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Mental illness in deployed soldiers
Is more likely as traumatic exposures increase, and this is often related to length of deployment

More than 29 armed conflicts involving 25 countries are now occurring around the globe.1 For people in the United Kingdom and United States the situation in Iraq and Afghanistan is a constant reminder of the cost of war. The price that soldiers, sailors, airmen, marines, and their families pay is always considerable.

In this week’s BMJ, Rona and colleagues assess the effect of the frequency and duration of deployment on the mental health of 5547 randomly chosen military personnel with experience in deployment.2 They found that people who were deployed for more than 12 months in the past three years were more likely to have mental health problems (odds ratio for post-traumatic stress disorder 1.55, 95% confidence interval 1.07 to 2.32), although exposure to combat partly accounted for these associations. Post-traumatic stress disorder was more likely when a mismatch occurred between the expected and actual lengths of deployment.

The study could help identify those at high risk of long term disability and guide policy.3 Deployment is a strange term. Few people would suggest that deployment itself is a substantial cause of psychiatric disorder or distress. Many nations deploy soldiers around the globe. The US and UK have deployed soldiers for decades to overseas assignments, both with and without their families, and without substantially increased risk of post-traumatic stress disorder.4 However, it is the nature of the deployment experience—the “toxic” exposures—including traumatic events, loss of attachments, and psychological and physical demands that increase the risk of mental illness.

Another example of how the nature of the deployment affects the risk of mental illness is seen in US military veteran prisoners of war repatriated at the end of the Vietnam war. Duration of solitary confinement and weight loss were the most robust independent predictors of poor psychiatric outcome because they were strongly related to various “toxic” exposures.5 If the length of deployment corresponds with the amount of combat trauma and related experiences, it can be a strong predictor of the risk of mental illness. But this is not always the case, as deployments vary greatly in the frequency, intensity, and type of exposures encountered. In real time, wars change in days, weeks, and months, and so may the exposures that comprise a deployment. The length of deployment is just one measure of these factors—remembering this is important for healthcare planning as well as for protecting forces in war.

The incidence of mental illness is usually only measured after soldiers return from deployment, often well after the trauma. The challenge is to assess the risk of mental illness in real time. This would enable risk to be assessed, so that soldiers identified to be at high risk or those diagnosed with mental illness could be treated at the battlefront. We must, therefore, move towards measuring relevant exposures in real time. Exposure to traumatic events and loss of coping and social support must be assessed in real time by commanders to protect the health of their personnel. Decisions about how long soldiers should be deployed must take into account how stressful the combat is likely to be. In addition, decisions on length of deployment must consider the stress of rotation home and return (for example, the transition from “battle mind” to “home front mind” and back to “battle mind”) and the ability of soldiers to sustain skills and mental and physical strength while home.

Perhaps most importantly, Rona and colleagues have shown that the Iraq war is not without its costs—both to the health of those deployed and eventually to the healthcare system—and that these same costs are related to duration of exposure. To date, the US army surgeon general has set up four mental health advisory teams to assess the mental health of deployed US soldiers via anonymous surveys. In 2006, the fourth team collected data from surveys and qualitative interviews from more than 1300 soldiers and nearly 450 marines.6 The report noted that the length of deployment and uncertainty about the date of return home were the top two concerns of soldiers. Morale among soldiers deployed several times was lower than that among those deployed for the first time. Similarly, soldiers deployed several times to Iraq were more likely to fulfill criteria for acute stress, post-traumatic stress disorder, depression, or any mental disorder than those who were deployed once. Soldiers deployed several times were 1.6 times more likely to screen positive for post-traumatic stress disorder than those who were deployed once, 1.2 times more likely to screen positive for anxiety, and 1.7 times more likely to have depression. Importantly, no specific cut off for duration of deployment eliminated risk. Soldiers deployed for longer than six months were also between 1.5 and 1.6 times more likely to screen positive for acute stress than those deployed for less than six months.

War develops as a result of seemingly unavoidable circumstances emerging within a specific social context.
Similarly, the ability to adapt to normal life after war is shaped by the specific social circumstances and contexts of the conflict. 1 Rona and colleagues’ finding that unmet expectations for a shorter deployment are associated with post-traumatic stress disorder shows how our hopes and beliefs about the future, a part of our changing social context, affect health and disease.

For the practitioner and the health planner, soldiers with the longest deployments will be among those most likely to need care, both at the battlefield and after their return home. Length of deployment is but one measure, not the most direct, of the exposures and risks when they return home. Providing continuity of care across time and space is a challenge for providers and health systems.

The Wanless review
Slow progress on public health may need more health spending

The review of National Health Service (NHS) funding and performance since 2002 published this week, which has been led by Derek Wanless, has something for everyone.1 2 The government’s supporters will focus on progress made in appointing extra staff, modernising buildings, buying new equipment, cutting waiting lists and waiting times, and improving priority areas of service provision such as cancer and cardiac care.

The government’s critics will emphasise the failure to improve productivity and the high cost of the new contracts for general practitioners, consultants, and other staff. Independent observers will note that progress on reform of the NHS and on the wider public health agenda falls short of the most optimistic “fully engaged” scenario set out in the original Wanless reports.3 4 The implication of this shortfall is that government may need to increase planned spending on the NHS to enable it to meet future demands.

While the review provides a comprehensive and even-handed assessment of NHS reform, two factors need to be borne in mind in drawing conclusions. The first concerns the lack of reliable information to assess progress in some key areas.

Most importantly, incomplete data on the range and quality of services delivered for the increase in resources made available to the NHS make it hard to accurately assess changes in productivity since 2002. This is important because estimates of future resource requirements are particularly sensitive to improvements in productivity.

While work is in hand to fill gaps in data and to develop a measure of productivity that reflects quality of care and the full range of services provided,5 the extent to which extra spending has improved performance is uncertain, as the review emphasises. Arguments that further major increases in funding are needed should therefore be treated with caution.

The second factor relates to the scale of the challenges involved in the NHS reform programme. Transformational changes of this kind rarely proceed in a linear fashion, so that performance often deteriorates before it improves.

The review says nothing about this problem and offers a “before and after” assessment of progress, rather than a more nuanced account. Failure to analyse the rhythm and pace of change means that it is not clear whether reform is on a rising or declining trajectory. If the progress noted is accelerating, then the review’s verdict on the state of the NHS today is more positive than it would appear.

Looking to the future, Wanless argues that the policy direction taken by the government is right, notwithstanding the disruptive effects of organisational change. In making this point, the review emphasises that the most notable improvements have been driven centrally through national service frameworks, guidance from the National Institute for Health and Clinical Excellence, and government targets.

It is all the more surprising therefore, that the report lends qualified support to patient choice, provider competition, and commissioning as drivers of change in the next stage of reform. These policies have been implemented too recently to have been evaluated properly, and it is not clear that they will be more effective than other approaches in bringing about change.

To take just one example, much hinges on general practitioners and primary care trusts becoming “world class commissioners,”6 yet evidence from other countries shows how difficult it is to commission health care effectively.7 On this matter, the authors’ aversion to further lurches in policy direction has outweighed a more considered assessment of the evidence.

The review is on sounder ground in its criticisms of the policy making process. Specifically, it notes that the pressure to produce quick results has led to some policies and initiatives being introduced without adequate preparation.

7 Engel CC. Post-war syndromes: illustrating the impact of the social psyche on notions of risk, responsibility, reason and remedy. (Am Acad Psychoanal Dyn Psychother 2004;32:311-34.)
It also argues that the government has failed to take full account of how the various elements of its reforms fit together. There are strong echoes here of the Cabinet Office’s capability review of the Department of Health and its criticisms of the quality of policy making in government.8

However, the review sounds the loudest warning bells on public health. Despite continuing progress in increasing life expectancy and reducing infant mortality, considerable threats for the future are identified in widening health inequalities and increasing rates of obesity.

The review reiterates the need for a comprehensive framework for public health and criticises the raiding of public health budgets to help tackle the financial deficits that emerged in the NHS in 2005. During a week in which the new secretary of state for health chose public health as the subject of his first major speech, it may be that the review’s message will be heeded this time around.

If there is a surprise about the review, it lies less in its analysis and recommendations, and more in the muted reaction of politicians. At least for now, there seems to be broad political consensus on the future funding of the NHS and the policies that need to be put in place to deliver further improvement.

The pessimistic view is that this reflects the poverty of thinking in the political class. A more generous interpretation is that it stems from the challenges involved in turning around a major organisation like the NHS and the realisation that no quick fixes are on offer. The opportunity this creates is for the NHS to build further momentum for improvement, relatively sheltered from the shifting winds of political debate.


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Screening for familial hypercholesterolaemia

Insufficient evidence exists to support universal screening

In this week’s BMJ, Wald and colleagues propose a universal screening strategy for familial hypercholesterolaemia.1 They suggest that serum cholesterol should be measured in children aged 1-9 years during routine visits to primary care, and that those with abnormal total cholesterol (greater than 95th centile) should have genetic tests or clinical investigations to confirm the diagnosis. A population cascade screening programme could then identify the parents of children who screen positive for the disorder.

This proposal is based on their meta-analysis of screening for familial hypercholesterolaemia. This study showed that measuring serum cholesterol in children age 1-9 can detect 88%, 94%, and 96% of cases, with false positive rates of 0.1%, 0.5%, and 1%, respectively.1 Their proposal is based on the ability of the test to detect the disorder with a reasonably high detection rate and a relatively low false positive rate. The authors present no new evidence for the long term health benefits or potential harms of identifying and treating children with familial hypercholesterolaemia.

Much attention has been paid to screening for lipid disorders at a young age because half of children with high concentrations of total cholesterol and low density lipoprotein will continue to have raised lipids in adolescence and early adulthood, and early identification and treatment in certain populations of adults can prevent coronary heart disease.2 A screening programme could identify three groups of children with abnormal cholesterol concentrations—children with monogenic dyslipidaemias, such as familial hypercholesterolaemia; those with undiagnosed secondary causes of dyslipidaemia (diabetes, hypothyroidism, etc); and those with multifactorial dyslipidaemias (polygenic or related to risk factors, such as obesity). The group most likely to benefit from screening, earlier identification, and treatment would be children with familial hypercholesterolaemias. In these children, treatment with statins and bile acid resins improves lipid profiles and intermediate outcomes.2 In children with abnormal lipids but without familial hypercholesterolaemia (multifactorial dyslipidaemias), evidence shows that medical or behavioural interventions do not improve lipid levels.2

The US National Cholesterol Education Panel and American Academy of Pediatrics recommend screening in children with a positive family history of hypercholesterolaemia or those with risk factors.3 This has been problematic because of a high false negative rate in detecting high serum cholesterol, ranging from 17% to 90%, as a result of variable definitions of positive family history and differing thresholds of abnormal cholesterol. Taking a family history is also associated with a high false positive rate, with 25-55% of children and adolescents qualifying for serum cholesterol
screening on the basis of family history alone.2

The screening strategy proposed by Wald and colleagues seeks to identify only those children with familial hypercholesterolaemia by requiring specific criteria for a clinical diagnosis: total or low density lipoprotein cholesterol above a given value, raised serum cholesterol in a first degree relative, and a family history of tendon xanthomata. As reported by Wald and colleagues, detection rates are relatively high, but even with a relatively low false positive rate, a universal screening programme without genetic confirmation will identify a large number of children who do not have the disorder. However, a programme that incorporates genetic confirmation of the diagnosis is likely to be expensive.

A third strategy, which is more appropriately called case finding rather than true screening, is cascade screening, where the family members of all patients with known familial hypercholesterolaemia undergo clinical diagnosis or genetic testing. This strategy is endorsed by the UK National Screening Committee and supported by the 2000 health technology assessment report, which concludes that such a case finding strategy in relatives of patients with familial hypercholesterolaemia followed by a clinical or genetic diagnosis would be most cost effective.4

Unfortunately, we have no direct evidence on the adverse effects of any of the above screening strategies. No data are available on the safety of long term treatment with drugs started in childhood or adolescence. Although lipid concentrations in children with familial hypercholesterolaemia can be improved with treatment,2 we have no evidence of a long term benefit on health. If a benefit exists, the difference between this benefit and that associated with detecting and treating the disorder in adults would need to be examined, and there is currently no evidence to do this.

Finally, while the false positive rate may be low, those children who are found to have raised cholesterol but who do not have familial hypercholesterolaemia or are false positives may be treated unnecessarily. Treatment in children with non-familial hypercholesterolaemia has not been shown to improve health outcomes in children or adults,2 and again the long term safety of lipid lowering agents in young children has not been determined.

On the basis of current evidence, the most cost effective approach to identifying people with familial hypercholesterolaemia is case finding in the family of those known to have the disorder. There is insufficient evidence to support universal screening with either serum cholesterol followed by clinical or genetic confirmation, or family history taking followed by serum testing.3

In this week’s *BMJ*, a randomised controlled trial by Su and colleagues compares the effect of two different strategies on the rate of exclusive breast feeding in 450 healthy pregnant women in a tertiary hospital in Singapore.1 The World Health Organization (WHO) recommends that, wherever possible, infants are exclusively breast fed for the first six months after birth;2 during this period they should receive breast milk only, and no other liquids (except drugs) or solids. In developing countries, where the risk of infection is high and facilities for adequate sterilisation are scarce, breast feeding protects against infant mortality, particularly mortality related to infection.3 Rates of breast feeding are high in such countries, but rates of exclusive breast feeding are lower as a result of certain cultural practices, such as delaying the initiation of breast feeding and giving prelacteal feeds.1 However, starting breastfeeding on the first day after birth protects against neonatal mortality.4 Exclusive and predominant breast feeding compared with partial breast feeding or no breast feeding protect against mortality in the first half of infancy.5

In more developed countries, where infection and inadequate sterilisation pose less of a problem, the health benefits of exclusive breast feeding persist. A cluster randomised trial of promoting breast feeding in Belarus resulted in significantly more exclusive breast feeding and significantly less diarrhoeal disease in the intervention clusters compared with the control clusters.6 In recent observational studies from Spain7 and the United Kingdom,8 exclusive breast feeding protected against hospital admission for infection in infancy. In the UK, rates of mothers starting breast feeding have increased from 62% in 1990 to 76% in 2005, but rates of sustained exclusive breast feeding remain low.9

The trial by Su and colleagues includes an antenatal and postnatal intervention to promote exclusive breast feeding and compares these interventions with routine hospital care.1 The first group of women were shown a
Many breastfeeding support strategies are effective in particular settings only. When the breastfeeding practices observed in the control arm of the Singapore trial are compared with the 2005 UK infant feeding survey, some striking contrasts are apparent (figure). In Singapore, mixed feeding is common and, therefore, breastfeeding rates are relatively high, but rates of exclusive breast feeding are low. Here, the challenge will be to increase the duration and exclusivity of breast feeding, as was shown in the intervention arms. In the UK, breastfeeding rates are lower than in Singapore, but the rate of exclusive breast feeding is higher, at least in the first few months.

The postnatal intervention in the trial by Su and colleagues included a visit by a lactation consultant within the first three days after birth before discharge. It would be difficult to implement this intervention in the current UK setting, as many women are discharged within 24 hours of delivery. A recent UK study found that delivering in “baby friendly” accredited maternity units was not associated with a longer duration of breast feeding. In contrast, in the Belarus trial, where the mean length of stay after birth was six to seven days, the baby friendly intervention was successful.

Further research should focus on evaluating the cost effectiveness of these hospital based interventions in Singapore and similar settings. In the UK, the National Institute for Health and Clinical Excellence is currently developing public health guidance on maternal and child nutrition (expected to be available at www.nice.org.uk in February 2008). The guidance will include recommendations aimed at promoting breast feeding, particularly in low income households. The next step will be to implement and evaluate the cost effectiveness of this guidance.

Chikungunya in Italy
Globalisation is to blame, not climate change

An epidemic of chikungunya virus has recently occurred in Italy, involving more than 190 cases. The concern is that climate change will bring mosquito borne tropical diseases to Northern Europe, but is this outbreak really the result of global warming? Although such an epidemic is new in Europe, it is probably caused by globalisation rather than climate change. Increased amounts of long distance tourism, travel, and trade mean that organisms that live in and on people or goods have more opportunity to be transported across continents.

Chikungunya is an epidemic disease with many similarities to dengue—it causes fever that lasts four to seven days, sometimes with a rash. It is often accompanied by intense arthralgia. Most infections cause noticeable disease, but haemorrhagic symptoms and other life threatening manifestations are rare.

The virus can be carried by several species of mosquito, but the vector in Italy and in recent epidemics elsewhere is *Aedes albopictus*. Its common names are Asian tiger in English and zanzara tigre in Italian. Its biology is similar to that of its cousin, *Ae aegypti*. Both evolved to breed in natural containers such as tree holes and plant axis, but now they have adapted to life with humans. They are abundant in many modern tropical and subtropical cities, and they exploit many kinds of containers made by humans. Unlike other mosquitoes their eggs can withstand desiccation, which allows them to travel around the world in a variety of containers.

The international ship borne trade in used tyres has played a major role in such spread because tyres make good breeding sites and hold water no matter which way up they are stored.

Decades ago, *Ae aegypti* travelled in this way from its ancestral home of coastal East Africa to every corner of the tropical world, becoming the main dengue vector in most of the world’s tropical cities. Much later, its Asian cousin *Ae albopictus* began the same process of migration, radiating throughout the Western Pacific and the Indian Ocean Islands, reaching Brazil in 1986 and Nigeria in 1991. It first arrived in the southern United States in 1983 and is now present in 26 states. It arrived in Italy in 1990, and gradually spread to scattered foci all over the country. The arrival of the zanzara tigre tends to be noticed because it bites during the day.

Meanwhile, an unprecedented series of chikungunya epidemics has been spreading throughout the Indian Ocean. These epidemics are often intense and in the past few years have involved millions of cases in Comoros, Madagascar, India, and the East African coast. Travelers have also been affected, and hundreds of imported cases have been reported from Europe (including Italy) and the US. In 2006, there were 133 imported cases in the United Kingdom and 774 in France. In the Italian outbreak, the index case reportedly travelled from India, and a recent analysis in Italy pointed to tourism as the main reason for travel in imported cases—11 of the 17 infected patients were tourists.

The Italian climate has always been suitable for *Ae albopictus* to flourish. The winters in its home range of Japan and Korea are colder than Italian winters; in these conditions the adults die out and the species survives the winter in the egg form. In Italy the adult forms may be able to live through the winter. If so, this could have important epidemiological consequences, because it might allow the virus to survive the winter inside mosquitoes and to reappear in spring.

What could have been done to prevent the recent outbreak, and what can be done to prevent further outbreaks in future? It is hard to see how Italian scientists could have done more to alert local health authorities to the risks arising from the invasion of the vector, but perhaps more could have been done to prevent its establishment and spread.

The options for prevention are limited as no vaccine exists. Better surveillance is needed, if only to ensure that cases are given appropriate attention and care, but surveillance alone is unlikely to curb transmission. Human cases of chikungunya and dengue are viraeemic and infective to mosquitoes early on in the disease course, so that prompt isolation of cases may not prevent onward transmission. In malaria, by contrast, humans are infectious to mosquitoes later in the course of the disease, and local cases in Europe are likely to be diagnosed and treated before the infection reaches this stage. That is probably one reason why the thousands of imported cases of malaria that enter Europe each year have not triggered local malaria epidemics, despite the presence of suitable vectors.

Control of transmission can probably be achieved only by measures directed against the vectors. We cannot stop people going to endemic areas, but education about the risks and methods of personal protection may help. Control of vector populations in Italy will certainly be more difficult and expensive now than it would have been in 1991 before the mosquito had spread over the whole country. The only effective long term approach is to suppress and eliminate the breeding sites, which is difficult to do thoroughly because there are many sites, which are usually small and scattered. Nevertheless, the longer we delay the harder it will be.

Finally, as well as focusing on vector control in Italy, European health authorities could consider whether European Union support for vector control efforts in areas where chikungunya is endemic might also benefit European citizens at home.

Way forward is not obvious at asthma crossroads

Barnes argues that using a combination inhaler (budesonide plus formoterol) as rescue therapy improves asthma control, and several studies support it’s use in the SMART (Symbicort (budesonide/formoterol) maintenance and reliever therapy) regimen. They have shown longer time to first exacerbation, reduced rate of severe exacerbations, and less inhaled corticosteroid dose, although with similar improvement in symptoms, peak flow rates, and quality of life in some studies.

However, the main concern is that all the above studies were conducted by the manufacturer (study design, data interpretation, data analysis, and publication). Three studies from the rival manufacturers of fluticasone/salmeterol have shown the opposite effect—stable dosing reducing exacerbation rate and improving symptom free days compared with the SMART regimen.

Secondly, in all SMART studies patients needing more than 10 inhalations were excluded.

Thirdly, there is no convincing evidence that in patients who are well controlled with stable dose inhaler therapy a change to the SMART regimen will be cost effective.


greater interest is the debate on once daily asthma maintenance therapy compared with twice daily regimens. Certainly, asthma treatment is at a crossroads awaiting a change of direction.

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Competing interests: SFH has received sponsorships for organising a CME programme, participating in conferences, and speaking from Astra Zeneca, GSK, and MSD.

CARDIOVASCULAR PREVENTION

Risk factors inform screening

First degree relatives of patients with coronary heart disease are at higher risk than the general population. Screening first degree relatives would be an improvement on unselected screening. However, family history is only one of several risk factors for cardiovascular disease. Selecting patients for screening on the basis of multiple risk factors is better than selecting patients on the basis of one risk factor. For most patients, many risk factors are known. All patients have an electronic record of their age and sex. Most have an electronic record of their smoking status and blood pressure, and some have a cholesterol measurement. If diagnosed, patients with diabetes have an electronic record of this diagnosis. If they have a family history of premature coronary heart disease, some patients have a record of this fact.

Earlier in 2007 I collected electronic data from three large general practices. Of 19552 patients aged 35 and older, 35% had full risk factor information, and 76% lacked only a cholesterol measurement. Of these, 2.2% (437) were aged 35-74, untreated but at a greater than 20% 10 year cardiovascular risk and hence eligible for treatment. When patients whose cholesterol concentrations were not known were included, 6.7% (1307) were untreated patients at high risk. Only 14% (181) of these patients had a record of a family history of premature coronary heart disease.

Since patients over 35 are about half the practice population, this means that in a typical practice about 3-4% of the population are currently untreated but have recorded risk factors indicating they are at high risk. These patients are identifiable by searching the practice database, without the need to wait until their relatives present to secondary care with heart disease.

Here’s to risk assessment

I was delighted to read the editorial suggesting that we should move away from the primitive “one threshold fits all” mentality for starting antihypertensive treatment and take a view based on the overall cardiovascular risk. We already do this when treating cholesterol for the purposes of primary prevention, so it is inconsistent not to use this approach for blood pressure, which is another continuous variable. The recent Joint British Societies’ guidelines recognise this as the predicted cardiovascular risk rises with systolic blood pressure to 160 mm Hg yet they are not used as a tool for assessing whether to treat hypertension.

This is part of the general problem that occurs when we assign arbitrary values to continuous and often fluctuating biological variables to create boundaries for disease labels. For example, bronchial hyper-reactivity can change quite notably over time, and it can be very difficult to decide whether the label of asthma is appropriate. Our target driven culture encourages the use of these labels, but I think that they are often not very helpful, and I often use asthma drugs in those whom I would not label as asthmatic.

Glucose metabolism represents another such variable, and I look forward to the day when I read an editorial suggesting that we abandon the World Health Organization’s criteria for diagnosing diabetes, in favour of a decision tool for the treatment of abnormal glucose metabolism based on risk.
DRUG PRICING

Misconceptions about PPRS
Iheanacho argues that the Office of Fair Trading may have pinpointed some areas of improvement in the existing Pharmaceutical Price Regulation Scheme (PPRS).1 However, its proposals for introducing a value based system of drug pricing are inherently flawed and, if implemented, would lead to a significant erosion of biopharmaceutical investment in the UK.

It is not true that “other countries have long been able to design, implement, and benefit from effective methods of value based pricing.” Many European countries base their pricing on international reference pricing where the UK’s pricing has a central role. In Germany therapeutic reference pricing is used, which has led to a severe erosion of that country’s research and development over the past decade. In Australia, which has been put forward as an example of value based pricing, the authorities have now decided to overhaul the system and drop their approaches to value based pricing.

What any serious assessment of drug pricing and reimbursement will uncover is that the real problem is in the detail of developing a system of value based pricing and the risk of replacing a system that works with an untried and poorly understood system that effectively undermines the balance between research investment and market return. The UK has traditionally been a leader in research in pharmaceuticals, and great care must be taken to ensure that it is not turned into a follower, which would undermine patients’ access to new treatments.

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Competing interests: None declared.

Author’s reply
Burnand gives a predictable, if disappointing, response from an industry that has done very well out of the unequivocally flawed Pharmaceutical Price Regulation Scheme. In seeking to challenge the basic principles of value based systems, the response attempts to downgrade some instances of where such pricing has provided tangible societal benefits, while completely sidestepping other examples (such as the systems in Canada and Sweden). The dig at the Pharmaceutical Benefits Scheme in Australia is superficial and potentially misleading, and those seeking a more balanced view of the regulation of drug prices in that country (including recent changes) would do well to look elsewhere.1,4

Reforming the pricing system in the UK will require constructive contributions from the pharmaceutical industry, for which Burnand’s comments are a poor model.

ike iheanacho editor, Drug and Therapeutics Bulletin

GOING APE

Unwitting experimentation?
I was intrigued by the choice of antidepressant for the gorilla treated by Pop.1 Is escitalopram on the zoo’s formulary? It is not on our local NHS formulary. Escitalopram is an s-enantiomer of citalopram, which is now off-patent, and a recent Drug and Therapeutics Bulletin highlighted how such drugs are developed and marketed after the patent expiry of the originator drug, to extend profits.2 In humans, as pointed out by DTB, there is little evidence that it is any better than any other serotonin reuptake inhibitors, but it is many times more expensive than generic alternatives. Has the gorilla unwittingly been experimented on in this way as a result of drug company marketing?

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Competing interests: MD is on the editorial board for Drug and Therapeutics Bulletin

SHOs in the mist?
This filler piece about a senior house officer (SHO) treating a depressed gorilla seems to raise more questions than it answers.1 Do SHOs in psychiatry have the time to spend two hours assessing a troubled gorilla? Presumably this costs more than peanuts. Was the NHS trust reimbursed for this consultation? Do SHOs have their own secretaries now?

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Competing interests: None declared.

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PPRS is not NICE
Some of Burnand’s comments on Iheanacho’s article are astonishing.1 If the mission of any national health system is maximising health, this mission is pursued by assuming that spending on a drug buys not the milligrams of the active substance but the clinical benefit resulting from it. From an ethical point of view, it is bad to use systems not based on clinical benefit (such as the Pharmaceutical Price Regulation Scheme, PPRS).

Outside the UK, many people consider the work done by the National Institute for Health and Clinical Excellence (NICE) in the area of value for money to be an extraordinary example of ethical progress. At last, there is a rationale to support the reimbursement of expensive innovative agents (for example, adjuvant trastuzumab for early breast cancer), as well as a rationale to explain why the reimbursement of poorly innovative agents is subjected to restrictions (such as anti-Alzheimer drugs).

Drug pricing systems not based on the value for money approach (such as the Italian one) can pay from €0.84 (£0.58; $1.17) for lansoprazole to €2.32 for esomeprazole, with no specific rationale behind these choices. They can also decide to pay for agents with very poor cost effectiveness profiles.

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Competing interests: None declared.

1 Iheanacho I, Slowy, the monster dies. BMJ 2007;335:452. (1 September.)

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Competing interests: None declared.

1 Nash JS. Reassessing normal blood pressure. BMJ 2007;335:408-9. (1 September.)

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Cancer, heart, and diabetes societies join to publicise problem of uninsured Americans

Janice Hopkins Tanne
NEW YORK
The American Cancer Society, the largest US voluntary health organisation, will devote its entire advertising budget for 2008 to telling Americans and presidential candidates that lack of health insurance or inadequate insurance prevents many people receiving early detection, treatment, and cure of cancer.

US residents with chronic diseases such as heart problems and diabetes face similar problems, said Richard Wender, national president of the society. The society will spend $15m (£7m; €11m) on what it calls an aggressive and emotive advertising campaign on television, in magazines and newspapers, and online. The society found that previous public service announcements didn’t attract attention but that paid-for aggressive advertising did.

The cancer society is joining forces with AARP (formerly the American Association of Retired Persons), which has 38 million members, the Alzheimer’s Association, the American Diabetes Association, and the American Heart Association as the election approaches to publicise the problem of access to quality health care. To keep the matter in the news, the associations sent their chief executive officers to speak in states that hold early primary elections to nominate presidential candidates.

Dr Wender said that the cancer society decided on the campaign because only by improving patients’ access to care can the society meet its goal to cut mortality from cancer in half by 2015. Otherwise, this mortality will fall by only 25%.

Access to care, he told the BMJ, was a problem that he sees every day in practice as chairman of the department of family and community medicine at Thomas Jefferson University in Philadelphia.

Recent studies have shown that people who were uninsured or had inadequate insurance were twice as likely as people who have private insurance to be given a diagnosis of advanced rather than early cancer (Cancer 2007;110:396-402, 403-11, and 231-3).

The society says that, second to use of tobacco, lack of access to quality care is the biggest barrier to reducing deaths from cancer.

Advers for breast cancer gene test triggers inquiry

Jeanne Lenzer
NEW YORK
A controversial television advertisement in the United States encouraging women to undergo genetic testing to determine their risk of breast cancer has triggered an inquiry into claims made by the advertiser, Myriad Genetics.

The women in the advertisement appear to be in their early 20s to late 50s, and each says she has a relative with breast cancer. A couple of the women say they want to get “BRACAnalysis” to learn about their risk of breast cancer and “do something about it.”

Some cancer specialists say that this “direct to consumer” campaign is unnecessarily alarmist. A New York Times article reports that the Connecticut attorney general, Richard Blumenthal, has issued a subpoena for information about the test, saying, “There’s enough serious and significant doubt about the accuracy of some of their claims that we feel a strong need to investigate” (www.nytimes.com, 11 Sep, “A genetic test that very few need, marketed to the masses”).

Myriad’s president, Gregory Critchfield, said in a statement released on 10 September, “The purpose of the BRACAnalysis public awareness campaign is to save lives. The risks of breast and ovarian cancers are very high in individuals carrying mutations in either the BRCA1 or BRCA2 genes.”

Testing, said Dr Critchfield, would allow women at high risk of breast cancer to “take steps to reduce their risk for these cancers.”

The US Preventive Health Services Task Force says that the 2% of women who have a BRCA mutation face a 35% to 84% chance of developing breast cancer by age 70 and a 10% to 50% risk of ovarian cancer by the same age—higher risks than the general population.

However, the task force concluded that there was insufficient evidence to determine whether the interventions offered to women with BRCA mutations, such as prophylactic mastectomy and oophorectomy, could reduce mortality.

Kay Dickersin, director of the Johns Hopkins Center for Clinical Trials, Baltimore, said the campaign was disturbing because not enough information exists about what to do with the results of genetic testing.

Citing a 2007 Cochrane review, Dr Dickersin said that only observational studies of women who underwent prophylactic bilateral mastectomies had been conducted. “Most of the studies,” said Dr Dickersin, “only looked at the number of women developing breast cancer—very few looked at breast cancer mortality.”
Mortality among under 5s falls below 10 million for first time

John Zarocosta GENEVA
The annual number of deaths of children aged 5 years or younger reached a record low last year, says Unicef, falling for the first time to less than 10 million—9.7 million, down from 12.7 million in 1990.

“More children are surviving today than ever before. Now we must build on this public health success to push for the achievement of the millennium development goals,” said Unicef’s chief, Ann Veneman. But she also said that there is no room for complacency.

“The loss of 9.7 million young lives each year is unacceptable. Most of these deaths are preventable—and, as recent progress shows, the solutions are tried and tested,” she added.

Of the 9.7 million children who died in 2006, 4.8 million were from sub-Saharan Africa and 3.1 million from south Asia, the figures show. West and central Africa had the highest death rates, with 186 deaths per 1000 children aged under 5, whereas the figure in rich industrialised nations is six per 1000.

The findings also show that China and India have achieved big reductions in child mortality, as have countries in Latin America and the Caribbean, but that previous gains have been reversed in southern African nations with a high prevalence of HIV and AIDS and in countries with current or recent armed conflicts, such as Sierra Leone, Sudan, and the Democratic Republic of the Congo.

Some of the progress in reducing child mortality has resulted, Unicef says, from the greater application of known basic health interventions. These include immunisation against measles, exclusive breast feeding, vitamin A supplementation, the use of bed nets treated with insecticide, and the treatment of malaria, pneumonia, diarrhoeal diseases, severe malnutrition, and HIV and AIDS.

“We’re seeing some very poor countries actually making tremendous progress”

Caroline White LONDON
Plenty of cheap, simple ways exist to tackle global poverty, but the world lacks the commitment to implement them, health experts and economists said at an international conference in London last week.

Convened to celebrate the centenary of the Royal Society of Tropical Medicine, the conference aimed to assess progress towards meeting the eight millennium development goals set by the United Nations for 2015.

One goal is to cut by two thirds the 10 million deaths each year of children aged under 5 years old, but only seven of the 60 countries with the highest child mortalities are on track to meet it, said Cesar Victora, professor of epidemiology at the Federal University of Pelotas, in Brazil.

“Children are dying of old diseases [diarrhoea, pneumonia, and malaria] for which we have simple, effective treatments,” he said. Breast feeding, oral rehydration, antibiotics, immunisation, and mosquito nets treated with insecticide could save six million of these lives every year, he added. But coverage was at “amazingly low levels,” he said, because of weak healthcare systems that can’t cope with large scale programmes and a dearth of adequately trained workers.

“We have the magic bullets, just not the guns to fire them,” he said, adding that greater efforts should be devoted to finding out how best to deliver solutions.

The economist Jeffrey Sachs, director of the US Earth Institute at Columbia University, New York, argued that one tenth of 1% of the rich world’s income, or $35bn, was all that was needed. “That’s less than a month of Pentagon [US defence] spending or a quarter of the cost of the Iraq war each day,” he said.

Weak healthcare systems hamper efforts to reduce child mortality

Immunisation coverage is at “amazingly low levels”
UK study will reimburse part of cost of IVF to women who donate eggs for research

Susan Mayor LONDON
Women will be reimbursed about half the cost of their in vitro fertilisation in return for donating “surplus” eggs for stem cell research, in the first study funded by the UK Medical Research Council (MRC) that will pay participants.

The MRC announced last week that it is funding a research proposal from the North East England Stem Cell Institute (NESC), based in Newcastle, to find ways of improving the efficiency of therapeutic cloning. This technique is designed to create stem cells specific to a patient that might eventually be used to treat conditions in which new cells could be therapeutic—such as diabetes, heart disease, and Parkinson’s disease.

Out of the funding of £470 000 (€680 000; $950 000) for the research, the MRC will provide £150 000 to reimburse part of the cost of treatment for women undergoing in vitro fertilisation at the Newcastle Fertility Centre and who donate some of the surplus eggs produced, for use in the research. This grant will provide £1500 towards the costs of the treatment, which is usually about £3000 for each egg donor. The money will be paid directly to the NHS trust, and the women’s treatment bills will be reduced accordingly.

This is the first time that the MRC has provided payment for people taking part in a research study. “While there are ethical issues in providing payment for treatment of people who are participating in research, and this is not normally MRC policy, in this case the women would be taking no additional risks to their health by providing surplus eggs for research,” the MRC said in a statement announcing its decision.

The recipient of the grant, Alison Murdoch, consultant gynaecologist with Newcastle Hospitals NHS Trust and professor of reproductive medicine at the University of Newcastle, explained that the payment scheme was needed to obtain sufficient eggs to make progress. Previously her group has found that about 30% of women asked to donate surplus eggs for stem cell research have done so.

“This provided 66 eggs over seven months, which meant that the research group would have an egg one week but nothing the next. We can’t carry out research when the supply is so ad hoc. To get anywhere we needed a more steady supply.”

See www.nesci.ac.uk.

MPs “dismayed” at confusion about electronic records

Zosia Kmietowicz LONDON
Confusion about what information to include in electronic patient records as well as a lack of engagement with frontline NHS staff, particularly doctors, has been blamed for delays in creating the database promised by the government, which would be accessible throughout the health service.

A highly critical report from the cross party health committee says that MPs were dismayed at the lack of clarity about what medical details would be included in the two types of electronic records planned by the NHS IT programme—summary care record and detailed care record—and what they would be used for.

The confusion has led to delays of more than two years in developing and installing new IT systems in some cases. Many NHS staff have lost faith in the new system and are frustrated with having to rely on outdated software.

One example given in the report is iSoft’s Lorenzo system for basic administration, which is to be installed in hospitals across the north and the Midlands but will not be trialled until next year. Until it is in place the uploading of patients’ medical records cannot begin.

The report calls for Connecting for Health, which took over responsibility for transforming information systems throughout the NHS from the Department of Health in 2005, to give local organisations and doctors a bigger role in implementing electronic record systems and deciding what systems they should adopt.

Kevin Barron, MP and chairman of the committee, said, “While the government is getting the framework in place, they still have some way to go before patients and the profession can see tangible benefits.”

A highly centralised approach to the NHS IT programme has “stifled local activity,” causing “frustration and resentment.” Relaxing central control will make local trust and strategic health authorities feel more engaged in the project—something that has been missing from the project until now, say the MPs.

The Electronic Patient Record can be seen at www.parliament.uk.
Mammography screening reduces mortality from breast cancer:

Organised mammography screening reduces the number of deaths from breast cancer, a study that was based on more than 300 000 women in Finland has found (International Journal of Cancer doi: 10.1002/ijc.23070). Results from the study, which followed up women from 1992 to 2003, show that breast cancer mortality fell by 22% (relative risk 0.8 (95% confidence interval 0.7 to 0.9)).

Public has its say on how NHS should be run:

Members of the public were invited to attend meetings in each of England’s 10 strategic health authorities this week to voice their opinions on how the NHS delivers care. Findings from the meetings will feed into the next stage of health minister Ara Darzi’s review of the NHS.

Polio worker is killed in fighting:

Farah Warsame Direye, a World Health Organization employee who was involved in Somalia’s national polio immunisation day on 11 September, was shot dead by members of a militia while in the Galgadud region, close to the Ethiopian border. The action was not specifically targeted at humanitarian workers, said WHO.

Hillary Clinton sets out $110bn plan to bring health care to all:

Senator Hillary Clinton has proposed a $110bn (£55bn; €80bn) plan to help fund health insurance for 47 million Americans who are currently without cover. Under the plan everyone would be required to take out health insurance, and federal tax subsidies would be available to help those least able to pay.

Statin use falls after TV show:

The use of statins in the Netherlands has fallen for the first time, by nearly 2%, after a Dutch television programme questioned their use (BMJ 2007;334:604-5). Figures compiled by the Foundation for Pharmaceutical Statistics show that this spring the number of people each month who stopped taking statins rose by 35%, while the number who started taking them fell by a third (www.sfk.nl).

More doctors will be able to avoid GMC hearing:

Clare Dyer BMJ

New rules expected to come into force within months will allow more doctors who undergo an investigation by the UK General Medical Council to avoid a public hearing. They can do so by acknowledging their shortcomings and agreeing to undergo retraining or restrict their practice. Rules that the GMC was expected to approve as the BMJ went to press will extend “consensual disposal”—which previously applied only in cases of ill health or deficient performance—to all types of case. The option will not apply to serious cases, those where there is a realistic prospect that the doctor would be struck off if the case went to a hearing of the fitness to practise panel. Nor will it apply if the facts are in dispute or if the doctor refuses to accept that his or her fitness to practise is impaired.

Juniors will find jobs—as long as they are flexible, says DH

Lynn Eaton LONDON

The Department of Health estimates that around 1500 junior doctors in England who are currently in short term “employment guarantee” contracts will not be able to secure coveted “run-through” training posts.

But they should, the department believes, be able to get some kind of job in the NHS when the second round of the recruitment process concludes at the end of October.

The department estimates that around 2500 short term contracts were awarded to guarantee the employment of junior doctors in the months immediately after the crisis in recruitment caused by the flawed medical application training service (MTAS) system, which was introduced earlier this year (BMJ 2007;334:1027). The appointment process was originally due to have been completed in England by 1 August, but after MTAS was scrapped a second recruitment round was added, with appointments due to be made by the end of October.

Of the 2500 junior doctors awarded the temporary employment guarantee contracts from 1 August, the health department estimates that some 1000 doctors have already secured either run-through or fixed term service appointment posts and have already moved or are about to move into these training posts.

It believes that there will be plenty of potential job opportunities for the 1500 doctors who have not yet secured a training post, providing that they are prepared to be flexible about where they work and what specialty they work in.

About 1400 run-through training posts are yet to be filled in the second round. Many junior doctors on employment guarantee contracts will be able to apply for one of these remaining posts. However, they are not automatically guaranteed these jobs, as they will be competing with applicants from other parts of the NHS.

But a further 1000 fixed term service posts are going to be made available, as promised in May by the former health secretary, Patricia Hewitt, and also service posts that have become vacant will be available.

“I can’t say absolutely definitely that no one will fail to get a post,” said a health department spokesperson. “But there are several opportunities for them to find posts.”

Meanwhile the Modernising Medical Careers team has rushed out a consultation paper on how recruitment will operate in 2008. It wants responses by Tuesday 25 September. John Tooke’s inquiry into the revised training process has said that its recommendations can apply only from 2009.

(See Personal View, p 615; Analysis, p 593; Head to Head p 590.)
Fractured care has led to resistance to HIV drugs among prisoners

Claire Laurent WARWICK

The chaotic nature of prison is detrimental to the health care of inmates, delegates at the Health Protection Agency’s conference in Warwick this week were told. The frequent transfer of prisoners around the system has led to a lack of continuity in care.

“HIV patients are transferred from one prison to another, but their retroviral drugs don’t go with them,” delegate Tim Moss, a consultant at Doncaster Royal Infirmary, told the conference. Discontinuous treatment meant that these patients were developing resistance to their antiretrovirals. “It is nothing short of negligence,” he said.

It was not just prisoners with HIV who experience this breakdown in care but also those with hepatitis C and tuberculosis. Many patients were lost to follow-up or did not complete their treatment, because of transfer to another prison. Healthcare workers were often not told about these changes so were unable to make the proper referrals.

Hepatitis B affects about a fifth of the 80,000 strong prison population and hepatitis C a third, with injecting drug use one of the biggest causes. The prevalence of HIV remains relatively low. “Prison health is public health,” said Andrew Fraser of the Scottish Prison Service. “They don’t choose to come to us, but we have a 24 hour duty of care to them.”

Scotland is to pilot a needle exchange system in its prisons, and in a closely argued debate the delegates voted in favour of such a provision in English prisons too. Rick Lines of the International Harm Reduction Association said that needle exchange schemes in prisons had been rigorously evaluated and shown to be effective in reducing the harm caused by needle sharing, yet they remained controversial. He said that this was due “to the prejudice and stigma against prisoners and drug users.”

“it is nothing short of negligence”

Growth slows in number of consultant physicians in UK

Susan Mayor LONDON

The number of consultant physicians in the United Kingdom showed the smallest increase for 15 years from 2005 to 2006, reports a survey published this week, and numbers of consultants in some major specialties fell.

The survey, carried out by the Royal College of Physicians, showed that the number of consultant physicians increased by only 1.8% from September 2005 to September 2006. This was the smallest increase recorded by the annual census since it began in 1991. Over this period the number of consultants grew by an average of 6.3% each year.

The annual increase in the number of consultant physicians in the UK has been shrinking for the past couple of years. In 2004-5 the number increased by 3.2% from the previous year, and the increase in 2003-4 was 5.4%.

The latest figures showed that the number of consultants fell in some smaller specialties, including clinical pharmacology and immunology, as well as in some of the larger ones, such as dermatology and rheumatology.

The overall slowing in the expansion of the number of consultant posts was due to fewer posts being advertised rather than a lack of suitable applicants, the survey showed.

Alistair McIntyre, director of the Royal College of Physicians’ medical workforce unit and a consultant gastroenterologist at Buckinghamshire Hospitals NHS Trust, said: “Consultant physicians are needed to lead the delivery of high quality care to patients and to contribute to the development of the NHS.”

“The lack of expansion in consultant numbers is likely to be detrimental to patient care. The UK has the lowest number of trained doctors—at consultant level—in the developed world.”

He added that the slowing in the numbers of consultants was a major concern for doctors now in training. “There is an increasing number of junior doctors coming through. If there is very limited expansion in consultant posts, the only new jobs will open up when people retire.” He said he hoped that the problem is a short term one, reflecting the shift to care in the community.

Other results from the survey showed great variation across the UK in the number of physicians working in the larger medical specialties. The census is available at www.rcplondon.ac.uk
Drug reduces risk of repeat breaks after hip fracture

Janice Hopkins Tanne  NEW YORK Patients who had undergone surgical repair of hip fracture after a minor fall and who were then given an annual intravenous infusion of zoledronic acid were less likely to have a new vertebral fracture, to have a new non-vertebral fracture, or to die, a new study has found.

The international, double blind, placebo controlled study was released early by the *New England Journal of Medicine* (doi: 10.1056/NEJMoa074941). The trial was sponsored by Novartis, the manufacturer of the drug, which is marketed as Reclast in the United States and Aclasta in the United Kingdom.

Just over a third of patients aged over 50 who have had a hip fracture are likely to die within two years, write the authors of an accompanying editorial (doi: 10.1056/NEJMe078192), and many who survive “do not regain their prefracture level of mobility and thereby endure loss of independence and deterioration in health-related quality of life.” Such patients are also at higher risk of having a new hip fracture or other fracture.

All patients in the study, which was headquartered at Duke University Medical Center in Durham, North Carolina, were able to walk before their hip fracture, and only 42% had osteoporosis diagnosed by dual energy, x-ray absorptiometry.

The study compared 1065 patients who received 5 mg of zoledronic acid and 1062 patients who received placebo within 90 days of surgical repair of their hip fracture. Patients received another infusion once a year afterwards. Both groups of patients received supplemental vitamin D and calcium. Some patients—9.3% in the zoledronic acid group and 11.8% in the placebo group—received concomitant treatment such as nasal calcitonin, selective oestrogen receptor modulators, hormone replacement, tibolone, and external hip protectors.

The average age of the patients was 74.5 years and their average body mass index was about 25. The median follow-up period was 1.9 years, and 71.3% of the patients completed the trial.

The percentage of patients who had a new clinical fracture was 8.6% in the zoledronic acid and 13.9% in the placebo group (hazard ratio 0.65 (95% confidence interval 0.5 to 0.84); P=0.001). Among the patients who had a new clinical fracture, the time to fracture was 39.8 months in the zoledronic acid group and 36.4 months in the placebo group.

New hip fractures occurred in 2% of the patients receiving zoledronic acid and 3.5% of those on placebo, a non-significant reduction in risk.

But new vertebral fractures occurred in 1.7% of the patients taking zoledronic acid and 3.8% of the patients taking placebo (hazard ratio 0.54 (0.32 to 0.92); P=0.02), and new non-vertebral fractures occurred in 7.6% and 10.7%, respectively, of the patients (hazard ratio 0.73 (0.55 to 0.98); P=0.03).

“We observed a relative reduction of 28% in the risk of death in the zoledronic acid group,” the authors wrote, adding that this may be partly due to the lesser risk of new fractures in this group. Of the 2111 patients included in the study (16 patients did not receive the drug or placebo), 242 died (12%). In the zoledronic acid group, 101 of 1054 patients died (9.6%), whereas in the placebo group 141 of 1057 patients died (13.3%) (hazard ratio 0.72 (0.56 to 0.93); P=0.01).

A quarter of EU citizens are being treated for chronic disease, with hypertension coming top

Rory Watson  BRUSSELS One quarter of the European Union’s 500 million people are undergoing long term treatment for illnesses ranging from hypertension and arthritis to ulcers and cataracts.

The findings, released last week, are the result of a survey carried out for the European Commission in September and October 2006 into the health of citizens in the 27 EU member states and Croatia.

The commonest long term treatment is for high blood pressure (36% of those being treated), which is particularly prevalent in central and eastern Europe. In Slovakia, Bulgaria, Romania, and Greece it accounts for at least half of people receiving a long term treatment, while the lowest levels of hypertension are to be found in Belgium, the Netherlands, and Luxembourg.

Long standing problems with muscles, bones, and joints are the second most common type of ailment, accounting for 24% of those receiving treatment. Next are diabetes (15%), depression (10%), asthma (9%), osteoporosis (8%), allergies (6%), migraines (5%), cancer (4%), chronic bronchitis (4%), strokes (4%), peptic ulcers (3%) and cataracts (2%).

Allergies are prominent among Swedes (34% of whom have experienced them), while muscle, bone, and joint problems are common in Hungary (33%) and Belgium (31%). The prevalence in France of chronic depression, at 9%, is twice the EU average.

Since the question was asked previously, three years earlier, there has been a significant increase in the number of people receiving long term treatment in Austria (up 5%) and notable decreases in Denmark and the Netherlands (both down by 11%) and Italy (down 5%).

Yet the survey also found that 24% of those questioned consider their health to be “very good” and a further 49% “good.”

The Eurobarometer special report *Health in the European Union* is available at www.ec.europa.eu/health.
Europe should run more transnational cancer projects

Rory Watson BRUSSELS

European policy makers face two challenges in funding cancer research. They need to do more about the major differences in spending between the European Union’s 27 member states, instead of trying to bridge the gap with the United States, and give more thought to closer cooperation among different projects and the creation of transnational research programmes.

This advice is contained in the second report from the European Cancer Research Managers Forum, published this week.

The forum estimates that €3.2bn (£2.2bn; $4.4bn) was spent on cancer research in Europe in 2004. Of this sum, €1.9bn came from 155 non-commercial funding organisations. Although this is well short of the €5.1bn allocated by similar sources in the United States, it represents a 38% increase in funding in Europe financing, in comparison with the results of the first survey two years ago. In contrast, funding in the US has remained relatively static. The remaining European funds, €1.3bn, came from national healthcare systems and universities.

Of the EU countries the UK devoted the most resources to cancer research, at €783m, divided almost equally between charitable and government funding. The UK also came out top in terms of spending per capita on cancer research (figure). In contrast, at least 15 EU countries devoted €5m or less.

Investments and Outputs of Cancer Research is available at www.ecrmforum.org.

Serious adverse events double in seven years in US

David Spurgeon QUEBEC

The number of reported serious adverse events from drug treatment more than doubled in the United States from 1998 to 2005, rising from 34 966 to 89 842, says a new study.

Over the same period the number of deaths relating to drugs nearly tripled, from 5519 to 15 107, show data from the US Food and Drug Administration’s adverse event reporting system, which collects all reports of adverse events submitted voluntarily to the agency either directly or through drug manufacturers (Archives of Internal Medicine 2007;167:1752-9).

Using extracts from the system that were published for use by researchers, the study’s authors—Thomas Moore and Michael Cohen, of the Institute for Safe Medication Practices at Wake Forest University, Winston-Salem, North Carolina, and Curt Furberg, of the university’s public health sciences division—analysed all adverse drug events and treatment errors reported to the agency from 1998, when the FDA started operating the system, to 2005.

Over the period the number of reported serious events grew four times faster than the total number of prescriptions to outpatients, which increased from 2.7 billion to 3.8 billion. In the subset of drugs associated with 500 or more reports in any year, those drugs that were withdrawn for safety reasons accounted for 26% of the reported events in 1999, this percentage falling to less than 1% in 2005. For 13 new biotechnology products, the number of reported serious events grew by nearly 16-fold, from 580 reported events in 1998 to 9181 in 2005.

A relatively small number of drugs were responsible for the overall increase in the number of adverse events reported: 298 of the 1489 drugs identified (20%) from the data accounted for 407 394 of the 467 809 events (87%). Oxycondone hydrochloride (OxyContin) and fentanyl topped the list of drugs associated with death.

Better systems for managing the risks from prescription drugs are needed, the authors say.
New anticoagulant gets mixed results

Idraparinux and incidence of venous thromboembolic events

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Idraparinux is a new anticoagulant that inhibits activated factor X. It has a long half life and can be given just once a week, by subcutaneous injection. But is it as good as standard anticoagulants at preventing recurrent venous thromboembolism?

In two parallel trials, the new drug worked well for patients with deep vein thrombosis but not so well for those with a pulmonary embolus.

Both trials compared idraparinux with the usual regimen of intravenous heparin followed by warfarin for three to six months. Among 2904 patients with deep vein thrombosis, risk of a recurrence was about the same in both groups (odds ratio 0.98 for idraparinux, 95% CI 0.63 to 1.50 at three months), but idraparinux caused fewer clinically relevant bleeding complications. Among 2215 patients with pulmonary embolus, idraparinux was associated with a significantly higher rate of recurrence at both three and six months (2.14; 1.21 to 3.78 at three months). It was also associated with a significant excess of deaths (6.4% vs 4.4% at six months, P=0.04), including deaths from pulmonary embolus.

Bleeding was less of a problem for patients taking idraparinux in both trials. But the authors warn that the new agent has a very long half life, and there’s no antidote when bleeding does occur.

Dabigatran as good as enoxaparin for thromboembolic prophylaxis after hip replacement

Dabigatran etexilate is another new anticoagulant, an oral inhibitor of thrombin that could help prevent venous thromboembolism after major orthopaedic surgery. The manufacturers tested it in a head to head trial against subcutaneous enoxaparin. They found that after about a month of treatment, the two drugs worked equally well in patients having a hip replacement. Rates of deep vein thrombosis, pulmonary embolism, or death were similar in all three randomised groups—6.7% (60/897) for patients given enoxaparin, 6.0% (53/880) for those given a high dose of dabigatran, and 8.6% (75/874) for those given a lower dose.

No extra bleeding complications occurred in patients given the new agent in either dose. But there were too few events to be completely certain about this result. Bigger trials focusing on safety are now needed, say the authors.

The trial’s biggest limitation was that nearly a quarter of the patients were excluded from the analysis, mostly because they didn’t have a venogram or the image wasn’t clear enough to interpret. This is a common problem for researchers using venography to look for venous thromboembolism, says an editorial (p 915). Its effects are unknown.


Meta-analysis confirms rosiglitazone’s poor safety record

Rosiglitazone is still approved by the US Food and Drugs Administration (FDA) for the treatment of type 2 diabetes, despite evidence from meta-analyses that it is associated with an increased risk of heart attack and heart failure.

A third meta-analysis, this time confined to four trials lasting more than a year, confirms these earlier findings. Patients taking rosiglitazone were 42% more likely to have a heart attack than controls taking other oral hypoglycaemic agents or placebo (94/6421 vs 83/7870; relative risk, 1.42; 95% CI 1.06 to 1.91). They were also twice as likely to develop heart failure (2.09, 1.52 to 2.88), a well known side effect of drugs in this class. Rosiglitazone was not associated with any excess deaths. The authors and a linked editorial (p 1216) agree that regulatory agencies will need to look again at this agent. In the meantime doctors should think carefully before prescribing it.

Pioglitazone, another drug from the same family, seems to have a strikingly different effect on ischaemic events. In a meta-analysis of 19 randomised trials, pioglitazone reduced the chance of a heart attack, stroke, or death by 18% (hazard ratio 0.82, 0.72 to 0.94). As expected, heart failure remained a problem. The FDA has issued black box warnings about the risk of heart failure with both drugs.


Children with heart failure need their own trials

More than half of all children referred for heart transplants have chronic heart failure. Evidence based treatment is difficult because all the standard drugs for heart failure have been tested in adults only. The first ever randomised trial in children compared the β blocker carvedilol with placebo in 161 children and adolescents with heart failure complicating dilated cardiomyopathy or congenital heart...
Supplements to lower homocysteine concentration disappoint again

Epidemiological and genetic studies show a clear association between high serum concentrations of homocysteine and a higher risk of cardiovascular disease. So for more than a decade, researchers have been trying to reduce the risk of cardiovascular disease by giving people homocysteine lowering supplements of B vitamins and folic acid. Four large trials have already reported disappointing results. Now a fifth finds that B vitamins and folic acid don't prevent cardiovascular disease, even in high risk patients with chronic renal failure.

Once again, the supplements brought down participant’s homocysteine concentrations but not their risk of death (hazard ratio 1.04, 95% CI 0.36 to 1.59).

The result was surprising—because β blockers work so well in adults—and disappointing. It is possible that the trial was too small to find a clinically relevant difference between the groups, say the authors. Or perhaps the outcome they used wasn't sensitive enough, the dose of carvedilol wasn’t big enough, or the children were too heterogeneous.

Alternatively, β blockers may work differently on young hearts that fail from aetiologies other than ischaemia. Children are not simply small adults, says an editorial (p 1214). This trial is an important illustration of the limitations of using adult evidence in children.

JAMA 2007;298:1171-9

Latest round in the stent controversy favours sirolimus eluting stents

In response to ongoing controversy about the safety of drug eluting stents compared with bare metal stents, researchers analysed data from 38 randomised trials including more than 18,000 people with coronary ischaemia. Bare metal stents, paclitaxel eluting stents, and sirolimus eluting stents were all associated with similar overall mortality and similar cardiac mortality over four years. But patients given a sirolimus eluting stent were significantly less likely to have a heart attack than patients given the other two types of stent. Both drug eluting stents reduced the need for further revascularisation compared with bare metal stents. The difference was greatest for stents eluting sirolimus (hazard ratio 0.7, 95% credibility interval 0.56 to 0.84).

All three stent types were associated with similar rates of stent thrombosis overall. Patients with paclitaxel eluting stents had around twice as many late thromboses (after more than 30 days) than patients with either bare metal or sirolimus eluting stents.

These findings are the most precise so far, and they suggest that sirolimus eluting stents have a better risk-benefit ratio than the only other drug eluting stent on the market.

JAMA 2007;298:1163-70

Vaccines against typhoid fever deserve a higher priority

Typhoid fever still kills more than half a million people every year worldwide and causes serious illness in many more. But it remains a low profile disease, largely ignored by the international health community, say commentators from the International Vaccine Institute in Korea. Recent studies have documented high incidences of typhoid fever in children living in urban slums in Indonesia, Pakistan, and Vietnam. Cheap antibiotics such as ampicillin that used to control the infection are becoming increasingly ineffective because of resistance, and vaccines are beginning to look like a better and more sustainable option, they write. Two safe and effective vaccines are already available, and the World Health Organization recommends giving one or the other to all children over 2 years living in areas where Salmonella typhi is a threat to public health. China and Vietnam have made a start, but there’s a danger that others will fall behind unless typhoid fever is given the priority it deserves. Vaccination is feasible, acceptable, and affordable. A subunit vaccine that gives 70% protection for at least three years costs no more than $0.50 (£0.25; €0.36) a dose.

N Engl J Med 2007;357:1069-71

Diesel pollution promotes myocardial ischaemia

Air pollution is associated with an increased risk of cardiovascular events such as heart attack, arrhythmias, and even death. To investigate why, researchers from Europe did a controlled experiment on 20 men with stable coronary heart disease. The men exercised on a bicycle ergometer in clean air and in air containing diesel fumes at a concentration found in heavy traffic. As expected, the men had asymptomatic myocardial ischaemia during driving in urban slums in Indonesia, Pakistan, and Vietnam. Cheap antibiotics such as ampicillin that used to control the infection are becoming increasingly ineffective because of resistance, and vaccines are beginning to look like a better and more sustainable option, they write. Two safe and effective vaccines are already available, and the World Health Organization recommends giving one or the other to all children over 2 years living in areas where Salmonella typhi is a threat to public health. China and Vietnam have made a start, but there’s a danger that others will fall behind unless typhoid fever is given the priority it deserves. Vaccination is feasible, acceptable, and affordable. A subunit vaccine that gives 70% protection for at least three years costs no more than $0.50 (£0.25; €0.36) a dose.

N Engl J Med 2007;357:1069-71
SCENT TRIALS

Smells form some of our most memorable experiences, but people who cannot detect them are largely forgotten. Geoff Watts sniffs out the researchers

Tell the world that you are blind or deaf or have no sense of touch and you can count on a measure of sympathy. But say that you have lost your sense of smell and the response will be, likely as not, indifference. We humans are not animals, are we? Of all our senses, smell is the least important.

Maybe so—but that is small consolation to people with the problem. Still more dispiriting for them is the lack of medical interest in disorders of smell, whether in treatment or research. Of the handful of UK clinicians with a special interest in the topic, two of the most active took it up more or less by chance and have to combine it with other work.

Unmet need
Evidence on the prevalence of olfactory disorders is patchy and conflicting. Tim Jacob, a physiologist who teaches a course on the senses at Cardiff University and also does research on smell, talks of American figures suggesting that around 2% of the population have a problem. But he can’t be sure. He’s on firmer ground when talking qualitatively.

“About 12 years ago,” he says, “I set up a website on smell. I was flooded with emails and phone calls from people who’d lost their sense of smell or taste. People who were desperate. People who felt that the health system had let them down. Their GPs had said there was nothing that could be done, and they should go away and just learn to cope.”

Affected people, it seems, aren’t getting answers to even the most basic questions such as the likely outcome of the condition, whether the loss can be remedied, and whether it may be a harbinger of worse to come. The effect of this on some people’s lives is severe. It causes distress and, in some cases, depression.

Glenis Scadding, a consultant allergist and rhinologist at the Royal National Throat, Nose, and Ear Hospital, became interested in smell through dealing with nasal polyps. Whether patients seeking help actually receive any depends on the individual general practitioner, she says. As word gets back to referring doctors that she can treat smell problems related to polyps, they sometimes begin (though whether through optimism or desperation isn’t clear) sending her more patients. “I’ve ended up seeing a load of people who don’t have polyps but have smell problems with other causes.” By and large, she adds, most general practitioners refer patients to ear, nose, and throat departments. But the chances of getting much truly informed help are slim simply because so few clinicians take a serious interest in the condition. In the abbreviation ENT it’s the E and T that are writ large; it might more aptly be rendered EnT.

Chris Hawkes is a consultant neurologist at Queen’s Hospital, Romford. His interest in smell disorders was prompted in part by wondering if motor neurone disease might be the outcome of a toxin entering the body through the nose. This led him to study the impairment of smell not only in motor neurone disease but in other neurological conditions such as multiple sclerosis, Alzheimer’s disease, and essential tremor as well as Parkinson’s disease, in which smell is often seriously impaired and probably one of its first symptoms.

He gets a trickle of patients from all over the place—sometimes because they have seen his name on the web and pressed their general practitioner for a
referral. Does he too think that his fellow clinicians are dismissive of smell? “All the time,” he says. “Or at least 95% of it.” And interest in taste problems, he thinks, is even lower.

Unrealistic patient demand for a cure where none exists is not, as you might imagine, a big problem according to one of the leading American authorities on olfaction. Richard Doty, professor of otorhinolaryngology at the University of Pennsylvania and director of its smell and taste clinic, sees one of his tasks as helping patients put their problems in perspective. “Many of the patients referred to us have been batted around the system and are sort of looking for closure; for people who actually know what they’re talking about. Many who we may not be able to help surgically or medically are still happy to have come here.” Even those who are told that nothing can be done at least have the satisfaction of a definitive opinion. They are free to stop seeking a remedy and concentrate instead on learning to live with the condition.

People who have lost their sense of smell must continue resigning themselves to widespread indifference

“It’s also therapeutic to have all these people out in the waiting room talking to each other on our clinic days,” says Professor Doty. “They realise they’re not alone.”

Science of smell

On both sides of the Atlantic the general approach to disorders of smell is broadly similar: look for an underlying cause to which the loss is secondary and tackle that. Nasal polyps, says Dr Scadding, are usually though not always pretty obvious. “We’ve learnt from people with polypl regrowth that the sense of smell can go before you can see any sign of the polyps. So it may not be physical blockage; it may be inflammation. But we’re not certain.”

Injury to nerves where they come through the skull is another cause. Even a small knock to the head can sever these nerves. Viral infections may trigger a loss of smell, as may neurodegenerative disease. And there are also various less common causes ranging from brain tumours to the side effects of drugs.

Researchers are continuing to try to find ways to treat loss of smell. To this end Dr Hawkes, Dr Scadding, and Professor Jacob would love to see even one properly funded taste and smell clinic in the United Kingdom, ideally backed up by research facilities. But they are not holding their breath.

Like many clinicians and researchers with ideas to explore and therapies to test, they cast wistful glances across the Atlantic. Indeed, spend half an hour on the web and you might conclude that the United States has at least a dozen clinics with a serious interest in taste and smell, many of them university based. But speaking from the US, Professor Doty is more cautious. For a start he doesn’t think that medical views there are so different from those in Britain. “There’s an attitude that if I can’t do anything about it, why bother.”

But what about all these clinics? He laughs. “There’s a tendency on the part of people in foreign countries to think that things must always be better in the United States. But that isn’t always the case. As for the clinics, there are places that will do some testing, but not many that will carry out a thorough assessment. And those that do thorough assessments sometimes limit their patients to certain groups because they’re doing research.” In short, while more is certainly available there, the provision is not quite as it first seems. And as ever in a system that strives to give consumers what they want, an entrepreneurial enthusiasm for meeting their needs may outstrip the scientific justification for what’s being offered.

From the vantage point of his clinic, Professor Doty is well placed to take a view of the future. Although he can foresee possibilities, he’s cautious about the likely rate of progress. The formation of scar tissue in nerves after head trauma, for example. “The cells still want to regenerate and they’re sending axons all over the place, but they’re not making the right connections.” Developments in stem cell biology offer the most hope—but not in the short term. Although he is also encouraged by recent developments in gene therapy for retinal disease,2 their applicability to olfactory receptors is still an open question.

In the meantime, people who have lost their sense of smell must continue resigning themselves to widespread indifference. This irritates Professor Jacob. “How people underestimate the importance of smell in their lives,” he says. “Yet everything you do in life is done against the backdrop of your olfactory system. It has an impact and influence that most of us are completely unaware of.” Perhaps Dr Scadding puts it best. She describes being deprived of your sense of smell as the olfactory equivalent of living in a world where the only colours are black and white.

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Competing interests: None declared.

2 UCL Institute of Ophthalmology. First trial of gene therapy for childhood blindness. www.ucl.ac.uk/1oo/research/researchers/clinical_trials.
For decades the United Kingdom has recruited overseas doctors to supplement its workforce. In more recent times, the number of doctors needed has increased as a result of an ageing population, labour intensive new technologies, and shortening of working hours. Recognising these factors, the UK greatly increased medical student places. In a few years there will be many thousands of additional medical graduates annually, and for the first time the UK will be able to meet its medical workforce needs largely through its own graduates. This large increase in medical student numbers creates an increased need for foundation programme places for new graduates and eventually for training places in the specialties if new graduates are to be effectively employed in the workforce.

Most medical disciplines require many years of postgraduate training for full certification, and graduation from medical school is at about the halfway point of a young doctor’s training path. Little can be done with a medical degree without completion of both the requirements for GMC registration and a period of post-registration training leading to full registration as a family doctor or specialist. Medical student training times are longer than for most other university courses, requiring five or six years of undergraduate training or a basic degree followed by a four year graduate entry course. Young people invest a great deal of time and hard work in completing their primary degree. The financial costs to the individual and to society are considerable.

Some other professional degrees—notably a law degree—provide useful skills for work outside the primary discipline, but this is less so with medicine, where the integrated training is useful only in medical practice or research and to a limited extent in industry. A strong case can be made that society has a moral obligation to ensure that young people who successfully complete a demanding primary medical course have the opportunity to complete their training and enter medical practice.

The European Union treaty requires a free flow of medical professionals across the continent and increasing numbers of non-UK graduates are now applying for both foundation training and further postgraduate training. Many hundreds of non-UK graduates applied for a foundation training place in 2007-8, and this number is likely to increase. The increasing number of UK graduates in the next few years make it likely that most foundation positions will be required for UK graduates to meet the requirements of GMC registration. Language barriers limit the ability of many UK graduates to obtain adequate early postgraduate training in non-English speaking countries. This situation may improve if language skills in general increase, but a lot of work is needed in this area.

There are clear advantages for doctors in early postgraduate training being supported by the health system they have started to gain some familiarity with as students. The more a student is in need of special mentorship and support, the more relevant a period of further training in the UK may be to assisting them gain the expertise for independent practice.

**International exchange**

We live in a global world, and free exchange of expertise is clearly desirable. This and a need for global movement later in medical training needs to be balanced against the likelihood that the training needs of UK graduates will place increasing demands on local training positions as the increase in graduate numbers filters through into family medicine and specialist training programmes. One possible solution would be to encourage a period of work in other countries towards the end of specialty or family medicine training and to encourage the development of bilateral exchange programmes. Creative programmes should be developed with postgraduate deanship, trust, and, where appropriate, university support to ensure that international training opportunities continue to be available both for UK graduates and international graduates, but such programmes should be aligned in scale with overall capacity at each stage of postgraduate training.

Fully trained family doctors and medical specialists are capable, language skills allowing, of working anywhere in the European Union or indeed internationally. Full mobility should be encouraged at the end of specialist training. If in future the UK has a transient excess of fully trained young doctors, they will be able to make a considerable input to health in other countries. If, instead, substantial numbers of medical graduates are not able to complete their training it would be a considerable waste of both personal and national investment.

Medical training in the UK is among the best in the world at both an undergraduate and postgraduate level. It is appropriate that a country with the wealth and stature of the United Kingdom cover its medical workforce needs without drawing doctors from less well advantaged countries in Europe or elsewhere. If the UK can contribute a relatively small number of fully trained medical doctors to work in other countries that would be a useful contribution to international health. A failure to provide training opportunities for the great majority of UK graduates and enable them to enter practice would represent a waste of human potential and a failure of care for young doctors.

**Competing interests:** EB completed his undergraduate training in Australia and benefited enormously from the opportunity to do further training in the NHS a quarter of a century ago.
After many young doctors failed to get NHS jobs this summer, Edward Byrne argues that training posts should go to UK graduates. But Edwin Borman believes restricting access would damage the profession.

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NO

Rumblings of revolution can be heard within the medical profession. What with relentless reforms to the health service, threats to our professionalism, the chaos of the medical training application service (MTAS), and a very real risk of doctors being unemployed, the forces of “blame someone,” “get rid of all of them,” and “I want the best for me and my own” have been let loose.

But that does not justify shutting the door on our colleagues who have come from abroad to work and train beside us in the United Kingdom. Just the opposite; when we prepare to “staff” the barricades, it is worth remembering that “United we stand, divided we fall.”

For most of the lifespan of the NHS, the UK has had an implicit policy to rely on international medical graduates to “top-up” the number of UK graduates. Such a system is cheaper (doctors coming from abroad bring their qualifications to the UK for free), it is more amenable to changing needs (recruitment of trained doctors within a year, rather than having to wait for them to graduate), and it provides for a sharing of experience and the development of healthcare links in a world where disease is globalised and medicine needs to be. The current medical workforce figures confirm this: 36% of doctors registered to practise in the NHS qualified abroad.¹

**Freedom of movement**

For many years, therefore, the UK has benefited from freely accepting doctors from abroad. Freedom also applies, and always should apply, to the migration of doctors,² whether the reason is to escape from tyranny, to get a better life, or to have access to specific training. And it is with freedom that doctors choose, from among many countries, to come to the UK to advance their medical career.

That decision carries responsibilities. A doctor who chooses to migrate to the UK accepts both the risks and the potential benefits; however, in a society based on fairness, it should also provide a right to be treated fairly. That right should encompass detailed and easily obtainable information on career prospects, reasonable notice of changes to immigration rules, and fair access to the posts that they had been told were available.

Populations also have rights: to health and healthcare workers.³ It is to the UK’s credit that it has led the way internationally in recognising that some countries need their own doctors more than the UK does. The NHS’s ethical recruitment policy does not allow doctors to be actively recruited from developing countries.⁴ But this cannot be used as an excuse to limit the rights of individuals to migrate.

**Equal opportunities**

The UK, and in particular the NHS, also has an admirable, though not perfect, record in providing equal opportunity, determined only on the basis of eligibility and merit. While politicians seem to be shying away from the word “multiculturalism,” all who work in the NHS accept that we do so on an equal basis with colleagues from many faiths, cultures, and countries.⁵

That is not to say that there are no problems; there is ample evidence of unfair discrimination in the NHS, as there is of vigorous efforts to eradicate such unacceptable behaviour.⁶ The crucial point is that, perhaps more than in any other aspect of life in the UK, the principle of equality is embedded in our function. The NHS, as the largest single employer in the UK, sets an example for others to follow.

Hence, it is to the credit of the medical profession that during the current crisis—even when jobs for UK graduates might have been safeguarded—all eligible applicants have been treated equally and posts have been allocated according to merit. This shows a level of solidarity that is characteristic of the best of the medical profession.

This sense of fraternity extends more widely than doctors from abroad working in the UK. The NHS also leads the world in encouraging links with practices and hospitals in developing countries. This initiative recently was given a further boost by Lord Crisp,⁷ but success and the benefits—that flow in both directions—are dependent on links that almost always are based on personal ties of colleagues who have worked together.

The good name of the medical profession in the UK has already been damaged by the government without notice introducing changes to the immigration rules. It would be a tragedy for the profession itself to sully its reputation by abandoning the principle of solidarity that goes back as far as the Hippocratic oath.

If you are looking for somewhere to allocate blame for the chaos that is MTAS, I suggest that you consider where it was decided that medical staffing no longer needed to be planned for centrally, and that training numbers should be limited to numbers that do not reflect the projected future need for consultants and general practice principals.

**Competing interests:** Edwin Borman is chairman of the BMA’s international committee. He trained in South Africa. The views expressed here are his own.

All references are on bmj.com

see Analysis p 593

**WE ARE KEEN TO HEAR YOUR IDEAS FOR HEAD TO HEAD ARTICLES**

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**WHERE DO YOU STAND ON THE ISSUE?**

Tell us on bmj.com
Last week the head of a leading mental health charity made an appeal for funds. Nothing unusual there you might suppose. It is the business of charities to play the role of Oliver Twist, forever saying they want something more. But Andrew McCulloch of the Mental Health Foundation did not direct his appeal at philanthropic individuals, but at the government. These days, when charities fall short in their fundraising it is not because they cannot wheedle any more pennies out of reluctant donors through flag days, second-hand shops, or legacies, but because their government grants and contracts haven’t come up to scratch.

To those raised in the conviction that charities ought to be everything that government isn’t, the extent to which the two sectors have become interdependent is remarkable. Hands up those who knew that more than 90% of the income of Mencap or Leonard Cheshire—two high-profile charities—comes from the government. Or two thirds of the income of Dr Barnardo’s.

Even fiercely independent organisations such as the Salvation Army have been dragged in, as donations from its own members and legacies decline and grants for social work from government grow, accounting in 2005-6 for a fifth of its revenues.

Among the bigger charities—those with an income of more than £10m (€14.6m; $20.3m) a year—two thirds get 80% or more of their income from delivering public services. If a charity is big, you might conclude, it is not because it has the warm-hearted support of millions, but because it is acting as a servant of the state.

Just how much money charities get from national and local government is difficult to ascertain. They are lumped together with other voluntary and non-profit organisations as TSOs, or “third sector organisations.” The Home Office says that in 2001-2, TSOs received £6.37bn, £904m of which came from the NHS. Others put the figures far higher: nobody really knows.

But have charities that choose to deliver services struck something of a Faustian bargain, sacrificing their rights to campaign in favour of an income stream? When the Charity Commission conducted a survey in 2006, it found that only 26% of charities that deliver services agreed they were free to make decisions without pressure to conform to the wishes of their paymasters.

A minority—less than 10%—admitted that their activities were determined more by funding opportunities than by their mission. A charity that sees its main job as attracting grants and contracts is not in any normal sense a charity at all.

This is not to say that such organisations do not behave charitably. Unfortunately it is government, national and local, that is the beneficiary. The survey found that only 12% of charities recovered all their costs, in all cases, when they provided services.

That means that 88% of them, to one extent or another, are subsidising government or its agencies. This is a radical redefinition of a charity’s role, but not one of which their supporters would necessarily approve.

The Charity Commission warned there would be consequences for charities for feeding at the public trough, though naturally it did not put it as crudely as that. “Public perception of the role of charity is narrower than the role charities fulfill in practice,” it said. “An increasing shift towards public service delivery will make public education a more challenging task.”

That’s nicely put.

It went on: “Are charities subsidising public services on the basis of decisions informed by beneficiaries’ interests? Or are they doing so accidentally, or because of a lack of negotiating power? What might be the impact of these funding issues upon public perception of charity over time?”

These questions are important because Gordon Brown has put the voluntary sector at the front of his political stall. The first outline of his philosophy as prime minister was delivered in a speech at the National Council of Voluntary Organisations. Please don’t rush to read it, as it is opaque beyond belief, but in the question-and-answer session Mr Brown promised to safeguard the independence of charities to speak out on issues without it affecting their ability to raise funds.

Some see this as a reversal of the Blairite mission to pressgang charities into becoming cheap service delivery vehicles. Others say nonsense, there is no change of policy, and providing services strengthens charities in their campaigning activities. Yet others say that what matters is the increasing shift from grants to contracts, because that further limits a charity’s ability to act freely.

Dr McCulloch launched his appeal on behalf of a number of small mental health charities that help young people. His own charity does not deliver services, so there was no self interest involved. Small charities, often locally based, are subject to the whims of local commissioners, who can turn off the tap when it suits them, or whenever the shoe pinches.

There are also concerns about the Department of Health’s commitment, despite Mr Brown. One charity boss who runs a leading and well respected organisation says he currently finds it impossible to arrange meetings with ministers, or health authority chief executives.

Charities are perhaps learning that supping with the devil calls for a long spoon. They want the best for their beneficiaries, but acting as an agent of government brings with it all the problems of being an NHS employee, without the pay, or the pension. Who’s being charitable to whom?

Nigel Hawkes is health editor, the Times nigel.hawkes@thetimes.co.uk
The effects of the collapse of the United Kingdom’s electronic recruitment and selection system for junior doctors, the Medical Training Applications Service (MTAS), have shaken British medicine. Anxiety has been raised about the careers of thousands of young doctors along with questions about the fitness for purpose of some of medicine’s key institutions.

The government has ordered an independent review not only of the recruitment system but of the whole of the new pattern of postgraduate education, Modernising Medical Careers, and it is understandable that the system is being blamed for all current difficulties.

The reality, in respect of medical unemployment, is more complicated and more worrying. Even if MTAS had worked perfectly, we would have still faced major problems with medical unemployment because of the government’s muddled approach to managing medical immigration. This has created a large surplus of applicants over available training places, making disappointment for thousands inevitable. The policy confusion has compounded a longstanding failure to address the implications of the major expansion in UK medical school output for postgraduate education and career structures. These are vitally important issues for the future of medicine in this country. But because immigration is such a sensitive matter, they remain little discussed—the “elephant in the room.”

### Implications of medical school expansion

In the late 1990s UK medical schools produced nearly 5000 graduates each year, considerably fewer than the NHS needed. This had two important consequences:

- The NHS recruited large numbers of doctors from overseas, with more than one third of training posts occupied by international medical graduates.
- UK graduates, provided they were willing to be flexible about their career choice, were reasonably assured of full specialist training and a post as a consultant or general practice principal.

In 1997 the Medical Workforce Standing Advisory Committee advocated a long term policy aim of being able to “rely largely on UK doctors though not aiming for a workforce composed entirely of UK doctors.” The committee recommended immediate expansion of medical school places by 1000, and the government added a further 1000 places as part of the NHS plan published in 2000, an overall increase of 40%. We are now halfway through this expansion, with the number of graduate doctors set to rise from 5576 in 2006 to 7000 in 2010.

The committee’s initial recommendation was based on some fairly conservative assumptions so the scale of the overall increase still seems reasonable. However, its implications for postgraduate training capacity have never been considered, not least because until recently the more pressing concern was filling the large surplus of senior house officer and specialist registrar posts needed to run the service.

Given the NHS’s position as a near monopoly employer, and the fact that foundation programme graduates need at least two further years of specialty training before they can be employed in career posts, it seems logical to ensure that these extra graduates are able to access such training. However, the advisory committee explicitly excluded such medium term planning from its remit, while shorter term planning of training numbers has always been based on assessments of NHS demand for consultants and general practitioners rather than trainee demand for specialist training. The only exception...
to this has been the Department of Health’s commitment to expand the number of foundation year 1 posts to match output from medical schools, while the extra investment in year 2 posts for general practice and other priority areas has resulted in sufficient full foundation programmes to match graduate growth to date (although this is by no means certain for the future).

Superficially, there should not be a problem. Much of the training capacity necessary to match the expansion of UK medical schools is in place, as table 1 shows. Whether these posts can actually be accessed by UK graduates depends on the competition that exists for them from doctors trained elsewhere. The advisory committee explicitly assumed that UK qualified doctors would replace those from overseas, stating: “We believe that, given the opportunity, trusts would prefer to fill these posts with domestic graduates rather than overseas doctors.”

But it is of course illegal for trusts and deaneries to discriminate on the basis of country of qualification, however much sense this might be thought to make in terms of workforce planning.

Thus even before this summer’s problems we faced a situation in which UK graduates might find it increasingly difficult to obtain a place on a traditional training programme. UK trained doctors began to voice concerns about possible unemployment in 2005 in free text returns to cohort studies run by the UK Medical Careers Research Group (Michael Goldacre, personal communication).

**Competition through MTAS**

These concerns were dramatically realised this summer, when a centralised system to select doctors for four levels of training post (specialty training years 1, 2, 3, and in a few specialties, 4) was introduced for the whole of the UK. A total of 19 172 posts were initially available through MTAS for round one applications, rising to 19 797 by June as extra posts were created; 32 649 eligible applicants competed for these posts, an average competition ratio of 1.65 applicants for each post.

Table 2 shows applicants and their success rates in round one by immigration status and country of training. Although the data on immigration status and country of training are derived from self volunteered non-verifiable information from the MTAS applications and so must be treated with caution, the overall picture is clear. In a system designed for the further training of UK medical graduates almost half the applicants were overseas trained doctors. There were broadly sufficient posts to accommodate UK applicants, together with those from the rest of the European Economic Area (who have clear legal rights to compete for posts on equal terms under European law), and this was the basis of Lord Warner’s assurance in December 2006 that “doctors in training in England should consequently be pretty confident about securing a training post.”

At that time it was not intended that international medical graduates would be able to compete in the initial application rounds. The Department of Health had announced earlier in 2006 that it was introducing a resident labour market test, requiring that international graduates be recruited only when no appointable doctor was available from within Europe. As a first step to achieving this it abolished permit-free training, but it was subsequently unable or unwilling to secure effective action to restrict entry through the highly skilled migrants programme. This is a scheme allowing highly skilled people (as judged by a scoring system based on age, educational achievement, and previous earnings) to migrate to the UK to seek work without a specific job offer. It is not occupation specific and, as table 2 shows, large numbers of doctors from outside Europe meet its criteria. The inclusion of thousands of overseas doctors has transformed the prospects for all applicants and has made widespread failure to secure a proper training post inevitable.

Some of the problems may be mitigated by the creation of special posts to tide eligible applicants over until next year’s competition round. However, competition ratios then are likely to be worse than this year unless more radical action is taken.

**Ways forward**

The UK urgently needs policy coherence on immigration and medical training. It currently has the worst of all worlds. Investing heavily in expanding our medical schools makes little sense if we cannot enable the extra graduates to pursue a career in medicine and contribute to the NHS. The implications of making medicine a career in which, after seven years of training and thousands of pounds of debt, graduates face a serious risk of permanent exclusion are enormous. Not only is this economic nonsense, it represents a betrayal of the legitimate expectations of those who entered UK medical training in recent years. It is also an abuse of doctors lured from overseas to compete for non-existent jobs.

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**Table 2 | MTAS round one applicants analysed by country of qualification and immigration status, together with appointment rates on 26 June 2007 (unpublished data, Department of Health)**

<table>
<thead>
<tr>
<th>Country of qualification</th>
<th>UK</th>
<th>Other EEA</th>
<th>HSMP</th>
<th>Other overseas</th>
<th>All</th>
<th>No (%) appointed</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>14 650</td>
<td>605</td>
<td>663</td>
<td>752</td>
<td>16 670</td>
<td>11 471 (69)</td>
</tr>
<tr>
<td>Non-UK</td>
<td>1 998</td>
<td>1803</td>
<td>9 351</td>
<td>2827</td>
<td>15 979</td>
<td>4643 (29)</td>
</tr>
<tr>
<td>All</td>
<td>16 648</td>
<td>2408</td>
<td>10 014</td>
<td>3579</td>
<td>32 649</td>
<td>16 114 (49)</td>
</tr>
<tr>
<td>No (%) appointed</td>
<td>11 043 (66)</td>
<td>937 (39)</td>
<td>3090 (31)</td>
<td>1044 (29)</td>
<td>16 114 (49)</td>
<td></td>
</tr>
</tbody>
</table>

EEA= European Economic Area, HSMP= Highly skilled migrants programme.
It is correspondingly difficult to understand the ambiguity on this issue of those organisations fighting to rebuild their credibility with trainees. The BMA is determined that the “MTAS fiasco must never be repeated” but remains a fierce critic of the necessary changes to immigration policy.10 The review led by the medical royal colleges was “deeply concerned,” calling for better workforce planning and “clear policy on the recruitment of overseas doctors” but saw the large number of non-UK doctors who applied as one of the successes of the system.11

The direct connection between policy on medical immigration and the likelihood of unemployment for UK medical graduates is inescapable. Although there are compelling reasons for the UK to provide postgraduate education tailored to the needs of other countries, this is not what the highly skilled migrant programme facilitates, and the damage to other health systems caused by wealthy countries recruiting doctors in this way has been graphically described.12 13 The most obvious action would be to suspend the skilled migrant programme as it applies to doctors and establish a two stage recruitment process similar to that used in other countries,14 whereby overseas applications are considered after those of domestic graduates (which in our case would have to include Europe).15

The rights of overseas doctors already in the system must be safeguarded, but if decisive action is not taken the situation will be worse next year. Not only does the UK remain an attractive place to train but if, as seems likely, “traditional” recruitment processes are used, foundation programme graduates could find it hard to compete for run-through training with overseas doctors with substantial specialty experience. This muddle is in no one’s best interests and needs open and honest discussion and clear leadership, however difficult that may be.

Competing interests: GW was chair of the Conference of Postgraduate Medical Deans (COPMeD) from 2004-2006.

2 Hawkes N. The royal colleges must up their game—or die. BMJ 2007;334:72A.
3 MMC Inquiry. www.mmcinquiry.org.uk
8 Home Office Border and Immigration Agency, information about the highly skilled migrant programme. www.workingintheuk.gov.uk/working_in_the_uk/en/homepage/schemes_and_programmes/hspm.html?
15 Delamothe T. Centralised application services for specialist training—other countries manage. BMJ 2007;334:1285.

Summary points

The UK had far more applicants than specialty training places this year. Government immigration policies not MTAS have created this imbalance. Expanding medical schools makes little sense if extra graduates cannot pursue a career in medicine. Immigration policies need to be changed to reflect this.

Analysis articles: advice to authors

These articles aim to stimulate discussion, raise debate, and air controversies. They can cover any aspects of medicine and health that are relevant to an international general medical audience, including sociological and ethical aspects of medicine, polemical pieces, and educational articles. These articles (whether single pieces or short series of articles) are mostly unsolicited.

They should include:

• 1500-1800 words set out under informative subheadings. Please include a 100-150 word introduction spelling out what the paper is about and emphasising its importance.
• No more than 20 references in Vancouver style, presenting the evidence on which the key statements in the paper are made.
• Up to three tables, boxes, or illustrations (clinical photographs, imaging, line drawings, or figures—we welcome colour). We may be able to publish some additional boxes or figures on bmj.com only.
• A summary box with up to five short, single sentences highlighting the main points.
• A statement of data sources and selection criteria: as well as the standard statements of funding, competing interests, and contributorship.
• At the end of every accepted analysis article the BMJ will add a statement explaining the article’s provenance (such as “non-commissioned, externally peer reviewed”).

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• Would a professional writer contribute to the article, and to what extent?
• Would the BMJ article be similar to articles submitted or published elsewhere?

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Antenatal education and postnatal support strategies for improving rates of exclusive breast feeding: randomised controlled trial

Lin-Lin Su, associate consultant,1 Yap-Seng Chong, senior consultant,1 Yiong-Huak Chan, head, biostatistics unit,2 Yah-Shih Chan, assistant director of nursing,3 Doris Fok, research coordinator and lactation consultant,3 Kay-Thwe Tun, clinical project coordinator,4 Faith S P Ng, biostatistician,4 Mary Rauff, senior consultant1

INTRODUCTION
Despite awareness of the many advantages of breast feeding, its rates often fall short of recommended practice. The World Health Organization1 and the American Academy of Pediatrics2 advocate exclusive breast feeding for six months and partial breast feeding thereafter for at least 12 or 24 months. In an effort towards achieving better breast feeding practices, UNICEF and WHO launched the baby friendly hospital initiative in 1991 to ensure that all maternity facilities support mothers in making the best choice about feeding. The initiative was introduced to the United Kingdom in 1993, but, although improvements have been reported,3 rates of breast feeding in the UK are still among the lowest in the world.45 Recent reports from the National Institute for Health and Clinical Excellence (NICE) urge NHS units to become baby friendly to improve rates of breast feeding and save money.46 Data from the millennium cohort study, however, show that though participating maternity units in the UK increased rates of initiation of breast feeding, duration did not increase.5 Other strategies are therefore required to support mothers in the UK to breast feed for the recommended time. The challenge lies in implementing programmes that can effectively improve rates of short and long term exclusive breast feeding.

A national survey in Singapore in 2001 found that only 21% of mothers were breast feeding at six months, with less than 5% of mothers exclusively breast feeding, despite the fact that nearly 90% of the mothers surveyed indicated that breast feeding was the best form of infant nutrition and 95% said they had attempted to breastfeed.7 It is evident that many mothers are unable to establish and maintain breast feeding successfully, despite wanting to do so. While antenatal education and counselling is helpful,8 68% of mothers said that despite wanting to do so. While antenatal education and counselling is helpful,8 68% of mothers said that they stopped nursing before two months postpartum.7 Other barriers were lack of knowledge about breast feeding and lack of support from health professionals.7 Women value being shown how to breastfeed rather than being told how to.910 Evidence of effective interventions to improve exclusive breast feeding.

ABSTRACT
Objective To investigate whether antenatal breast feeding education alone or postnatal lactation support alone improves rates of exclusive breast feeding compared with routine hospital care.

Design Randomised controlled trial.

Setting A tertiary hospital in Singapore.

Participants 450 women with uncomplicated pregnancies.

Main outcome measures Primary outcomes were rates of exclusive breast feeding at discharge from hospital and two weeks, six weeks, three months, and six months after delivery. Secondary outcomes were rates of any breast feeding.

Results Compared with women who received routine care, women in the postnatal support group were more likely to breast feed exclusively at two weeks (relative risk 1.53, 95% confidence interval 1.47 to 1.60), six weeks (1.53, 1.47 to 1.60), three months (1.67, 1.61 to 1.74), six months (1.73, 1.68 to 1.79), and six months postnatally (1.81, 1.74 to 1.87). Women receiving antenatal education were more likely to breast feed exclusively at six weeks (1.73, 1.64 to 1.83), six months (1.82, 1.74 to 1.90), and six months postnatally (1.85, 1.77 to 1.93). The numbers needed to treat to achieve one woman exclusively breast feeding at six months were 11 (6 to 80) for postnatal support and 10 (6 to 60) for antenatal education.

Conclusions Antenatal breast feeding education and postnatal lactation support, as single interventions based in hospital both significantly improve rates of exclusive breast feeding up to six months after delivery. Postnatal support was marginally more effective than antenatal education.

Trial registration Clinical Trials NCT00270920.
feeding for the recommended duration of six months is sparse. While there is evidence for the effectiveness of professional support in prolonging duration of breast feeding and increasing rates of initiation of breast feeding, the strength of its effect on the rate of exclusive breastfeeding is unclear.11,12

We used a randomised controlled study to compare the relative effectiveness of an antenatal breast feeding education protocol and a postnatal lactation support protocol versus routine care in improving rates of exclusive breast feeding in a tertiary hospital setting.

METHODS
Study population
We recruited healthy pregnant women who were attending antenatal clinics at the National University Hospital, a tertiary hospital in Singapore. One research assistant, who is an experienced lactation consultant, recruited women from the outpatient obstetric clinic. Mothers were eligible for participation if they were more than 34 weeks’ gestation at the time of delivery, expressed an intention to breast feed, and had no illness that would contraindicate breast feeding or severely compromise its success. We excluded women with high risk and multiple pregnancies. Women who agreed to participate gave written informed consent.

Assignment and intervention
Women were randomised into three groups. Group 1 was the control group and women received routine antenatal, intrapartum, and postnatal obstetric care with no special intervention applied. At our hospital, this included optional antenatal classes, which did address infant feeding, and postnatal visits by a lactation consultant should any problems with breast feeding arise.

Women randomised to group 2 received one session of antenatal breastfeeding education in which they were shown a 16 minute educational video entitled “14 Steps to Better Breastfeeding” (InJoy Videos, Boulder, CO), which introduced the benefits of breastfeeding, demonstrated correct positioning, latch on, and breast care, and

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**Definitions of types of breastfeeding**

- **Exclusive breast feeding**—only breast milk given to baby. Medicines, vitamins, and oral rehydration solution may be given but no formula or water
- **Predominant breast feeding**—breast milk and water, sweetened water, and juices given without formula
- **Partial breast feeding**—breast milk and complementary food such as formula milk, gruel, semisolids, or solids are given
- **No breast feeding**—no breast milk given and only formula milk and other liquids or food given

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**Flow of participants through each stage of randomised trial**

- **Eligible women (n=544)**
- **Randomised women (n=450)**
  - Group 1: standard hospital care (n=151)
  - Excluded (n=5):
    - Withdrawn (n=2)
    - Delivered in another hospital (n=3)
  - Analysed on intention to treat basis (n=151)
  - 1st-2nd week:
    - Lost to follow-up (n=0)
    - Dropped out (n=7)
  - 6th-8th week:
    - Lost to follow-up (n=2)
  - At 3 months:
    - Lost to follow-up (n=2)
  - At 6 months:
    - Lost to follow-up (n=8)
    - Completed follow-up at 6 months (n=126)
  - Completed follow-up at 6 months (n=126)
  - Group 2: one session of antenatal breastfeeding education (n=150)
  - Excluded (n=1):
    - Delivered in another hospital (n=1)
  - Analysed on intention to treat basis (n=150)
  - 1st-2nd week:
    - Lost to follow-up (n=7)
    - Dropped out (n=5)
  - 6th-8th week:
    - Lost to follow-up (n=5)
  - At 3 months:
    - Lost to follow-up (n=5)
    - Completed follow-up at 6 months (n=122)
  - Completed follow-up at 6 months (n=122)
  - Group 3: two sessions of postnatal lactation support (n=149)
  - Excluded (n=8):
    - Withdrawn (n=5)
    - Delivered in another hospital (n=2)
    - Could not be contacted (n=1)
  - Analysed on intention to treat basis (n=149)
  - 1st-2nd week:
    - Lost to follow-up (n=3)
    - Dropped out (n=12)
  - 6th-8th week:
    - Lost to follow-up (n=5)
  - At 3 months:
    - Lost to follow-up (n=6)
  - At 6 months:
    - Lost to follow-up (n=3)
    - Completed follow-up at 6 months (n=119)
discussed common concerns. They were also given printed guides on breast feeding\textsuperscript{13,14} and an opportunity to talk to a lactation counsellor for about 15 minutes. They subsequently received routine intrapartum and postnatal obstetric care.

Women randomised to group 3 were placed in a two session postnatal lactation support programme. They were visited by a lactation consultant within the first three postnatal days before discharge from hospital. They also received the same printed guides on breast feeding\textsuperscript{13,14} during this visit. A second support session was provided during their first routine postnatal visit one to two weeks after delivery. During these two encounters, the women received hands-on instructions in latching on, proper positioning, and other techniques to avoid common complications. Each encounter lasted about 30 minutes.

We conducted our study in conjunction with the clinical trials and epidemiology research unit, which is an independent organisation funded by the National Medical Research Council. This unit performed the randomisation, sequence allocation, trial coordination, site monitoring, data collection, and analysis for this study according to good clinical practice guidelines. The unit generated and maintained a list of random codes for participants, corresponding to the two interventions and the control assignment groups. Treatment assignment was generated with a computer programme. The clinical project coordination department of the Clinical Trials and Epidemiology Research Unit randomised women by means of telephone calls. Unit personnel would then log on to the password protected website to obtain the randomisation number and assign the study group. Backup envelopes were used if website randomisation failed. The sequence was therefore strictly concealed until the intervention was assigned. The research assistant ensured that appropriate interventions were carried out depending on the group to which the women were allocated. The trial data were collected on printed case record forms, and the unit performed data entry. Clinical project coordinators of the unit regularly monitored sites to ensure accuracy of recruitment and data collection as well as strict compliance to the study protocol. We

<p>| Table 1 | Baseline characteristics of women according to group allocation.* Figures are numbers (percentages) of women unless stated otherwise |
|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|</p>
<table>
<thead>
<tr>
<th><strong>Mean (SD) age (years)</strong></th>
<th>Group 1 (n=151)</th>
<th>Group 2 (n=150)</th>
<th>Group 3 (n=149)</th>
<th>Total (n=450)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primiparous</td>
<td>60 (40)</td>
<td>59 (39)</td>
<td>59 (40)</td>
<td>178 (40)</td>
</tr>
<tr>
<td>Multiparous</td>
<td>91 (60)</td>
<td>91 (61)</td>
<td>90 (60)</td>
<td>272 (60)</td>
</tr>
<tr>
<td><strong>Ethnicity:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chinese</td>
<td>46 (31)</td>
<td>62 (41)</td>
<td>65 (44)</td>
<td>173 (38)</td>
</tr>
<tr>
<td>Malay</td>
<td>82 (54)</td>
<td>65 (43)</td>
<td>69 (46)</td>
<td>216 (48)</td>
</tr>
<tr>
<td>Indian</td>
<td>16 (11)</td>
<td>20 (13)</td>
<td>12 (8)</td>
<td>48 (11)</td>
</tr>
<tr>
<td>Other</td>
<td>7 (5)</td>
<td>3 (2)</td>
<td>3 (2)</td>
<td>13 (3)</td>
</tr>
<tr>
<td><strong>Highest educational qualification:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher than secondary</td>
<td>53 (35)</td>
<td>56 (37)</td>
<td>51 (34)</td>
<td>160 (36)</td>
</tr>
<tr>
<td>No qualification/primary</td>
<td>98 (65)</td>
<td>94 (63)</td>
<td>98 (66)</td>
<td>290 (64)</td>
</tr>
<tr>
<td><strong>Employment:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student/housewife</td>
<td>86 (57)</td>
<td>86 (57)</td>
<td>69 (46)</td>
<td>241 (54)</td>
</tr>
<tr>
<td>Employed</td>
<td>65 (43)</td>
<td>64 (43)</td>
<td>80 (54)</td>
<td>209 (46)</td>
</tr>
<tr>
<td><strong>Entitlement to &gt;2 months maternity leave for employed women:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>27 (42)</td>
<td>26 (41)</td>
<td>31 (39)</td>
<td>84 (40)</td>
</tr>
<tr>
<td>No</td>
<td>31 (48)</td>
<td>31 (48)</td>
<td>40 (50)</td>
<td>102 (49)</td>
</tr>
<tr>
<td>Not applicable</td>
<td>7 (11)</td>
<td>7 (11)</td>
<td>9 (11)</td>
<td>23 (11)</td>
</tr>
<tr>
<td><strong>Household monthly income:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;$Singapore $5000</td>
<td>141 (93)</td>
<td>132 (88)</td>
<td>136 (91)</td>
<td>409 (91)</td>
</tr>
<tr>
<td>$&gt;Singapore $5000</td>
<td>10 (7)</td>
<td>18 (12)</td>
<td>13 (9)</td>
<td>41 (9)</td>
</tr>
<tr>
<td><strong>Family structure:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nuclear</td>
<td>80 (53)</td>
<td>81 (54)</td>
<td>68 (46)</td>
<td>229 (51)</td>
</tr>
<tr>
<td>Not nuclear</td>
<td>71 (47)</td>
<td>69 (46)</td>
<td>81 (54)</td>
<td>221 (49)</td>
</tr>
<tr>
<td><strong>Had previously breast fed:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>85 (56)</td>
<td>85 (57)</td>
<td>84 (56)</td>
<td>254 (56)</td>
</tr>
<tr>
<td>No</td>
<td>66 (44)</td>
<td>65 (43)</td>
<td>65 (44)</td>
<td>196 (44)</td>
</tr>
<tr>
<td><strong>Attended hospital antenatal class:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>7 (5)</td>
<td>12 (8)</td>
<td>9 (6)</td>
<td>28 (6)</td>
</tr>
<tr>
<td>No</td>
<td>144 (95)</td>
<td>138 (92)</td>
<td>140 (94)</td>
<td>422 (94)</td>
</tr>
</tbody>
</table>

*Group 1=standard hospital care; group 2=antenatal breastfeeding education; group 3=postnatal lactation support.
recorded and discussed all instances of protocol violation. Similarly, a research assistant recorded, and the unit monitored, all adverse events. All data were kept confidential and analysis was not performed until completion of the study.

Outcome measures
The primary outcomes were rates of exclusive breastfeeding at discharge from the hospital and at two weeks, six weeks, three months, and six months after delivery. We defined exclusive breastfeeding as giving breast milk as the only food source, with no other foods or liquids, other than vitamins or medications, being given. The box shows the definitions of the four categories of breastfeeding. Secondary outcomes were the frequencies of any breastfeeding at each of these intervals.

Follow-up
During the baseline antenatal interview, all mothers answered a standard questionnaire that documented their demographic data, home environment, and experience of breastfeeding. They were also given an infant feeding diary. The first postnatal interview was conducted before the women were discharged from the hospital. Detailed data about the intrapartum and immediate postpartum experience, including mode of delivery, birth weight of newborns, and infant feeding in the hospital, were recorded during this interview. The two week and six week interviews were performed either during the women’s routine clinic visit for postnatal reviews or via home visits. At these visits, they were asked to fill in a standard questionnaire regarding infant feeding by referring to their diaries. The mothers were subsequently interviewed over the telephone at three months and six months after delivery regarding their breastfeeding and weaning practices as recorded in their infant feeding diaries. Rates of exclusive, predominant, partial, and no breastfeeding were tracked at all these time points.

Statistical analysis
To calculate sample size, we estimated that at six months 10% in group 1, 15% in group 2, and 25% in group 3 would still be breastfeeding. To detect these differences across the three groups with a two sided test of 5% with 90% power we needed to randomise 450 women equally into the three groups.

The trial data were entered into CLINTRIAL version 4.4 (PhaseForward), specialised software for managing longitudinal trial data. This programme facilitates interactive entry and data correction and maintains consistent and accurate trial data. We used SAS version 9.1 (SAS Institute, Cary, NC, USA) for statistical analyses. We collected descriptive statistics on the breastfeeding for the three groups and analysed data on an intention to treat basis. We assessed the pairwise comparisons between the different study groups in their rates of breastfeeding using modified Cox regression analysis15 to provide the adjusted relative risks and 95% confidence intervals. Significance was set at P<0.05. We carried out primary analyses for all participants who had completed follow-ups, with sensitivity analyses when appropriate.

RESULTS
We recruited 450 women from February 2004 to September 2005, of whom 151 were randomised to receive standard hospital care (group 1), 150 to antenatal education (group 2), and 149 to postnatal lactation support (group 3). Four women were randomised by using backup envelopes because of dysfunction in web randomisation and this resulted in the imbalance in numbers of women per group. Follow-up was completed in May 2006. The figure shows the trial profile, including the number of women lost to follow-up. In total, 367 (82%) completed six months of follow-up, with a similar number lost to follow-up in the three study groups. Baseline characteristics among the three randomised groups were similar (table 1). The three study groups were also similar in the variables related to birth and infant morbidity, including the mode of delivery and the mean birth weight (table 2).

Effect of intervention
Table 3 shows the primary outcome of rates of exclusive breastfeeding at the various time points for each group. Compared with the control group, women randomised to postnatal intervention were significantly more likely to breastfeed exclusively from two weeks till six months after delivery. At two weeks, 38% (48/128) of women randomised to postnatal intervention were exclusively breastfeeding compared with 21% (28/136) of women who received routine hospital care (relative risk 1.82; 95% confidence interval 1.14 to 2.90; number needed to treat=6, 4 to 17). This significant improvement was still present six weeks, three months, and six months after delivery (table 3). At six months, 19% (22/119) of women in the postnatal intervention group were exclusively breastfeeding compared with 9% (11/126) of the women in the control group (2.12; 1.03 to 4.37). For every 11 women who received postnatal lactation support, one exclusively breast fed for six months (number needed to treat=11, 6 to 80).

Women randomised to antenatal education were more likely to exclusively breastfeed compared with

Table 2 | Perinatal factors of women by group allocation. Figures are numbers (percentages) of women unless stated otherwise

<table>
<thead>
<tr>
<th>Mode of delivery:</th>
<th>Group 1 (n=138)</th>
<th>Group 2 (n=138)</th>
<th>Group 3 (n=134)</th>
<th>Total (n=410)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal vaginal</td>
<td>105 (76)</td>
<td>104 (75)</td>
<td>103 (77)</td>
<td>312 (76)</td>
</tr>
<tr>
<td>Vacuum (ventouse)</td>
<td>3 (2)</td>
<td>3 (2)</td>
<td>4 (3)</td>
<td>10 (3)</td>
</tr>
<tr>
<td>Forceps</td>
<td>0</td>
<td>0</td>
<td>1 (1)</td>
<td>1 (0.2)</td>
</tr>
<tr>
<td>Caesarean section</td>
<td>30 (22)</td>
<td>31 (22)</td>
<td>26 (19)</td>
<td>87 (21)</td>
</tr>
<tr>
<td>Mean (SD) gestational age at birth (weeks)</td>
<td>39.1 (1.3)</td>
<td>39.2 (1.2)</td>
<td>39.4 (1.3)</td>
<td>39.2 (1.3)</td>
</tr>
<tr>
<td>Mean (SD) birth weight (g)</td>
<td>3194 (439)</td>
<td>3171 (429)</td>
<td>3171 (411)</td>
<td>3179 (426)</td>
</tr>
</tbody>
</table>

*Group 1=standard hospital care; group 2=antenatal breastfeeding education; group 3=postnatal lactation support. Based on number of women who delivered at the hospital.
the control group only from six weeks postnatally, when 29% (39/133) of women in the antenatal education group were exclusively breastfeeding compared with 17% (23/136) of women receiving routine care (1.73, 1.04 to 2.90; number needed to treat=8, 5 to 41). This significant benefit was also evident at three months and six months after delivery (table 3). At six months, 19% (23/122) of women randomised to receiving antenatal education were exclusively breastfeeding compared with 9% (11/126) of women in the control group (2.16, 1.05 to 4.43). One woman exclusively breast fed for six months for every 10 women who received antenatal breastfeeding education (number needed to treat=10, 6 to 60).

We compared the efficacy of antenatal education and postnatal support with regard to breast feeding and found no significant difference in improvements in the rate of exclusive breast feeding (table 3). However, women who received postnatal support were more likely to either exclusively or predominantly breastfeed their babies at two weeks compared with women who received antenatal education (1.53, 1.01 to 2.31; number needed to treat=7, 4 to 28).

We also assessed the secondary outcome of the rate of any breast feeding. The incidence of any breast feeding was higher in women who received postnatal lactation support than in women in the control group (1.19, 1.05 to 1.36; number needed to treat=8, 5 to 26) at six weeks after delivery (table 4). They were also more likely to breast feed at six weeks compared with women who received antenatal education (1.16, 1.02 to 1.31; number needed to treat=9, 5 to 60). There was no significant difference among the three groups at discharge from hospital, two weeks, three months, and six months after delivery.

Sensitivity analysis

Our primary data analysis was based on women who completed follow-up at the particular time points of data collection. The main reason for loss to follow-up was that we could not contact the women. We performed sensitivity analyses on the assumption that none of the women lost to follow-up were exclusively breast feeding at any time point. With these assumptions, women who received antenatal education were significantly more likely to be exclusively breast feeding at six weeks (1.71, 1.02 to 2.86), three months (1.84, 1.02 to 3.32), and six months (2.11, 1.03 to 4.32) compared with the women receiving routine care. Women who received postnatal lactation support were also more likely to exclusively breast feed at two weeks (1.74, 1.09 to 2.77) and six weeks (1.76, 1.06 to 2.94) compared with the control group.

**DISCUSSION**

Antenatal breastfeeding education and postnatal lactation support both significantly improved the rates of exclusive breastfeeding up to six months after delivery compared with routine care in a tertiary hospital setting. While both strategies were effective, postnatal support was marginally more effective than antenatal education in improving breastfeeding practice.

**Strengths and weaknesses**

This study was rigorously conducted. All the mothers in our study complied with the intervention. Compliance with the assigned interventions was documented in the case record files and monitored by clinical project coordinators. We minimised potential recall bias in maternal self reporting of breastfeeding with infant feeding diaries. Though the study was pragmatic and carried out in a non-research setting in a busy tertiary hospital, we were able to follow good clinical practice guidelines. Women received both antenatal and postnatal interventions in addition to routine ambulatory and inpatient hospital care. All other aspects of management were similar. The findings can therefore be generalised to any setting where women’s pregnancy and delivery are managed in a hospital setting. Our primary outcome was rates of exclusive breastfeeding up to six months after delivery. The protective effects of breast feeding have been shown to be dose responsive, and minimal breast feeding may not be protective. Researchers in lactation have advocated that research on promotion of breast feeding must target exclusive breast feeding, and ours is one of the larger randomised controlled trials with this primary outcome.

Most of the women in our study did not attend the optional antenatal classes offered by the hospital. Our

**Table 3 Number (percentage) of women exclusively breast feeding by group allocation**

<table>
<thead>
<tr>
<th></th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
<th>Group 2 v group 1</th>
<th>Group 3 v group 1</th>
<th>Group 3 v group 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>At discharge from hospital</td>
<td>25/138 (18)</td>
<td>27/138 (20)</td>
<td>36/134 (27)</td>
<td>1.08 (0.63 to 1.38, P&lt;0.782)</td>
<td>1.48 (0.89 to 2.47, P&lt;0.130)</td>
<td>1.37 (0.83 to 2.26, P&lt;0.213)</td>
</tr>
<tr>
<td>At 2 weeks</td>
<td>26/136 (21)</td>
<td>36/133 (27)</td>
<td>48/128 (38)</td>
<td>1.32 (1.00 to 2.15, P&lt;0.278)</td>
<td>1.82 (1.14 to 2.90, P&lt;0.012)</td>
<td>1.39 (0.90 to 2.13, P&lt;0.139)</td>
</tr>
<tr>
<td>At 6 weeks</td>
<td>23/136 (17)</td>
<td>39/133 (29)</td>
<td>40/128 (31)</td>
<td>1.73 (1.04 to 2.90, P&lt;0.036)</td>
<td>1.85 (1.11 to 3.09, P&lt;0.019)</td>
<td>1.07 (0.69 to 1.66, P&lt;0.777)</td>
</tr>
<tr>
<td>At 3 months</td>
<td>17/134 (13)</td>
<td>31/127 (24)</td>
<td>29/122 (24)</td>
<td>1.92 (1.07 to 3.68, P&lt;0.030)</td>
<td>1.87 (1.03 to 3.41, P&lt;0.040)</td>
<td>0.97 (0.59 to 1.62, P&lt;0.918)</td>
</tr>
<tr>
<td>At 6 months</td>
<td>11/126 (9)</td>
<td>23/122 (19)</td>
<td>22/119 (19)</td>
<td>2.16 (1.05 to 4.43, P&lt;0.036)</td>
<td>2.12 (1.03 to 4.37, P&lt;0.042)</td>
<td>0.98 (0.55 to 1.76, P&lt;0.948)</td>
</tr>
</tbody>
</table>

*Group 1 =standard hospital care; group 2=antenatal breastfeeding education; group 3=postnatal lactation support. Based on completed follow-up.
At discharge from hospital 131/138 (95) 132/138 (96) 131/134 (98) 1.01 (0.79 to 1.28), $P = 0.95$ 

At 2 weeks 127/136 (93) 126/133 (95) 126/128 (98) 1.02 (0.79 to 1.20), $P = 0.90$ 

At 6 weeks 96/136 (71) 97/133 (73) 108/128 (84) 1.03 (0.89 to 1.20), $P = 0.66$ 

At 3 months 65/134 (49) 73/127 (58) 71/122 (58) 1.19 (0.85 to 1.66), $P = 0.32$ 

At 6 months 43/126 (34) 52/122 (43) 48/119 (40) 1.25 (0.83 to 1.87), $P = 0.28$

**Table 4 | Number (percentage) of women breastfeeding at all by group allocation**

<table>
<thead>
<tr>
<th></th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
<th>Group 2 v group 1</th>
<th>Group 3 v group 1</th>
<th>Group 3 v group 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative risk (95% CI) number needed to treat (NNT) (95% CI)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At discharge from hospital 131/138 (95) 132/138 (96) 131/134 (98) 1.01 (0.79 to 1.28), $P = 0.95$</td>
<td>1.03 (0.79 to 1.28), $P = 0.90$</td>
<td>1.05 (0.82 to 1.35), $P = 0.67$</td>
<td>1.04 (0.81 to 1.33), $P = 0.76$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At 2 weeks 127/136 (93) 126/133 (95) 126/128 (98) 1.02 (0.79 to 1.20), $P = 0.90$</td>
<td>1.03 (0.89 to 1.20), $P = 0.66$</td>
<td>1.19 (0.85 to 1.36), $P = 0.66$</td>
<td>1.16 (1.02 to 1.31), $P = 0.02$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At 6 weeks 96/136 (71) 97/133 (73) 108/128 (84) 1.03 (0.89 to 1.20), $P = 0.66$</td>
<td>1.19 (0.85 to 1.36), $P = 0.66$</td>
<td>1.20 (0.86 to 1.68), $P = 0.28$</td>
<td>1.01 (0.73 to 1.40), $P = 0.94$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At 3 months 65/134 (49) 73/127 (58) 71/122 (58) 1.19 (0.85 to 1.66), $P = 0.32$</td>
<td>1.25 (0.83 to 1.87), $P = 0.28$</td>
<td>1.18 (0.78 to 1.78), $P = 0.42$</td>
<td>0.95 (0.64 to 1.40), $P = 0.78$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At 6 months 43/126 (34) 52/122 (43) 48/119 (40) 1.25 (0.83 to 1.87), $P = 0.28$</td>
<td>0.909 1.05 (0.82 to 1.35), $P = 0.67$</td>
<td>0.812 1.02 (0.80 to 1.30), $P = 0.86$</td>
<td>0.783</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Group 1 = standard hospital care; group 2 = antenatal breastfeeding education; group 3 = postnatal lactation support. Based on completed follow-up.

Our findings may be applied in most hospital settings to devise policies regarding strategies to promote breast feeding. Lack of breast feeding is significantly associated with higher use and cost of health care. Improved short and long term health of breastfed children, improved wellbeing of mothers who have breast fed, and the cost of goods consumed are major factors leading to economic benefits from the promotion of breast feeding.26 28 Future research should compare the specific cost effectiveness of such strategies for improvement of breastfeeding practice.

We thank Su-Yin Lee and the NHG-NUS Medical Publications Support Unit for help in preparing the manuscript.

**Contributors:** Y-SC and L-LS developed the study concept and design, wrote grant applications, supervised the study, interpreted the results, and wrote the paper with help from YSC and MR. Y-SC is guarantor. DF and K-TT advised on the study design, coordinated the study, liaised with participants, entered data, and monitored the trial. Y-SC and FSPM advised on the selection and conduct of statistical tests, and the interpretation of the results. All authors contributed to and approved the final draft.

**Funding:** National Healthcare Group (grant No NHG-RPR 03002).

**Competing interests:** None declared.

**Ethical approval:** Institutional Review Board of the Yong Loo Lin School of Medicine, National University of Singapore.

**Provenance and peer review:** Non-commissioned, externally peer reviewed.

WHAT IS ALREADY KNOWN ON THIS TOPIC

Various forms of education on breast feeding are effective but only by increasing rates of initiation of breast feeding

While there is evidence for the effectiveness of professional lactation support in prolonging duration of breast feeding, the strength of its effect on the rate of exclusive breast feeding is unclear

WHAT THIS STUDY ADDS

Hospital based antenatal education on breast feeding and postnatal lactation support both significantly improve rates of exclusive breast feeding for up to six months after birth. Postnatal lactation support is marginally more effective than antenatal education.


Accepted: 28 June 2007
Mental health consequences of overstretch in the UK armed forces: first phase of a cohort study

Roberto J Rona, professor of public health,1 Nicola T Fear, senior lecturer in military epidemiology,2 Lisa Hull, study coordinator,1 Neil Greenberg, senior lecturer in military psychiatry,2 Mark Earnshaw, research fellow,2 Matthew Hotopf, professor of general hospital psychiatry,1 Simon Wessely, professor of epidemiology and liaison psychiatry1

ABSTRACT
Objective To assess the relation between frequency and duration of deployment of UK armed forces personnel on mental health.
Design First phase of a cohort study.
Setting UK armed forces personnel.
Participants Operational history in past three years of a randomly chosen stratified sample of 5547 regulars with experience of deployment.
Main outcome measures Psychological distress (general health questionnaire-12), caseness for post-traumatic stress disorder, physical symptoms, and alcohol use (alcohol use disorders identification test).
Results Personnel who were deployed for 13 months or more in the past three years were more likely to fulfil the criteria for post-traumatic stress disorder (odds ratio 1.55, 95% confidence interval 1.07 to 2.32), show caseness on the general health questionnaire (1.35, 1.10 to 1.63), and have multiple physical symptoms (1.49, 1.19 to 1.87). A significant association was found between duration of deployment and severe alcohol problems. Exposure to combat partly accounted for these associations. The associations between number of deployments in the past three years and mental disorders were less consistent than those related to duration of deployment. Post-traumatic stress disorder was also associated with a mismatch between expectations about the duration of deployment and the reality.
Conclusions A clear and explicit policy on the duration of each deployment of armed forces personnel may reduce the risk of post-traumatic stress disorder. An association was found between deployment for more than a year in the past three years and mental health that might be explained by exposure to combat.

INTRODUCTION
British commanders have raised concerns about the ability of the armed forces to cope with simultaneous major operations in Iraq and Afghanistan, and the UK armed forces have been asked to do more than was envisaged in the most recent defence review.1-3 The National Audit Office reported that the number and frequency of deployments were important reasons for leaving the armed forces.4 The UK armed forces acknowledge that excessive deployments may have an effect on job satisfaction and have recommended maximum deployment levels, called the harmony guidelines. Since 2003 the measurement of guideline violations has provided some support to the complaints.4 An increase in the pace of deployments has also been recognised in the United States.5-6

The pace of military operations, “operational tempo,” may have an effect on health, place strain on the families of military personnel, lower morale, and influence intentions to remain in the armed forces.7-8 The nature of the relation between number of deployments and health consequences is far from clear. Overstretch is conceived as over-committing the armed forces at a time of simultaneous major deployments. Thus it should be associated with operational tempo. Deployment is an essential ingredient of military life, is considered a valuable feature of a military career, and for many is the reason for joining up. It can also be a source of conflict and tension within families and may have mental health consequences.7-8

Some of the available reports have considered operational tempo as a characteristic that would have an effect not only on deployments but also on garrison duties and training in general.7-8 American researchers have reported an association between number of months of deployment and mental health and physical symptoms, but the associations have been related to the duration of a single deployment.5-6 No research has been published on the effects of operational tempo in the UK armed forces.

Many features of operational tempo may influence health, including the duration, intensity, location, and type of deployment.6 The nature of deployment varies between the three services (naval services (Royal Navy and Royal Marines), Royal Air Force, and army) and there may also be a more subtle effect related to the mismatch between an individual’s expectations of deployment and the realities.

We collected information on frequency and duration of deployments in the past three years to assess the possible consequences of the Iraq war on health.11
We have also obtained information on duration of last deployment and expectation of that deployment’s duration. In this paper we assessed the relations between operational tempo and psychological health in the context of the harmony guidelines. As a secondary outcome we studied the associations between operational tempo and problems at home.

**METHODS**

This study is based on the first phase of a cohort study of UK armed forces personnel in which we compared the mental and physical health of those deployed to Iraq between 18 January and 28 April 2003 with those who were in the armed forces but not deployed to Iraq. We obtained randomly chosen stratified samples by service and enlistment type (regular or reserve). Operation Telic is the codename for the current operations in Iraq. Full details of the study and responders can be found elsewhere. In total 4722 personnel who were deployed on Telic 1 (the war fighting phase) and 5550 personnel who were not deployed on Telic 1 completed a questionnaire on experiences of the military, deployment, and post-deployment and on health outcomes. The overall response rate was 60% for regulars, deployed or not, and 62% for those deployed on Telic 1. We approached those in the sample at least three times to elicit completion of the questionnaire, unless they refused. We excluded those with no deployment experience in the past three years because our objective was to assess the effect of duration and frequency of deployment and not the contrast between deployed and non-deployed personnel, which has already been reported. We also excluded 953 reserves with deployment experience because their deployments in the past three years were noticeably shorter and less frequent than those in the regular services. The study sample was 5547 regulars. Most of the participants (98.5%) completed the questionnaire after deployment.

**Outcome measures**

We measured psychological distress, using the 12 item general health questionnaire; post-traumatic stress disorder, using the 17 item national centre for post-traumatic stress disorder checklist; fatigue, using the Chalder fatigue scale; physical symptoms, using a checklist of 53 symptoms similar to that used in our previous study of Gulf War veterans; and use of alcohol, using the alcohol use disorders identification test developed by the World Health Organization. The defined cut-off values for each of the measures were a score of four or more for the general health questionnaire and fatigue scale, a score of 50 or more for the post-traumatic stress disorder checklist, a score of 18 or more for physical symptoms, and a score of 16 or more for the alcohol use disorders identification test, which according to the WHO corresponds to severe alcohol problems. Other outcomes were intentions to stay in the armed forces and problems at home either during or after deployment, including not receiving enough support from the family, partner finishing the relationship, problems with children, serious financial problems, and other major problems at home.

**Main independent factors**

To evaluate operational tempo we asked participants roughly how many months in the past three years they had been away on deployment. We assessed number of deployments by whether the participants answered yes to any deployments to Afghanistan, Bosnia, Kosovo, Macedonia, northern or southern Iraq and Kuwait, and Sierra Leone. As the main question was whether duration of deployments greater than those set out in the harmony guidelines have an effect on psychological health we created a category in which participants could state whether they were deployed above the guidelines. Based on the army guideline for an operational tour with 24 months’ interval during 36 months, a unit could not be deployed for more than 12 months. We subdivided the remaining deployment periods into three categories of equal duration. Some service personnel in the group 8 to 12 months could have been deployed over the recommended limit. In a separate analysis we assessed the difference between actual and expected duration in theatre on the last deployment according to three categories: actual was same as expected, actual was less than expected, and actual was more than expected.

**Table 1** Duration and frequency of deployments since 2000 for about a three year period, by service and combat role (regulars only). Values are numbers (percentages)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total (n=5547)</th>
<th>Royal Navy (n=568)</th>
<th>Royal Marines (n=261)</th>
<th>Army (n=3684)</th>
<th>Royal Air Force (n=1034)</th>
<th>Combat (n=1521)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration of deployment (months):</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>896 (16.2)</td>
<td>52 (9.2)</td>
<td>32 (12.3)</td>
<td>520 (14.1)</td>
<td>292 (28.2)</td>
<td>130 (8.6)</td>
</tr>
<tr>
<td>5-8</td>
<td>1811 (32.7)</td>
<td>121 (21.3)</td>
<td>54 (20.7)</td>
<td>1221 (33.1)</td>
<td>415 (40.1)</td>
<td>414 (27.3)</td>
</tr>
<tr>
<td>9-12</td>
<td>1630 (29.4)</td>
<td>162 (28.5)</td>
<td>83 (31.8)</td>
<td>1163 (31.6)</td>
<td>222 (21.5)</td>
<td>512 (33.7)</td>
</tr>
<tr>
<td>≥13</td>
<td>1210 (21.8)</td>
<td>233 (41.0)</td>
<td>92 (35.3)</td>
<td>780 (21.2)</td>
<td>105 (10.2)</td>
<td>465 (30.6)</td>
</tr>
<tr>
<td>No of deployments:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>3336 (60.1)</td>
<td>386 (68.0)</td>
<td>136 (52.1)</td>
<td>2175 (59.0)</td>
<td>639 (61.8)</td>
<td>886 (58.3)</td>
</tr>
<tr>
<td>2</td>
<td>1691 (30.5)</td>
<td>146 (25.7)</td>
<td>86 (33.0)</td>
<td>1207 (32.8)</td>
<td>252 (24.4)</td>
<td>520 (34.2)</td>
</tr>
<tr>
<td>≥3</td>
<td>520 (9.4)</td>
<td>36 (6.3)</td>
<td>39 (14.9)</td>
<td>302 (8.2)</td>
<td>143 (13.8)</td>
<td>115 (7.6)</td>
</tr>
</tbody>
</table>
Confounders and explanatory variables
All analyses were adjusted for the possible confounders of age, sex, serving status (whether participant remained in the services), marital status, and service. We further adjusted for role in theatre (combat, combat support, combat service support), type of deployment (war in at least one deployment, peace enforcement operations), time spent in a forward area in close contact with the enemy (not at all, up to a week, up to a month, more than a month), and problems at home during and after deployment, collected for the last deployment.

Analysis
We carried out multiple logistic regressions for the sample regardless of service but adjusted for service. We also carried out analyses separately for each service, as the experience of deployment may vary between them. Two models were used to analyse each of the outcomes. In the first we adjusted for variables that were considered confounders and in the second we further adjusted for possible explanatory variables. We analysed separately for duration and number of deployments and the difference between expected and actual duration for the last deployment. In the analyses we assessed the odds ratios and 95% confidence intervals for each group compared with the reference group (one deployment, 5-8 months on deployment in past three years, or no difference between actual and expected duration of deployment). We also assessed other effects associated with experience of deployment. For all analyses we used Stata version 9.2.

RESULTS
Overall 5547 (63.9%) of 8686 regulars who completed the questionnaire had participated in at least one deployment in the past three years. Royal Air Force personnel had less prolonged periods of deployments than personnel in the other services, whereas the Royal Navy and Royal Marines had proportionally more personnel with long periods of deployment (table 1). Most of those deployed had one or two deployments in the past three years. Almost a third of those with a combat role in their last deployment had been deployed for 13 months or more in the past three years.

A consistent association was found between prolonged deployments (≥13 months) and problems at home both during and after deployment (table 2). Although consistent the effect size was small and was reduced after adjustment for role in theatre, time spent in a forward area, and type of deployment (table 2). No association was found between number of deployments and problems at home, or between number and duration of deployments and intention to stay in the armed forces (data not shown).

The prevalence of all psychological symptoms was higher among those deployed for 13 months or more (table 3). This was shown by a consistent association between the time spent on deployment (category ≥13 months) and psychological symptoms when adjusted for the confounding factors in the first

### Table 2 | Association between duration and number of deployments since 2000, for about a three year period, and problems at home during and after deployment (n=5547)

<table>
<thead>
<tr>
<th>Variables</th>
<th>No (%)</th>
<th>Adjusted odds ratio (95% CI)*</th>
<th>Odds ratio (95%CI)†</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Problems at home during last deployment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration of deployments (months):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;5</td>
<td>163 (18.2)</td>
<td>1.04 (0.84 to 1.29)</td>
<td>1.14 (0.92 to 1.42)</td>
</tr>
<tr>
<td>5-8</td>
<td>329 (18.2)</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>9-12</td>
<td>325 (20.0)</td>
<td>1.10 (0.93 to 1.31)</td>
<td>1.12 (0.93 to 1.34)</td>
</tr>
<tr>
<td>≥13</td>
<td>267 (22.1)</td>
<td>1.28 (1.06 to 1.54)</td>
<td>1.22 (1.00 to 1.48)</td>
</tr>
<tr>
<td>No of deployments:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>638 (19.1)</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>2</td>
<td>338 (20.0)</td>
<td>1.04 (0.89 to 1.20)</td>
<td>1.02 (0.87 to 1.19)</td>
</tr>
<tr>
<td>≥3</td>
<td>108 (20.8)</td>
<td>1.15 (0.91 to 1.45)</td>
<td>1.11 (0.87 to 1.41)</td>
</tr>
<tr>
<td><strong>Problems at home after last deployment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration of deployments (months):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;5</td>
<td>144 (18.2)</td>
<td>1.04 (0.83 to 1.30)</td>
<td>1.11 (0.89 to 1.40)</td>
</tr>
<tr>
<td>5-8</td>
<td>298 (18.0)</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>9-12</td>
<td>291 (19.3)</td>
<td>1.03 (0.86 to 1.24)</td>
<td>0.97 (0.80 to 1.17)</td>
</tr>
<tr>
<td>≥13</td>
<td>248 (22.5)</td>
<td>1.25 (1.02 to 1.52)</td>
<td>1.14 (0.93 to 1.40)</td>
</tr>
<tr>
<td>No of deployments:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>561 (18.8)</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>2</td>
<td>325 (20.6)</td>
<td>1.14 (0.97 to 1.33)</td>
<td>1.09 (0.92 to 1.28)</td>
</tr>
<tr>
<td>≥3</td>
<td>95 (19.4)</td>
<td>1.14 (0.89 to 1.45)</td>
<td>1.13 (0.87 to 1.45)</td>
</tr>
</tbody>
</table>

*Adjusted for sex, age, serving status, rank, service, and marital status.
†Adjusted for sex, age, serving status, rank, service, marital status, role in theatre, time spent in a forward area, and type of deployment.
The prevalence of severe alcohol problems increased with duration of deployment (P for trend <0.001). Role in theatre, time spent in a forward area, type of deployment, and problems at home partly explained the associations in relation to the post-traumatic stress disorder checklist, psychological distress, and, to a lesser extent, multiple physical symptoms. No single variable explained the decrease of association between deployment for more than 13 months or more and psychological symptoms. This association was also observed for fatigue caseness but became non-significant after adjustment for problems at home, time spent in a forward area, type of deployment, and role in theatre (data not shown).

The relation between number of deployments and prevalence of psychological symptoms was less clear (table 3). An association was found between those with three or more deployments and caseness (P=0.05), but this became non-significant after adjustment for explanatory factors (table 3). Some evidence was found for an association between number of deployments and caseness on the post-traumatic stress disorder checklist and multiple physical symptoms, but the associations were non-significant (P>0.05).

Effect modifications were not found for deployment and type of service on each of the psychological outcomes. The results for the Royal Navy and for the army plus the Royal Marines were generally consistent with the results for all three services combined, but this was not the case for the Royal Air Force (data not shown). In the Royal Air Force, the group with three or more deployments was associated with caseness on the post-traumatic stress disorder checklist and psychological distress (associations were of borderline statistical significance). The association decreased after adjustment for the explanatory variables.

Table 4 shows the relation between the difference in actual and expected duration of deployment for the most recent deployment and psychological symptoms. A moderately strong association was found between a longer than expected period of deployment and caseness on the post-traumatic stress disorder checklist, which was not found for the other psychological outcomes. The association between longer than expected period of deployment and caseness on the post-traumatic stress disorder checklist persisted in analyses carried out separately for the Royal Navy (odds ratio 12.34, 95% confidence interval 1.02 to 148.73) and the army plus the Royal Marines (2.18, 1.09 to 4.36).

**DISCUSSION**

Deployment for 13 months or more over a three year period was consistently associated with problems at home during and after deployment and with psychological symptoms. The effect sizes were small for problems at home and moderate for psychological symptoms. A combat role during deployment, type of deployment, spending time in a forward area in close contact with the enemy, and problems at home partly explained these associations. The associations were less consistent for number of deployments. A noticeable association was found between an expectation that the most recent deployment would be shorter than it actually was and caseness for post-traumatic stress disorder. This association was also observed separately in the Royal Navy and the army plus Royal Marines and the effect sizes were moderately large.

**Data quality**

Although information bias in cross sectional studies cannot be excluded this is unlikely in our study because the main independent variables were objective and the participants were not specifically informed about the use of the data to assess the effect of "operational tempo,” the pace of military operations. Omission of information or forgetfulness could have

---

**Table 3** Prevalence and association between duration and number of deployments since 2000, for about a three year period, and psychological symptoms, adjusted for confounders and explanatory factors (n=5547)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Post-traumatic stress disorder</th>
<th>Psychological distress case</th>
<th>Multiple physical symptoms</th>
<th>Severe alcohol problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration of deployment (months):</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;5</td>
<td>26 (3.0)</td>
<td>1.00 (0.61 to 1.61)</td>
<td>1.13 (0.67 to 1.92)</td>
<td>169 (19.1)</td>
</tr>
<tr>
<td>5-8</td>
<td>55 (3.1)</td>
<td>1.00</td>
<td>1.00</td>
<td>308 (17.3)</td>
</tr>
<tr>
<td>9-12</td>
<td>60 (3.8)</td>
<td>1.10 (0.75 to 1.61)</td>
<td>0.96 (0.63 to 1.45)</td>
<td>308 (19.2)</td>
</tr>
<tr>
<td>≥13</td>
<td>62 (5.2)</td>
<td>1.58 (1.07 to 2.32)</td>
<td>1.24 (0.81 to 1.89)</td>
<td>257 (21.8)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No of deployments:</th>
<th>1</th>
<th>2</th>
<th>≥3</th>
</tr>
</thead>
<tbody>
<tr>
<td>121 (3.8)</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>57 (3.4)</td>
<td>0.93 (0.67 to 1.30)</td>
<td>0.85 (0.59 to 1.22)</td>
<td>0.85 (0.59 to 1.22)</td>
</tr>
<tr>
<td>25 (4.9)</td>
<td>1.49 (0.94 to 2.37)</td>
<td>1.32 (0.79 to 2.19)</td>
<td>1.27 (1.00 to 1.64)</td>
</tr>
</tbody>
</table>

*Adjusted for age, sex, serving status, rank, marital status, and service.
†Adjusted for age, sex, serving status, rank, marital status, service, role in theatre, time spent in a forward area, problems at home, and type of deployment.
affected responses but this should not have been a major problem in a three year period. Only 6% of people allocated to the Telic 1 group by the Defence Analytical Services Agency did not endorse this deployment in the questionnaire. The main reason for the disagreement was confusion about the end date of Telic 1. Reverse causality is an unlikely explanation for the association between duration of deployment and psychological symptoms. It is difficult to imagine that service personnel with psychological symptoms would serve in a deployment when their unit did not or that commanding officers would choose to deploy those with psychological symptoms more often than others. If anything the opposite would be more likely. We cannot exclude reverse causality in the analysis assessing the difference between expected and actual duration of deployment and post-traumatic stress disorder—that is, participants with post-traumatic stress disorder may have been hoping to have shorter periods of deployment than other participants. We believe that the specificity and consistency of the finding in contrast with other psychological symptoms studied supports the view that this may be causal. In a survey of US troops in Iraq, uncertain date of returning home was a major source of concern and increased psychological distress.\(^\text{18}\) One study commented that there was high level of psychological distress in personnel when date of exit from theatre was uncertain or when doubted because of changes of dates in the past.\(^\text{19}\)

We do not have data on psychological symptoms before deployment, as is available for a smaller cohort study.\(^\text{20}\) Such information would have been helpful to ensure that reverse causality could not have explained the association between expected and actual duration of deployment and post-traumatic stress disorder. We have already shown, however, that the presence of psychological symptoms before deployment has a minimal effect on long term mental health in military personnel.\(^\text{20}\) The assessment of psychological symptoms before deployment would have been less helpful in the analysis of duration of deployment over the past three years because there was great variation in the number of operations in which service personnel participated. Some people would have needed multiple psychological assessments and others only one and, on the basis of our previous study, the consistency between assessments would have been low and difficult to include in the current analysis.\(^\text{20}\)

The army started monitoring deployment in the latter part of 2003; instructions for the army in the harmony guidelines were released in May 2005. Seventy six per cent of the regulars completed the questionnaire before the document was released and 90% completed it by the end of October 2005, when few would have known about the document.

In the harmony guidelines the definition of excessive deployment in the army does not correspond to that for the naval services or the Royal Air Force. The only reasonable analytical approach was to use one definition for participants regardless of service. As we did not have independent information on the intensity of combat such information was provided by participants. In this study we were not able to identify a precise traumatic exposure as being responsible for the symptoms of post-traumatic stress disorder.

### Table 4

<table>
<thead>
<tr>
<th>Variables</th>
<th>No (%)</th>
<th>Odds ratio (95% CI)*</th>
<th>Odds ratio (95% CI)†</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caseness on post-traumatic stress disorder checklist</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration of deployment:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Same as expected</td>
<td>29 (2.7)</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Less than expected</td>
<td>48 (3.1)</td>
<td>1.04 (0.64 to 1.76)</td>
<td>1.10 (0.66 to 1.84)</td>
</tr>
<tr>
<td>More than expected</td>
<td>17 (6.6)</td>
<td>2.27 (1.21 to 4.24)</td>
<td>2.38 (1.21 to 4.65)</td>
</tr>
<tr>
<td>Caseness on general health questionnaire</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Duration of deployment:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Same as expected</td>
<td>177 (16.5)</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Less than expected</td>
<td>269 (17.4)</td>
<td>1.06 (0.86 to 1.33)</td>
<td>1.13 (0.89 to 1.42)</td>
</tr>
<tr>
<td>More than expected</td>
<td>57 (21.4)</td>
<td>1.34 (0.95 to 1.88)</td>
<td>1.30 (0.90 to 1.89)</td>
</tr>
<tr>
<td>Multiple physical symptoms</td>
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<td></td>
</tr>
<tr>
<td>Duration of deployment:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Same as expected</td>
<td>103 (9.5)</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Less than expected</td>
<td>183 (11.8)</td>
<td>1.25 (0.96 to 1.62)</td>
<td>1.27 (0.96 to 1.68)</td>
</tr>
<tr>
<td>More than expected</td>
<td>22 (8.1)</td>
<td>0.82 (0.51 to 1.34)</td>
<td>0.82 (0.49 to 1.36)</td>
</tr>
<tr>
<td>Severe alcohol problem</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Duration of deployment:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Same as expected</td>
<td>177 (16.5)</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Less than expected</td>
<td>266 (17.2)</td>
<td>1.03 (0.87 to 1.28)</td>
<td>1.02 (0.81 to 1.29)</td>
</tr>
<tr>
<td>More than expected</td>
<td>52 (19.3)</td>
<td>1.11 (0.77 to 1.59)</td>
<td>1.11 (0.76 to 1.62)</td>
</tr>
</tbody>
</table>

*Adjusted for sex, age, serving status, rank, service, and marital status.

†Adjusted for sex, age, serving status, rank, service, marital status, role in theatre, time spent in a forward area, and problems at home.
Duration of deployments and mental health
Several reports have assessed duration of deployment in relation to health although most have been restricted to one specific deployment. Most of these studies have shown that psychological distress is associated with duration of deployment. The comparison of duration of deployment has not been standardised and, with exceptions, adjustment for possible confounders has not been carried out.

No previous analysis has looked at duration of deployment over a long period, such as the three years in the current study. This construct is important because it is nearer to the concept of “overstretch” in a period of multiple deployments. Overstretch conveys the notion that smaller forces are carrying out an increasing number of operational duties worldwide. The harmony guidelines provide a tangible measure of overstretch. Our analyses provide evidence that deployment above this limit has some generalised adverse psychological consequences. With the exception of severe alcohol problems a threshold of deployment duration exists beyond which a deterioration in psychological health can be shown. It is possible that the current policy of the US army for one year deployments may in part explain the differences in prevalence of post-traumatic stress disorder between the two forces, even taking into account the higher combat intensity experienced by US forces compared with UK forces in Iraq.

Type of deployment, time spent in a forward area, and problems at home both during and after deployment reduce the level of the associations between duration of deployment and psychological outcomes. In relation to problems at home after deployment, our results suggest that many problems bottled-up during a long period of deployment may come to light on returning home.

We also found that alcohol intake has increased in the UK armed forces and that the increase has been more than in the civilian population. Our study indicates that duration of deployment may be a factor in the high alcohol intake of military personnel. In contrast with other outcomes of psychological health, in which the association was mainly shown in those deployed for more than 12 months in the past 36 months, the risk of alcohol misuse increased with increasing duration of deployment.

Number of deployments and mental health
The association between number of deployments and psychological symptoms was less consistent than for duration of deployment. One study proposed that successive deployments could have a stress buffering effect; thus an initial deployment could decrease the likelihood of psychological symptoms in subsequent deployments. We did not find evidence in support of such a hypothesis. Another study found no association between number of deployments in the past three years and the brief symptoms inventory. In our study many of those with several deployments were deployed for short periods. Although this pattern was a characteristic of the Royal Air Force our results were similar in each of the services. A possible explanation for our results is that shorter periods of deployment with intervals of rest and recuperation may act as a buffer against the development of psychological symptoms.

Conclusions
Our results indicate that adherence to a clear and explicit policy on duration of each deployment may have beneficial effects on mental health. Overstretch in the UK armed forces may have consequences on problems at home, and deterioration of psychological health may be more apparent in those directly exposed to combat.

Contributors: RR planned and sought funding for the study, supervised data collection, designed analysis, and was the lead author in writing the paper. NTF was involved with the data collection, was responsible for the data processing, discussed and carried out the analysis, and wrote this paper. LH was responsible for the coordination of this study and was involved in the planning of the study and writing of the paper. NG was involved in the planning and writing of the paper. ME was involved in the planning and writing of the paper. SW sought funding for, and led the planning of, the study, supervised data collection, and made comments on the analysis and writing of the paper. All authors approved the final version. RR and NTF are guarantors for the paper.

Funding: The study was funded by the UK Ministry of Defence. The work was independent of the funders but a copy of the paper was sent to them. The Defence Analytical Services Agency provided the sampling frames of the armed forces. We indicated our requirements to obtain random samples for the study and discussed feasibility and operational issues with the Defence Analytical Services Agency. The agency supplied addresses and identifiers directly related to personnel in the random samples and deployment allocation in relation to the Iraq war (Telic 1). The funders did not participate in data collection, data processing, data analysis, or interpretation of findings.

Competing interests: SW is honorary civilian consultant adviser to the British army. NG and ME are members of the Defence Medical Services seconded to King’s College London. Although NG and ME are paid from Ministry of Defence funds they have not been directed in any way by the ministry in relation to this publication.

Ethical approval: This study was approved by the Ministry of Defence (Navy) personnel research ethics committee and the King’s College Hospital local research ethics committee.
15 Chalder T, Berelowitz G, Pawlikowska T, Watts L. Development of a
14 Blanchard EB, Jones-Alexander J, Buckely TC, Forneris CA.
13 Goldberg DP, Gatter R, Sartorius N, Ustun TB, Piccinelli M, Gurje O,
11 Hotopf M, Hull L, Fear NT, Browne T, Horn O, Iversen A, et al. The
10 The Canadian Community Health Survey (CCHS)-Cycle 1.2.
3 Summers D and agencies. Blair pledges increased military spending as he defends intervention. 12 Jan 2007. www.guardian.co.uk/ military/story/0,1988945,00.html.
1 BBC News. UK Army “not too small to cope.” The Ministry of Defence has denied the army is too small to cope with its current overseas commitments. 22 Dec 2006. http://news.bbc.co.uk/1/hi/uk/politics/6202331.stm.

3 Summers D and agencies. Blair pledges increased military spending as he defends intervention. 12 Jan 2007. www.guardian.co.uk/ military/story/0,1988945,00.html.
1 BBC News. UK Army “not too small to cope.” The Ministry of Defence has denied the army is too small to cope with its current overseas commitments. 22 Dec 2006. http://news.bbc.co.uk/1/hi/uk/politics/6202331.stm.
CLINICAL REVIEW

Management of infertility

Adam H Balen,1 Anthony J Rutherford1

Around 9% of couples are involuntarily childless. At least a quarter of couples experience unexpected delays in achieving their desired family size,1 although only a half seek treatment. In recent years, publicity about infertility treatments has increased, and couples are now more willing to seek advice. The first of these two brief reviews covers the main causes of infertility, with particular reference to advances in the past five years; the second review will look at polycystic ovary syndrome and anovulatory infertility.

The role of the general practitioner is to initiate the investigation of both partners and ensure timely onward referral to a specialist clinic. Treatments for infertility are never far from the public eye, often courting controversy and ethical dilemmas. This article aims to provide general practitioners with a balanced and evidence based overview of the latest advances and where they fit into current practice.

Sources and selection criteria
We referred to the Cochrane database of systematic reviews, NICE guidelines for the investigation and management of infertility (2004), and our knowledge of the current literature.

What is the effect of age on fertility?
The most important determinant of a couple’s fertility is the woman’s age (fig 1). For women up to 25 the cumulative conception rate is 60% at six months and 85% at a year, but conception rates are more than halved by 35 or over.1 The finite number of oocytes means that age reduces fertility and increases the risk of congenital abnormalities.2 3

Male fertility also declines with age, most noticeably after the age of 55, with a concomitant increase in chromosomal anomalies in offspring.4 5 Even men older than 35 have half the chance of achieving a pregnancy compared with men younger than 25.3

Does environmental pollution affect male fertility?
A decline in male fertility has been reported in several countries, although this is controversial,6 and more longitudinal studies are needed. A decline in sperm density is occurring at the same time as an increase in the incidence of testicular cancer and the frequency of hypospadias and cryptorchidism. Environmental pollution—possibly arising from oestrogenic industrial waste—is a likely cause. In a prospective observational study, organic farmers who were asked to provide semen samples were found to have significantly higher sperm concentrations than printers, electricians, or metal workers,7 which lends further credence to the possible effects of environmental toxins.

Can women predict their fertility?
A secular change has occurred in family planning—the mean age of mothers at first birth in Western countries is now around 29.5 years, as opposed to 25 years two decades ago.8 The risks of complications in pregnancy rise significantly with increasing maternal age.8

How reliable are ovarian reserve tests?
Women often wish to have an idea of their potential fertility. The concentration of serum follicle stimulating hormone (FSH) measured during the first three days of menstruation is the most commonly used test of “ovarian reserve”—a term that refers to the number of oocytes in the ovary and their fertility potential. Other measurements may increase the positive predictive value of follicle stimulating hormone, including an ultrasound scan to measure ovarian volume and the number of antral follicles, serum inhibin B concentration, and anti-Mullerian hormone (AMH) concentration.9 It has been suggested that these tests may help determine a woman’s future natural fertility, although evidence for longer term predictions is lacking and the use of ovarian reserve testing outside of the context of planning infertility treatment is unclear.10

Can women protect their fertility?
Techniques have been developed for cryopreserving oocytes and ovarian tissue in women who have

ONGOING RESEARCH QUESTIONS AND PROJECTS

- How can we increase the success rate of assisted conception while minimising the risks of multiple pregnancy by the transfer of single embryos?
- How can fertility be preserved in the context of cancer treatments that cause sterility or as insurance against ageing?
- Monitoring the long term health of children conceived by assisted conception treatments
- Monitoring the long term health of women who have received ovarian stimulation for induction of ovulation or assisted conception
treatments for cancer that result in sterility. This has raised interest in the idea that women who have yet to find a partner or who wish to pursue a career could bank oocytes when young for future use. Unfortunately, however, these techniques are still relatively inefficient. To freeze oocytes, women have to undergo the same stimulation as when having in vitro fertilisation, the survival rate is relatively low, and subsequent fertilisation and pregnancy are not guaranteed. On average, using standard stimulation regimens, eight to 12 mature oocytes are produced per cycle, which currently provides a modest live birth rate of 18.3%—much lower than with conventional in vitro fertilisation. Strips of ovarian cortex containing oocytes have been cryopreserved before giving women sterilising chemotherapy for cancer. Up to 75% of oocytes are lost as part of the freezing, thawing, and grafting process however, so this technique should be reserved for women in whom no alternative exists, especially as a whole ovary is normally needed.

How can we protect against sexually transmitted diseases? Sexually transmitted infections are a preventable cause of infertility. In the United Kingdom, we have failed to achieve a successful sexual health education programme, so that our adolescent population has an ever rising rate of chlamydial infections and other sexually transmitted diseases, unwanted pregnancies, and the risks associated with abortion. The efficacy of population screening for Chlamydia to prevent infertility is unclear. Education about family planning should deal with protecting future fertility, not just preventing unwanted pregnancy.

When should you investigate infertility?

The NICE guidelines for the assessment and treatment of people with fertility problems define infertility as “failure to conceive after regular unprotected sexual intercourse for two years in the absence of known reproductive pathology,” although they suggest that patients should be offered tests after one year. If the woman has a history of irregular periods, pelvic inflammatory disease, or appendicitis causing peritonitis, or the man has a history of orchitis or cryptorchidism, testing should begin at an earlier date. Box 1 summarises the recommended investigations for both men and women, and box 2 provides the normal parameters for semen.

What are the principles of treatment?

The first principle of fertility treatment is that the interests of the unborn child must be foremost. Thus, at the infertility consultation advice should be given about preparation for pregnancy, both physical (diet, alcohol consumption, smoking, etc.; box 3) and psychological (the need for counselling).

Because multiple pregnancy can have such devastating effects, both in terms of the obstetric outcome and the effect on the life of the family, as much effort should be invested in the safety of treatment as in its efficacy. Because people have such high expectations of fertility treatment, some couples find it almost impossible to face the possibility that they might not have children. Therefore, even in these cost containing days of efficiency based medicine, people with a poor prognosis should still be offered some form of treatment. Indeed, we offer some treatment even when the chances of success are slim after appropriate informed discussion, to
help couples to resolve their “fertility wish” without regrets in the future. With all treatments we should of course be aware of the psychological and social pressures and consider a formal evaluation of health related quality of life.17

What’s new in assisted conception treatments?

Almost three decades since the birth of Louise Brown (the first baby born after in vitro fertilisation) the role of assisted conception treatment has expanded considerably. The original indications for in vitro fertilisation were mechanical obstruction to fertility, mostly tubal damage, endometriosis, and, less often, fibroids (the management of which is covered in the NICE guidance).14 Intracytoplasmic sperm injection (ICSI), which now accounts for around 40% of in vitro fertilisation treatments, has revolutionised the management of male factor infertility, for which there are few other options if men wish to have their own genetic child. Modifications to the treatment, from superovulation strategies to generate more mature oocytes, through to advances in culture technology that allow embryos to thrive in the laboratory, have led to a steady increase in live births over the past 20 years—currently greater than 25% per cycle in the UK.18

About 30 000 assisted conceptions are performed annually in the UK and these are responsible for about 1% of all births (fig 2).18 Despite NICE recommendations that all couples should be offered three complete cycles to provide a realistic opportunity to conceive,13 most primary care trusts still only provide one—if any—treatment per couple.16 This puts the UK 17th out of 23 for fertility treatment funded by the state in Europe.

The problem of multiple pregnancies

A major problem of the growth of assisted conception is the dramatic rise in multiple births (fig 3). Legislation introduced by the Human Fertilisation and Embryology Authority (HFEA) in 2002 limits the number of embryos transferred to two for women under 40. This has prevented the birth of triplets (and greater), but the number of twin pregnancies has not declined. In Belgium, state funding is dependent on a stringent embryo replacement policy—all good candidates (young patients under 35 in their first cycle) are limited to a single embryo. A voluntary reduction to a single embryo transfer policy in Sweden led to a significant fall in multiple pregnancies while maintaining the overall live birth rate.20 Evidence suggests that by adopting a single embryo transfer policy and cryopreserving the spare embryos for subsequent replacement if the initial cycle fails, the live birth rate is not significantly different from that after a double embryo transfer.21

A recent report suggested that a less aggressive ovarian stimulation policy and single embryo transfer was as successful and more cost effective than a conventional superovulation protocol and double embryo transfer over four cycles, taking into account the neonatal costs of twin pregnancies.22 A report published by the Human Fertilisation and Embryology Authority recommended strongly that a single embryo transfer policy be introduced in the UK.21 The only way that this is likely to be achieved is through regulation, and to be equitable this must be accompanied by better National Health Service funding.

New advances in in vitro fertilisation

Most unsuccessful in vitro fertilisation cycles fail after embryo transfer, so research has focused on trying to identify the best embryos to transfer. Non-invasive ways to assess the embryo’s health have looked at the embryo’s metabolism—in particular the amino acid profile.21 Metabolically quiet embryos are more likely to develop than those with a high amino acid turnover. Research is currently exploring whether these initial results can be translated into a valuable clinical tool.

Many embryos are karyotypically abnormal, and the proportion increases greatly with age.
Preimplantation genetic screening of patients at highest risk of aneuploidy has been considered.24 One cell is removed from a six to eight cell, three day old embryo and tested for the six chromosomes most likely to cause miscarriage. Unfortunately, studies to date have failed to show that this has any effect on the live birth rate.

Conclusions
We have deliberately not provided algorithms for the management of infertility, which have been amply covered elsewhere.25 Whole reviews have been written on each topic, and we have tried to refer to some of the latest papers. We have dealt mainly with conditions that affect female fertility as these tend to be more amenable to treatment, whereas for most men with subfertility the problem is managed with assisted conception treatments, such as intracytoplasmic sperm injection or the use of donated sperm when azoospermia exists. Recent changes in the lifestyle of the population have undoubtedly had a profound effect on fertility, whether as a result of the increased tendency to delay childbearing or increasing rates of sexually transmitted infections and obesity. Better health education is a prerequisite for improving the fertility prospects of the next generation.

Contributors: AHB conceived the outline of the review and wrote the body of the text with contributions and advice from AJR. AHB is guarantor.

ADDITIONAL EDUCATIONAL RESOURCES

Resources for health professionals
British Fertility Society—A national multidisciplinary organisation representing professionals practising in reproductive medicine (www.britishfertilitysociety.org.uk/)
European Society of Human Reproduction and Embryology—Facilitates research and dissemination of findings in human reproduction and embryology (http://www.eshare.com/)
Human Fertilisation and Embryology Authority—Independent regulator that oversees safe and appropriate practice in fertility treatment and embryo research in the UK (http://www.hfea.gov.uk/)
Cochrane Database of Systematic Reviews—Contains reviews on various aspects of infertility management (www.mrw.interscience.wiley.com/cochrane/cochrane_clsysrev_articles_fs.html)

Resources for patients
Infertility Network UK—National UK patient support organisation for couples with infertility (www.infertilitynetworkuk.com)

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Provenance and peer review: Commissioned; externally peer reviewed.

EVIDENCE BASED CASE REPORT

Do all fractures need full immobilisation?

Paul Glasziou

No—and the hunt for evidence prompted Paul Glasziou to muse about the usefulness of rules of thumb in clinical practice.

As I was about to start my morning general practice clinic, the receptionist told me of a patient who was coming in with an injury and handed me a faxed report from radiology, which stated: “possible fracture of the radial head.” The “possible” suggested it was undisplaced or minimally displaced, so I wondered if it needed treating at all. While waiting for the first patient to arrive and sipping my tea, I checked the orthopaedics texts in my room and did a PubMed search.

Searching for the evidence

I went to the Clinical Queries section of PubMed Central (which is bookmarked on my Firefox toolbar) and used the narrow version of the “therapy” filter (which filters for randomised trials). I entered search terms to describe the condition “fracture and radial and head,” which brought up seven studies. Two of these studies were not trials and three were not relevant (two looked at different types of internal fixation, and one looked at different methods of reduction), which left two that were relevant. I used the most recent study (2002) because it was more relevant to this patient's problem and I had access to the full text. I had access only to the abstract of the second trial, but this seemed to be consistent with the findings of the first trial. My search took only a few minutes.

Assessing the evidence

The trial randomised 60 patients into two groups. One group was treated with rest in a broad sling for five days followed by mobilisation, and the other was treated with immediate mobilisation and an exercise programme that started 24 hours after injury. The randomisation process was haphazard rather than randomised, but baseline characteristics were not significantly different between the two groups (although the immediate mobilisation group seemed to have had more minor fractures). Follow-up assessments were done by an independent observer who was blinded to treatment, but the authors did not mention loss to follow-up. As usual, the trial was not perfect, but none of the flaws seemed sufficient to invalidate the results.

All fractures in both groups united without problems. At the end of the first week, the early mobilisation group had slightly more pain (10 v 6 on a 25 point scale) but better range of motion (flexion of 112° v 98°). However, most measures showed no difference at that time or at further follow-up (four and 12 weeks).

Outcome for the patient

When I saw the patient, it was clear that she had tenderness over the radial head but still had a full—though somewhat painful—range of elbow movement. I explained the choices to her—that immobilisation would help a little with the pain but make no long term difference, and it would mean that temporarily her arm would be a little stiffer. She opted for no immobilisation with a simple bandage for comfort.

Of course, I could have called the local orthopaedic registrar, and that is often the wise thing to do. But once I had seen the patient I was sure that this was just a “minor” fracture that could be dealt with in primary care.

Clinical training and practice is replete with heuristics—rules of thumb—in both diagnosis and treatment. For example, “beware the unilateral red eye,” “if a child fails to speak by 16 months then assume that the child is deaf until proved otherwise,” and “where there is pus, let it out.” One treatment rule we use for soft tissue injury is RICE (rest, ice, compression, and elevation). However, is this rule based on good research? Recently some colleagues and I questioned this advice, and did a systematic review of whether immobilisation is best for the treatment of limb injuries. We identified 49 trials, and we found that less rest and more mobility seemed to be better, even in the 14 studies of fractured limbs. Subsequently, a trial showed that short arm plasters were preferable to long arm plasters for forearm fractures in children. Some people have suggested we change the rule from RICE to MICE (mobilisation, ice, compression, elevation). However, applying this general principle to individual patients and injuries is not always straightforward.

I was puzzled about exactly when I can apply the MICE heuristic to injuries, but a helpful reviewer suggested that, “The majority of hand fractures and radial head fractures are now treated by mobilisation. Many minor lower limb fractures are similarly treated. In many distal radial fractures and most proximal humeral..."
and clavicle fractures, immobilisation is simply for pain relief.” With that clarified, I am now left wondering how many other mnemonics provide misleading advice? Indeed, a colleague—Carl Heneghan—pointed out that the C of RICE is also questionable, with a trial in ankle sprains showing that compression bandages provide no advantage and lead to a greater use of analgesia.¹

Thanks to the reviewers for helpful comments, in particular, CM Court-Brown for the advice in the final paragraph.

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10-MINUTE CONSULTATION

Ramadan fasting and diabetes

Aziz Sheikh,¹ Sunita Wallia²

A 45 year old man with type 2 diabetes mellitus consults to discuss how he might fast safely during Ramadan

What issues you should cover

• Explore his motivation—whether he wants to fast (as most will) or whether he is looking for a “legitimate” exemption from fasting on medical grounds. A diagnosis of diabetes does not confer an automatic exemption, so if the second scenario is suspected it needs to be explored with sensitivity.

• Although everyone agrees on the need to avoid food and drink during daylight hours, a range of views exists on the use of drugs. Ask his opinion on the use of oral and injectable drugs when fasting.

• Find out how long the fast will last. The length of the fast varies according to the time of year in which Ramadan falls. Ramadan starts on about 12 September this year and in the United Kingdom the fast will be about 13 hours at the start of the month and 11 hours at the end of the month. If Ramadan falls in the summer, fasts can last for more than 18 hours, in which case fasting for people with diabetes can prove more challenging.

• Inquire about his current treatment regimen, glycaemic control, and comorbidities. Achieving good glycaemic control before Ramadan will make it easier to maintain control while fasting. People taking drugs may need to change their regimens.

• If he has some experience of fasting with diabetes, find out how he fared and if he has any specific concerns.

• Find out whether he has sought religious advice. If fasting is medically detrimental, he needs to know that he is exempt. Some people may want reassurance from religious authorities when deciding not to fast.

What you should do

• Explain that the decision is ultimately his, but that you can advise him and help him maximise his chances of fasting safely. Most people with well controlled diabetes should be able to fast, but if fasting is judged unsafe (in those with brittle diabetes or cardiac or renal complications (or a combination)), clearly communicate this. Most people will be receptive to such advice, even if they choose to ignore it.

• Encourage him (ideally with input from a dietitian trained to deal with cultural issues) to eat foods that are high in dietary fibre (such as whole grains, fruits, and vegetables) and have a low glycaemic index (such as beans and pulses) at the pre-dawn (Suhur) and sunset (Iftar) meals to promote glycaemic control. Discourage him from eating foods with a high glycaemic index (such as more than three dates, which are traditionally used to break the fast) until about half an hour after taking drugs to minimise sharp rises in blood sugar at sunset.

• If blood glucose is well controlled by diet alone, advise him that fasting is safe.

• Self-monitoring of blood glucose is essential for safe fasting in patients taking antidiabetic drugs, particularly before and after the pre-dawn and sunset meals. It should guide the individual tailoring of treatment regimens described below.

• To minimise the risk of hypoglycaemia, advise patients taking oral hypoglycaemic agents as follows: If taking a long acting sulphonylurea, switch to a short acting preparation or metformin, or both. If a single daily dose is used, take this with the sunset meal. If two or three doses are taken each day, take half the normal evening dose before dawn and the normal morning (and any midday) dose after sunset.

Provenance and peer review: Not commissioned; externally peer reviewed.


**A paper that changed my practice**

It was an article in the *Observer* newspaper about 10 years ago describing how an English and French family had exchanged their 9 year old daughters for six months. Subsequently, my eldest daughter, and then all of my children, went on to do exchanges in France and Germany. You might think that this experience would have little relevance to my practice as a GP, but it shows transformative learning at its best.

For a start, I had to be approved to foster the children privately, was assigned a social worker and had to be monitored by him or her. I always had a different social worker, and I discovered how they work and how they vary.

A new child in the family who does not speak your language quickly teaches you how much you can achieve with non-verbal communication. You also discover how people learn languages when immersed in a new country and what words and phrases are more easily understood. Not only does this help with patients but also with the variety of overseas doctors I have taught for their foundation programme. Passing the Professional and Linguistics Assessment Board (PLAB) exam is not always sufficient for the vagaries of local dialect.

We are taught about achieving shared understanding of health and agreeing management plans with our patients. This has a different dimension when the child is living with you and parents can telephone you at home at any time to express their concerns that their offspring only seems to receive paracetamol whatever the problem. I learnt, in a very intimate way, how other families function. Children have a great habit of getting to the nitty-gritty, and it is impossible to be on your best behaviour for six months. Rituals that have grown up for no logical reason are quickly exposed and challenged.

I learnt what it feels like when my children experienced racial discrimination. This happened to both my European children in this country and to my own children abroad.

As a result of the above, and most importantly, I learnt to be more tolerant. Not bad for one newspaper experience would have little relevance to my practice as a GP, but it shows transformative learning at its best.

**USEFUL READING**

For professionals

Health Scotland. Focus on diabetes: a guide to working with black and minority ethnic communities in Scotland living with long term conditions. www.nhsoggcequality.co.uk/equality/mainmenu/home/pdf/focusONDiabetesMar07.pdf


NHS Ethnicity and Health Specialist Library. www.library.nhs.uk/ethnicity/


For patients


We welcome articles up to 600 words on topics such as A memorable patient, A paper that changed my practice, My most unfortunate mistake, or any other piece conveying instruction, pathos or humour. Please submit the article on http://submit.bmj.com. Permission is needed from the patient or a relative if an identifiable patient is referred to.

We also welcome contributions for “Endpieces,” consisting of quotations of up to 80 words (but most are considerably shorter) from any source, ancient or modern, which have appealed to the reader.

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• Advise patients taking insulin as follows:
  - If a once daily dose is used, switch to a twice daily regimen
  - If basal bolus insulin is used, reduce the long acting component to two thirds of normal, split into two equal doses taken during the sunset and pre-dawn meals. Take the rapid acting component as before, but omit the middle dose.
• Emphasise the need to carry dextrose or glucose tablets at all times to treat hypoglycaemia; explain the importance and legitimacy of breaking the fast in emergency situations.
• Encourage moderate exercise.
• Arrange for a review one week into Ramadan or earlier if concerns arise.

Thanks to Eiad Afaris, Domhnall Macaulay, Chris Burton, Sangeeta Dhami, Brian McKinstry, Hilary Pinnock, Iftikhar Saraf, and Yasser Shehata for their helpful comments on earlier drafts of this article.

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MTAS or a tale of evidence heedless medicine

PERSONAL VIEW Parashkev Nachev

Evidence based medicine has completely transformed our profession to the extent to which no doctor—not even the most cavalier one—would countenance a change to current practice that has not been justified by a rigorous comparison between the old and the new. What constitutes a rigorous comparison is well established; indeed, agreement on the principles of designing and reporting therapeutic trials is so widespread that all good journals refuse to publish any study that does not fit the standard template.

One might therefore have thought that the response of any competent physician to what I am about to describe would be predictably derisive. Imagine that the government proposed a radically new treatment (let’s call it Effupin) for a complex and important condition that has hitherto been treated in an imperfect but largely satisfactory way. Effupin’s mode of action is unknown: its use is motivated by anecdotal reports from veterinary practice. It has never been tested from the author). None of the known members of Work Psychology Partnership has any medical qualifications (www.workpsychologypartnership.com). The selection methods they have developed have never been used to select specialist trainees. The superiority of their methods is arbitrarily assumed—indeed their promotional literature suggests that the only reason why doctors object to them is a “resistance to change” (www.publications.parliament.uk/pa/cm200607/cmhansrd/cm070423/text/70423w0030.pdf). The Department of Health has refused to reveal how they came to be appointed (a copy of the DoH’s refusal to release this information under the Freedom of Information Act is available from the author).

Imagine further that Effupin has been designed by a company that stands to benefit directly from its widespread adoption. The government has appointed the company on the basis of a process the details of which it refuses to make public. Finally, the government insists that Effupin is compulsory and that no clinician is individually allowed to use any alternative.

Now one would not have to be an expert in evidence based medicine to recognise the fatal flaws in such a proposal. And yet this is precisely the kind of error that the leaders of our profession have committed. I am speaking, of course, of the United Kingdom’s new Medical Training and Applications Service (MTAS) for the selection of specialist trainees. Not the website, or the technical glitches that have occupied such a disproportionate amount of print in the lay press, but the fundamental principles of selection on which it is based.

The criteria and procedure for selection in MTAS were principally designed by a handful of organisational psychologists engaged through their consulting firm, Work Psychology Partnership, for a fee of £92,950 (€134,000; $186,000) excluding value added tax (www.publications.parliament.uk/pa/cm200607/cmhansrd/cm070423/text/70423w0020.htm). The Department of Health has refused to reveal how they came to be appointed (a copy of the DoH’s refusal to release this information under the Freedom of Information Act is available from the author).

None of the known members of Work Psychology Partnership has any medical qualifications (www.workpsychologypartnership.com). The selection methods they have developed have never been used to select specialist trainees. The superiority of their methods is arbitrarily assumed—indeed their promotional literature suggests that the only reason why doctors object to them is a “resistance to change” (www.mmc360.com/documents/recruitment_to_specialist_training.pdf). Unsurprisingly, their claims are not supported by any scientific studies that examine the critical outcome measures—it could hardly be otherwise given that no such study can be carried out in less than the time it takes to train a specialist. Instead, we have a series of essentially anecdotal reports, citing favourable feedback from key “stakeholders.” That the authors do not discriminate between anecdote and evidence is obvious from the proposed selection process itself, in which the greatest weight is given not to demonstrable achievements, but to apocryphal tales from the applicant’s clinical career.

If the evidence falls disastrously short of the standards to which we are accustomed, the ethics of its publication are in my view arguably kindred. Despite the obvious potential conflict of interest, Professor Fiona Patterson, apparently the principal agent of Work Psychology Partnership in this project, does not mention her consulting firm on her academic website. By contrast, every slide of the material prepared for the Department of Health I have seen is emblazoned with the Work Psychology Partnership logo (www.mmc360.com/documents/recruitment_to_specialist_training.pdf).

As I have demonstrated, the failure was not so much foreseeable as glaring—from the outset. And yet, the leaders of our profession failed to act when there was still time to do so. The maintenance of professional standards in specialist medicine is the responsibility of the royal colleges: what else do they exist for? And let us be clear that the principal issue here is professional standards, not the welfare of junior doctors, as the BMA tends to present it. Monstrous though their loss is, the hundreds of excellent doctors unfairly denied a career in British medicine will find success abroad or in some alternative walk of life.

It is hard to comprehend how the royal colleges could have allowed this system to be implemented without any apparent resistance. Either they were coerced into it, or they behaved in a grossly incompetent manner by not intervening. If it was the former, then the colleges owe it to the past and future of medicine in this country to declare that they were coerced by the government, whatever the consequences might be. If it was the latter, then in my view they are clearly unfit to represent our profession.

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See also News p 582, Head to head p 590, and Analysis p 593.
Old docs rock

The sound of the hairdryer blasted above the tape machine. I giggled on hairspray, and my hands were tacky with hair gel—having “big hair” was high maintenance. Rain was an ever present danger. These were the days when the hardest boys in school wore make up and tucked pink Pringle jumpers into their stretch jeans, and no one sniggered. This was the briefest period of our lives and yet the most vivid: youth. But the idiotic dreams of youth soon give way to responsibility and commitment. All that remains are embarrassing photos and a soundtrack of pop songs. Now we are told that youth is extending into middle age, but it is more than that: youth has become a god and must be worshipped.

Nostalgia is nature’s gift to humanity to make the past look brighter than it actually was, giving us the energy to trudge on with the misery of our lives. So, recently in a cold and wet field on the Ayrshire coast, 15 000 fans poured into the “Retrofest” 1980s pop revival festival—my wife had insisted that we go. The line-up was a galaxy of pop fluff and fashion criminals that I would have paid not to see in the 1980s: Curiosity Killed the Cat (the ridiculous hat), Nick Heyward (the jumper tucked into stretch jeans), Howard Jones (the vegetarian); Kajagoogoo (the mullet hairdo), to name but a few.

I have mixed feelings about armies. In 1970s Belfast, we Catholic children welcomed British soldiers as our saviours till the tide of opinion changed and we were told to ignore them as they passed by on street patrols. In fake military-style justice thousands of young people had brutal punishment beatings from Northern Irish paramilitaries—a big number for a small country.

In the Royal Victoria Hospital I patched up a young father, shot through the spine by an 18 year old from an impoverished housing estate in Glasgow; given an army uniform and a gun he had simply lost it one afternoon.

I grew up near Long Kesh, a dark and secretive place where the innocent, the politically motivated, and the murderous were interned for years without trial and where the prison authorities used the “five techniques” of wall-standing, hooding, subjection to white noise, and deprivation of food and drink. Now, the internet, global news coverage, and documentary films shine light on Guantanamo Bay, follow the British Navy personnel taken prisoner by Iran this year, and show us the rape and murder by US soldiers of a 14 year girl in Iraq. Armies and their workings are more familiar. We can have virtual seats on the world’s international front lines, and we can choose to watch, to engage . . . or not.

It was a member of the French Foreign Legion, an abscondee from Belfast, who would let me into the UN compound in Bosnia after curfew. It was the British soldiers in UNPROFOR (the United Nations Protection Force) who would “commission” items for my UN medical evacuation unit in Sarajevo. Decent, practical men all, but I never did ask them what their units had done in Northern Ireland.

Armies make me nervous. Armies and their workings are more familiar. We can have virtual seats on the world’s international front lines, and we can choose to watch, to engage . . . or not.

Time moves on. Long Kesh may become an International Centre for Conflict Transformation, a national sports centre, and residential and commercial units. I teach with British Army colleagues on planning and logistics in complex emergencies, as they do both so well. In Belgrade, I bring my children each year to Anzac day, Remembrance Sunday, and the French equivalent, bearing the framed photograph of my grandfather in his British Army medical officer uniform, a gas survivor from the trenches in the first world war. We talk about my aunt, a member of the Women’s Royal Naval Service in the second world war. We wear poppies and lay flowers on the graves of those brave, scared, and lonely soldiers who died far away from home. Soldiers who had mothers with mixed feelings.

And my prayer? May I never have to watch my children march off to war. May my children do anything else to save the world but pull a trigger.

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Yet unless either statesmen or the people are disposed to take a wider view of the subject, it is unlikely that Hume would find much favour today. We live in an age of obsession with health, when the deaths of a few people are sufficient to spark a panic worldwide. How could Hume have passed over the Black Death with such apparent unconcern and equanimity?

One possible explanation is that he was callous and indifferent to the fate of the great mass of mankind. I do not think this is very likely, however, for few people who knew him had anything bad to say of Hume. In his letter to William Strachan he says: “Upon the whole, I have always considered him [Hume]... as approaching as nearly the idea of a perfectly wise and virtuous man, as perhaps the nature of human frailty will admit.”

Since both Hume and Smith wrote their moral philosophy, it is unlikely that Hume was merely hard hearted when he wrote so little of the Black Death.

In these circumstances, everyone in Hume’s day must have had a close personal acquaintance with death, and therefore the events of 1349 must have seemed correspondingly less terrible than to us, who have so much difficulty in grasping the fact of our own mortality.

Theodore Dalrymple is a writer and retired doctor.
**Doping in sport—a warning from history**

East German athletes who were doped to win gold medals in the 1976 Olympics now struggle with chronic health problems. Domhnall Macauley reviews a new documentary

Sport is tough, mean, and uncompromising. With national, social, and political gains for an emerging nation in the postwar era, sport was an obvious playground to express superiority. The German Democratic Republic looked coldly at what was required and did it. Potential medal winners were selected at an early age and prepared systematically. Coaches were rewarded by performance, and every aspect of the athletes’ progress was recorded. East German athletes were prepared, organised, and comprehensively monitored throughout their sporting careers. It was no surprise, therefore, that systematic drug use was part of this preparation. In 1974 “sports theme plan 1425” began with the aim of achieving medals in the 1976 Olympics in Montreal. The East German team won 40 gold medals, and its female swimmers, in particular, were dominant, winning 11 of the 13 events.

This programme charted the lives of individual athletes and the price they paid for sporting achievement. Ute Krause and Rica Reinisch were swimmers, and Katharina Bullin was a volleyball player. Ute described their training, the physiological tests, the vitamin drinks, and the pills they were given. She also described the changes to her body and how this eventually led to an eating disorder and her leaving the sport.

Rica was an incredibly successful athlete, winning three gold medals in swimming at the Moscow Olympics in 1980 aged 15. Athletes were given oral anabolic steroids until the time of competition but were injected with testosterone during competition as it was then undetectable. She initially refused to have the injections before the relay event but was pressurised by her coach. Shortly afterwards she developed gynaecological problems, and the following year left the sport on the medical advice of a gynaecologist from outside the sporting system.

Katharina also described the androgenic changes to her body, her problems with identity, and how she has now given up trying to disguise her masculine features. She also described the catalogue of injuries sustained and how she is in constant pain and has difficulty walking.

The story of Heide Kreiger was the most dramatic. She won a gold medal as a shot putter at the 1986 European Athletic Championships while taking huge doses of anabolic steroids. This had inevitable androgenic effects. She struggled with her sexuality, dropped out of sport at age 22, changed sex nine years later to become Andreas, and married Ute in 2004.

These were some of the casualties of this remarkable and incredibly successful sporting experiment, and they had little choice but to participate. In some aspects they had a privileged life—opportunity for international travel, valued positions in society, and good living conditions—when average citizens had a basic existence. As in many areas of achievement, it is the personal stories behind the stardom that have the greatest impact.

It is the involuntary and systematic abuse of underage athletes that hits hardest. These athletes, recruited from as young as 10 years old, did not know what medication they were taking and were discouraged from asking. The girls were also given oral contraceptives from an early age.

Sports doctors and coaches were aware of the physical changes caused by doping with anabolic steroids and documented the side effects. Dr Rainer Hartwich, director of clinical research at Jenapharm, where the anabolic steroids were manufactured, pointed out that the coaches and authorities were aware of the problems. The sports doctors had signed a confidentiality agreement, monitored by the East German secret police, the Stasi. They made no protest, and 70 of them were later convicted of illegal doping.

For a brief moment, we had a glimpse of a particularly interesting issue—the role of these doctors and their ethical position and responsibilities. They participated in the doping “to earn money, be important, to be someone.” One of the few doctors to speak out openly, Dr Ulrich Sünder, an area sports doctor in Berlin from 1973-90, said that they were afraid they would be struck off as what they were doing was “against doctors’ ethics and the principles of medical care.” He thought they got off relatively lightly. But, all too quickly, the moment passed, and we were left wondering where those doctors are now and how they feel about their role.

What this programme described is history. Hidden in the small print are the brief footnotes that record the flotsam and jetsam of top sport, the wasted lives of some athletes and early deaths due to doping. Perhaps it is a little unfair to judge history by current standards. But doping remains a part of sport. It may not be as organised and systematic on a national level, but every new season brings further reports of athletes testing positive for drugs. How many doped athletes will there be in Beijing and in London? What price will they pay to satisfy demands that their performances be faster, higher, and longer?

Domhnall Macauley is primary care editor, BMJmacauley@bmj.com

**The Great Olympic Drug Scandal: Revealed**

Channel Five, September 18, 8 pm

Rating: ★★★☆☆
**Geoffrey Merton Berlyne**

Former professor of medicine State University of New York, New York (b 1931; q Manchester 1954; MD, FRCP), died from myeloma on 19 May 2007. After a distinguished undergraduate career, Geoffrey Berlyne played a large part in establishing a nephrological unit at Manchester Royal Infirmary and in pioneering renal dialysis. In 1968 he became professor of medicine at Be’er Sheva University in Israel and in 1976 professor of medicine at the State University of New York, working mainly with underprivileged patients at the Brooklyn Veterans’ Administration Hospital. He published nearly 300 papers, was editor of Nephron for many years, and published several books, his A Course in Renal Diseases reaching three editions and being translated into several languages. He leaves a wife, Ruth; three children; and nine grandchildren.

**Neville Berlyne**

Former professor of medicine State University of New York, New York (b 1931; q Manchester 1954; MD, FRCP), died from myeloma on 19 May 2007. After a distinguished undergraduate career, Geoffrey Berlyne played a large part in establishing a nephrological unit at Manchester Royal Infirmary and in pioneering renal dialysis. In 1968 he became professor of medicine at Be’er Sheva University in Israel and in 1976 professor of medicine at the State University of New York, working mainly with underprivileged patients at the Brooklyn Veterans’ Administration Hospital. He published nearly 300 papers, was editor of Nephron for many years, and published several books, his A Course in Renal Diseases reaching three editions and being translated into several languages. He leaves a wife, Ruth; three children; and nine grandchildren.

**William Ian Cranston**

Former professor of medicine St Thomas’ Hospital, London (b 1928; q Aberdeen 1949; MD, FRCP), d 22 February 2007. William Ian Cranston (“Bill”) was, at 20, the youngest ever graduate from Aberdeen Medical School. After junior posts he did national service in the Royal Air Force in Malta, Iraq, and Germany and aboard the RAF’s inaugural flying hospital service. After demobilisation, four years at St Mary’s Hospital, Paddington, and eight years at Oxford University, and at the age of 36, he was appointed professor of medicine at St Thomas’, where he stayed for 29 years until his retirement. He was responsible for the undergraduate medical programmes, and his research concentrated on fever and temperature control, particularly the role of pyrogens. He also chaired the Committee on the Safety of Medicines. Predeceased by his wife, Pamela, in 2000, he leaves four sons and eight grandchildren.

A Cranston, A Cranston, I Cranston, D Cranston

**Ralph Meyrick Emrys-Roberts**

Former general practitioner Walton on Thames, and champion of community hospitals (b 1918; q St Thomas’, London, 1942), d 29 July 2007. Meyrick Emrys-Roberts is credited with saving UK cottage hospitals when Enoch Powell was determined to close them down as uneconomic. In 1951 he joined a general practice in Walton on Thames, and was the medical adviser to the television series Emergency Ward Ten. In 1964 he became chairman of a group concerned with the future of small general practitioner-run hospitals, in 1969 setting up the Association of GP Community Hospitals (AGPCH) and, as chairman, championing many cottage hospitals over 10 years. Meyrick was then the first president of what became the Community Hospitals Association (CHA). Retiring from general practice in 1981, he published a history of cottage hospitals in 1992. He leaves a wife and three daughters.

A N Crowther

**Lyn Pilowsky**

Professor of psychiatry Institute of Psychiatry, London (b 1961; q Flinders University 1986; MRCPsych, PhD), died from a brain tumour on 16 July 2007. Lyn Pilowsky was one of the first psychiatrists in the world to use single photon emission tomography in schizophrenia research. She was the first to show that high dose typical antipsychotic treatment conferred no additional benefit in cases resistant to treatment, reducing unnecessary side effects substantially. She was also the first to uncover the basis of the atypical action (limbic selectivity) of clozapine. Her more recent work concentrated on new targets for treatment such as NMDA (N-methyl-D-aspartic acid) and sigma-1 receptors. Lyn had a passion for music, and was the lead singer in a bluegrass band for several years. She leaves a daughter, Judith.

James Stone

**John Reginald Trounce**

Former professor of clinical pharmacology Guy’s Hospital Medical School (b 1920; q Guy’s 1943; MD, FRCP), d 16 April 2007. During 1944-7, John Trounce served with the Royal Army Medical Corps, becoming regimental medical officer in the Welsh Regiment, and being mentioned in despatches. He was the first reader in therapeutics in the University of London in 1958 and the first professor of clinical pharmacology at Guy’s in 1964. He laid the foundations of Guy’s Renal and Dialysis Unit, developed an integrated group of clinics and services in medical oncology for managing a broad range of tumours, and built up a strong research oriented academic department relevant to patient care. He helped to write several important textbooks, including the Short Textbook of Medicine, Clinical Pharmacology for Nurses, and the Textbook of Clinical Pharmacology. Predeceased by a son, he leaves a wife, Ruth; two children; and five grandchildren.

James Trounce

**David Martin Walker**

General practitioner Bath (b 1952; q Nottingham 1975; MRCP, DRCOG), died from oesophageal cancer on 28 July 2007. After house jobs in Nottingham David Walker took up partnership at his training practice in Hammersmith, soon becoming a general practice trainer and in 1988 one of the course organisers of the training scheme. He also practised homoeopathy and acupuncture, was doctor for the Hammersmith Odeon and Lyric Theatre, and trained as a police surgeon. In 1991 he established a singlehanded practice in Bath, where he continued as a trainer and a police surgeon, was doctor for Bath racecourse, and founded and chaired the out of hours service. Diagnosed with oesophageal cancer in 2004, he continued to work, returning just three months after his oesophagectomy. He leaves a wife, Beverly; five sons; and two stepsons.

Peter Churn

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Girls who think they’re milk intolerant (and thus cut dairy foods from their diet) consume 212 mg of calcium a day less than those who don’t. A survey of 13 year olds found that almost half of those who thought they were intolerant proved, on hydrogen breath tests, not to be (Pediatrics 2007;120:e669-77). Self imposed restriction of dairy foods because of perceived milk intolerance as early as age 10, the authors say, is associated with lower spinal bone mineral content and a later risk of osteoporosis.

For centuries, bars, taverns, and inns have provided settings in which to enjoy convivial drinking with friends, and most of the time they are fun, problem-free places. But identifiable characteristics of bars themselves may lie behind those drinkers who behave badly. Along with the bar’s location, the internal layout may be a risk factor if it leads to unnecessary overcrowding. Environmental factors should be taken into account when reviewing licensing arrangements, designing bars, and planning the location of future drinking establishments (Journal of Substance Use 2007;12:157-89).

A short story about how a different approach—listening, and giving a single mother with a young baby a leaflet about a local playgroup, rather than yet another prescription for antidepressants—changed a woman’s life is this year’s winner of the British Holistic Medical Association’s student essay competition (Journal of Holistic Healthcare 2007;4:5-6). And there’s a twist to the tale—which Minerva won’t reveal here.

Xenohormesis is the adaptive remodelling of the body in response to ecological signals embedded in the diet. Two researchers propose in Medical Hypotheses (2007;69:746-51) that taste preferences evolved to serve a secondary function, that of xenohormesis. Stress causes plants (such as ripening fruit) and animals (when being hunted, for example) to convert complex sugars to simple sugars, and echoes of this stress experience are picked up along the food chain. As successive consumers incorporate, through dietary intake, the stress phenotypes of their prey, cues for stress may accumulate, giving new meaning to the phrase “you are what you eat.”

Low oestrogen levels that are seen after the menopause stimulate the immune system to increase the production of tumour necrosis factor in bone marrow. This activates osteoclasts to digest bone matrix, causing osteoporosis. The many complicated feedback signals in the immune system make it difficult to completely understand these pathways, but animal research has shown that molecule CD80 increases the activation of T cells which then produce tumour necrosis factor (Proceedings of the National Academy of Sciences of the USA 2007 September 17). The researchers say that blocking this molecule offers a new target for preventing postmenopausal bone loss.

Scientists have developed a new strategy for tackling cancer. They’ve found that combination therapy using three anticancer drugs which inhibit different receptor tyrosine kinases (signalling proteins) results in a better outcome than monotherapy for the brain tumour glioblastoma multiforme (Science 2007 September 13). The combination therapy is probably superior because multiple activators for these proteins are present in glioma cells. These activators can be identified quickly from biopsy specimens, leading to the possibility of a "personalised" therapeutic regimen. Similar strategies could be used to tackle other solid tumours like lung and pancreatic cancers.

Analysis of data from 30 prospective studies indicates that an increase of five units in body mass index (BMI; kg/m²) is related to an increased risk of colon cancer in both men and women, with a stronger association in men. Body mass index is positively associated with hormonal changes of pregnancy, or with alcoholism.

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Women who need to have an ovary, or two, removed before their natural menopause may want to postpone the surgery for as long as possible—to protect their brains. A 38-year study in Neurology (2007;69:1074-83) found that when women had oophorectomy before menopause, the younger they were, the higher their risk of cognitive impairment or dementia in later life.