

Background

Already in 1945, Sir Alexander Fleming warned scientists about the risk for antimicrobial resistance. Methicillin resistant *Staphylococcus aureus* (MRSA), first reported fifty years ago, terrorises acute care hospitals in most European countries and abroad.

In the early nineties, a Belgian policy for MRSA management in acute care hospitals was worked out including guidelines, microbiological and epidemiological surveillance, and improvement of identification techniques for MRSA in hospital microbiology laboratories.

Methodology

Since 1994, the Scientific Institute of Public Health and the National MRSA Reference laboratory set up an epidemiological surveillance in acute care hospitals, collecting semi-annual MRSA data, aggregated at hospital level.

Hospitals participated on voluntary basis until 2006, when participation became mandatory. Semestrial resistance rates (MRSA/*S.aureus*) and the incidence of nosocomial MRSA (n-MRSA, isolated > 48h. post admission) were calculated on data excluding duplicates (patients counted only once). Semi-annual national and local feedback reports were sent to all hospitals.

Results

Surveillance data were available for 33 semestrial observation periods (1994 - 2010). 77% of the Belgian hospitals delivered data for at least 10 surveillance periods.

- During **period-1** (1994-1998), the resistance rate decreased in acute care hospitals from 24.4% to 14.4% and the incidence of n-MRSA from 4.1 to 2 cases/1000 admissions.
- Unfortunately between 1999-2003 (**period-2**), the resistance proportion and nosocomial incidence increased dramatically and doubled in a five-year time span, reaching respectively 31.1% and 4.3 cases/1000 admissions. Meanwhile, a national survey on MRSA-carriage in 60 Belgian nursing homes (NH) showed also a high prevalence (19%) of MRSA-carriage among NH residents, highlighting the need for targeted screening of this population at admission to the hospital.
- In **period-3** (2003-2010), the resistance rate in acute care hospitals decreased slowly (- 10%) attaining 21.1% in 2010. In the same time span the incidence of n-MRSA dropped from 4.3 to 1.5 cases/1000 admissions.

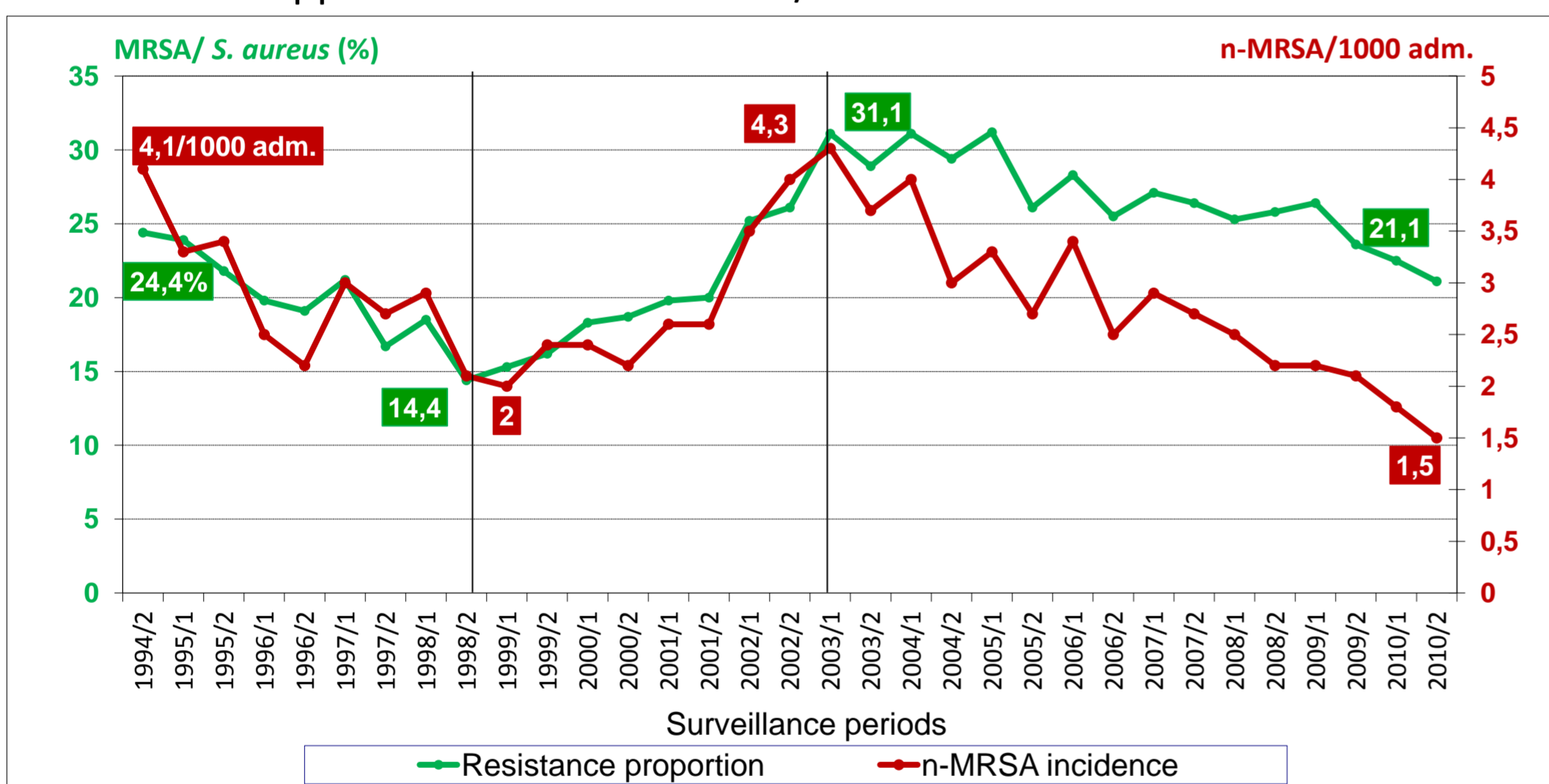


Figure 1: Resistance proportions and incidence of nosocomial MRSA in acute care hospitals in Belgium: 1994-2010 (mean rates for hospitals with at least 5 participations since 1994)

Actions

In order to incurve the dramatic evolution observed during period-2, a **bundle of actions** was implemented in hospitals and in nursing homes with focus on 5 action lines:

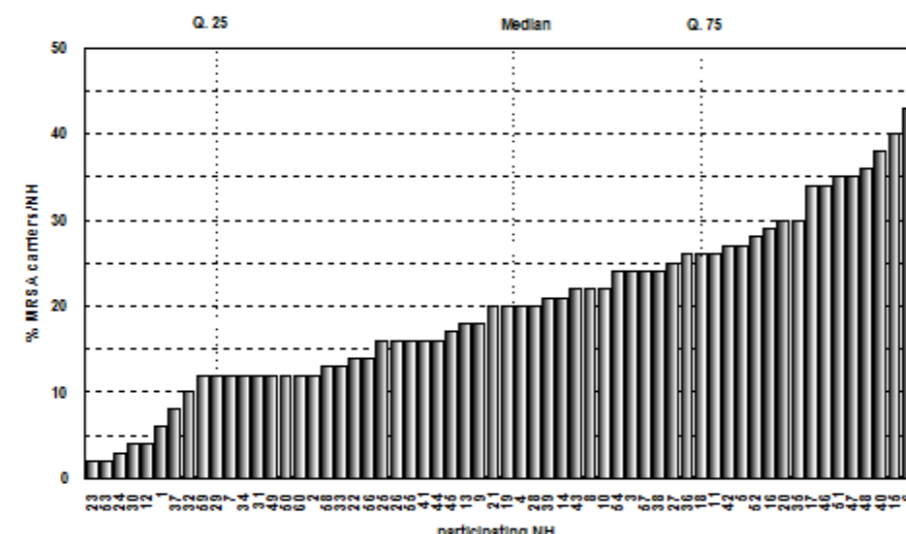
1- Antimicrobial stewardship in acute care hospitals

Since 2002: nationwide implementation of *antibiotic management teams in Belgian hospitals* (E. Van Gastel, M. Costers, W. Petermans, M. Struelens, JAC, 2010; 65: 576-580).

Since 2008: surveillance of antimicrobial consumption in acute care hospitals in Belgium (www.nsih.be/surv_qm/inleiding_fr.asp)

2- Investigation & management of the MRSA reservoir in Belgian NHs

In 2005: national prevalence survey on MRSA carriage in 60 Belgian NHs.



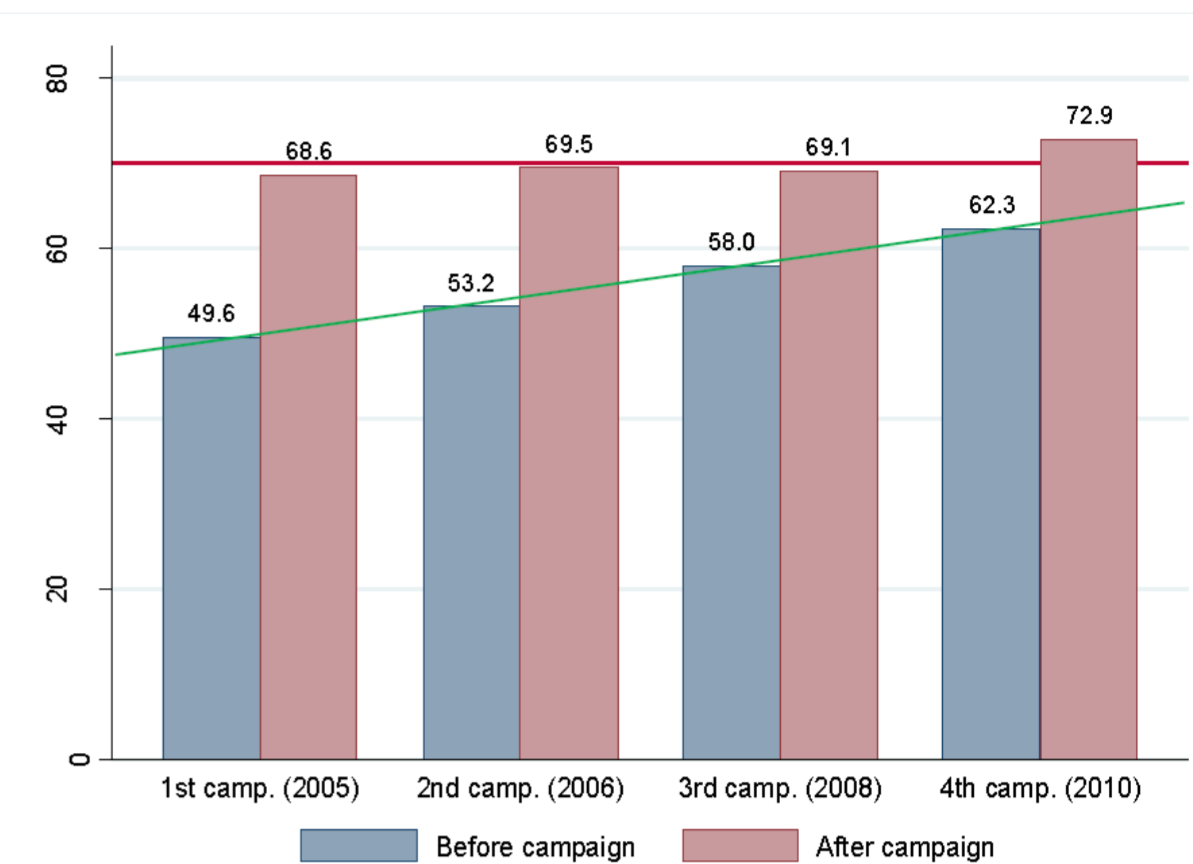
Actions (cont'd)

3- Promotion of hand hygiene in Belgian healthcare settings

In 2005 - 2006/07 - 2008/09 - 2010/11

4 consecutive, nationwide hand hygiene campaigns were organized in Belgian healthcare facilities.

Compliance before vs. after campaign



4- Guidelines for the management of MRSA in nursing homes (2005) and revision of guidelines for acute care hospitals (2003).



RECOMMANDATIONS POUR LE CONTRÔLE ET LA PRÉVENTION DE LA TRANSMISSION DE *STAPHYLOCOCCUS AUREUS* RESISTANT À LA MÉTHICILLINE DANS LES HÔPITAUX BELGES



5- Target screening in acute care hospitals

Since 2006, all Belgian acute care hospitals performed target screening of patients at risk, at admission and/or during hospital stay.

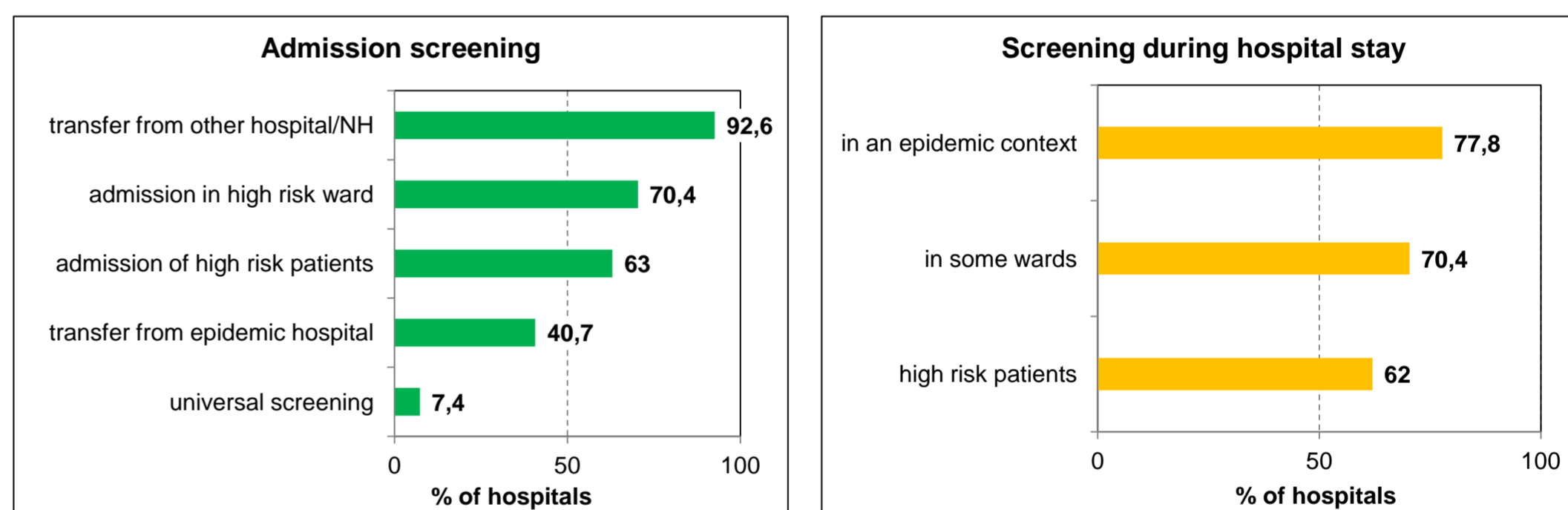


Figure 2: Proportion of hospitals performing screening at admission (left figure) and during hospital stay (right figure) by screening indication : surveillance data, 2010.

The incidence of MRSA present at admission ranged between 7.1 and 9.3 cases per 1000 admissions. Known carriers formed the largest group (+/- 3.3 cases/1000 adm.), followed by patients transferred from other healthcare facilities and NHs. Patients without previous contacts with healthcare represented 1 case/1000 admissions.

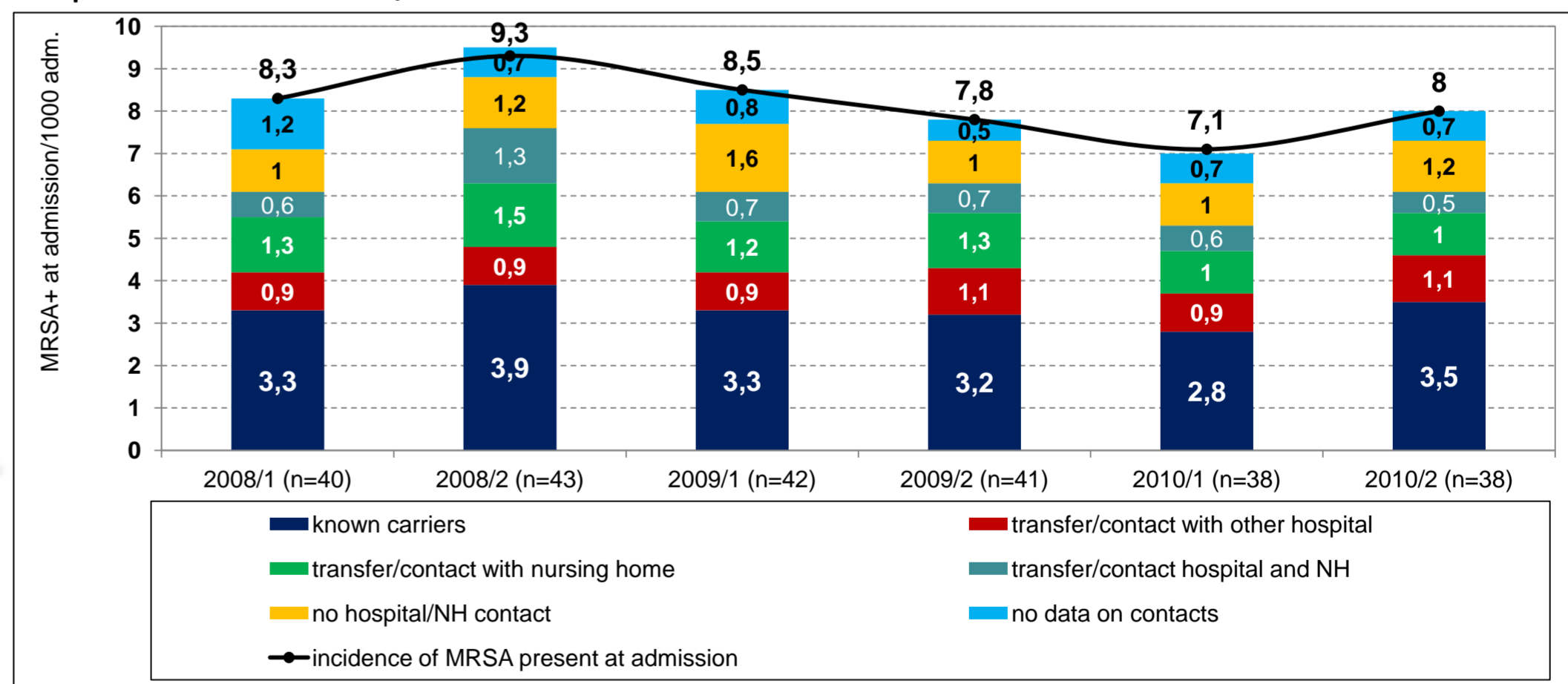


Figure 3: Incidence of MRSA present at admission, distribution by previous contacts with healthcare: surveillance data 2008-2010.

Conclusion

Since 2003, the nationwide implementation of bundled actions for the control of MRSA in Belgian healthcare facilities resulted in a very successful evolution. *The action lines were:*

- The implementation of an antibiotic management team in each hospital and participation at repeated, nationwide hand hygiene campaigns,
- The revision of existing guidelines for the control of MRSA in acute care hospitals with promotion of target screening at admission and during hospital stay,
- A study on MRSA carriage among NH residents and the implementation of specific guidelines for these facilities in order to prevent MRSA transmission.