The 2013 winter influenza season in South Africa will once again be carefully monitored by three influenza surveillance programmes coordinated at the NICD. Last year, these programmes showed that the season was biphasic with co-circulation of influenza A(H3N2) and influenza B. The predominant strains identified in 2012 and their genetic sequence characteristics are described in detail in this issue. Interestingly, the influenza B/Brisbane/60-like viruses predominated and low reactors to reference antisera for these isolates were identified for the first time. Also in this issue, the communicable disease surveillance and risk assessment undertaken during the 2013 Africa Cup of Nations soccer tournament is described, the sensitivity of drug resistant HIV-1 isolates to 2nd-generation NNRTI’s is assessed, the status of the ‘silent’ Hepatitis C epidemic in South Africa is analysed using a recently developed surveillance database and a multiplex PCR technique for identification of mammalian blood meals in malaria vector mosquitoes is validated in comparison to the standard ELISA method. Importantly, information concerning currently available data on a recently described coronavirus associated with severe respiratory disease is also provided in this issue. I trust you will find these contributions interesting and useful, and thank all authors for their timely inputs.

Basil Brooke, Editor
Cote d’Ivoire, Democratic Republic of Congo, Ethiopia, Ghana, Mali, Morocco, Niger, Nigeria, South Africa, Togo, Tunisia and Zambia. Thirty-two games were played in five different stadiums in five provinces: FNB Stadium/Soccer City in Johannesburg, Gauteng Province, Moses Mabhida Stadium in Durban, KwaZulu Natal Province, Nelson Mandela Bay Stadium in Port Elizabeth, Eastern Cape Province, Mbombela Stadium in Nelspruit, Mpumalanga Province and the Royal Bafokeng Stadium in Rustenburg, North West Province. These stadiums have a capacity of 40,000-50,000 people, with 94,000 in Soccer City, which hosted the opening and closing ceremonies.

AFCON 2013 was a series of mass-gathering events defined as gatherings of large numbers of people in the same place and time for a particular purpose. These events included a significant number of international visitors. Planning for mass-gathering events is conducted across government departments, with the health sector typically involved in planning for emergency medicine, disaster management, bioterrorism response, disseminating pre-travel health advice and communicable disease surveillance and response. Communicable disease concerns include the import or export of diseases to susceptible populations, amplification and rapid transmission of outbreaks, impaired outbreak detection and response, and public health infrastructure strained by large numbers of visitors. High profile mass-gathering events can also increase media scrutiny and political pressure on public health activities.

This article briefly describes the communicable disease surveillance and risk assessment undertaken during AFCON and reviews the communicable disease incidents identified.

Methods
The public health surveillance and risk assessment undertaken for AFCON 2013 followed that protocol developed and implemented during the 2010 Federation of Football Associations’ (FIFA) World Cup, held in South Africa.

The Role of the Public Health Cluster
Communicable disease surveillance and incident response was overseen by the Public Health Cluster (PHC), which includes senior representatives from the Department of Health Directorates of Communicable Disease Control, Communications, Environment and Port Health, Food Safety, Malaria Control and Surveillance and Epidemiology, the National Institute for Communicable Disease (NICD) and the World Health Organisation (WHO). The PHC met daily at 8am at the Department of Health between 16\textsuperscript{th} January and 13\textsuperscript{th} February 2013. The aims of each meeting were to report any health incidents potentially relevant to AFCON, to conduct rapid risk assessment of each incident, and to report risk assessments to those senior health representatives briefing the Joint Operating Committee ‘JOCOM’, the pan-departmental committee responsible for ensuring the safety of AFCON.

Figure 1 provides a summary of health reporting arrangements during AFCON. Activities were undertaken in the provinces where games were hosted as well as nationally. The PHC depended on a daily flow of information from each of the departments/organisations represented at the meeting, as depicted in figure 2.
Figure 1. Flow diagram of the reporting structure for public health during AFCON 2013.

Figure 2. Description of data flows into the Public Health Cluster.
Data Flows into the Public Health Cluster -
Enhanced national notification-based communicable disease surveillance and incident reporting

During AFCON 2013 all five provinces hosting matches established both a Provincial Health Operations Centre (PROVHOC), run by staff in the provincial health department, and a cross-departmental Provincial Joint Operations Centre (PROVJOC), which was briefed daily by the PROVHOC. The PROVHOCs were responsible for conducting daily surveillance on 18 priority conditions and collecting information on any public health incident with potential significance for AFCON. The list of priority conditions (described in Table 1) was agreed during preparation for the 2010 World Cup. This was an enhancement of the routine national surveillance of notifiable diseases, requiring daily reporting. The PROVHOCs were required to submit a report to the National Health Operations Centre (NATHOC) in the Department of Health by 5am daily. Each report included data on the priority conditions and associated incidents. The NATHOC was responsible for compiling data on the priority conditions and public health incidents from all five PROVHOCs into one report for the PHC and the Operations Command Committee, to be submitted by 7am daily.

### Table 1: List of priority conditions under enhanced surveillance during AFCON 2013.

<table>
<thead>
<tr>
<th>No.</th>
<th>Name of disease</th>
<th>Reported by NICD</th>
<th>Reported by NATHOC*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Anthrax</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>2</td>
<td>Botulism</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>3</td>
<td>Cholera</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>4</td>
<td>Viral Hepatitis</td>
<td>√ (Hepatitis A)</td>
<td>√</td>
</tr>
<tr>
<td>5</td>
<td>Influenza</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>6</td>
<td>Malaria</td>
<td>√</td>
<td>√ (Malaria programme)</td>
</tr>
<tr>
<td>7</td>
<td>Measles</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>8</td>
<td>Meningococcal disease</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>9</td>
<td>Plague</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>10</td>
<td>Polio</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>11</td>
<td>SARS</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>12</td>
<td>Severe Unexplained Respiratory Illness</td>
<td>X</td>
<td>√</td>
</tr>
<tr>
<td>13</td>
<td>Smallpox</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>14</td>
<td>Typhoid fever</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>15</td>
<td>Rift Valley Fever</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>16</td>
<td>Crimean Congo Haemorrhagic Fever</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>17</td>
<td>Other Viral Haemorrhagic Fevers</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>18</td>
<td>Yellow fever</td>
<td>√</td>
<td>√</td>
</tr>
</tbody>
</table>

*NATHOC = National Health Operations Centre
Enhanced national laboratory based communicable disease surveillance

There is no statutory laboratory notification of diseases in South Africa. However, during the FIFA World Cup and AFCON, laboratory reporting of 17 of the priority conditions was a major component of the daily reporting system. The National Institute for Communicable Diseases (NICD) was responsible for co-ordinating daily reports. These included reports from the Corporate Data Warehouse (CDW), a laboratory data management system run by the National Health Laboratory Service (NHLS) and NICD, as well as reports from the private laboratory networks. The CDW is a database used to collate data from the laboratory information systems of a network of the 250-300 public sector health laboratories across South Africa, allowing real-time alerts on specific organisms diagnosed and the analysis of other positive laboratory test results for specific diseases. During AFCON the NICD/NHLS requested a daily extract of all positive test results of the 17 priority conditions from the CDW. In addition, because private laboratories conduct a major proportion of all diagnostic tests in South Africa, preparation for AFCON by the NICD also involved the inclusion of reports from major private laboratories. Two major laboratory networks, Ampath (300 laboratories) and Lancet, and three major laboratories, vanRensburg and Partners, Pathcare and Vermaak en Vennote, were contacted and agreed to participate by delivering daily reports to the NICD using standard line-lists of the 17 CDW priority conditions.

The NICD provided trend data from a number of well-established surveillance programmes to inform disease risks. These programmes included influenza and severe respiratory diseases, enteric diseases and meningeal pathogens. The NICD was also responsible for providing daily reports on any public health incident reported to the NICD as part of the routine epidemic reporting system and risk assessment.

Reporting to the PHC from other Directorates in the Department of Health

No special arrangements for surveillance or incident reporting were introduced for the other directorates attending the PHC.

The Directorate of Communicable Disease Control (CDC) was responsible for obtaining reports from their local and provincial counterparts on communicable disease incidents reported to the PHC by NATHOC.

The Directorate of Port and Environmental Health was responsible for informing the PHC of any incident reported by their local counterparts, such as port health officials, assessed to be of relevance to AFCON.

The Directorate of Food Safety was represented to provide expertise on food safety issues in the event of a suspected food borne outbreak reported through the communicable disease data flows (CDC, NATHOC and NICD).

The Directorate of Communications was responsible for reviewing local and national South African media daily to identify any health topics covered in relation to AFCON, and for reporting such stories to the PHC.

International communicable disease surveillance

Representatives from the World Health Organization (WHO) were responsible for identifying and reporting international communicable disease outbreaks that had the potential to spread to South Africa during AFCON 2013. Methods for identifying potential outbreaks of concern included an internal daily review of the WHO’s ‘Event Management System’ (EMS) on global public health incidents; contacting WHO counterparts in other national offices for situation updates; and daily monitoring of internet sources. Communicable disease events in Africa were the main focus of surveillance activities.
Internet sources used included ProMED-mail (http://www.promedmail.org/), HealthMap (http://healthmap.org/en), and Google news.

Results
The Public Health Cluster held 28 meetings between 16th January 2013 and 12th February 2013, and produced 23 situation reports (SitReps). No major public health incidents related to AFCON occurred during the tournament.

Seven health events assessed to be relevant to AFCON were identified. These were reported by the PHC in the SitReps. All of these events were given a risk assessment rating of “Minor or no risk to the ORANGE AFCON to South Africa or internationally”.

Three events related to seasonal communicable disease activity with no direct link to AFCON participants or spectators but with potential media interest were reported: two unrelated cases of Crimean Congo Haemorrhagic Fever (CCHF) following tick bites; 462 Malaria cases, including 2 Odyssean clusters; and fourteen suspected measles cases.

Two reports of possible new outbreaks were received during the AFCON surveillance activities and included in the SitRep. Both were found to be false alarms. One was a ProMed report of a diarrhoeal outbreak in Cape Town unsubstantiated by local authorities and the other was a suspected food-borne outbreak at Mbombela Stadium which was ruled out on investigation.

One ongoing outbreak of Shigella flexneri in the New Brighton area, Eastern Cape Province, with 67 laboratory confirmed cases was reported in the SitRep. This is a suburb of Port Elizabeth where matches were played. This outbreak was considered low risk to AFCON because visitors were considered unlikely to visit the affected area and because the outbreak was declining.

Five incidents were reported from airport port health officers involving travellers from countries endemic for Yellow Fever who were without proof of vaccination. No incidents were reported by port health officers at overland or sea ports of entry.

A major public health event did occur in South Africa during AFCON as a consequence of extensive flooding in the north of the country, affecting Limpopo, Mpumalanga, KwaZulu-Natal and Gauteng provinces. This event did not significantly impact on the tournament although the flood response could have affected the public health workforce and associated surveillance activities.

Twelve communicable disease events that occurred outside of South Africa but within the African continent were risk assessed by the PHC, including outbreaks of cholera and VHF. All were assessed to be of low risk for AFCON.

Discussion
No major public health incidents related to AFCON occurred during the tournament. This could be the result of chance, relatively small numbers of international visitors, or preventative public health action. AFCON was always anticipated to be a relatively small-scale mass-gathering event compared to other global events, such as the 2010 FIFA World Cup. Although no figures have yet been provided, anecdotal reports suggest that the number of international visitors attending AFCON was relatively small, and therefore the risk of the importation of communicable diseases was low.

It is also possible that the preparations by public health in advance of and during the event reduced the risk of health incidents. Heightened health protection controls
and greater vigilance, particularly among food safety, environmental health and port health, all of whom implemented systems developed during the World Cup, may have played a role.

The risk assessment and surveillance activities led by the PHC generally worked well. Of the seven incidents reported in the SitReps, all were reported to the PHC meeting within 24 hours. The PHC conducted risk assessment on all seven events, as well as reported international events, and was characterised by a positive and collaborative group dynamic.

A full discussion of the challenges and lessons learned is outside the remit of this article. The key challenge to laboratory surveillance was that as a passive surveillance system it was dependent on clinical recognition and submission of appropriate patient specimens to laboratories.

Strengthening surveillance and response capacity should remain a priority during mass gatherings. Public health systems either developed for or enhanced during mass gatherings should provide a legacy for improving public health surveillance systems within South Africa.

Acknowledgements
All members of the AFCON Public Health Cluster are thanked for their inputs. These include the National Institute for Communicable Diseases, National Health Laboratory Service, Vermaak and Partners Pathologists, Lancet Laboratories and Pathcare Reference Laboratories.