

# Double Vision

A roadmap to double medical school places

Dr Sean Phillips and Iain Mansfield





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## About the Authors

**Dr Sean Phillips** is Head of Health and Social Care at Policy Exchange. He has co-authored reports on measures to tackle the waiting list for elective care, reforms to general practice, clinical research and the future for specialised services. Prior to joining Policy Exchange, he completed a doctorate in History at the University of Oxford. He previously worked as a consultant on matters relating to digital health and emergent technologies in healthcare in Berlin, advising consumer health, insurance, and start-up clients.

**Iain Mansfield** is Director of Research and Head of Education and Science at Policy Exchange. He is a former Special Adviser to three Education Ministers, including Education Secretary Gavin Williamson and Universities Ministers Jo Johnson and Michelle Donelan. Prior to that he has held a variety of senior positions in the private and public sector, including as a Senior Civil Servant at the Department for Education, as Director of UK Trade and Investment, The Philippines in the Foreign and Commonwealth Office and as Head of Public Sector at the Association of Chartered and Certified Accountants. He has been a university governor and a Director of a British Chamber of Commerce.

## Endorsements

“Expanding medical school places will be essential to supporting the future needs of the NHS. This timely report strikes the right balance between optimism and pragmatism, recognising that progress will be needed along each of ‘seven pathways’ the authors identify to double places. It recognises the critical role that existing schools – as well as new schools – will play, balancing this with due consideration for the additional clinical placements, educators and researchers who will be required. It marks an important and credible contribution to the debate and deserves a wide readership in the healthcare and higher education sectors, as well as across Government. We hope its recommendations are taken forward.”

**Dr Katie Petty-Saphon**, Chief Executive, Medical Schools Council

“We know that the UK needs more doctors and that UK universities provide a world-class medical education. If you want to double the number of medical school places, this report provides a clear plan on how to do it. And, given it would cost less than 1% of the total NHS budget, why wouldn’t you want to do it?”

**Professor Alistair Fitt**, Chair, Universities UK Health Education & Research Policy Network (HERPN); Vice Chancellor, Oxford Brookes University

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Survey Responses were received from the following institutions:

- |                                      |                                      |
|--------------------------------------|--------------------------------------|
| 1. <b>University of Aberdeen</b>     | 18. <b>University of Oxford</b>      |
| 2. <b>Anglia Ruskin University</b>   | 19. <b>University of Plymouth</b>    |
| 3. <b>Bangor University</b>          | 20. <b>University of Sheffield</b>   |
| 4. <b>University of Cambridge</b>    | <b>Medical School</b>                |
| 5. <b>Cardiff University</b>         | 21. <b>University of Southampton</b> |
| 6. <b>University of Chester</b>      | 22. <b>St George's University</b>    |
| 7. <b>Edge Hill University</b>       | <b>of London</b>                     |
| 8. <b>University of Exeter</b>       | 23. <b>St Mary's University,</b>     |
| 9. <b>Hull York Medical School</b>   | <b>Twickenham, London</b>            |
| 10. <b>Keele University</b>          | 24. <b>University of Sunderland</b>  |
| 11. <b>Lancaster University</b>      | 25. <b>Swansea University</b>        |
| <b>Medical School</b>                | 26. <b>University College London</b> |
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| 13. <b>Leicester Medical School,</b> | 28. <b>University of Worcester/</b>  |
| <b>University of Leicester</b>       | <b>Three Counties</b>                |
| 14. <b>University of Lincoln</b>     | <b>Medical School</b>                |
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## Executive Summary

Everyone agrees that the UK needs more doctors. Yet our political system has often focused on short term tactics to meet the shortfall. The consequence is a large increase – and often a reliance – on international recruitment and the use of locum or bank staff: the number of international medical graduates registering in the UK has increased by 61% since 2012/13; the NHS in England now spends £3bn on locums each year. But the UK still remains comparatively under-doctored. Another 45,000 doctors would be required to bring us up to the OECD average.

The case for expanding the domestic training of doctors is both moral and economic. We know that there is a global shortage of medical staff, and a consensus that it would be unsustainable and unethical to continue to rely on recruiting doctors from developing countries. At the same time, investing in our domestic pipeline makes financial sense: thousands of talented students are rejected from medical schools each year and last year and more people applied to medicine and dentistry courses than ever before.

Individuals rejected from medical school do not disappear; they go on to enrol on other university courses which are not subject to a cap on places. Some will enrol on graduate-entry medicine courses, but a larger proportion will have missed out on the opportunity to contribute to treating and caring for the population. The absence of medical schools in some parts of the UK meanwhile may be a contributory factor in limiting opportunities to those from lower socio-economic backgrounds who have persistently been under-represented in medical courses, limiting attempts to widen participation. This is a loss for society and the individual. It is also a loss for the clinical service, for where education and research activity go, improved outcomes and satisfaction – for doctors and their patients alike – follows.

Correcting this ‘sliding doors’ moment should be a focus for any Government and there are signals both main parties recognise this to be a priority. In his previous role as Secretary of State for Health and Social Care, the current Chancellor, Jeremy Hunt, secured a commitment in 2017 to open five new medical schools and increase places in England by 25%. Wes Streeting, the current Shadow Health and Care Secretary and his colleague Rachel Reeves, Shadow Chancellor, have pledged that a future Labour Government would double medical school places to 15,000 per year.

The question is, therefore, no longer *why?* but *how?*

In this report, we set out a roadmap to double the number of medical school places, to enable **15,000 medical students a year to enrol on courses in England by 2029**. This will result in more than **an additional 17,000 doctors working in the NHS by 2035**, and **an additional 45,000 by 2040**, thereby closing the gap to the OECD average.

Doing so would require **Government investment of approximately £1.2bn over the five- year period from 2024-25 to 2028-29**, and further ongoing support for the costs of training a larger cohort of medical students each year. In the medium to longer term however, the investment will pay for itself, both in terms of increased student loan repayments and income tax returns. The Institute for Fiscal Studies has calculated that medicine provides a lifetime return to the Exchequer of £260k for women or £505k for men – and, more immediately, by the increased supply of doctors leading to a significant reduction in the current £3bn annual bill the NHS currently pays for locum and agency staff.

Whilst there is a clear and foreseeable route to increase medical places by 2000 – 3000 places, building on the previous expansion round, to double places – creating an additional 7,500 places within five years – requires imagination and more far-reaching innovation. It will be challenging and is not without risk, but it is achievable if the will and determination are there.

This paper focuses upon seven critical pathways to achieve this ambitious goal. These are:

- Expanding existing medical schools;
- Opening new schools;
- Diversifying the talent pool;
- Adapting curricula and course structure;
- Optimising the teaching workforce;
- Delivering more clinical placements;
- Securing funding.

Along each pathway we explore the approaches needed to overcome barriers as well as exploring the regulatory reforms which may be required.

Making any of these reforms in isolation would be worthwhile and would deliver an increase in the number of medical students. This is not an all or nothing situation. In order to achieve the ambitious target of doubling the number of medical school places, however, significant progress and innovation would be needed across all seven pathways.

It is important to state from the outset that expanding the number of doctors alone will not address current performance issues. Nor indeed is expanding medical school places in isolation a solution to the wider workforce challenge. The reforms discussed in this paper, however, would be beneficial over and beyond the immediate goal of training more doctors. There are opportunities to modernise curricula, to incorporate new technologies and training techniques, and to consider novel ways of giving a future generation of doctors the skills they need to care for a

population where an increasing proportion of the population have two or more medical conditions – meaning a new balance between generalism and specialism is required.

Furthermore, many of the key themes and principles we explore here will have applicability for a range of professions and qualifications desired across the NHS. At large, there is a need to enable the widest possible participation and offer a range of routes into health and care professions through apprenticeship schemes, access and conversion courses and to develop a small over-supply to ensure workforce models are sustainable in the long-run.

This will need to be combined with increases in capital spending to deliver the necessary expansion. Policy Exchange's previous work has called for the Government to bring capital spending on healthcare to the level of its OECD comparator countries and this will be essential to improving staff productivity and stimulating innovation.

Doubling the number of medical school places would be a critical component in how we address the workforce and future clinical service challenges facing the NHS. The roadmap developed in this paper sets out a credible way in which it could be achieved – through the concerted efforts of universities, government, the NHS, professional bodies and the medical profession itself.

## Summary of Recommendations

- 1. The Government should commit to doubling medical student numbers, to enable 15,000 medical students a year to enrol on courses in England by 2029.** This doubling should be regarded as a UK-wide commitment, and should feed into plans across Scotland, Wales and Northern Ireland, where existing commitments are in place. This will result in more than an additional 17,000 doctors working in the NHS by 2035, and an additional 45,000 by 2040.
- 2. The Department of Health and Social Care (DHSC) should launch a new round of medical places expansion in 2024, with a follow-up round in 2026, to significantly expand existing medical schools and establish 12-15 new medical schools, primarily in under-doctored areas of the country.** New medical schools could include the conversion of existing (and future) private medical schools into schools that cater to international students into ones that support state-funded places, or the establishment of geographically distinct new schools by (or through partnership with) existing medical schools, similar to the University of Cumbria's recent partnership with Imperial College London. Allocation of places should be primarily based on national needs and the capacity of the NHS and others to provide placements, rather than a strictly competitive approach – subject to bids meeting minimum quality criteria.
- 3. To support this expansion, the Government should provide £650m of capital funding, and maintain real terms or higher funding for the funding of medical places, clinical placements and bursaries.** The total additional funding required would be £1.2bn over the five-year period from 2024-2029. With medical schools at different stages of preparedness to respond to additional places, with some having newer buildings or a wider range of clinical courses, there may also be a role for integrated care systems to match funding or to support facility development, as has taken place between the Herefordshire and Worcestershire Integrated Care System and Three Counties Medical School.<sup>1</sup> To further support the financial viability of expansion, the Government could consider increasing the permitted proportion of international students from 7.5% to 10%, particularly where the full costs of degrees can be borne independently by those students. Caution will be needed to ensure additional pressure (logistical and financial) upon clinical placements is sustainable.

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1. Bill Tanner, 'Gloucestershire NHS invests in new medical school', *Gloucestershire Live*, 6 March 2022 [link]

4. **Medical schools should expand and diversify the talent pool of applicants by broadening their approach to assessing evidence of ability**, in ways that are fair, transparent and non-discriminatory. This could include considering whether A-Level grades could be lowered for those with high UCAT or BMAT scores (and vice-versa), a significant increase in outreach and access efforts, including those that directly support raising academic attainment in unrepresented groups; and a greater recognition of wider academic and professional achievements for graduate and mature entrants, particularly those with experience in other healthcare roles.<sup>2</sup>
5. **By 2024, the General Medical Council (GMC) should establish a framework by which to approve course adaptations at existing and new schools to enable a significant expansion of the number of part-time, Accreditation of Prior Experiential Learning (APEL) courses and graduate pathways.** There must however be a recognition that externalities may determine progress here, such as the question of whether qualifications with the Republic of Ireland are mutually recognised which would be required to recognise prior learning and experience towards a medical degree in the UK.
6. **By the end of 2024, the Medical Schools Council (MSC) should publish a new set of principles to expand Simulation-Based Education (SBE) within undergraduate curricula.** This should be accompanied with the introduction by DHSC of a new tariff funding mechanism for simulated placements in undergraduate medicine.
7. **DHSC, working with Health Education England (HEE), the GMC and MSC should reform how healthcare professionals, particularly GPs, work with medical schools to increase the capacity of teaching staff.** Dedicated job plans with medical education as a key feature of roles should be created; a scheme should be introduced to enable recently retired healthcare professionals to undertake teaching and supervision as a protected activity; new measures to streamline status, pensions and responsibilities for clinical academics should be explored. Protected teaching time for Clinical Teaching Fellows should be introduced; a dedicated scheme which seeks to boost the number of academic GPs should be introduced. Amendments to *Good medical practice (GMP)* and the Consultant contract to improve recognition of teaching as a core competency and requirement of clinical practice could also be considered.

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2. We note that the BMAT will be discontinued in 2024/5.

- 8. Placement Planning Boards at ‘System’ level (covering populations of around 500,000 to 3 million people) should be established, bringing together ICB leadership, Deaneries, placement providers and Medical Schools to strategically plan placements on a population basis.** DHSC should also establish a national Placement Planning Unit to support and to improve alignment of clinical placements across providers and medical schools. This would bring together key stakeholders, including the responsible Health Minister, GMC the MSC and NHS England/HEE, whose work in developing a specialty placements distribution programme should be complimented.
- 9. DHSC should expand the range of placement providers covered by the Education and Training Tariff.** Whilst there should be a focus upon primary and community care (including hospices), leveraging the role that voluntary (VCSE) and independent sector providers could play in supporting clinical placements should be further explored. An expansion in clinical placement providers should also be accompanied by a commitment from providers to improve transparency over their expenditure on medical education. A new framework for reporting could be set out by Placement Planning Boards to enable this.

# Introduction

There are currently forty-five medical schools across the UK that are members of the Medical Schools Council, the representative body for UK medical schools (see p. 56). The number of medical school places each of these institutions offers each year at either undergraduate or graduate entry level is determined by a cap, set by the Government.<sup>3</sup> The cap is set in recognition of the cost of a medicine or dentistry degree (which is part-subsidised by the Government – see p. 50 for details of how these costs are determined and where costs are borne). This is to ensure that each student has access to safe and high-quality placements and training. The vast majority of medical students enter medical school via the undergraduate route, but just over 500 a year (England) or around 750 a year (UK) now enter via graduate entry. Of these places across the UK, 79.7% are in England; 12.3% in Scotland; 4.6% in Wales and 3.4% in Northern Ireland.<sup>4</sup>

Despite removing the limits on the numbers entering some healthcare professions in 2017, restrictions on medical school students have remained.<sup>5</sup> The current cap for 2022/23 has been set at 7,571 places for medicine, with a further 809 places for dentistry.<sup>6</sup> On average, medical schools admit 235 students in each intake, although the size of each medical school's intake varies considerably across the country. By way of example, Edge Hill University's annual intake is currently 30; at King's College London, it is 430.<sup>7</sup>

Demand to study medicine and dentistry is high.<sup>8</sup> Since 2017, the number of applicants for medicine courses has risen each year by around 1,500 (See Table 1, p. 11). There were 29,710 applicants for medicine through the Universities and Colleges Admissions Service (UCAS) in 2022, a 2.5% increase on the previous year.<sup>9</sup> Entry is extremely competitive. 1,325 applicants who achieved at least two 'As' missed out on a place in 2019. Each year medical schools are rejecting many applications from individuals who have the potential to contribute to a career in medicine.

3. Health education funding, *Office for Students* [link]
4. Double or quits: a blueprint for expanding medical school places, *Royal College of Physicians*, 5 January 2021 [link]
5. Compare to the system of determining MPharm student numbers which are not subject to such a cap
6. 'Medical and dental target intakes for entry in 2022-23', Health education funding, *Office for Students* [link] /
7. Data accessible via the downloadable spreadsheet, entitled 'Medical and Dental Students survey 2021 intake results for 2020-21 and 2021-22 academic years', Health education funding, *Office for Students* [link]
8. The criteria for entry that each medical school sets out can be found here: Entry requirements for UK medical schools: 2022 entry, *Medical Schools Council* [link]
9. Update: UCAS Application Stats For 2022 Entry Medicine, *The Medic Portal*, 12 November 2021 [link]

**Table 1 – Applicants for ‘medicine courses’ at UK institutions**

Year	Number of applicants to study medicine
2014	22,740
2015	20,390
2016	20,100
2017	19,210
2018	20,730
2019	22,430
2020	23,710
2021	28,690
2022	29,710

*Source(s): ‘Record number of applicants to medicine results in increased competition for places’, Medical Schools Council, 23 February 2021 [link] & Deadline Applicant Statistics: October (2018 cycle, The Universities and Colleges Admissions Service (UCAS) [link]*

There is significant scope meanwhile to widen access to medicine and to ensure we draw upon talent from every part of society (this is a topic explored in further detail on p. 30). Medicine remains one of the most “inherited” professions, meaning youngsters are likely to follow a parent into it.<sup>10</sup>

### How we got here

Medical school expansions have taken place intermittently since the foundation of the NHS, punctuated by periods of restriction, where concerns over over-supply of doctors dominated, and periods where concerns of shortages prevailed. A timeline on p. 15-16 indicates the major developments in medical school expansion over the past seventy-four years.

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10. Nicola Woolcock, ‘A-level results: Cap on medicine degrees may deny even A\* candidates’, *The Times*, 18 August 2022 [link]



Table 2 – A History of Medical School Expansion Since Foundation of the NHS

Year	Description
1944	<p><b>Inter-Departmental Committee on Medical Schools, chaired by Sir William Goodenough</b></p> <ul style="list-style-type: none"> <li>Advocates increase in the number of doctors and association of every hospital with a university teaching centre.</li> <li>Whole-time professors of medicine, surgery, and obstetrics and gynaecology encouraged</li> </ul>
1945	2,500-2,700 students enter medical school annually.
1955	<p><b>Committee on Medical Manpower, chaired by Sir Henry Willink publishes findings</b></p> <ul style="list-style-type: none"> <li>Estimates number of doctors required in the long term, recommending a reduction of 10% as possible for at least 15 years.<sup>11</sup></li> </ul>
1968	<p><b>Royal Commission on Medical Education, chaired by Lord Todd published.</b></p> <ul style="list-style-type: none"> <li>Recommends increase in medical school intake to 3,500 (and to 5,000 by 1985).</li> <li>Led to new schools in Southampton, Leicester and Nottingham (established in 1970s–1980s); consolidation of London institutions (with schools at University College London, King's College London, Imperial College London and Queen Mary, University of London).</li> <li>Favoured large schools with average intake of 200</li> </ul>
1979	<p><b>Vocational Training Regulations</b></p> <ul style="list-style-type: none"> <li>Establishes mandatory three-year training for general practice, including one year in a training practice attached to trainer</li> </ul>
1989	University of Cambridge offers first MB/PhD programme, enabling students to focus on academic research
1992	<p><b>Calman Reforms</b></p> <ul style="list-style-type: none"> <li>Led to introduction (from 1996) of Specialist Registrar posts with explicit curricula, regular assessments of progress, and limited to a maximum of seven years.</li> </ul>
1993	<p><b>General Medical Council publishes 'blueprint' for undergraduate medical training entitled, <i>Tomorrow's Doctors</i>.</b></p> <ul style="list-style-type: none"> <li>Represents step change in medical training by taking the start of pre-registration year as reference point to which 'professional' component of undergraduate course is directed.</li> </ul>
1990s	<ul style="list-style-type: none"> <li>University of Manchester introduces 'problem-based learning' curriculum</li> <li>University of Birmingham creates community-based medicine strand to boost general practice experience in studies.</li> </ul>
1997	3,749 students enter medical school annually
2000	<ul style="list-style-type: none"> <li>Abbreviated four-year medical school courses for graduate-entry introduced.</li> <li><i>The NHS Plan</i> promises a further 1,000 medical school places</li> </ul> <p>5229 home entrants compared with 4361 in 1995, a rise of 20%.</p>
2000-2005	<ul style="list-style-type: none"> <li>Eight new medical schools open, including: Brighton and Sussex, East Anglia, Hull York, Keele, Lancaster, Exeter, Plymouth, Warwick.</li> <li>Graduate entry medical school created at Swansea University (2004)</li> </ul>

11. Geoffrey Rivett, 'A shortage of doctors was producing "a pretty ghastly awful picture"', *Health Service Journal*, 28 July 2009 [link]

<b>2005</b>	<p><b>Introduction of Modernising Medical Careers (MMC)</b></p> <ul style="list-style-type: none"> <li>• Programme for postgraduate medical training; introduction of the Foundation Programme, a two-year scheme for all medical graduates; establishment of the Postgraduate Medical Education Board (PMETB) [now merged with the General Medical Council].</li> </ul>
<b>2006-2007</b>	6,194 enter medical school annually
<b>2008</b>	<p><b>Tooke Report published - final report of the independent inquiry into Modernising Medical Careers</b></p> <p>Consolidation of responsibility for all stages of medical education and training under the GMC</p>
<b>2008-2009</b>	28,329 total medical (clinical and pre-clinical) full-time undergraduates (a 71% increase in medical school places from 1997/8)
<b>2014</b>	<p><b>Shape of Training Review, chaired by Professor Sir David Greenaway published.</b></p> <p>Proposals include:<sup>12</sup></p> <ul style="list-style-type: none"> <li>• on leaving medical school, doctors should be allowed to be fully registered to practise, rather than completing a year working under supervision as they do now.</li> <li>• on completion of their postgraduate training doctors should be awarded a certificate of specialty training, rather than the certificate of completion of training (CCT)</li> <li>• the length of training for a qualified doctor to become a consultant could be reduced to between six and eight years</li> <li>• specialties be grouped together under “patient care themes” with common clinical objectives</li> </ul>
<b>2016</b>	<ul style="list-style-type: none"> <li>• Proposal to expand medical school places: 1,500 places, comprising 500 places for allocation across existing medical schools; a further 1,000 places in new medical schools.</li> </ul>
<b>2018</b>	<ul style="list-style-type: none"> <li>• New medical schools awarded domestic places by HMG: Anglia Ruskin, Aston, Edge Hill, Lincoln, Sunderland, Central Lancashire and Kent and Medway.<sup>13</sup></li> <li>• Graduate entry programme established between Dundee, St Andrews and the Highlands and Islands University</li> </ul>
<b>2020-2021</b>	<p>Temporary expansion in intake in 2020 and 2021, with funding from the Departments of Education (DfE) and Health and Social Care (DHSC)</p> <ul style="list-style-type: none"> <li>• Graduate entry school opens at the University of Ulster (2021)</li> </ul> <p>7,500 enter medical school annually</p>
<b>2022</b>	<ul style="list-style-type: none"> <li>• Imperial and the University of Cumbria announce partnership to establish new medical school in Carlisle</li> </ul>

12. David Greenway, Securing the future of excellent patient care [link]

13. Note that UCLAN was already admitting international students. It was awarded 20 publicly funded places in the second round of allocations.

Indeed, there is much to learn from past approaches as we consider future expansion – not least from the last two most significant rounds of expansion: in the early 2000s and from 2017 to the present day.

#### Establishing Four New Medical Schools (1998-2005)

Between 1998-2005 the Government increased medical student numbers by 57% (from 3749 to 5894).<sup>14</sup> To achieve this, numbers were increased at existing medical schools; shortened programmes open to science graduates were introduced; “twinning” arrangements (with existing curricula hosted at a new site) and four new schools (Brighton and Sussex, Hull and York, Peninsula and the University of East Anglia) were established. Common to these new schools were a five-year course, an intake of roughly 120 in the first year and a significant proportion (between 20-50%) that were graduate or mature students.<sup>15</sup>

Each school adopted new approaches to its curriculum design, with dissection and laboratory work replaced in some schools.<sup>16</sup> To manage tensions between teaching and research, Hull York Medical School placed staff active in research in existing departments of the universities of Hull and York, providing infrastructure and critical mass for research. In each case, these new medical schools were able – as one reviewer put it at the time – to “capitalise on the opportunity of development from a ‘clean slate.’”<sup>17</sup>

In 2018, the government pledged to create 1,500 additional Medical School places – a 25% increase.<sup>18</sup> This meant that by 2020, there were around 7,500 places available (compared to 6,000 previously). This included an expansion of places at existing medical schools, whilst five new medical schools were also opened, including at the University of Sunderland, Anglia Ruskin, Kent and Medway Medical School, Aston and Edge Hill, taking on roughly 400 students each year between them. The Lincoln Medical School, developed in partnership with the University of Lincoln and University of Nottingham was also established during this time. See Fig. 1 for a map depicting this expansion of places.

18. New medical schools to open to train doctors of the future, *Health Education England*, 20 March 2018 [link]

14. Amanda Howe & Peter Champion et al., ‘New perspectives—approaches to medical education at four new UK medical schools’, *BMJ*, 5 August 2004 [link]

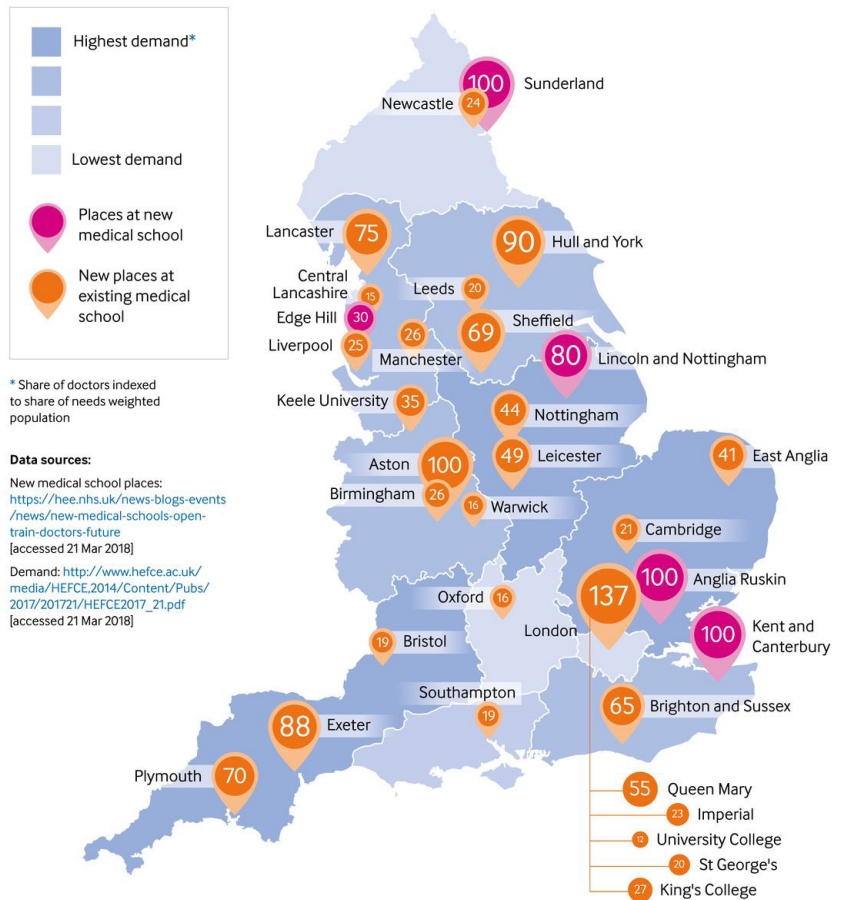
15. Ibid.

16. John C McLachlan & John Bligh et al., ‘Teaching anatomy without cadavers’, *Medical Education*, Vol. 38, No. 4 (April 2004), 418-424 [link]

17. Amanda Howe & Peter Champion et al., ‘New perspectives—approaches to medical education at four new UK medical schools’, *BMJ*, 5 August 2004 [link]

Figure 1: Geographical Distribution of New Medical School Places In 2018

Allocation of new medical school places



Note: Aston Medical School regarded as one of the new schools.

Source: Abi Rimmer, 'Five medical schools are created in England in bid to increase home grown doctors', BMJ, 21 March 2018 [link]

# Chapter 1 – The Case for Expansion

In this chapter, we summarise the principal arguments in favour of expanding medical school places.

## 1. Meeting Future Healthcare Demand

Everyone agrees that the UK needs more doctors, but training sufficient numbers has proven a stubborn challenge. Since the foundation of the NHS, the UK has not produced sufficient numbers of doctors to be self-sufficient. In every decade since the 1940s, finding more staff has been a pressing priority for policymakers.<sup>19</sup> Short term tactics have often been deployed to meet the shortfall, but they will not suffice if we are to tackle this issue in the long-run. The challenges before us are long-standing, but are more pressing today amid a backdrop of growing demand for primary and community care and amid growing waits for elective care.<sup>20</sup> Workforce planning will always be complex and “can never be an exact science, whether led nationally, regionally”, but we can think longer-term and can take a more strategic and joined up approach to the recruitment and training of the future workforce.<sup>21</sup>

Shortages of doctors affect both the quality of the clinical service and the retention of staff, who are more likely to burn-out or leave where under-staffing persists.<sup>22</sup> As it stands, an extra 45,000 doctors would be needed in the NHS in England if the Government wanted to reach the OECD EU average of 3.7 doctors per thousand patients.<sup>23</sup> Many regions (such as rural or coastal areas) and certain specialities (including general practice and psychiatry) are have particular challenges of ‘under-doctored’ areas and are more adversely affected than others.<sup>24</sup> This can produce a vicious cycle of under-provision whereby those in most need of care are often the least likely to be able to access it: ‘the inverse care law’.<sup>25</sup>

A need to expand is widely recognised and has been advocated by a range of organisations in recent years. In 2018, the Royal College of Physicians called for the number of medical school places to be doubled.<sup>26</sup> In 2021, the Medical Schools Council (MSC) called for 5000 additional places to reach a total of 14,500 graduating doctors per year.<sup>27</sup> The MSC predicted that up to thirteen new medical schools would be needed, each producing 250 graduates per year on average, along with an expansion of existing schools, to an average of 200-250 graduates per year, to meet the target of 5000 more students.<sup>28</sup>

Not only do we need more doctors, but we require more with a

19. Bill Morgan, NHS staffing shortages: Why do politicians struggle to give the NHS the staff it needs?, *The King's Fund* (November 2022) [link]
20. The state of medical education and practice in the UK 2021, *General Medical Council* [link]
21. A comprehensive new workforce implementation plan, *NHS Long Term Plan* [link]; Billy Palmer, ‘Doing right when you are wrong: perspectives on workforce planning in the NHS in uncertain times’, *Nuffield Trust*, 13 June 2022 [link]
22. Workforce: recruitment, training and retention in health and social care, House of Commons Committee, *Third Report of Session 2022–23* [link]
23. Clea Skopeliti, ‘UK’s number of doctors per capita is one of lowest in Europe’, *The Guardian*, 23 December 2019 [link]
24. The expansion of medical student numbers in the United Kingdom, *Medical Schools Council*, October 2021 [link], p. 7
25. Julian Tudor Hart, ‘The inverse care law’, *The Lancet*, 27 February 1971 [link]
26. Abi Rimmer, ‘UK medical school places must double, says Royal College of Physicians’, *BMJ*, 25 June 2018 [link]
27. This increase was calculated using a baseline of the temporarily expanded number of medical school places made available during the pandemic.
28. The expansion of medical student numbers in the United Kingdom, *Medical Schools Council*, October 2021 [link]

skillset required for the future (both clinical and non-clinical) and for the needs of the clinical service. In a recent editorial piece in the *BMJ*, Dr Kamran Abbasi reflects that “reform of medicine is urgent and necessary. Increasingly, patients have two or more conditions at the same time... an intellectual shift is required to think of multimorbidity as predictable clusters instead of a random assortment of individual parts. And that sea change is the revival of generalism, even for specialists.”<sup>29</sup> Ultimately, it is a new balance between generalism and specialism that is required. As the recently published Future Doctor report from Health Education England (HEE) puts it, “Future Doctors must have a strong bedrock of generalist skills, which can be transferred and extended over the course of a career. Access to generalists in primary and secondary care will prevent patients from seeing multiple specialists, which costs patient time and risks fragmented care, duplication and waste”.<sup>30</sup>

There is a broader point here too about diversifying career pathways, so that growth of the workforce is not exclusively consultant-led down the line. Creating greater flexibility and leaning into the needs of the emergent workforce is one way of turning the tide on the growing attrition of junior doctors. In 2011, when preliminary career-destination surveys were first conducted, 71.3% of F2 doctors progressed into specialty training. By 2016 this had dropped to 50.4%. By 2019, the number was just 37.7%.<sup>31</sup>

Medical Schools themselves have a dual role: to extend biomedical and scientific understanding, and to create curricula that prepare future doctors to practise within the NHS.<sup>32</sup> Medicine is changing and our approach to educational training must keep pace, whilst it must also maintain the highest standards. Expanding medical school places represents just one aspect of future workforce planning, which requires an ‘end-to-end’ approach. As a recent review puts it: “education, training, and workforce plans have typically considered each health-care profession in isolation and have not adequately responded to changing health and care needs”.<sup>33</sup> There is also a need to consider the broader non-clinical skillset that will be valued by the clinical workforce – analytical skills to leverage the possibilities of big data; or an understanding of the opportunities and ethical challenges posed by artificial intelligence. These are just two examples.<sup>34</sup>

## 2. Global Shortages of Medical Professionals

International medical students and graduate arrivals have made a significant contribution to the NHS since its inception and will continue to do so in the years ahead. International Medical Graduates (IMGs) are now the second largest group of doctors employed by the NHS, constituting 30-40% of the junior doctor workforce.<sup>35</sup> In 2021, 63 per cent of doctors registering with the GMC for the first time qualified abroad, outnumbering home-grown graduates. In fact, the number of IMGs has increased by 40% in the last five years at a time when the number of UK graduates in the workforce has only increased by 10%.<sup>36</sup>

We welcome the contribution of international medical graduates to the NHS. However, growing global demand for medical graduates makes

29. Kamran Abbasi, ‘Generalism for specialists: a medical reformation’, *BMJ*, 16 January 2020 [link]

30. The Future Doctor Programme: A co-created vision for the future clinical team, *Health Education England* [link]

31. Hannah C.P. Wilson, Sarah Abrams & Arabella Simpkin Begin, ‘Drexite: Understanding why junior doctors leave their training programs to train overseas: An observational study of UK physicians’, *Health Science Reports*, Vol. 4, No. 4 (December 2021) [link]

32. Peter Kopelman, ‘The future of UK medical education curriculum – what type of medical graduates do we need?’, *Future Hospital Journal*, Vol. 1, No. 1 (2014), 41–46 [link]

33. Michael Anderson & Ciaran O’Neill et al., ‘Securing a sustainable and fit-for-purpose UK health and care workforce’, *The Lancet*, Vol. 397, No. 10288 (2021), 1992–2011 [link]

34. Costanza Potter, ‘All GPs should be trained in AI healthcare, HEE recommends’, *Pulse*, 25 October 2022 [link]

35. Richard Bogle et al., ‘Supporting International Medical Graduates in the NHS’, *The Physician*, Vol 6, No. 2 (2020) [link]

36. The state of medical education and practice in the UK: The workforce report 2022, *General Medical Council* [link], p. 5

an over-reliance on international medical professionals unsustainable in the longer run.<sup>37</sup> A recent study in *The Lancet* estimates that 6.4 million more physicians will be needed globally to meet goals for universal health coverage (UHC).<sup>38</sup>

A further important consideration is the fact that almost nine in ten (89%) UK graduates who took up a licence to practise in 2015 maintained their license in 2021. This was however only the case for two thirds (66%) of international medical graduates (IMGs) and under half (47%) of the European Economic Area (EEA) graduates who joined that year.<sup>39</sup>

### 3. Benefits to Place

Historically, medical schools have been mal-distributed around the UK.<sup>40</sup> For example, the East of England has 7.4% of the yearly intake of medical students (and 9.3% of the UK population); London has 26.7% of the medical students and 13.4% of the UK population.<sup>41</sup> An absence of medical schools in many parts of the UK limits access to talented individuals – particularly those from lower socioeconomic backgrounds – from participating in medicine.

This matters because one of the strongest indicators of where doctors practice is where they train – particularly for graduate students and those undertaking postgraduate study. 24% of all licensed doctors who qualified in England live within 10 miles of the medical school where they qualified.<sup>42</sup> 80% of doctors completing their specialty training and gaining their Certificate of Completion of Training (CCT) settle within 50 miles of the area where they trained.<sup>43</sup> Data suggests that recruiting medical students from lower socioeconomic groups and those who originate from ‘under-recruiting’ areas may be part of the solution to filling training posts in these areas with implications both for widening access and equitable distribution of health services.<sup>44</sup>

‘Placing’ Medical Schools, placements and speciality training also matters because there is a clear correlation between the number of training posts in an area and the health outcomes in that area. Consider the case of coastal communities, the subject of the Chief Medical Officer, Professor Chris Whitty’s annual report from 2021. They have older and more deprived populations, yet have 14.6% fewer postgraduate medical trainees, 15% fewer consultants, and 7.4% fewer nurses per patient.<sup>45</sup> Without making substantial progress, the ‘inverse care law’ will persist.<sup>46</sup>

The MSC writes convincingly therefore, that “regionality will...be crucial in siting new medical schools. Currently placements are most under pressure in large urban teaching hospitals. It would not be wise to place more medical schools in these areas. Instead, distribution should focus on building capacity in rural and coastal settings and smaller hospitals serving local populations.”<sup>47</sup>

37. J Meirion Thomas, ‘Poaching doctors from abroad is unethical’, *The Lancet*, Vol. 399, No. 10334 (2022), P1466-1467 [link]
38. ‘Measuring the availability of human resources for health and its relationship to universal health coverage for 204 countries and territories from 1990 to 2019: a systematic analysis for the Global Burden of Disease Study’, *The Lancet*, Vol. 399, No. 10341 (2022), P2129-2154 [link]. This trend has been long understood however, see Richard M Schefler and Jenny X Liu et al., ‘Forecasting the global shortage of physicians: an economic- and needs-based approach’, *Bulletin of the World Health Organisation*, Vol. 86, No. 7 (2008), 516–523 [link]
39. The state of medical education and practice in the UK: The workforce report 2022, *General Medical Council* [link], p. 58
40. Claire Nussbaum & Efthalia Massou et al., ‘Inequalities in the distribution of the general practice workforce in England: a practice-level longitudinal analysis’, *BJGP Open*, Vol. 5, No. 5 (2021) [link]
41. Ben Kumwenda & Jennifer A. Cleland, ‘Geographical mobility of UK trainee doctors, from family home to first job: a national cohort study’, *BMC Medical Education*, Vol. 18, No. 314 (2018) [link]
42. Jake Beech, Simon Bottery & Anita Charlesworth et al. ‘Closing the gap: Key areas for action on the health and care workforce’, *Nuffield Trust*, March 2019 [link], p. 17
43. Addressing Health Inequalities: Distribution of Medical Specialty Training Programme, *Health Education England – London programme team*, 23 June 2022 [link]
44. Ben Kumwenda & Jennifer A. Cleland, ‘Geographical mobility of UK trainee doctors, from family home to first job: a national cohort study’, *BMC Medical Education*, Vol. 18, No. 314 (2018) [link]. See also J. Cleland, P.W. Johnston and L. Walker, ‘Attracting healthcare professionals to remote and rural medicine: Learning from doctors in training in the north of Scotland’, *Medical Teacher*, Vol. 34, No. 7 (2012), e476-e482 [link]
45. Chief Medical Officer’s annual report 2021: health in coastal communities, *gov.uk*, 21 July 2021 [link]
46. Rebecca Fisher, Lucinda Allen & Hugh Alderwick, ‘Tackling the inverse care law: Analysis of policies to improve general practice in deprived areas since 1990’, *The Health Foundation*, January 2022 [link]
47. The expansion of medical student numbers in the United Kingdom, *Medical Schools Council*, October 2021 [link]

## Chapter 2 – The Seven Pathways to Expansion

In this chapter we examine seven key pathways to enable future expansion. These are:

- Expanding existing schools
- Opening new schools
- Diversifying the talent pool
- Adapting curricula and pathways
- Optimising the teaching workforce
- Delivering Placements
- Securing Funding

In order to determine these pathways and to forecast a growth in places over the coming decade at existing schools, we invited all current medical schools across the UK to respond to a survey, which asked them to reflect on their scope for expansion and to consider current constraints.

Twenty-eight Medical Schools responded in total, representing a majority of UK institutions (62%), including schools in England, Wales and Scotland. A breakdown of the types of medical schools which responded by intake size is detailed in Fig. 2. Fig. 3 profiles the characteristics of the Medical Schools which did not respond to the survey by way of comparison.

We are of the view that the sample is representative geographically, in terms of the size of its annual intake and in representing both newer and more established Medical Schools.



Figure 2: Characteristics of Participating Medical Schools

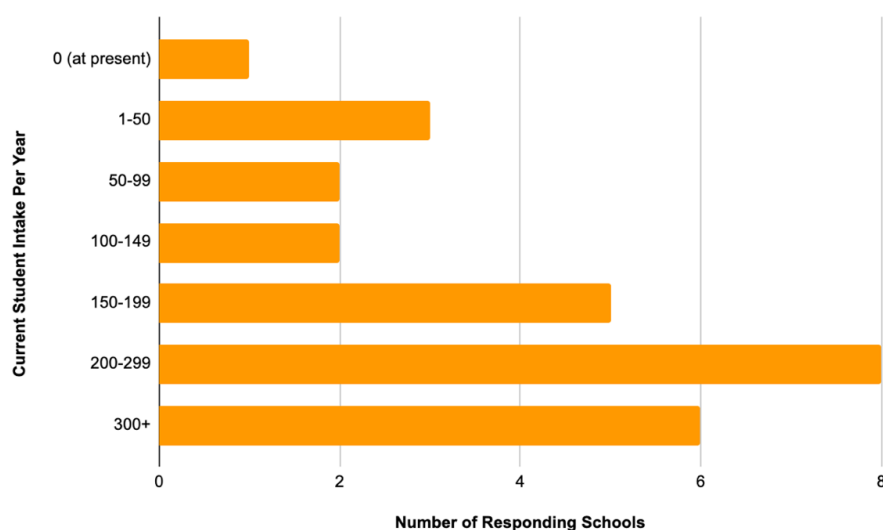
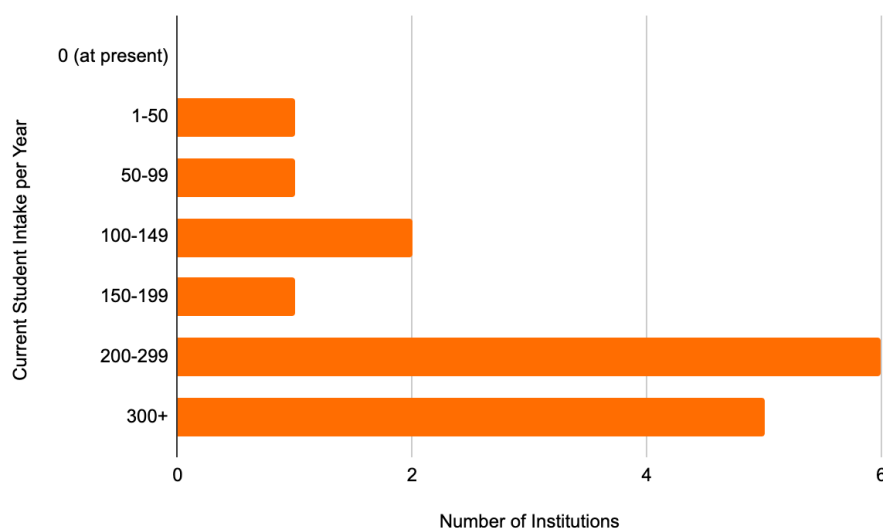


Figure 3: Characteristics of Non-Participating Medical Schools



## 1. Expanding Existing Schools

There is an appetite – which we have both read and heard – from the sector to expand to enable increases in the number of medical school places available in the years to come. Some schools already have capacity to expand.<sup>48</sup> Others – such as the University of Surrey have proceeded with the development of a medical school which would initially serve a privately-funded international intake of roughly fifty per year. St Mary’s University Twickenham is exploring a similar model.<sup>49</sup> Chester, Brunel, and the Three Counties Medical Schools have also all sought to meet regulatory approval from the GMC to establish new medical schools since 2018.<sup>50</sup>

The vast majority of medical schools responding to our survey were

48. Rachel Hall, ‘Medical schools in England offering new students £10,000 to study elsewhere’, *The Guardian*, 10 August 2021 [link]

49. University of Surrey announces new medical school, *University of Surrey*, 25 May 2022 [link]

50. Emma Wilkinson, ‘The real reason that new UK medical schools are focusing on international students’, *BMJ*, 24 February 2022 [link]. The Three Counties Medical School will open in 2023.

supportive of expanding places. Many regarded it as the ‘right thing to do’. One survey respondent described expanding places as a “moral and practical imperative”. Whilst a majority of the Medical Schools surveyed had plans to expand numbers, with many awaiting approval of capital plans, or seeking a commitment from the Government to uplift the number of home-based places that could be allocated each year, almost all wished to ensure an incremental introduction of places to facilitate changes to clinical placements. The incremental approach was also seen as important in mitigating against sudden increases and the sense that those in enlarged cohorts would see themselves as ‘guinea pigs’, with disadvantages for their overall student experience as a result. The MSC has posited that the ‘sweet-spot’ of student numbers is roughly 250 students.<sup>51</sup> Some Medical Schools already have a large intake over more than 400, such as Manchester and King’s College London, and it is unlikely that places at these institutions would be expanded, even if there was capacity to do so or there was a ready availability of clinical placements.

The results however show that there is scope to undertake expansion within current Medical Schools. Even under the most optimistic scenarios however, expansions at these Medical Schools alone will be unlikely to enable a doubling of places.

### Survey Findings

#### Assessing the UK-wide figures (by 2028/29):

- On average, each Medical School could increase their annual intake by 80 students.
- 11% of schools could not (or did not wish to) expand their intake beyond current figures.
- 19% of schools could double their current numbers (or more).
- 59% of schools could expand numbers by more than a third.

#### Assessing the England-only figures (by 2028/29):

- 4 Medical Schools (18% of those responding) could double their places (or more).
- 11 Medical Schools (50% of those responding) could increase their intakes between 30-50%.

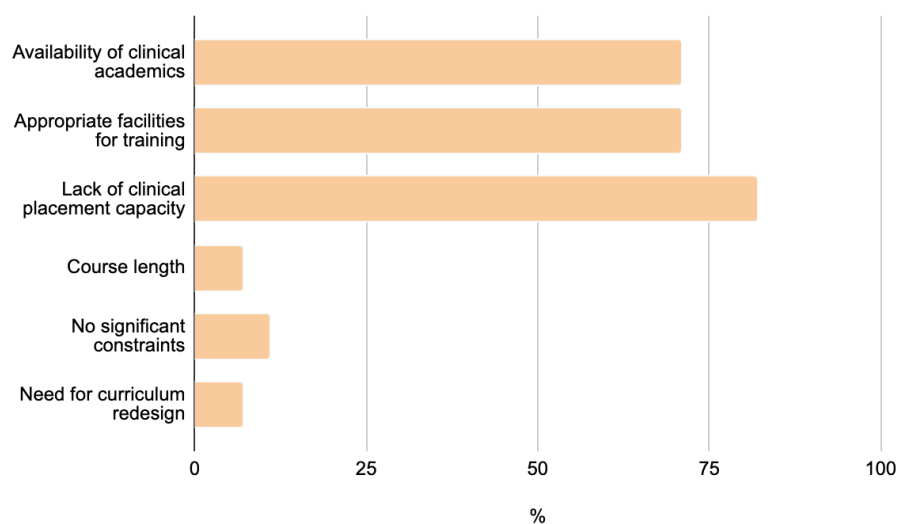
Beyond noting their existing plans for expansion, we also asked those responding to our survey to consider the greatest constraints to future expansion. Over 60% of the Medical Schools responding listed the availability of clinical academics, appropriate facilities for training and a lack of clinical placements as the three most significant factors which would inhibit further expansion (Fig 4, p. 25). A lack of clinical placements (78%) was listed as the most significant factor. Of less significance, were considerations regarding curriculum design and the course length. A handful of Medical Schools foresaw no barriers to expansion (based on

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51. The expansion of medical student numbers in the United Kingdom, *Medical Schools Council*, October 2021 [link]

the expansion plans they had outlined in a previous section of the survey).

**Fig. 4 - Which of the following areas would represent your biggest constraint(s) to expanding the intake of medical students each year? (% of respondents noting each response)**



## 2. Opening New Schools

Our findings show that in order to double the number of Medical School places in the coming years, the development of new schools will be necessary. The MSC suggests in its 2021 report that a further twelve would be required. We suggest that between twelve and fifteen would be required to double the number of medical school places.<sup>52</sup>

Many of those we spoke to noted the importance of place or ‘regionality’ in planning future Medical Schools to ensure social purpose and to best meet the needs of the local healthcare system. Indeed, this criterion was included in the bidding process during the last major expansion, with each of the new schools developed then, demonstrating their ability to make a difference to ‘place’. For an example, see a case study of the current approach currently being taken at the University of Portsmouth on p. 27-8. Reasons for the importance of this approach for diversifying the talent pool are detailed on p. 30-31.

We are of the view that a future expansion in Medical School should partly be based upon the ability of the institution to address the healthcare needs of its region – something which ought to be determined on a granular analysis of the workforce needs of its local system, meaning a consideration of:

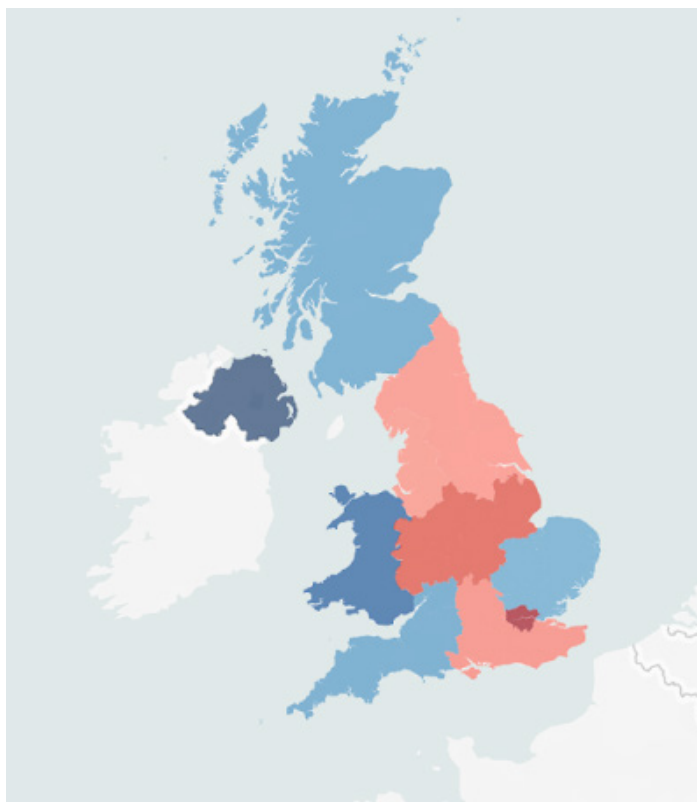
- the relative numbers of licensed doctors in that region (see Fig. 5, p. 26 for this top-level view);
- an assessment of the needs of particular speciality training places (e.g., general practice or ophthalmology) noting that one in ten specialty postgraduate medical training posts go unfilled.<sup>53</sup>

52. The expansion of medical student numbers in the United Kingdom, *Medical Schools Council*, October 2021 [link]

53. Jake Beech, Simon Bottery & Anita Charlesworth et al. ‘Closing the gap: Key areas for action on the health and care workforce’, *Nuffield Trust*, March 2019 [link], p. 20

In England, this could mean looking to places, such as Bournemouth, Colchester or Falmouth as sites that could be ‘well-placed’ to meet growing healthcare system needs, but where there are comparatively few medical schools presently nearby to meet them.<sup>54</sup>

**Fig. 5 - Heatmap of number of doctors recognised by the GMC**



Source: ‘The Register – UK Maps’, General Medical Council [link]

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54. We should note that we have deliberately chosen to list these places because we have not canvassed the opinions of Vice Chancellors (nor other staff members) of relevant HEIs that already exist in these places and indeed therefore, and have not based this upon existing enthusiasm to establish a medical school.

### Case Study – University of Portsmouth

The University of Portsmouth (UoP) has long had ambitions for a medical school to build on its current courses in pharmacy, adult nursing, physiotherapy, and physician associates.

Small regional medical schools have a critical and unique role to play in their ability to work with trusted regional health and social care partners to focus on the workforce and health needs of that region. Medical schools have an effect on the local health economy well before any students even arrive, encouraging recruitment and retention from those looking for a teaching role and those planning their research.

Portsmouth and the surrounding area, being both rural and coastal, has a large ageing population and a high incidence of chronic illness and comorbidities, yet, it has one of the worst GP/patient ratios in the UK with 2,559 patients per GP compared to, for example, Liverpool with 1,614, or Wirral, 1,720.

In developing its plans for the school, UoP has worked with existing schools and practitioners with an existing track record of success. Brighton and Sussex Medical School is the 'contingent partner' while Professor Chris Holland, Founding Dean at Kent Medway Medical School, is an adviser. The Dean of Development is Professor John Cookson, well known for his creation of many medical schools and his research.

UPMS will be small (80-100 students in each year) in order to focus on regional placements. It will be a 4-year graduate entry programme. It is intended to recruit many students locally as these are more likely to stay and serve the local population after qualification, building on UoP's strong record of widening participation while maintaining high academic standards. The key focus for UPMS will be to encourage and develop a diverse population of young people from an early age to believe that they can become doctors and support them on that journey.

Although the GMC insists, rightly, that new doctors must be able to enter any branch of the profession, the course is structured with the needs of the local community in mind, with a shift of emphasis into the community.

For example, Year 3 will consist of two Longitudinal Integrated Clerkships each of about 22 weeks on the Isle of Wight and in rural Hampshire. These include secondary care in outpatients in both community and acute hospitals and in-patient care. Some time spent in acute hospitals is envisaged, particularly for acute paediatrics, obstetrics and A&E. In this way, students experience the full range of patient problems, including dermatology, ENT, ophthalmology, usually covered in short rotations.

The University has already committed its own capital funds to transform part of its existing estate, adding to its world class simulation facilities recently recognised by an award of £2 million by the Office for Students to further build on this strength.

The new Medical School building will be ready to open its doors in September 2023 at the same time as the project team is scheduled to achieve GMC Stage 6, giving them permission to recruit students. UPMS will be ready to welcome students in September 2024.



Image: Copyright University of Portsmouth

The GMC has a duty to ensure medical education and training in the UK is of a high standard, and it carries out approval activities across undergraduate and postgraduate medical education, managing bodies able to award a primary medical qualification and conducting quality assurance for bodies seeking to start a new programme. The GMC currently sets the expectation that “any institution...establishing a new school or programme [should] contact [the GMC] three years before they expect their first cohort of students.”<sup>55</sup> Were the Government to commit to an expansion of places as set out in our summary of recommendations, it is unlikely that new schools could come ‘on stream’ until 2027 (round one) and 2029 (round two), with the exception of schools that are already in development, and could potentially begin taking students sooner.

Since the early 2000s, a growing number of aspirant medical schools have established partners with existing schools in order to share curricula, or to act as a contingency partner. One example is Kent and Medway’s relationship with Brighton and Sussex.<sup>56</sup> Another is the University of Cumbria’s recently established partnership with Imperial.<sup>57</sup> This can enable a new medical school to become established more quickly using a tried and tested curriculum and approach to teaching, whilst additional support for quality assurance purposes can be developed. This need not be a pre-condition however. Edge Hill University has successfully proceeded with the development of a bespoke curriculum and approach to meet the needs of its local health economy.

**Table 3 – Examples of Recent Medical School Partnerships**

Institution(s)	Notable Features of Partnership
Cumbria-Imperial	Joint Medical School with joint research programmes in areas such as health and social inequalities. <sup>58</sup>
Kent & Medway-Brighton & Sussex	Contingency partner
Lincoln-Nottingham	Students study in Lincoln, but are registered with the University of Nottingham (Lincoln is ‘aiming for independence’ in 2026) <sup>59</sup>
Three Counties (Worcester)-Swansea	Contingency partner

Our survey shows an appetite to enter into partnership arrangements. Almost a third (32%) of responding Medical Schools noted that they were not currently in such an arrangement but would be interested in establishing one. 40% of responding Medical Schools had already established such an arrangement (see Fig. 6, p. 29).

55. New schools and programmes process, *General Medical Council* [link]

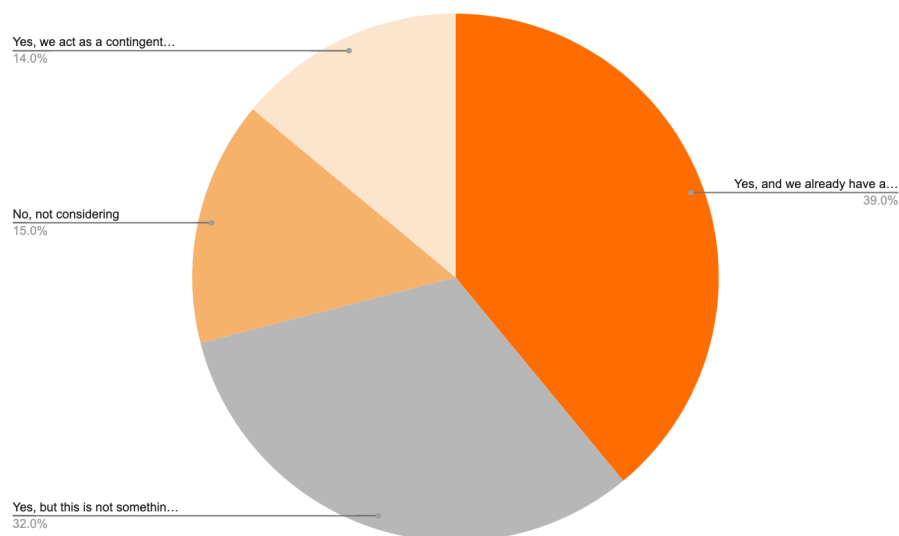
56. Quality Assurance Report for Kent and Medway Medical School, Academic Year 2020-2021, *General Medical Council* [link]

57. ‘University of Cumbria and Imperial announce plan for new Carlisle medical school’, *Imperial College London*, 7 April 2022 [link]

58. University of Cumbria and Imperial College London to open Cumbria’s first medical school in 2025, *ITV*, 7 April 2022 [link]

59. ‘Lincoln Medical School eyeing independence after success’, *The Lincolnite*, 12 October 2022 [link]

**Figure 6: Would you be prepared to partner / twin with a new medical school, for example by sharing a curriculum?**



In summary, we recommend that in 2024 DHSC launches a new round of medical places expansion, with a follow-up round in 2026, to significantly expand existing medical schools to establish 12-15 new medical schools, primarily in under-doctored areas of the country.

Bidding criteria, determined jointly by the OfS and HEE should consider the following criteria (in addition to financial matters and quality assurance):

- a. 'regionality', or the ability for the institution to widen access in the local region and to support the local health economy;
- b. the ability of the institution to train doctors in a multi-disciplinary environment;
- c. the ability to offer new forms of degree, such as part-time courses to enable nurses or physios to undertake a medical degree whilst working in the NHS. This would also be beneficial to those with disabilities who can currently train part-time, but cannot attend medical school part-time;
- d. the ability of the institution to utilise novel placement settings beyond secondary care, such as hospices or across the independent sector (and to assess the maturation of these partnerships);
- e. whether it has entered into a 'twinning' arrangement with an existing Medical School in order to share curricula, for support and/or for quality assurance purposes;
- f. The ability to recruit sufficient academic staff to educate students;
- g. the ability to deliver Simulation Enhanced Learning (and to assess capacity);
- h. a lesser – but important consideration – should be 'speed to market'.

These principles expand on metrics developed in the last major DHSC competition in 2017 which included widening participation and improving access, alignment of expansion to local NHS need and supporting shortage specialties. These principles should also be used.<sup>60</sup>

A common thread of our engagement with medical schools was that collaboration, rather than competition, should be at the heart of future expansion plans. We therefore recommend that – subject to bids meeting minimum quality criteria – allocation of places should be primarily based on national needs and the capacity of the NHS and others to provide placements, rather than a strictly competitive approach

### 3. Diversifying the talent pool

Demand to study medicine in the UK is high and growing.<sup>61</sup> Since 2017, the number of applicants for UK medicine courses has risen each year by around 1,500, with 29,710 applications in 2022.<sup>62</sup> Entry standards are high, with universities typically requiring candidates to achieve at least AAA at A-Level, in addition to undertaking a clinical aptitude test (typically either the BioMedical Admissions Test (BMAT) or University Clinical Aptitude Test (UCAT), or Graduate Medical Schools Admissions Test (GAMSAT) for graduate entry medicine), multiple mini interviews and consideration of work experience or other signs of an applicants' commitment, as well as assessing personal skills, such as the ability to cope with uncertainty, to be a good team player and effective communicator.<sup>63</sup> Some medical schools offer lower grades to candidates from certain backgrounds or schools, although in many cases these candidates do go on to achieve AAA or higher. A list of the minimum requirements for each medical school in 2022 is published by the Medical Schools Council.<sup>64</sup> For schools which receive government funding for UK domiciled students, a maximum of 7.5% of places may be allocated to overseas students; the rest are reserved for domestic students.<sup>65</sup>

Entry remains extremely competitive, with 1,325 applicants who achieved at least two As missed out on a place in 2019.<sup>66</sup> Kent and Medway Medical School informed us that, in the year they set their entry requirements to AAB, all accepted candidates actually achieved AAA or higher.

One measure of seeing that the quality of applicants remains high, despite the increase in applicants, this can be seen in the mean score of the BMAT test: in 2018, when the test was taken by 27,466 individuals, the Total Cognitive Mean Scaled Score was 2485; in 2021, when it was taken by 37,230 individuals, the Total Cognitive Mean Scaled Score had slightly increased, to 2499. The increase number of applicants had not resulted in a mean reduction in ability.

It is sometimes considered, in light of the statistics above, that it would be relatively easy to fill an increased number of medical places with high-ability applicants. However, while it is certainly correct that currently a relatively large number of highly able applicants are not accepted – and that places could be increased by 2000 – 3000 without significant

60. The criteria adopted in 2017 is set out in 'Expansion of Undergraduate Medical Education: Government Response to Consultation', DHSC, August 2017 [link], p. 6

61. The criteria for entry that each medical school sets out can be found in: Entry requirements for UK medical schools: 2022 entry, Medical Schools Council [link]

62. 'Update: UCAS Application Stats For 2022 Entry Medicine', The Medic Portal, [link]

63. It should be noted that the BioMedical Admissions Test (BMAT) will be discontinued from 2024/5. See 'Reforms to Cambridge Assessment Admissions Testing from 2024', Cambridge Assessment Admissions Testing [link]

64. Entry requirements for UK medical schools: 2022 entry, Medical Schools Council [link]

65. 'The Sunday Times is wrong about international medical students', Medical Schools Council, 13 March 2021 [link]

66. Double or quits: a blueprint for expanding medical school places, Royal College of Physicians [link], table 10



difficulty – to double the number of students will require more innovative approaches to identifying and attracting talented applicants, including from under-represented regions and groups, and making greater use of routes such as graduate entry or medical apprenticeships.

To demonstrate that this is the case, consider results from 2019, the most recent year in which the grading profile represents the non-pandemic grading profile, and to which Ofqual will be returning in future years.<sup>67</sup> In that year, just over 17,000 students got an A or above in Chemistry A-Level, which is typically required to enter medical school.<sup>68</sup> Only 66% of students taking A-Level chemistry will also take biology – also typically required at A grade for medical school – meaning a maximum of approximately 11,350 students will have achieved an A in A-Level chemistry AND taken A-Level biology.<sup>69</sup> This is already well below the 15,000 applicants required to double the number of medical places – particularly when one considers that, of that 11,350, not all will have achieved an A in A-Level biology (required by many, though not all, medical schools), not all will have a third A and, perhaps most fundamentally, not all will wish to study medicine, or will have the appropriate aptitudes, in terms of interpersonal skills or emotional intelligence, to do so effectively.

A similar pattern can be observed by considering an analysis of the UCAS data from 2022.<sup>70</sup>

Of 31,195 unique applicants for undergraduate medicine from whom data is available, there are 12,315 for whom achieved A-Level grade data is available, which will represent almost all of those students, domiciled in England, Wales and Northern Ireland, who applied through UCAS. We assigned each grade profile to one of the three categories:

Category	Grades within category	Number of undergraduate medicine applicants achieving these grades in 2022
<b>Met</b> ( <i>unambiguously meeting the typical AAA offer required</i> ):	A*A*A*, A*A*A, A*AA, AAA	6505
<b>Borderline</b> ( <i>just below, or arguable comparable, to the typical AAA offer required</i> )	A*A*B, A*A*C, A*A*, A*AB, AAB	1430
<b>Not met</b> ( <i>clearly below the typical AAA offer required</i> )	All other grades	4380

As can be seen, similar to the analysis set out above, it is clear there is not a sufficiently qualified pool of traditionally qualified candidates currently applying to undergraduate medicine to double the number of places.

### Broadening the talent pool

Widening access and participation has long been a challenge and objective for policymakers and medical schools alike. Those from less affluent backgrounds are less likely to apply and less likely to gain an accepted offer to study medicine.<sup>71</sup> Just 4.3% of applicants to Medicine, dentistry

67. Grading exams and assessments in summer 2023 and autumn 2022, *gov.uk*, 29 September 2022 [link]

68. 'Chemistry – A-Level', *Education Data Lab* [link]

69. Natasha Plaister, 'What are the most popular subject combinations at A-Level?', *Education Data Lab* [link]

70. Data in this paragraph is derived from data provided to Policy Exchange by UCAS for the purposes of this research.

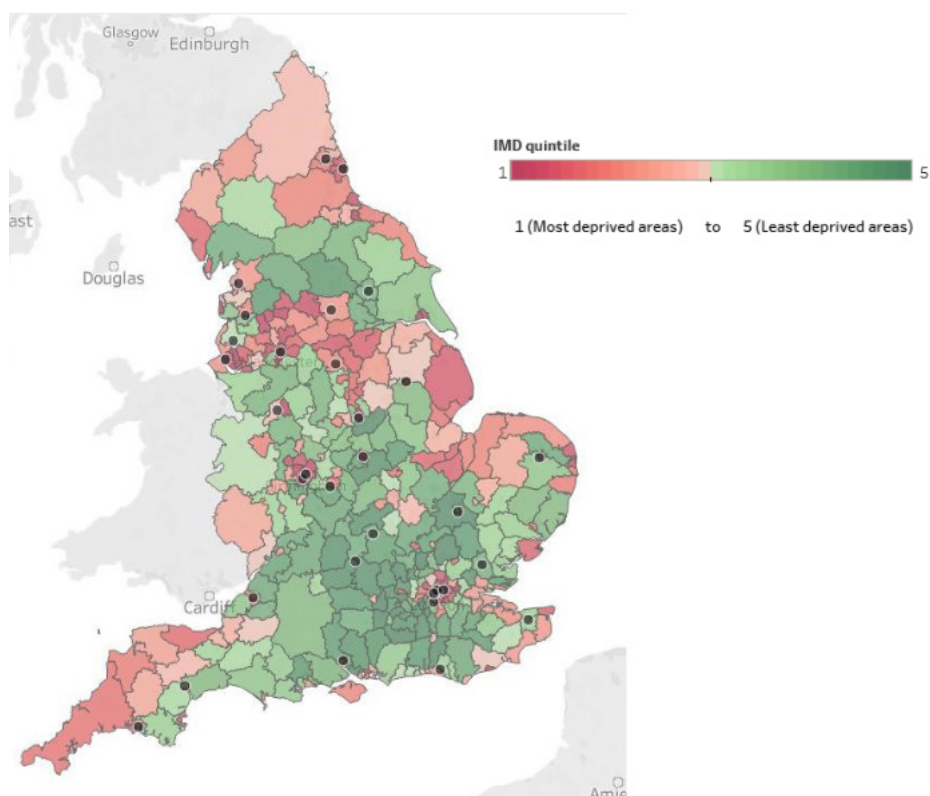
71. Kathryn Steven, Jon Dowell & Cathy Jackson, 'Fair access to medicine? Retrospective analysis of UK medical schools application data 2009-2012 using three measures of socio-economic status', *BMC Medical Education*, Vol. 16, No. 11 (2016) [link]

and veterinary science are from a disadvantaged background compared to an average of 10.9% for other subjects.<sup>72</sup>

### The importance of place

Opening new medical schools in areas of low higher education participation or high deprivation can be immediately impactful. Such schools can, firstly, provide a destination for talented students who are unwilling or unable to move away from home – perhaps for caring or financial reasons – but who are able to apply for a medical school within commuting distance. These new medical schools can also build strong local links, increasing aspiration and, more significantly, actively supporting student attainment amongst local schools and 6<sup>th</sup> form colleges, helping to enhance the pipeline of talent. As can be seen in Fig. 7 there remains significant room to open more medical schools in areas of high deprivation:

**Fig. 7 – Map of medical schools in England and the English Index of multiple deprivation**



*Source: Map taken from The expansion of medical student numbers in the United Kingdom, Medical Schools Council Position Paper (October 2021) [link]*

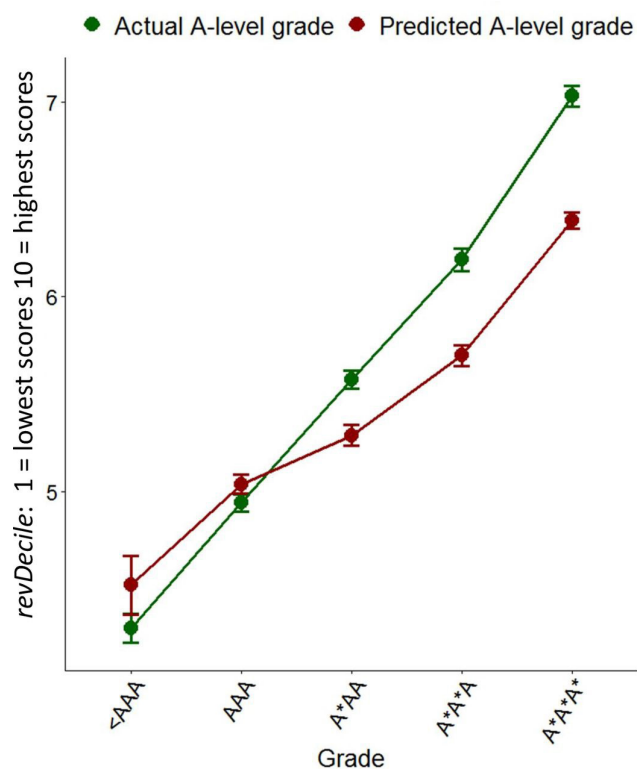
All of the new medical schools that opened following the 2018 expansion have demonstrated the strength of this: at the University of Sunderland for example, 28% of students are from POLAR 1 and 2 while 42% come from some form of widening participation background, including those who are care leavers, eligible for free school meals or with a household income below £42,750<sup>73</sup>.

72. Alexander J. Martin, Benjamin J. Beska & Greta Wood et al., 'Widening interest, widening participation: factors influencing school students' aspirations to study medicine', *BMC Medical Education* (30 May 2018) [link]

73. Information provided by the University of Sunderland

New medical schools can also support the policy objective of supplying more doctors to under-doctored areas. It has been shown in research by Goldacre et al. 2013 in their cohort survey of 31,353 UK trained doctors in 11 cohorts from 1974 to 2008, doctors were more likely to work in the region they trained in, with 48% undertaking specialty training in the same region as their medical school. In addition, 34% of respondents who had reached GP or consultant status has settled in the same region as their home.<sup>74</sup>

**Figure 8: “Mean Educational Performance Measure revDeciles (95% CI) in relation to actual A-level grades (green) and predicted A-level grades (red)”**



Source: Table reproduced from I. C. McManus, Katherine Woolf & David Harrison et al., ‘Predictive validity of A-level grades and teacher-predicted grades in UK medical school applicants: a retrospective analysis of administrative data in a time of COVID-19’, *BMJ Open*, Vol. 11, No. 12 (2020) [link]

74. Michael Goldacre & Jean Davidson et al. ‘Geographical movement of doctors from education to training and eventual career post: UK cohort studies’, *Journal of the Royal Society of Medicine*, Vol. 106, No. 3 (2013), 96–104 [link]

### Case Study – School of Medicine, University of Sunderland

The School of Medicine at Sunderland was launched with a mission to meet NHS workforce needs and to transform the health and wealth of Sunderland and the wider region, a socioeconomically challenged part of the UK.

A key driver of Sunderland's approach has been to make medicine accessible to those with the talent, but who have otherwise lacked opportunity. Outreach visits, teacher advice evenings and applicant summer schools have encouraged interest and instilled confidence in applicants. Admissions criteria are carefully considered to avoid unnecessary exclusions. Applicants have the opportunity to undertake Multi Mini Interviews and live practice. Whilst applicants are assessed through the Universities Clinical Aptitude Test, they are only excluded if performance falls within the two lowest deciles. These measures have enabled more students from disadvantaged backgrounds to remain in the applicant pool, even whilst the entry tariff (AAA) is typically met or exceeded.

Effective partnership working has been key to success. Sunderland has benefitted greatly from its partnership with Keele and the two universities both share values about the wider economic and social value of medical education and a focus on producing graduates to work in general practice and psychiatry. Effective partnerships have also been created with hospital trusts, GP practices, Health Education England and Newcastle University, the other local provider. Sunderland has established joint operational processes, bringing all these organisations together, ensuring trusts can host students from both Newcastle and Sunderland, demonstrating that creating a new medical school does not necessarily destabilise placement provision for others. Placement monitoring and information sharing occurs in bi-monthly meetings.

The establishment of the School was made possible because of infrastructure investments by the University for wider health provision, and a business plan that showed recurrent costs would be met in time. The University has invested over £25M in clinical simulation, laboratories and mock wards, with a further £16M since 2019. Investments include a cadaveric facility, a technology-enhanced active learning space, and a suite of problem-based learning rooms. Modest initial pump priming from Health Education England assisted with early clinical placements.

By creating a strong 'brand' for generalism in medical practice, the School has achieved a high out-turn into generalist specialties as well as retaining a significant proportion of the trained workforce locally. The presence of the medical school is thought to contribute c.£20M of income to the local economy annually.



Image reproduced with kind permission of the University of Sunderland; Copyright University of Sunderland

### Access and outreach

Beyond this, there are a number of potential ways to widen the applicant pool without diluting quality. A-Level grades remain a highly valid predictor of future academic attainment, with performance at A-Level correlating strongly with future attainment on a medical degree (see Fig. 8, p. 33). Other studies have similarly shown support for the Academic Backbone model, with school attainment predicting performance in undergraduate and post-graduate medical assessments, and the effects spanning many years.<sup>75</sup>

Nevertheless, while A-Levels remain a strong predictor, they are not the

75. I.C. McManus & Katherine Woolf et al., 'The Academic Backbone: longitudinal continuities in educational achievement from secondary school and medical school to MRCP(UK) and the specialist register in UK medical students and doctors', *BMC Medicine*, Vol. 11, No. 242 (2013) [link]

only predictor, and the diversity of application requirements and potential routes into medical school provide opportunities to identify talent in broader ways, while simultaneously ensuring that application procedures are fair, transparent and non-discriminatory with regards to sex, ethnicity or any other elements of a student’s characteristics or background.

High performance on aptitude tests such as BMAT and UCAT are also strong predictors of future attainment. Rather than adopting a requirement for very high scores on both these tests and in A-Levels, medical schools could consider whether high performance on one measure could permit a lower performance on another. The University of Sunderland, for example, already does this: only the bottom 20% of performers on UCAT are eliminated, with A-Level grades, interviews and other considerations used to select amongst the others.<sup>76</sup> Other medical schools could consider adopting a similar approach; alternatively, more medical schools could consider whether high performance on UCAT or BMAT could give them confidence to admit students with slightly lower A-Level grades, such as AAB or ABB.

The Office for Students is currently asking universities to consider how they could do more to raise attainment in schools<sup>77</sup>. This provides an opportunity for medical schools to extend their efforts in this area. Findings show that tailored outreach is required, build familiarity, confidence, etc.<sup>78</sup> Some schemes, such as the extended medical degree programme at King’s College London have shown early promise.<sup>79</sup> Gateway courses, designed to attract and targeted at students under-represented in medicine, are becoming increasingly popular, with approximately 15 such programmes now in operation.<sup>80</sup> One review shows modest evidence that gateway courses allow students from under-represented groups to achieve greater academic potential.<sup>81</sup> There is also strong evidence that targeted tutoring is an effective way to raise attainment amongst all students<sup>82</sup>, and providing tutoring to students from disadvantaged backgrounds who could not otherwise afford it is again a means whereby medical schools could help to widen and diversify the range of suitable applicants. The Universities of Exeter and Cambridge are amongst universities to have already established such schemes.<sup>83</sup>

### Graduate and mature entry

The final way in which the talent pool could both be increased and diversified is through a significantly greater emphasis and expansion of graduate and mature entry. Currently, just over 500 – or under 10% - of the placements for medical school are for graduate entry, although at some medical schools this represents a significantly higher proportion of the total intake<sup>84</sup>. There is a tremendous opportunity to dramatically increase this number. A further advantage of this route is that graduate medicine is only a four-year course, thereby potentially increasing the number of doctors working within the NHS more rapidly.

The Office for Students has identified increasing pathways for mature learners as a key priority for widening access to higher education.<sup>85</sup> When

76. Information provided by the University of Sunderland.

77. Access and participation plans, *Office for Students* [link]

78. Alexander J. Martin & Benjamin J. Beska et al., ‘Widening interest, widening participation: factors influencing school students’ aspirations to study medicine’, *BMC Medical Education*, Vol. 18, No. 117 (2018) [link]

79. Extended Medical Degree Programme MBBS [link]

80. Selecting for Excellence, *Medical Schools Council* [link]

81. Sally Curtis & Daniel Smith, ‘A comparison of undergraduate outcomes for students from gateway courses and standard entry medicine courses’, *BMC Medical Education*, Vol. 20, No. 4 (2020) [link]

82. Small group tuition, *Education Endowment Foundation* [link]

83. Year 10 Tutoring Pathway (South West only), *University of Exeter* [link]; STEM Smart, *University of Cambridge* [link]. Note that these schemes are not unique to medicine, nor need they be to be effective.

84. Tamsin Dyer, ‘How Difficult is Graduate Entry Medicine?’, *Medic Mind* [link]

85. Mature and part-time students, *Office for Students* [link]

recruiting at graduate level, medical schools have a much broader array of evidence to draw on. A-Levels and cognitive tests, of course, remain valid, but some students who underperformed at school may have developed and excelled at university – either entering at 18 or later, through mature study – and can demonstrate high academic ability through this means. Other individuals may also have demonstrated their ability through professional experience, either in the NHS or elsewhere, which can satisfy admissions departments that the individual is capable of completing a medicine degree. Mature learners, as they are making a more active decision to return to study, can also be more self-motivated and better able to learn than younger students. A study has shown that, after taking into account other factors such as entry qualifications, mature graduates have a seven-percentage point advantage over young graduates, which means that mature students with the same entry qualifications as younger students do better in their studies.<sup>86</sup>

Particularly for those already working in other healthcare roles within the NHS, the new Medical Doctor Degree Apprenticeship may also offer a key route for growing and diversifying the talent pool. Health Education England states that the apprenticeship, “offers NHS organisations the opportunity to grow their future medical workforce and attract and recruit from a wider pool of people in the local community. It also gives individuals, who for a multitude of reasons may be unable to attend university full time, a new route to train as a doctor.”<sup>87</sup>

In conclusion, while broadening the talent pool sufficiently to fill 15,000 medical places per year without lowering standards will not be easy, we are confident that, with sufficient imagination and effort, it is possible. This will require opening medical schools in areas of under-representation; a significant increase in outreach and access efforts, including those that directly support raising academic attainment in unrepresented groups; considering how the UCAT and A-Level grades can be interpreted in the round to identify those with the ability to succeed; and the significantly enhanced use of graduate entry routes, including the new Medical Doctor Degree Apprenticeship.

#### 4. Adapting curricula and course structure

Medical schools must demonstrate that their graduates have met all the GMC’s requirements in terms of knowledge, skills and behaviours.<sup>88</sup> However, one of the strengths of the UK’s system is that schools develop their own curricula and the means by which students acquire the necessary skills and knowledge.<sup>89</sup> UK medical schools are currently collaborating to set and deliver a final common test of applied knowledge (the medical licensing assessment, or MLA), regulated by the GMC. From 2024 the common pass mark will provide confidence that every graduate possesses the required minimum level of knowledge.<sup>90</sup>

In the interviews we conducted, we heard from Medical Schools keen to learn how they could further move from time-based to competency-based approaches, and to enable greater flexibility and individualisation for their students. Improved surveillance of student progress was regarded

86. Ibid.

87. Medical Doctor Degree Apprenticeship, *Health Education England* [link]

88. Rather, there are a set of standards and ‘Outcomes for Graduates’, see Standards, guidance and curricula, *General Medical Council* [link]. For an overview of current curricula, see Courses at medical school, *British Medical Association* [link]

89. Courses at medical school, *British Medical Association* [link]

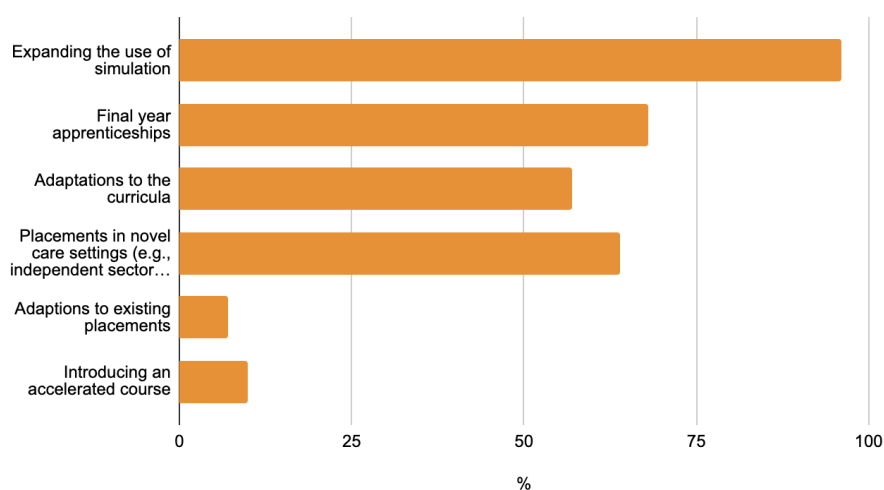
90. The introduction of The Medical Licensing Assessment (MLA) – a two-part assessment will include an **applied knowledge test (AKT)**, an on-screen exam, with multiple choice questions, whilst **The clinical and professional skills assessment (CPSA)**, a practical assessment of your clinical skills and professionalism – will be implemented from 2024/25. Schools will continue to set their final exams – but, when the MLA is launched, exams will need to meet GMC requirements. ‘New assessment for prospective GPs to come in from 2024/25’, *Pulse*, 27 July 2020 [link]

as a key enabler. We also heard of the opportunities presented by online learning and in expanding ‘virtual placements’ as a novel approach to tackling clinical placement shortages and in developing the capabilities that undergraduates would increasingly need as part of clinical service over their careers, such as delivering remote consultations, learning about the ethical implications of medical innovations, such as artificial intelligence or in data analytics to support population health planning.<sup>91</sup>

Despite a wide variety of approaches taken to medical education, some specialisms have long-standing concerns about their lack of representation in medical school curricula, teaching posts and in access to placements.<sup>92</sup> A 2020 study in the *British Journal of General Practice* revealed that the median proportion of medical curriculum assigned to GP teaching was 9.2%. The same study found no significant difference in the percentage of GP teaching based on a school’s location (England versus devolved nations; north versus south). However, the percentage of GP teaching in ‘older’ medical schools was significantly lower than that in ‘newer’ medical schools.<sup>93</sup> There is a need therefore to address this imbalance.

In surveying current Medical Schools, we asked respondents to consider the features of their current curriculum they were most interested in adapting or considering for future reform (see Fig. 8).

**Figure 9: Thinking about the design of your curriculum, which of the following, if any, are you: (% of respondents noting each response)**



### The use of simulation

All but one of the Medical Schools responding to our survey (see Fig. 9) noted that an expanded use of simulation was something currently being undertaken (or seriously considered).

‘Simulation’ is an “artificial representation of a real-world practice scenario that supports student development and assessment through experiential learning with the opportunity for repetition, feedback, evaluation and reflection”.<sup>94</sup> Simulation-based education (SBE) or

91. Oranicha Jumreornvong & Emmy Yang, ‘Telemedicine and Medical Education in the Age of COVID-19’, *Academic medicine*, Vol. 95, No. 12 (2020), 1838-1843 [link]; Ali Asghar Hayat & Mohammad Hasan Keshavarzi et al., ‘Challenges and opportunities from the COVID-19 pandemic in medical education: a qualitative study’, *BMC Medical Education*, Vol. 21, No. 247 (2021) [link]

92. Maulina Sharma, Ruth Murphy & Gillian A Doody, ‘Do we need a core curriculum for medical students? A scoping review’, *BMJ Open*, Vol. 9, No. 8 (2018) [link]

93. Emily Cottrell & Hugh Alberti et al., ‘Revealing the reality of undergraduate GP teaching in UK medical curricula: a cross-sectional questionnaire study’, *British Journal of General Practice*, Vol. 70, No. 698(2020), e644-e650 [link]

94. Definition from ‘Pandemic Powered Improvements: Best practice in innovative healthcare education placements created during the pandemic’, *Council of Deans of Health* [link], p. 3

95. Margaret Bearman, Debra Nestel & Pamela Andreatta, 'Simulation-based medical education' in Kieran Walsh (ed.), *Oxford Textbook of Medical Education* (Oxford, 2013), pp. 186–197 [link]
96. Simulation-based education at Manchester Met, *Manchester Metropolitan University* [link]
97. Rashmi Datta et al. 'Simulation and its role in medical education', *Medical Journal of the Armed Forces of India*, Vol. 68, No. 2 (2012), 167–72 [link]
98. Technology Enhanced Learning, *Health Education England* [link]
99. David A Cook & Rose Hatala et al., 'Technology-enhanced simulation for health professions education: a systematic review and meta-analysis', *JAMA*, Vol. 306, No. 9 (2011), 978–88 [link]
100. Enhancing UK Core Medical Training through simulation based education: an evidence-based approach: Full systematic review results, *Health Education England* [link]
101. Aby Mitchell, 'Using simulation exercises to improve student skills and patient safety', *British Journal of Nursing*, Vol. 30, No. 20 (2021) [link]; Thomas Dale MacLain, Nicholas Lowe & Jeremy Dale, 'The use of simulation in medical student education on the topic of breaking bad news: A systematic review', *Patient Education and Counseling* [link]
102. H. Higham & B. Baxendale, 'To err is human: use of simulation to enhance training and patient safety in anaesthesia', *British Journal of Anaesthesia*, Vol. 119, Supp. 1 (2017), 106–114 [link]
103. Marc A Seifman, Abby B Young, Debra Nestel, 'Simulation in plastic and reconstructive surgery: a scoping review', *International Journal of Healthcare Simulation*, Vol. 1, No. 2, 2–13 [link]
104. 'Enhancing education, clinical practice and staff wellbeing. A national vision for the role of simulation and immersive learning technologies in health and care – Technology Enhanced Learning (TEL)', *Health Education England* (November 2020) [link]
105. Christa, Palancia Esposito & Kelly Sullivan, 'Maintaining Clinical Continuity Through Virtual Simulation During the COVID-19 Pandemic', *The Journal of Nursing Education*, Vol. 59, No. 9 (2020), 522–525 [link]
106. Mimi Launder, 'Simulated learning hours to double for student nurses', *Nursing in Practice*, 29 November 2021 [link]; The NMC first allowed students to replace 300 clinical practice hours with simulation in February 2021, as part of part of a series of recovery standards introduced in response to Covid-19, see 'Recovery and emergency programme standards', *Nursing and Midwifery Council* [link].
107. Neil Malcolm Harrison & Ashley Dennis, 'Developing an integrated national simulation-based educational programme for Scottish junior doctors through structured, multistep action research cycles', *BMJ Open*, Vol. 12, No. 8 (2022) [link]
108. Mayur Gami, Shilen Shah & Alexander Hartland, 'Perspective of a Teaching Fellow: Innovation in Medical Education: The Changing Face of Clinical Placements During COVID-19', *Journal of Medical Education and Curricular Development*, 11 March 2022 [link]

Simulation-based learning (SBL) provides a structured environment in which practitioners can learn or practise skills without causing harm to patients.<sup>95</sup> SBE or SBL can include both physical simulation, such as the use of mannequins or patient actors. For instance, Manchester Metropolitan University has developed a 'Social Development Laboratory' – a realistic home environment with a bathroom, kitchen, bedroom and living room to recreate home-based scenarios to support the development of communication, empathy and listening skills.<sup>96</sup> SBL can also include modes of virtual simulation, such as the use of virtual reality (VR).<sup>97</sup>

SBE is increasingly becoming a vital component of medical education. The Annual Report of the Chief Medical Officer in 2008 provided an impetus to its growth and in 2013, Health Education England launched a Technology Enhanced Learning (TEL) Programme to support its expansion throughout medical education.<sup>98</sup> Simulation – in comparison with no intervention or when added to traditional practice – is often associated with better learning outcomes.<sup>99</sup> Improved patient outcomes from certain core medical training procedures (including central venous catheterisation, thoracentesis, abdominal paracentesis) and emergency presentations (cardiorespiratory arrest) can result if taught using SBE, according to a systematic review from HEE.<sup>100</sup> Further benefits can include improved patient safety and interprofessional working.<sup>101</sup>

Simulation training today largely addresses high-complexity procedures, and was pioneered in anaesthetics and surgical training.<sup>102</sup> There are however many under-represented areas, including low-complexity procedures and activities addressing communication, collaboration, management and leadership.<sup>103</sup> There is also the potential for an expanded role for simulation in stimulating interest in medicine and dentistry more widely. NHS Ambassadors could leverage simulation to enhance awareness of NHS working environments and career opportunities.<sup>104</sup>

The effectiveness of virtual simulation during the pandemic has accelerated opportunities to use virtual simulation to support clinical learning experiences.<sup>105</sup> Both the General Medical Council (GMC) and the Nursing and Midwifery Council (NMC) advocate its use in undergraduate training. The NMC now stipulates that up to 600 hours (of a total 2300 practice hours required to qualify) can be delivered by SBE where universities have the capability to deliver it, a recent increase from a former maximum of 300 hours.<sup>106</sup> This increasing drive by bodies to include simulation in healthcare curricula means that effective sharing of best practice and effective implementation in curricula is increasingly important.<sup>107</sup> HEE's technology enhanced learning team's work with the Association of Simulated Practice in Healthcare (ASPiH) is likely to be beneficial in this regard, whilst there is much to learn from the work of medical schools or placement providers who have adopted blended learning approaches, such as that introduced in Broomfield Hospital, Mid Essex where student-patient interactions on the ward were supplemented with virtual and face-to-face teaching sessions.<sup>108</sup>



## Virtual reality

Virtual reality (VR) has particular utility in helping to create “difficult to simulate” scenarios, providing greater immersion for the user and ensuring more consistent educational experiences.<sup>109</sup> One study examining use of VR in antibiotic prescribing found it to be a useful training tool, where other initiatives have failed to induce behaviour change, with an ability for users to develop greater self-awareness and to modify future reactions.<sup>110</sup> The results of a pilot study from Cardiff University meanwhile, in which virtual reality videos were used in undergraduate palliative and oncology medical teaching has now been “permanently introduced into routine teaching”.<sup>111</sup> Another recent study from the University of Liverpool has demonstrated ‘significant improvements’ in students’ acquisition of key psychiatric skills and exposure to psychopathology. The study however reflected that further analysis was required to evaluate the efficiency and cost-effectiveness of virtual-reality over more traditional methods.<sup>112</sup>

Simulation can clearly ‘steepen the learning curve’. However – as our roundtable participants and interviewees made clear – students need proper contact with ‘real patients’ and the ‘real service we are preparing them to work in’. A review of a variety of teaching modalities in second-year rheumatology at a single institution between 2013 and 2017 for instance found that “technologically advanced novel learning strategies were outperformed by the more traditional active learning modality of Live Patient Encounters.”<sup>113</sup>

## Course adaptations

The expanded use of simulation – for instance – has led some to question whether there are possibilities to create accelerate medicine courses. We are of the view that this is something which ought to be considered by institutions only for those considering graduate entry and where a significant period of clinical service (at least three years) or a high-level of life sciences proficiency (such as candidate that had been awarded a PhD in a relevant field) had already been developed.

We foresee greater opportunities to enable flexibility for those who wish to continue contributing to clinical service during their study of undergraduate medicine. Other considerations could include adapting the final year of undergraduate study to embed an ‘internship’ before the start of the Foundation Programme. This is a subject of contention within existing schools. Some responding to our survey thought an internship at the end of the programme “should be mandated” to improve preparation for practice, with some recommending the establishment of an “F1 locum appointment for training” position.<sup>114</sup> Others did not agree with the notion of a final-year internship at all. This, “would make the course much too short and risks quality” as one response put it.

Other medical schools informed us that they wished to maintain the current length of the course, but make more use of final-year apprenticeship models, graduate pathways or part-time learning for existing clinical staff, stating that these approaches would enable them to enhance access and

109. Fátima Gutiérrez et al. ‘The effect of degree of immersion upon learning performance in virtual reality simulations for medical education’, *Studies in health technology and informatics*, Vol. 125 (2007), 155-160 [link]

110. Caroline Fertleman & Phoebe Aubugeau-Williams et al., ‘A Discussion of Virtual Reality as a New Tool for Training Healthcare Professionals’, *Frontiers in Public Health*, 26 February 2018 [link]

111. Mark Taubert, Lucie Webber & Timothy Hamilton, ‘Virtual reality videos used in undergraduate palliative and oncology medical teaching: results of a pilot study’, *BMJ Supportive and Palliative Care*, Vol. 9, No. 3 [link]

112. Alexander Challinor & Declan Hyland, ‘A literature review for the introduction of psychiatric simulation to University of Liverpool Medical School’, *BJPsych Open*, Vol. 7, 51 (2021) [link]

113. Cory J. Rohlfen & Harlan Sayles et al., ‘Innovation in early medical education, no bells or whistles required’ *BMC Medical Education*, Vol. 20, No. 39 (2020) [link]

114. Anne Harvey, ‘Covid-19: medical schools given powers to graduate final year students early to help NHS’, *BMJ*, 26 March 2020 [link]

provision to a wider variety of qualified applicants. There was strong consensus that none of these approaches should be imposed in a blanket way upon the sector, but that some or all could have merit if deployed by individual medical schools.

We are of the view that – echoing the flexibility of curricula design at large – in 2024, the GMC should develop a new framework through which to assess, and to accelerate the approval of course adaptations at existing and new schools to enable an expansion of the number of part-time, or accelerated courses, final-year apprenticeships and graduate pathways.

### Optimising the teaching workforce

A further barrier to expanding medical school places at pace is the lack of educators – and particularly, the clinical academic workforce – which undertakes the vast majority of work to develop and deliver curricula and to support students through medical school. Clinical academics make up around 4.6% of the medical consultant workforce of the UK (and less than 0.1% of the workforce for Nursing, Midwifery, Allied Health Professionals (NMAHPs)).<sup>115</sup> With an ongoing high clinical service demand, competition for clinician time (between delivery of service, research and education) becomes increasingly pressing, creating a knock-on effect for the overall number of educators and upon a number of outputs, such as the volume of clinical research. This is notable, because where high-quality clinical research, high-quality patient care follows.<sup>116</sup> Placing medical schools appropriately can have a beneficial role in the recruitment and retention of staff too, in which a workforce, drawn principally from a defined catchment area, more likely to remain in post to serve their local population.

There is – in particular – an insufficient focus on academic primary care medicine, impacting on the career choices of potential academic trainees (and indeed the GP profession at large). The ‘Wass Review’, *By Choice Not Chance* (2016), shows that only 6% of medical school clinical academics are in primary care, despite GPs forming 50% of the workforce. The report also reveals that a large portion of general practice research is now held within the nine schools within the National School for Primary Care Research, diluting students’ access to primary care research across the remaining medical schools.<sup>117</sup>

One approach is to move to formalising ‘medical educator’ posts, more closely aligned to those which have been established in the USA and Canada, with a view to creating greater parity of esteem. Key to this is resolving a set of tensions which persist between joint appointments, pensions, Research Excellence Framework requirements. Currently, these issues create barriers and inhibit clearer career progression compared with the requisite steps to advance a clinical career toward consultant posts.<sup>118</sup> Fig. 10 – shows the variety of approaches that can be taken at present.

“Multifaceted programmes of training, including protected time, relational and support aspects” have been shown in a recent study as appearing most successful in promoting clinical academic careers.<sup>119</sup> There

115. The Medical and Dental Clinical Academic Survey, CATCH [link]

116. Robert Ede & Sean Phillips, ‘A single bus ride may have saved more than a million lives: what the Government can now do to further boost clinical research’, *Policy Exchange*, 21 January 2022 [link]

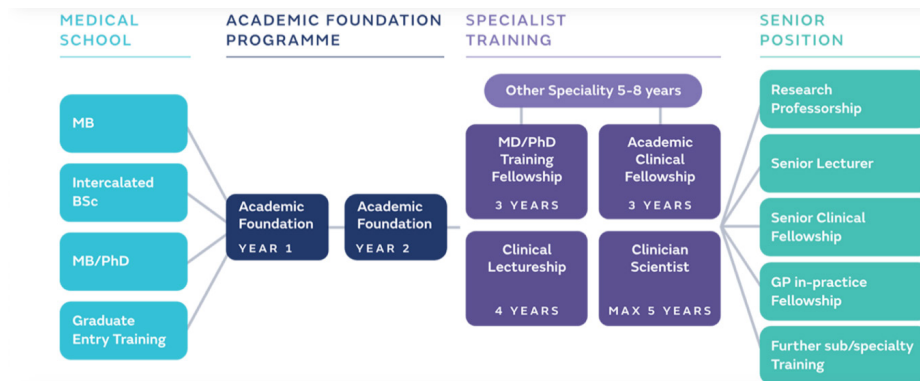
117. By choice – not by chance: Supporting medical students towards future GP careers (November 2016) [link]

118. This is not just the case for those studying medicine, but also nursing, AHPs etc. Dorothea Baltruks & Patrick Callaghan, Nursing, midwifery and allied health clinical academic research careers in the UK, *Council of Deans of Health* (August 2018) [link]

119. Gary Raine & Connor Evans, ‘Strengthening the clinical academic pathway: a systematic review of interventions to support clinical academic careers for doctors and dentists’, *BMJ Open*, Vol. 12, No. 9 (2021) [link]

is a need therefore for Clinical Teaching Fellows (higher trainees funded by the Tariff) to have protected teaching time and job plans to create clearer pathways to undergraduate teaching.

**Figure 10: Example medical clinical academic training pathway**



Source: Example medical clinical academic training pathway, CATCH [link]

We would wish to see the number of clinical academics engaged in teaching significantly increased over the coming decade, (commensurate with Medical School place expansion) to create a sustainable pipeline of educators. Support for the current workforce, many of whom are retiring early or leaving the medical profession early is also needed. We believe that a dedicated scheme to enable near- or recent retirees to teach as a protected activity should be introduced by the Government. The role of GP Teaching Fellow should be developed and enhanced in England, echoing recommendations made by the Scottish Government’s review of medical education in 2019.<sup>120</sup> We believe that such developments can also produce a net-positive research spin-off, benefitting the NHS, higher education sector and life sciences sector at large.

NHS Employers should consider amendments to the Consultant contract (2003) to stipulate that educational supervision is required as a core component of their employment. Amendments to *Good medical practice* (GMP) to improve recognition of teaching as a core competency and requirement of clinical practice could also be considered.<sup>121</sup>

## 6. Delivering Placements

The availability of clinical training placements is a further rate-limiting factor on the ability to expand medical school places.<sup>122</sup> Consistently during our research, it was made clear to us that the expansion of medical school places must come with a concomitant increase in the number of Foundation Programme and specialist training places. As such, the introduction of larger undergraduate cohorts will require careful planning to minimise “bottlenecking” within postgraduate training pathways.<sup>123</sup> This is a pressing issue. In 2021, the number of Foundation Programme (F1) applicants on the ‘reserve list’ was 494, a ten-fold increase on 2016. In 2022 it had almost doubled to 791, meaning – in some cases – a near

120. John Gillies, ‘Undergraduate medical education: recommendations’, *Scottish Government* (October 2019) [link]

121. Domain 3: Communication partnership and teamwork, *General Medical Council* [link]

122. Khadija Meghrawi & Omolara Akinnawonu, ‘Recurrent oversubscription of the UK Foundation Programme reflects the government’s failure to plan for the medical workforce’, *BMJ*, 18 March 2022 [link]

123. The state of medical education and practice in the UK 2021, *General Medical Council* [link]

year-long delay before taking up a place on the programme.<sup>124</sup>

This is a pressing issue for some specialisms, such as general practice, and given a wider need to boost medical generalist skills.<sup>125</sup> Yet the benefits to clinical service from boosting the number of educators and fostering an educational environment are clear. A recent study shows receiving care in a postgraduate GP training practice was associated with both improved patient satisfaction and ‘more appropriate secondary care usage’.<sup>126</sup>

This is partly a funding challenge, with respondents reflecting that HEE income and tariff had reduced significantly over past decade and was unlikely to be enough to cover costs if student numbers expanded with new (and sometimes, more expensive) modalities for teaching required. It also relates to the state of NHS services at large and their ability to provide a high-quality and supportive experience and adequate space to students – one in which they feel inspired to commit to, over the longer term.

Consistently during our research, we heard of a need to innovate in how clinical placements are delivered to meet future demand. Many of those we spoke to reflected the challenge of balancing a need to distribute doctors effectively across the country, whilst noting the opportunities of working in the ‘big centres’. With 1800 of the current 7500 annual intake of medical students based in London, this skew is reflected in postgraduate training also. By way of example, almost 25% of ophthalmology trainees in England are London-based, yet it is in the East of England and Southwest England where the greatest burden of eye disease in an ageing population will be.<sup>127</sup> Others reflected the possibilities of thinking beyond large acute hospitals as primary placement providers, through the innovative use of community hospital, primary care and virtual placements to increase capacity without impinging on established medical school neighbours. The aim, many reflected, was a need to create the conditions whereby those on placements were regarded as assets, rather than another challenge to delivering clinical service.

Two case studies below – both from large acute providers, Manchester University NHS Foundation Trust and Guy’s and St Thomas’ NHS Foundation Trust respectively – present a useful portrait of the opportunities and challenges currently facing placement providers.

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124. Caitlin Tilley, ‘Almost 800 medical graduates unallocated for FY1 places’, *Pulse*, 11 March 2022 [link]

125. Emily Cottrell & Hugh Alberti et al., ‘Revealing the reality of undergraduate GP teaching in UK medical curricula: a cross-sectional questionnaire study’, *The British Journal of General Practice*, Vol. 70, No. (2020), e644-e650 [link]

126. Sanjiv Ahluwalia & John Spicer et al., ‘Understanding the relationship between GP training and improved patient care – a qualitative study of GP educators’, *Education for Primary Care*, Vol. 31, No. 3 (2020), 145-152 [link]

127. Vishal Shah & Jordan Marshall et al., ‘Ophthalmology in England: how is training geared to supply our future workforce?’, *Eye* (9 November 2022) [link]

Case Study – Manchester University NHS Foundation Trust



**Manchester University**  
NHS Foundation Trust

Manchester University NHS Foundation Trust (MFT) is one of the largest acute Trusts in the UK, employing over 28,000 staff, with ten hospital sites. The Trust provides a wide range of services from comprehensive local general hospital care through to highly specialised regional and national services and is the biggest provider of specialist services in the north west.

**Current Student Numbers**

Stage 2: Year 2	
Total Year 2	
Stage 2: Year 3	
Total Year 3	279
Stage 3: Year 4	
Total Year 4	280
Stage 3: Year 5	
Total Year 5	262
Total All years	821

MFT provides 821 clinical placements for Manchester University Medical School, and affiliates with District General Hospitals (DGHs) to do so. The Trust have been approached about expanding numbers of clinical placements. There are a number of barriers to this expansion:

- Increased competition for clinical space and supervision from other clinical specialities who need education and training.
- With their affiliate model, the DGHs who provide clinical placements are being approached by private medical schools simultaneously. There are potentially more students being placed for the same number of patients and at a quicker rate than education supervisors can be put in place, despite utilising additional clinical fellows. We get reports that placements already feel overcrowded.
- Operational and workforce pressures, as well staff burnout, has reduced enthusiasm for undergraduate supervision. This also contributes to difficulties in supporting certain modules and Clinical Competency Assessment examiners.
- The lack of financial transparency on how funding moves from Health Education England to frontline services makes it difficult to enable services to facilitate supervision being factored into job plans, and plan for future expansion. This also makes it harder to hold services to account for undergraduate training.
- There are wider social factors that also need to be addressed. This includes insufficient travel monies and accommodation for students to travel to distant workplaces. There are also instances where students are discriminated against by peers, supervisors and other staff.



Image courtesy of MFT

MFT has changed its education practice to reflect the changes in curriculum and GMC standards, with assessment of skills being mandated. This includes specific preparation for the Medical Licensing Assessment when it is introduced. The Trust has increased use of virtual working in both clinic and teaching which has been working well. MFT uses real-time data from students to review placement performance and recognise the best supervisors through annual awards.

MFT is supportive of giving final year students more of a 'hands-on' role in clinical teams and the curriculum is already designed for this to be an apprenticeship for foundation training, with the ability to do shadow actions through the Electronic Health Record. MFT has a Feedback Orientated Observed Teaching scheme that helps with this, which is supported by a virtual ward project that is about to be rolled out on a wider scale.

One of the challenges in the future will be balancing the dynamics with our university, affiliates and private medical schools to provide clinical placements across a finite number of patients and supervisors, and how we integrate and coordinate students from multiple facilities and their requirements on individual sites. We have introduced a specific placement lead to look at expanding capacity, work collaboratively with medical schools and strengthen relationships.

Case Study – Guy’s and St Thomas’ NHS Foundation Trust



**Guy’s and St Thomas’**  
NHS Foundation Trust

Guy’s and St Thomas’ (GSTT) are one of the UK’s leading providers of hospital and community-based healthcare, research and education. The Trust has five main hospitals in London and works in the community in Lambeth and Southwark to provide a full range of lifelong, general and specialist care.

GSTT provides clinical placements for 532 students for GKT Medical School – Kings College (GKT) and GKT has requested to increase student numbers in the future. While possible in some areas there are limitations in others;

Stage 2: Year 2	
Total Year 2	176
Stage 2: Year 3	
Total Year 3	172
Stage 3: Year 4	
Total Year 4	90
Stage 3: Year 5	
Total Year 5	94
Total All years	532

- **Clinical service pressures:** teaching clinics are required to be templated to see fewer patients but waiting times are rising. Workforce pressures and lack of clinical teaching staff time also inhibit training.
- **Insufficient educational capacity to deliver mandatory skills in the clinical environment:** some services have reached maximum capacity to enable all students to meet real patients.
- **Educational space limits on hospital site:** major limitation to expansion on a constrained site. Simulation centres are expensive and space heavy and are not a replacement for learning in clinical areas.
- **Requirements to train other members of the multi-disciplinary team:** Hospital birth centre needs to train midwives, and increasing MBBS students impacts on midwifery training.
- **Curriculum design:** If students are only on placement two days per week, this inhibits uptake of clinical opportunities on non-placement days.
- **The need to provide all placements for students in one trust to provide continuity:** spare capacity in cardiology cannot be utilised as students also need training in neurology which has reached capacity.
- **Restructure of clinical services in a network:** availability of patients with neurological problems with no neurology in-patients

As a result of recent curriculum and delivery of care changes (and the COVID Pandemic) GSTT has completely reorganised the structure of their undergraduate clinical placements and UGME delivery. This included implementing and evaluating:

- Complete redesign of timetables using a blended learning approach to focus on the specific learning outcomes determined by the new curriculum and the GMC requirements. Emphasis on equity of delivery of the basics for all students.
- Selective use of clinical environment to provide what cannot be taught elsewhere.
- Using patient educators and actors as well as development of innovative clinical skills, virtual reality and simulation programmes to prepare students for clinical environment learning and reduce pressure on clinical areas – while recognising the limitations of these devices.

- Recruitment of educational fellows: Junior doctors with dedicated time for undergraduate teaching.
- Responsibilities transferred to the Trust: clinical OSCE examination delivery and academic supervision of students.
- Creation of a new UGME administration, delivery and governance structure to ensure quality and safe learning at scale, including extensive use of online platforms.

Clinical placement educational capacity was not considered in the design of the curriculum, but is now the basis of a collaborative trust-medical school working group going forward. These changes have resulted in improved UGME quality (reflected in improved NSS scores). However, these measures are considerably more expensive to deliver. Costs have increased simultaneously with the undergraduate tariff reducing (income has halved in the last seven years).

## Expanding the Range of Placement Providers

Increasingly, patients are cared for in primary care, or by third sector or independent providers. This is not yet however reflected in the balance of where clinical placements take place. The development opportunities of the third sector are already being recognised by some institutions. Sheffield Medical School has a mandatory four-week social accountability placement for its third-year doctors. At the University of Leeds, whilst on placement in general practice in years one and two, students work with voluntary groups close to the GP practice they are attached to.<sup>128</sup> The intention of these placements in particular is to provide students with practical learning experiences away from clinical settings.<sup>129</sup>

We also foresee opportunities to mature relationships with the independent sector, which should be regarded as a partner and catalyst to the necessary expansion in placements. With a greater number of patients being treated on the NHS in independent sector settings (38% of all NHS ophthalmology, and trauma & orthopaedic patients were treated by independent sector providers in 2021 for instance).<sup>130</sup> Throughout our research, we consistently heard of a growing appetite from providers to go further in supporting medical education and in expand the number and range of clinical placements offered. The nature of this offer will ultimately depend upon relationships at a local level, and we ought to be conscious of the geographic skew of the independent sector toward the ‘Greater South East’. But there are innovative approaches that ought to be explored. When providers are contracted to deliver elective, clauses could be introduced, ensuring that provision for placements and medical education are accommodated. Independent sector providers may wish to consider strengthening their partnerships with Medical Schools directly by offering a select number of scholarships to applicants, perhaps as part of widening access initiatives, on the condition that a proportion of clinical placements over the course of their studies are undertaken within their facilities.

Other approaches which should be explored include a further expansion of ‘virtual’ placements. A quality improvement project from the University of Nottingham produced “findings [which] are reassuring and suggest that transition to virtual small group teaching, using methods such as flipped classrooms and blended learning, enables continued and sustained delivery of high-quality education and student experiences in primary care.”<sup>131</sup>

We believe that by 2024, DHSC should explore expanding the range of placement providers covered by the Education and Training Tariff. There should be a focus upon primary and community care (such as hospices) as well as leveraging the role that the third sector and independent sector providers could play in supporting placements.

128. Clinical placements, *University of Leeds School of Medicine* [link]

129. Helen Crimlisk, ‘Educational partnerships with the third sector: a model to address NHS workforce challenges?’, *The Health Foundation*, 28 June 2019 [link]

130. The independent healthcare sector: an overview, *The Independent Healthcare Providers Network* [link]

131. Bakula Patel & Jaspal Taggar, ‘Virtual teaching of undergraduate primary care small groups during Covid-19’, *University of Nottingham Research Depository* [link]

### Aligning stakeholders

As it was put to us, there is a need for national and regional plans to manage placement capacity and to improve coordination. A substantial increase in places will require a more intelligent use of the capacity that exists and joined-up thinking about how to use it. One interviewee reflected, “there is... little scope for ongoing, purposeful planning of how to best deliver medical education across regions such that there is optimal use of placement capacity”. Undergraduate education is rarely considered by commissioners of services, so many providers can decide whether or not to participate in teaching. This adds another level of complexity to the university’s obligation to monitor the quality of teaching, as well as the practical difficulties of securing placements.<sup>132</sup>

We believe therefore that new arrangements should be introduced to support and better align clinical placements across providers and Medical Schools and to improve the connection between teaching and clinical service. At a national level, DHSC should establish a Placement Planning Unit, comprising a board which would hold meetings (at least twice per year), bringing together key stakeholders, including the responsible Health Minister, NHS England/HEE, GMC and MSC to analyse trends at a national level. It should publish placement ‘heatmaps’ on an annual basis. Long-term placement planning should also be developed through Placement Planning Boards at System level, at which ICS leadership, Deaneries, placement providers and Medical Schools would be represented to plan placements according to the specific needs of stakeholders. The aim should be to improve the interface between educators in providers and medical schools, and to ensure alignment of curriculum to practice. In some places, effective placement planning tools have already been rolled out, such as in Wales. We also heard about the benefits of the ARC PEP-NET System, which provides web-based information about practice environments in which students undertake practice learning, which was being used to support nursing placements in North East England. With greater flexibility over placement providers and the Tariff, this should be coupled with a renewed commitment to boosting the transparency of placement expenditure for medical education. At a national level, a minimum data set could be developed to enable ease and greater standardisation of reporting.

A specific focus on expanding placements in primary care will be needed. By 2030, we believe the number of placements in general practice should be doubled. The forthcoming ‘National Average GP Placement Tariff’ from HEE and emergent parity between primary and secondary care placement providers is welcome, but requires sufficient flexibility to reflect variation in the provider resource required to deliver the placement. i.e., a mechanism should be introduced to enable practices to take on a clinical academic GP, whose salary could be provided by the relevant medical school. Where this is not possible, resource for locum staff to cover, or to account for the additional supervision required (often from GP partners) for undergraduate students in their penultimate and final years of study will be required.<sup>133</sup>

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132. Aileen O'Brien & Ania Korszun, 'Follow the money: how is medical school teaching funded?', *BJPsych Bulletin* Vol. 45, No. 2 (2021), 73-76 [link]

133. Joe Rosenthal & Richard Darnton et al., 'Parity at last: a new funding model for undergraduate primary care education in England', *The British Journal of General Practice*, Vol. 72, No. 719 (2022), 257-258 [link]



Placement Planning at System level should be explicitly encouraged to identify untapped GP capacity to host placements. NHS Employers and the British Medical Association should consider amendments to the future GP contract to incentivise expanding the number of placements across PCNs. Where physical placements cannot be expanded, the offer and availability of ‘virtual placements’ should become commonplace for students in their first two-three years at Medical School. Best practice may be learned from the Virtual Primary Care project, now hosted by the MSC.<sup>134</sup> To meet this offer, remote access to GP clinical systems and the ability to enable observational-only experiences should be developed. Key considerations to develop the model would include patient consent and data sharing arrangements. Amendments to the GP contract may be required.

There are also broader considerations which DHSC must consider as part of its longer-term primary care reforms and their inter-section with education. For instance, new capital investment to improve GP practice estates should include consideration of adequate provision for educating the primary care workforce of the future.

## 7. Securing Funding

In considering the cost of expanding medical places, there are two forms of funding to consider: the ongoing cost to the Government of training an increased number of medical places, and the capital spending initially required to build the facilities and other infrastructure required to train additional students, either by expanding existing medical schools or by creating new ones.

It is also critical not to consider costs in isolation, or absent counterfactuals. While it is correct that the cap on medical school places has traditionally been justified on the basis that it costs more to train a medical student than a student on another course, this is an increasing anomaly in an era in which other university places are not capped. In most cases, a student not accepted for medical school will not directly enter the workforce but will instead undertake another university course, often in the sciences, which also receive additional grant funding, albeit lower than that received by medical courses, and without the need to fund placements.

Medical students repay a higher proportion of their student loan than other students, including other students on STEM courses, and pay a higher amount in income tax over their lifetime to the Exchequer. The IFS estimated in 2019 that the Resource Accounting and Budgeting (RAB) charge for medicine, for the 2017 cohort of students, was only 18%, compared to an average RAB charge of 54%<sup>135</sup>. Recent reforms to the student finance system, including the repayment thresholds have significantly reduced the overall RAB charge, but this will not alter the fact that medicine will continue to have a significantly lower RAB charge than most or all other subjects<sup>136</sup>.

The IFS has also calculated the discounted lifetime exchequer returns of different degrees<sup>137</sup>. For women, medicine provides a lifetime return

134. Virtual Primary Care, *Medical Schools Council* [link]

135. Chris Belfield & Jack Britton et al., ‘Where is the money going? Estimating the government cost of different university degrees,’ IFS Briefing Note BN244 [link]

136. Fairer higher education system for students and taxpayers, *gov.uk*, 24 February 2022 [link]

137. These figures include the impact of tuition and maintenance loan payments, as well as teaching grants, and any student loan repayments and tax and National Insurance payments. The final results are highly dependent on the discount rate used, but the calculations remain our best current estimate of understanding the returns of different degrees.

to the Exchequer of £260k, compared to £28k for chemistry, £77k for pharmacology or -£13k for biosciences; for men, medicine provides a lifetime return to the Exchequer of £505k, compared to £107k for chemistry, £46k for pharmacology or £24k for biosciences<sup>138</sup>. Not all students rejected from medical school will take another related degree, but, overall, it can be seen that medicine has a high net additional positive lifetime return to the Exchequer of £183k for women, or £398k for men, compared to the most financially positive plausible alternative degree.

New medical schools can have a positive effect on the health, social, economic and research activity of a region<sup>139</sup>. The University of Sunderland has calculated that its medical school contributes an additional £20m to the local economy<sup>140</sup>. In Canada, the research of Hogenbirk et al. on the Northern Ontario School of Medicine (NOSM) found that for every dollar spent in support of the medical education programme (and associated activities including spending by staff, clinical teachers and learners), an estimated \$0.66 cents (CAD) was generated in additional economic activity (in 2019 in NOSM's service region of Northern Ontario).<sup>141</sup>

Increasing the number of medical places is likely to increase the number of doctors available to the NHS and thereby reduce the costs of locums and agency staff. In 2021 the NHS spent £3 billion<sup>142</sup> on agency staff, which analysis suggesting a typical 80% premium compared to paying a permanent member of staff<sup>143</sup>, though this can be much higher. The Government has estimated that this represents a premium of approximately £60,000 per doctor, arguing that 'the costs of undergraduate and foundation training is recouped within 6 years, and within 10 years if the costs of specialty training are included<sup>144</sup>.' This would result in a significant medium-term saving to the NHS.

Due to the current way in which budgets are set in Whitehall, medical places (alongside a small number of other health-related disciplines such as dentistry and nursing) are the only courses where expansion has an impact on a managed departmental budget and therefore must be explicitly negotiated with Her Majesty's Treasury (HMT) during the Spending Review process. For other places, the cost of these is attributed to the Department for Education's Annual Managed Expenditure (AME); while forecasts are made, it does not form part of the core negotiation during a typical Spending Review. Furthermore, if student numbers increase by more than the forecast – as the Government currently does not control them, but operates a demand-driven system – the additional cost has no impact on the DfE's other budget; there is, for example, no requirement to reduce other budgets, as would be the case with most other cost overruns. For all intents and purposes, the costs sit outside the normal budgeting process. By contrast, additional medical school places must be explicitly negotiated between the Department of Health and Social Care (DHSC) and HMT during spending reviews, where they are explicitly in competition with other healthcare priorities, such as reducing NHS waiting lists or medical workforce pay.

The Government meanwhile has allowed other higher education courses

138. Jack Britton & Lorraine Dearden et al., The impact of undergraduate degrees on lifetime earnings, *Institute for Fiscal Studies* [link]

139. Ferhana Hashem & Catherine Marchand et al., 'What are the impacts of setting up new medical schools? A narrative review', *BMC Medical Education*, Vol. 22, No. 759 (2022) [link]

140. Evidence supplied by University of Sunderland.

141. John C. Hogenbirk, David R. Robinson & Roger P. Strasser, 'Distributed education enables distributed economic impact: the economic contribution of the Northern Ontario School of Medicine to communities in Canada', *Health Economics Review*, Vol. 11, No. 20 (2021) [link]

142. 'Desperate NHS pays up to £2,500 for nursing shifts', BBC News, 11 November 2022 [link]

143. Based on staffing returns to ca. 70 hospital trusts as reported in: Taking the Temperature Report |Quarter 4 2017-18, *Liaison Group*, July 2018 [link] and Submission to the NHS Pay Review Body, *NHS Improvement*, September 2016 [link]

144. Expanding undergraduate medical education - impact assessment (August 2017), DHSC [link]

to expand unchecked, with the initial Higher Education Participation rate increasing from 46.5% in 2013-14 (when it was announced caps would be removed) to 53.4% in 2019-20<sup>145</sup>. This includes expansion of courses on which the graduate premium is zero or negative. Collectively, these represent a significantly higher expenditure in student loan outlay for the Government than any conceivable expansion of medical school places, frequently on courses which result in much less economic return, both in terms of repayment of student loan and in increased tax revenues for the Exchequer, than medicine.

Whilst it is undoubtedly true that a medical student does cost more than a student on almost any other course, the budgeting process outlined above has created perverse incentives, whereby Government exerts extremely tight control – and in most years has allowed no increase in numbers – to a course which has one of the highest economic and social returns, whilst instead funding less valuable courses to grow without limit.

### The Cost of training a medical student

There have been a number of estimates of the cost of training a medical student. The Government’s Impact Assessment on expanding the number of medical school places, published in 2017, estimated the cost at £230,000<sup>146</sup>. *Double or Quits* (2021), a publication by the Royal College of Physicians, estimated the total public cost of training a medical school student as £192,981<sup>147</sup>. Meanwhile, *The Expansion of Medical School Places in the United Kingdom* (2021) estimated the annual cost of creating an additional 5,000 places at £1bn, or an annual cost of £200,000 a year<sup>148</sup>.

Some of these estimates appear to be overestimates, as they include the full cost of student loan outlay as a public cost, when in practice medical students repay a significant portion of their student loan (the Government estimates 90%<sup>149</sup>, meaning only a Resource Accounting and Budgeting (RAB) charge of 10% on the total loan outlay figure should be accounted to the public purse). Full Fact has argued that the figure of £230,000 can be split into grants totalling £163,000 and a further £64,300 from student loans, of which most will be repaid, and that therefore ‘we expect the final cost to “the taxpayer” is closer to £163,000 than £230,000.’<sup>150</sup>

The principal public cost components of training a medical school student comprise a number of elements:

- **Tuition fee loan.** This loan, available to all domestic students, is valued at £9,250 a year. Approximately 95% of English students take out a tuition fee loan<sup>151</sup>.
- **Maintenance loan.** Domestic students are also eligible to take out a maintenance loan. The amount a student may borrow varies, depending on whether or not they are living with their parents, studying in or outside of London, and their parents’ household income, up to a maximum of £12,667 for a student studying in London, not living with their parents, eligible for the maximum income-contingent loan. In years 3 and 4, when medical courses

145. Academic Year 2019/20 – Participation measures in higher education, [gov.uk](https://www.gov.uk/government/statistics/participation-measures-in-higher-education) [link]

146. Expansion of Undergraduate Medical Education: A consultation on how to maximise the benefits from the increases in medical student numbers, DHSC (March 2017) [link]

147. Double or quits: a blueprint for expanding medical school places, *Royal College of Physicians*, 5 January 2021 [link]

148. The expansion of medical student numbers in the United Kingdom (Position Paper), *Medical Schools Council*, October 2021 [link]

149. Expanding undergraduate medical education – impact assessment (August 2017), DHSC [link]

150. The cost of training a doctor, *Full Fact*, 21 October 2016 [link]

151. Paul Bolton, ‘Student Loan Statistics’, *House of Commons Library*, 2 December 2022 [link]

are longer, students who qualify for the income-contingent portion of the loan may borrow an additional Long Course loan. In year five, students may borrow a reduced loan<sup>152</sup>.

- **NHS Bursary:** All students are eligible to receive a grant of £1,000. Some students are eligible to receive a means-tested grant of up to £3,191 for those studying in London and living away from their parents<sup>153</sup>.
- **Strategic Priority Grant:** Universities receive grant funding from the Office for Students equal to £1,587 in years 1 and 2 and £10,580 in years 3-5 (clinical years) of an undergraduate medical degree.<sup>154</sup>
- **Clinical Placement tariff.** In years 3-5, a tariff is paid for the clinical placement to the placement provider, equal to £30,750 + Market Forces Factor (MFF) per year<sup>155</sup>.

Cost Element	Annual public cost per student / £	Year in which it applies
Tuition fee loan	9250	Years 1, 2, 3, 4 and 5
Maximum maintenance loan	12,667	Years 1 and 2
	14,677	Years 3 and 4
	3,263	Year 5
NHS Bursary (tuition fee)	£9,250	Year 5 (and 6) <sup>1</sup>
NHS Bursary (non-means-tested)	1,000	Years 5
NHS Bursary (means-tested, maximum)	3,191	Years 5
Teaching Grant	£1,587	Years 1 and 2
Teaching Grant	£10,580	Years 3, 4 and 5
Clinical placement	30,750 + MFF	Years 3, 4 and 5
<sup>1</sup> The NHS tuition fee bursary also contributes to fees in all years beyond the first in a graduate entry medicine course.		

By consolidating these, we can arrive at an estimate of public costs for each year of an undergraduate medical degree. It should be emphasised that this is an estimate: there will be some costs not included in this summary, such as additional payments that may be received by medical students with disabilities; in addition, the proportion of students claiming the maximum maintenance loan, or eligible for NHS bursaries is necessarily an estimate. There are also some additional costs associated with Foundation training posts which are funded by HEE such as educational faculty costs and Study Leave, Excess Travel and relocation costs. There may also be broader costs associated with expansion, for example changes to GP and consultant contracts, establishing “clinical teaching fellows” as described above, and so on.

The further forward we consider matters, the greater the degree of estimation is required. For example, the Government has, in recent years, frozen the maximum tuition fees, while increasing the maximum

152. Student finance for undergraduates, [gov.uk](#) [link]

153. NHS Bursary students, [NHS Business Services Authority](#) [link]

154. Funding for academic year 2022-23, [Office for Students](#) [link]

155. Education and Training Tariffs – Tariff guidance and prices for the 2022 to 2023 financial year, [DHSC](#), 31 March 2022 [link]

maintenance loan by inflation and increasing the Strategic Priority Grant by slightly above inflation. The changing composition of medical school places associated with expansion is also likely to have an impact. Currently, 22% of medical school places are in London; this may reduce if a higher proportion of new medical places are based outside London, in under-doctored areas, thereby reducing costs.<sup>156</sup> Equally, if an increase in medical places results in a greater proportion of students coming from lower socio-economic classes, while this is to be welcomed in terms of increasing diversity and tapping into previously untapped talent, it would slightly increase public costs by increasing the proportion of students eligible for higher maintenance loans and NHS bursaries.

Perhaps most significantly, we cannot say how the balance between undergraduate and graduate medical entrants will vary, nor the number of students opting to take a five year, or a six-year intercalated course, the latter of which carries additional cost to the public purse. One further way in which the Government could mitigate the financial costs of expansion would be to consider increasing the permitted proportion of international students from 7.5% to 10%, which would increase a valuable surplus-generating revenue stream for medical schools. Caution is needed here, however, due to the additional pressure that this would place on clinical placements.

In compiling the table below, we have therefore based figures on 2022-23 costs and assumed these remain constant in real terms. We have assumed that 95% of students take out a fee loan<sup>157</sup> and a RAB charge of 10% for both maintenance and fee loans<sup>158</sup>. We have used the Royal College of Physicians' estimate that the proportion of the maximum maintenance loan taken out is 68.9%<sup>159</sup> and that the proportion of the maximum NHS bursary (including means-tested and non-means-tested elements) is 37.9%<sup>160</sup>. Finally, we have assumed the average MFF is 1.06, based on an average of the MFFs given in Annex H of the NHS England - ICB allocations 2022/23 document<sup>161</sup>.

Estimated Public Cost / £						
Element	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
Tuition Fee Loan	925	925	925	925	925	4625
Maintenance Loan	873	873	1011	1011	225	3993
NHS Bursary	0	0	0	0	5094 <sup>1</sup>	1588
Strategic Priorities Grant	1587	1587	10,580	10,580	10,580	34914
Clinical Placement	0	0	32595	32595	32595	97785
<b>TOTAL</b>	<b>3385</b>	<b>3385</b>	<b>45111</b>	<b>45111</b>	<b>45913</b>	<b>142,905</b>

<sup>1</sup>Note that for a student in receipt of an NHS bursary, there will be an additional cost of £9,250 in Year 5 and no tuition fee loan.

156. Figure derived from medical places per school published by the OfS, see Health education funding, *Office for Students* [link]

157. Paul Bolton, 'Student Loan Statistics', *House of Commons Library*, 2 December 2022 [link]

158. 10% is likely to be an overestimate, as the Government estimate was made before the recent changes to student finance. See Expanding undergraduate medical education – impact assessment (August 2017), *DHSC* [link]

159. Double or quits: a blueprint for expanding medical school places, *Royal College of Physicians*, 5 January 2021 [link]

160. *Ibid.*

161. NHS England - ICB allocations 2022/23 document, Technical Guidance Document, Annex H [link]

It is necessary to also consider the cost of Foundation training. This comprises a clinical placement funding at nationally agreed tariff of £11,937 + MFF and a contribution from HEE of approximately 40-44% of the basic salary, equal to £15,297 (£16,758 in London) for F1 and £18,974 (£20,435 in London) for F2.<sup>162</sup> Using the same assumptions as previously for the proportion of students in London, this gives a total cost of £60,220 for the Foundation period.

In total, therefore, we estimate the total public cost of training a doctor is **approximately £143,000, or £203,000 including Foundation training.**

This compares highly favourably with the **net additional positive lifetime return to the Exchequer of £183k for women, or £398k for men** compared to the most financially positive plausible alternative degree.

### Capital Funding

A major expansion of medical school places will require capital funding for the construction of additional buildings, laboratories, facilities and equipment in order to either significantly expand current medical schools or to open new medical school places. In addition to directly funding equipment, during the course of the project we heard repeatedly that relatively modest additional investment in IT resources, such as timetabling software, could help to maximise the effective use of existing facilities, unlocking additional places.<sup>163</sup>

From interviews with new and aspiring medical schools, we understand that the capital and staff costs associated with opening a new medical school is typically estimated in business cases at between £40m - £50m, often for a typical steady-state cohort of approximately 100 students. During the 2018 expansion of medical school places, there was no dedicated capital funding available: Government relied on the ability and appetite of universities to self-fund the expansion, which they did from a variety of sources. For example, the University of Sunderland told us, “There were contributions from HEFCE, OfS, Sir James Knott Trust and the Garfield Weston Foundation. However, the large majority was self-funded by maintaining modest surpluses over an extended period.” Interviews with other new medical schools told a similar story.

While the Government could probably deliver a small expansion using a similar method, we do not consider it feasible to double the total number of medical school places without some significant investment of capital funding. Our survey of medical schools also confirmed this, with the majority of respondents answered that they would require some additional capital funding to expand, particularly if this involved a significant expansion<sup>164</sup>.

Those responding to our survey gave highly variable answers as to how much capital funding would be required, with answers ranging from £1m / 100 students to £24m / 100 students. The median value was £11m / 100 students. However, given the experience of 2018, it is clear there is a considerable ability to source capital from foundations, donors or existing surpluses.

162. Education and Training Tariffs – Tariff guidance and prices for the 2022 to 2023 financial year, DHSC, 31 March 2022 [link]

163. Feedback from interviewees and round table attendees.

164. Based upon our survey of medical schools.

**We estimate the total capital requirement as follows:**

- 12 new medical schools for a total cost of £50m each for the first 100 students: £600m.
- The remaining 6300 additional students, whether at a current or a new medical school, funded at £11m / 100 students = £693m.
- Universities are able to find half of the capital from foundations, donors or existing surpluses.

**This gives a total capital requirement of approximately £650m.** Given the approximate nature of the calculation, we believe it is more accurate to say, at this stage, that *doubling medical school places would require a capital injection of £500m - £1bn.*

**Net Annual Public Funding Required**

In the table below, we estimate the net annual public funding required until 2035.<sup>165</sup> In addition to the assumptions set out above, we assume:

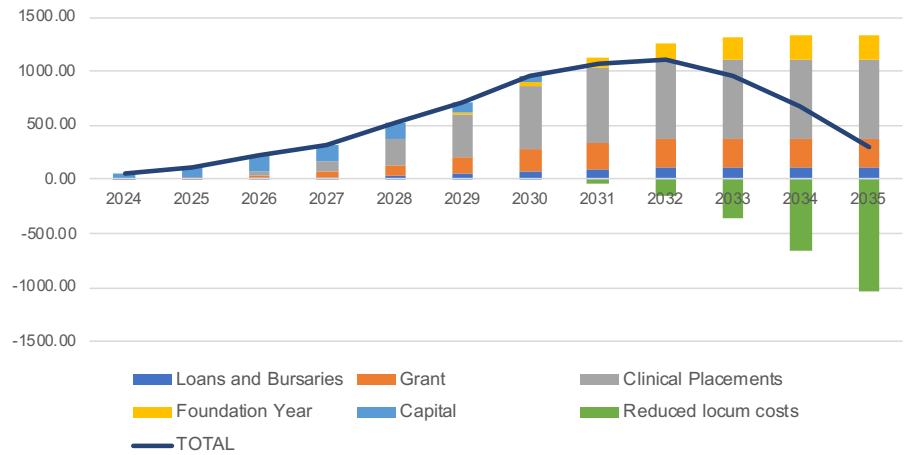
- An additional 1000 places in 2024, 2000 in 2025, 3500 in 2026, 5,500 in 2027 and 7,500 in 2028.
- That capital spending is spread in a 50/100/150/150/150/100/50 ratio over the first seven years of the period.
- That 90% of students who enter medical school go on to enter foundation training.
- That the number of doctors still in the workforce each year after completing Foundation training is equal to the proportion set out in the General Medical Council's 2022 Workforce report (93% five years after F2).<sup>166</sup>
- That each additional doctor in the workforce (once they have completed their Foundation training) saves the NHS £60,000 a year on reduced locum costs<sup>167</sup>.

<sup>165</sup> These figures do not include Barnett consequentials

<sup>166</sup> The state of medical education and practice in the UK: The workforce report 2022, General Medical Council [link]

<sup>167</sup> Expanding undergraduate medical education – impact assessment (August 2017), DHSC [link]

Figure 11: Projection of Net Annual Funding Required



The total funding for the five academic years 2024–25 to 2028–29 is therefore calculated at approximately £1.2bn.

The number of additional doctors in the NHS, under the same assumptions, is set out in the table below.

Just over 17,000 would be supplied by 2035, and approximately 48,500 by 2040.

Figure 12: Projection of Additional Doctors on the Register by 2040

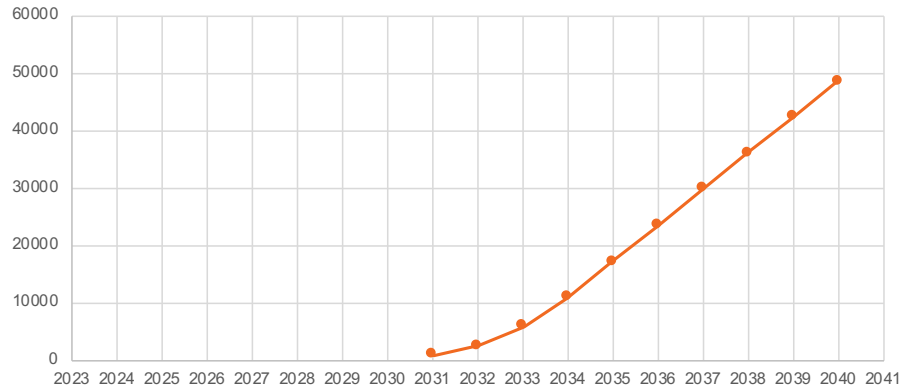
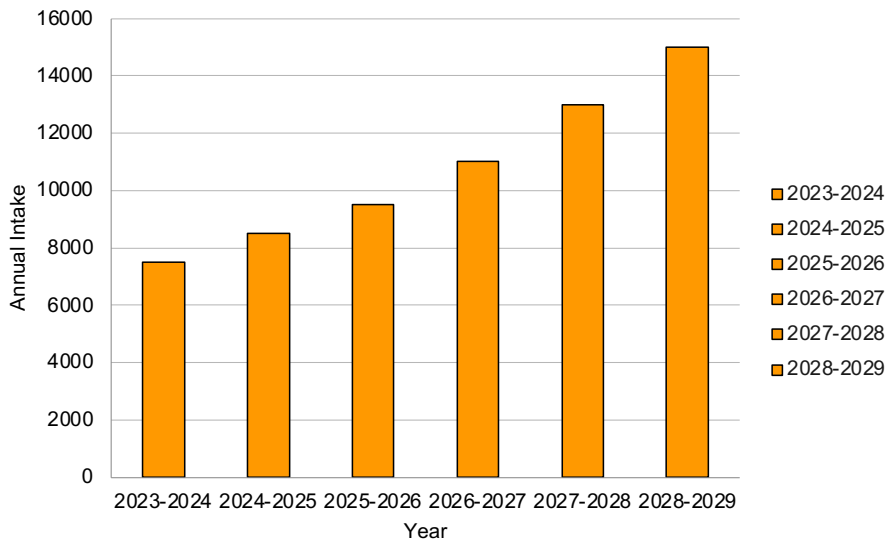




Figure 13: Projected Growth of Medical School Intake Annually



These assumptions are based upon the staging-posts set out in the summary of recommendations which take into consideration the projected growth set out by existing medical schools. It also assumes two expansion rounds (beginning 2024 and 2026 respectively) for new schools.

## Appendix

### List of UK Medical Schools (2022)

- University of Aberdeen School of Medicine and Dentistry
- Anglia Ruskin University School of Medicine
- Aston University Medical School
- Barts and The London School of Medicine and Dentistry
- University of Birmingham College of Medical and Dental Sciences
- Brighton and Sussex Medical School
- University of Bristol Medical School
- University of Buckingham Medical School
- University of Cambridge School of Clinical Medicine
- Cardiff University School of Medicine
- University of Dundee School of Medicine
- Edge Hill University Medical School
- The University of Edinburgh Medical School
- University of Exeter Medical School
- University of Glasgow School of Medicine
- Hull York Medical School
- Imperial College London Faculty of Medicine
- Keele University School of Medicine
- Kent and Medway Medical School
- King's College London GKT School of Medical Education
- Lancaster University Medical School
- University of Leeds School of Medicine
- University of Leicester Medical School
- University of Liverpool School of Medicine
- London School of Hygiene & Tropical Medicine
- University of Manchester Medical School
- Newcastle University School of Medical Education
- Norwich Medical School
- University of Nottingham School of Medicine
- University of Nottingham - Lincoln Medical School
- University of Oxford Medical Sciences Division
- Plymouth University Peninsula Schools of Medicine and Dentistry
- Queen's University Belfast School of Medicine
- University of Sheffield Medical School
- University of Southampton School of Medicine
- University of St Andrews School of Medicine
- St George's, University of London

- University of Sunderland School of Medicine
- Swansea University Medical School
- University of Central Lancashire School of Medicine
- University College London Medical School
- University of Warwick Medical School
- Brunel University London, Brunel Medical School
- Ulster University, School of Medicine
- University of Chester Medical School<sup>168</sup>

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168. The University of Chester has not yet admitted medical school students



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Policy Exchange  
1 Old Queen Street  
Westminster  
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