

## BMJ on the internet

Visit our home page at <http://www.bmj.com/bmj/>

See pp 1381, 1387

1840 marked the introduction of the penny post and the first issue of the *Provincial Medical and Surgical Journal* (the *BMJ*'s precursor).<sup>1</sup> Since then the journal has depended crucially on the postal services for its distribution. Any change to this intimate relationship has been unthinkable—until the arrival of the internet.

The internet is a global network of computers that allows communication among its estimated 30 million users.<sup>2</sup> As Enrico Coiera points out in his article on recent advances in medical informatics (p 1381),<sup>3</sup> one of the internet's most important recent innovations has been the creation of the World Wide Web, which allows users to exchange not only text (email does that) but images, sound, and video. Documents are stored as "home pages" at "web sites" and are available for the price of a local telephone call to anyone with a computer, a modem, and a contract for access to the internet. Two years ago there were about 100 web sites; on current projections this will have increased to about 40 000 by the end of this year.<sup>4</sup> From this week the *BMJ* will be one of these sites—the first general medical journal to launch itself into cyberspace. For the journal the consequences may be as far reaching as the introduction of the penny post.

Users will now be able to scan the list of contents, read the editor's choice, pick out from the page headed "This week in *BMJ*" what interests them most, and download the full structured abstracts of these papers. Some articles will be available in full text (for example, in this week's journal all the articles on electronic developments). As more of the "hard" copy of the journal is produced electronically we hope to increase this proportion. Past issues of the journal will be available from an electronic archive, as will our advice to authors on the conduct and presentation of research. Details of other journals and books published by the *BMJ* Publishing Group (with ordering facilities) will also be provided.

Speed of delivery is an advantage that will most appeal to readers outside Britain. Whereas more than 95% of readers in Britain receive their journal by the publication date, other Europeans have to wait three to four days, east coast Americans a week, and Australians nearly a fortnight. Now readers everywhere will have access to the journal from the moment of publication. Making the journal more widely available is another advantage. We are painfully aware that subscriptions to journals are an unaffordable luxury in many countries.<sup>5,6</sup> Funding agencies, such as the World Bank, are targeting the telecommunications systems in these countries for modernisation, so that in the near future their medical

libraries are much more likely to have computers connected to the internet than a rack full of current journals.

One of the features of the World Wide Web that provides special advantages to journal readers is that it allows links to be followed—both within documents at one web site and between documents at different sites.<sup>7</sup> For example, in the electronic version of this editorial the mention of Coiera's article on medical informatics in the second paragraph is underlined. To call up the full text of this article, readers of the electronic journal need only click on the highlighted text.

### "Toto, I have a feeling we're not in Kansas anymore"

The beauty of the world wide web is that it allows rapid access to web sites elsewhere. Clicking on the address of the Interactive Medical Student Lounge given in Coiera's appendix whisks the user within seconds to a web site in Kansas. Clicking on a list of medical libraries provided on this site transfers the user to the Karolinska Institute's library in Stockholm; another click provides a description and a readable facsimile page from the oldest printed book in that library's collection. (This process is what aficionados of the World Wide Web call "net surfing.")

We are restricting most of the *BMJ*'s home page to text because images, sound, and video take a long time to download with currently available software. But there are tantalising possibilities for the future—for example, our recent fortnightly reviews on Parkinson's disease could have included video clips of parkinsonian gait and tremor. The linkage functions of the web mean that access to a paper could provide simultaneous access to any correspondence and editorial comment it provoked. Linkages could provide the full text of references to papers, and the full text of references to references (and so on), so that readers need no longer take authors' interpretations of earlier work on trust. Authors' original data could also be made available through an electronic archive linked to the paper.

Predicting the future of electronic publishing is as risky as any other branch of futurology. For some commentators the world wide web is just another piece of whizz bang technology looking for a use. But for others the web is the greatest advance in information transfer since the invention of the printing press, and after a few moments' reflection it's easy to appreciate why they might think this. Electronic journals manage without paper, print, postage, and most of the current production process—which together account for

much of the cost of traditional journals. Some people believe that electronic publishing will fundamentally change the way that science gets done and may even spell the end of scientific publishing in its current form (p 1387).<sup>8</sup>

We hope that the *BMJ*'s presence on the internet might help to change the one-to-many relationship the journal has with its readers. The electronic medium allows for much greater interaction than the traditional format of the journal, and our home page makes it easy for readers to send their comments back to us. At present we have just dipped our toes in the water; future electronic developments will be closely informed by what our readers tell us they want and need.

For those who felt out of their depth on reading the title and subtitle of this editorial and now feel that they are drowning we will be offering a more detailed guide to the internet and the World Wide Web in future issues, which is likely to be followed by a regular column devoted to the topic. Visitors to

this year's annual representative meeting of the BMA in Harrogate in July will be able to see our home page at first hand—and so, from this week, will anyone with access to the internet, from Addis Ababa to Zagreb.

TONY DELAMOTHE  
Deputy editor

*BMJ*,  
London WC1H 9JR  
bmj@bmj.com

- 1 Bartrip PWJ. *Mirror of medicine. A history of the BMJ*. Oxford: Oxford University Press, 1990.
- 2 La Porte RE, Akazawa S, Hellmonds P, Boostrom E, Gamboa C, Gooch T, et al. Global public health and the information superhighway. *BMJ* 1994;308:1651-2.
- 3 Coiera E. Medical informatics. *BMJ* 1995;310:1381-7.
- 4 Neubarth M. Web fever: catch it. *Internet World* 1995 Apr:4.
- 5 Groves T. Information sharing: getting journals and books to developing countries. *BMJ* 1993;307:1614-7.
- 6 Kale R. Health information for the developing world. *BMJ* 1994;309:939-42.
- 7 Schatz BR, Hardin JB. NCSA Mosaic and the world wide web: global hypermedia protocols for the internet. *Science* 1994;265:895-901.
- 8 La Porte RE, Marler E, Akazawa S, Sauer F, Gamboa C, Shenton C, et al. The death of biomedical journals. *BMJ* 1995;310:1387-90.

## Ebola virus

### *Poor countries may lack the resources to prevent or minimise transmission*

Twenty years ago Ebola virus first emerged in simultaneous outbreaks in Sudan<sup>1</sup> and Zaire.<sup>2</sup> Two subsequent outbreaks have occurred,<sup>3,4</sup> but transmission among human populations has not been sustained. Despite substantial progress in our understanding of Ebola we have not identified its natural reservoir or the trigger for its re-emergence in new outbreaks in humans.

As the journal went to press, the World Health Organisation had reported 114 cases of Ebola infection and 79 deaths in a new outbreak centred in Kikwit, a rural town of 400 000 situated in Bandundu Province, Zaire, 1000 km from the location of the 1976 outbreak in Zaire.<sup>5</sup> A cordon sanitaire has been placed around the town, but some travellers have circumvented it. The few cases reported in nearby towns have so far been among already ill patients transferred from Kikwit to other hospitals. The index case, seen in early April, was a hospital laboratory worker presumed at first to have typhoid; subsequent cases were initially found among a surgical team and others who cared for the laboratory worker, with secondary spread to other health workers and to family members acting as carers. Two thirds of the deaths have been among health workers. Until the outbreak provoked a response, Kikwit General Hospital was short of barrier nursing supplies and disinfectants.

The current outbreak resembles earlier African outbreaks,<sup>1-3</sup> in which the first cases were found in hospitals where infection control mechanisms were not in place because of economic constraints. Ebola virus was spread to health workers in contact with body fluids, and also from patient to patient by the reuse of unsterilised needles. Secondary transmission occurred also among family members who administered care, among those who prepared corpses for burial, and in other towns where travellers from the epicentre subsequently became ill and infected new carers. Airborne spread is not considered important; one study noted that those exposed to ill patients even in small, crowded village huts were not at increased risk without direct contact.<sup>3</sup>

Illness occurs 2-21 days after infection but generally within 7-14 days, beginning abruptly with headache, malaise, and fever; vomiting, bloody diarrhoea, or a maculopapular rash may develop a few days later. Severe bleeding and shock may follow and are likely to lead to death. No treatment exists

beyond supportive care. Mortality reportedly ranges from 50% to 90%.<sup>1-3</sup> Two thirds of cases have resulted in death in the current outbreak, but experience with more extensively studied viral haemorrhagic fevers suggests that very mild cases may go unrecognised. Early cases may also be difficult to differentiate from typhoid or malaria, and not even the late signs are specific; the identification of presumptive cases may be more difficult at present because of an unconfirmed outbreak of shigella dysentery.

Ebola and Marburg are members of a unique ribonucleic acid virus family, the filoviridae.<sup>6</sup> Ebola virus nuclear protein and polymerase genes are distantly related to the equivalent paramyxovirus genes.<sup>7</sup> The reason for the extreme pathogenicity of these agents is not understood. Virulence varies among strains<sup>8</sup>; sequencing of the current strain in Zaire by the United States Centers for Disease Control and Prevention shows that it resembles the one that caused the outbreak in 1976.<sup>9</sup>

Past outbreaks have been contained by identifying cases and introducing simple measures to prevent direct contact with body fluids and to limit travel. Experience indicates that nursing supplies, disinfectants, case identification measures, and the isolation and supportive care of ill patients are likely to be best provided where the outbreak is based, once national and international responses are in place. Public health officials must not only effect these measures but convince local people that they minimise risk not only to other communities but to themselves by staying put. Reassuring the public that people who have not been ill cannot transmit Ebola, even if they are infected, is difficult but crucial.

Specific guidance to consultants in communicable disease control, public health doctors, and port medical officers have been issued swiftly here and in similar countries unlikely to be affected by the outbreak. The response has been low key, with no quarantine placed on travellers from Zaire who are not ill and therefore not infectious.<sup>10</sup> Timely communications and a coordinated response from clinicians, public health specialists, and virologists seem to have minimised media overreaction and public concern.

Local, national, and international responses in Zaire, involving a much greater need for resources, have also been put into place. Zaire is fortunate to have its own epidemiologist