

Answering Ireland's call: pathology during the COVID-19 pandemic

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INTRODUCTION

The unprecedented healthcare demands, generated in response to the novel SARS-CoV-2 pathogen, were met by a resilient pathology service in Ireland that supported all aspects of patient management.

As in the UK and elsewhere, pathology departments in Ireland include the disciplines of histopathology, microbiology, haematology, immunology and chemical pathology, with delivery of these services (to a population of 4.9 million) being largely hospital based. They are funded directly or indirectly by the publically funded health service executive (HSE) with private hospital laboratories also contributing, especially for those who pay health insurance.

The response to the COVID-19 pandemic was largely led by a national public health emergency team (NPHET), established by the Irish government and chaired by the chief medical officer. Throughout the pandemic, this group of experts continually monitored events and provided independent advice to government on the public health measures required. Key to the coordinated laboratory response was the establishment of the COVID-19 Laboratory Taskforce (CLT), established in April 2020 that included: experts in senior health service management, emergency management and procurement, medical and scientific input, expertise in data analytics, and modelling with daily reports. This group augmented the existing national communication structures in Ireland for pathology services including the National Clinical Programme for Pathology (N-CPP, established in 2011 to lead the delivery of pathology services in publicly funded Irish laboratories), the Clinical Programme in Antimicrobial Resistance and Infection Control (in existence for over a decade), the first NPHET (established in 2017 to address the spread of carbapenemase-producing Enterobacterales)¹ and the Faculty of Pathology (established in 1981) at the Royal College of Physicians of Ireland.

As in society generally, the necessary infection and prevention and control (IPC) measures, for example, social distancing, presented challenges in laboratories with restricted workspace. Rationalisation of services was, however, undertaken to focus on the emergency, while continuing routine services as far as possible to minimise adverse impacts on patients and ensuring laboratory staff safety.

RESPONSE TO THE PANDEMIC

Although initially, the testing for SARS-CoV-2 was centralised in the National Virus Reference Laboratory (NVRL), within 2–3 weeks, molecular testing

was available in larger pathology laboratories, and subsequently in smaller public and private hospitals. Early in the pandemic and throughout most of it, all testing to diagnose or screen for the presence of SARS-CoV-2 was publicly funded.

Testing for SARS-CoV-2 was initially hampered by access to testing platforms and reagents, but this and laboratory validation was facilitated by the N-CPP through prioritising and bulk ordering. Consequently, within 7 weeks, testing was available in 17 pathology departments, as well as the NVRL. Modelling was undertaken by the CLT, to determine the number of tests hospitals would need. A hub and spoke model was developed, and funding procured for additional equipment and staff. Local testing, it was felt, would facilitate the optimal management of COVID-19 infected patients and IPC measures to prevent onward spread from emergency departments and acute wards. Support and expertise was provided by the NVRL and later whole-genome sequencing (WGS) was introduced. By September 2020, there were 31 public hospitals performing testing, with 10 using rapid assays only, 21 providing rapid and batch testing, and considerable molecular testing taking place by international standards. Up to 15 000 tests per day (300/100 000 population) were being performed (figure 1). Additional support was provided by universities and research institutions in manufacturing and supplying reagents.

While there was an understandable focus on microbiology regarding diagnostic testing and subsequently WGS to investigate healthcare-associated outbreaks,² there were adaptations to services and research in the other disciplines to meet the challenges and the complications of COVID-19 disease. Examples include the collaboration between the Irish Blood Transfusion Service, universities and industry that confirmed the presence of SARS-CoV-2 among blood donors before the first case was clinically diagnosed.³ Among the first cases of fatal fetal death due to placentitis were reports from Irish pathologists, and publicity surrounding this issue, helped ensure high uptake of vaccination among pregnant women.⁴ With critical care colleagues, the role of pulmonary endotheliopathy and microvascular immunothrombosis in acute COVID-19 leading to death was described.⁵ The significance of symptoms after acute COVID-19 among healthcare staff and their implications were highlighted by occupational health and pathology departments.⁶ The duration of antibodies to other coronaviruses and the implications of those produced arising from infection with SARS-CoV-2

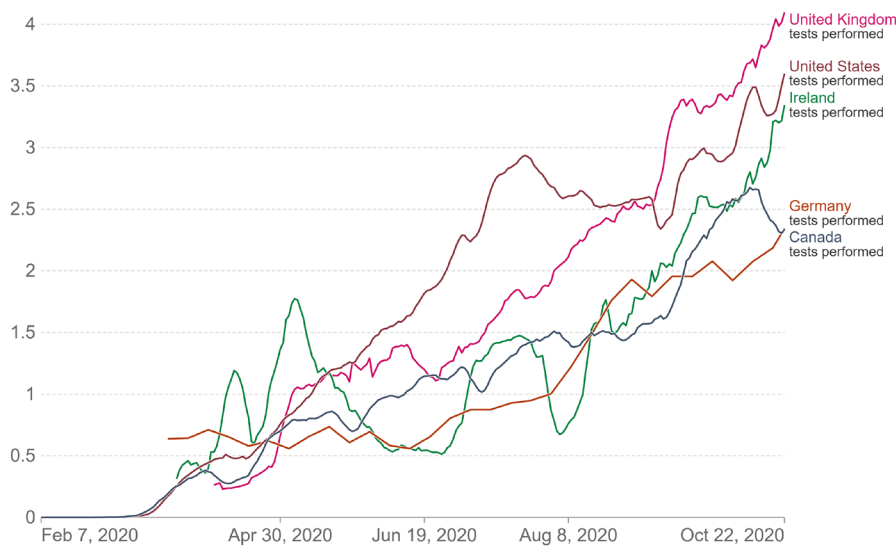


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Daily new COVID-19 tests per 1,000 people

7-day rolling average

Our World
in Data

Source: Official data collated by Our World in Data

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Figure 1 Increase in testing for SARS-CoV-2 in Ireland, February–October 2020, with international comparisons.

were reviewed with studies showing that such antibodies are produced as early as 2 weeks.⁷

The pandemic caused major challenges in postgraduate training across the disciplines of pathology with temporary suspension of in-person teaching. While virtual teaching via videoconferencing helped, social distancing impacted training, specifically multihead microscopy and in-house laboratory sessions. Arrangements between the Faculty of Pathology in Ireland and the Royal College of Pathologists in London were crucial to maintaining career progression with the facilitation of examinations in Ireland (on an all-island basis), minimising the requirement for travel.

Deficits in laboratory-based workforce became a major issue as the COVID-19 response progressed. Increasing demand for clinical microbiologists and medical laboratory scientists was apparent. It was clear that current training programmes for both were not meeting requirements. Also, those wishing to take up fellowships outside of Ireland were unable to do so due to travel restrictions. Beneficial initiatives to support training in all subspecialties including Pathology Post Certificate of Completion of Specialist Training Fellowships were introduced and a workforce planning project was initiated with the National Doctors Training and Planning section of the HSE.

The lack of fully digitised and interconnected electronic health records with no universal individual health identifier hugely hampered efforts. Many laboratories use standalone IT systems, and the absence of connectivity greatly hampered the recording of positive and negative COVID-19 results and avoiding duplications or omissions. However, great efforts were made by individuals, departments and the HSE to mitigate the worst consequences with a bespoke IT solution to feed laboratory results into a national database which supported contact-tracing. The lack of ability to generate real-time data to monitor the effect of COVID-19 on other hospital services, including cancer services, was also highlighted by a report led by the Faculty of Pathology.⁸ Completion of the national laboratory information

management system project (in train for some years) was again highlighted as a significant priority.

WHERE NOW

At this juncture, it is time to reflect and focus on the services partly or completely set aside by the pandemic. Cancer care has been significantly disrupted, particularly during the first wave of the pandemic. However, the resilience shown despite this, needs to be augmented so that the backlogs generated by the pausing of screening programmes, decreases in diagnostics and the adverse effects on certain cancer treatments, can all be addressed.⁸ As the capacity of the virus to cause harm in the vaccinated and boosted population has diminished, it should soon be possible to reduce widespread screening for SARS-CoV-2, allowing microbiology laboratories to deal with other infections.

Much has been learnt about the immunopathology of SARS-CoV-2 infection that may have implications for the assessment and treatment of other infections, especially those in critical care, where antiviral and anti-inflammatory agents are being used in selected patients.⁹ As during the pandemic, this enhanced collaboration between immunologists, microbiologists and others will significantly contribute to better care.

There are some compensations for the disruption wreaked by the pandemic. The increasing use of virtual meetings and conferences has assisted in achieving greater connectivity, including enhanced accessibility of international expertise. Overall, however, a hybrid approach to enhance communication is now favoured.

Ireland did not follow the UK example of significant centralisation of pathology services in the last decade and microbiology has availed of some of the advantages of decentralisation.¹⁰ This includes the relatively rapid provision of molecular testing for SARS-CoV-2 at local level, greatly assisting patient flow, clinical management and IPC. The ability to deliver point-of-care testing at short notice with appropriate quality control has provided additional confidence to pursue this in other areas,

including screening for antibiotic-resistant bacteria and INR measurements.

Finally, the pandemic required engagement between pathology, politicians, other colleagues, the HSE, patients and the general public to communicate the challenges and technical aspects of testing and related matters. There is now an unprecedented awareness among the public on the vital role that pathology plays. However, pathologists must maintain those channels of communication and education to make the case for further development of pathology services.

CONCLUSIONS

As elsewhere, the pandemic has been an unprecedented challenge to pathology in Ireland. However, in coping and delivery, pathology services have shown strengths and innovation while under considerable pressure from politicians and the public. Local testing, strong lines of communication with national decision-makers and a mature governance infrastructure involving training-bodies, clinical programmes, healthcare management at local and national level and public health, have all been huge advantages. Now, however, the task is to learn from this, build on these achievements, and press for much needed developments such as an electronic health record for all, while making inroads to those services delayed by the pandemic.

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