Pseudomonas aeruginosa is one of the leading causes of bacteria and pneumonia in hospitalized patients especially in intensive care units (ICUs). In Belgium, a national surveillance programme of antimicrobial resistance in acute hospitals has shown that this organism was the first cause of late onset nosocomial nosocomial pneumonia in ICUs and that it accounted for 5% of all nosocomial bacteraemia (NSH surveillance programme, Scientific Institute of Public Health, Brussels).

In addition to being intrinsically resistant to several antimicrobial agents, P. aeruginosa can rapidly develop in vitro resistance to most conventional antipseudomonal antibiotics during treatment [1, 2, 3]. Resistant isolates have been spread in few successful international lineages (ST111, ST235 which were the predominant ones in Belgium over the years, [4-7]) and the occurrence of other international lineages (e.g: ST175, ST233 and few others (see Fig.4).

Our study aimed at assessing the proportion and incidence of MDR P. aeruginosa isolates and to collect prospectively up to 5 nonduplicated MDR PA isolates over a 3 month period in 2016. Identification of all isolates was verified by MALDI-TOF MS or a microarray test (Bruker Daltonics, Germany) by means of a universal database version 3.1.2. In vitro Antimicrobial susceptibility was checked by disc diffusion using CLSI guidelines and interpretative criteria (CLSI H100-A9 document, January 2016) and MICs of 12 antimicrobial agents were determined by microdilution using customized Sensititre® panels (GNX2F panels, Sensititre, TREK diagnostics, Cleveland, USA). All isolates were analyzed by multiplex PCR and with specific primers targeting the following classes: aminoglycosides, fluoroquinolones, beta-lactams, and carbapenems.

The large diffusion of MDR PA isolates in Belgian hospitals raises concern both for patient management and infection control and underlines the need for continuous epidemiological monitoring. The majority of MDR PA isolates harboured carbapenemase encoding genes (range: 1-158; Mean: 11,9 isolates per hospital).

Conclusions
- The proportion and incidence of MDR PA isolates have almost doubled in Belgium since 2009 and reached 6.1% and 51000 patient adm. in 2015.
- Carbapenemase-producing isolates (essentially VIM-type) account for nearly 50% of the MDR PA isolates. Among the antimicrobial agents tested, colistin displayed the best in vitro activity (95% activity at MIC of 2 µg/ml) while other compounds including the recently marketed ceftolozane/tazobactam combination were active against >40% of the isolates.
- The increase of MDR PA is mainly linked to the probable importation and subsequent spread of a limited number of successful international clones (mostly ST11 and ST235, and more recently ST175, ST33 and few other lineages).
- The large diffusion of MDR PA isolates in Belgian hospitals raise concern both for patient management and infection control and underlines the need for continuous epidemiological monitoring.

References