22 July 2014

Strategy and Policy Board

To consider

Publication of evidence on undergraduate education

Issue

1 We are preparing for publication a package of evidence on undergraduate education. This includes reports closing the review of the impact of Tomorrow’s Doctors (2009) and the audit of undergraduate assessment, along with Tableau reports giving data for medical schools. The evidence will also be highlighted in the State of medical education and practice Report 2014.

Recommendation

2 The Strategy and Policy Board is asked to consider plans to report on the review of the impact of Tomorrow’s Doctors (2009) and the assessment audit.
Publication of evidence on undergraduate education

Issue

3 Concerns about how well UK medical graduates were prepared for practice led the GMC in 2005-6 to publish options and proposals relating to the introduction of a national licensing examination. In 2007 we also embarked upon a review of Tomorrow’s Doctors, leading to publication of the current version in 2009 (TD09). This edition placed more emphasis on ‘outcomes for graduates’, on assessment and on the use of data e.g. about the progression of students and doctors in training.

4 Since TD09 was published, we have significantly improved our use of data, we have revised our approach to quality assurance including a UK-wide audit of undergraduate education, and we have reviewed the impact of TD09. We are now at a point when we can publish evidence on key aspects of undergraduate education.

Review of the impact of Tomorrow’s Doctors (2009)

5 The review has focused on collecting evidence on the preparedness of recent graduates. We commissioned a team led by Dr Lynn Monrouxe at Cardiff University who undertook a rapid literature review and also conducted qualitative research. F1 doctors kept diaries in which they recorded evidence of their experience and the researchers also interviewed the F1 doctors and others with perspectives on their preparedness.

6 In addition we have drawn upon data collected through the GMC’s quality assurance activities as well as registration data. We have also pursued and reviewed external data sources such as surveys of F1 trainees and trainers and data from the UK Foundation Programme Office. We also keep a log of evidence and representations that we have received about undergraduate curricula.

7 Very few UK medical graduates are very poorly prepared for practice. There is some evidence that preparedness has improved and that TD09 has resulted in curricular changes. But there remain some key areas of concern, e.g. about prescribing, emergency care and resilience in a clinical environment. There are also major variations in preparedness between medical schools. When the debate about moving the point of full registration was first aired earlier this year, we asked the researchers to consider this as well. Their evidence is that there are widespread concerns about this proposal.

8 We will publish the research report in line with our established practice. We also intend to publish a separate overarching report with key data and conclusions from the research and our parallel investigations. The draft report is at Annex A.
**Tableau reports**

9 Following publication of data on postgraduate training in a similar format, we have prepared three sets of Tableau reports which will allow medical schools to investigate their own performance in comparison to other schools. (Tableau is a company providing interactive data visualisation software, whose products have recently been purchased by the GMC). We intend to publish these reports alongside the 2014 *State of medical education and practice* Report (SoMEP). These reports cover:

a The preparedness of their graduates, using data from the National Training Survey.

b The outcomes of the Annual Review of Competence Progression (ARCP) for their graduates, including data for the Foundation Programme as well as specialty training.

c The specialties which their graduates have entered, using our data on Specialty and GP Registration.

10 The Tableau reports are being reviewed by a panel of testers from medical schools and were favourably received by medical school staff on 28 May. The Tableau reports will be accompanied by a Key Findings Report to provide an overview of the data available. We are also collecting data on the choices made by graduates when leaving the Foundation Programme and on their performance in specialty examinations. Further Tableau reports will be published in due course.

**Assessment audit**

11 We have carried out an audit of our evidence on undergraduate assessment at 31 medical schools in the UK. This was a paper based audit and therefore evidence obtained has not been formally verified as would happen with other quality assurance evidence. However, acknowledging those limitations, we found variation in the ways schools assess students and supporting policies and procedures for assessment. This is to be expected as each school has a different curriculum and associated policies and procedures. On the whole the review team found that schools were delivering assessment in line with the standards in *Tomorrow’s Doctors* (2009) and found many examples of notable practice. We will be following up the audit with a number of visits to schools later in 2014.

12 In January 2013 we produced summaries of our evidence about each medical school’s approach to assessment. The summaries included information from the annual reports we receive from schools about how they are delivering education and from each school’s most recent GMC visit. A panel of three GMC associates with assessment expertise reviewed the evidence in March 2013 and identified
areas for each school where we needed further information. Schools were asked to provide this additional information and this was reviewed by the assessment experts. We then produced individual feedback for each school.

13 We found considerable notable practice in assessment strategies and blueprinting, with many schools having clear and rational strategies for assessing medical students across their programme and corresponding blueprints. Some schools did not provide clear blueprints for their assessments, which were lacking in detail or not effectively mapped to *Tomorrow’s Doctors* (2009). In response to this finding we intend to work with the Medical Schools Council Assessment Alliance (MSCAA) to develop an optional template blueprint mapped to *Tomorrow’s Doctors* (2009) which schools can use to develop their own document.

14 Guidance and procedures governing student progression were a challenge for many schools. We found that some schools’ progression rules reflect the guidance of their host University or College rather than guidance which could better reflect the needs of a medical school and medical students. A number of schools appear either unduly generous or have confused arrangements about both re-sits and how long it can take to complete a course.

15 Most schools submitted adequate evidence about their assessment of professionalism, with many using a ‘cause for concern’ reporting system which allows students who are not acting professionally to be picked up. The majority of schools submitted evidence to demonstrate appropriate quality management of their assessments. Again, the guidance of the host University or College on quality management can have an impact on the policies and procedures of medical schools in areas such as determining the mark for a pass in an assessment, and the method used for measuring the reliability of marking.

16 On equality and diversity, we found wide variation in how schools monitor progression and performance in assessments in relation to the nine protected characteristics. We found wide variation in what schools consider to be grounds for a reasonable adjustment to assessments and progression such as more time to complete clinical and non-clinical assessments and more time allowed for completion of the course. Some schools take measures to screen reasonable adjustments to ensure they do not compromise clinical competence.

17 The findings of the audit will feed in to a summary report which we will publish in September 2014. The draft report is at Annex B.

*Publication*

18 We are now finalising a package for publication in early September. This includes:
The report of the rapid literature review and original qualitative research by Lynn Monrouxe and colleagues.

The overarching report on our conclusions about the preparedness of UK graduates (Annex A).

The three Tableau reports for medical schools along with a Key Findings Report.

The overarching report of the assessment audit (Annex B).

A summary of key findings on undergraduate education in the 2014 State of Medical Education and Practice.

Strategic implications

19 Evidence from the research, the assessment audit and the data collection and analysis should be reviewed as we develop our approach to key strategic issues. The evidence suggests there is scope to aim for higher and more consistent quality in undergraduate education, while recognising the innovation and choice that can result from diversity.

20 A key issue is the impact of this work on the debate around a national licensing examination (NLE), which Council will be discussing in September. It is important to note that shortcomings and variations in UK medical education relate largely to clinical skills and professional practice (rather than core medical knowledge), but one purpose of the NLE would be to establish a level playing field for entry to UK practice regardless of where a doctor qualified. So the NLE discussion will be against the background of the fact that one third of doctors practising in the UK qualified abroad, as well the state of undergraduate education in the UK. One option for an NLE, were the GMC to decide to develop it, would therefore be a Part 1 examination of knowledge (possibly integrated into medical school finals for UK graduates) followed by an extended period of clinical experience requiring commitment and resilience before candidates took a Part 2 test of clinical skills. All this, of course, would require considerable discussion, development and consultation over a number of years even if we decided that there should be a NLE, and there would be many other options in addition to the one outlined above.

21 The evidence also points to the need for more effective support and supervision following graduation, enhancing both trainee development and patient safety. This has implications for the debate around moving the point of full registration.

22 There is also a case for reviewing the ‘outcomes for graduates’ and the list of practical procedures in TD09. Such a review could take place once Council has reached specific conclusions about the scope of any national licensing examination and the registration status of new graduates. In any case, the new
requirements in _TD09_ came into force in the academic year 2011/12, leading to significant curricular changes which are only now having an impact. Before undertaking a major review of the ‘outcomes for graduates’, we will publish a restructured version of the current outcomes, organised under the four domains of the 2013 edition of _Good medical practice (GMP)_). This will help to emphasise that the principles of _GMP_ underlie professional education, development and practice from entry to medical school through to retirement.

**Supporting information**

**How this issue relates to the corporate strategy and business plan**

23 This issue relates to both Strategic aim 1, to make best use of intelligence to ensure good standards, and to Strategic aim 2, to help raise standards in medical education and practice. The reports we plan to publish will bring much greater transparency to performance in and outcomes of undergraduate medical education.

**Other relevant background information**

24 We propose to publish the following in September 2014, which can be made available to the Board upon request once finalised:

a The research report commissioned from Lynn Monrouxe and colleagues.

b The overarching report on the preparedness of graduates following _TD09_ (at Annex A).

c The overarching report of the assessment audit (at Annex B).

d The Key Findings Report for the Tableau reports.

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Draft report: Be prepared - are new doctors safe to practise?

1 The draft text of the report on the preparedness of new graduates follows. The report will be published in early September 2014 as part of a package of evidence on undergraduate education and in light of the publication of the 2014 *State of Medical Education and Practice.*
What we found

We have a problem – new doctors are not always as prepared as they should be.

Very few medical graduates are very poor at medical practice. But there are low-level concerns about a large number of new doctors – around one in ten feel poorly prepared for beginning their medical careers. In some respects, the problem is wider than this.

More graduates are prepared for beginning their medical careers

Positively, there are some indications that preparedness is improving. This follows major changes in medical education – some of them linked to our 2009 publication *Tomorrow’s Doctors*, which sets out what is expected of new graduates and the standards of teaching, learning and assessment in UK medical schools.

Preparedness varies between medical schools and aspects of practice

There are major differences between medical schools in the preparedness and subsequent progression of their graduates. Variation isn’t necessarily a bad thing, as long as it doesn’t compromise the care patients receive, but substandard pockets of medical education must be improved.

Preparedness is often poor in certain aspects of practice. We need to improve the competence of new doctors in prescribing, the early management of emergency patients (especially when on call), some practical procedures and, loosely, resilience, professionalism and employability. Graduates sometimes acquire specific skills in the abstract, but can’t put them into practice while under the pressures of the day-to-day clinical environment.

The root causes are various. The level of preparedness is affected by the characteristics of the students that medical schools select, by undergraduate curricula including the opportunities for gaining clinical experience, and by the supervision and support given to new graduates and the clinical environments in which they find themselves.

How we’ll tackle the issue

We will work with medical schools, postgraduate training bodies, employers and individual doctors, both new and well-established, to address the shortcomings and make sure that patients get the doctors they need.
Why we’ve written this report

We regulate medical education and set the outcomes and competencies that new graduates need to show.

We also assure the quality of medical education to see how our requirements are being met – we do this by collecting information from doctors in training and from the organisations involved, and by visiting the sites where education is delivered.

In 2009 we published the latest version of *Tomorrow’s Doctors*, which includes the outcomes for graduates and standards that medical schools need to achieve. This followed a major review, which included research we commissioned and full consultation with medical schools, employers and others.

Assessing the impact of *Tomorrow’s Doctors*

We have now reviewed the impact of *Tomorrow’s Doctors* to see what we can learn. This gives us a base of evidence for future work to make sure that our regulation is effective and focused. It gives us a starting-point for reviewing the outcomes for graduates.

It also helps us to consider the case for fundamental changes to regulation, which includes a proposal to abolish the year of provisional registration after graduation. Also, should we introduce a licensing examination for doctors wishing to practise in the UK?

In reality, it is hard to reach firm conclusions about the impact of *Tomorrow's Doctors*. It came into force only in the academic year 2011–12, so new graduates received much of their medical education under the previous version. Also, other major changes have been introduced, so it isn’t possible to single out the influence of *Tomorrow’s Doctors* confidently.

Therefore, this review focuses on how well prepared medical graduates are to become safe doctors in training. We consider how preparedness has changed, how it varies between medical schools and in what respects graduates have appeared particularly well or poorly prepared.

We also make some suggestions about factors that may influence preparedness, including the impact of *Tomorrow’s Doctors*.

Our new standards for medical education

Separately, we have been reviewing our standards for the delivery of education and training, covering both undergraduate and postgraduate stages. Information has been shared between the two complementary reviews. *Tomorrow’s Doctors* will be
replaced by a new set of standards for the delivery of education and training, alongside a stand-alone set of curricular outcomes to be achieved by graduates.
What is preparedness and how can it be measured?

We take a wide view on what makes a new graduate prepared for medical practice. Other related terms include:

- professionalism
- employability
- competence
- readiness
- fitness for purpose
- fitness to practise.

In this report, we use preparedness to cover all the attributes that we should expect of new graduates.

There are tensions to bear in mind.

- On one hand, it is important to be reasonably precise about the skills we expect new graduates to demonstrate; on the other hand, we must not overlook their overall capability.
- On one hand, new graduates need to be able to contribute to patient care from day one; on the other hand, they need to be instilled with the values and habits to sustain a career over decades.
- On one hand, they still have much to learn and are entering a new stage of training in which they should be properly supervised and supported; on the other hand, they are now employees and their patients are waiting and need safe treatment.

Unsurprisingly, it is particularly difficult to define a precise boundary between being prepared and not. Employers may say substantial numbers of new graduates have not been properly prepared for their responsibilities.

A smaller proportion of graduates may agree that they do not have all the skills they need to cope with the demands upon them – this may be natural and reasonable, or reflect poor support and supervision.

Much smaller numbers will be identified formally as doctors in difficulty and carefully monitored through the Foundation Programme. Even smaller numbers will be referred to us, and could have their registration erased or compromised as a result.

These different thresholds reflect the range of expectations that face graduates, but don’t stop us identifying areas of concern that need to be addressed.

Various mechanisms cast light on graduate preparedness

- Surveys of new doctors and their trainers
  These can be large-scale and methodologically sound, but can be influenced by the factors such as respondents’ age, sex and working environments. Where there
are differences between the perceptions of the new doctors and their trainers, the new doctors tend to have a more positive view of their own preparedness.

- **Feedback from employers and other organisations**
  This gives an important perspective, but may not be scientifically robust.

- **Examinations**
  Exam results should be reliable and valid, but focus on limited competencies at a specific point.

- **Other assessments and monitoring**
  These should be robust, but in some cases are restricted to small numbers of graduates.

- **Direct evidence on the safety or quality of patient care delivered by new doctors**
  This is very valuable, but can be very limited.

By combining sources and types of evidence, we can build up a picture of graduate preparedness.
How well prepared are medical graduates?

A long-running study into preparedness by Goldacre and colleagues found that 53% of 2008 graduates and 49% of 2009 graduates agreed that their medical school had prepared them well.\(^\text{ii}\)

Several indicators are available from more recent surveys of trainers and doctors in their first year of training (F1s in the Foundation Programme).

**What do F1 doctors think?**

- 69.9% agree or strongly agree that they are ‘adequately prepared for my first foundation post’. 9.2% disagree or strongly disagree.
- 74.4% agree or strongly agree the ‘skills I learned at medical school set me up well for working as a foundation doctor’. 8.5% disagree or strongly disagree.
- 13.6% ‘feel forced to cope with clinical problems beyond your competence or experience’ on a daily or weekly basis.
- 24.5% say they sometimes or definitely get ‘very frightened or panic feelings for apparently no reason at all’.

**What do F1s’ trainers think?**

- They think that 92.2% of the F1s understand what is expected of them. They think that 7.8% do not.
- They think that F1s can fail to cope with the transition from medical school: 4.4% definitely fail, 23.9% sometimes fail, and 71.7% never fail.
- They think that 4.6% of F1s definitely seem overly anxious, 28.6% sometimes seem overly anxious; and 66.8% never seem overly anxious.

**Preparedness and employment**

A 2009 survey of employers found that:

> interviewees were keen to say that some junior doctors are excellent and some respondents thought that standards were generally improving. The message from many respondents was, however, that junior doctors are generally not meeting the needs and expectations of the current NHS.\(^\text{iii}\)

A similar picture was reported more recently in the final report of the independent Shape of Training review.

> We heard from almost all employers that they were concerned that many doctors when leaving medical school are not fit to take up their Foundation Programme posts.\(^\text{iv}\)
As stressed by the new qualitative research by Monrouxe and colleagues, which we commissioned, difficulties in perceived preparedness often relate to aspects of the working environment, including:

\[
\text{the challenges of a high-volume time pressured workload, often with inadequate levels of staff. Trainees may feel prepared for situations when all goes to plan, but unprepared when exposed to high volumes of work which demand prioritization and multi-tasking; or uncertain thresholds (not knowing when to refer to seniors); inadequate team-working; or when seniors are not easily accessible.}
\]

How many graduates formally cause concern?

The numbers of graduates who are formally recognised as causing particular concern are much smaller than you might expect from the reports of employer opinion.

- We refuse provisional registration to very few UK graduates.
  - Four in 2010
  - Two in 2011
  - Four in 2012
  - Two in 2013.

Some applied again and were then awarded provisional registration.

- 531 Foundation Programme doctors did not complete their year of training in 2013 – 235 F1s (3.2%) and 296 F2s (3.0%). Among the F1s, 0.7% were in less than full time training, 0.8% had more than four weeks’ absence, 0.9% went into extended or remedial training, 0.1% were dismissed, 0.6% resigned and 0.2% did not complete for some other reason.\(^v\)

- There were 378 Foundation Programme doctors in difficulty in 2013 – 193 F1s (2.6%) and 185 F2s (2.4%).\(^vi\)

- 18 F1s and 13 F2s were referred to us that year.

- 2.5% of UK graduates from 2012 were still provisionally registered in March 2014 (97.5% had secured full registration). Graduates can retain provisional registration longer than the normal year for a range of reasons.

- 1.1% of F1s and 1.0% of F2s received an unsatisfactory outcome in their Annual Review of Competence Progression (ARCP) in 2013.

- The rate of unsatisfactory ARCP outcomes increases in later stages of training, where the impact of undergraduate education will be less – up to 25.1% in core training and 14.0% in higher training.
How does preparedness affect patient safety?

It is difficult to assess the impact of graduate preparedness on patient care. However, one study identified a 6% increase in deaths among patients admitted at the point when new graduates enter the NHS and most other doctors in training change posts. Surveys by two medical royal colleges found that more than four in five respondents believed that patient care suffers during this changeover period.\textsuperscript{vii}

The risks to patient safety in the changeover period relate to the mass movement of doctors in training into new roles, not only the introduction of new graduates. However, the new qualitative research reports:

\textit{F1 doctors felt unprepared for the step change in responsibility, the workload, the degree of multitasking, deciding who and when to ask for help, understanding how the hospital works (which varied by hospital) and dealing with underperformance of other team members.}

Deaths increase when no consultants are present

There is no doubt that patients are more at risk when consultants are scarce or absent. Many reviews have found that patients suffer when there is a delay in involving consultants and the increased death rate for hospital patients at weekends has been attributed to lower consultant involvement.\textsuperscript{viii}

While this evidence demonstrates the benefits of consultant-delivered care, it also indicates the dangers that result from relying upon doctors in training who are not appropriately prepared for the practice they need to deliver.

Preparedness needs to be improved

The overall picture indicates that there is room for progress. Employers have concerns about the preparedness of new graduates and a small minority of new graduates appear to regard themselves as generally poorly prepared. Their trainers share a similar view.

All but a tiny number of UK graduates obtain GMC registration and around 3% have formally recognised difficulties while they are in the Foundation Programme, or do not make progress at the usual rate. But the picture looks more worrying when we look at particular aspects of preparedness and variations between medical schools.
How has preparedness changed?

Past research

The research by Goldacre and colleagues shows that new doctors reported a general trend of improving preparedness before the 2009 version of Tomorrow’s Doctors. The percentage of graduates who agreed that they had been well prepared increased from 36% for 1999/2000 to 50% for 2002 and 58% for 2005, before falling back to 49% for 2009. Those who disagreed fell year on year from 41% to 31% to 21% to 16%. ix

A 2012 literature review by Tallentire and colleagues reported a less clear-cut picture. They found that since 1993, graduates’ perception of their own preparedness:

- improved for practical procedures and team working
- showed little change for acute care, communication and ethics
- declined for prescribing.

Other professionals saw little change in preparedness in communication, ethics, prescribing and practical procedures, but a decline in preparedness for acute care. x

Research we commissioned

The rapid review by Monrouxe and colleagues didn’t find strong evidence of change following the publication of Tomorrow’s Doctors in 2009. However, more recent cohorts of graduates were better prepared than previous cohorts.

The new qualitative research indicates areas of possible improvement. Some interviewees, eg other healthcare professionals and patient representatives, noted an improvement in the communication skills of F1s. Interviewees also felt that recent graduates were more oriented towards multi-professional team working.

Results from annual surveys of doctors in training

Recent quantitative surveys of new doctors suggest a continuation of the improvement reported by Goldacre and colleagues.

In our 2009 national training survey, new doctors were asked: ‘Do you feel that you were adequately prepared for your first F1 post?’ 54.3% of UK F1s said they were, but 33.0% disagreed.

In 2012, F1s were asked to respond to the statement: ‘Before commencing my first foundation post I felt prepared for the role’. For 2013 and 2014, the statement was tweaked to: ‘I was adequately prepared for my first foundation post’. In 2014, 69.9% agreed and 9.2% disagreed. Possibly the much lower percentage in 2012 relates to
our not using the qualified phrase ‘adequately prepared’ that year and asking how the graduates felt ‘before’ their first post.

New doctors were also asked: ‘In this post how often did you feel forced to cope with clinical problems beyond your competence or experience?’ The same question has been used each year from 2009 and shows a consistent pattern of major improvement up to 2012 and a less clear picture since then. There is a disappointing but small increase since 2012 in the numbers saying this happens daily.
A further survey of F1s by Clare van Hamel indicates improvement in their overall preparedness between 2012 and 2013. However, significant changes were not found in the proportion of F1s with serious anxiety or in relation to prescribing ability.

**Fewer doctors in difficulty**

Also, the proportion of formally recognised doctors in difficulty in the Foundation Programme has declined – from 4.6% in 2010, to 2.6% in 2013 for F1s. And from 4.2% in 2010, to 2.4% in 2013 for F2s.\(^\text{x1}\)

**Indications of an overall improvement in preparedness**

There has been improvement in the views that new doctors hold of their own preparedness, both before and since the 2009 publication of *Tomorrow’s Doctors*.

This is probably due to a range of factors, which could include changes in undergraduate education, in the Foundation Programme or in the support available from employers. Also, fewer new graduates are formally recognised as having difficulty, which suggests better preparedness at the weaker end of the spectrum (assuming there has been a reasonable consistency in the threshold for being recognised as in difficulty).
However, Tallentire suggests declining preparedness from 1993. In any case, the evidence is partial and we don’t have consistent data over time on the views of trainers and employers, let alone more objective evidence on changes in preparedness.
Does preparedness vary between medical schools?

Variation between medical schools in the interests, abilities and career progression of their graduates is inevitable and not in itself a cause for concern. However, understanding the extent of variation in some aspects of preparedness can highlight problematic issues across medical education and whether they are tied to particular locations – perhaps with causes that can be identified and addressed.

Evidence from surveys

The rapid review by Monrouxe and colleagues found six studies suggesting differences between schools and two suggesting no differences. In particular, the reports from Goldacre and colleagues have documented a range across schools in the perception that new doctors have of their preparedness. The rapid review concludes: ‘there is compelling evidence to suggest that medical school does make a difference in terms of self-reported preparedness’.

More recent survey evidence supports this conclusion, such as responses to our 2014 national training survey.

There was a wide variation between medical schools in the new doctors who confirmed: ‘I was adequately prepared for my first foundation post’. This agreement ranged from 60.7% to 85.0% (those disagreeing ranged from 2.4% to 12.5%). There were five universities or medical schools where more than 80% of graduates said they were adequately prepared; seven with 70–79% of graduates prepared; and the other 17 with 60–69% of graduates prepared.

We can also look at responses to the question: ‘In this post how often have you felt forced to cope with clinical problems beyond your competence or experience?’ At one institution, 30.7% of graduates answered ‘never’. At the other extreme, there was one school where that response was given by only 17.9% of graduates.

On feeling they have obtained the skills to set them up for practice, the percentage agreeing or strongly agreeing varied across schools from 61.8% to 96.6%.

Statistical analysis of the van Hamel survey of new doctors in 2013 found no significant differences between medical schools in either the mean anxiety score or the percentage with serious anxiety. But for an overall preparation question and for nearly all the specific preparation domains, there were highly significant differences between the medical schools. Also, there were significant differences between the schools for all the measures of prescribing ability.

How have perceptions of preparedness changed over time?

Using responses to our 2014 national training survey, we can also consider variation between schools in how their graduates’ perceived preparedness has changed over time.
At one school, the number of graduates regarding themselves as prepared increased by 134.7% between 2009 and 2014 (from 31.4% to 73.8%). There was also a school with a 75.2% increase. At the other extreme were two schools with decreases in graduates’ declared preparedness, of 4.3% and 10.8% (although changes in the question asked may have contributed to these trends).

We can also look at the change in the graduates coping beyond their competence between 2009 and 2014. If we look at those answering ‘daily’ or ‘weekly’, all medical schools seem to have improved. The best improvement was one medical school with a fall of 79.6% (from 39.7% of graduates to 8.1% saying they have to cope beyond their competence daily or weekly). At the other extreme was a school with a fall of 30.8% over that period.

ARCP outcomes

The ARCP outcomes data also reveal variations between medical schools.

In F1, unsatisfactory outcomes ranged from 0.0% among graduates from some schools to 3.64% for graduates from one school. The overall UK figure was 1.06%.

In F2, the range was from 0.0% for some schools to 2.52% for one school. The overall UK figure was 1.03%.

For core training, with an overall UK figure of 25.06%, the range was from one school where 5.41% of graduates in the programme achieved unsatisfactory outcomes, to another where 36.7% received unsatisfactory outcomes.

For higher training, with a UK figure of 14.02%, the range was from 5.75% (leaving aside some schools with very small numbers of graduates covered by our data) to 19.21%.

In interpreting these figures, it’s important to bear in mind:

- the impact of the education provided by the medical school is likely to be highest on Foundation Programme outcomes and lowest on higher specialty training
- training programmes vary hugely in their rate of unsatisfactory outcomes, so an apparently good result for a medical school may be largely due to its graduates entering training programmes where it is relatively rare to receive an unsatisfactory outcome. For example, some programmes tie ARCP outcomes to passes in examinations
- medical schools vary in the time that their graduates spent in training programmes during 2009–13, the period covered by these data, and the longer they were in programmes, the more opportunities they had to receive an unsatisfactory outcome.

Foundation Programme data

We can also consider the spread of medical schools in relation to the selection of their graduates into the Foundation Programme in 2014.
92.2% of applicants were allocated one of their top five choices. The range across the medical schools was from Norwich (81.8%) and King’s College London (83.8%) up to Dundee, Warwick, Glasgow and Lancaster, all at more than 99%.xii

Looking at the results from the situational judgement test, which are scored out of 50, the averages for the various UK schools ranged from Norwich (37.30), Swansea (38.31) and Aberdeen (also 38.31) up to Edinburgh (40.08), Cambridge (40.25), UCL (40.50) and Oxford (41.03).

The average for EEA graduates was 33.26 and for other international graduates 31.34. So the average results for the UK medical schools for the situational judgement test vary by less than 8%. Nevertheless, variations in individuals’ performance are seen as substantial enough to justify their being used as a major component in ranking for entry to the Foundation Programme.xiii

We can also look at the numbers of Foundation Programme doctors in difficulty. At one extreme is one medical school with more than 4% of its graduates in difficulty. There are also schools with fewer than 1% of their graduates in that position. Again, this suggests only a limited variation between schools, given the small numbers of graduates officially in difficulty from any one school.

There’s some variation in graduates who remain provisionally registered

There is also variation in the numbers of graduates from each school who take longer than usual to obtain full registration. Looking at the 2012 graduates who were still provisionally registered in March 2014, there were five medical schools with fewer than 1% provisionally registered, including two with none at all.

There were six schools with more than 4% of their graduates still provisionally registered, including one with 8%. This can be for a range of reasons, not all linked to the doctors’ preparedness.

Choice of specialty varies between medical schools

Medical schools also vary substantially in the specialties that their graduates apply to. For example, looking at first round applications in 2012 and 2013, on average 24.3% of doctors in the Foundation Programme made an application to Core Medical Training.

However, the UK medical schools ranged from one where 16.1% of graduates in the Foundation Programme applied to Core Medical Training to another where 53.0% did so. On average, 37.0% of doctors on the Foundation Programme applied for GP training, varying from 17.4% of graduates from one school to 48.0% at the high end.

We can also look at our data on specialist and GP registration. It takes several years to complete training as a GP or a specialist and the period of training varies
substantially. So we need to go back a few years to obtain figures that give a true comparison in relation to the final destinations of graduates.

We have chosen to look at the destinations of graduates from the five years 1995–99. Looking at the specialty destinations by university, the most obvious point is the distinct profile of graduates from Cambridge and Oxford. In particular, the percentage of graduates becoming GPs ranged from just 17.1% at Oxford and 18.3% at Cambridge up to the University of Wales at the other extreme, with 46.8% of their graduates becoming GPs. Similarly, the range for anaesthesia was from 3.7% of graduates from Cambridge and 4.6% from Oxford, up to 9.9% for Birmingham.

Conversely, there are also specialties in which Cambridge and Oxford have a very high proportion of graduates compared with other universities. For the physicians, the range was from Dundee at 9.0% up to Oxford at 29.2% with Cambridge coming second at 22.8%. And for the surgeons the range was from 5.1%, again at Dundee, up to 13.8% at Cambridge, with Oxford in third place.

Clearly, this is taking us some way from preparedness at the point of graduation. But we can see the substantial variations between medical schools in relation to specialisation of their graduates, whether or not this is desirable.

On the one hand, the pattern broadly seems to reflect the prestige and the entry standards for the medical schools, so having large numbers becoming physicians or surgeons results from competition for places in specialty training. On the other hand, the medical schools producing large numbers of GPs are helping to address a key area of concern in medical staffing. The specialties most valued by doctors in training may not be the most valuable to the NHS.

**Are some medical schools better than others?**

There are major differences between medical schools in the preparedness and subsequent careers of their graduates.

Clearly, events later in a doctor’s career will tend to be less closely attributable to their undergraduate education. In any case, this information is not sufficient to demonstrate that some schools are better than others. That depends on the criteria you use, and not least whether it is relevant to consider the value added by the medical school taking into account the potential of the students they enrol.

Also, there is room to debate whether the variation between schools in graduate preparedness is a problem and, if so, how it could be tackled. For example, a national licensing examination might reduce variation in preparedness by preventing some very poor graduates from practising and possibly by encouraging more uniformity in undergraduate curricula.
In what ways are new doctors poorly prepared?

The research we commissioned

Monrouxe and colleagues’ rapid review of the academic literature since 2009 found:

- research suggesting that new doctors are reasonably well prepared for history-taking and performing full physical examinations, but less so for prescribing, clinical reasoning and diagnosis, and the early management of emergency patients
- variation reported on competence in practical procedures
- mixed findings on team-working and communication with colleagues and patients
- some evidence that new doctors are poorly prepared for dealing with error and safety incidents and that they lack understanding of the clinical environment
- mixed evidence on professionalism.

Monrouxe and colleagues also carried out new, original research. In this, data from interviews with new doctors and others, and from diaries kept by new doctors, were mapped against the outcomes of graduates set out in Tomorrow’s Doctors.

The researchers found that some new doctors find translating scientific knowledge into clinical practice challenging, but understanding human structure, function and pathological mechanisms provides confidence for decision-making. Others thought that they are generally poorly prepared to look beyond the biomedical aspects of a patient's condition.

The research also shows that graduates are confident in speaking with patients for history taking, to summarise patients’ histories, to explain examination findings, and to communicate these to senior staff. But they are less prepared for the high number of patients to examine.

New doctors feel well prepared for simple diagnosis and treatment planning but less well prepared for complex cases. They rarely talk about involving the patients’ family or carers. Other groups raised doubts about how far new doctors treat patients holistically, accept complexity and consider financial aspects of treatment options.

The research also found that:

- graduates are not always well prepared for communicating with patients and colleagues
- graduates are not well prepared for providing immediate care in medical emergencies
- new doctors are poorly prepared for prescribing drugs in the view of other healthcare professionals
- New doctors think they are relatively well prepared to carry out every day practical procedures
they are relatively unprepared in relation to behaving according to ethical and legal principles
graduates seemed relatively well prepared to work effectively in multi-professional teams
overall graduates are unprepared to protect patients and improve care.

**What other evidence is there about areas of concern?**

For a useful overview, Goldacre and colleagues reported on five themes.

**Interpersonal skills**
Overall, 2.7% of graduates from 2008 and 2009 felt unprepared on interpersonal skills, ranging from none at all at one medical school to 8.8% at the other extreme.

**Clinical knowledge**
17.5% said they were unprepared in clinical knowledge, ranging from 2.4% to 28.9%.

**Clinical procedures**
21.3% were unprepared on clinical procedures, ranging from 4.1% to 41.2%.

**Physical, emotional and mental demands**
26.4% were unprepared for the physical, emotional and mental demands, ranging from 0.0% to 45.3%.

**Administrative tasks**
31.8% were unprepared for the administrative tasks, ranging from 5.2% to 54.7%.xiv

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**Percentages of doctors indicating, one year after graduation, that they felt unprepared in the following areas of work**

<table>
<thead>
<tr>
<th>Area of Work</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interpersonal skills</td>
<td>2.7%</td>
</tr>
<tr>
<td>Physical/emotional/me...</td>
<td>17.5%</td>
</tr>
<tr>
<td>Administrative tasks</td>
<td>31.8%</td>
</tr>
<tr>
<td>Administrative tasks</td>
<td>21.3%</td>
</tr>
<tr>
<td>Clinical knowledge</td>
<td>17.5%</td>
</tr>
<tr>
<td>Clinical procedures</td>
<td>26.4%</td>
</tr>
</tbody>
</table>

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xiv
In van Hamel’s 2013 survey, F1s were asked to identify up to three areas where they felt well prepared. Common themes covered clerking patients, clinical skills, history taking, practical procedures and ward rounds. They were also asked to identify up to three areas where they felt their preparation was inadequate. Common themes were being on-call, the e-portfolio, prescribing and computer systems.

The trainers were particularly concerned about the competence of F1s in prescribing and pharmacology and also about their use of the e-portfolio. Other themes coming up included time management and prioritisation, the practical procedures, and communication with patients and colleagues, team working and presenting cases.

In relation to the F1s’ competence in practical procedures, trainers particularly mentioned concerns about cannulation, the ABG blood test, catheterisation and venepuncture.

We can compare the information from van Hamel’s initial survey of F1s, the follow-up survey and the survey of trainers, all in 2013. This looks at the percentages disagreeing or disagreeing strongly that the F1s were prepared.

<table>
<thead>
<tr>
<th></th>
<th>Induction survey</th>
<th>Follow-up survey</th>
<th>Trainers survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recognising critically ill patients</td>
<td>6.5</td>
<td>2.2</td>
<td>5</td>
</tr>
<tr>
<td>Prepared in practical procedures</td>
<td>6.7</td>
<td>1.2</td>
<td>14.8</td>
</tr>
<tr>
<td>Knowing what is expected</td>
<td>10</td>
<td>2.6</td>
<td>7.8</td>
</tr>
<tr>
<td>Handover</td>
<td>12</td>
<td>4</td>
<td>4.7</td>
</tr>
</tbody>
</table>

So for three of the areas, the trainer view is between the F1s’ view at induction and in the follow-up survey. However, in relation to preparedness in the practical procedures, the trainers appear particularly unimpressed. We can note the specific statement that the trainers were asked to respond to: ‘The F1 was adequately prepared in practical procedures’. This may have focused the trainers’ responses on their view of the preparedness of new doctors at the start of the Foundation Programme, rather than how well they were performing at the time of the survey.

**The concerns of employers, deans, medical schools and royal colleges**

Back in 2009, employers were found to be concerned about the graduates’ ‘confidence and competence in clinical-decision making, clinical procedures and prescribing in practical situations, lack of understanding of the NHS and how it works, and standards of professionalism which are below those generally expected of NHS employees’. xv
More recently, postgraduate deans report some concerns about the resilience of new doctors, their preparedness to work in busy areas, anxiety about engaging in the care of the acutely ill, prescribing skills, practical procedures, professionalism and knowledge of NHS structures, among other areas.

Most medical schools report that they are not aware of concerns about the preparedness of their graduates. While this may be encouraging, it may also be due to restricted interpretations of what counts as a concern about preparedness. However, areas of concern mentioned repeatedly included communication or language skills, prescribing, prioritisation and resilience or coping with stress.

Medical royal colleges and faculties have concerns about variable or generally inadequate undergraduate education in relation to their specialties. The concerns relate not only to scientific grounding and knowledge, but also to clinical experience and practical skills. While the colleges and faculties covering hospital specialties are concerned about their representation in undergraduate curricula, the Royal College of General Practitioners suggests that specialist role models may receive too much focus.

The data on Foundation Programme doctors in difficulty in 2012–13 shows that nearly half are grouped under the ‘Knowledge, skills and performance’ heading of Good medical practice. Other major factors were ‘Safety and quality’ and ‘Communication, partnership and teamwork’. ‘Maintaining trust’ trailed the other categories.\textsuperscript{xvi}
Of the 31 Foundation Programme doctors referred to us, 13 were for misconduct issues, 12 for performance issues and six for health issues.

We can look briefly at a few particular competencies or aspects of preparedness.

- Prescribing
- Practical procedures
- Communication and teamwork
- Emergencies and acutely ill patients
- Professionalism.

**Prescribing is a worry**

Prescribing does remain an area of concern, despite the emphasis on this competency in *Tomorrow’s Doctors*. The rapid review from Monrouxe and colleagues found 24 studies suggesting graduates are poorly prepared and five suggesting they are well prepared for providing safe and legal prescriptions.

The EQUIP study published in 2009 found F1s had a prescribing error rate of 8.4% and F2s had an error rate of 10.3%. The overall error rate was 8.9% and all grades of doctor made errors. Almost all errors were intercepted by pharmacists before they
could affect patients.\textsuperscript{xvii}

The new qualitative research found that some groups feel that graduates lack an understanding of basic pharmacology and don’t know how to prescribe economically. Other healthcare professionals – such as pharmacists – feel that graduates know how to access support for prescribing but lack knowledge and can’t write a legally controlled drug prescription or take a patient’s drug history with sufficient detail and care. They feel that graduates see prescribing as absolute, rather than requiring clinical judgment, and suggest they needed a greater diagnostic understanding of the patient. Prescribing errors are common and there is a perception that graduates are not aware of common error sources and safety checks.

From Clare van Hamel’s 2013 surveys in the Foundation Programme we can look at the percentages disagreeing or disagreeing strongly that F1s are able to prescribe appropriately for each category of medication. There was significant improvement between the induction survey of the F1s and the follow-up survey:

<table>
<thead>
<tr>
<th>Category</th>
<th>Induction survey</th>
<th>Follow-up survey</th>
<th>Trainers’ survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple analgesics</td>
<td>1.63</td>
<td>0.2</td>
<td>7.8</td>
</tr>
<tr>
<td>Bronchodilators</td>
<td>5.48</td>
<td>3.8</td>
<td>4.1</td>
</tr>
<tr>
<td>Antimicrobial therapy</td>
<td>9.08</td>
<td>2.8</td>
<td>7.6</td>
</tr>
<tr>
<td>Intravenous fluids</td>
<td>10.19</td>
<td>4.4</td>
<td>6.2</td>
</tr>
<tr>
<td>Inhaled steroids</td>
<td>12.3</td>
<td>9.9</td>
<td>7</td>
</tr>
<tr>
<td>Anticoagulants</td>
<td>23.18</td>
<td>9.1</td>
<td>10.8</td>
</tr>
<tr>
<td>Narcotic analgesics</td>
<td>24.47</td>
<td>10.7</td>
<td>19.6</td>
</tr>
<tr>
<td>Oral anti-diabetic drugs</td>
<td>24.71</td>
<td>18.4</td>
<td>12.6</td>
</tr>
<tr>
<td>Insulin</td>
<td>40.13</td>
<td>26.8</td>
<td>12.8</td>
</tr>
<tr>
<td>Average</td>
<td>16.8</td>
<td>9.6</td>
<td>9.8</td>
</tr>
</tbody>
</table>

In van Hamel’s follow-up survey of F1s in 2013, one third said they had been involved in drug prescription errors.

A Prescribing Safety Assessment is now used across medical schools, which should help to identify poor prescribers before they graduate. Data on pass rates have not been published yet.

**New doctors are pretty good at the practical procedures**

There is generally a more encouraging story on specific practical procedures, including the 32 listed in *Tomorrow’s Doctors*.

The rapid review of literature found contradictory evidence of preparedness. Some studies suggested that new graduates were largely well prepared for practical
procedures, while others concluded that graduates are unprepared in some respects. They were found well prepared for venepuncture and less so for suturing, central line insertion and chest drain insertion.

A separate review of literature across ten countries or regions found that England has the lowest average deficit on clinical skills; better than countries such as New Zealand, Ireland and the USA. ‘The lower deficit rate in England provides some support for the UK General Medical Council’s clear, detailed induction curriculum, which has been heralded by other countries as good practice.’xviii

The new qualitative research found that F1s are confident in areas such as taking, managing and checking bloods, cannulation, catheterisation, electrocardiograms and respiratory function tests.

There is also recent statistical evidence from the survey of applicants to the Foundation Programme on how they perceive their competence in practical procedures. UK-wide, at least 99% of applicants said they are competent or expected to become competent in 23 of the 32 procedures listed in Tomorrow’s Doctors. The lowest scores were in nutritional assessment (95.1%), administration of insulin (94.9%) and blood transfusion (91.5%).

**There are mixed messages on communication and teamwork**

The position on communication and teamwork appears complex.

The rapid review of literature found some studies that suggest graduates are well prepared for team working and communicating with colleagues and patients. But other research suggests shortcomings in communication within the multi-disciplinary team.

In the new qualitative research, areas of under-preparedness include difficult situations when F1s were dealing with:

- Dealing with angry or upset patients and relatives and managing complaints
- Communicating with patients whose first language was not English
- Communicating with vulnerable patients (including those with mental health issues)
- Breaking bad news
- Dealing with more informed patients.

Many F1s are well prepared to communicate with colleagues, but challenges include:

- Clinical disagreements with senior medics or nursing staff
- Challenges in gaining support from seniors
- Communicating interprofessionally
- Not providing or receiving sufficient information during handovers.
The research also found that F1s sometimes talk about the pressure they feel when other healthcare professionals expect them to make decisions for which they felt unprepared.

F1s reported their uncertainty of whether to report an inappropriate behaviour they had witnessed. The research also found evidence of some ‘them and us’ thinking – for example, when F1s talk about having non-medics as their seniors and differences in work ethic of colleagues.

**New doctors are not well prepared for emergencies**

F1s don’t seem prepared for emergency situations and looking after patients who are acutely ill.

The rapid review of literature found ten studies that gave evidence of poor preparedness on diagnosing and managing acute medical emergencies, and only two self-report studies suggesting preparedness.

This was supported by the new research that found difficulties largely related to on-call duties during evenings and weekends, suggesting that this is when F1s are most likely to take the lead in providing immediate care, and when support is less available.

F1s feel well prepared for some aspects (eg CPR) but are unprepared for others (eg their own emotional response, changing a consultant’s management plan, what to do if the patient was not improving). In emergency situations, they often struggle to gather the relevant information and to prioritise activities.

In Clare van Hamel’s 2013 follow-up survey of F1s, 15% of F1s said they had been involved in near misses or critical incidents involving the recognition of critically ill patients.

**New doctors could be more professional**

There is also room for progress in competencies or attributes associated with professionalism.

The rapid review of literature review found some evidence that new doctors are prepared to identify their limitations, but poor in time management. There is contradictory evidence on new doctors identifying their own learning needs, on reflective practice and on ethical and legal aspects of practice.

Research conducted by Monrouxe and Rees into medical students on placements has identified shortcomings in relation to patient consent, dignity and occasionally safety – often where they were asked to do something unprofessional by their seniors. The students did not always take obvious or direct action when they witnessed unsatisfactory care and could be worried about the consequences for
them if they did so.\textsuperscript{xix}

The new research found that F1 participants talk about being prepared for certain activities, such as:
- filling out death certificates
- gaining patient consent for procedures.

But they feel less well prepared for other activities, such as:
- completing do not attempt resuscitation (DNAR) forms
- acting when the DNAR situation was unclear
- deciding when a coroner or the police should be involved
- confidentiality for patients brought into hospital by the police or prison service
- self-discharge from hospital.

F1s were often unclear about their responsibilities and felt constrained by hierarchical structures in some medical teams.

The research also found that F1s generally talk negatively about coping with uncertainty and change – for example, uncertainty around diagnoses, seniors changing their minds, ethical issues. F1s are generally unaware or unconcerned with the financial implications of their practice. This was noted by others interviewed too. Other doctors in training thought cost efficiency was for ‘later on’ in their careers.

\textbf{So, what do we know?}

The research we’ve explored throughout this report confirms there is a complicated picture on areas of preparedness. The rapid review and Goldacre’s five themes are a helpful starting point, but the evidence they use is becoming increasingly dated.

It appears that prescribing remains a significant area of concern. There’s more encouraging evidence on practical procedures generally, but concerns about some areas. However, not all the procedures mentioned are listed in \textit{Tomorrow’s Doctors}, pointing to the scope for moving towards a common understanding of what new graduates should be able to do. Also, it is worth repeating that many of the Foundation Programme doctors in difficulty are struggling in relation to their knowledge, skills and performance.

More generally, it appears that there is a widespread sense of a leap into a new world of responsibility, emergencies and seriously ill patients, complex cases and comorbidity, pressures and priorities, NHS systems and expectations, hierarchies, established practices and accepted standards of care, and routine activity. To some extent, the real world is bound to be a shock to new graduates, particularly in medicine. But perhaps more could be done to prepare students, to take a view on their resilience and to make sure they are effectively supervised and supported when they begin as an F1.
Finally, there are many calls for changes in undergraduate curricula and in the outcomes for graduates that we set. These arise largely in relation to alleged shortcomings in UK medical practice, although the evidence to support these shortcomings varies. These perceived shortcomings raise important issues, although in this context we must note that the doctors concerned may have received their undergraduate education many years ago and sometimes in other countries. But there is, in particular, little doubt about the need to:

- make sure new graduates demonstrate professional behaviour, including taking effective action to tackle failings in patient safety, in light of the findings of the Francis and Berwick reviews and the 2013 edition of *Good medical practice*

- address healthcare needs and demands, including the conclusions of the Shape of Training review, reflecting demographic change and scientific advances, and their potential impact on the timing of full registration and the focus of postgraduate training.
What makes a new doctor prepared?

We have briefly considered evidence on the preparedness of new graduates, how it has changed over time, how it varies from one medical school to another and how it covers a range of attributes.

We can also review what we know about the determinants of preparedness. This covers the characteristic of the students selected into medical school as well as the type of undergraduate education they receive, not least their opportunities to gain experience of clinical practice.

An underlying factor will be how medical schools are regulated and the requirements that we set. But we should also mention the impact of the postgraduate environment on the preparedness of new doctors.

Selection and population

We haven't attempted to regulate closely how medical schools select their students and a variety of approaches have been adopted.\textsuperscript{xx} Future research could consider whether selection methods have any impact on the preparedness of the graduates five or six years later.

It is clear that the student population varies across schools and has changed over time, possibly with an impact on preparedness. Research and data highlights a number of factors that could affect a graduate’s perception of preparedness.

Ethnicity

The rapid review suggests that ethnicity is related to perceptions of preparedness. Meanwhile, Goldacre and colleagues found a difference in self-declared preparedness according to the ethnicity of the graduates.\textsuperscript{xxi} Our analysis of data from the national training survey indicates that ethnicity does affect F1s’ answers to the question on feeling prepared, but not on feeling forced to cope with clinical problems beyond their competence or experience. McManus and colleagues found that non-white candidates generally underperform in undergraduate and postgraduate assessments, but are equally likely to be on the Specialist Register.\textsuperscript{xxii}

Gender

The rapid review found that gender did not typically predict perceptions of preparedness. However, Goldacre and colleagues found women are slightly less likely than men to agree that they feel well prepared.\textsuperscript{xxiii} Our analysis indicates that gender affects F1s’ answers to the questions both on feeling prepared and on feeling forced to cope with problems beyond their competence or experience. McManus and colleagues found that women perform better in assessments but are less likely to be on the Specialist Register.\textsuperscript{xxiv}
Age

Our analysis indicates that age does affect F1s’ answers to the questions both on feeling prepared and on feeling forced to cope with problems beyond their competence or experience. F1s in their early thirties are less likely than those in their twenties to perceive themselves as prepared.

Personal attributes

Personality traits that have been linked to preparedness include agreeableness, conscientiousness, extraversion, willingness to seek learning opportunities, personal interests and maturity.

Qualifications

Research into performance in MRCP(UK) (Membership of the Royal Colleges of Physicians of the United Kingdom) examinations found that about 60% of medical school variance can be explained by differences in candidates’ qualifications before their admission to medical school.\textsuperscript{xxv} An analysis using data from five longitudinal studies found that attainment at secondary school predicted performance in undergraduate and postgraduate medical assessments.\textsuperscript{xxvi}

Goldacre and colleagues reported that the sex and ethnic differences they found were ‘small in comparison with the large differences between medical schools’.\textsuperscript{xxvii}

Type of medical school can affect preparedness

Can we draw any associations between preparedness and types of medical school?

Monrouxe and colleagues report from their rapid review of literature: ‘graduates from more recent cohorts, graduate-entry students, students on problem-based learning courses, UK (versus non-UK trained) trainees and those with an intercalated degree feel better prepared’. But Goldacre and colleagues found no association of preparedness with graduate entry or intercalated degrees.\textsuperscript{xxviii}

Separately, Goldacre and colleagues have reported: ‘Three of the new medical schools are in the top six, in respect of percentages of graduates feeling well prepared for work, and only one is below the national average percentage’.\textsuperscript{xxix} In our 2014 national training survey, two of the wholly new schools performed very strongly on graduates’ declared preparedness and the other two were close to the national average.

There is also the moot point about how students are assessed. There is some evidence that assessment methods and standards for passing exams vary across medical schools. We have conducted an assessment audit, and the Medical Schools Council Assessment Alliance is currently investigating.
Finally, our research indicates that the performance of medical schools in the National Student Survey may be associated with their graduates’ apparent preparedness in some respects. This may be due to subjective factors rather than real differences between medical schools or in the performance of their graduates.

**Practice makes perfect**

One aspect of undergraduate education may particularly influence preparedness. That is, the extent and quality of the opportunities to gain experience – to practise practising medicine – through placements generally and in particular through arrangements for student assistantships, shadowing and induction.

The rapid review found:

- authors consider student assistantships to be valuable, but there is no evidence yet about their effectiveness
- shadowing is typically effective, with variable findings about the best approach
- induction can be effective but programmes vary.

The new qualitative research also addresses student placements and assistantships. Assistantships are perceived to smooth the transition to F1 by helping students find out how things work on the ward, practise practical skills, feel part of the team and follow patients’ journeys.

However, the degree to which participants could engage with opportunities, take on responsibility or feel part of the team is variable and affected by multiple factors, including:

- personal characteristics of the student (eg confidence)
- interpersonal factors (eg team leadership)
- cultural or systemic factors (eg knowing protocols).

**How does shadowing and practical experience help?**

Opinions are divided on the effectiveness of shadowing. The consensus is that shadowing alone does not guarantee graduates’ preparedness. Medical students need to be highly proactive to maximise the benefit, and the timing and the location of the shadowing are important.

The importance of high-quality practical experience is underlined by recent surveys of new doctors.

In our 2013 national training survey, F1s were asked: ‘What, if anything, would improve the shadowing period to make you feel more prepared for your first F1 post?’ There was a high level of support for shadowing, which clearly many F1s had found helpful in building up their confidence or preparedness. That widespread
support applies both to the national four-day arrangement and to longer shadowing periods arranged by medical schools.

There were some significant areas of concern or where respondents suggested improvements. In particular, respondents said they would have welcomed more time in clinical observation or, preferably, hands-on involvement rather than in induction activities, and some had insufficient support from outgoing F1s. Comments also indicated a worrying lack of competence in specific tasks among some graduates.

F1 doctors were also asked: ‘What, if anything, in addition to shadowing, would have made you feel more prepared for your first foundation post?’ In the largest grouping of answers, the new doctors suggested that they would have felt more prepared if they had received more training that directly related to the job that they would be taking on.

Many of the responses showed that the graduates thought medical school was not matched to the reality and responsibilities of the working life that they went into. There were favourable comments about long shadowing periods and student assistantships that left graduates aware of, and ready for, what was expected of them.

Responses to the van Hamel survey demonstrate that anxiety is linked to time spent in an apprenticeship role. There is a consistent but reasonably small downwards trend in anxiety as apprenticeship time increases. However, there is no evidence suggesting any effect of induction length upon serious anxiety.

Our statistical analysis of data about medical schools found some correlations to support the suggestion that clinical experience can contribute to preparedness – at least as perceived by the new doctors. We didn’t find any clear association between preparedness and whether graduates receive their undergraduate education and postgraduate training in the same locality.

**Tomorrow’s Doctors has created changes and challenges**

The 2009 version of *Tomorrow’s Doctors* was substantially different from its predecessor. The competencies required of graduates were set out more clearly, including emphasis on the importance of prescribing and professionalism. There were also more specific requirements relating to assessment, for example. It also introduced student assistantships.

**Compliance reported by medical schools**

Medical schools have told us about their understanding of their compliance with the requirements in *Tomorrow’s Doctors*.

For the three sets of outcomes for graduates, cases of non-compliance fell rapidly from 651 in 2009, spread evenly across the three areas, to just 21 in 2012. In
relation to the nine domains of standards for delivery of education by medical schools, non-compliance fell from 398 cases in 2009, to 47 in 2012.

Initially, the greatest non-compliance was for domain 2 on quality assurance, review and evaluation, followed by the domain 5 on design and delivery of the curriculum, including assessment. By 2012, the outstanding non-compliance related largely to difficulties in obtaining feedback from patients and employers and information about graduates’ progression.

Findings from visits to medical schools

From 2009–12, our teams visiting medical schools set out 192 requirements or recommendations for medical schools. Domain 5 on curricula dominated, including issues related to blueprinting for assessment.

Considering the visits in 2011–12 in particular, the most common domains posing challenges to schools were:

- domain 5 on curricula and assessment (17 requirements and recommendations)
- domain 2 on quality assurance, review and evaluation (nine requirements and recommendations)
- domain 6 on supporting students and teachers and trainers (nine requirements and recommendations).

The leading issues related to:

- quality management, control and monitoring (27 items)
- assessment (23 items)
- communication with students (14 items)
- curriculum (11 items)
- supervision and support for students (11 items).

What curricular changes were needed?

In 2013, we asked the medical schools what curricular changes had been required to comply with Tomorrow’s Doctors since its publication. Medical schools set out 170 changes.

Among the three sets of outcomes for graduates, the area most affected was outcome 2 – the doctor as a practitioner – with 35 curricular changes. Outcomes mentioned repeatedly included providing immediate care, prescribing, communication, consultation and diagnosis.

Another 19 changes related to the list of practical procedures in Tomorrow’s Doctors. 28 curricular changes were reported in relation to outcome 3 – the doctor as a professional.
Repeated themes related to reflection and keeping an eportfolio, patient safety and human factors, and mentoring colleagues. Curricular changes were also reported relating to the standards for the delivery of teaching, learning and assessment. 17 of the changes related to innovations in assessment and 11 to the introduction of student assistantships and other improvements to clinical placements.

In addition, medical schools were asked what curricular changes had been made since 2009 to address issues raised by postgraduate bodies or employers. Medical schools reported 52 curricular changes made to address issues raised not only by postgraduate bodies and employers but also by national bodies and from other sources.

15 of these changes concerned outcome 2 – the doctor as a practitioner – largely about prescribing. Another three changes related to the list of practical procedures in which graduates need to be competent. Nine changes were reported relating to outcome 3 – The doctor as a professional. These tended to be about patient safety and raising concerns, or about management, leadership and team working. Another four changes related to developments to help graduates in the transition to practice.

In relation to the standards for education delivery in Tomorrow’s Doctors, seven changes were made in response to issues raised about clinical placements including student assistantships. Five changes concerned assessment and three concerned supporting students.

Has Tomorrow’s Doctors raised challenges?
The medical schools were also asked about risks or challenges relating to the implementation of *Tomorrow’s Doctors*. Areas that have caused particular difficulty or concern include:

- the collection of data for monitoring of equality and diversity among the student population
- clinical placements particularly in the context of resource constraints
- supporting students and developing (including formally recognising) trainers
- ensuring patient and public involvement.

In short, *Tomorrow’s Doctors* has driven change and posed challenges for medical schools. Key areas relating to preparedness include the outcomes for prescribing, practical skills and professionalism, assessing the outcomes through blueprinting, and deepening students’ experience through student assistantships and clinical placements generally.

In addition, we have stressed the need to involve patients and employers and to monitor the progression of graduates – all intended to improve the fit between undergraduate curricula and the expectations on new doctors.

**Postgraduate training and employment**

We are concerned in this report with the preparedness of new graduates.

But, prepared for what? Perceptions of preparedness depend on expectations on graduates, from trainers, employers and the graduates themselves. In general, where there is a mismatch between the attributes of new graduates and the expectations on them, we need to consider how to address this – recognising that the expectations may need to change as well as the attributes.

In particular, new doctors must have effective induction and introduction to medical practice, and continuing support, supervision and training. But we know this doesn’t always happen.

**Are there also differences between foundation schools?**

More specifically, while we have considered differences between medical schools in the perceived preparedness of graduates, there are also differences between foundation schools in the preparedness of their F1s.

This is not a separate phenomenon, since medical schools’ graduates are not equally spread across the foundation schools. But differences in graduate preparedness are linked to, and may be caused by, both the medical school and the foundation school that they attend. The same is likely to apply to differences in preparedness between employers, although the thin spread of graduates across many sites makes this difficult to establish statistically.
The factors that determine preparedness

The characteristics of the students selected into medical schools will influence their preparedness on graduating. This is relevant when considering the value added by particular schools. But there is no reason to believe that variations between schools, over time and between aspects of preparedness can be reduced to demography, although academic performance leading up to A-levels is undoubtedly strongly linked to future career progress.

The evidence is thin and the analysis is contested in relation to the impact on preparedness of medical schools’ approaches to selection, curricular design and delivery, and assessment. But these things do matter and need to be understood better. Variation should be justified by evidence, rather than ignorance or maintenance of the status quo.

Effective experience of clinical practice appears key in preparing students. Much progress has been made in recent years.

*Tomorrow’s Doctors* has made a difference to undergraduate education, for example by focusing on assessment, clinical placements, and feedback, data and monitoring. But there remain concerns about graduate preparedness in relation to some of the outcomes for graduates, such as prescribing.

The difficulties are not solely attributable to undergraduate education and its regulation. Employers and postgraduate bodies need to work with medical schools and ourselves to reach a mutual understanding of preparedness and how it can be improved.
What could happen next?

This report argues that there is room for progress in the preparedness of medical graduates, arguably building on recent improvement.

While very few new doctors are very poor, a significant minority see themselves, and are seen by their professional colleagues, as poorly prepared. Medical schools vary widely in the preparedness of their graduates, and not always in a good way. And we are particularly concerned about some aspects of practice such as prescribing, coping in emergency situations, resilience, professionalism and employability. The shortcomings in preparedness have various causes and are largely amenable to change, so there is no need for despondency.

Tackling the shortcomings will involve addressing the realities of clinical environments and the expectations of employers and trainers alongside considering the design, delivery, assessment and regulation of undergraduate education.

All this is irrespective of the implications of moving full registration to the point of graduation. New graduates need more support and supervision, not less. And patients need stronger protection, not weaker. Regulatory arrangements should take this as a starting point.

What should the GMC do?

- We need to consider the outcomes for graduates in light of the evidence and concerns on preparedness and in the context of Good medical practice and the development of generic professional capabilities for specialty and GP training, while making sure that the outcomes don’t unfairly obstruct disabled people seeking a career in medicine.
- We need to give additional data, advice and support to medical schools as well as focused quality assurance.
- We need to work with medical schools, employers and postgraduate bodies to align their expectations of graduates and make sure that they are properly supervised and supported and that the clinical environments support good medical practice and training.
- We need to make sure that assessment and evaluation of students is robust to improve safety, confidence and the fit with the needs of employers and patients. We have conducted an assessment audit and will consider the potential contribution of a national licensing examination.
- We must continue to improve our collection and analysis of data, to provide a thorough evidence base for regulatory intervention and support, for example through annual consideration of the preparedness of new graduates.
Evidence used for this report

To contribute to the evidence available on preparedness, we commissioned a rapid review of the existing literature and original qualitative research from a team led by Dr Lynn Monrouxe at Cardiff University.

Criteria for considering studies in the literature review included:

- manuscripts published from 2009 onwards (but often reporting research conducted before 2009)
- in English
- all types of studies
- involving a range of participants (medical students, doctors in training, clinical teachers, patients, NHS employers)
- any outcome measures.

Numerous databases were used to conduct literature searches and 81 papers were reviewed. Data were extracted from these papers and the findings have been analysed in relation to the outcomes for graduates and the practical procedures listed in *Tomorrow's Doctors*.

For the original research, the team conducted interviews at four sites with a range of individuals with an informed view on the preparedness of F1s. These included:

- 34 F1s
- 33 other doctors in training
- 32 clinical educators
- 30 deans and Foundation Programme directors
- 13 other healthcare professionals
- 7 employers
- 11 policy and government representatives
- 25 patient and public representatives.

The interviews collected information about specific incidents rather than relying on generalised subjective perceptions. In addition, a subsample of the F1 interviewees kept an audio diary of their experiences. Overall, 1,729 narratives were identified.

- 23.7% (409) were classified as prepared
- 32.0% (553) classified as unprepared
- 44.4% (767) classified as unspecified.

Alongside the commissioned research, we have considered information that we collect either to register doctors or through our growing use of data in quality assuring medical education. This includes information collected through our annual national training survey as well as data from the ARCP faced by doctors in training.

In addition, we have drawn on external data and we’re grateful for access to findings from Dr Clare van Hamel’s annual surveys of F1 doctors and their trainers,
information from the UK Foundation Programme Office, and other contributions from various organisations and researchers.
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Draft report: How are students assessed at medical schools across the UK?

1 The draft text of the report on the audit of undergraduate assessment follows. The report will be published in early September 2014 as part of a package of evidence on undergraduate education and in light of the publication of the 2014 *State of Medical Education and Practice*. 
How are students assessed at medical schools across the UK?

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**Introduction**

In 2013–14, we reviewed the assessment systems used in 31 medical schools across the UK. The review has helped us understand how robust undergraduate assessment is and to compare the way that medical schools assess students. This report summarises the key themes and highlights case studies that appear to be working well locally. We also identify where assessment systems are not meeting our standards as set out in *Tomorrow’s Doctors* (2009) and we have taken steps to investigate these further.

**What did we do?**

We analysed data from the annual reports that medical schools submitted to us between 2009 and 2013. These reports tell us about substantial changes to curricula and assessment systems, highlight concerns, and update us on a school’s progress if we’ve required or recommended changes on previous quality visits.

We asked schools for further information to give us a comprehensive overview of each schools’ assessment strategies, delivery standards, quality management and governance processes, and assessment outcomes.

This was a paper based audit and therefore evidence obtained has not been formally verified as would happen with other quality assurance evidence. However, acknowledging those limitations, we were able to identify the structure of each system and areas working well to share with all schools.

**What did we find?**

We found many examples of areas working well that could benefit other schools. In some schools, we did not find any aspects of their assessment systems that appeared to need further review or improvement. But, some schools manage aspects of assessment very well, they perform less well in others or fail to use modern assessment practices.

In the following sections, we look at:

- Which assessment strategies schools have
- How schools validate the scoring of assessments and exams
- How schools measure students’ progression
- How the professionalism of students is assessed
- How schools ensure the quality management of their assessment strategies
- How schools ensure equal opportunities for students

We found variation across assessment systems, from when assessments happen, to what guidance students are given, and the number and nature of hurdle assessments, final exams and workplace assessments. As each school has developed over time, so their assessment programmes and practices have also developed. Whether a school is part of a university that uses a tutorial-based system also affects how its assessment system evolves.

Not all components of an assessment system are of equal importance, but together they reflect how a school considers its assessment strategy and the impact on students.
Aspects of assessment that are central to meeting our standards – how schools map their curricula to ensure students meet required competences across the course, and how schools teach professionalism – vary widely across schools. There are also significant differences in how individual schools work with students who have behaved poorly or are failing to progress. This includes arrangements for students to re-sit exams, repeat study years and exit with grace arrangements (where students leave on good terms, but without completing the course).
What is an assessment strategy?

An assessment strategy is the school's overarching approach to assessment and how assessment fits within the wider curriculum. We looked at choices of assessment tools, the timing and distribution of assessments, and the range of approaches to in-course and high stakes summative testing. (High stakes' assessments are exams usually held at the end of a time of study, which carry a large number of marks. When without being passed, students cannot progress to the next stage of a course of study, they are known as hurdle exams). The formats for final exams used by each school were also looked at. Some schools failed to provide enough evidence for us to properly audit their strategies.

We expect an assessment strategy to be clear and comprehensive, setting out a school’s philosophy about the value of assessment and how it selects assessment tools.

A school's assessment strategy can be influenced by that of its host university, but this can be adapted and applied well for use at medical school level. At University College London Medical School, for example, where the host university’s approaches to assessment are reflected in that of the school, the school's overarching assessment strategy demonstrates a clear level of expected outcomes by level and year of study, and how its methods of assessment are linked to this.

What makes a successful assessment strategy?

Overall, many schools demonstrate commendable practice in this area, with assessment strategies that are linked to the domains in Tomorrow’s Doctors (2009) and achieve a sensible balance between assessment for learning and for professionalism.

In particular, Keele University School of Medicine and Cardiff University School of Medicine have clear and comprehensive assessment blueprints and a good approach to final-year assessment that provides a good balance between what is required from a student’s skills logbook, their marks from high stakes exams and their overall performance.

Most schools have an effective assessment strategy, and continually review how well the strategy is working and show how it meets the standards in Tomorrow’s Doctors (2009). At University of Newcastle Medical School, for example, the assessment process appears robust and well thought out and executed, with a clear philosophy and rationale towards assessment.

Most schools extensively help students prepare for exams

We found good examples of schools using year-by-year guides, outlining the key information that students need to know, alongside a clear timetable for high stakes summative exams.

Several schools give students a clear timetable of all in-course assessments, including a countdown mechanism to plan for exam preparation. University of Birmingham Medical School also uses tools, such as an in-course skills passport, to help record which skills students are acquiring.

Timing of assessment is crucial
We found extensive variety in the timing of final year assessment. Schools should time knowledge and performance tests sensibly. It is important to avoid overburdening students and for students to know what needs to be prepared for and when.

At St George's, University of London, for example, some assessments have been moved to better balance student workload, with the final year balanced to provide comprehensive assessment of knowledge, professionalism, prescribing and clinical skills.

**Format of exams is sometimes poorly planned**

Hurdle exams should be mapped across knowledge, skills and ability domains as outlined in *Tomorrow's Doctors (2009)*. Not all assessments can be high stakes. But, in some schools, a greater proportion of exams are high stakes or hurdle exams, or both, without a clear reason why.

Some schools seem especially reliant on very long exams, or on essay questions. One school used no other form of assessment between years one and three.

We believe that greater use of statistics at individual question level (known as item level) and a more planned approach should help schools achieve acceptable reliability and content validity in shorter assessments rather than longer exams. Most UK schools achieve this.

**Approaches to assessment blueprinting vary**

How schools map their curricula across course modules and course years to meet the competence domains in *Tomorrow’s Doctors (2009)* is known as blueprinting. Blueprinting should also be used to show how the intended learning outcomes of individual exams meet competence domains. We were impressed, for example, by how University College London Medical School builds performance expectations, domain by domain, in its blueprint.

Blueprints should be electronically available and give students a comprehensive domain-based catalogue of course content, so they can personalise the blueprints for their own use. Many schools do this – St George’s University of London shows particularly good practice in this area. Its blueprint, for example, shows assessment outcomes which are clear and well mapped to *Tomorrow’s Doctors (2009)*.

We found significant variation in how schools approach this area. Some schools appear to have no specific blueprint at all. Other schools’ blueprints were basic and lacking in detail, too list based, not effectively mapped to *Tomorrow’s Doctors (2009)*, or conversely, tried to include too much detail. A blueprint should be a comprehensive guide, but not seek to replicate every aspect of an assessment strategy.

**Pull out quotes**

‘The new strategy includes a sound philosophy and clear selection and use of assessment tools, improved quality management and better feedback to students.’ – from our review of Cardiff University School of Medicine
‘In-course assessment is comprehensive. The final year is comprehensively assessed, across knowledge, professionalism, prescribing and clinical domains.’ – from our review of St George’s, University of London

‘The strategy for hurdle exams shows a sensible balance of in-course assessment for learning techniques.’ – from our review of University of Edinburgh College of Medicine

‘Key information about assessment tools, standards, decision making and progression to final award has been communicated well to students.’ – from our review of University of Newcastle Medical School

‘This is a course with a well described approach to assessment; concise and comprehensive with a good philosophy about the role of assessment within the broader curriculum.’ – from our review of University of Dundee School of Medicine.
How do schools validate the scoring of assessments and exams?

Overall, we found there is less variety amongst schools in assessment and exam scoring validity, perhaps because its parameters are narrower.

To judge the overall accuracy and replication of exam scoring, we examined the extent to which schools consider the precision of how students score in high stakes exams. Schools with a comprehensive approach to this issue routinely carry out statistical analysis of assessments as part of their quality assurance processes. Such schools ensure validity of scoring is construed through methods such as blueprinting of assessments, standard setting and how the statistics of student performance correlate with other assessments.

Having both a psychometrician and data analysts as part of the school staff is ideal. We encourage schools to make these appointments where they are lacking.

A number of schools demonstrate considerable evidence of their approaches to quality assurance. We noted Barts and the London School of Medicine and Dentistry's continuing commitment to good practice in deciding how a student has performed in exams (known as standard setting). The University of Bristol Medical School has made significant changes to improve the reliability of its assessments, through measures including increased examiner training, fake items (which do not count towards a final mark but measure if a student completed an aspect of a test) and more rigorous standard setting.

Commonality of approach in standard setting methods

We found a number of schools with highly successful assessment regimes all use the same method for standard setting for knowledge tests (Angoff) and a borderline regression method for Objective Structured Clinical Examinations (OSCE). Other techniques such as Hoftsee are employed at other schools, some of which have reported they are also considering a move to Angoff methods. If this is to take place, it would be helpful to see the rationale for any such change in further detail, as it may reflect a maturity in processes regarding setting standards.

A large number of schools also share the same approach to assessing the headline reliability of data (Cronbach’s alpha) and use detailed item level analysis for written test formats.

While these schools all enjoy success using these methods, it is of note that in its submissions to the audit, University of Oxford Medical School made a well-reasoned argument as to why Cronbach’s alpha may not be the best index of reliability for OSCE assessments for its students. The school prefers a Bayesian approach based on students’ attainment in previous exams. This technique may be of interest to other schools with homogenous and generally highly performing students.

Assessment expertise works best when shared

When continuing the development of their assessment quality assurance, it is also important that schools do not work in isolation. We noted some schools, for example University of Leeds School of Medicine, have demonstrated commitment to developing, sharing and applying assessment expertise, both internally and externally.
Some schools were found to be overall lacking in staff with assessment expertise. There is also considerable variety around the amount of ongoing training in place for assessment staff, the timing of training, and overall professional development given to both staff and examiners - an area which will also be looked at in the quality management section of this review.

**Pull out quotes** -

‘Statistical analysis of assessments is comprehensive. Reliability co-efficients are routinely above those considered to be gold standard.’ – from our review of University of Newcastle Medical School

‘A thorough programme of quality assurance that includes the appointment of a psychometrician and data analysts, training of key assessment staff, development of assessment-related research and evidence-based changes.’ – from our review of University of Leeds School of Medicine.
How do schools measure students’ progression?

In this area we looked at policies on student progression through a course. This included reviewing each school’s rules relating to issues including the maximum time allowed for a student to be on a course before they complete it, the number of re-sits students are allowed to undertake, how progression throughout a course is monitored, and how a school manages and supports students who leave the course.

What is to be admired in this area is the clear and transparent robustness of policy, as demonstrated by many schools, At Aberdeen, for example, progression arrangements are clear and straightforward. All years are treated equally with scope for migration, and students are permitted one re-sit each year, except for finals.

**Robust policies give clear statements about re-sits**

Bristol provides a good example of a good relationship between the maximum number of years allowable for study and opportunities to repeat years. We found its policy to be clear and therefore not liable to be open to misinterpretation.

However, there is considerable variety across all schools as to how student progression is approached. As a result this is an area in which the amount of variety in school approaches results in a rather confusing picture about what is and is not school policy. A clear relationship is needed, for example, between the maximum number of years for allowable study and the opportunities to repeat years. Yet some schools have rather complex or inflexible progression systems.

When more transparent policies are in place, re-sit arrangements are robust, stating who can re-sit an exam, why and when. But we found many schools have confused arrangements about re-sits, when they are allowed and why, and under what circumstances a re-sit applies.

How long should students be allowed to study for?

A robust school regulation should state rules for progression through and completion of a course by students.

We encourage schools to develop transparent and practical policies regarding progression, the number of re-sits allowed and the time students can take to complete programmes. We know that some schools feel restricted by their host university’s policies in this area and we would suggest schools work with their host university to develop policies which work for medicine.

How are students who do not progress treated by schools?

Schools that reflect the guidance of their host university, rather than specific in-house school guidance, particularly seem to apply to this to ‘exit with grace’ arrangements (where students leave on good terms, but without completing the course).
Where exit with grace policies are working well, progressive arrangements apply to students leaving after junior and senior levels of study, with careers guidance available to students who are leaving the course. University of Glasgow School of Medicine provides a good example, with arrangements in place for each of the clinical and non-clinical years of study.

However, in some schools, exit with grace arrangements, including opportunities to transfer to another course of study - and at what stage this can be done at and until - are not always clearly defined. Some schools appear to not have any such arrangements in place at all.

Schools also need to have clear policies in place when making decisions about students who are failing to progress and may need to be obliged to leave a course. This is another area in which policies can be influenced by a schools’ host university approach. Progression decisions should also be supported by effective data.

We approve of schools taking measures such as Cardiff University School of Medicine’s use of an extenuating circumstances board, which operates independently of the schools’ examiner boards. The school also has a committee to oversee student conduct. This is a method which is it to be encouraged. It is vital that only those students who are fit to practice medicine, irrespective of their performance in examinations, are permitted to graduate.

**Pull out quotes**

‘The school has good exit with grace arrangements, with a certificate, diploma and BMedSci available after successful completion of years one to three of the programme. Careers advice and transfer to other programmes are also available.’ – from our review of University of Glasgow School of Medicine

‘The school is implementing changes to the timing of final year assessments to allow failing students time for remediation and re-sit, rather than having to repeat the year due to insufficient time for remediation.’ – from our review of Norwich Medical School.
How is students’ professionalism assessed?

The assessment of professionalism is both critical and challenging. To become embodied in student behaviour, it should be implicitly introduced and reinforced throughout the course. Ideally it should begin by being espoused in the values of the school, then continue to be assessed and monitored while being taught throughout the programme.

A number of schools have an innovative approach to teaching professionalism. At schools including Cardiff University School of Medicine, students are given an explicit message that professionalism has a considerable place in their training. From years one to five, equal weighting is given to the identification and assessment of professional behaviours. Attitude and conduct is one of three equally weighted domains that students must pass in order to progress, with no compensatory passing allowed.

At University of Edinburgh Medical School there is a thorough description of how professionalism is assessed in the curriculum and assessment documentation. Various teaching methods are used and professional behaviours tracked during clinical attachments.

Students should be prepared to take responsibility

Other devices used by schools to assess professionalism include University of Nottingham Medical School’s use of a cause for concern reporting mechanism and Newcastle University Medical School’s student guide to professional behaviour, which outline student responsibilities and requirements, with a system weighted according to the severity of the offence. Similarly, at University of Manchester School of Medicine, students undertake a student professionalism agreement. At numerous schools, student behaviour can also be tracked longitudinally across the course, through a monitoring system.

We were interested to read detailed descriptions of the teaching of professionalism at King’s College London School of Medicine. This moves from earlier teaching phases introducing issues such as probity and respect to later clinically focused phases focusing on issues including self-care, whistle blowing and relationships with other professions.

How can professionalism be assessed?

Successful professionalism teaching should also include devices to track professional behaviour during clinical attachments undertaken by students, as well as at module level, in a wide range of formats.

As an example, University College London Medical School has both an end of module sign off and a course sign off for professionalism demonstrated by students, as well as end of year assessments on professionalism.

Elsewhere, at the University of Birmingham Medical School, we found students are assessed on a broad range of evidence sought from across the course, with a focus on attendance, engagement and participation, in addition to more traditional formats, such as high stakes examinations.
We were particularly keen to see schools include patients in this area. At Keele University School of Medicine, communication with patients is assessed extensively, including the conduct and behaviour of students during a final year work placement as a primary care assistant. During this placement students undertake a patient survey, the results of which are included in their portfolio and discussed within an appraisal.

**Professionalism needs continual monitoring**

However, we found many schools are not comprehensive or structured enough in their approach to teaching and assessing professionalism. Professionalism should be continually monitored and assessed and adapted into a more comprehensive approach.

But at some schools, although professionalism appeared implicit throughout course teaching, it is not assessed or monitored, beyond informal arrangements, such as those where senior members of staff can be alerted to concerns about students.

Meanwhile, some schools assess professionalism not in all aspects of teaching but only in clinical assessments and placements, while at other schools it was difficult for us to ascertain if professionalism was assessed in exams or not.

**Pull out quotes**

‘Communication with patients is assessed extensively throughout the course. Innovative practice includes students undertaking a patient survey, the results of which are included in their portfolio and discussed at appraisal.’ – from our review of Keele University School of Medicine

‘There is a broad range of evidence sought from across the course, focusing on attendance, engagement and participation, while also utilising more traditional formats including high stakes exams.’ – from our review of University of Birmingham Medical School

‘Teaching and assessment of professionalism is supported at both module and placement level and as an overarching approach within the course.’ – from our review of University College London Medical School.
How do schools ensure the quality management of their assessment strategies?

To assess each school's quality management, we reviewed each school's process and quality management loops, and how they related to a school's development and refinement of its overall assessment processes.

As part of this we reviewed evidence of each assessment strategy's learning and teaching development and evidence of engagement with partners including employers, deaneries, local education and training boards, the public and patients. The guidance and training available to staff was also scrutinised.

As with elsewhere in this review, we found host university guidance can dominate that of a school in this area, particularly in areas which overlap with the validity and reliability of assessment. Variables include what training is available for assessment item writers and assessors, if training is mandatory or voluntary, how said training is timed and how much weight is given to it. Ongoing refresher training is preferable in this area, as assessors as well as students need to keep up to date with continual changes in medical education and practice.

Many schools have mandatory training for staff

We were pleased to see schools ensuring training for staff is mandatory and supervised by senior staff. Keele University School of Medicine is an example, with tiers of training requirements dependent on role and activity. We liked how University College London Medical School tests out new examiners in year three examinations, before they are permitted to assess high stakes year five clinical examinations.

At Cardiff University School of Medicine, training is provided on the job, in a formal and supervised manner for item writers, standard setters and OSCE examiners, all led by senior and experienced members of staff.

Schools including Barts and the London School of Medicine and Dentistry, and University of Manchester School of Medicine should also be noted for the quality loop the schools employ, with one to one mentorship given to key assessor roles.

However, some schools appeared to not provide any training for assessors or item writers, or failed to provide evidence of the training arrangements they do have.

Collaboration not isolation

Where quality management is working well, schools recognise that assessment is not a static process but requires ongoing refinement and learning from experience.

It is important that as part of this process, schools do not work in isolation but rather should work with local health education networks, local trusts and boards, local clinicians and associated health professionals. Many schools actively seek out collaboration with external partners, with some ensuring this level of engagement goes all the way to school exam board level.
Though it is to be encouraged, approaches to the amount of public and patient involvement invited by schools in their assessment strategies also vary. Some schools including Brighton and Sussex Medical School use both real and stimulated patients at OSCEs, in order to give feedback on student performance to examiners. We also noted University of Leicester Medical School’s ambitious and commendable bid to introduce a patient executive at assessment board level.

**Helping students prepare improves quality**

Another aspect of assessment reviewed here is the guidance given to students preparing for exams. This should include preparation countdowns with key dates, in preparation for finals, and year by year specific handbooks including guidance on assessments. Schools should also adjust the timing of exams, so as to avoid over-burdening students.

School data and marking policies and standard setting, also reviewed in assessment strategies, are another aspect of quality management which are subject to an amount of variation across schools but need clear policies.

**Pull out quotes -**

‘Training for staff, including, workshops and 1:1 mentorship for all key roles is excellent and [auditors] were pleased to see it is mandatory.’ – from our review of Barts and the London School of Medicine and Dentistry

‘Clinicians and allied health professionals help write and deliver written and clinical assessments and there is usually trust representation on examination boards.’ – from our review of Brighton and Sussex Medical School

‘There is a high level of engagement in the school’s assessment processes from local education providers and clinicians. Public and patient engagement goes up to high level lay person board representation.’ – from our review of Hull York Medical School

‘There is double marking of all fail and borderline assessments and re-marking of a ten per cent random sample by both internal and external examiners, which is good for reassuring students.’ – from our review of Queen’s University Belfast School of Medicine.
How do schools ensure equal opportunities for students?

We asked schools to provide evidence of their approaches to two main aspects of monitoring equality and diversity. First, under what conditions might students’ assessments need adjusting because of educational or health needs – known as reasonable adjustments. Second, the extent to which schools undertake analysis of the performance of students, according to protected characteristics such as their age, gender, race, sexual orientation and so on.

Although under the current system a unified approach to reasonable adjustments is not possible, we expect schools to have a reasoned approach to their reasonable adjustment policy. Reasonable adjustments should be monitored, alongside the assessment outcomes of the student making the request, so as to have a sense as to how one may be affecting the other. This is another area where a host university’s policies can be dominant in a school’s approach.

Do schools monitor the protected characteristics of students?

Data collected in this area varies widely from school to school. What schools consider to be a reasonable adjustment, in respect of issues including student disability, long term health condition, or pregnancy, all vary.

We noted University of Aberdeen Medical School’s thorough approach in this area. The school has recently carried out a project to look at attainment in regards to student protected characteristics and educational background. This would seem to be something that should be carried out by all schools, as it could provide valuable data on what influences the educational attainment of their students.

While some further schools have extensive protected characteristics monitoring in place, including monitoring characteristic subgroups, other schools seem to have little data in this area, beyond determining if a student is international or from the UK.

How are reasonable adjustments made?

Schools currently vary in their approach to making adjustments to learning tools so as to make these suitable for all students’ learning styles, for example, on how much to limit the amount of reading material students have, or the length of final exams.

We found Aberdeen to have a comprehensive approach to reasonable adjustments for students with educational needs or health issues. University of Nottingham Medical School also provided us with case by case examples of how reasonable adjustments can be made.

Written exam assessment adjustments, as described by Keele University School of Medicine, can include providing an amanuensis for students unable to write, extra time in exams, separate exam rooms, coloured overlays, enlarged papers and enhanced examiner briefing.

Both clinical and non-clinical exams need adjustments

Clinical exams require a different approach to reasonable adjustments. At Swansea University College of Medicine, for example, during clinical exams, students unable to carry
out some procedures due to short term conditions such as pregnancy or a broken limb may be allowed to describe how they would carry out a procedure, rather than doing it.

Meanwhile some schools describe how they take measures to ensure reasonable adjustments are screened to ensure they do not compromise clinical competence. As an example, at Brighton and Sussex Medical School, all candidates in need of adjustments are put on the same OSCE circuit.

But we were concerned to see that while some schools are prepared to make reasonable adjustments for both clinical and non-clinical assessments, others do so just for non-clinical exams.

**Pull out quotes**

‘Reasonable adjustments are screened to ensure they do not compromise clinical competency.’ – from our review of University of Southampton Faculty of Medicine

‘Students with special educational needs can benefit from extra time in written examinations, separate examination rooms, coloured overlays, enlarged papers and enhanced examiner briefing. Candidates in need of adjustments are all put on the same OSCE circuit.’ – from our review of Brighton and Sussex Medical School

‘The school has a well described assessment policy in respect of disability and long term conditions with a range of reasonable requirements demonstrated on a case by case basis.’ – from our review of University of Nottingham Faculty of Medicine.
What happens next?

We found a lot to praise and encourage at a large number of schools. Some show a considerably innovative approach to a number of aspects of their assessment requirements.

As has been seen here, there is considerable variation as to how medical schools approach assessment. There are two ways to regard this. It depends on if a degree of variation is desirable, and if so, how much. The current status quo in assessment regimes can be considered manageable, so long as standards are maintained and areas in which some schools are falling below best standards are improved (individual recommendations as to what schools should be doing to improve their systems are included in their audit reports).

However, variation can lead to uncertainty. If a sense of uniformity is deemed preferable, then the current state of affairs must be considered unacceptable.

There is therefore a debate to be had as to whether a national approach to medical school assessment, carried out across all schools and applicable to all doctors who wish to practice medicine in the UK, should be considered in the UK. If such an approach is to be undertaken, there are a number of schools whose assessment strategies contain policies which could be worthy of consideration as the template for a national system of medical school assessment.