

Key Factors Promoting MDRO Selection and Spread

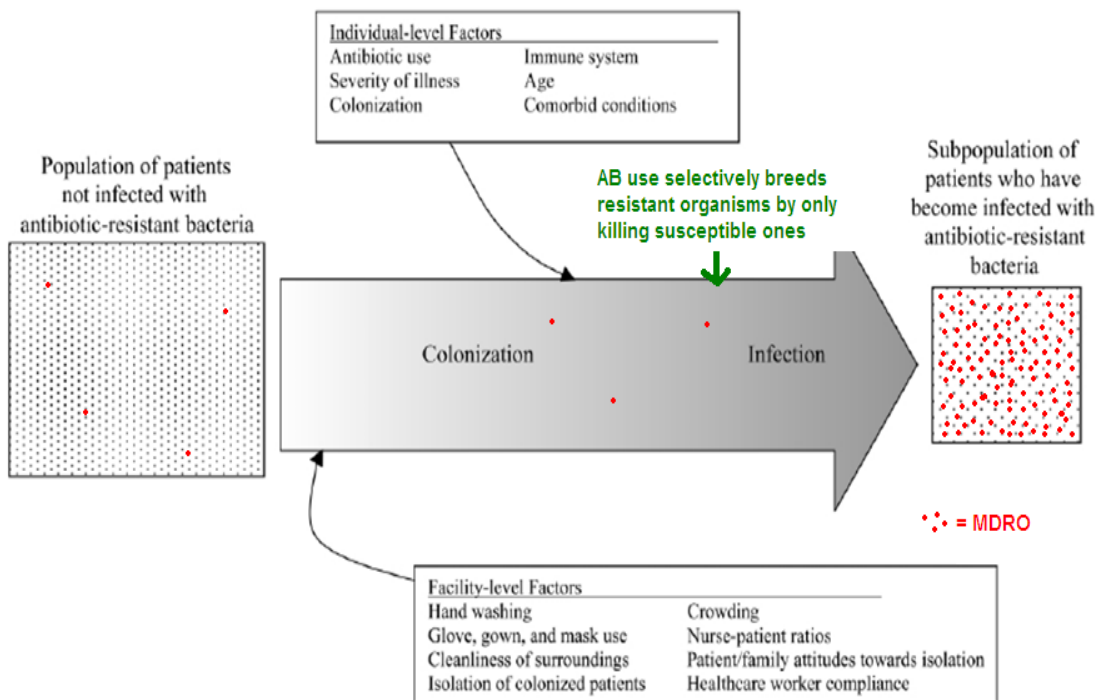


Figure 1. Factors that influence the acquisition of a nosocomial antibiotic-resistant bacterial infection

Antibiotic (Resistance) Knowledge Gaps

We Know

- Hand hygiene works
- Respiratory hygiene works
- Bugs spread in close proximity e.g. wards, hospitals, LTCF
- **Any one of us or our patients may be carriers of MDRO's**, they are low level endemic, and generally transient for 1-12 months to any individual including HCW's when colonising, use good hand hygiene and Standard Precaution practices **on/for everyone** to slow down the spread of MDRO's (which in turn are being created by every antibiotic use selective pressure of our shared microbiome)
- Increase AB use increases AB Resistance across the whole shared community microbiome
- Incidence of microbes totally resistant to all antibiotics is increasing rapidly worldwide

We Do Not Know

- Geographical mechanisms e.g. AKL vs rest of NZ - MRSA rates much higher in AKL (of all *S. aureus* community isolates in AKL 12% MRSA positive, Canterbury 5% MRSA) (AB load alone?, socioeconomic?, environmental?)
- Eradication efficiency of MRSA – evidence supports benefits but primarily **only** when implemented for **clinical** outbreaks, recurrent infections, especially resistant strains, and some pre op procedures. Without infection or further antibiotic use, MRSA, ESBL and VRE is usually a **transient** colonisation for an individual - 90% MDRO carriers spontaneously lose MRSA, ESBL, VRE colonisation in 1-12 months **without treatment**

Newer Concepts in SSI ↓

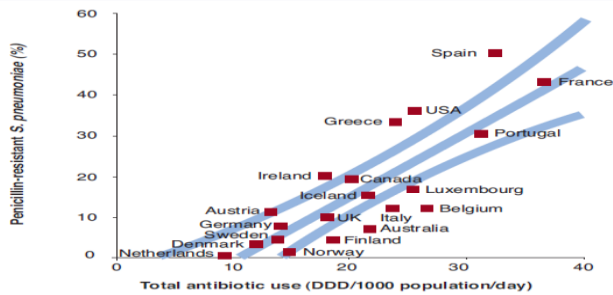
- **Blood Sugar** regulation important
- **Body Temperature** regulation intra op outside 1-1.5°C core increases SSI x2
- **Oxygenation** - ↑ periop inspiration ↓ SSI

Future Strategies

- **Surveillance** ↑
 - ID epidemics by common & uncommon isolates
 - Correct AB prophylaxis (AB, timing, dose, duration)
 - Document costs, risk factors, readmission rates
 - Monitor post disch infections, 2^o consequences
- **Preventing Emerging Resistance**
 - AB necessary ?, choice, route, time, evidence??

Antibiotic usage/resistance link

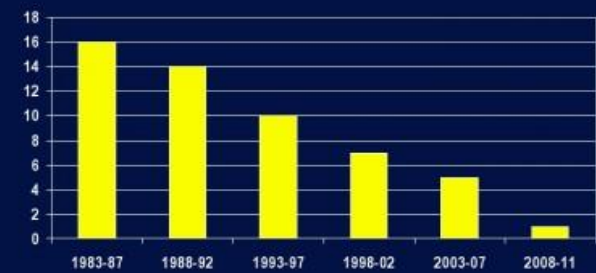
Antibiotic use and AMR from 1990–2000 in selected countries



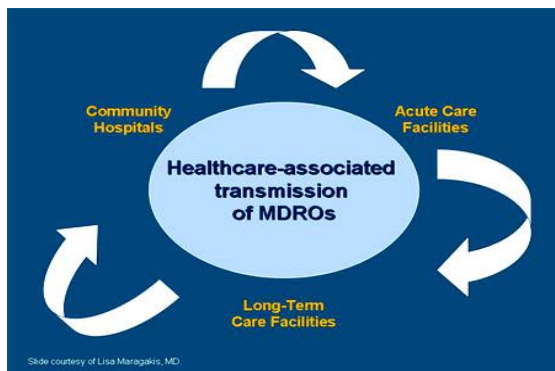
DDD: Defined Daily Doses
Total antibiotic use in outpatients versus prevalence of penicillin-nonsusceptible *Streptococcus pneumoniae* in 20 industrialized countries.

Aibrich WC, Monnet DL, Harbarth S. Antibiotic selection pressure and resistance in *Streptococcus pneumoniae* and *Streptococcus pneumoniae*. *Emerging Infectious Diseases*, 2004; 10(3):514-7.

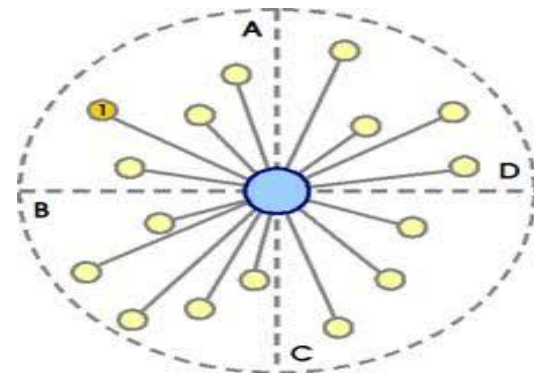
ANTIBIOTIC APPROVALS: 1983-2011



Infectious Disease Society of North America, 2011



Slide courtesy of Lisa Maragakis, MD



MDRO Approach Silo or Horizontal Required ?

