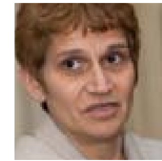
# NEWS

**UK news** NICE recommends preventive drugs for women at high risk of breast cancer, p 4
**World news** Virus will spread while natural host is unknown, p 6
References on news stories are in the versions on bmj.com



**bmj.com**
UK needs 10 000 more GPs by 2022 to meet needs, report says

## New inquest is ordered after coroner's verdict into infant's death is quashed

**Clare Dyer** BMJ

A new inquest has been ordered into the death in hospital of a 14 month old boy after a High Court judge reviewed evidence that raised "very serious questions indeed" about the quality of his care.

Mr Justice Kenneth Parker quashed a deputy coroner's verdict that Thomas Duffy had died of natural causes at Alexandra Hospital in Redditch, Worcestershire, less than six hours after he was admitted with respiratory problems.

A six day inquest had been scheduled, and many witnesses were due to give evidence. But the deputy coroner decided after hearing only the pathologist and the court appointed expert witness, the retired consultant paediatric cardiologist Elliot Shinebourne, that Thomas had died of natural causes. The deputy decided that he was so ill he could have died at any time and refused a request by the Duffy family to adjourn the inquest to obtain more expert evidence.

The judge said that it was rare for an application for judicial review of such a refusal to succeed, but this was an unusual case. The deputy coroner's decision was one that was not reasonably open to her and "was at real risk of causing substantial injustice."

Thomas and his parents arrived at Alexandra Hospital at 2 37 am on 19 March 2011. Chest radiography showed that he had an enlarged heart, but a locum paediatric registrar thought that he had a "viral induced wheeze," and he was given salbutamol.

He was admitted to a ward and given fluids in excess of the recommended dose for his weight. By 5 15 am he had significant metabolic acidosis when he was reviewed again by the registrar, who contacted the on-call paediatric consultant.

But the consultant "declined" to come to the hospital and arrived only after he was told that Thomas had had a cardiorespiratory arrest at 8 10 am. The boy was pronounced dead at 9 am.

The judge said there was evidence that raised "very serious questions indeed" about the quality of care Thomas had received, particularly from the consultant who had declined to come to the hospital and from the registrar, whose competence fell "well short" of that which could "reasonably have been expected."

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PHOTALTO/ALAMY

Cases of ketoacidosis suggest that insulin has been witheld from the patient for some time

## Audit shows preventable diabetes complications are still occurring

**Jacqui Wise** LONDON

More than 60 hospital inpatients with diabetes had diabetic ketoacidosis, a life threatening but entirely preventable complication, in just one week in England and Wales, a national audit report shows.[1]

The National Diabetes Inpatient Audit also documented 232 cases of severe hypoglycaemia requiring injectable treatment. The audit report, commissioned by the Healthcare Quality Improvement Partnership, said that these findings were "shocking" as these life threatening harms were preventable.

The audit, carried out by the NHS Health and Social Care Information Centre working with the charity Diabetes UK, collected data over five days in September 2012 from 13 410 patients with diabetes in 136 trusts in England and six local health boards in Wales. Most of the patients were admitted to hospital for reasons other than their diabetes; just 8.2% in England and 9.6% in Wales were admitted specifically for diabetes.

The audit found no improvement on previous years in the proportion of patients developing diabetic ketoacidosis. In England 59 inpatients (0.5%) developed diabetic ketoacidosis after admission in 2012, similar to the 65 (0.6%) in 2011 and 44 (0.4%) in 2010. In Wales two patients (0.2%) developed diabetic ketoacidosis in the current audit, similar to the three patients (0.3%) in 2011.

The audit's lead, Gerry Rayman, a consultant physician at the Diabetes and Endocrine Centre at Ipswich Hospital NHS Trust, said, "It is of grave concern that some patients are developing diabetic ketoacidosis, which is a potentially life threatening complication in hospital. This is due to their needs being neglected and should simply never happen."

Bridget Turner, director of policy and care improvement at Diabetes UK, said, "Even a single case of diabetic ketoacidosis developing in hospital is unacceptable because it suggests that insulin has been withheld from that person for some time. The fact that this is regularly happening raises serious questions about the ability of hospitals to provide even the most basic level of diabetes care."

The audit found that more than a third of patients with diabetes experienced a medication error. The commonest was insulin not being increased when blood glucose concentrations were persistently high. Other errors included insulin not being reduced when appropriate, staff failing to note that they had given insulin, and insulin being given at the wrong time.

However, numbers of medication errors have fallen slightly from 44.5% of patients in 2010 to 39.8% of inpatients in 2012.

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# BMA passes vote of no confidence in England's health secretary

**Nigel Hawkes** EDINBURGH

The BMA has passed a vote of no confidence in England's health secretary, Jeremy Hunt. At its annual representative meeting on Monday 24 June a motion linking Hunt's "attack on the NHS and his comments about mediocrity and coasting" with a call to express no confidence in him was passed overwhelmingly, with only a handful of dissenters.

Jacky Davis, a consultant radiologist at the Whittington Hospital in London and a member of the BMA council, said that Hunt had provoked a huge wave of anger among doctors. "His main interest seems to be blaming staff for the predictable chaos resulting from his government's policies," she said. "How much longer are we going to put up with the government treating the NHS as a car boot sale? There are so many reasons to have no confidence in this secretary of state I can't list them all—we'd be here all morning."

Despite a suggestion from Andrew Mowat, an East Midland GP, who said that he was no apologist for the government but that doctors would do their patients no service by voting for the motion, it was passed on a wave of antigovernment sentiment that also saw a series of critical motions on other issues sail through.

In March this year he warned that "weeds of failure grow more quickly in a garden of mediocrity" and that too many hospitals were "coasting" rather than striving. Such remarks, together with his suggestion that the crisis in hospital emergency departments was caused by GPs not offering an adequate service out of hours—a claim rejected yesterday as "shameful" by the chairman of the BMA council, Mark Porter—have quickly earned him the ire of doctors.

Among the other motions passed was a call to repeal the Health and Social Care Act—"bad for patients, bad for the NHS, and bad for the public," the meeting asserted—and more specifically to withdraw section 75 of the act, which covers the competition obligations of commissioners. Chaand Nagpaul, a north London GP, who moved the motion, said that section 75 was unequivocal in making it clear that competitive tendering was obligatory and was an "open invitation" for private industry to bid for services.

Resisting Porter, who argued that the BMA was already campaigning against section 75 and that further action should be left to the discretion of its council, the representatives passed the motion by an overwhelming majority.

Those who argued against calling for the repeal of the whole act, including John Canning of the BMA's General Practitioners Committee, were similarly rebuffed, but much more narrowly. Canning argued that the structural reorganisation that had resulted from the act had cost £1.6bn. "What would it cost to undo it? Turning the clock back won't work," he said.

But Louise Irvine, a GP from southeast London and a member of council, said that the act would be repealed without any "redisorganisation" by removing only the competition elements of the act. Representatives agreed, but only by a slim majority on an electronic vote, with 46.6% in favour and 43.4% against, and 10% abstaining.

George Rae, a GP from Whitley Bay, Tyne and Wear, called for the BMA to consider balloting GPs on withdrawing from clinical commissioning groups, were not getting the autonomy they were promised. Porter reminded the meeting that all GPs were obliged by law to belong to a CCG, so withdrawing would be illegal. But Rae said that the motion simply suggested that the BMA should "consider balloting GPs on withdrawal," and the motion passed in its entirety.

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TONY WALSH

TONY WALSH

**Doctors backed Jacky Davis's call to express their anger at the health secretary's actions**

# Government has turned NHS into a "Byzantine system"—Porter

**Nigel Hawkes** EDINBURGH

The government has driven the NHS in England "to the edge" by budget cuts and unwanted legislation, while failing to listen to doctors who are trying to deal with an unprecedented scale of demand, the BMA's chairman of council said this week.

Mark Porter, making his first speech to the BMA's annual representative meeting since becoming chairman of the association, said that the government had built "a Byzantine system that nobody wanted" while responding to the real issues of the NHS in ways that were both inadequate and divisive.

He won the loudest applause from representatives for an attack on moves towards an NHS that was open 24 hours a day, seven days a week. "Like many doctors here I feel personally offended by the terms in which this debate has been couched," he said.

"Like many of you I work nights and weekends as well, at times when much of the private sector is fast asleep and ministers are tucked up soundly in their beds . . . The calls we sometimes hear for a Tesco NHS, full service 24/7, are just ridiculous when the health service can barely afford its current model."

Doctors were already trying to deal with "sheer, unparalleled scale of demand on existing services," he said. "And we experience overwhelming frustration that we cannot achieve the changes and improvements that we can see are so necessary to deal with this pressure."

Rather than triggering planned and thoughtful efficiency improvements, the financial pressures faced by the service were leading to too many botched, quick fixes, including some drastic cuts in staffing that left remaining staff spread far too thinly.

"At the Norfolk and Suffolk NHS Foundation Trust, for example, there are plans to cut one third of consultant posts and 40% of staff and associate specialist doctor posts by 2016. The BMA has been very clear that the safety and quality of services is under threat . . . We simply cannot allow NHS organisations to behave like this."

Although the government may call this a cost improvement programme, the health secretary "really does need a new thesaurus if he thinks efficiency is synonymous with cheap," Porter said, to applause. He cited the example of the new 111 urgent telephone services, some of which had been launched in the face of warnings that they were unsafe.[1]

Cite this as: *BMJ* 2013;346:f4097

# Former head of CQC hits back at allegations of a cover up

**Jeremy Laurance** LONDON

The former head of England's healthcare watchdog has hit out at critics and the organisation she led for four and a half years, claiming that the investigation alleging that she and former colleagues ordered a report to be deleted was "illegal" and "against natural justice."

Cynthia Bower, who was chief executive of the Care Quality Commission from its inception in 2009 until her resignation from the £200 000 a year post in 2012, has denied that she backed a cover up of an internal review that had detailed the commission's failings in regulating University Hospitals of Morecambe Bay NHS Foundation Trust in Cumbria.[1]

Louise Dineley, the review's author and head of regulatory risk and quality at the CQC, told the management accountancy firm Grant Thornton that Jill Finney, former CGC deputy chief executive, had given the instruction to "delete" the review at a meeting in March 2012 and that Bower and Anna Jefferson, the CQC's media manager, backed the move.[2] All three have denied that there was an agreement to conceal the review.[3]

Bower claims that she and her former colleagues have been "hung out to dry" by the CQC. The report into the alleged cover up, which was commissioned by Bower's successor at the CQC, David Behan, was "unfair," she said, and unreasonable.

Instead of authorising Grant Thornton to look into the commission's dealings with Morecambe Bay trust (the report was published on 19 June[4]), CQC should have referred allegations of a cover up to the police, she said.

"I can't speak for someone else's interpretation," said Bower. "All I can say is I didn't say [delete the report], no one else said it, and the report still exists. I categorically deny the words that have been put in people's mouths. This is a report that has hung people out to dry for something we categorically deny.

"I have no reason to be concerned by a police investigation—I would have welcomed it. It would have been a fairer and more reasonable process."

UNITED NATIONAL PHOTOGRAPHERS/ REX

**Cynthia Bower, who led the CQC for 4.5 years, said the allegations have rendered her "unemployable"**

Cumbria police have since announced that they were investigating whether any criminal offences may have occurred during the alleged cover up of the review into Morecambe Bay trust, where it is feared that a high number of babies and mothers died because of poor care.

Bower admitted that the CQC's inspection had failed to detect problems at the trust and that the commission should have registered it with conditions rather than "as compliant" in April 2011 and as a foundation trust in October that year. She could not outline the steps that the CQC had taken to improve inspections since then.

Bower said that she has had to flee her home in Birmingham, where the media were now camped, and that she was "on the run." She is currently taking legal advice about her next steps but said that her career was "finished" after she resigned last week from two posts.

"I am unemployable. It would be extremely difficult to consider even voluntary roles when this sort of criticism has been levelled at me," she said.

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TONY WALSH

**Mark Porter said doctors worked at times when much of the private sector was fast asleep**

# A&E doctor is suspended for deficient performance

**Clare Dyer** BMJ

A middle grade accident and emergency doctor who gave a wrong diagnosis to a woman with an ectopic pregnancy and to a man with a broken neck has been ordered to be suspended from the medical register for nine months, after a Medical Practitioners Tribunal Service panel found her professional performance to be deficient.

Camelia Jurcut, who qualified in Romania in 1999, was working at Skegness and Scunthorpe Hospitals between June and November 2011 when a string of incidents took place that alarmed colleagues.

The young woman, named only as Patient A, presented with severe lower abdominal pain in the first trimester of a second pregnancy. Jurcut failed to take a proper history or arrange a referral and inappropriately discharged her with no treatment except paracetamol, the panel found.

Nurses were so concerned that soon after the patient's departure they tried to reach her by telephone. In the event the patient called the hospital back four hours later because she was in severe pain. She was brought in by ambulance, and an ectopic pregnancy was swiftly diagnosed.

The man, Patient D, had a head laceration from a fall and was complaining of severe neck pain. Jurcut failed to identify a neck fracture or to properly examine the available x ray pictures and inappropriately discharged him. Another patient, Patient B, was a man with Crohn's disease who presented with a foul smelling ulcer at his scrotum. Jurcut was found to have taken an inadequate history and admitted intending to discharge the patient, who had sepsis.

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## IN BRIEF

**Transplant doctor charged with attempted manslaughter:** Prosecutors have charged the former head of organ transplantation at Göttingen University Hospital in Germany with 11 counts of attempted manslaughter and three of bodily harm with fatal consequences. The case involves altering patients' data to move them to the top of donated organ waiting lists.[1] Four other Göttingen doctors remain under investigation.

**Risk of suicide and homicide is often missed:** More than a third of 81 people with mental illness who committed suicide (15 of 42 (36%)) or homicide (16 of 39 (41%)) had not been adequately assessed or managed in the week before they took the action, a study has found.[2] Louis Appleby, who carried out the study, said there was a need for risk management to be individually tailored rather than following a 'tick box' approach.

**Wash hands to avoid cryptosporidium from petting farms:** From January to May this year there were 12 outbreaks of cryptosporidiosis associated with petting farms across England, affecting around 130 people, Public Health England has said. To avoid *Cryptosporidium* infection, visitors to petting farms should not eat or drink or touch their faces while petting animals or walking around the farm, said the agency in new guidance.[3] Hands need to be washed with soap and water, not just gels or wipes.

**Helpline is set up to support victims of female genital mutilation:** More than 70 women and girls as young as 7 years old seek treatment for female genital mutilation in England every month, despite the practice being illegal in the UK,[4] show data collected by the National Society for the Prevention of Cruelty to Children. The charity has set up a helpline (0800 028 3550) for anyone worried about the practice.

**More people survive major trauma incidents:** A fifth of patients who would have died before major trauma networks were set up are now surviving severe trauma, show results from the Trauma Audit and Research Network. The trauma networks were set up to ensure that patients got the best possible care from the time of the trauma incident through to their rehabilitation at home. The networks started in London in 2010 and were rolled out across England in April 2012.

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# Consistent food labelling system is rolled out across the whole UK

**Jacqui Wise** LONDON

Consumer and health groups have welcomed the new consistent labelling system for the fronts of packs of food that has been launched in the United Kingdom, although some have voiced concerns that the scheme remains voluntary.

The system combines traffic light colour coding and nutritional information showing the amount of fat, saturated fat, salt, sugar, and energy in a food product. The red, amber, green, traffic light system aims to give consumers key information at a glance. The label also shows how much of an adult's reference intake (formerly known as guideline daily amounts) is in a portion.[1]

The scheme was first announced last October.[2] Manufacturers such as Mars UK, Nestlé UK, PepsiCo UK, Premier Foods, and McCain Foods have now signed up to it, together with the supermarkets Sainsbury's, Tesco, Asda, Morrisons, the Co-operative, and Waitrose. However, other major manufacturers, including Coca-Cola and Cadbury, have not adopted the system, saying that they preferred to use guideline daily amounts rather than a traffic light system.

The labels will help people compare foods at a glance, said minister Anna Soubry

In July 2011 the European Union passed legislation making it compulsory for food labels to contain details of energy, protein, fat, carbohydrate, sugar, and salt levels.[3] As a result of this new ruling, which comes into force in 2016, the UK government carried out a public consultation on a consistent pack labelling system.[4]

The public health minister Anna Soubry said that people are confused by the variety of labels used currently. "Research shows that, of all the current schemes, people like this label the most, and they can use the information to make healthier choices," she said.

She added, "The labels are not designed to demonise foods with lots of reds but to have people consider what they are eating." Soubry called on more manufacturers to sign up to using the label. A pledge to sign up to the pack labelling system will form part of the government's Responsibility Deal with the food industry, which aims to reduce the prevalence of obesity.

Lindsey Davies, president of the UK Faculty of Public Health, welcomed the announcement and said it was a big step forward. But she added, "For this voluntary approach for food labelling to be the success we hope it will be, it needs to be evaluated to check it's working as intended. At the moment it's not clear how that will happen."

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# NICE recommends preventive drugs for women at high risk of breast cancer

**Jacqui Wise** LONDON

Women in England and Wales with a family history of breast cancer will, for the first time, be offered preventive treatment with tamoxifen or raloxifene, after the National Institute for Health and Care Excellence (NICE) issued new guidance.[1]

The new guideline represents a major shift in breast cancer treatment in England and Wales, giving women at high or moderate risk of developing breast cancer an alternative to a double mastectomy.

Tamoxifen and raloxifene are not currently licensed as preventive treatments for breast cancer in the UK, although they are approved for this use in the United States. Several large studies have shown that they reduce a person's risk of developing breast cancer by around a third (30-40%).

Gareth Evans, a consultant in clinical genetics at St Mary's Hospital, Manchester, who helped develop the guidelines, said, "This is the first time that doctors in the UK can offer chemoprevention for breast cancer. It means there is more in the armamentarium for women to choose to help prevent the risk of breast cancer."

Women with a high risk of developing breast cancer (a lifetime risk of 30% or more) should be offered tamoxifen or raloxifene for five years, NICE recommends. Preventive chemotherapy should also be considered if women are

# £28m bill for compromise agreements that left staff feeling "gagged"

**Adrian O'Dowd** LONDON

The UK's public spending watchdog, the National Audit Office, has raised concerns about the inconsistent nature and lack of transparency and accountability in the use of compromise agreements in the public sector, in a new report.[1]

The report estimated that £28.4m has been paid out in the three years up to March 2013, in so called special severance payments to employees.

Public sector workers can be offered these payments in return for terminating their employment contract and agreeing to keep the facts surrounding the payment confidential.

The office investigated the practice by obtaining information from four government departments—health, defence, education, and communities and local government—as well as analysing data from the Treasury. From the £28.4m total, the average payment was £15 000, but payments ranged from £250 to the highest payment of £266 000 from the Department of Health, which accounted for 45% of all the compromise agreements considered by the report.

The office found that none of the agreements it reviewed restricted the individual's rights under the Public Interest Disclosure Act, and six made clear that nothing in the agreement prevented the individual from "whistleblowing." However, the report said: "Some people we spoke to who had been offered, or accepted, compromise agreements have felt gagged."

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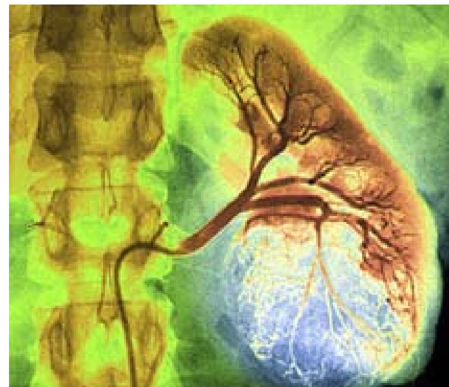

SOVEREIGN, ISM/SPL

**GPs were more likely to attribute symptoms in women to other causes, such as bacterial infection**

# GPs refer men with urological cancers more promptly than women

**Susan Mayor** LONDON

GPs in England refer men presenting with symptoms that later lead to a diagnosis of bladder or renal cancer more promptly than they do women with the same symptoms, shows a study that looked at national data.[1]

Researchers looked at data from the English National Audit of Cancer Diagnosis in Primary Care to find the proportion of men and of women diagnosed with bladder or renal cancer between 2009 and 2010 who had three or more consultations with their GP before being referred to a specialist. Previously the National Cancer Patient Experience Survey had found differences between men and women in promptness of referral.[2]

The lead author, Georgios Lyratzopoulos, National Institute for Health Research postdoctoral fellow at Cambridge University, said, "Our results confirmed what patients reported: that women are more likely than men to experience a non-prompt diagnosis of bladder and renal cancer." He suggested that this may be because GPs were more likely to attribute women's initial symptoms to other causes, such as infections.

More than a quarter (27% (95% confidence interval 21% to 33%)) of women who were later given a diagnosis of bladder cancer had had at least three pre-referral consultations, whereas the proportion in men was 11% (9% to 14%) ($P<0.001$).

And there was a similar difference in patients with renal cancer: 30% (22% to 39%) of women having three or more GP consultations before being referred and 18% (13% to 25%) of men ($P=0.025$).

Even after adjusting for age, macroscopic haematuria status, and use of primary care led investigations, women with bladder cancer were more than three times as likely as men to have had at least three GP consultations before being referred (odds ratio 3.3 (2.1 to 5.3); $p<0.001$). The odds ratio for renal cancer was 1.9 (1.1 to 3.4); $P=0.03$.

The average interval between the first GP consultation and specialist referral was only slightly longer for women than for men (six versus four days, respectively, for bladder cancer and 16 versus 10 days for kidney cancer). But in the 25% of people with the longest delays, the average time to referral was two weeks longer in women. This difference rose to more than two months for bladder cancer and more than three weeks for kidney cancer in the 10% of women and men with the longest delays.

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assessed as at moderate risk of developing breast cancer (lifetime risk of 17% to 30%). Evans said that tamoxifen would be the drug of choice for women without a uterus and raloxifene for women with a uterus. He said that the cost of tamoxifen, at around £25.

Evans said that the side effects of treatment with tamoxifen or raloxifene included hot flushes, mood swings, and loss of libido but that these usually stopped after six months. Because of these side effects, and because a double mastectomy still offers the greatest risk reduction, some women would still opt for surgery.

Caitlin Palframan, assistant head of policy at Breakthrough Breast Cancer and a member of the guideline development group, described the new guideline as a "game changer for people with a high risk of breast cancer." She said, "In the past mastectomy was the only choice. Now they have another option which is less invasive."

Around a fifth of women who develop breast cancer have a significant family history of the disease. NICE said that around 3% of all women aged 35 or older in England and Wales could be eligible to receive preventive chemotherapy for breast cancer. This equates to 488 371 women.

Cite this as: *BMJ* 2013;346:f4116

BREAST CANCER UK

**Chemoprevention is an alternative to a double mastectomy, chosen by actor Angelina Jolie to reduce her risk of breast cancer. Her mother (left) died of the disease aged 56**

## Novartis found to be in breach of advertising code over drug brochure

**Jacqui Wise** LONDON

Novartis has been found to have made several breaches of the drug advertising code of practice over a brochure promoting a new drug for chronic obstructive pulmonary disease (COPD).[1]

The *Drug and Therapeutics Bulletin* made several specific complaints about the evidence used and the claims made in a brochure that was sent to UK GPs, *Evidence Review of Seebri Breezhaler (Glycopyrronium Bromide)*. One of the complaints was that it contained an unsubstantiated argument for the treatment of exacerbations of COPD.

The Prescription Medicines Code of Practice Authority upheld all the complaints and ruled that Novartis was in breach of the code of practice. The authority considered that Novartis's claim that reductions in exacerbations could reduce death rates was misleading and could not be substantiated.

The authority also ruled that the presentation of the data in a table on glycopyrronium and exacerbations was not complete enough to allow the reader to appreciate its statistical significance and was misleading.

The editor in chief of the *Drug and Therapeutics Bulletin*, James Cave, said, "For 50 years we have argued successfully to remove or restrict medicines and curb excessive promotional claims by pharmaceutical companies.

"This latest victory is particularly important because it has put a stop to the increasingly used claim that, by preventing exacerbations, drugs can reduce mortality. Unfortunately this has yet to be demonstrated by any drug used in the treatment of COPD."

Cite this as: *BMJ* 2013;346:f4061

## MERS will spread while natural host is unknown

HASSAN AMMAR/AP/PA

**WHO fears that the upcoming Hajj to Mecca in October will lead to an upsurge in cases of the new coronavirus**

**Owen Dyer** MONTREAL

An emergency meeting of the World Health Organization in Cairo on 19 June has urged closer worldwide cooperation to combat the Middle Eastern respiratory syndrome (MERS) coronavirus that has claimed 39 lives in eight countries,[1-4] as fear grows that the upcoming Hajj to Mecca could spread the disease around the world.

"Fast and complete reporting of cases, with contact histories, clinical care and treatment outcomes in as much detail as possible, and collected in a uniform manner across countries, is necessary," said a WHO statement.

Meanwhile an international team of experts who tracked the path of contagion in Saudi Arabia has issued a report on the virus's clinical features in the *New England Journal of Medicine*.[5]

Their report documents the first 23 cases in the outbreak in four hospitals in the eastern Saudi governorate of Al-Hasa. It noted striking similarities to the coronavirus that caused severe acute respiratory syndrome (SARS) but also some key differences.

The clinical course of the MERS virus is similar to that of SARS, with an initial phase of non-specific fever and mild cough that may last several days before progressing to pneumonia. As with SARS, some patients develop gastrointestinal symptoms. Another SARS-like feature is heterogeneity of transmission, with many patients not infecting anyone, while one patient infected seven others.

Transmission of MERS may be possible slightly earlier in the course of the disease than in SARS, and transmission during incubation cannot be ruled out. It remains unknown whether transmission can occur through airborne respiratory droplets and whether virus is shed in stool. Throat swabs may return false negative results and should not rule out MERS when exposure and symptoms indicate it.

The mortality rate of MERS is given as 65%, far higher than that of SARS. But this is probably an overestimate, one of the report's coauthors, Allison McGeer, of the University of Toronto, told the *BMJ*. Milder cases that would have lowered that average have almost certainly passed undetected. But, she added, the Jordanian data indicate that truly asymptomatic cases are rare.

A vital piece of the puzzle still missing is the identity of the virus's natural host and reservoir. "As long as this is unknown, and there are still sporadic, community acquired new cases cropping up around the Arabian peninsula, we will continue to have an issue, and there will be exported cases," said McGeer, who led Canada's response to the 2003-04 SARS pandemic and has just returned from Saudi Arabia.

Saudi media are reporting that some of the community acquired cases involved men who worked with camels, and one man was in contact with a sick camel immediately before falling ill. A theory gaining currency in the kingdom is that camels pass MERS to humans after being infected by eating dates contaminated by bat droppings, but evidence is lacking.

The prevalence of male patients is also a mystery. "There's been endless speculation on this," said McGeer. "Of course, this is Saudi Arabia, and the hospitals themselves have male and female areas. Men may be more likely to come into contact with the natural host outdoors. Some have suggested that burkhas are protective, though they actually let quite large particles through. There's also talk of a smoking link." Men seem to be at greater risk outside the Middle East too.

Much of the transmission of the disease in the Al-Hasa outbreak centred on a city hospital's dialysis ward, but no significant association was found between kidney disease and mortality from MERS.

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