and depression) and other adverse health outcomes (cardiovascular disease, obesity, and diabetes). The importance of such studies is highlighted by a recent report suggesting that plasma concentrations of C-reactive protein before deployment are predictive of PTSD development after deployment.<sup>7</sup> Such prospective biomarker studies will clarify the causal relationship between inflammation and the increased risk for these highly comorbid disorders that account for a high proportion of morbidity and mortality worldwide.8 The directionality of this causal relationship is also important from the treatment perspective because reduction of systemic inflammation is a viable option to decrease the rate of negative health outcomes and increase the quality of life in individuals with PTSD.9 A similar antiinflammatory treatment regimen has proved to be efficacious for treatment-resistant depression.9 The promise of inflammatory markers is that in the near future, they might serve as therapeutic targets for the alleviation of PTSD symptoms; the meta-analysis by Passos and colleagues<sup>1</sup> cannot get us all the way there, but does take an important step in the right direction.

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We declare no competing of interests.

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# Mental health in emergency response: lessons from Ebola

9

The outbreak of Ebola virus disease (EVD) in west Africa in 2014-15 received global media attention. Such outbreaks typically lead to widespread fear and panic, and stigmatisation and social exclusion of patients with the disease, survivors, and relations.<sup>1</sup> The psychosocial effects include adjustment disorders, symptoms of anxiety, and depression.<sup>2,3</sup> For example, in the Nigerian response, a patient experienced severe distress, needing specialist psychiatrist consultation on the isolation ward.<sup>2</sup> Other responses to stress included contacts either over-reporting or under-reporting core symptoms of interest to the contact tracing teamboth of which might distort efforts to identify cases. Additionally, delirium is common at the end-stage of the disease, presenting a serious and dangerous management challenge in which strict infection control must be maintained.

In the west African outbreak, health workers had to cope with the deaths of colleagues, threats to their lives, and working excessive hours in addition to their own anxiety and fear of contamination. The breakdown of social support systems increased psychological distress associated with EVD in Liberia and Sierra Leone.<sup>4</sup>

WHO included psychosocial support as a key component of case management in their outbreak response plan for west Africa.<sup>5</sup> In the 2014 controlled outbreak in Nigeria, mental health professionals were actively part of the Ebola Emergency Operation Centre in Lagos, greatly increasing the attention paid to mental health effects of the outbreak. They participated in case management, contact tracing, operational research, and development of an emergency response plan.

At-risk countries need to have intervention strategies that integrate mental health in the response to infectious disease outbreaks. These can be divided into three broad categories: before, during, and after the outbreak.

Before an outbreak, the in-country emergency response plan should have a list of mental health professionals that have the skills necessary to participate in the response to emerging infectious disease outbreaks, such as EVD. Shortages of essential professionals should be noted in the plan so as to make



possible timely requests for support from international partners in the event of an outbreak, and to plan for necessary training of general health personnel. Of the countries most affected by the Ebola outbreak, Guinea had three psychiatrists, Liberia had one, and Sierra Leone had no working psychiatrist before the outbreak.<sup>6</sup> Nigeria has more professionals than the other two African countries because of its size (although less than one psychiatrist is available per million people, and it has low proportionate numbers of other mental health professionals). In the Nigerian response, three psychiatrists, a psychiatry trainee, a psychologist, and five social workers were mobilised in-country, in addition to several international development staff.

Resource-poor countries need mental health professionals with training in public health. This staffing would allow clinicians to support their governments to plan robust health systems for decentralised mental health care with a task sharing model,<sup>78</sup> as well as equipping them to prepare and participate effectively in emergencies. In this respect, the Nigerian response benefited from the Nigerian Field Epidemiology and Laboratory Training Program,<sup>9</sup> a 2-year Master's course aimed at improving public health systems. Two mental health professionals who received this training were available to be an integral part of the response team.

In sub-Saharan Africa, almost all mental health professionals are based in tertiary institutions. Countries therefore need to have a mechanism to release identified professionals during times of national emergency. In the Nigerian outbreak, three Government institutions released mental health professionals who were part of the psychosocial response.

As in the preparatory phase, it is important that mental health professionals are part of relevant cluster meetings and coordination processes during an outbreak. From this, the mental health and psychosocial response can be mobilised in a timely fashion, especially if good preoutbreak strategies are diligently followed. During the west African Ebola outbreak, cultural issues such as burial practices and different understanding of causation played an important part in spreading the disease, and anthropologists were essential in finding acceptable public health messages that respected cultural needs while addressing population behaviour that risked extending the outbreak.<sup>10</sup> All those who are part of the response need to be trained in skills necessary for personal protection from infection; the Nigerian experience illustrates this need. After confirmation of Ebola in Nigeria, the Federal Ministry of Health requested release of identified staff for the period of the outbreak. Information and documents about standard operating procedures for personal protection were sent in advance to the mental health professionals. Despite training and preparation for the response, some mental health workers were still apprehensive. However, through interaction with Médecins Sans Frontières and WHO clinicians, who had many years of experience, most of their fears and initial apprehension were allayed.

After control of the outbreak, mental health services should be prepared to manage the substantial increase in need for psychological support. In some cases this can be an opportunity to build back better; a common finding that emergencies present opportunities to build stronger services, based on increased resources after emergency situations.<sup>11</sup>

The mental health and psychosocial response should be assessed as part of the overall review of the response. A mental health professional should be part of the team reviewing the emergency preparedness plan post outbreak. This integration occurred in Nigeria, and as a result the plan is more comprehensive than would otherwise have been the case.

In conclusion, the quite well coordinated response to EVD in Nigeria offers lessons for inclusion of mental health practitioners in future outbreaks of infectious diseases. Mental health professionals with relevant skills should be trained and identified in advance, and gaps in essential professionals should be clearly communicated. An emergency plan for these staff's deployment should be made and they should be part of relevant cluster meetings and coordination processes during an outbreak. In this way, support for people during emergencies can address mental health as well as physical needs.

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We declare no competing interests.

We thank the management and staff of the Federal Neuropsychiatric Hospital Kaduna, Nigeria, for their support.

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# Reducing extramedical use and harms of pharmaceutical opioids: the potential role of abuse-deterrent formulations

6

Are so-called abuse deterrent<sup>1</sup> formulations of pharmaceutical opioids important tools for addressing painkiller addiction?<sup>2</sup> Extramedical use of pharmaceutical opioids (ie, use outside the bounds of a doctor's prescription, including diversion and use by those to whom it was not prescribed) is an area of increasing interest. Increasing harms, such as overdose and dependence, related to extramedical use have resulted in a surge of research examining the features of opioids that make them more (or less) attractive for misuse, generally known as abuse liability.<sup>3</sup> Efforts have increased to develop formulations that are less prone to hazardous use (particularly via routes other than oral, eq, injection), dependence and diversion to illicit markets<sup>1,4</sup> (appendix). These include slowrelease formulations, combining the opioid antagonist naloxone with an opioid agonist to antagonise the desired euphoric effects of the opioid if injected, and formulations that are resistant to crushing and powdering, which are therefore more difficult to inject, snort, or smoke. However, questions remain as to the relative impact of these formulations, compared with other strategies, to achieve a substantial decrease in primary indicators of pharmaceutical opioid use,

misuse, diversion, and harms (see appendix for a summary of the effect of various strategies).

An article by Elie Dolgin<sup>2</sup> reported on the experience in the United States over the past five years, where a range of formulations of pharmaceutical opioids intended to be less amenable for tampering and less attractive for diversion, have been released. Evidence from a number of research groups suggests that such formulations may reduce the extent of tampering (by patients and those using diverted medications), the attractiveness of these formulations for diversion and extramedical use, and consequent harms.<sup>5,6</sup> Early data from surveillance in Australia has suggested similar patterns following the introduction of a potentially abuse-deterrent formulation of oxycodone.<sup>7</sup> Clearly, there is evidence to suggest that abuse-deterrent formulations can have a role in reducing the risk of a number of indicators of use, non-adherence, diversion, and harms related to pharmaceutical opioids (appendix).

This is encouraging, but abuse-deterrence is not synonymous with prevention of tampering or extramedical use.<sup>1,8</sup> Laboratory testing and real world experience indicate that successful circumvention of barriers to tampering can occur,<sup>9,10</sup> and none of these technologies



See Online for appendix

