Real-time surveillance of bacteria and antibiotic resistance over 15 months using BALYSES and MARSS surveillance systems, Marseille, France

Cédric ABAT 1, Philippe Colson 1, Hervé Chaudet 1, Jean-Marc Rolain 1, Didier Raoult 1 *

Affiliations: 1 IHU Méditerranée Infection, Aix-Marseille Univ., URMITE UM 63 CNRS 7278 IRD 198 INSERM U1905, Facultés de Médecine et de Pharmacie, 27 boulevard Jean Moulin, 13385 Marseille CEDEX 05, France

* Corresponding author: didier.raoult@gmail.com

INTRODUCTION

Infectious diseases represent major and unpredictable causes of morbidity and mortality worldwide (1,2). Hence, efficient surveillance systems are warranted. Since 2002, we created at university hospitals of Marseille several automated real-time epidemiological surveillance systems to detect abnormal epidemiological events linked to infections using data from our routine clinical microbiology laboratory. These systems include EPIDMC (3), and BALYSES and MARSS, implemented in 2013, more specifically to survey bacteria and antibiotic resistance (4). We present here results from the weekly surveillance by BALYSES and MARSS from July 2014 to September 2015.

MATERIALS AND METHODS

BALYSES (the Bacterial real-time Laboratory I-based Surveillance System) 656 bacterial species monitored

MARSS (the Marseille Antibiotic Real-time Surveillance System): p-lactam antibiotic resistance phenotypes for 15 bacterial species of interest monitored

RESULTS

255,513 clinical samples collected from 13,470 non-redundant patients and cultivated to identify bacterial pathogens

60,221 bacterial strains isolated over the study period

44,362 antibiotic susceptibility testing performed on

1,172 alarms triggered by BALYSES (898 alarms triggered for 297 bacterial species surveyed) and MARSS (274 alarms triggered), i.e. around 18 alarms per week over the study period

61 alarms led to epidemiological and clinical investigations (47 triggered by BALYSES / 14 by MARSS). 40 were true epidemiological events and 18 led to official report to the French Health Regional Agency

CONCLUSIONS

Our automated surveillance tools allowed improving the control, prevention, and treatment of infections. A next step is to implement a web-based platform to merge all our surveillance systems for more accurate monitoring and alert management. We are also extending our surveillance to a representative panel of private and public clinical microbiology laboratories of the Provence-Alpes-Côte d’Azur French region.

REFERENCES