The Royal College of Pathologists
Pathology: the science behind the cure

British Infection Association

The infection sciences workforce: challenges and solutions

A Meeting Pathology Demand briefing

Introduction

The Royal College of Pathologists (RCPath) works with pathologists at every stage of their career across 17 pathology specialties, including microbiology and virology. RCPath set curricula, organise training and run exams, publish clinical guidelines and best practice recommendations, and provide continuing professional development. RCPath engages a wide range of stakeholders to improve awareness and understanding of pathology and the vital role it plays in everybody's healthcare. Working with members, RCPath runs programmes to inspire the next generation to study science and join the profession.

The British Infection Association (BIA) works to ensure optimal delivery of healthcare to patients diagnosed with infection. It does this through representing the views of infection specialists, and providing expert opinion on infection-related matters, to external agencies, patients and the wider public. The BIA also sets and reviews standards in infection practice, including the development of guidelines. It supports infection specialists within their daily work, through facilitating communication and providing useful resources. The BIA develops and provides education and training, fosters excellence in all aspects of infection-related research, and supports collaboration with other infection-related specialist groups.

As part of the College's Meeting Pathology Demand series, we collaborated with the BIA to carry out a survey of the infectious diseases' workforce, to help determine whether there is the right number of staff with the right skills in the right places to ensure safe and effective high-quality patient care and support. Like many pathologists, medical microbiologists have a role in the direct management and treatment of patients as well as undertaking diagnostic work in the laboratory.

This briefing contains the findings of the survey, open between April and August 2021, which was designed to be completed by 1 individual for each acute NHS organisation in the UK by the service lead for microbiology, virology or infectious diseases, or the medical director. The results of the survey highlight the challenges facing medical microbiology. We have made recommendations for solutions to those challenges and set out the commitments the College is making to help alleviate the problems facing medical microbiologists.

What is medical microbiology?

Medical microbiology encompasses the diagnosis of infection caused by bacteria, fungi, parasites and viruses, the management of these infections, infection prevention and control (IPC) and antimicrobial stewardship.

Who are medical microbiologists?

Medical microbiologists support and oversee the prevention, diagnosis and treatment of illness caused by microorganisms (bacteria, viruses, fungi and parasites). They identify the best treatment for particular infectious diseases and monitor patients following treatment. They may be dually accredited in infectious disease. Some microbiologists are clinical scientists by background.

They give advice on the best samples to collect to diagnose an infection, such as a swab, blood test or urine test. They then work with scientists in the laboratory to discover what is causing the infection. Once the cause of the infection has been identified – and often before – the microbiologist gives advice about how to treat it.

Medical microbiologists also play a key role in making sure antibiotics are prescribed and used appropriately, by advising on patient management and producing treatment guidelines for a variety of conditions. They do this partly to minimise the emergence and spread of antimicrobial resistance. They play an important role in antimicrobial

stewardship. The expertise of microbiologists is critical in tackling the antimicrobial resistance crisis, one of the greatest threats to modern medical practice, and to IPC in healthcare, including controlling the spread of COVID-19 and many other infections in hospitals.

Many medical microbiologists are IPC doctors for their hospital, directing measures to protect patients from cross-infection from other patients, visitors, staff and the hospital environment including the air, food and water supplies.

Medical microbiologists often spend time on the wards and in intensive care units and outpatient clinics. Here they diagnose and guide treatment, dealing with all ages and types of patients, from premature babies to the elderly, and medical, surgical, cancer and transplant patients. Most also give advice to general practitioners on the management of infection in the community. They also work in laboratories where their investigations range from the culture of bacteria on agar plates to the use of cutting-edge molecular biology tests. They see patients in clinics and on wards and advise clinical and laboratory colleagues on investigating and treating all types of infection.

Medical microbiologists work closely with many healthcare professionals, such as biomedical scientists, antimicrobial pharmacists, GPs and infection control nurses, and often attend clinical multidisciplinary team meetings. They also work with non-clinical colleagues, such as estates managers, to make sure buildings are designed and maintained to reduce the risk of infection.

Many medical microbiologists are involved in research, spanning molecular biological investigations to clinical trials and implementation science. The global spread of infections means that some microbiologists work collaboratively with colleagues abroad, identifying the next global infectious threat.

Many microbiology laboratories are able to carry out standard diagnostic tests for viral infections. These laboratories will refer samples to specialised virology laboratories where these need more sophisticated virological diagnosis.

The roles of microbiologists and virologists are closely aligned, and both specialties train alongside each other when learning about infection. For the first 2 years of training, they complete Combined Infection Training (CIT), which gives a baseline knowledge and experience of infectious disease, virology and microbiology.

A specialist virology service typically includes medical and academic virologists, clinical scientists, biomedical scientists and many other grades of supporting staff. Such services are increasingly closely related to a microbiology and/or infectious diseases service, creating an infection science team, which itself may be embedded within a multidisciplinary pathology centre.

Who are clinical virologists?[1,2]

Clinical virology is delivered by different groups of professionals working together to provide a comprehensive service. A specialist virology service typically includes medical and academic virologists, clinical scientists, biomedical scientists and many other grades of supporting staff. Such services are increasingly closely related to a microbiology and/or infectious diseases service, creating an infection science team, which itself may be embedded within a multidisciplinary pathology centre. It can be confusing as the term ‘clinical’ is used widely, but the staff member may be medically qualified and have carried out academic work too, or they may be laboratory based with a training background in science. Biomedical scientists are also part of the multidisciplinary team, delivering laboratory testing, advising on test result interpretation, and supporting the development of new technology and other forms of research.

The provision of a clinical virology service is a mixed picture; for example, medical virologists may be involved in test development and clinical scientists may provide clinical advice. Not all hospitals have laboratories or staff dedicated to virology; most hospitals have medical microbiology laboratories that are able to carry out standard diagnostic tests for viral infections. These laboratories are run by microbiologists, doctors and scientists. These laboratories will refer samples to specialised virology laboratories for more sophisticated virological diagnosis.

The nature of the workload of virology laboratories means that they are all specialists. However, some laboratories – especially those that are part of the UK Health Security Agency, Public Health Scotland, Public Health Wales and the Health and Social Care Public Health Agency in Northern Ireland – have additional responsibilities and capabilities. These include genome sequencing of viruses and diagnosis of high consequence infectious disease agents, such as Ebola virus. Some of these laboratories have an international responsibility. For example, the reference laboratory in London is a

World Health Organization (WHO) global specialised measles and rubella laboratory and contains WHO-accredited national laboratories for influenza and poliovirus.

Who are infectious disease doctors?

Doctors working in infectious diseases diagnose, investigate and treat infections caused by micro-organisms such as bacteria, viruses, protozoa and fungi. Like all infection specialists, they combine clinical and laboratory skills to diagnose and provide effective management and treatment for a wide range of infectious diseases. Infectious disease doctors are often responsible for inpatient care and like other infection specialists may have outpatient responsibilities. With the advent of the shape of training, many recently UK-trained infection specialists will have a Certificate of Completion of Training (CCT) in Infectious Disease and Medical Microbiology or Virology.

COVID-19

Medical microbiology, virology and infectious disease teams were heavily involved in the COVID-19 pandemic response. They were instrumental in establishing SARS-CoV-2 testing in laboratories across the NHS, advising on infection control efforts within healthcare and helping to manage infected patients. The possibility of future public health threats and increasing complexity of managing infectious diseases illustrates the vital importance of maintaining the infection sciences workforce.

Outside tertiary centres (i.e. national or regional specialist centres with highly specialised consultants, equipment and expertise), virology testing and advice is mainly overseen by medical microbiologists (rather than virologists).

The College produced '[COVID-19 testing: a national strategy]' to ensure appropriate standards would be met.[3] In addition, the College produced a [resource hub for COVID-19].

Findings

The RCPath/BIA survey of infection services generated a total of 108 partial or complete responses capturing 113 NHS organisations across the UK. This constituted a 72% total response rate. Response rates for the individual devolved nations were: 74.8% for England (98 of 131 organisations), 50% for Scotland (7 of 14 organisations), 71% for Wales (5 of 7 organisations) and 60% for Northern Ireland (3 of 5 organisations). There were 2 responses on behalf of a pathology network covering more than 1 organisation and most correspondents were clinical leads.

Workforce

Across the 108 organisations from which responses were received, there were 704.9 full-time equivalent (FTE) consultant posts and the majority (66%; 468.1 FTE) were consultants accredited in medical microbiology either with or without infectious diseases. Just under one fifth (18%; 127.4 FTE) were consultants accredited in infectious diseases with or without general internal medicine and 9% (64.3 FTE) were accredited in medical virology or medical virology dual accredited with infectious diseases.

The median number of total FTE infection consultants per organisation was 4.3 for medical microbiology, 1.2 for infectious diseases and 0.6 for medical virology, equating to 6.1 overall. There were 40 organisations (35.2%) that had 3 or fewer total consultants and 6 (5.3%) had only a single consultant (Figure 1). Since medical microbiologists provide on-call services 24/7, and are frequently called on out of hours, such small departments with very few consultants, or a single consultant, are unsustainable unless they can link with other medical microbiologists to provide a network for the on-call rota. The effect of vacancies in smaller departments also risks making the pressure of the on-call unsustainable.

Where there were fewer infection specialty consultants in post in an organisation, those consultants tended to be single specialty medical microbiology rather than dually accredited, for example medical microbiology and infectious diseases or virology and infectious diseases. When adjusted for numbers of acute inpatient beds, there was a median of 7.2 infection consultants per 1,000 acute beds, but this varied for each nation – 8.4 for Scotland, 6.5 for Wales, 11.5 for Northern Ireland and 6.9 for England. The findings revealed that 34.3% organisations had fewer than 1 consultant for every 200 beds.

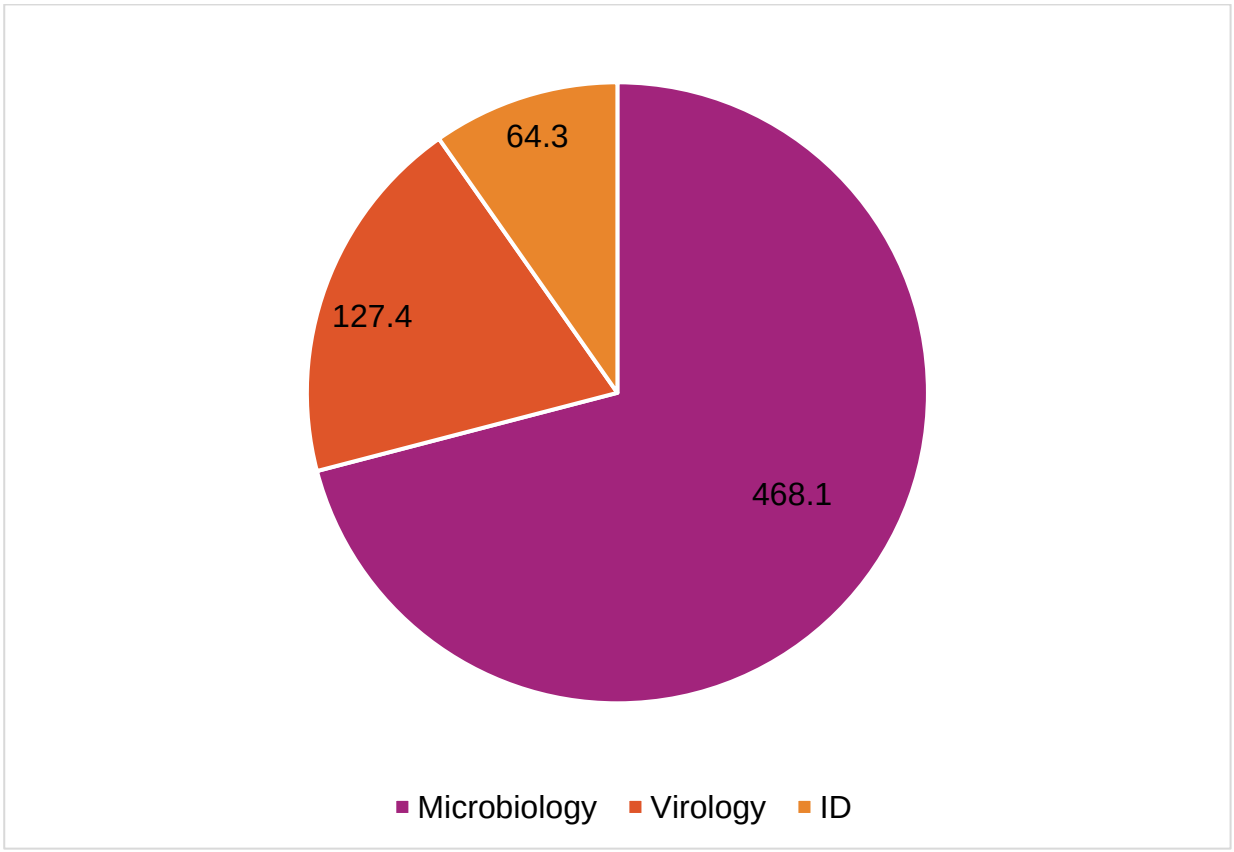
There was also significant variation between organisations and those which self-reported as infectious disease specialist units who typically had more consultants per 1,000 acute beds.

Centres with larger numbers of total consultants and infectious disease and/or medical virology specialists were situated within large urban areas and predominantly in the South East and Midlands of England, central belt of Scotland and around Cardiff and Belfast.

There were 26.5 FTE Specialty and Associate Specialist (SAS) doctors in total (mean: 0.25; median: 0). There were also 3.6 vacancies specifically for SAS doctors. There was a significant contribution of non-training doctors – 72.1 FTE in total (mean: 0.67; median 0). There were also 7 vacancies for these non-training posts.

Together, SAS doctors and consultant clinical scientists accounted for 7.7% (53 of 686.9) of clinical consultant FTEs overall. However, this decreased to 5.8% (5 of 85.5) at the 38 (35.2%) services that had 3 or fewer total clinical consultants, reflecting the fact that they are concentrated in larger centres.

Figure 1: Consultant staffing.



Note: Medical microbiology and virology includes consultant clinical scientists.
ID: Infectious disease.
Figure courtesy of the British Infection Association (www.britishinfection.org).

Table 1: Filled consultant posts/organisation/1,000 acute beds (mean standard deviation).

	MM	MV	ID	MM/ID	MV/ID	ID/GIM
Northern Ireland	7.88 (4.60)	0.55 (0.95)	0.55 (0.95)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Scotland	5.13 (1.86)	0.41 (0.76)	0.49 (0.84)	0.31 (0.83)	0.00 (0.00)	1.68 (1.81)
Wales	4.90 (4.78)	0.18 (0.4)	0.00 (0.00)	0.73 (1.01)	0.00 (0.00)	0.13 (0.30)
East of England	4.71 (1.91)	0.49 (0.91)	0.00 (0.00)	0.84 (1.45(	0.00 (0.00)	0.66 (1.89)
London	4.43 (2.78)	0.60 (1.06)	0.40 (0.81)	1.90 (2.02)	0.28 (0.46)	1.30 (2.00)
Midlands	4.96 (6.06)	0.08 (0.21)	0.55 (0.97)	0.32 (0.66)	0.06 (0.22)	0.57 (0.95)
North East and Yorkshire	4.05 (3.07)	0.09 (0.23)	0.61 (1.41)	0.20 (0.37)	0.10 (0.39)	0.00 (0.00)
North West	3.67 (1.68)	0.31 (0.59)	1.16 (2.74)	0.00 (0.00)	0.14 (0.39)	0.28 (0.86)
South East	2.90 (1.47)	0.26 (0.51)	0.08 (0.20)	1.28 (1.42)	0.00 (0.00)	0.60 (1.42)
South West	5.06 (2.26)	0.17 (0.57)	0.29 (0.86)	0.69 (1.50)	0.00 (0.00)	0.33 (0.78)

GIM: General internal medicine; ID: Infectious disease; MM: Medical microbiology; MV: Medical virology.
Table courtesy of the British Infection Association (www.britishinfection.org).

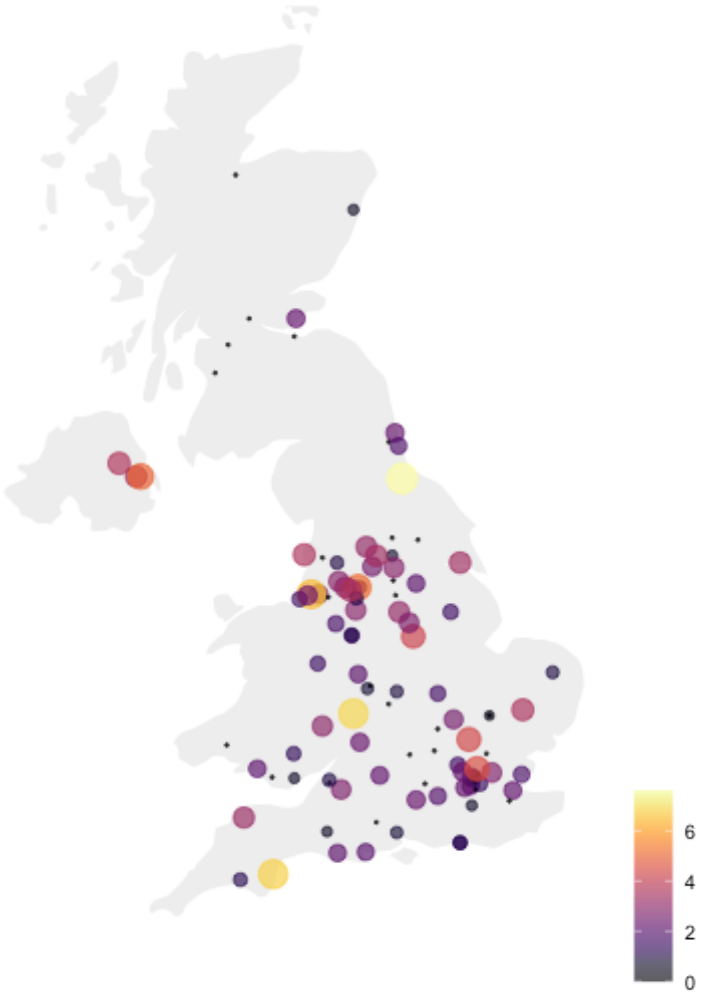
Workforce vacancies

Many hospitals have been unable to fill medical microbiology posts over many years, and workforce pressures are keenly felt.

From the survey results, 17.5% (119 of 587.1) of all funded FTE consultant-level posts were vacant, although this was higher for medical microbiology (20.3%) than for infectious disease (9.3%) or medical virology (14.6%).

Each replying organisation had an average of 1.4 consultant-level vacancies. Across the UK, this was lower in Scotland (0.2) and Wales (1.1) but higher in Northern Ireland (2) and England (1.5). Figure 2 presents data on consultant-level vacancies across the UK by 1,000 beds. This variation is also apparent as a disproportionate burden of vacant posts at smaller centres and those which are currently staffed by consultants accredited in medical microbiology alone.

Figure 2: Consultant vacancies per 1,000 acute beds.



Data and figure reproduced with kind permission from Lawrence S, Aggarwal D, Davies A, Partridge D, Ratnaraja N, Llewelyn MJ. The State of Hospital Infection Services in the UK: National Workforce Survey 2021. *Clin Infect Pract* 2022;doi 10.1016/j.clinpr.2022.100151.[2]

Figure 2 shows the mean number of staff per organisation standardised per 1,000 acute inpatient beds. As organisations obviously vary massively in size, this compares them in a meaningful way that approximates some measure of demand, i.e. acute beds. For example, an organisation with 500 beds may have 3 microbiologists. A different

organisation with 2,000 beds may also have 3. But their size means absolute numbers of staff are not comparable. If standardised per 1,000 beds, the former would have 6 and the latter would have 1.5, demonstrating that staff in the latter are likely more stretched than the former. This is especially relevant for devolved national differences in organisation size, e.g. in Scotland where organisations seemed to be much larger and cover bigger geographical areas.

Table 2: Vacant consultant posts/organisation/1,000 acute beds (mean standard deviation).

	MM	MV	ID	MM/ID	MV/ID	ID/GIM
Northern Ireland	1.44 (1.29)	0.00 (0.00)	1.10 (1.90)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Scotland	0.31 (0.83)	0.08 (0.21)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Wales	0.64 (0.92)	0.11 (0.25)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
East of England	1.22 (1.40)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.14 (0.45)
London	0.89 (0.96)	0.07 (0.27)	0.06 (0.21)	0.32 (1.19)	0.00 (0.00)	0.00 (0.00)
Midlands	1.50 (1.43)	0.11 (0.30)	0.09 (0.36)	0.06 (0.22)	0.06 (0.22)	0.12 (0.47)
North East and Yorkshire	1.43 (2.05)	0.00 (0.00)	0.11 (0.43)	0.30 (0.89)	0.00 (0.00)	0.00 (0.00)
North West	1.66 (1.20)	0.23 (0.49)	0.24 (0.81)	0.18 (0.73)	0.00 (0.00)	0.09 (0.34)
South East	0.61 (0.81)	0.07 (0.24)	0.00 (0.00)	0.15 (0.36)	0.00 (0.00)	0.05 (0.17)
South West	1.78 (1.92)	0.00 (0.00)	0.00 (0.00)	0.08 (0.29)	0.00 (0.00)	0.00 (0.00)

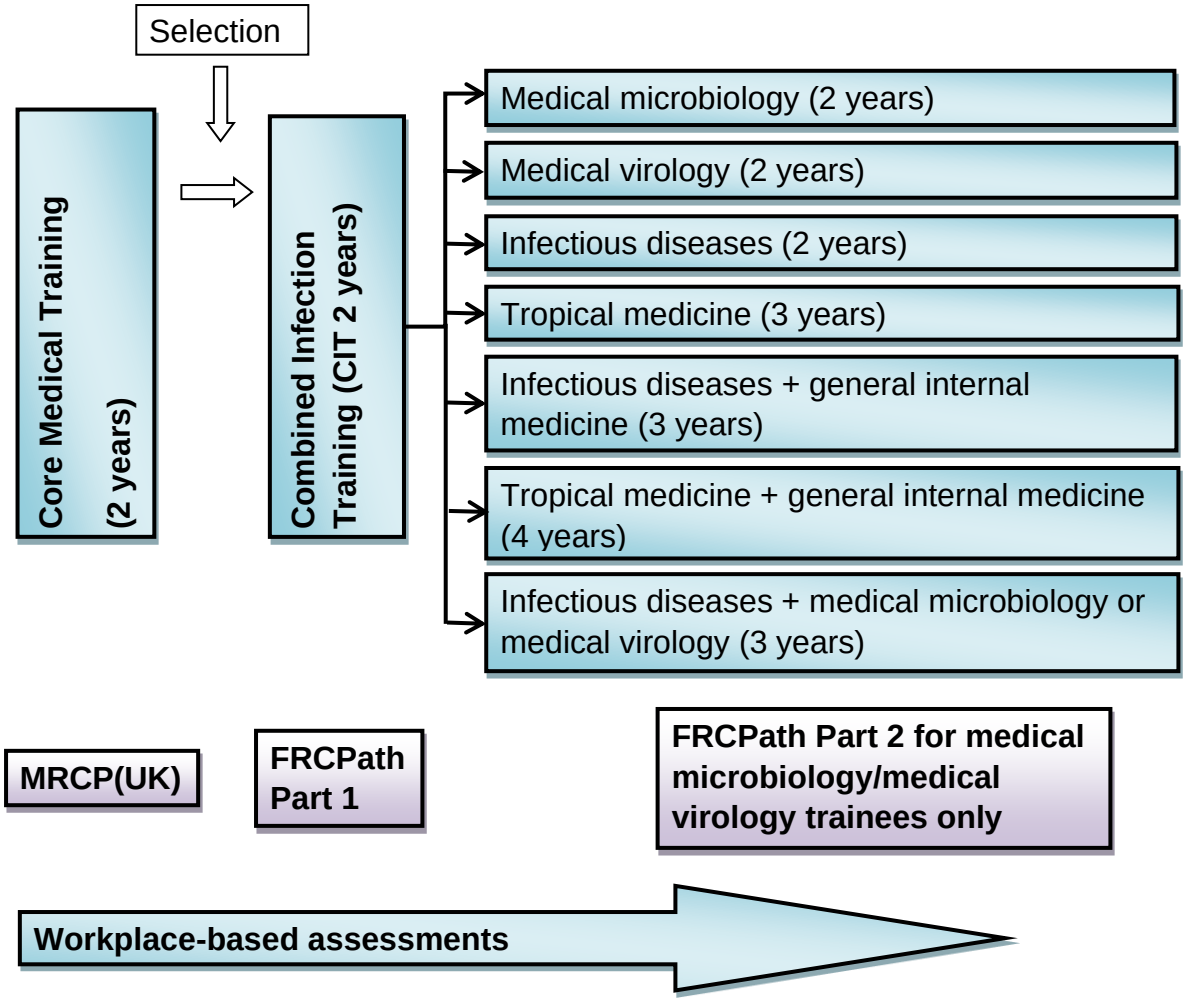
GIM: General internal medicine; ID: Infectious disease; MM: Medical microbiology; MV: Medical virology.
Table courtesy of the British Infection Association (https://www.britishinfection.org/).

Training

Medical microbiology is 1 of 4 ‘infection’ specialties; the others being medical virology, infectious diseases and tropical medicine. Medical microbiology training can be undertaken either as a single specialty or dual specialty training programme with infectious

diseases. Either route requires trainees to first complete 2 years of internal medical training and attainment of the Membership of the Royal College of Physicians (MRCP [UK]) examination. All trainees entering the infection specialties must undertake 2 years of CIT. After CIT, the 4 specialties have their own separate higher specialty training programmes (2 years for single specialty programmes, e.g. medical microbiology, or 3 years for dual programmes, e.g. microbiology and infectious diseases) leading to a CCT in 1 or 2 specialties (see Figure 3). During specialty training and prior to the award of the CCT, microbiology trainees must also attempt and pass the Fellowship of the Royal College of Pathologists (FRCPath) examination.

Figure 3: Infection training flow diagram.



For clinical scientists, the Scientist Training Programme (STP) is a 3-year programme of work-based learning, supported by a university accredited master's degree. Trainees are employed by an NHS organisation for the duration of the programme and will spend time in a range of settings, before specialising in the last 2 years of the programme.

The aim of the STP is to produce graduates who will possess the essential knowledge, skills, experience and attributes required of a newly qualified clinical scientist in the NHS. They will be competent to undertake complex scientific and clinical roles, defining and choosing investigative and clinical options, and making key judgements about complex facts and clinical situations within a quality assurance framework. Many work directly with patients, and all will have an impact on patient care and outcomes. They will be involved, often in lead roles, in innovation and improvement, research and development, and/or education and training.

After completion of STP, the Higher Specialist Scientist Training (HSST) programme is a bespoke 5-year workplace-based training programme supported by a doctoral level academic award. It seeks to train and develop an increased number of very senior consultant clinical scientists who can lead the development of new research, technology and practice working within multiprofessional clinical teams to deliver quality improvement, innovation and world-class outcomes for patients. These programmes are delivered by the National School of Healthcare Science.

Clinical scientists in microbiology deliver a timely and effective diagnostic laboratory and clinical service to patients at an equivalent level to medically trained consultant medical microbiologists.

Outpatient parenteral antibiotic therapy services

Of the organisations who responded, 80% provided an outpatient parenteral antimicrobial therapy (OPAT) service.

The OPAT service allows patients who are medically stable but need short- to long-term intravenous (IV) antibiotic treatment to be safely treated at home or in an outpatient setting. The service provides patients with the same quality care that they would otherwise receive as an inpatient, without the need for them to stay in hospital.

Patients and carers can be taught to self-administer IV antibiotics via a ‘vascular access device’ (also known as an IV line) or can be referred to community nurses for daily administration of their medication. In some cases, patients may be seen in a day unit. Patients are usually seen weekly by an OPAT nurse and fortnightly by a medical microbiology consultant.

Infection prevention and control

The input of an infection specialist in the control and prevention of healthcare-associated infections is essential to the optimal functioning of a hospital and community health services. This contribution is usually provided as a specialist role – Infection Prevention and Control Doctor (IPCD) and Director of Infection Prevention and Control (DIPC). The DIPC may be a doctor or a senior nurse on the Executive Board. The nature and time allocated to these roles vary across organisations depending on organisation size, number of sites covered, specialist sites within the organisation and available IPC resources in terms of nurses, antimicrobial pharmacists and clinical scientists. Dedicated time must be allocated to allow for the IPC role to be adequately covered.

Medical microbiologist time needs to include time allocated for IPC and antimicrobial stewardship. The programmed activities (PA) allocations for these should be considered as part of direct clinical care and not supporting professional activities.

In general, the IPCD role involves providing advice on policies for IPC, risk assessment and management of exposures to infection. It involves working with infection control teams, DIPC and others on a local or regional basis, including liaison with the relevant health protection staff in the investigation and prevention of communicable diseases in the community. It may also involve assisting in the investigation and control of community outbreaks. Those working within public health laboratories will contribute to surveillance in local and regional departments of epidemiology and health protection.

The survey results indicated that the median number of PAs/week allocated in consultant job plans for IPC activity per organisation was 4.7 for medical consultants, 0.2 for consultant clinical scientists and 0.4 for other staff, primarily nurse consultants. The BIA/RCPath/RCP recommendation is for 6–10 PAs/week to maintain service standards, depending on the size and nature of the organisation.

Laboratory authorisation of reports, quality assurance and troubleshooting

Figure 4 indicates the average number of consultant hours per week spent authorising laboratory reports, on quality assurance activities and general troubleshooting.

Figure 4: Average consultant hours per week spent on administration, etc.

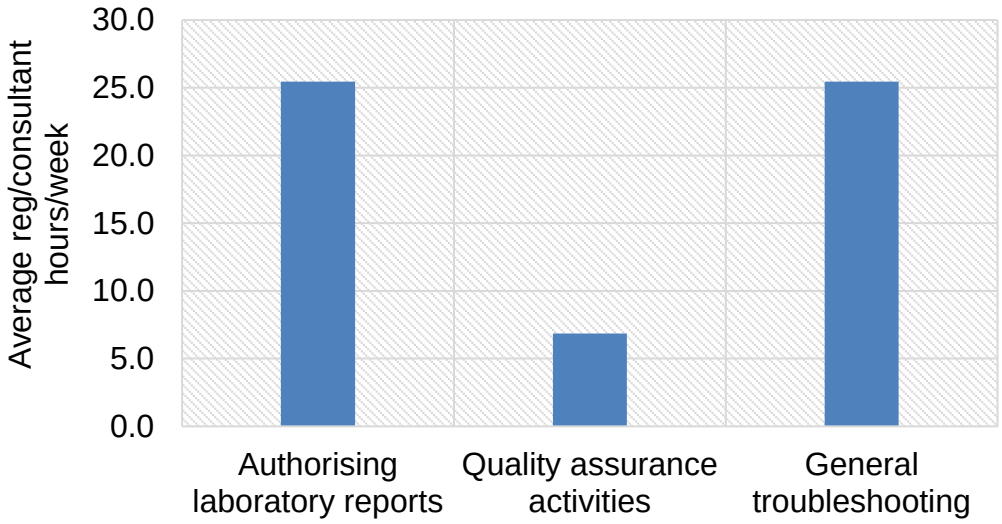


Figure courtesy of the British Infection Association (https://www.britishinfection.org/).

Over recent years, diagnostic services have been increasingly centralised. In addition, new diagnostic technologies, including for point-of-care testing, are being introduced. There are new consultants trained in infectious diseases and either acute medicine and/or medical microbiology/virology who are increasingly delivering direct patient care. Furthermore, the nature and burden of infectious diseases which affect NHS patients are changing.

Antimicrobial stewardship

Antimicrobial stewardship is about using antimicrobials responsibly, which involves promoting actions that balance both the individual's need for appropriate treatment and the longer-term societal need for sustained access to effective therapy.[4]

The emergence and spread of antibiotic resistance has become a serious risk to global health and health services, limiting treatment choices and threatening patients' lives. Medical microbiologists are at the forefront of tackling resistance and emerging infections, often working across international boundaries to develop global strategies to prevent and control these challenges.

The NHS and health organisations across the world are trying to reduce the use of antibiotics. The overuse of antibiotics in recent years has led to the emergence of strains of bacteria that have developed resistance to many different types of antibiotics, including:

- meticillin-resistant *Staphylococcus aureus*

- *Clostridioides difficile*
- bacteria that cause multidrug-resistant tuberculosis
- carbapenemase-producing organisms.

These types of infections can be serious and challenging to treat and are becoming an increasing cause of disability and death across the world. The biggest worry is that new strains of bacteria may emerge that can't be effectively treated by any existing antibiotics.

Out of hours

Although just over half of organisations mentioned having an on-site medical microbiology presence at weekends, almost 100% of sites would have a busy on-call medical microbiologist at weekends.

Conclusion

The data shows a pending workforce crisis. There is a lack of succession planning through inadequate trainee numbers and existing consultant level vacancies on a background of public health threats, increasing patient numbers and complexity of infections. Despite the move to create infection services to allow for greater use of the diverse skills among infection specialists, there remains an inability to meet the ever-increasing demands on this specialist workforce.

Moving forward: what we need

Increased medical microbiology and virology training numbers

There are 2 pressing reasons why an increase in medical microbiology and virology training numbers is urgently needed.

First, a fifth of consultant medical microbiology posts are currently vacant and there are not enough medical microbiology trainees in training to fill these posts. The specialty is not unpopular and, where training posts are available, it is possible to attract applicants. What is needed is a large expansion in training posts. It takes a minimum of 6–7 years of postgraduate training before trainees will be ready to apply for consultant posts. This includes 2 years of internal medicine training prior to MRCP(UK), which is mandatory.

Second, the specialty needs an expansion in consultant posts. This is due to the rapidly increasing workload and, even in current full capacity departments, there are insufficient staff to provide the required range of high-quality service (IPC, antimicrobial stewardship, diagnostic, clinical). Furthermore, there are not enough trainees to expand the number of consultant posts.

Improved recruitment into training and early exposure to pathology

Our survey briefly addressed trainee numbers and recruitment. There is already a government initiative to increase medical student numbers – this is important and the Royal College of Pathologists supports further necessary expansion. We are also seeking to engage medical students through increased exposure to pathology in the undergraduate curriculum. We have published a pathology undergraduate curriculum, promoted through the Medical Schools Council, and are supporting a range of activities to promote medical microbiology and, more broadly, pathology as a career among undergraduates. We also have several initiatives to engage foundation doctors, including the RCPath Foundation Fellowship Scheme.

Clinical scientists to support services

The College will continue to recommend and encourage NHS organisations and employers to appoint consultant clinical scientists to support medical microbiology services and patient care. Furthermore, we will work to ensure availability and continuity of funding for HSST, particularly across some of the devolved nations.

IT systems that are fit for purpose

Pathologists need better IT for day-to-day work, including modern, functional laboratory information management systems (LIMS), voice recognition support and remote working software for multidisciplinary teams. A third of LIMS are more than 30 years old.[5]

The College appreciates the announcement of a significant investment of £120 million in LIMS/digital pathology promised for 2021–2022. This corresponds to the NHS priorities for 2022/2023 announced on 24 December 2021 (achieving 'digitisation in every service').[6] These modern systems are vital in pathology services to effectively manage requests for diagnostic tests, samples and reports, to provide safe and accurate diagnostic results on which to base guidance for treatment and plan further investigations.

Recommendations

To support the specialty, the College will work with relevant authorities such as Health Education England, governments of the UK, departments of health, the General Medical Council, healthcare commissioners and other royal colleges. The College has identified the following as being critically important.

Recommendation 1: Lobby for an expansion in medical and clinical scientist trainee posts.

We will support and promote the need for expansion of medical specialty trainees and clinical scientist trainees, and consultant numbers in microbiology to Health Education England, the government and the devolved nations. We will use our data to demonstrate shortfalls in numbers and the impact this has on the workload of those in post.

We will also highlight the affect this has on the ability of services to maintain quality and improve diagnostic laboratory capability and capacity in the face of growing demand for microbial medicine. There is a need to improve the quality of medical microbiology/medical virology laboratory provision across the 4 nations as an integrated part of the NHS and community health systems. The College will advocate for this development.

Recommendation 2: Promote the recruitment and development of clinical scientists.

We will promote the recruitment and development of clinical scientists to develop diversity of approach in staffing and running of clinical laboratory medical microbiology/medical virology facilities and services.

Recommendation 3: Improve retention of consultant-level staff.

We support fair, equitable retire and return legislation and we will press for the implementation of a long-term UK-wide solution to the NHS pension tax issue.

Recommendation 4: Promote microbiology and virology in undergraduate education.

These are included as a core part of the RCPath undergraduate curriculum, in the new undergraduate lecture series and in small grant funding for electives that are match-funded by the Microbiology Society.

Recommendation 5: Promote pathology as a career for foundation doctors.

We will continue to use our current initiatives to promote pathology to foundation doctors, such as the RCPath Foundation Fellowship scheme. We will also consider new initiatives and offer a range of relevant activities and experiences.

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Pathology: vital to patient care

Pathology is the study of disease.

Pathologists work with frontline hospital clinicians, primary care practitioners and patients to prevent, identify, treat and monitor diseases.

Pathologists are involved in the diagnosis of disorders affecting every organ of the body, from before birth to after death.

The work of pathologists and clinical scientists is vital for effective healthcare. The majority of tests requested by doctors will be performed and interpreted by a clinical scientist or medically qualified pathologist.

Pathologists carry out millions of tests every day and are involved in almost all patient care pathways within the NHS.

About the Royal College of Pathologists

The College works with pathologists at every stage of their career. We set curricula, organise training and run exams, publish clinical guidelines and best practice recommendations, and provide continuing professional development.

We engage a wide range of stakeholders to improve awareness and understanding of pathology and the vital role it plays in everybody's healthcare. Working with members, we run programmes to inspire the next generation to study science and join the profession.

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