DOCTOR VIOLENCE page 284 • **UK TB STATUS** page 286 • **PALANTIR CAMPAIGN** page 288

MenB jab rollout after fatal outbreak

University students in Kent will be offered a meningitis B vaccine after an outbreak that left two young people dead.

Fatalities include one student at Kent University and a sixth form pupil from a school in Faversham. Fifteen cases had been confirmed as of 17 March, with most those admitted to hospital believed to be students.

The UK Health Security Agency (UKHSA) said tests had shown the cases were a result of MenB infection, and antibiotics were being offered as a precaution to those at risk.

Speaking in the Commons, the health secretary Wes Streeting said the government would begin a targeted vaccination programme for students living in halls of residence in Canterbury, in response to the "unprecedented outbreak." He added he would ask the UK's Joint Committee on Vaccination and Immunisation (JCVI) to re-examine meningitis vaccine eligibility.

Although a MenB vaccine is available, it has only been offered since 2015, to infants at 8 weeks, 12 weeks, and 1 year of age. This means that current students are unlikely to have had it unless they paid for it privately.

The MenACWY vaccination, which gives good protection against MenA, C, W, and Y, is routinely offered to teenagers in school years 9 and 10, but it doesn't protect against Men B.

The JCVI has previously not recommended a routine MenB jab for older children or adults because it is not deemed cost effective in these groups. Private MenB vaccinations cost £100-£120 a dose in the UK, with a full course of two doses priced at around £220.

Students are particularly at risk of meningitis because they mix with many others, some of whom are unknowingly carrying the bacteria at the back of their nose and throat. It can be spread through sneezing, coughing, kissing, or sharing items that have touched mouths.

The UKHSA said investigations confirmed that some of the people infected had visited the Club Chemistry nightclub in Canterbury from 5 to 7 March before becoming ill. The agency has advised anyone who visited the club on those dates to come forward for preventive antibiotic treatment as a "precautionary measure."

Invasive meningococcal disease is one of the most serious potential consequences of infection. It indicates the bacteria have entered the bloodstream or the fluid around the brain. This can cause inflammation of the membranes around the brain and spinal cord or can lead to septicaemia and sepsis.

Gareth Iacobucci, *The BMJ*

Cite this as: *BMJ* 2026;392:s516

Students at the University of Kent queue to receive precautionary antibiotics after two people died from meningitis B infection

LATEST ONLINE

- Foreign doctor recruitment saved NHS £11bn
- Unemployment linked to decline in self-reported health
- Retraction calls on pivotal study on breastfeeding and codeine

MEDICAL NEWS

Martha's rule sparks 10000 calls from patients, staff, and relatives in 16 months

One in three calls to "Martha's rule" helplines in the first 16 months of the scheme helped NHS staff identify that a patient's condition was deteriorating, NHS England says.

Data show that from September 2024 to December 2025, 10 119 calls were made to helplines by patients, families, and staff. A third of these calls (3457) helped identify acute deterioration, which led to 1885 patients receiving changes in care. This included 446 potentially lifesaving interventions to transfer patients to higher levels of treatment.

All adult and paediatric acute inpatient sites in the NHS are now in the process of implementing Martha's rule, with posters being put up around wards and buildings to help raise public awareness.

The rule was made in memory of Martha Mills (left), who died in 2021 aged 13 after developing sepsis in hospital. An inquest concluded that she would probably have survived if she had been moved to intensive care earlier.

Her parents said that they were not listened to when they expressed concern about Martha's deterioration and have campaigned vigorously for a new system to be put in place. Under the rule, staff and patients' families can request a review from a different team if they are concerned that a patient's condition is deteriorating and that they are not being responded to.

Jacqui Wise, London Cite this as: *BMJ* 2026;392:s458

Corridor care

NHS England sets out single definition

Corridor care has been officially defined by NHS England as patients spending "at least 45 minutes" in a clinically inappropriate area of an emergency department or general and acute ward. It has written to all trust chief executives and chairs, urging them to take "formal ownership" of the problem as part of new measures to tackle the crisis. The "single definition" will now be used across the NHS and, from May NHS England will use it to publish monthly data on corridor care.

Maternity care

Inquiry chair is named in government U turn

The health secretary, Wes Streeting, appointed Donna Ockenden (right) to lead the independent review into Leeds Teaching Hospitals NHS Trust's maternity and neonatal service. The inquiry was announced in October 2025, but Streeting had said that Ockenden would not chair it.

The U turn follows a campaign by families and MPs to appoint Ockenden, who is currently leading a review of maternity services in Nottingham. Last year a BBC investigation into the Leeds trust found the deaths of at least 56 babies and two mothers over the previous five years might have been prevented.

Training

Bill to prioritise UK trained graduates passes

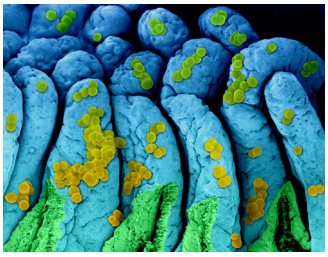
A bill pledging to prioritise UK trained medical graduates for training places has become law, but doctors' leaders say that questions remain over international medical graduates and the definition of "significant experience." The Medical Training (Prioritisation) Act 2026 promises to prioritise UK trained graduates for foundation training places and to prioritise UK medical graduates and non-UK trained doctors deemed to have "significant NHS experience" for specialty training places.

The issue was a major factor in the ongoing dispute between the government and the BMA's Resident Doctors Committee.

AMR

Pharma pipeline projects are down by a third

Pharmaceutical projects to tackle the threat of antimicrobial resistance (AMR) have declined by over a third (35%) in the past five years despite rising deaths from



resistant infections. The finding comes from a major benchmarking report by the Access to Medicine Foundation, a global health equity non-profit organisation, which analysed the efforts of drug companies to tackle superbugs. The World Health Organization has declared AMR a top threat to global public health and development.

FDA

Prasad leaves US agency for a second time

Vinay Prasad, the US Food and Drug Administration's chief medical and scientific officer, will leave the agency for the second time amid disputes with drug companies. The FDA commissioner, Marty Makary, reportedly said in an email to staff on 6 March that Prasad would depart in April, adding he would return to his previous role at the University of California, San Francisco, where he is a professor of epidemiology and biostatistics. Prasad, who was also director of the FDA Center for Biologics Evaluation and Research, previously resigned in July 2025 after only three months in the job.

Weight loss

Sweden opts not to subsidise Wegovy

Sweden's drug watchdog has decided not to cover the glucagon-like peptide 1 receptor agonist semaglutide (Wegovy), meaning patients will have to pay for the drug out of pocket. Novo Nordisk had applied for a limited subsidy to cover adults with a body mass index (BMI) of at least 35 and at least three weight related comorbidities, as well as those with a BMI of at least 40 and at least two weight related comorbidities. The Dental and Pharmaceutical Benefits Agency rejected the application, citing a "high risk the drug will be used for more patients than intended," which could have "major economic consequences."

IN BRIEF

Menopause

NICE approves daily pill for hot flushes

A new non-hormonal daily pill for menopausal hot flushes and night sweats can now be prescribed on the NHS when hormone replacement therapy (HRT) is unsuitable. Fezolinetant (Veoza, made by Astellas Pharma) has been recommended by NICE to treat moderate to severe vasomotor symptoms caused by menopause, in final draft guidance. Fezolinetant is a neurokinin 3 receptor antagonist that works by blocking nerve pathways in the brain that trigger vasomotor symptoms. A 45 mg tablet is taken once a day.

A daily pill to prevent menopausal hot flushes will now be available on the NHS

Cancer

UK death rates fall to lowest level on record

Cancer death rates in the UK are at their lowest level on record, 29% down from a peak in 1989, said an analysis by Cancer Research UK. Around 250 in every 100 000 people die from cancer each year, 11% lower than the mortality rate 10 years ago. Cervical cancer has seen one of the biggest improvements, with a 75% fall in death rates over the past 50 years. Progress is set to continue with the ongoing impact of the HPV vaccine, first introduced in 2008.

Emergency care

Long waits linked to almost 900 deaths in Scotland

A Scottish Liberal Democrats' analysis suggested that 871 deaths in Scottish emergency departments (EDs) in 2025 were associated with a 12 hour or more wait for admission. Fiona Hunter, the Royal College of Emergency Medicine's vice president for Scotland, said, "These harrowing figures show something must change in the approach to fixing the crisis in our EDs." She added the figures suggested the crisis was getting worse. Last year the college published 2024 figures showing 818 excess deaths linked to long waits.

Doctors sound alarm over patient safety

More than half of emergency department clinical leads in England who responded to a survey by the Royal College of Emergency Medicine said their department was unsafe for patients. The snapshot survey carried out on 2-3 March had 80 responses, with 51% saying their department was fairly or very unsafe, while 28% said very or fairly safe. Additionally, 88% said overcrowding was a daily occurrence, with 96% saying it occurred at several days a week.

Middle East

WHO calls for protection of health workers

Health workers and facilities have come under attack from US and Israeli air strikes across the Middle East, health leaders and charities warned. The International Committee of the Red Cross, Médecins Sans Frontières, and the World Health Organization have urged restraint as the escalating situation threatens to collapse already fragile healthcare systems. "The expansion of the conflict is increasingly impacting health services throughout the region," WHO's director general, Tedros Adhanom Ghebreyesus, wrote on X after reports that paramedics had been killed and injured by Israeli air strikes in southern Lebanon (right).

GMC

In 2025, **44%** of doctors were confident in the General Medical Council's regulation of their profession, up from **33%** in 2022

[GMC survey]

Cite this as: *BMJ* 2026;392:s491

SIXTY SECONDS ON . . . SPACE DRUGS

A NEW HALLUCINOGENIC?

Not quite. The UK government wants to enhance manufacturing of pharmaceuticals while in orbit around the Earth. Its initiative aims to set out a clearer route to bringing drugs made in space safely to market.

SOUNDS OUT OF THIS WORLD

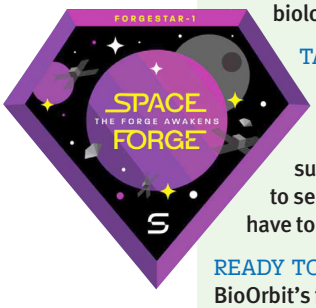
That's the idea. MHRA, the Civil Aviation Authority, the UK Space Agency, and the Regulatory Innovation Office are to work together "to provide a supportive regulatory environment to space, biopharma, and pharmaceutical companies."

UNIVERSE HEALTHCARE?

Low gravity in space enables more precise drug formulation, particularly for biologics and protein based drugs such as monoclonal antibodies, vaccines, and insulin. The government says microgravity can improve drug solubility, purity, crystallisation, and stability, supporting more effective delivery and potentially lowering manufacturing risk and cost.

ARE THE COSTS ASTRONOMICAL?

The space agency has provided funding for three in-orbit manufacturing studies. This includes £250 000 to London based startup BioOrbit that is designing an in orbit manufacturing system to crystallise biologic drugs for cancer treatments.



TAKING DRUG DEVELOPMENT TO A HIGHER ORBIT?

The company hopes to develop drugs that can be injected subcutaneously, allowing patients to self-inject at home rather than have to spend hours in hospital.

READY TO LAUNCH?

BioOrbit's feasibility study aims to clarify regulatory requirements to see if existing regulations for terrestrial manufacturing will also apply in space. The firm's chief executive Katie King said, "BioOrbit is pioneering the future of medicine in space, unlocking advanced therapies that directly benefit UK patients and support the NHS."

TO INFINITY AND BEYOND . . .

The initiative aims to position the UK as a global leader in harnessing the conditions in space to revolutionise drug development and production. Space Forge's ForgeStar1 (above), the UK's first in-orbit manufacturing platform, has recently generated plasma.

Jacqui Wise, London

Cite this as: *BMJ* 2026;392:s482

NHS halts cross sex hormone treatment for under 18s

NHS England has paused prescribing hormones to treat gender incongruence or dysphoria for young people. The health service said the decision was made after a review found the available evidence did not support their use for under 18s. Previously, the NHS could prescribe oestrogen or testosterone alongside psychological support to young people aged 16 and 17 who had a diagnosis of gender incongruence or gender dysphoria.

Alongside the "pause," there will be a 90 day public consultation on removing these treatments from the NHS as a routine intervention for young people under 18. Trans advocacy groups criticised the decision, labelling it "cruel," with some considering legal action.

Existing patients

Patients currently receiving masculinising or feminising hormones can continue their treatment, but this will need to be reviewed with their clinical team, NHS England said. The hormones can cause irreversible changes in those who take them, such as deepening of the voice or breast development.

NHS England's review on the clinical evidence was commissioned after Hilary Cass's 2024 report on gender identity services for children and young people. It found a weak evidence base for prescribing puberty blockers as well as uncertainties about the subsequent prescription of cross sex hormones.

NHS England's national medical director for specialised services, James Palmer, said the new "in-depth" review had established that the evidence does not support the continued use of masculinising or feminising hormones in this patient group.

"The NHS has exercised extreme caution when considering starting young people on this treatment—in accordance with the advice from Dr Cass—and as part of this action will now be pausing any new referrals for this treatment for 16-17 year olds," he said.

This is a profound attack on young people's bodily autonomy
Tammy Hymas

"The NHS continues to offer specialist support for under 18s managing gender incongruence, including mental health support and referral to children and young people's gender services where appropriate."

Tammy Hymas, policy lead at the advocacy group TransActual, called the decision "a profound attack on young people's bodily autonomy."

The drug watchdog, MHRA, last month announced it was pausing the Pathways trial that is assessing the effect of puberty blockers on young people to strengthen its protocol.

Jacqui Wise, London

Cite this as: *BMJ* 2026;392:s461

Nearly one in six resident doctors were attacked while working last year

NHS doctors are facing "toxic" racism as well as increasing violence and abuse, the health service's staff survey has revealed.

Conducted from September to November 2025, the survey also found little progress on improving morale or reducing burnout among staff. NHS England responded that it has not "moved fast enough to fix" staff problems.

When asked about physical violence at work, almost one in six (16%) resident doctors reported experiencing at least one attack from patients or their families or members of the public in the past year. This was higher than the NHS average of 14.5%.

For specialist, associate specialist, and specialty (SAS) doctors this figure was 11.8% and for consultants 9.9%. This was down slightly from 10% for consultants compared with 2024's results, but

Patients at risk from new "advice and guidance" rules, GPs warn

New rules requiring GPs in England to seek remote specialist advice for every referral they make into selected specialties are putting patients at risk, general practice leaders warn.

Concerns relate to changes to NHS England's advice and guidance (A&G) system that senior GPs fear could delay patient care and remove family doctors' autonomy.

A&G requires GPs to seek advice from a hospital clinician before referring a patient. Requests are submitted electronically and then reviewed remotely by a clinician, who advises whether or not a patient should be added to the waiting list. NHS guidance on A&G states that response times should typically range from two to five working days.

First established in 2015, A&G aims to reduce what some NHS officials have deemed unnecessary referrals by GPs of patients to outpatient care. Previously optional, NHS England is now making A&G mandatory for all practices as part of ministers' efforts to drive down the elective treatment waiting list, which sits at 7.25 million.

Local integrated care boards have now been asked to identify 10 specialties in their locality where all referrals by GPs should go through A&G, and GPs will be expected to follow this pathway. This means that in each geographical area all referral routes into the selected specialties will be consolidated into one centralised system—known as the single point of access.

But in a podcast interview with *The BMJ*, Katie Bramall, chair of the BMA's General Practitioners Committee for England (GPCE), said the policy was "awful for patients"

up from 10.5% for SAS doctors and 15.3% for resident doctors.

When broken down by ethnic background, a higher proportion of white staff across all three groups reported at least one attack in 2025—11.1% *v* 8% for consultants, 19.5% *v* 12.5% for resident doctors, and 14.9% *v* 10.3% for SAS doctors.

However, when asked about violence from managers staff from ethnic minority groups reported higher levels—at 0.3% *v* 0.7% for consultants, to 0.3% *v* 0.9% for resident doctors, and 0.8% *v* 1.2% for SAS doctors.

This trend continued when looking at physical violence from colleagues: 0.55% compared with 1.1% among consultants, 0.6% *v* 1.4% among residents, and 0.8% compared with 1.9% among SAS doctors.

Looking at abuse, bullying, and harassment from patients and the public, the survey found a slight rise in the past year, although numbers remain below 2021 and 2022 levels. In 2025 a total of 31.2% of consultants, 32.8% of resident, and 33.1% of SAS doctors reported at least one incident. This was up from 30.7%, 32%, and 32.8% respectively in 2024.

Between one fifth and one quarter of doctors say they are thinking about leaving their workplace—from 21.3% of resident doctors to 24.7% of consultants. This is slightly lower than 2024, at 23% and 26% respectively

When looking at harassment, bullying, or abuse from managers and colleagues, the survey found levels remained higher among doctors from ethnic minorities when compared with their white counterparts. However, the largest difference was seen between SAS doctors.

Colleague incidents

Some 17.2% of white SAS doctors reported at least one incident involving a colleague, compared with 24.6% of SAS doctors from all other ethnic groups combined.

Sarah Woolnough, chief executive at the King's Fund, said, "Every year we see yet more appalling survey results exposing the persistent, everyday reality of racism in the NHS.

"Its toxic consequences are sadly felt daily across hospitals and community and mental health services, leaving a damaging and wholly unacceptable impact on the staff who we rely on to deliver the best quality care. You can't run a health service on hostility."

Doctors are still experiencing high levels of burnout, with 27.7% of consultants, 35.5% of resident doctors, and 28.5% of SAS doctors reporting feeling burnt out "often" or "always" because of their work. This is similar to levels reported in 2024 (28.4%, 35.5%, 27.4% respectively), but a slight decrease on the levels seen in 2023 (31%, 38.9%, 29%).

Danny Mortimer, director general for people at NHS England, said, "We know about everyday pressures staff face, such as not being able to get decent food on a night shift, and we haven't moved fast enough to fix them. These survey results show it is now for the NHS to deliver improvements because there is so much more to do to make the NHS a better place to work."

Every year we see yet more appalling survey results exposing the persistent, everyday reality of racism in the NHS
Sarah Woolnough

Elisabeth Mahase, *The BMJ*
Cite this as: *BMJ* 2026;392:s486

There will be more non-elective attendances in emergency departments. It's really flawed thinking
Katie Bramall (below)

and politically driven. "Taking away the right to refer means everyone's going to be trapped in a doom loop in general practice," she said. "In [my] surgery on Monday, I'd say 80% of my consultations were patients deteriorating on various pathways who just want clarity about when they might be seen."

She said the A&G changes were a "false economy," adding, "Those patients [on waiting lists] are deteriorating, they're going to become pathologically more challenging, and ultimately are probably going to have worse outcomes when they do receive their elective care. And they're going to have more non-elective attendances in emergency departments as they have exacerbations that we can't control. It's really flawed thinking."

Referendum

The A&G issue has contributed to GPCE rejecting the GP contract for 2026-27, and it is holding a referendum of its members to gauge their reaction, which closes on 25 March at midday.

Wessex Local Medical Committee, which represents practices in the south-west, has also expressed concern about the policy.

It said that NHS England's mandate had been made without it "being able to demonstrate either the quality of the consultation that informed it [the decision] or that the approach is safe to use at scale."

The LMC noted that, once single point of access is implemented in a specialty, all other referral routes are closed and there is no alternative pathway.

"When a GP remains concerned, the steps available to them—and who carries clinical responsibility in the interim—are not clearly established," it warned. "When a GP assesses that a patient needs specialist care, that assessment can now be overridden remotely—by a clinician who has not seen the patient.

"We have seen a case in our region in which an urgent cancer referral was converted to an A&G response more than once rather than accepted as a referral, and where we believe the diagnosis that followed was delayed."

Amanda Doyle, NHS England's national director of primary care and community services, defended the A&G rollout. She said, "Advice and guidance is now well established across the country, with widespread uptake and sustained growth in requests reflecting increasing confidence in its use."

Gareth Iacobucci, *The BMJ*
Cite this as: *BMJ* 2026;392:s492

NEWS ANALYSIS

Is England about to lose its low incidence tubercolosis status?

- Current incidence sits just below the WHO threshold of 10 per 100 000
- 80% of TB cases in England are in people born outside the UK
- TB symptoms include a long lasting cough, fatigue, and a high fever

In 2024 England saw its largest annual increase in tuberculosis (TB) cases since national surveillance began in the late 1990s.

The 13.5% increase (from 4831 cases in 2023 to 5490 in 2024), which continued an upward trend since 2020, prompted the UK Health Security Agency (UKHSA) to warn that the country was on the brink of losing its low incidence status.

While the UKHSA describes the current situation as "stable," with 5424 cases reported in 2025, England's TB notification rate remains high at 9.4 per 100 000 people. This is only just under the 10 per 100 000 threshold set by the World Health Organization.

In early 2026 the ongoing threat was highlighted by an outbreak at an Amazon warehouse in Coventry, where at least 10 people tested positive for latent TB.

Tom Wingfield, reader in tuberculosis and social medicine at the Liverpool School of Tropical Medicine and honorary consultant physician in infectious diseases, said the national figures are "not where any of us would want them to be."

Doctors working in TB services say that without additional resources to screen and treat people it is only a matter of time before the scales tip and the WHO threshold is surpassed.

What is driving the trend?

Just over 80% of notified TB cases in England are in people born outside the UK. There has also been an increase, albeit to a lesser extent, in people born in the UK, Wingfield said.

This trend suggests there's "definitely something happening that is outside of, or additional to, migration patterns," he said.

Unpicking this is complex, but TB is associated with deprivation and is more common in large urban areas. In 2025, 34% of cases in England (1853 of 5424) were in London.

There is definitely something happening outside of, or additional to, migration patterns
Tom Wingfield

The TB workforce in this country just hasn't kept pace with the sudden rises
Esther Robinson

Social risk factors such as poverty, drug and alcohol misuse, crowded housing, and experience of homelessness or prison all play a part.

Symptoms of TB usually occur gradually and include a long lasting cough, feeling tired or exhausted, a high fever or night sweats, appetite loss, and weight loss. If it has spread to other areas of the body, patients may also experience swollen glands, joints, or ankles, and aches and pains.

What screening and testing is there?

Pre-entry screening for TB is compulsory for anyone coming from a high incidence country who wants to stay in the UK for more than six months.

In 2024 more than 700 000 people were checked through this route, which looks for active TB in a chest x ray. Just under 400 cases were identified.

England has also had a testing and treatment programme for latent TB infection since 2015-16 as part of a national action plan.

The programme aims to test 25% of new entrants to the UK (within the past five years) who were born or have spent more than six months in a high risk country and are aged 16 to 35. It runs in 26 integrated care boards (ICBs) (of 42 in total) that have the highest burden of TB in England.

While screening for active TB is a big success story, there is also a "real opportunity" to expand screening for latent disease, Wingfield said. "That is the reservoir of people who will go on to develop TB," he explained.

Esther Robinson, head of the UKHSA's TB unit, reiterated that most TB in England is from people coming into the country who are asymptomatic and don't know they have it. While more people are being screened, "the level of funding set in 2015 only enables us to reach 17% of eligible migrants in those 26 ICBs at the moment," she said.

TB services teams, which are funded by ICBs, have the knowledge of how to tackle TB but "not currently the funding," she added.

Robinson noted that England's post-pandemic bounce in TB cases "has been both bigger and longer" than in comparable countries.

While there is no clear reason for this, Onn Min Kon, head of services for TB at Imperial College Healthcare NHS Trust and professor of respiratory medicine at the National Heart and Lung Institute, said it may be down to patterns of migration changing, with more people coming in from higher incidence areas.

Is the workforce coping?

Experts said services are under pressure, underfunded, and struggling to manage the workload of those with active disease, never mind doing more prevention.

Last year a national review of TB services published by the NHS's Getting it Right First Time programme identified workforce and resourcing as key problems.

"The TB workforce in this country just hasn't kept pace with the sudden rises," said Robinson. This workforce is "very skilled," takes time to train, and can't just be installed "overnight," she added. "If they are short staffed, they have to prioritise the people who are unwell, so you deal with active TB and the contact tracing around that first."

Wingfield added that the TB caseload for community nurses who "work tirelessly," often covering large

THE LATENT testing programme aims to test 25% of new entrants to the UK (within the past five years) who were born or have spent more than six months in a high risk country and are aged 16 to 35

SPL

geographic areas, is very high.

At least half the people with TB accessing community nursing care require additional input because of factors such as language difficulties, poverty, drug misuse, or homelessness, Robinson added.

There is also the matter of ensuring people identified as having TB receive preventive therapy.

Wingfield said, "We've been doing an audit of our hospital data to find out how many of the people on the wards who have TB disease had previously had a test for TB infection and then didn't receive preventive therapy—and it is a significant group of people."

Barriers to receiving preventive therapy include people needing to take antibiotics for many months when they feel well. This could mean they either don't feel the need to keep taking the drugs or stop prematurely if the antibiotics make them feel unwell. Within that group there will also be some with chaotic and challenging lives where preventive treatment is not a priority, Wingfield said.

The way people interact with healthcare services and communication between primary and secondary care also need to be improved, he added. "There is something we could learn from high TB burden, low income settings, where they have introduced the role of TB champions who are trained, provided a wage, and are able to support and facilitate outreach," said Wingfield.

While most TB is being brought into the country, the UKHSA estimates that around a third of cases are related to transmission that occurs in the UK, Robinson added. "It disproportionately affects the most vulnerable people living in poor quality housing, that is overcrowded and with poor ventilation," she said.

I can name services that have the highest rates of TB who don't even have an outreach worker
Onn Min Kon (below)

Can clinicians do more?

Whether the UK is just above or just below the WHO threshold, the actions needed remain the same, Robinson said.

But she warned that more cases mean limited resources being stretched further.

She also urged clinicians to have TB on their radar when they see patients with potential symptoms. "We've not really managed to shift healthcare associated delays in diagnosis at all in the past 10 years," she said.

Work is happening to develop better predictive tests to show when latent disease is likely to become active, but that is some years off, Robinson said. And there is still no effective vaccine against TB, although a GSK candidate is currently in phase 3 trials.

Kon said rising TB rates were "very concerning."

"We need much more secure funding and staffing for screening," he said. "I can name services that have the highest rates of TB who don't even have an outreach worker."

TB rates are now rising outside of the large cities where cases traditionally occur, he added. As a result, areas with the least well established TB services are having to deal with a 20-30% rise in their workload.

What about treatments?

Frustratingly, preventive treatments that people with latent TB take for a much shorter period of time are available—but not in the UK, Kon added.

"Rifapentine, which is not licensed in the UK or western Europe because the manufacturers don't think it's worthwhile, is potentially shortening treatment to one month," he said.

He also warned UK drugs shortages have affected TB medicines, with several key antibiotics facing intermittent outages with still no long term solution.

"If I run out of the drugs, I'm going to save them for active cases," he said. "You're basically denigrating your ability to treat people in a timely manner."

What is clear, as demonstrated in the UK figures, is that TB is a global disease and the fight will never be won without controlling it in countries of origin, Kon said.

"With USAID dropping its funding, catastrophically for some countries who were relying on it, we do need to be much more strategic," he said.

Emma Wilkinson, Sheffield

Cite this as: *BMJ* 2026;392:s471

PALANTIR: **Coalition urges NHS organisations to refuse to use controversial tech giant's software**

- Group worried over spread of Palantir's federated data platform in the NHS
- NHS England says all trusts should be using FDP products from April
- BMA producing guidance on how members can limit Palantir use

The BMA's Tom Dolphin (centre) said that the use of software created by Palantir—founded in 2003 by Peter Thiel (left) and Alex Karp—risked patient safety

The BMA will provide guidance to members on what this means in practice
Tom Dolphin

Every hospital in England has been urged to disobey an NHS directive to use software operated by controversial US analytics software company Palantir.

A coalition of human rights, health and patient organisations, and unions sent out the plea to NHS trusts by email, out of concern over Palantir's federated data platform (FDP).

They urged hospitals to not follow NHS England's instructions to sign a memorandum of understanding to use the FDP, as set out in planning guidance issued in October.

This guidance said all trusts should be using FDP "core products" from April, although this, NHS sources indicated, was a policy decision rather than an enforceable instruction.

The FDP was created during the pandemic with the aim of helping manage a federalised, siloed health service at a time of national crisis. Palantir won the now £1bn contract to supply the service using its Foundry software, a platform that can connect incompatible databases and allows customers to integrate and analyse data from across many sources.

Waiting lists, supplies, and beds

In the post-covid NHS this involves monitoring things such as waiting lists, hospital supplies, and available beds and operating theatres.

But a new briefing document from the health worker campaign group Medact, called *Concerns Regarding Palantir Technologies in NHS Data Systems*, emphasises that hospitals have the ability to refuse NHS England's directive and urges them to do so.

The document, shared with *The BMJ* and the *Guardian*, outlines concerns over Palantir's past behaviour, data security of the FDP platform, potential harm to trust among patients, and the risk of the FDP being used by other government departments to access people's health data.

"We know the FDP rollout is not going to plan, and we know that NHS England is under intense pressure to cancel the contract when it reaches its break clause in February 2027," said Medact's Rhiannon Mihranian Osborne.

She spoke for a collection of groups concerned about Palantir, including Amnesty International, the Good Law

Project, Privacy International, Just Treatment, Corporate Watch, and the United Tech and Allied Workers Union.

She added, "Fifty thousand patients have written formal complaints to their hospitals, and the BMA is telling members to explore ways around using Palantir products.

"It's a key time for local hospitals to exercise their autonomy when NHS England isn't listening."

Medact is also concerned that, with Palantir systems in place, the Home Office border control, police forces across the country, and current or future UK governments could use NHS data for other purposes.

Some political parties have already indicated a potential willingness to use health data in this manner.

For example, Reform has announced plans to share data between the Home Office, NHS, HM Revenue and Customs, the Driver and Vehicle Licensing Agency, banks, and the police as part of a proposed UK Deportation Command "to identify illegal migrants and deport them."

But NHS England sources have said that, as Palantir was appointed in line with public contract regulations, it must operate only under the instruction of the health service when processing data and that strict stipulations in the contract about confidentiality would prevent such data sharing.

Palantir was founded in 2003 by the Silicon Valley billionaire Peter Thiel, former philosophy academic Alex Karp, and computer scientist Stephen Cohen, with financial backing from the CIA.

It initially supplied software platforms to governments and military and law enforcement organisations. Customers include the US Army and Department of Defense, the UK and Israel defence ministries, and NATO, as well as most NATO members and the Ukrainian military.

Palantir also works with law enforcement in the UK and the US. In the US it controversially provided services for Immigration and Customs Enforcement (ICE).

In January it emerged that US immigration agents were using an app developed by Palantir that draws on the health records of millions of Americans to find and detain people they deemed illegal immigrants.

In the wake of this, the BMA chair of council, Tom Dolphin, warned that the use of Palantir in the NHS could risk patient safety.

"If patients no longer feel able to trust the NHS to handle their data confidentially or worry that the personal information they share with their doctor will be used for purposes which they do not expect, this will undermine public trust in a confidential health service," he wrote in a rapid response to *The BMJ*.

"No longer provide endorsement"

Dolphin added, "It is the view of the BMA that doctors working in the NHS can no longer provide the tacit endorsement that using a product implies and must immediately take steps to explore refusing any non-direct care usage of Palantir's federated data platform, with a view to moving away from the platform entirely in time, when a suitable alternative can be put in place."

He later told *The BMJ* directly, "The BMA will provide guidance to members on what this means in practice, including whether there is an option to not use Palantir's platform in such situations."

The FDP rollout in the NHS is incomplete, but NHS England said that more trusts were signing up to the system, which had clear benefits.

"The FDP is already delivering for patients and the NHS—helping to join up care, increase hospital productivity, speed up cancer diagnosis, and ensure thousands of additional patients can be treated each month," an NHS England spokesperson told *The BMJ*. "The platform is now being used by over 150 NHS organisations across England, with another 57 signed up to implement it in the next few months."

However, some trusts, including Royal Marsden, Great Ormond Street, Leeds Teaching Hospitals, and Nottingham University College, have not adopted the platform, with some, including Leeds and Greater Manchester Integrated Care Board, saying their existing systems were superior.

Palantir has rejected the claims made in Medact's document, including that its engineers were accessing patient identifiable data.

The company stated that Palantir engineers were able to access data only under the direction of NHS England data controllers and only for appropriate engineering activities.

"Palantir software is playing an important role in improving patient care through the NHS federated data platform," a Palantir spokesperson told *The BMJ*, "helping to deliver 100 000 additional operations, a 12% reduction in discharge delays, and the removal of 675 000 patients from waiting lists.

"That role has been publicly recognised by a large number of trusts. How the software is used is entirely under the control of the NHS, with data only able to be processed in accordance with their strict instructions.

"We have no intention of and no means of using the data in the way that the Medact report is suggesting. To do so would be illegal and in breach of contract. The software has world leading, fully auditable data security and governance capabilities."

Stephen Armstrong, London

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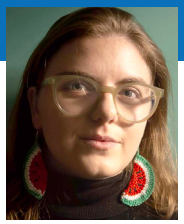

It's a key time for local hospitals to exercise their autonomy when NHS England isn't listening
Rhiannon Mihranian Osborne

Protest against Palantir in Florida on 3 March

"THE PLATFORM is now being used by over 150 NHS organisations across England, with another 57 signed up to implement it in the next few months"

JACK TAYLOR/GETTY IMAGES

THE BIG PICTURE

FOUNT OF FILTH: **Artwork reflects the effects of water pollution on health**

Visitors and commuters to central London faced a stark reminder of the severe impact contaminated water can have on human health.

The 10 metre wide structure featured bronze-like statues of men, women, and children appearing to vomit murky brown water, while a businessman, his pockets stuffed with banknotes, watches on, removed from accountability for polluting the waterways in which they swam or surfed with sewage.

The fountain was erected to publicise a Channel 4 factual drama, *Dirty Business*, which Nic Moran, the broadcaster's head of marketing, said "put the human cost [of the sewage scandal] at the forefront and told the real stories behind the public health crisis."

Consumption of water contaminated with human faeces exposes people to bacteria such as salmonella and *E coli*, viruses, and protozoa, all of which can cause diarrhoea and vomiting.

Alison Shepherd, *The BMJ* **Cite this as: *BMJ* 2026;392:s511**

The fountain on London's South Bank last month. It features images inspired by former UK surfing champion Sophie Hellyer and prominent outdoor swimmer Ella Foote, both of whom say they have been made ill by polluted water

Health and economic inactivity in young people

Support programmes should be expanded to cover common mental health disorders

Around three million people in the UK aged 16-24 are economically inactive.[2] Studies show increases in common mental health disorders in young people who are without work,[3] such as rising anxiety, depression, and stress related conditions.

Economic inactivity describes people of working age who are not employed or looking for work in the past four weeks and are not waiting or able to start work in the next two weeks.[1] Before the covid-19 pandemic, UK rates were consistently lower than those of comparable advanced economies.[5] However, although the pandemic drove up inactivity globally, the UK has seen a slower recovery than its G7 peers.[5]

Higher rates of inactivity risk locking young people into poorer long term prospects through a bidirectional relationship in which poor health reduces work capacity, while prolonged worklessness further undermines health.[6] For young people from lower socioeconomic backgrounds the prospects for social mobility are profound. Quality of employment also matters: good quality work protects health and poor quality work is detrimental.[7] Artificial intelligence is reducing entry level opportunities, with highly exposed firms cutting junior roles by almost 6%, raising concerns about diminishing pathways into work.[9]

Support for people to work

In the UK, high quality evidence on the effectiveness of return-to-work initiatives is scarce, particularly for socioeconomically deprived groups.[10] The strongest evidence comes from international studies, particularly in Denmark, Netherlands, and Norway,[11] which have similar rising trends in mental health problems.[12] Across these settings individual placement and support (IPS) consistently increases paid employment and job duration, particularly for young people.[11] These interventions typically involve one-to-one personalised support from a dedicated employment specialist, with rapid job search tailored to individual preferences and close integration with clinical mental health services.[11]

UK policy continues to emphasise conditionality and sanctions

Most interventions in the UK focus on individuals or the employment environment, often integrated with mental health support.[10] IPS provision is largely restricted to people with severe mental health conditions, such as schizophrenia and bipolar disorder, and delivered within secondary care mental health services.[11] Parallel NHS initiatives are expanding for people with common mental disorders such as anxiety and depression—for example, employment advisers embedded within talking therapy services—showing the feasibility of integrated, personalised vocational support.[10] While adding cognitive behavioural therapy to IPS has shown no additional benefit, access to an employment adviser alongside psychological therapies, improves both mental health and likelihood of gaining work.[10]

Policy in the UK continues to emphasise conditionality and sanctions. Although sanctions may increase the number of people exiting from benefits, they are associated with poorer job quality, instability, material hardship, and mental health problems.[13] This raises concerns about recent proposals that would make it harder for people with milder mental health conditions to qualify for disability and health related benefits.[14] Alongside these reforms, the government is also investing in more specialised schemes for inactive groups, including young people, to re-enter the workforce, particularly in regions experiencing the highest rates of economic inactivity, alongside increased support for a broad range of mental health conditions.[14]

Managing inequalities

Reducing recurrent and stubborn inactivity demands collaborative action across the employment, health, skills, and community sectors to tackle the interconnected drivers of inequality (poor health, skills shortages, depressed regional labour markets).[16 17] Systems-thinking principles can help align actions across sectors, reducing the risk of unintended consequences (such as pushing people into unsustainable work[13]), and supporting long term change by addressing underlying structures, environments, policies, and individual behaviours together.[17] In keeping with this approach, the Mayfield review calls for a shared responsibility model in which individuals, employers, government, and the health service collaborate to create healthier, more inclusive employment opportunities.[18]

Reducing health related economic inactivity requires an approach that enables people to maintain good health while supporting access to high quality employment, supplemented by evidence based supportive interventions such as IPS. A fairer, healthier labour market is possible if health and work are addressed together.

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EDITORIAL

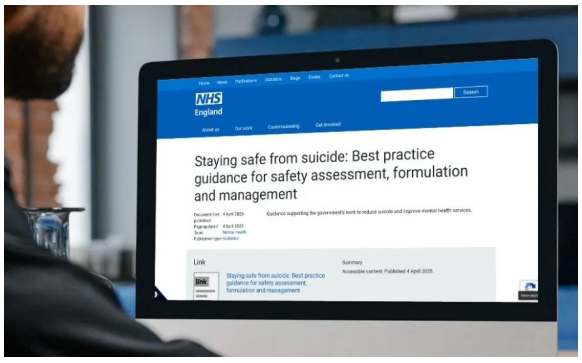
Suicide prevention and cardiovascular conditions

Confident discussions around mental health start with specialised training

Physical illness is recognised as a high risk factor for suicide in guidelines from the National Institute for Health and Care Excellence (NICE) and the NHS five year suicide prevention strategy. Middle aged to older adults with acute coronary syndrome (ACS), heart failure, and cardiac implantable electronic devices (CIEDs) are 2-4 times more likely to die by suicide than the general population.[5-7]

Two consensus statements in 2025, from the European Society of Cardiology (ESC)[8] and the American Heart Association (AHA),[9] focus on the intersection of mental health and cardiovascular disease. Both represent missed opportunities to prioritise suicide prevention. The ESC endorses routine screening for mental wellbeing,[8] whereas the AHA endorses targeted, symptom prompted screening.[9] Both cite the Patient Health Questionnaire-9 (PHQ-9),[10] which directly asks about the frequency of "thoughts that you would be better off dead or of hurting yourself in some way." Asking and responding confidently to questions such as this, listening with empathy, and connecting with further support are core skills in the NHS's *Staying Safe from Suicide* best practice guidance.[11] However, neither cardiology consensus statement frames suicide as preventable or treats suicide risk as a clinical safety priority requiring urgent action.

Risk of death by suicide is higher in the first three months after heart failure treatment for patients with comorbid mental health conditions such as depression.[6] Regardless of mental health conditions, the risk of death by suicide is highest in the first 3-12 months after a cardiac event or diagnosis[12 13] but extends as far as four years;[14] a period when patients undergo secondary cardiovascular prevention and lifestyle interventions and ongoing follow-up in primary care. Notably, more than half of the people with coronary heart disease who die by suicide have visited a health practitioner in the month before their death.[15] Recent data point to a "silent" suicide decedent profile characterised by physical illness, low mental health, and substance-use diagnoses, low use of psychotropic medication, and low levels of disclosure of suicidal intent in older adults.[16] This profile indicates that reliance on pre-existing mental health conditions or PHQ-9 alone is insufficient for patient safety.



Risk of death by suicide is highest in the first 3-12 months after a cardiac event or diagnosis

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Celine Gallagher, senior research fellow and cardiac nurse
Rajiv Mahajan, electrophysiologist and researcher, Adelaide University
Anonymous, cardiology patient, patient author

If you're struggling, you're not alone. In the UK and Ireland, Samaritans can be contacted on tel 116 123 or email jo@samaritans.org.

Evidence gaps

The ESC and AHA consensus statements agree that mental health is integral to cardiovascular care.[8 9] The NHS Quality and Outcomes Framework previously incentivised depression screening in patients with coronary heart disease, but the policy was withdrawn after limited evidence of improved outcomes.[26] This experience has fuelled scepticism about routine mental health screening in cardiology. The ESC recognises enduring knowledge gaps including optimal screening intervals and treatment algorithms.[8] In the largest randomised controlled trial evaluating efficacy of depression screening after acute coronary syndrome (CODIACS),[27] no clear benefit was demonstrated in quality of life or depression-free days. Notably, CODIACS omitted the PHQ-9's suicidality item, using an 8 item protocol instead.[27] Disclosure of suicidal ideation, intent, or plans should not be conflated with depression case finding; it represents a distinct patient safety concern.[28]

In cardiology, explicit coverage of suicide is largely confined to the evaluation of candidates for heart transplantation,[17] where suicidal ideation and suicide attempt history are addressed in the psychosocial eligibility assessment. By contrast, specialty care guidelines for oncology,[18-20] neurology,[21] and dermatology[22] directly and explicitly incorporate suicide risk identification and management.

To translate suicide prevention into future cardiology practice, we recommend two feasible and sustainable actions. First, international cardiology societies (such as the ESC and AHA) should describe the risk of death by suicide after major cardiovascular events in future mental health position statements. Addressing suicide should include clear signposting, triage processes for urgent and imminent risk, and referral pathways that prioritise suicide prevention. Second, cardiology societies should recommend that staff (cardiologists, cardiac nurses, rehabilitation and allied health professionals) who care for people with acute coronary syndrome, heart failure, or cardiac implantable electronic devices complete general competency based suicide prevention training.

If secondary cardiac prevention aims to prevent avoidable death after acute coronary syndrome, heart failure and cardiac implantable electronic devices implant, the question is no longer whether we should adopt mental health screening, but how cardiology will systematically fulfil its responsibility in suicide prevention.

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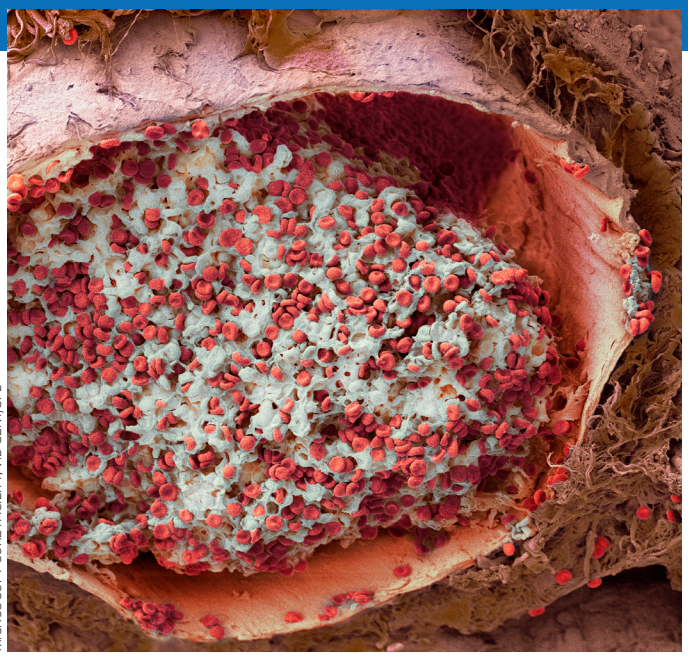

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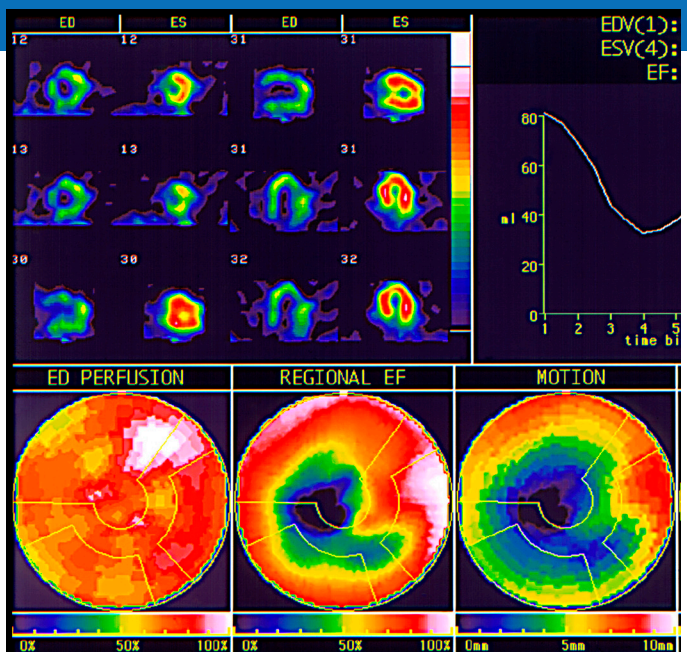


ZEPHYR/SPL

COVID-19

Why covid-19 is “a vascular disease masquerading as a respiratory one”

Cardiovascular symptoms are seen in both acute and long phases of the virus. **Katharine Lang** reports on what we’ve learnt since the onset of the pandemic

Cardiovascular complications from covid-19 have been seen widely since the early days of the pandemic, when a small study in Wuhan reported myocardial injury in several patients. Soon after, studies found that up to 30% of those admitted to intensive care units showed myocardial injury.

“In many respects covid-19 is a vascular disease masquerading as a respiratory one,” says Andy Benest, vascular biologist at the University of Nottingham. “The virus enters through the airways but exerts its systemic effects through the vasculature, the common denominator in the lungs, heart, kidneys, and brain,” he says.

Although covid is transmitted through the respiratory system, much of the pathology unfolds in the vascular system, with microvascular damage, thromboinflammation, and dysregulated perfusion underpinning the cardiac, pulmonary, and neurological manifestations of severe disease.

Viral effects on the vasculature are mostly indirect, through inflammation, immune activation, and coagulation cascades

Cardiovascular complications are relatively common in the acute phase of covid. Studies have found that acute cardiac injury occurred in 6-25% of people admitted to hospital. One 2020 study reported that 14.1% of people admitted to hospital with covid experienced some type of cardiovascular complication.

Why is the cardiovascular system affected?

Early studies suggested that the endothelium could be directly infected by the virus, as it enters these cells through angiotensin-converting enzyme 2 (ACE2) receptors. Benest says, however, that this may not be the case.

“The notion that endothelial cells express ACE2 at meaningful levels is increasingly questioned. Transcriptomic and protein data suggest ACE2 is present in perivascular and smooth muscle cells, but largely absent in true endothelial cells,” he says.

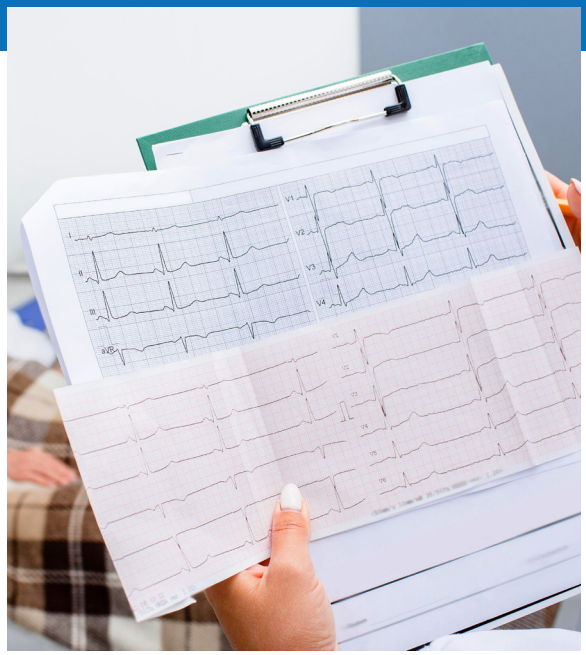
This does not mean the endothelium is unaffected, Benest points out. Rather, it implies that the viral effects on the vasculature are mostly indirect, through inflammation, immune activation, and coagulation cascades rather than direct endothelial infection.

“Covid’s hallmark vascular features—endothelial activation, microthrombosis, and barrier dysfunction—likely arise from cytokine driven injury, platelet-leukocyte interactions, and altered coagulation rather than primary viral cytopathy,” he told *The BMJ*.

What are the cardiovascular symptoms?

In the acute phase covid-19 can cause myocarditis, myocardial infarction, arrhythmias, heart failure, blood clotting in the lungs (which can also affect the heart), and other complications, says Ziyad Al-Aly, professor of medicine at Washington University in St Louis in the US.

A large study, using data from UK Biobank, found that those infected by early variants had a doubled risk of cardiovascular events. For those with severe infection requiring



(Left to right) Blood clotting in lungs, heart tests after heart attack, ischaemic heart disease

hospital admission, the risk of myocardial infarction and stroke was four times that of controls—an equivalent increase in risk to having coronary artery disease.

A 2022 study of almost 154 000 US veterans told a similar story. At least 30 days, and not more than a year, after infection, these veterans had a greater risk of cerebrovascular disorders, dysrhythmias, ischaemic and non-ischaemic heart disease, pericarditis, myocarditis, heart failure, and thromboembolic disease than two groups of more than 5 million contemporary and historical controls.

The increased risks were greatest in those who had been admitted to hospital with covid, but those who had had mild symptoms were still more likely to experience cardiovascular complications than controls.

Who is at most risk of heart problems after infection?

Benest says that hypertension, diabetes, obesity, and pre-existing cardiovascular disease (CVD) all magnify post-covid risk, emphasising how underlying cardiometabolic health has a major influence. "Age adds vulnerability through accumulated endothelial dysfunction and reduced vascular elasticity," he says.

Several factors increase a person's risk of cardiovascular complications following covid-19, but severity of the acute infection is one of the clearest indicators. "People requiring admission to hospital or intensive care units show the highest rates of subsequent vascular and cardiac events," Benest says, adding that even mild cases carry a small, measurable increase in risk.

Studies have also shown the pre-existing risk factors for CVD can be amplified by covid infection: diabetes and hypertension may increase the severity of covid, as well as raising the risk of cardiovascular complications during and after acute infection.

Covid and flu vaccinations both have a protective effect in people with CVD, post-covid and with long covid

What is long covid's effect on the heart and cardiovascular system?

Long covid has been described as a "complex, multisystem disorder that can affect nearly every organ system and can be severely disabling," and in 2024 it was reported to be affecting around 400 million people worldwide.

The cardiovascular system is commonly affected, with symptoms being the third most frequent manifestation of the condition after neurological-neuropsychiatric and pneumological symptoms.

Al-Aly points out that one of the characteristics of long covid is dysautonomia and postural orthostatic tachycardia syndrome.

A systematic review found that chest pain, palpitations, dyspnoea, and syncope were common in people with long covid. Another study found that people with long covid were 1.6 times as likely as those without long covid to experience cardiovascular symptoms.

As with acute covid, the more severe the initial infection, the more likely the person is to experience cardiovascular complications as part of long covid.

Do new variants of covid cause worse effects?

With the availability of vaccines, and some immunity from previous infection, newer variants do not seem to carry the same risk of complications as earlier ones.

"Variant differences appear to reflect severity rather than biology," Benest says. "Earlier variants like delta caused more intense systemic inflammation and higher rates of thrombosis and myocardial injury."

So far, no variant has shown unique tropism for the vasculature or heart, he says, adding that the intensity of the host's inflammatory and coagulative response remains the key determinant of cardiovascular outcome.

"There have been incredibly pathogenic variants that did not appear to take hold in the same way as delta and omicron did, which means it's critical we understand more about how those variants might have impacted the cardiovascular system differently, to be awake to more emergent variants," Benest says.

The best preventive measure is vaccination

While some antivirals (nirmatrelvir/ritonavir and molnupiravir) have proved effective at reducing the risk of heart and vascular complications, others, such as remdesivir and baricitinib, are thought to increase risk.

Both Al-Aly and Benest say that the best way to minimise the risk of cardiovascular complications is to prevent severe infection through vaccination.

And it is not only covid-19 vaccination that appears to give protection against further cardiovascular complications in people with CVD. One large study found that both covid and flu vaccinations have a protective effect in people with CVD, post-covid and with long covid.

"Vaccination substantially reduces both acute and long term cardiovascular complications by blunting systemic inflammation. And, finally, lifestyle factors such as good blood pressure, lipid control, and regular exercise remain protective; covid-19 tends to magnify existing vascular risks rather than create new ones," Benest says.

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SUSTAINABILITY

Weight loss drug waste: what happens to the empty pens?

Pharmaceutical companies facing increasing demand for GLP-1 agonist receptors are struggling to minimise their impact on the environment. **Mahima Adey** reports

Not all biodegradable plastics have the necessary properties
Matthew Parker

You have to think about financial sustainability
Adeola Onasanya

As demand for glucagon-like peptide-1 (GLP-1) receptor agonists such as semaglutide (Ozempic, Wegovy), and GLP-1 and glucose dependent insulinotropic polypeptide agonists like tirzepatide (Mounjaro, Zepbound) surges so do fears that the millions of pre-filled plastic pens they're dispensed in are contaminating water and soil.

"The US almost exclusively uses single dose pens. One pen has one dose in it, and it's used once and thrown away. Whereas a lot of Europe are using a multidose pen," says Matthew Parker, device innovation lead at the Technology Partnership in Cambridge in the UK. Pre-filled pens are more user friendly and allow for treatment at home without the guidance of a doctor or a nurse, Parker says.

Treatment at home can, however, lead to incorrect disposal. "In hospital or other medical settings, training is provided on the disposal of clinical waste, meaning it's more likely to be done correctly. By contrast, the public using weight loss pens at home don't have the same access to guidance and disposal methods," says Mark Hall, who deals with clinical waste at waste management company Business Waste.

Used pre-filled pens are classified as clinical waste and must be disposed of in sharps containers that are puncture resistant.

Yet as many as six million used pens may be improperly dumped each year in the UK alone, which is equivalent to 96 tonnes of plastic, says Hall. "To put it into context, that's the same as nine million plastic water bottles," he says.

Around 12% of adults in the US use a GLP-1 drug according to research by the non-profit think tank Rand. And a survey by Agri-Food Analytics Lab at Dalhousie University, published in 2024, estimated that 10% of adults in Canada used a GLP-1 drug for either type 2 diabetes or weight management, or both. Exact numbers for the UK are not known, but combining NHS prescribing data with private market reports suggests that in 2024 around one million people (1.5% of the population) in the UK were using GLP-1 drugs.

Production of the drug is also expected to increase because the patents for semaglutide expire in 2026 in several countries, including Canada. It is presumed that this will result in the production of generic versions, possibly increasing the environmental implications.

Current disposal

Packaging for GLP-1 drugs includes patient information leaflets that outline directions for disposal. Instructions are also available on pharmaceutical company websites.

Information from manufacturers Novo Nordisk (semaglutide) and Eli Lilly (tirzepatide) tells users that empty pens should not be included with household waste and should be disposed of in a sharps container along with the needles.

"Some pharmacies and GP surgeries will take your full sharps bin for disposal," says Hall. Local councils may be able to provide one-off or regular collections from home.

Orla Smith, a patient who is using tirzepatide prescribed for weight loss by a private clinic in the UK, tells *The BMJ* that at her initial consultation she was provided with a sharps bin to dispose of the needles used with the pre-filled pens, and that her local pharmacy provides cardboard boxes for patients to recycle the pens. But not everyone will follow the guidance, and inappropriately discarded needles pose health risks both to patients and to handlers of waste.

"Putting sharps waste into your household general waste presents a huge risk to bin collection workers," says Hall. The World Health Organization estimates there is a 30% risk of contracting hepatitis B from an infected needle.

Another risk is that used pens might still contain the drug at the time of disposal. "Disposing of pens with leftover medication contributes

to pharmaceutical pollution," says Hall. "Pharmaceuticals can disrupt fish development, harm aquatic species, and alter natural processes in rivers and soil."

In the UK, around 23 million medical pens end up in landfill each year. "As these plastic products break down, they can create microplastics. Research shows that these pose a danger to both human and animal health," Hall tells *The BMJ*.

Pharmaceutical companies have published environmental policies that acknowledge their negative impact on the environment and continue to explore how they can become more environmentally friendly.

The disposal of empty injection pens adds to the environmentally damaging medical waste problem

Reuse, recycle?

Reusable pens have been developed for use with insulin and this could be the next step for GLP-1 drugs. Their use would involve placing cartridges of the drug into a pen and would result in much less plastic being used, says Parker.

But there are problems with this solution. "It's a risk," Parker tells *The BMJ*. "If a user puts an insulin cartridge in a GLP-1 device and accidentally delivers a quarter of a vial of insulin, that might be really dangerous."

According to Novo Nordisk's 2021 annual report, the company produces more than 600 million pre-filled pens every year. It encourages their appropriate disposal through a scheme called PenCycle, which operates through pharmacies across the UK. Under this scheme, patients return empty pens to the company.

"Users must remove the needle first and dispose of it in a sharps bin," says Hall. Since the pens cannot be reused, they are repurposed into furniture and lamps.

The scheme is limited to the UK, however, and the pens can be repurposed only if they are empty.

Currently, pens from Eli Lilly cannot be recycled. "We are engaged in injection pen recycling pilots in Denmark, France, Germany, Spain, and the US," the company said in a statement, adding that they are investing in research "to identify renewable or biobased materials to make our future packaging and devices more sustainable."

"Pens are problematic because they are made up of different materials, which makes recycling difficult," says Hall.

There are also challenges around the use of biodegradable plastics, Parker says. "For the pens, some of the plastics need to be transparent, some of them need to have very high strength, some of them need to have very little friction," says Parker. "A lot of the biodegradable plastics that have been available don't have these properties."

Pens are made up of different materials, which makes recycling difficult
Mark Hall

Alternative formulations

Another solution could be developing new formulations of the drug. For example, in the US semaglutide is now available in pill form—branded Wegovy for weight loss and Rybelsus for treatment of type 2 diabetes.

Risks and benefits have to be weighted, says Adeola Onasanya, a research fellow at the University of Birmingham who studies the development and implementation of medical devices in a sustainable manner.

"Is it easier for patients to pop a drug in their mouth than inject?" she asks. "Maybe. But is it safe? Is it environmentally safe, in that it doesn't contribute to waste?"

And it is important to note that the environment is only one aspect of sustainability, adds Onasanya, and that other factors must be considered.

"You have to think about financial sustainability," she says. "You need to find a cost you can sustain long term."

Additional considerations are social sustainability, she says. Patients cannot easily be switched to a different form of semaglutide as there are differences in pharmaceutical properties and dosing instructions that might impact their treatment.

"Does it fit into people's lives? Will it make life harder or easier?"

Patient safety still comes first, Onasanya says. "If it's going to impact patient safety, all the other parameters will have to be downgraded; every other thing goes below that."

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PUBLIC HEALTH

Microplastics and human health: what we know

As new research suggests levels of the pollutant may have been overestimated, **Katharine Lang** asks if we should still be concerned

Microplastics are present in oceans, lakes, and the air. And from there, people can ingest them, inhale them, or even absorb some through the skin. This has caused concern about the health implications.

But a recent study, analysing data from 283 sites worldwide, indicates that levels of atmospheric microplastics may be 2-4 times lower than previously estimated.

Ioanna Evangelou, the lead author, says previous studies were subject to large uncertainties, as measurements were taken in only one area—a national park in western US —then estimated for other areas for which the measurements were not representative. "It's not surprising we arrive at different results with the significantly larger dataset," she says.

Evangelou, an atmospheric scientist at Vienna University, thinks estimates of aquatic levels could be similarly inaccurate. "We need more, better measurements, and, most importantly, we need measurements that provide more precise information about the size of the particles being measured."

She emphasises the difficulty of taking measurements. "We're talking about particles ranging from 1 nm (for nanoplastics) to 5 mm. That's already a difference of a factor of five million in diameter," she says, adding that "many measurements don't even capture all polymers, meaning we also need to have a better understanding of exactly what is being measured and what isn't." But that is not to imply that we should be complacent about microplastic pollution. "Lower airborne concentrations generally mean lower risk, but numbers alone don't tell the whole story," Evangelou cautions. "Health impacts also depend on the particle size and shape, the additives or attached pollutants, and, of course, the exposure duration. Furthermore, ingestion represents a critical exposure pathway for humans, as microplastics have been detected across numerous species, thereby infiltrating the trophic chain."

Micro and nanoplastics research is still in an early unstable phase

A study in February from the University of Technology in Sydney highlighted the risks from inhaled microplastics. Lead author Keshav Raj Paudel said that, although earlier research on microplastics focused mainly on oceans and human exposure through eating seafood, "growing evidence suggests that inhalation may be an equally, if not more, significant route." His study concluded that inhaled microplastics can trigger lung inflammation and tissue damage and act as carriers for other pollutants and carcinogens.

Evangelou says: "Plastic production is increasing so rapidly that even significant improvements in recycling will likely not reduce emissions. We also shouldn't forget that plastic accumulates, so even a reduction in emissions wouldn't be enough to reduce the amount of plastic in the environment."

Health effects

Microplastics have been detected in the human cardiovascular, digestive, endocrine, lymphatic, respiratory, reproductive, and urinary systems, as well as in breast milk, semen, stool, sputum, and urine.

In a review of animal studies, researchers found evidence that microplastics may cause dysfunction of the intestine, liver, and excretory and reproductive systems, raising the question of whether they have similar effects in people.

Studies suggest that they might, but the potential mechanisms are unclear. Fazel Monikh, from the University of Padova, Italy, says that health effects might be caused by the particles inducing physical irritation, immune response, or inflammation or by additives with toxic effects leaching from the particles. "Experimental studies in various organisms show that microplastics can induce oxidative stress, inflammation, and cellular dysfunction under certain conditions," he says.

"However," he said, "it is scientifically incorrect to attribute all observed or potential health effects solely to microplastics. Human disease is multifactorial, and current toxicological and clinical protocols are not sufficiently sensitive to detect subtle or long term effects of low dose, chronic exposure. Absence of clear evidence is not evidence of absence; rather, it reflects the limitations of our current models and biomarkers."

Current analytical methods may not be able to determine the levels of microplastic in human tissues accurately. "Lipids can generate signals that closely resemble those of polyethylene, leading to false positives if not carefully validated. At present, this is not simply a matter of better sample handling, it is a fundamental limitation of the techniques themselves," says Monikh.

He cautions that strong conclusions about human health risks from microplastics should be avoided. "The field of micro and nanoplastics research is still in an early, methodologically unstable phase," he says. "Until more selective analytical tools are developed, studies should be interpreted cautiously, use rigorous controls, and ideally combine multiple independent methods rather than relying on a single technique."

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Plastic and microplastics in a nutshell

Plastic is a lightweight, durable, flexible, and cheap material, largely comprising polymers made from crude oil with various additives. Invented in 1860, its use increased exponentially in the 20th century. From around 1.8m tonnes in 1950, production rose to 363m tonnes by 2022. By 2050, annual global production is projected to reach 902-1124m tonnes.

But what happens to plastic after use? Despite recycling efforts, most ends in landfills, incineration plants, or is disposed of improperly. The UN Environment Programme reports that 19-23m tonnes of plastic waste leaks into aquatic ecosystems every year. When plastics break down, they produce microplastics and nanoplastics—particles with a diameter of less than 5 mm and less than 1 µm, respectively—which, studies indicate, accumulate in tissues, potentially causing health problems.

ROLE MODEL

“I witnessed endless suffering”—the GP whose journey into medicine started in a refugee camp

GP Amal Paul talks to **Kathy Oxtoby** about growing up in Bangladesh and building his life in Leeds

For Amal Paul, a GP partner in Leeds, one of the most rewarding aspects of being a general practitioner is that “every day you feel that you’ve done something positive for someone.”

“Seeing the smiling face of a child or having a patient thank you is an amazing reward,” he says. To him, the role is “not only trying to heal the patient, but also their family and the community,” and he enjoys “building relationships with patients, getting to know their families, and seeing their children grow up.”

It was Paul’s mother’s dream that he become a doctor. “I was born and brought up in Pak Hili, a small village in Bangladesh, in the 1950s. There were no qualified doctors for more than twenty thousand local people. My mother wanted me to become a doctor so that I could look after the local community.”

He began a pre-medical course in 1969 at Government Azizul Haque College. But in 1971, during the Bangladesh war of independence against Pakistan, “our village was burnt and destroyed, and we fled to India as refugees,” he says. “In the refugee camps I witnessed the endless suffering and sad deaths of children and elderly people from preventable diseases. That vivid experience further inspired me and made me determined to pursue a career as a doctor.”

Our village was burnt, and we fled to India as refugees

In 1972 Paul returned to Bangladesh and was awarded a place at Rajshahi Medical College. After graduating, and following a one year internship at Rajshahi Medical College Hospital, he returned to his village as the local doctor. “My mother’s dream had come true—her son had come back to work for the community,” he says.

He recalls the case of a 6 year old patient who had diarrhoea and was close to death. “I cycled five miles on an unmetalled road to see them, gave them IV fluids, and sat with them for several hours. When they opened their eyes and asked their mum for something to eat, the people around me burst into tears of joy. I’ll never forget that day.”

After two years working in the community, Paul began training in obstetrics and gynaecology at the Institute of Post Graduate Medical Education and Research Hospital in Dhaka. Four years later he moved to the UK for postgraduate training in the specialty. “Most of my teachers had qualified in the UK, and it was my dream that one day I would have a UK medical qualification,” he says.

Paul completed his Royal College of Obstetricians and Gynaecologists specialty training exam in 1992 and spent several years working in the specialty. He missed working in the community, however, and in 1998 began training as a GP, qualifying in 2002.

Ten years later Paul decided to spend a year working as a doctor in the Australian outback, which included serving Indigenous Australians. In 2023 he returned to Australia for six months to work for Puntukurnu Aboriginal Medical Service to care for “one of the most deprived patient populations I have ever known.” His time caring for this community was “an amazing experience,” he says.

Over the past 20 years he has worked to improve access to healthcare and to tackle health inequalities in Leeds, such as supporting patients with diabetes care and prevention.

The covid-19 pandemic “reshaped my life again,” he says. As the clinical director of his primary care network he “worked long days, which included helping to roll out the vaccination programme and to raise awareness about the importance of being vaccinated.” His efforts were recognised by the lord mayor of Leeds, and he received a certificate of appreciation for outstanding leadership in 2021.

Paul’s main ambition is to continue his work in preventative medicine. “If, for example, we can prevent a patient who is pre-diabetic from developing diabetes, we can improve their quality of life,” he says.

Family is everything to Paul. “My wife, children, and grandchildren are the greatest part of my life,” he says. He also loves travelling with his wife to different countries. And he is an active member of his local Bangladeshi community.

To doctors starting out in their careers he says to be “open and ready to experience things, and make your life journey your own way.”

“My journey has had its twists and turns. But I am grateful to have achieved the things I have, and I don’t have any regrets. I feel humbled and fulfilled.”

Kathy Oxtoby, London

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NOMINATED BY KHALEDA SULTANA

Khaleda Sultana, senior house officer at King George Hospital, Essex, says she first met Paul at a South Asian cultural event in Leeds.

“I’d recently moved to the UK after getting married and was on a career break. Each time we met he would gently encourage me to restart pursuing my career and to work towards GMC registration—which was as daunting to me as climbing Mount Everest. Dr Paul has remained an inspiration and guiding light throughout my journey. I’m now planning to become a GP, just like him.”

NOMINATE A ROLE MODEL

To nominate someone who has been a role model during your medical career, send their name, job title, and the reason for your nomination to emahase@bmj.com

CAREERS CLINIC

How do I prepare to give evidence at a coroner's inquest?

Speak to defence organisations, arrive early, and dress smartly, experts advise

Know your material

Sean Bourke, emergency medicine consultant, medical examiner, and learning from death lead

"It's normal to feel anxious, but don't bury your head in the sand. Preparation and communication are key. If your organisation has a legal team, meet with them ahead of time. They are expert in the process and will be aware of the idiosyncrasies of your local coroner. Defence organisations and legal firms also offer seminars, online learning, and advice.

"When you attend you will have access to your evidence, but knowing your material well will free up your brain to focus on the questions you're being asked.

"Whether attending virtually or face to face, you should prepare similarly. Dress smartly and arrive in good time. Consider if you are going to 'swear' or 'affirm' your intention to be truthful. Swearing may require you to bring your own holy book.

"The family of the deceased may be present. They may have legal representation. Most questions will come from the coroner. Respond to them directly, addressing them as sir or ma'am. The family or legal teams can ask you questions. Family will be given more leeway, but coroners are experienced in managing these and will stop inappropriate questions. Be honest in your answers.

"If attending online and several team members are called, reserving a room for the day can provide a quiet environment where you are not interrupted and can share access to common notes and resources.

"If you have been involved in an incident where mistakes were made or there were complications, be open about this. Coroners appreciate reflective practitioners. Residents in training programmes will be required to declare these at their annual review of competence progression."

Speak to your defence organisation

Kathryn Leask, medicolegal adviser at the Medical Defence Union

"Preparation is key. Evidence can be in the form of a written statement or oral evidence given at a hearing. Depending on the circumstances a well considered report may avoid the need to attend in person. Don't delay in preparing a report and make sure you meet the deadline. Delaying or not submitting a report can lead to a General Medical Council referral by the coroner.

"It's always a good idea to ask for independent advice from your defence organisation; the earlier the better so you can be assisted in drafting the report. If you're called to give evidence, this could be as a witness or as an 'interested person.' This may depend on your involvement in the patient's care and if the coroner believes acts or omissions during this care may have contributed to the death.

"If you're an interested person you are entitled to be legally represented—so, again, contacting your defence organisation early allows time for this to be arranged and for you to meet your legal team. General hospital doctors can be represented by the hospital, unless there is conflict. This might be where a doctor disagrees with another colleague or where they disagree with the outcome of a significant event review. If a doctor is directly criticised by the coroner, they will have to consider if this engages their regulatory requirement to refer themselves to the GMC.

"Once in court you could be asked questions by the coroner, the patient's family, or any legal representatives, including your own. Answer questions factually and honestly but say if you don't know the answer, have forgotten, or if a response would be outside the limits of your speciality, competence, or experience."

Don't be tempted to fill a silence

Jo Galvin, senior medicolegal adviser at MDDUS

"Although it may be unfamiliar, attendance at an inquest is an important continuation of your duty of care, helping to provide clarity to those close to the patient. Remember that it is a fact finding process, rather than one seeking to apportion blame.

"Liaise with your defence organisation who can help you ascertain any key areas beforehand.

"Arrive promptly and dress formally, whether you're attending in person or remotely. If attending remotely, make sure you have a good internet connection, are alone in a location where you won't be disturbed, and have an appropriate background. Try to remain on mute unless speaking and don't record the hearing.

"Take any statement and records with you, familiarising yourself with them in advance. You will take an oath or affirmation and have a professional and legal obligation to be truthful.

"Listen carefully to each question and answer only that question, rather than anticipating the next one. If the answer is outside the scope of your knowledge or expertise it's important to say so. Don't be tempted to fill a silence; the coroner may need time to make a note of your response or to consider their next question.

"Speak clearly, explaining the clinical rationale for any decisions made and any medical terminology. Be considerate in answering any questions posed by those close to the deceased.

"After the inquest has concluded, the coroner will provide a record of inquest which summarises the findings and it is advisable to ask the coroner's office to send you a copy."

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