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SHORT REPORT
Developing a new syndromic surveillance system for the London 2012 Olympic and Paralympic Games

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SUMMARY

Syndromic surveillance is vital for monitoring public health during mass gatherings. The London 2012 Olympic and Paralympic Games represents a major challenge to health protection services and community surveillance. In response to this challenge the Health Protection Agency has developed a new syndromic surveillance system that monitors daily general practitioner out-of-hours and unscheduled care attendances. This new national system will fill a gap identified in the existing general practice-based syndromic surveillance systems by providing surveillance capability of general practice activity during evenings/nights, over weekends and public holidays. The system will complement and supplement the existing tele-health phone line, general practitioner and emergency department syndromic surveillance systems. This new national system will contribute to improving public health reassurance, especially to meet the challenges of the London 2012 Olympic and Paralympic Games.

Key words: Olympic Games, out-of-hours medical care, primary healthcare, public health, syndromic surveillance.

The Health Protection Agency (HPA) will play a key role during the London 2012 Olympic and Paralympic Games to ensure the health of those visiting and participating is protected from infectious diseases and environmental hazards. In preparation for London 2012 the HPA has put in place systems to monitor and respond rapidly to any outbreaks of infectious diseases or environmental hazards. New systems include rapid laboratory testing, surveillance of undiagnosed serious infectious illness (USII) and enhanced syndromic surveillance [1]. This paper will describe a new general practice-based syndromic surveillance system monitoring out-of-hours (OOH) and unscheduled general practice activity. A forthcoming paper describes the HPA Microbiological Services preparations for London 2012 [2].

In England the role of the HPA is to protect the community against the threat of infectious diseases and other dangers to health. To support this role the HPA currently employs a programme of syndromic surveillance including systems utilizing a tele-health phone line, general practitioner (GP) and

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emergency department data to routinely monitor the emergence and spread of common infectious diseases in the community in 'real-time' [3–5]. These syndromic surveillance systems also provide critical surveillance support during national incidents which have the potential to affect public health [6, 7].

Since 2009 the HPA has been working in collaboration with partner organizations to provide daily health protection surveillance before, during and after the London 2012 Olympic and Paralympic Games. The London 2012 Olympic and Paralympic Games are expected to attract up to 800 000 daily visitors and will host over 15 000 athletes from 204 different competing nations and up to 200 000 workers, officials, volunteers and media [8]. The Games therefore represent a significant mass gathering and a major challenge to health protection services and community surveillance [9]. Syndromic surveillance will play a major role in responding to the challenge of the Olympic Games; the existing HPA syndromic surveillance programme has been enhanced to improve its robustness and has been complemented with two new syndromic systems in order to meet this challenge. One of these new systems, the Emergency Department Syndromic Surveillance System (EDSSS), will provide daily surveillance data on emergency admissions from sentinel hospital emergency departments across England [5]. This paper describes another new surveillance system which will improve the existing GP national surveillance in England.

In England, existing GP national syndromic surveillance consists of the HPA/QSurveillance [4] and Royal College of General Practitioners networks [10]. Each system monitors scheduled GP consultations for a range of clinical indicators during normal working weekday hours. In anticipation of the Olympics, it was recognized that these GP systems would not be capable of providing surveillance capability during evenings/nights and at weekends or public holidays. This was highlighted as a risk for Olympic surveillance and an objective to develop a system that would monitor OOH and unscheduled general practice activity was established.

During 2010 a project was launched that aimed to capture GP OOH data from one of the major software providers of GP OOH care systems in the UK (including 90% of England OOH service providers). Individual GP OOH service providers using the software system were recruited across England to take part in the project to develop the new national GP OOH surveillance system by voluntarily contributing daily activity data.

During 2010 the recruitment of OOH providers initially focused on London. During this early recruitment phase (October–December 2010) the total number of daily OOH contacts recorded by the system increased to an average of 4500 per day (Fig. 1*a*). After the London recruitment phase recruitment was expanded to those OOH service providers outside London. By May 2012, 46 (over 70% of the total using the software) OOH service providers had been recruited to the system of which 11 service providers cover 30 of the 31 districts across London.

Each OOH provider submitted an automated daily extract of fully anonymized consultation data which were securely transferred to the HPA. Within the anonymized dataset, requested fields included age, gender, partial postcode, the OOH provider, clinical diagnosis codes (Read codes), prescribing information and informational outcomes.

The new surveillance system monitors general practice activity by grouping the clinical codes assigned to each case into clinical indicators. Eight key syndromic clinical indicators were initially developed. These indicators were based on aggregated clinical Read codes [11] used and recorded by the OOH GPs to describe the clinical presentation (including symptoms) and diagnosis of a patient. The initial key indicators developed were: respiratory illness, influenza-like illness (ILI), difficulty breathing/wheeze/asthma, gastroenteritis, vomiting, diarrhoea, myocardial infarction (MI) and heatstroke. These indicators were developed in response to the enhanced surveillance requirements of mass gatherings. Following testing and assessment of the initial eight key indicators these have been expanded to include a further 24 indicators. These syndromic indicators have been developed to expand the potential usefulness of the system in responding to health protection incidents, e.g. severe cold weather, to monitor outbreaks such as measles and to complement the indicators in the established general practice syndromic surveillance systems.

OOH GP activity has been monitored using the new system over weekdays, weekends and public holidays. The number of total contacts recorded during weekends and public holidays showed significant increases as the number of patients using OOH services increased due to the reduced GP surgery hours over weekends and public holidays (Fig. 1*a*).

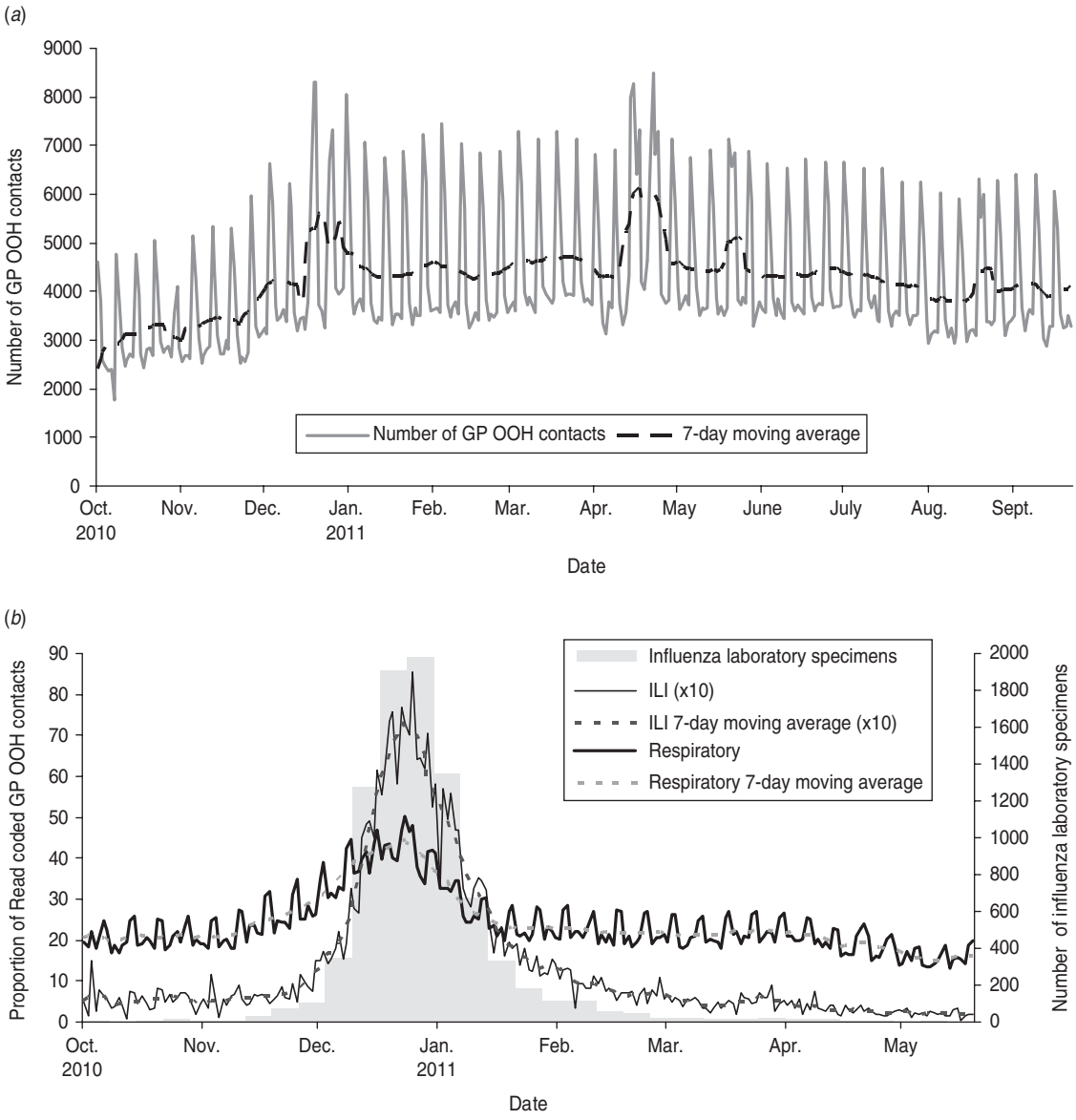

Fig. 1. (*a*) Total daily general practitioner out-of-hours (GP OOH) contacts recorded across London (October 2010–September 2011). The 7-day moving average is illustrated to reveal smoothed trends. (*b*) Daily GP OOH contacts for respiratory and influenza-like illness (ILI) clinical indicators for London during the 2010–2011 influenza season and weekly influenza laboratory specimens, England; respiratory and ILI contacts presented as a proportion (%) of all coded contacts (ILI contacts scaled up by a factor of 10). The 7-day moving average is illustrated to reveal smoothed trends for each indicator.

During winter 2010–2011 the UK experienced a period of high seasonal influenza activity [12]. The OOH surveillance system was able to monitor community-based influenza activity using the respiratory and ILI indicators (Fig. 1*b*, which also shows the number of influenza laboratory specimens recorded by the HPA for England). The peak of influenza activity occurred during the period between Christmas and New Year, a period when several public holidays occur in the UK. The advantage of the daily OOH system, compared to the existing in-hours GP systems, was that there was no apparent impact of holidays on the consultation rate of ILI thus providing a clear epidemiological picture of the peak of the epidemic curve in general practice in 'near' real time. This information was critical to the HPA in monitoring the progression of influenza activity. Decisions about NHS resource allocation during the influenza season are informed in part by understanding first, when the seasonal influenza arrives and second, when it has

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peaked. The OOH surveillance system appears to have the potential to help with identifying when influenza has peaked.

The HPA OOH Surveillance System has provided timely data on GP activity undertaken OOH. During the 2010–2011 influenza season the system demonstrated its usefulness in monitoring influenza activity and illustrated several advantages over existing GP surveillance systems. The main advantages are: the ability to describe OOH activity, the capacity to monitor a variety of syndromes and to develop new indicators tailored to meet health protection requirements and the ability to focus on a given geographical area such as London. The new system provides an important data source when other general practice data are not available because of public holidays and weekends. A public health surveillance output has been established which, in line with existing HPA syndromic surveillance bulletins [13], has focused on providing a routine summary of key findings, incorporating epidemiological interpretation of data, for a health protection audience. The key to the success of syndromic systems is linking syndromic data with public health practice and action and ensuring that appropriate data and messages are disseminated in a timely fashion to health protection teams facilitating health protection action within the community.

The OOH syndromic surveillance system is passive, requiring OOH service providers to do nothing additional in their service other than agree to participate, thus complying with the general principles of syndromic surveillance [14]. However, a limitation is that there is restricted control over how clinical data are recorded and the quality of those data captured. The system is also subject to the changing pattern of general practice OOH care provision across England.

Data quality within the OOH dataset has provided several problems. Read coded data are used to assign a syndromic indicator to each patient consultation. However, the level of Read coding varies greatly between OOH providers (ranging between 10% and >90%). Coding is mandatory for some providers but optional for others. Where the level of coding is poor, patient consultations cannot be assigned a syndromic indicator thereby making the record unusable for monitoring syndromes. In these instances the quality of data has a direct impact on the usefulness of the system, particularly at local level.

Further developments of this syndromic system include the full expansion to provide cover in all English health regions, and developing statistical alerting systems and baselines that will be integrated into the routine management of the system to identify unusual patterns of activity. There will also be a series of structured validation exercises to compare the data to established surveillance systems including Olympics-based scenarios where the OOH statistical alerting systems will be tested against a series of simulated incidents. The final test will come during the London 2012 Olympic and Paralympic Games where the OOH system, along with other HPA syndromic surveillance systems, will be formally used to monitor the health of the nation during the Games.

NOTE

This paper was written prior to the 2012 Olympic Games and therefore reflects an expectation of events.

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DECLARATION OF INTEREST

None.

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