A new software to help optimize regional antimicrobial stewardship policy? Results from a two year-survey of antibiotic consumption and antimicrobial resistance in five hospitals in South-Eastern France

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Background

Antibiotic (ATB) consumption and antimicrobial resistance (AMR) are important indicators to guide Antimicrobial Stewardship (AMS) policies. Since 2011, the online software ConsoRes, developed by the Infection Control Committee against Nosocomial Infections East, was implemented to collect data and to perform a cross-scale analysis of ATB consumption and AMR rates in clinical wards.

We report our first results of ConsoRes implementation in the 5 hospitals working in a multidisciplinary network on Infectious Diseases in South-Eastern France named Reso-Infectio-PACA-Est.

Material and Methods

- Retrospective multicentre survey using ConsoRes from January 2013 to December 2014 in volunteer hospitals for **ATB consumption** (Defined Daily Dose/1000 patient-days, DDD/1000PD) **and AMR rates** (MRSA and FQ-R *Escherichia coli*).
- **Five hospitals** involved: 1 University Hospital (UH, 1692 beds) and 4 General Hospitals (GHA, 622; GHB, 849; GHC, 391 and GHD, 453).
- The **presence of an Infectious Diseases** (ID) specialist was informed.
- We focused on 2 populations of at risk-patients exposed to ATB: patients in **intensive care units** (ICU) and in **geriatric wards**.
- ID advices were given upon request and on a weekly basis in ICU (in UH, GHB and GHD) and in geriatric units (UH and GHA).

Results

Table 1. Hospital data.

Hospitals	Beds	ID presence (Y/N) Since when	ATB consumption in 2013 (DDD/1000PD)	ATB consumption in 2014 (DDD/1000PD)
Antibes Hospital (A)	622	Y (2013)	471	337.6
Cannes Hospital (B)	849	Y (2010)	559	527.8
Draguignan Hospital (C)	391	Y (2014)	349.0	359.8
Grasse Hospital (D)	453	Y (2015)	300.4	321.8
Nice University Hospital	1692	Y (1999)	431.4	464.6

- ✓ ATB consumption in each hospital, ICU and geriatric wards consumptions remained stable, except in geriatric units in GHA, and this decrease could be explained in part by the arrival of an ID specialist in 2013 (Fig. 1).
- ✓ Penicillins, cephalosporins (Ceph) and FQ consumption remained stable, excepted in two cases: a drop in Ceph and FQ consumption in GHA, and an increase in carbapenems (CP) in UH (10.3 in 2013 *vs* 15.8 in 2014), likely explained by an OXA-48 producing *K. pneumoniae* regional epidemic in 2013.
- ✓ Two hospitals (UH and GHD) used fewer antibiotics than the others in ICU, probably related to multidisciplinary operational teams. High variability was observed in Ceph consumptions among hospitals.
- ✓ MRSA rates remained stable, ranging from 10.5 to 20%.
- ✓ FQ-R *E. coli* remained stable for each site, from 11.4 to 25.1%, except a decrease observed in 2014 at the UH (Fig. 3).

Fig 1. ATB consumption in the 5 hospitals in 2013 and 2014: overall means, ICU and geriatric wards means in DDD/1000 PD.

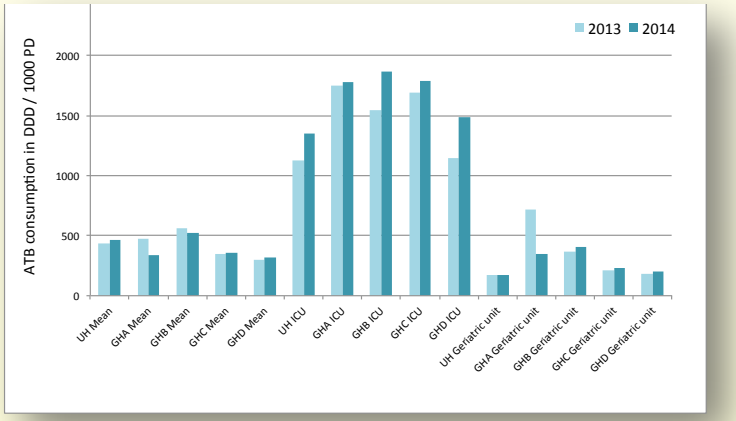


Fig 2. Evolution of MRSA% in the UH since 2011 to 2014.

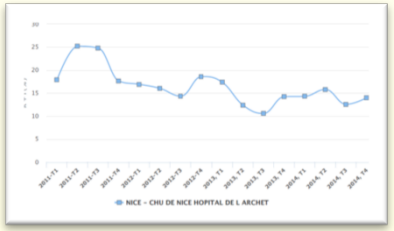
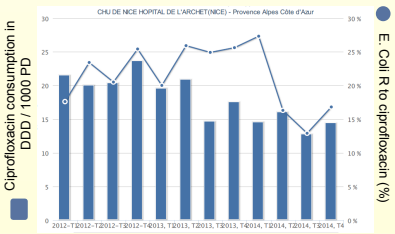


Fig 3. Evolution of *Escherichia coli* resistance (R) to ciprofloxacin and ciprofloxacin consumption at the UH from 2012 to 2014.



Conclusion

The Reso-Infectio-PACA-Est experience enabled us to quickly survey trends and to compare practices between differents units and hospitals. Prospective monitoring and associated prescriptions quality audit may allow adapting guidelines to local AMR rates, identifying inappropriate ATB use, targeting improvement interventions, and evaluating the impact of those actions. These indicators may be useful to assess the impact of this regional multidisciplinary AMS network.

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