Infectious Disease Surveillance by Medical Examiners and Coroners

To the Editor: Medical examiners and coroners (ME/C) investigate ≈20% of all deaths in the United States (*1*); these include persons who die outside the health care system or die precipitously without a confirmed diagnosis. Surveillance through ME/C offices for unexplained deaths that might have infectious causes can serve as a sentinel system to identify new agents, identify notifiable diseases missed by traditional surveillance systems, recognize unique signs and symptoms of known pathogens, and detect bioterrorism (*1*). This surveillance model, called Med-X, is based on standards for autopsy performance, diagnostic testing, and public health reporting and is currently being performed locally in a small number of offices.

To assess more widely the capacity of ME/C offices to conduct infectious disease surveillance, the National Association of Medical Examiners distributed an Internet-based questionnaire to 155 ME/C offices in the United States that serve populations >300,000; the questionnaires were completed during August–September 2009. Survey questions addressed interest in and physical, personnel, and logistical capacities for conducting surveillance for deaths that could have resulted from infectious diseases. Because many infections can be transmitted during autopsy, specific biosafety features for the autopsy suite were also assessed.

The ME/C offices that responded (68/155) are responsible for 59% of the population served by the target ME/C offices and, on average, perform autopsies on 33% (range 12%–80%) of their cases. Most of the responding offices were the principal office for the area, which was primarily at the county or parish level. Of the responding offices, 97% indicated an interest in a medical examiner–based surveillance system for infectious diseases; 13% currently identify and report cases through the Med-X system. Almost half of the respondents noted some Biosafety Level 3 features in their facilities, including negative pressure ventilation, double-door entry into autopsy suites, or appropriate air exchange and ventilation systems. With respect to current capabilities and practices of surveillance of infectious diseases, most respondents had optimal databases that contained complete and searchable data that included circumstances of death narrative, autopsy findings, and laboratory results. Most offices also had established practices of identifying infectious diseases and of reporting to local or state health departments notifiable and nonnotifiable diseases.

The most often cited barriers to participation in ME/C infectious disease surveillance were funding and resources (85%), lack of supplies (76%), insufficient laboratory testing capability (69%), and personnel requirements (63%). These factors all relate primarily to the subsequent autopsies resulting from the surveillance. With respect to current autopsy practices, survey results suggest that inadequate usage of personal protective equipment (6%), lack of autopsy suites with negative pressure (21%), and inadequate required vaccinations (e.g., hepatitis B) for pathologists (40%) are areas where improvement is needed.

During the past few decades, several diseases of public health importance, including new or emerging infectious diseases, have been recognized and identified through the collaborative efforts of public health partners and medical examiners, performance of autopsies, and subsequent postmortem diagnostic testing (*2*–*4*). The findings from this survey suggest that interest and potential exist for the establishment of an enhanced national ME/C-based surveillance system for novel or emerging infectious diseases and bioterrorism. A surveillance protocol is already available for distribution (*5*). Although survey respondents showed high interest in such a system, this result may be an overestimation because of the offices targeted and the low overall response rate. Addressing existing barriers, including funding and infrastructure deficiencies, may increase participation in such a national surveillance system. Development of a national surveillance system of this type would require fulfilling recently identified steps needed to strengthen the competency of national death investigation systems (*6*), establishment of uniform statewide and interstate standards of operation such as those outlined in the National Association of Medical Examiners accreditation checklist (*7*), consolidation of smaller offices, regionalization of services, and standardization of staff training.

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Multidrug-Resistant *Acinetobacter baumannii* Clone, France

To the Editor: *Acinetobacter baumannii* is an opportunistic pathogen that is a source of nosocomial infections, mostly pneumonia (*1*). Treatment of infections caused by *A. baumannii* is becoming a serious clinical concern as this microorganism becomes increasingly resistant to multiple antimicrobial drugs (*2*). *A. baumannii* resistance to carbapenems is mostly associated with production of carbapenem-hydrolyzing class D β-lactamases and metallo-β-lactamases (*2*). New Delhi metallo-β-lactamase 1 (NDM-1) is one of the most recently discovered metallo-β-lactamases among various gram-negative species, including *A. baumannii* (*3*). We recently reported the recovery of NDM-1–producing *A. baumannii* isolates throughout Europe (*4*). In that study, the genetic background of several strains was identified and corresponded to sequence types (STs) 1, 25 and 85. The ST85 clone was isolated in France from 2 patients previously hospitalized in Algeria (*4*,*5*).

The present study was initiated by the recent isolation of 6 more NDM-1–producing *A. baumannii* linked with North Africa. To determine the extent of spread of this organism from Africa to France, we genetically analyzed 8 other NDM-1-producing *A. baumannii* isolates collected from different towns in France during 2011–2012. Of these 8 isolates, 6 were from patients previously hospitalized in different cities in Algeria (including Algiers, Setif, Constantine, and Tlemcen), 1 from a patient previously hospitalized in Tunisia, and 1 from a patient previously hospitalized in Egypt. These 8 isolates came from 2 clinical samples (blood cultures and wound) from 6 screening rectal swab samples collected at the time of hospital admission (online Technical Appendix, wwwnc.cdc.gov/EID/article/19/5/12-1618-Techapp1.pdf). Because the 8 samples were recovered from 5 hospitals, nosocomial acquisition can be ruled out.

The isolates were identified by 16S rRNA gene sequencing. Susceptibility testing was performed by disk diffusion (Sanofi-Diagnostic Pasteur, Marnes La Coquette, France) and interpreted according to updated Clinical and Laboratory Standards Institute guidelines (*6*). The MICs of β-lactams (imipenem, meropenem and doripenem) were determined by the Etest technique (AB bioMérieux, Solna, Sweden) according to the manufacturer's recommendations. All isolates were resistant to β-lactams, including all carbapenems (MICs >32mg/L). The isolates were also resistant to fluoroquinolones, gentamicin, sulfonamides, and chloramphenicol but susceptible to amikacin, netilmicin, rifampin, tetracycline, and tigecycline according to Clinical and Laboratory Standards Institute guidelines (*6*) and colistin according to European Committee on Antimicrobial Susceptibility Testing guidelines (www.eucast.org/fileadmin/src/media/PDFs/EUCAST_files/Disk_test_documents/EUCAST_breakpoints_v1.3_pdf.pdf).

The production of metallo-β-lactamases was suspected by use of a combined disk test, based on the inhibition of the metallo-β-lactamase activity by EDTA as described (*4*). All isolates were positive for production of metallo-β-lactamases.

For all 8 isolates, PCRs aimed at detecting carbapenemase genes, using primers described elsewhere (*7*), followed by sequencing, led to identification of the $bla_{\text{NDM-1}}$ gene. The isolates also carried a naturally-occurring $bla_{\text{OXA-51}}$-like gene, namely $bla_{\text{OXA-94}}$ (online Technical Appendix). The $bla_{\text{OXA-51-like}}$ β-lactamase confers a low level of resistance to carbapenems.

Genotypic comparison was performed by multilocus sequence typing as described (*8*) and by repetitive extragenic palindromic sequence-based PCR by using the DiversiLab system (bioMérieux, La Balme-les-Grottes, France) according to the manufacturer's instructions. The genomic pattern of all isolates was identical (Figure). Further multilocus sequence typing indicated that all isolates belonged to ST85. This ST was identified in Greece during a nationwide study that focused on carbapenem resistance in clinical isolates of *A. baumannii* and