The unprecedented scale of the West African Ebola virus disease outbreak is due to environmental and sociological factors, not special attributes of the currently circulating strain of the virus

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Context
An outbreak of Ebola virus disease (EVD), caused by Zaire ebolavirus, beginning in south-eastern Guinea in December 2013,1 but not formally identified until 23 March 2014, has spread to the neighbouring countries of Liberia, Sierra Leone and Mali, with limited transmission to Nigeria, USA, Spain and Senegal. The cumulative total of cases and deaths is 14 413 and 5177, respectively as of 11 November 2014, making this outbreak 45 times larger than any previous one. No validated treatments are yet available, although numerous experimental therapies are under investigation, and the prospect of a long battle to eliminate EVD in West Africa. Limitations for future outbreaks depend on rapid response, development of health care and recognition of the problem.

Methods
For each of the 4010 cases, demographic characteristics, as well as signs and symptoms were recorded. The prognostic indication for each symptom was calculated as an OR between its occurrence in patients with fatal outcome versus survivors. Epidemiological variables were calculated from the data and projections of future case incidence derived.

Findings
The case fatality ratio (CFR) in the 4010 cases was estimated at 71% (95% CI 69% to 73%), within the range of CFRs reported for previous outbreaks (60–88%). Contagiousness is quantified by reproduction number (R, the average number of new cases resulting from each existing case) and, although found to vary slightly between countries, lies within the range 1.71–2.02 (95% CI 1.44 to 2.26) for the early stages of the outbreak and 1.38–1.81 (95% CI 1.27 to 2.03) by September 2014. On this basis, projected cases for 2 November 2014 were calculated at 5740 in Guinea, 9890 in Liberia, and 5000 in Sierra Leone. Haemorrhagic symptoms had the greatest association with likely fatal outcome with OR of 8.02 for bloody nose (95% CI 1.54 to 148.62) and 6.69 for bleeding gums (95% CI 1.35 to 121.32).

Implications for practice
In summary, the current EVD strain is shown to be a typical Zaire ebolavirus in terms of its contagiousness and clinical presentation. The reasons for the magnitude of the West African epidemic are therefore likely to lie with non-virological factors such as population density, poverty, lack of access to medical care, funerary practices, and failure to recognise the outbreak early. R of around two implies that a reduction in transmission of 50% or more would bring the outbreak under control, but this may be difficult to achieve under present circumstances, raising the prospect of a long battle to eliminate EVD in West Africa. Limitation of future outbreaks depends on rapid response, development of health infrastructure, and infusion of human and material resources. Physicians in endemic areas need to be aware of the diffuse presentation of EVD in its early stages.

Competing interests None.

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