

Rising to the challenge of the COVID-19 pandemic; increasing capacity and reducing turnaround times in the first 10 months of the COVID-19 pandemic



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INTRODUCTION

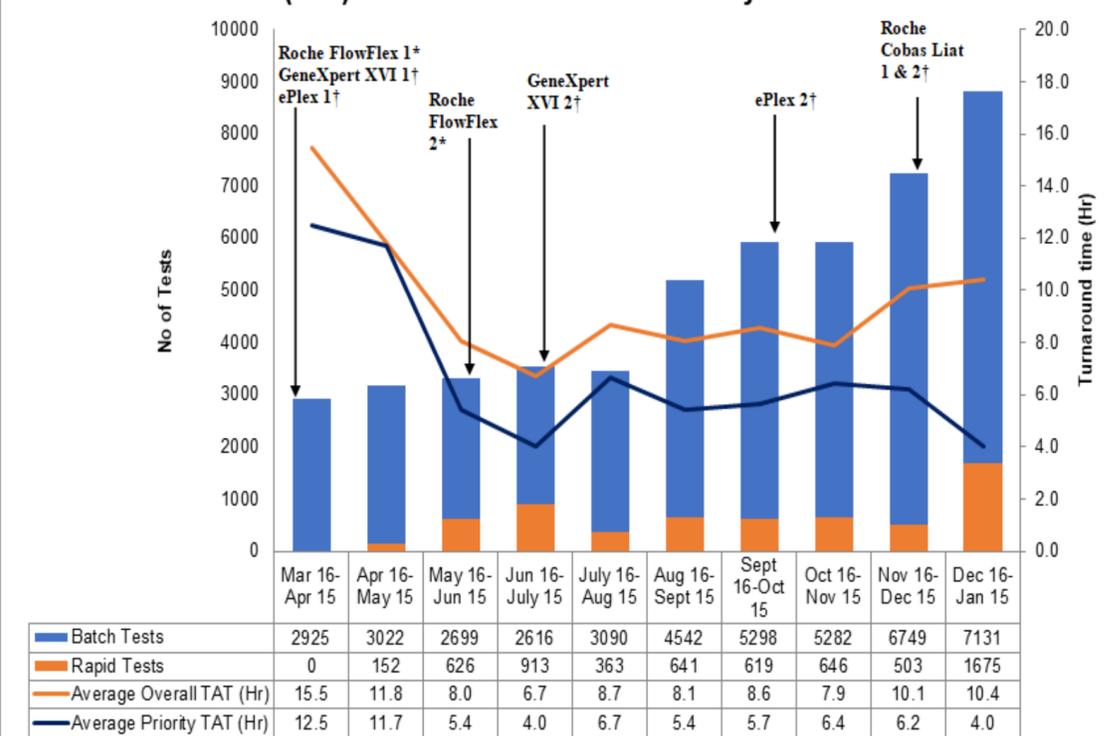
- The COVID-19 pandemic demanded an urgent response from diagnostic laboratories. Testing for SARS-CoV-2 posed enormous challenges due initially to the lack of proven assays, restricted testing capacity, and unreliable and disrupted supply chains. Continuous improvement in turnaround times (TAT) was imperative to protect both patients and staff.
- We describe the experience of the microbiology laboratory in Beaumont Hospital in introducing on-site SARS-CoV-2 testing in mid-March 2020, subsequently increasing local testing capacity and reducing TAT.

METHODOLOGY

- The monthly number of completed tests and average TAT from the testing start date; 16th March 2020 to 15th January 2021 were reviewed. A combination of batch testing (Roche FlowFlex) and rapid testing (GeneXpert XVI, Genmark ePlex) were used.
- The monthly average TAT was assessed for priority areas; Emergency Department (ED) and critical care. Dates of the introduction of new assays/additional capacity were recorded.

RESULTS

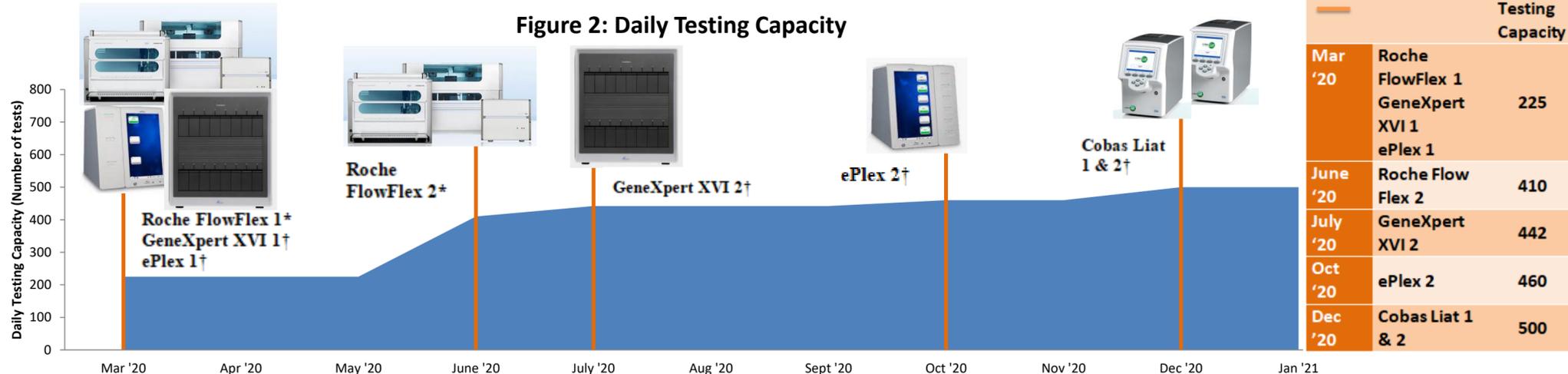
Figure 1: Monthly SARS-CoV-2 Test Output and Turnaround Times (TAT) 16th March 2020-15th January 2021



* Batch testing platform † Rapid testing platform

- Over 10 months 49,492 tests for SARS-CoV-2 were performed.
- Testing capacity increased by introducing an additional system of each of the three existing laboratory analysers: Roche FlowFlex, GeneXpert XVI and Genmark ePlex (Figure 2).
- Two Roche Cobas Liat near-patient-testing analysers were procured and placed close to the ED.
- Comparing March 2020 with January 2021 (Figure 1):
 - 122% increase in daily testing capacity (n=225 to n=500)
 - 201% increase in monthly testing output (n=2,925 to n=8,806)
 - Overall TAT fell by 34% (average from 15.5 to 10.4; range 6.7 - 15.5 hours)
 - Priority areas TAT fell by 68% (average from 12.5 to 4.0; range 4.0 - 12.5 hours)
- By January 2021, 19% of tests were performed using rapid TAT platforms (n=1,675); 852 in the laboratory setting (GeneXpert XVI and ePlex) and 823 using near-patient analysers (Cobas Liat)
- Training was completed for 55 staff members; 24 laboratory-based and 33 in near-patient care

Figure 2: Daily Testing Capacity



CONCLUSIONS

- Prompt expansion of a local SARS-CoV-2 testing service, through innovation, flexibility and staff training increased capacity and diversification across testing platforms facilitating rapid and effective responses to testing demands.
- Substantial reductions in TAT overall and especially for priority areas were achieved, facilitating safe patient placement, timely patient management and prompt initiation of appropriate infection prevention and control interventions.

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