WHTC University application subject guides

Medicine

This guide has been written to help support you in your application to university. It contains the following information relevant to your subject to help you decide where apply and put together the best application that you possibly can:

1. Course links
2. Entrance requirements
3. Recommended A-levels
4. Admissions tests
5. Recommended reading
6. Interesting MOOCs
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1. Course links

Below are links to the top courses for this subject in the UK (according to The Complete University Guide). Click on the links to find information about what the course is like, what you'll learn, and loads of information about things such as fees and accommodation. However, remember that there are loads of other great universities out there, so check out The Complete University Guide or just google studying your subject at university.

Please note that the rankings outlined here should be used as a purely as statistical reporting, and makes no significant different to graduate prospects as almost all graduating medical students will enter employment.

The current junior doctor job placement scheme puts emphasis on where a candidate sits in relation to their medical school year group therefore it is better you place yourself as highly as possible in your final grades to ensure the best placement possibilities are open to you. Ultimately the most important thing to

consider when deciding where to apply for medicine is to find a place which is a good fit for you and where you could see yourself flourishing. Medicine is a long course so it is important to apply to as many universities as possible to keep your options open, before narrowing them down to the right one for you!

1. University of Oxford
2. University of Cambridge
3. Imperial College London
4. King's College London
5. Queen Mary University of London

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2. Entrance requirements

Here are the grades that the university suggests you need to get in to that course, and the likely offer that they will give you.

1. Oxford: A* A A (Candidates are required to achieve at least a grade A in both Chemistry and at least one of Biology, Physics, Mathematics or Further Mathematics)
2. Cambridge: A* A* A (A Levels in Chemistry and one of Biology, Physics, Mathematics)
3. Imperial: A A A (To include an A grade in Biology, an A grade in Chemistry)
4. King's College London: A* A A (To include Biology and Chemistry)
5. Queen Mary: A* A A (To include Biology or Chemistry)

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3. Recommended A-levels

Different universities may differ as to what A-levels they ask you for. Some might list one subject as 'essential', while another might list the same subject as just 'helpful', so make sure to check out the course page (under Section 1 of

this document, or on the university website) to be sure what your chosen university expects!

Biology and Chemistry are both essential to study Medicine as a University degree course, and it is also required to study either Physics and Mathematics or Mathematics or Further Mathematics as the other additional A levels. In this instance, the study of Mathematics is considered as a Science. The transferable skills and rigour of these disciplines complements those utilised in Medicine and also demonstrates resilience and critical thinking, which are desired skills for this course.

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4. Admissions tests

What admissions tests are you typically required to sit in addition to submitting your application? This also differs from uni to uni, so if your chosen university isn't on this list, make sure you check out the course page so you know exactly what you need to apply.

Oxford: BMAT (Biomedical Admissions Test)

Cambridge: BMAT (Biomedical Admissions Test)

Imperial: BMAT (Biomedical Admissions Test)

King's College London: UCAT (University Clinical Aptitude Test)

Queen Mary: UCAT (University Clinical Aptitude Test)

Universities requiring the UCAT (less Science focused admissions test)

Most university medical schools require the UCAT to be sat. Your total UCAT score will be out of 3,600.

This is the accumulation of scores achieved in four sections:

1. Verbal Reasoning
2. Quantitative Reasoning
3. Abstract Reasoning
4. Decision Making

Your performance on each of these sections is scaled to a score between 300 and 900, a good score will vary from year to year. In most years, a score above 650 would represent a good outcome.

Above 680 would normally be considered a high score.

If you manage to get a high score, you might be wise to apply to universities that place a higher emphasis on the test, as this could boost your chances of getting an interview.

If you scored highly, it might be a good idea to apply to universities that place a lot of emphasis on the UCAT.

Many of these have a UCAT cut-off score and rank their applicants this way. This means your chance of securing an interview will be higher if you performed well in the test.

If you didn't get the score you were hoping for, it's a good idea to apply to universities that place more emphasis on other admissions criteria.

Universities requiring the BMAT (more Science focused admissions test)

The BMAT is currently used by the following UK universities:

- University of Oxford
- University of Leeds
- University of Cambridge
- University College London
- Lancaster University
- Imperial College London
- Brighton and Sussex Medical School.

If you are applying to one of these universities, make sure you register for the test. Last year, Brighton and Sussex invited applicants who scored 15.1 or higher in the BMAT for interview. The cut-off score varies from year to year.

Some medical schools will advertise the deciles their successful candidates sit in online, or the banding for particular components of each test, but students may email admissions to obtain average scores for successful applicants in the previous admissions cycle

Further information regarding selection process

The grade requirements outlined above are the minimum grade requirements to be considered. The typical offers made to at least 80% of A-level applicants for 2019 entry are A* A A (including an A* in either Biology or Chemistry).

Oxford: Please note that competition to study Medicine at Oxford is particularly strong and only around 425 applicants are shortlisted for interview each year. Applicants are shortlisted for interview on the basis of BMAT performance, GCSE performance (if applicable) and other information on their application. No student is admitted without interview. All shortlisted candidates, including those from overseas, will be expected to come to Oxford for interview in December.

Cambridge: Admissions Tutors use the BMAT results in conjunction with the other elements of students' applications to decide which candidates will be invited to interview and to help with deciding who should be offered places on the course. Students who achieve higher BMAT results are more likely to be invited to interview but there isn't a 'pass' mark for the BMAT at Cambridge.

Imperial: In 2019, the minimum requirements for interview included a minimum score in each of the BMAT sections 1, 2 and 3 and a minimum sum of scores across sections 1 and 2.

Candidates were required to score a minimum of 3.5 in Section 1 and Section 2, with the sum of scores in these two Sections being at least 8.6. They were required to score a minimum of 2.5C in Section 3.

Aberdeen: Candidates' UCAT scores are considered in our selection for interview but are not the sole indicator for selection. They are considered alongside actual and predicted academic achievement in deciding who will be selected for interview.

In 2019 the highest UCAT score invited to interview was 3280, and the lowest UCAT score invited to interview was 2360.

Queen Mary: All candidates must score above the third decile or above to be invited in for interview.

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5. Recommended reading

Reading some relevant books or articles is a really great way to demonstrate your passion for your chosen subject in your personal statement, and show how you've gone beyond the curriculum. Plus, if you really want to spend three years or more studying this subject at university, it should be enjoyable! Try taking notes and jotting down your thoughts as you're reading so that you can share some of this in your personal statement

General scientific magazines and publications

Nature – www.nature.com
Free to access articles

Nature is a British multidisciplinary scientific journal, first published on 4 November 1869. It is one of the most recognizable scientific journals in the world, and was ranked the world's most cited scientific journal by the Science Edition of the 2018 *Journal Citation Reports* and is ascribed an impact factor of 43.070, making it one of the world's top academic journals.

New Scientist – www.newscientist.com
Free to access articles

New Scientist, first published on 22 November 1956, is a weekly English-language magazine that covers all aspects of science and technology. Based in London, it publishes editions in the UK, the United States, and Australia. Since 1996 it has been available online.

Discover – www.discovermagazine.com
Free to access articles

Discover is an American general audience science magazine launched in October 1980 by Time Inc.

Science - https://www.sciencemag.org
Free to access scientific articles

Science, also widely referred to as Science Magazine, is the peer-reviewed academic journal of the American Association for the Advancement of Science and one of the world's top academic journals.

National Geographic - https://www.nationalgeographic.com
Some free to access scientific articles

National Geographic (formerly the ***National Geographic Magazine*** and branded also as **NAT GEO**) is the official magazine of the National Geographic Society. It has been published continuously since its first issue in 1888, nine months after the Society itself was founded. It primarily contains articles about science, geography, history, and world culture.

General scientific journals

eLife - https://elifesciences.org/
Free to access peer-reviewed journals

eLife is a peer-reviewed open access scientific journal for the biomedical and life sciences.

Bioessays - https://onlinelibrary.wiley.com/journal/15211878
Some free to access peer-reviewed journals

BioEssays is a monthly peer-reviewed review journal covering molecular and cellular biology. Areas covered include genetics, genomics, epigenetics, evolution, developmental biology, neuroscience, human biology, physiology, systems biology, and plant biology. The journal also publishes commentaries on aspects of science communication, education, policy, and current affairs.

Cell – www.cell.com
Free to access peer-reviewed journals

Cell is a peer-reviewed scientific journal publishing research papers across a broad range of disciplines within the life sciences.

The BMJ – www.bmj.com
Free to access peer-reviewed medical journals

The BMJ is a weekly peer-reviewed medical journal. It is one of the world's oldest general medical journals.

PLOS Medicine - https://journals.plos.org/plosmedicine
Free to access peer-reviewed medical journals

PLOS Medicine is a peer-reviewed weekly medical journal covering the full spectrum of the medical sciences. It began operation on October 19, 2004, as the second journal of the Public Library of Science, a non-profit open access publisher

The Lancet - https://www.thelancet.com
Free to access peer-reviewed medical journals

The Lancet is a weekly peer-reviewed general medical journal. It is among the world's oldest, and best known general medical journals

The New England Medical Journal - https://www.nejm.org
Free to access peer-reviewed medical journals

The New England Journal of Medicine (NEJM) is a weekly medical journal published by the Massachusetts Medical Society. It is among the most prestigious peer-reviewed medical journals as well as the oldest continuously published one

Recommended books

This is Going to Hurt: Secret Diaries of a Junior Doctor by Adam Kay

This funny yet shocking book has been a bestseller for over a year, won four National Book Awards and been the Sunday Times Number One Bestseller for over eight months.

Why has this book captivated so many readers? That has to be down to the sheer honesty of the author Adam Kay, a Junior Doctor who writes about his experiences working for the UK's NHS in obstetrics and gynaecology.

Created from pages of his own diaries after long, tiring shifts, Kay leaves out no detail of his life as a junior doctor, and the results are often shocking, hilarious and heartbreaking.

When Breath Becomes Air by Paul Kalanithi

Paul Kalanithi was a Neurosurgeon who got diagnosed with inoperable lung cancer at the age of thirty-six, on the brink of completing his medical training. After many years being a doctor treating the dying, he became the patient.

What comes out of this is a touching exploration of life, death and the relationship between a doctor and a patient.

This is a book which you will find hard to forget and is undeniably inspiring despite its gloomy topic. Any medical student or anyone considering studying medicine should read this book.

The Selfish Gene by Richard Dawkins

As relevant and influential today as when it was first published, The Selfish Gene has become a classic exposition of evolutionary thought. Professor Dawkins articulates a gene's eye view of evolution - a view giving centre stage to these persistent units of information, and in which organisms can be seen as vehicles for their replication.

The Emperor of All Maladies by Siddhartha Mukherjee

In The Emperor of All Maladies, Siddhartha Mukherjee, doctor, researcher and award-winning science writer, examines cancer with a cellular biologist’s precision, a historian’s perspective, and a biographer’s passion. The result is an astonishingly lucid and eloquent chronicle of a disease humans have lived with - and perished from - for more than five thousand years.

The Gene: An Intimate History by Siddhartha Mukherjee

In this book the author spends time carefully chronicling the story of genetics while including bits of his own personal history with hereditary illness, the “intimate” history suggested by the subtitle. He places the gene in a trilogy of scientific ideas that dominated the twentieth century, alongside the atom and the byte.

Gene Machine: The Race to Decipher the Secrets of the Ribosome by Venki Ramakrishnan

Everyone knows about DNA, the essence of our being, the molecule where our genes reside. But DNA by itself is useless without a machine to decode the genetic information it contains. The ribosome is that machine. Nobel Prize winner Venki Ramakrishnan tells the story of the race to uncover its enormously complex structure, a fundamental breakthrough that resolves an ancient mystery of life itself.

The Immortal Life of Henrietta Lacks by Rebecca Skloot

Her name was Henrietta Lacks, but scientists know her as HeLa. She was a poor black tobacco farmer whose cells—taken without her knowledge in 1951—became one of the most important tools in medicine, vital for developing the polio vaccine, cloning, gene mapping, and more. Henrietta’s cells have been bought and sold by the billions, yet she remains virtually unknown, and her family can’t afford health insurance. This phenomenal New York Times bestseller tells a riveting story of the collision between ethics, race, and medicine; of scientific discovery and faith healing; and of a daughter consumed with questions about the mother she never knew

The Epigenetics Revolution by Nessa Carey

How is it that, despite each cell in your body carrying exactly the same DNA, you don't have teeth growing out of your eyeballs or toenails on your liver? How is it that identical twins share exactly the same DNA and yet can exhibit dramatic differences in the way that they live and grow? It turns out that cells read the genetic code in DNA more like a script to be interpreted than a mould that

replicates the same result each time. This is epigenetics and it's the fastest-moving field in biology today. The Epigenetics Revolution traces the thrilling path this discipline has taken over the last twenty years.

Hacking Darwin by Jamie Metzl

At the dawn of the genetics revolution, our DNA is becoming as readable, writable, and hackable as our information technology. But as humanity starts retooling our own genetic code, the choices we make today will be the difference between realizing breathtaking advances in human well-being and descending into a dangerous and potentially deadly genetic arms race.

When Breath Becomes Air by Paul Kalanithi

Paul Kalanithi was a Neurosurgeon who got diagnosed with inoperable lung cancer at the age of thirty-six, on the brink of completing his medical training. After many years being a doctor treating the dying, he became the patient.

What comes out of this is a touching exploration of life, death and the relationship between a doctor and a patient.

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The Man Who Mistook His Wife for a Hat by Oliver Sacks

A million-copy bestseller, The Man Who Mistook His Wife for a Hat is described as ‘a provocative exploration of the mysteries of the human mind’ and is written by Oliver Sacks, who has spent fifty years working as a neurologist.

Sacks gives case studies of individuals who have lost their memories and are no longer able to recognize common objects or people, as well as stories of people with extraordinary artistic or mathematical talents.

These case studies are part of the reason this book became so popular and medical students will enjoy this as it shows the strong, fascinating link between medicine and psychology.

Unnatural Causes by Dr Richard Shepherd

Dr Richard Shepherd is a forensic pathologist, meaning he solves the mysteries of sudden, unexplained deaths. He's been involved in many high-profile cases such as the Hungerford Massacre, 9/11 and the Princess Diana inquiry and has performed over 23,000 autopsies in his working life.

Unnatural Causes gives a fascinating insight into his career, which is sometimes gruesome and chilling but always interesting. It also gives readers a glimpse into Dr Shepherd's personal life, and the strains the job takes on his relationships and his own emotions.

In Stitches by Andrew Youn

Growing up in a small town where diversity was uncommon, Dr Youn, an Asian-American kid with thick glasses and a massive protruding jaw, stuck out from his classmates like a sore thumb.

However, his visit to an oral surgeon to get his jaw reconstructed let to a major breakthrough in his life's calling. Youn went on to become an extremely successful celebrity plastic surgeon, and he explains in this book how he achieved this.

In Stitches lives up to its name, both leaving you in stitches with Youn's sense of humor as well as leaving you contemplating what he had to say.

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6. Interesting MOOCs

Another great way of learning more about your chosen subject and demonstrating your interest is to take a MOOC, or Massive Open Online Course. These are free courses delivered by universities that you can take

online. If the ones below don't take your fancy, try looking at Class Central - they have a huge list of different courses for every subject imaginable, and they're all free!

Nutrition, Heart Disease and Diabetes (Wageningen University)

Learn about the role of nutrition in relation to diseases of the circulatory system and diabetes, which are major causes of death worldwide. You'll learn about the etiology of heart attacks, type 2 diabetes, stroke, other forms of cardiovascular diseases and how often these occur worldwide. You will learn about biological modifiable risk factors, such as blood pressure, blood cholesterol and obesity, and how they impact these diseases in a different way

Understanding Clinical Research: Behind the Statistics (University of Cape Town)

If you are simply interested in properly understanding the published literature or if you are interested in how scientific and medical research is carried out, this course is your first step. It offers an easy entry into interpreting common statistical concepts without getting into nitty-gritty mathematical formulae. To be able to interpret and understand these concepts is the best way to start your journey into the world of clinical literature.

Improving Healthcare through Clinical Research (University of Leeds)

Everything we do in healthcare has to be discovered and thoroughly tested before it can be put into practice. In this course you will explore clinical research – its challenges and its huge benefits to modern healthcare. You will work through case studies and examine how research contributes to the treatment of major diseases, such as cancer and dementia, examining the process of conducting research and the ethical questions raised. You will learn how members of a research team, academics and participants in clinical research all contribute to this process of discovery.

This course is designed for anyone who wants to know more about modern healthcare, and the role of clinical research and discovery within it.

7. Useful additional resources

There are loads of other great things out there that you might want to look at to develop your interest and strengthen your application, from videos to podcasts, to websites. Here are a few suggestions:

Medical school comparison tool:
https://www.themedicportal.com/application-guide/choosing-a-medical-school/comparisontool/
UCAT: https://www.ucat.ac.uk/
BMAT: https://www.admissionstesting.org/for-test-takers/bmat/preparing-for-bmat/
Medical Schools Council: https://www.medschools.ac.uk/studying-medicine/applications
This page includes their **list of skills and attributes of an ideal candidate** to study medicine, as well as advice and web links on how to **gain work experience/clinical experience virtually**.
Medical Schools Council resource page – particularly recommend their **Interview Prep** section, which takes you through the different kinds of interviews in 30 mins. https://www.medschools.ac.uk/studying-medicine/applications/resources-for-students-and-teachers

Further reading:
Staircase 12: https://www.univ.ox.ac.uk/applying-to-univ/staircase12/
TED talks: https://www.ted.com/topics/medicine
Podcasts:

- Stuff you missed in history has some good medical history episodes
- This podcast will kill you (infectious diseases)
- Bedside Rounds (medical history)

Websites:

- Becoming a Dr – free resource aimed at aspiring and current UK-based students. Sign up for access to free webinars and resources https://www.becomingadr.org/aspiring/
- Free course on how the NHS works: https://www.futurelearn.com/courses/the-nhs-explained
- Free Open University courses: https://www.open.edu/openlearn/science-maths-technology/science/biology

8. Related courses

At university, there are loads of different combinations of subjects that you can do. Maybe you might find one of these alternatives more interesting? A few ideas are listed below with a sample link, but in most cases there are lots of universities that offer these different combinations so make sure to have a good look around!

Biomedical Sciences

Biomedical science is one of the broadest areas of modern science and underpins much of modern medicine - from determining the blood requirements of critically ill patients to identifying outbreaks of infectious diseases to monitoring biomarkers in cancer
Biomedical science staff mostly work in healthcare laboratories diagnosing diseases and evaluating the effectiveness of treatment by analysing fluids and tissue samples from patients. They provide the 'engine room' of modern medicine - 70% of diagnoses in the NHS are based on pathology results provided by laboratory services.

Biochemistry

Biochemistry is the branch of science that explores the chemical processes within and related to living organisms. It is a laboratory based science that brings together biology and chemistry. By using chemical knowledge and techniques, biochemists can understand and solve biological problems.
Biochemistry focuses on processes happening at a molecular level. It focuses on what's happening inside our cells, studying components like proteins, lipids and organelles. It also looks at how cells communicate with each other, for example during growth or fighting illness. Biochemists need to understand how the structure of a molecule relates to its function, allowing them to predict how molecules will interact.
Biochemistry covers a range of scientific disciplines, including genetics, microbiology, forensics, plant science and medicine. Because of its breadth, biochemistry is very important and advances in this field of science over the past 100 years have been staggering.

Radiotherapy and oncology

Oncology is the study and practice of preventing, diagnosing and treating cancer. One method of treating cancer is radiotherapy, which involves the use of high-level radiation to either cure a patient or to control their symptoms. A degree in radiotherapy and oncology will typically train students in the key skills of planning and preparing cancer care, including the use of advanced technology and specialist machines to deliver radiation treatment. Degrees normally involve a significant amount of time spent on placement in facilities such as NHS hospitals or specialised cancer clinics, as well as in simulated clinics.

Paramedic science

If you're looking for a fast-paced work environment, you could consider a degree in paramedic science (sometimes known as paramedic practice). Paramedics are trained to attend to patients at the scenes of accidents and emergency; they must be able to keep a level head in stressful situations, work well under pressure and provide excellent medical care and advice, even while in the back of a moving ambulance. On most paramedic degrees you will normally spend around half of your time on placement. This will be in clinical practice areas such as NHS facilities, where you will be working under the supervision of qualified paramedics – and bear in mind that you could find yourself working weekends and night shifts even as a university student.

Optometry

Optometrists are healthcare professionals who specialise in the examination, diagnosis and treatment of the human visual system. As an optometrist your duties will typically include prescribing and fitting glasses, contact lenses and other aids, as well as treating a range of common eye conditions such as glaucoma. Degrees normally combine academic studies with clinical and practical opportunities, with many courses offering the chance to work with real patients and in high-tech simulation facilities.

To work as an optometrist you'll need to register with the General Optical Council, which requires working for a year as a pre-registration optometrist after your BSc. Check course details carefully though, because some universities offer four-year masters degrees which incorporate this pre-registration year within the course.

Pharmacology

Pharmacology is the study of drugs and the effects they produce upon the human body. These drugs could be medicines, food additives, agricultural compounds such as insecticides, natural hormones, and even animal toxins and venoms. On your degree you will typically study the effects that these drugs have on tissues, cells and molecules within the body, including the potential toxic effects of

medicines used in the treatment of disease. Courses will often examine both the actions of current drugs and the development of new drugs.

While there will be plenty of practical laboratory work on a pharmacology degree, there are fewer opportunities for clinical work experience than on the majority of healthcare degrees. However, many universities offer the option to take a placement year, so if industry experience appeals to you, be on the look-out for sandwich courses.

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9. Oxbridge example interview questions

As you will know, applicants to Oxford and Cambridge have to take an interview in order to get a place. It is normal to get open-ended questions, as well as being given charts or pieces of writing to analyse. Here is a sample of the kind of questions you might get asked. Remember, you're supposed to not know the answer! They often deliberately choose topics that they think no one will have studied in order to make the questions fair. What they're looking for is to see how you think under pressure, and how you can present your ideas and your logic.

What do you think makes a good doctor?

Answer guide:

- This is a standard medical school question and one to prepare for any medical school interview. The GMC's "Good Medical Practice" guidelines (available online) are a useful guide to read.
- Say anything sensible and justifiable; for example, you may suggest a good doctor should keep up to date with new research. This is both because of the impact this may have on disease management in the distant future, as well as in day to day practice by helping to manage patients ideas/ expectations about what they have read about in the news pertaining to their own illness.

Common mistakes:

- The difference in answering this question in an Oxbridge Medicine interview is that they will not want to hear a rehearsed response of three or four factors. They may push you to think about other things that you think are important.

Talk to me about an area of medicine or medical research that you find interesting.

Answer guide:

- Here is your opportunity to show that you have prepared for your Oxbridge Medicine interview. You may have mentioned something in your personal statement, in which case definitely read up on what you've mentioned.
- You don't need to know a great deal of detail about your topic of choice. You just need to have read something interesting that you'd be happy to discuss – this could be a research paper or a news article.
- For example, you may have an interest in Alzheimer's disease. A little bit of reading will tell you that there are lots of new 'drugs' being tested on animals that have shown some effect in improving memory. This might start a discussion on how one can model a disease like Alzheimer's in animals or how good animals are as a model of human disease.

Common mistakes:

- Be careful not to pick something too niche or too general- remember, at your Oxbridge Medicine Interview you will be talking to people who undertake research for a living and can see through it immediately if you start talking about something you don't really understand.

Look at this genetic tree and tell me about it.

Answer guide:

- This kind of question is common in an Oxbridge Medicine interview because you should have some idea about how to read these from A-Level Biology.
- Approaching these questions is really simple. First, state what you see. Is there a specific pattern (e.g. only boys or girls affected)? Have a look over common inheritance patterns- you should be familiar with AD and AR inheritance. Have a brief look at X-linked inheritance as this may be a new concept- but you really don't have to understand it to do well on a question like this, all you need to do is talk aloud and be logical.

How do vaccines work?

Answer guide:

- This is picking on something you will likely have some idea about from GCSE/A-Level. If a scientific concept like this is brought up in an Oxbridge Medicine interview, interviewers will often ask if you have learnt about it at school (different syllabuses cover slightly different topics).
- Your answer may be that you know vaccines are parts of pathogens that have been made non-pathogenic (for example, won't cause disease). They react with the immune system allowing immunity to form (by the production of specific antibodies). This means that future infection can be cleared by these antibodies. They may discuss this further using your scientific knowledge: for example, how is it that antibodies can be specific for certain pathogens?
- They may delve deeper into the subject and explore other ideas. For example, some students are given a graph of a number of individuals vaccinated on the X axis and incidence of disease on the Y axis and are then asked to discuss it. The graph may show that not everybody needed to be vaccinated to result in zero cases of the disease. This may then resulted in a discussion of herd immunity and its importance, as well as considering who couldn't be vaccinated (for example, newborn babies, those with very weak immune systems that cannot recognise the non-pathogenic antigen).

Common mistakes:

- Don't worry if you haven't learned about vaccines at school. Be honest: it isn't a problem if you haven't been taught about it. The interviewers want to know how you approach the problem.

What are the ethical implications of boxing?

Answer guide:

- Ethical questions are common to all medical school interviews and will definitely feature somewhere in an Oxbridge Medicine interview.
- The approach to any ethical question is the same: show you understand both sides. Usually it will be okay to detail both sides and leave it there – but if pushed, you can settle on either side as long as you justify yourself (for example, which factors are more important and why).
- In this question one could explore a number of avenues. One idea to discuss may be the following: there is good evidence that boxing causes long term brain damage – this is on a spectrum, but at the worst end, this may result in the possibility of severe physical and mental handicap perhaps requiring specialist hospital input and long term residential care.

Should the taxpayer have to pay for this? Boxing isn't a job for most (unless you are a professional boxer), it is a hobby so could be avoided.

- You may also discuss that many people choose other sports as a hobby, and will often have injuries from these. These injuries may be less severe and require less money to treat individuals but are overwhelmingly common (for example, ACL damage in football/rugby). Does that mean that any sporting related injury should have to be paid for by the individual? If so, this could mean people are less likely to play sport, perpetuating population obesity and equally impacting on NHS expenditure in the future.
- This is just one avenue of thought – you could pick any idea and explore it further. The best approach is to discuss both sides of the argument and possible wider implications. Interviewers will often latch on to what you say and guide you down an avenue of discussion.

Common mistakes:

- Don't just state a one-sided argument – make sure you're aware of both positive and negative implications of an ethical scenario.

Put these countries in order by their crude mortality (deaths per thousand of the population): Bangladesh, Japan, South Africa, the UK.

Interviews for Medicine aim to gauge candidates' understanding of the science underpinning the study of medicine, as well as skills in scientific enquiry. This question invites candidates to think about a public health question and epidemiology that can be approached in many different ways, without necessarily knowing anything about specific mortality rates around the world. We would expect the initial discussion to probe the differing causes of death that contribute to mortality rates – such as those 'Western diseases' heart disease and cancer – and how they compare to those found in developing countries (high infant mortality, infectious diseases, poor nutrition, high rates of HIV etc.). The majority of candidates will expect Bangladesh or South Africa to have the highest crude mortality rate, and will be surprised to find that it is in fact Japan.

The other part of the mortality rate calculation is of course the age of the population: we would ideally steer the conversation towards a discussion of why a wealthy but older country like Japan might have a higher mortality rate, while a country like Bangladesh – which many people might initially expect to have a high mortality rate due to relative poverty as a country – actually has a relatively lower mortality rate because of its young population. Similarly, Britain actually has the second-highest mortality rate because of the age structure of its population: we are a relatively old country and a majority of deaths occur in older people. We wouldn't expect students to get the right answer on their own, and in fact that's not the point: the point is to see how they apply their understanding of social and cultural factors in health and illness to a problem of

epidemiology. Some students might already have a detailed knowledge of demography, others might need to be given more relevant information – the point isn't what they know, it's what questions they ask to make their conclusions, and how they interpret information to draw those conclusions. We might then go on to discuss how you could make a valid comparison between mortality rates in different countries.

Interviewer: Chris Norbury, The Queen's College
The viruses that infect us are totally dependent on human cells for their reproduction; is it therefore surprising that viruses cause human diseases?

Like most good interview questions, this could be a starting point for any number of interesting conversations. Most candidates will have a reasonable understanding that viruses are essentially parasitic genetic entities, but the interviewers are not really looking for factual knowledge.

In a tutorial-style discussion, strong candidates will engage with the paradox that viruses need us for their own reproduction, and yet cause us damage. They might point out that some of our responses to viral infection (such as sneezing) favour the spread of the virus. The interviewer might steer the discussion towards viral infections associated with high mortality, and the idea that any virus that killed off its host entirely would run the risk of extinction – unless it could infect other host species too. Candidates may have come across examples of viruses that jump from non-human animals to human hosts in this way.

We might then ask if the candidate considers it possible that there are viruses that infect humans and reproduce successfully, but do not cause any disease. How might we go about finding and characterising such viruses? These questions probe selection criteria including problem-solving, critical thinking, intellectual curiosity, communication skills, ability to listen and compatibility with the tutorial format.