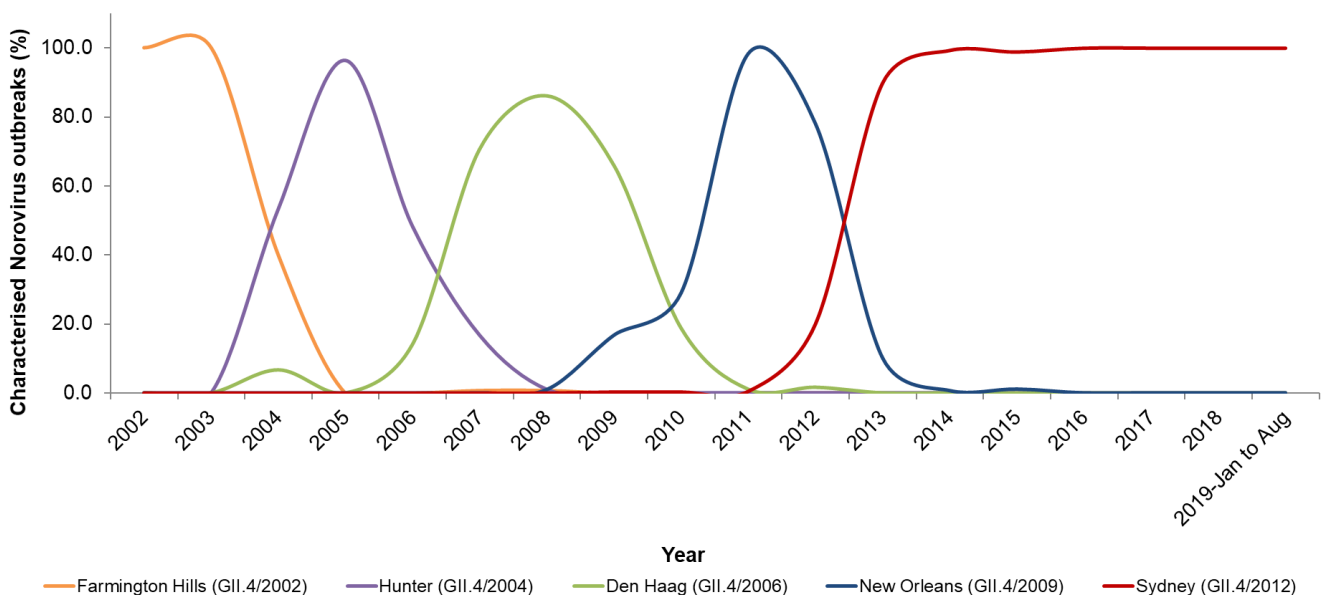


Figure 5: Norovirus-confirmed outbreaks (all settings, by month) referred to VRD (England and Wales), 2016-2019



- Noroviruses of the genocluster genogroup II-genotype 4 (GII.4) were the most frequently detected in England and Wales during 2019, accounting for 50.5% of characterised samples.
- GII.4 Noroviruses are the most commonly detected since 2015.
- GII.4 Noroviruses Sydney2012-like variant are the most frequently detected norovirus genotype worldwide since 2014.

Figure 6: GII-4 norovirus strains detected by year 2001-2019 (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]**

One outbreak of diarrhoea and vomiting was reported in prisons during weeks 39, 2019 and 40, 2019.

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, 2019 to week 40, 2019) is 338. This is 40 per cent lower than the five season average (post-vaccine) for the same period in the seasons 2014/15 to 2018/19 (566).

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 2011/12-2019/20 (England and Wales)

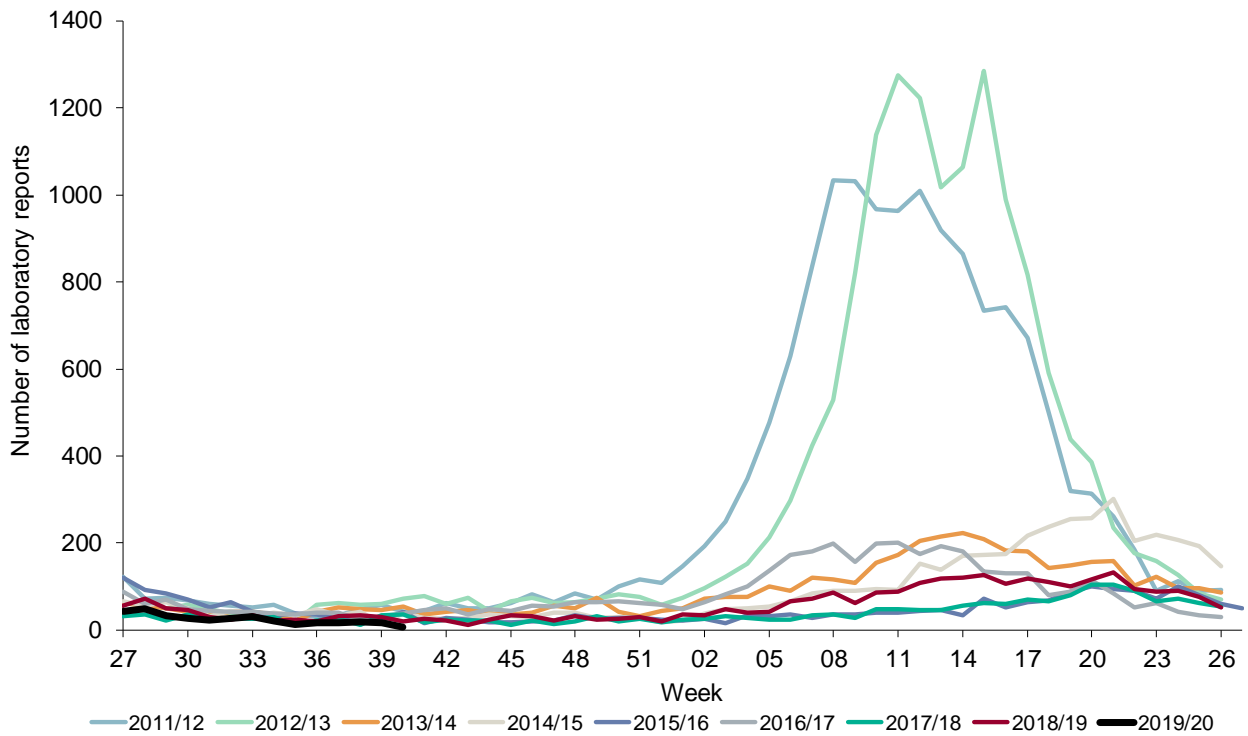
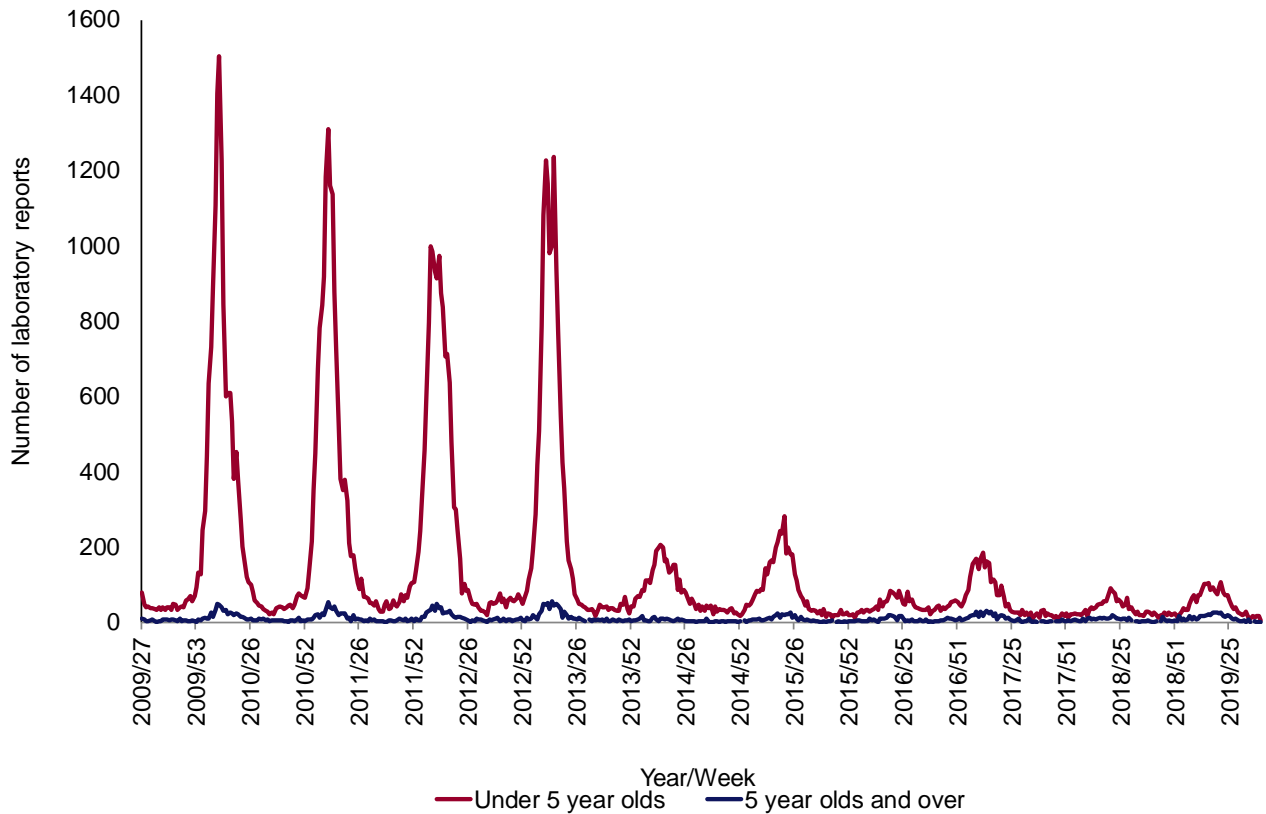


Figure 8: Laboratory reports of rotavirus by week and age group 2009-2019 (England and Wales)



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

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.