The impact of improving Influenza testing turnaround times on hospital flows and length of stay

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1. Introduction

Testing for influenza using PCR is no longer the preserve of specialist virology laboratories. Commercially available CE marked assays allow local laboratories to offer a PCR service reducing the transport times associated with sending samples to reference centres. Moreover, batch analysis is being replaced by random access platforms with further improvement of turnaround times. This observational study investigated whether these potential improvements in turnaround times were realised by the Path Links laboratory service in Lincolnshire, and how this improvement translated into a positive impact on patient care.

Previously all respiratory virus PCR had been referred to Addenbrooke's virology laboratory in Cambridge. In January 2017, the Werfen Arrow extraction / Cepheid SmartCycler system was introduced allowing batch PCR analysis. Later, from January 2018, the GeneXpert, a random access cartridge-based system was implemented.

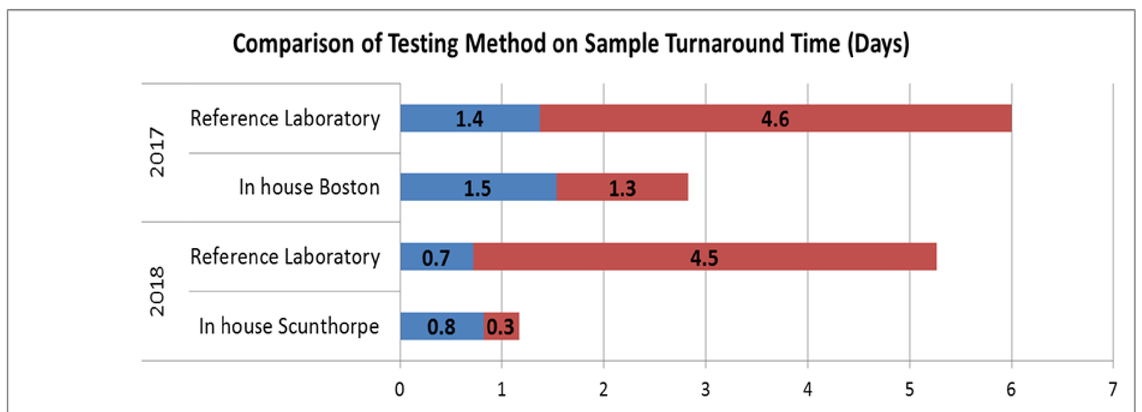
The intention was that by optimising laboratory processes, the turnaround time for influenza samples would be improved, alongside an advantage in releasing BMS staff time which had been a challenge using the Werfen system. The anticipated benefits in confirming or refuting an influenza diagnosis rapidly were both treating individual patients more effectively and helping to prevent the spread of influenza in the hospital. Antibiotic stewardship benefits were envisaged, but were not measured during this study. Furthermore it could enable patients to be discharged more quickly to recover at home thus reducing their length of stay and freeing up hospital beds.

2. Methods

Data from the periods January to March 2017 and 2018 from the laboratory, patient administration, and infection prevention department database were collated and compared. Parameters examined included laboratory turnaround time, final result, and patient length of stay. During times of particular laboratory pressure or analyser down-time, samples were referred for testing, so some data for reference testing during the same period are available. Those patients with length of stay of over 30 days duration were excluded from the analysis, as it was felt that there were other causes of increased duration of hospital admission.

3. Turnaround time results

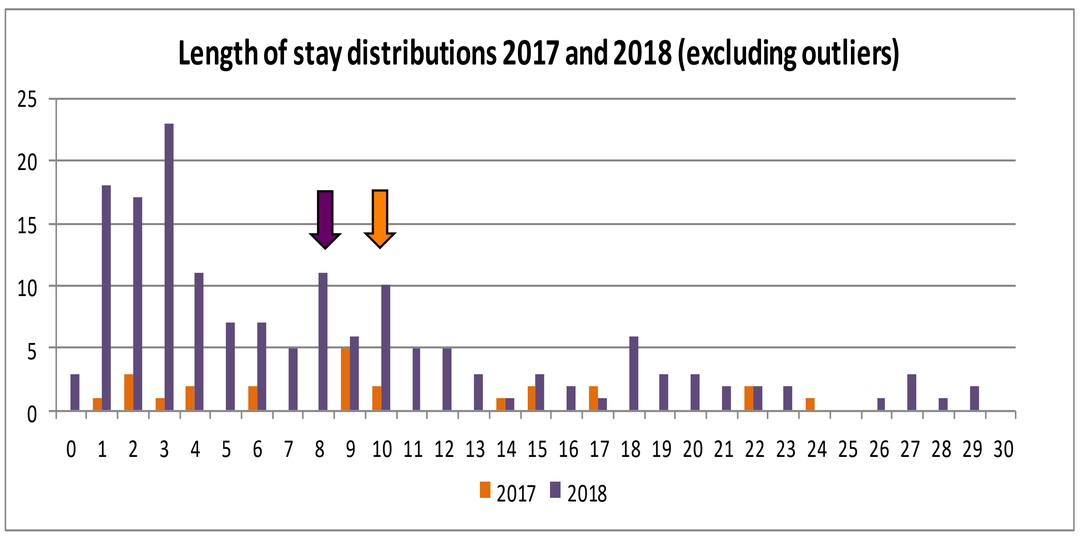
From January to March 2017 samples number = 249
Influenza detected = 24
From January to March 2018 samples number = 787
Influenza detected = 163.
Impact of testing method on turnaround times:
Batch analysis Mean turnaround time 2.8 days



	2018		2017	
	In house Scunthorpe	Reference Laboratory	In house Boston	Reference Laboratory
Average of TaT (Days from Collection to Receipt	0.8	0.7	1.5	1.4
Average of TaT (Days) from Receipt	0.3	4.5	1.3	4.6

4. Length of stay results

The mean length of stay for patients with suspected influenza: January to March 2017 was 10.0 days and in the same period in 2018 this had reduced to 8.2 days. The difference is 1.8 days however this difference is not statistically significant using a one tailed t-test.



5. Conclusions

It was felt that introducing in house testing at Scunthorpe was of benefit to the Trust as the turnaround time for testing samples was significantly reduced. This meant that the Trust could efficiently isolate those patients with influenza thus preventing the spread of the virus within the hospital and also remove patients from isolation thus freeing up this facility for other patients.

Although the reduction in the length of patient stay was not statistically significant, any reduction is beneficial for hospitals facing winter pressures and also for individual patients.

6. Discussion

We acknowledge that there are many reasons why length of stay may reduce over time, and also note that the influenza epidemic during the winter season 2017-18 had a particularly high impact. However, unlike the previous year during that period, there were no full ward closures because of influenza despite the challenge of isolation facilities of <15% in some areas.

Following this study, a business case for implementation of the GeneXpert within the Path Links microbiology laboratories at both Scunthorpe and Boston has been successful, and the technology has been introduced for this winter season. Furthermore, the trusts have agreed not to introduce point of care testing for influenza in clinical areas.

This observational study demonstrated that improving laboratory turnaround times for influenza testing can have a real life benefit for both individual patients and the hospital system as a whole, including reduced length of stay and improved use of isolation facilities.