controlling MRSA and multiple drug resistant organisms:

experience in the Netherlands

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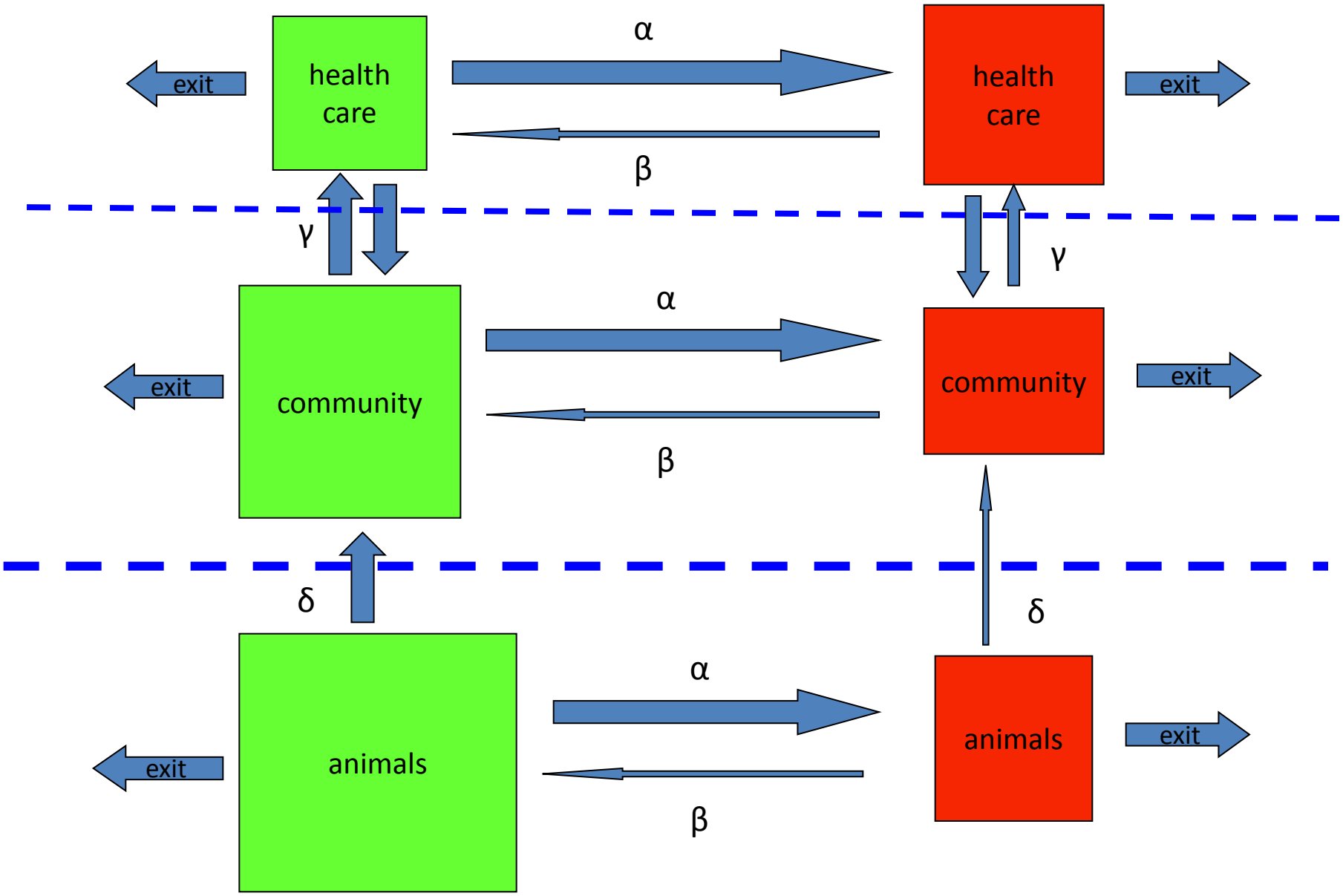
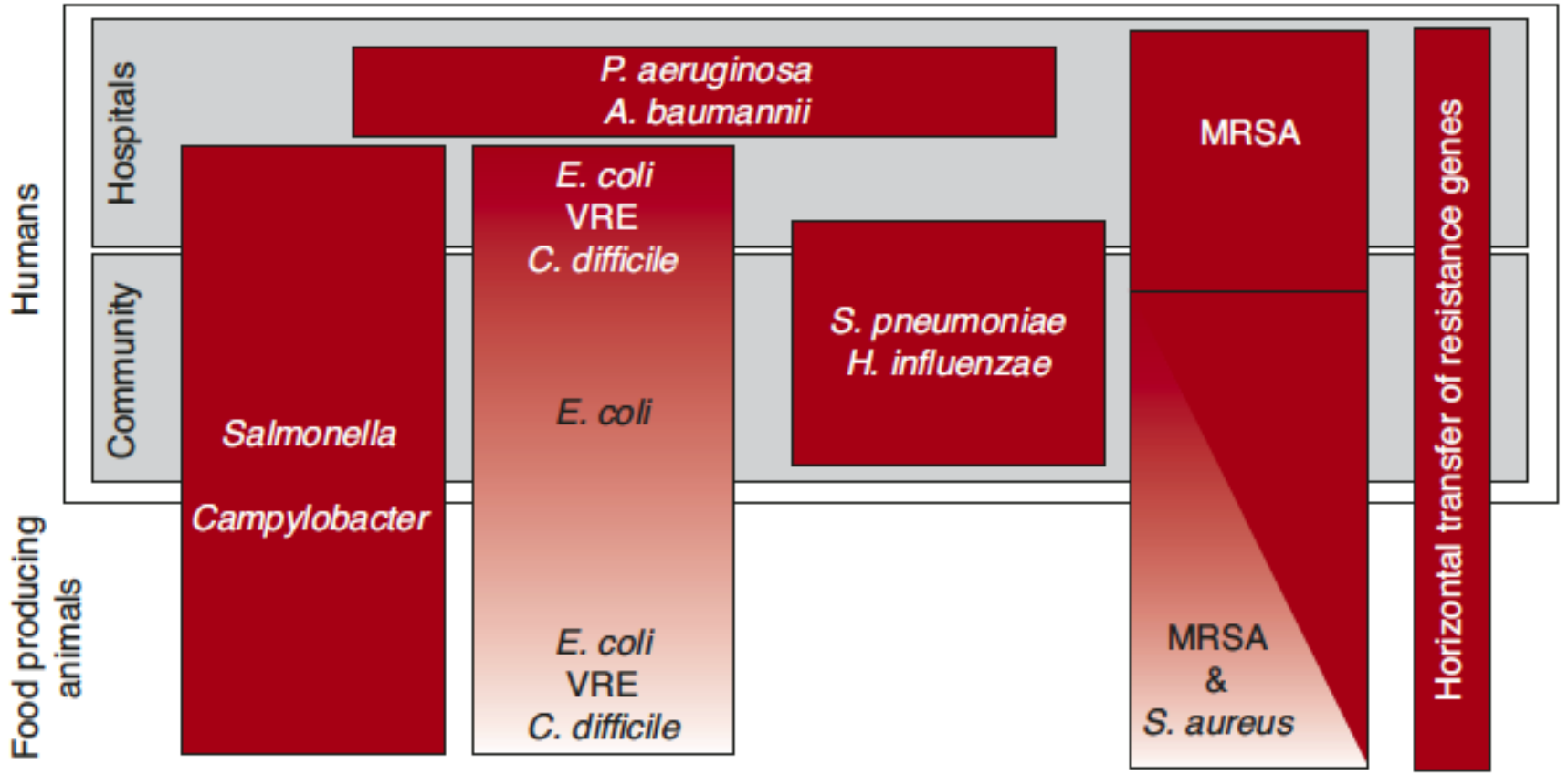
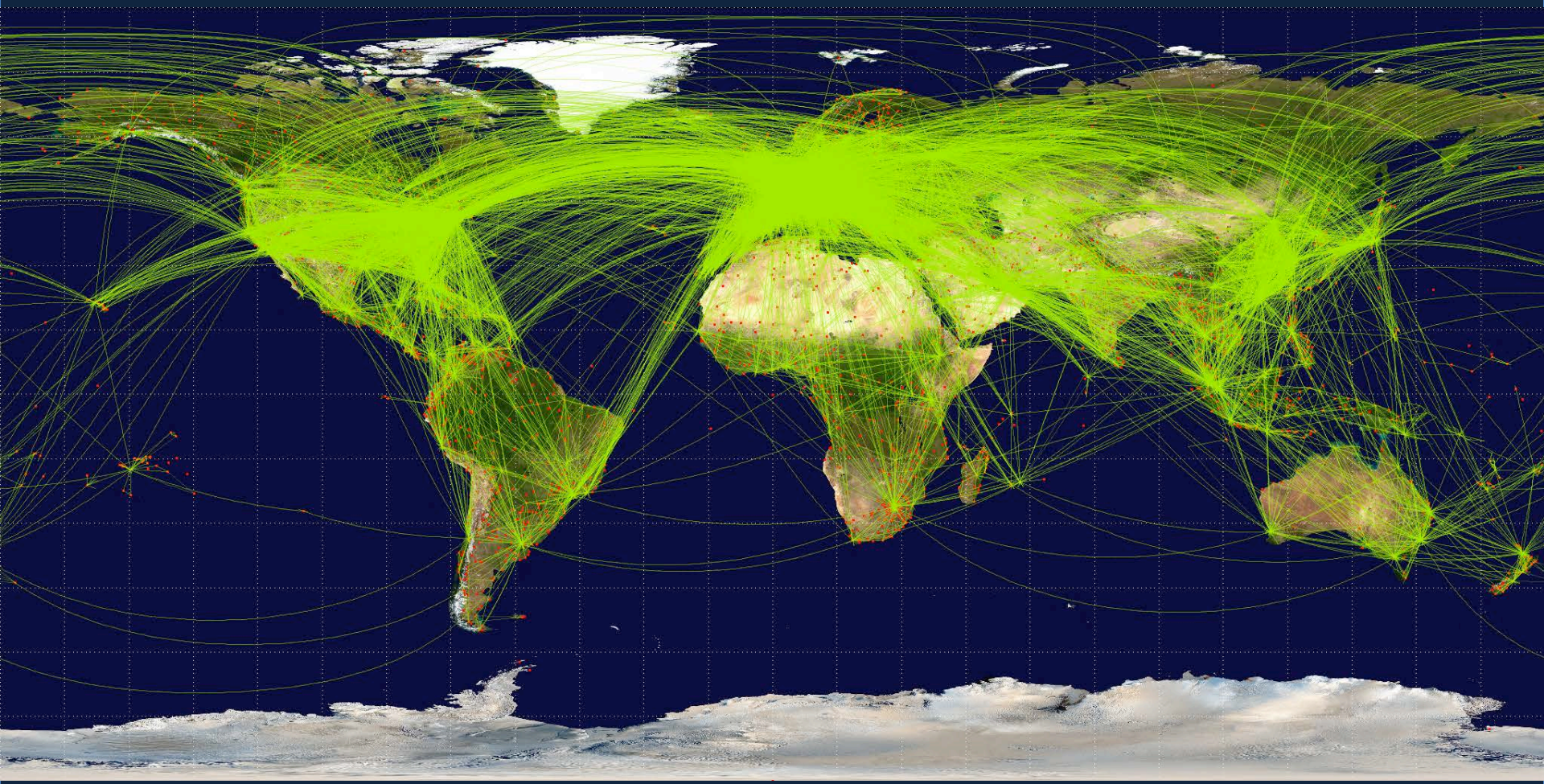
emergence of antibiotic resistance in society



reservoirs of resistant superbugs



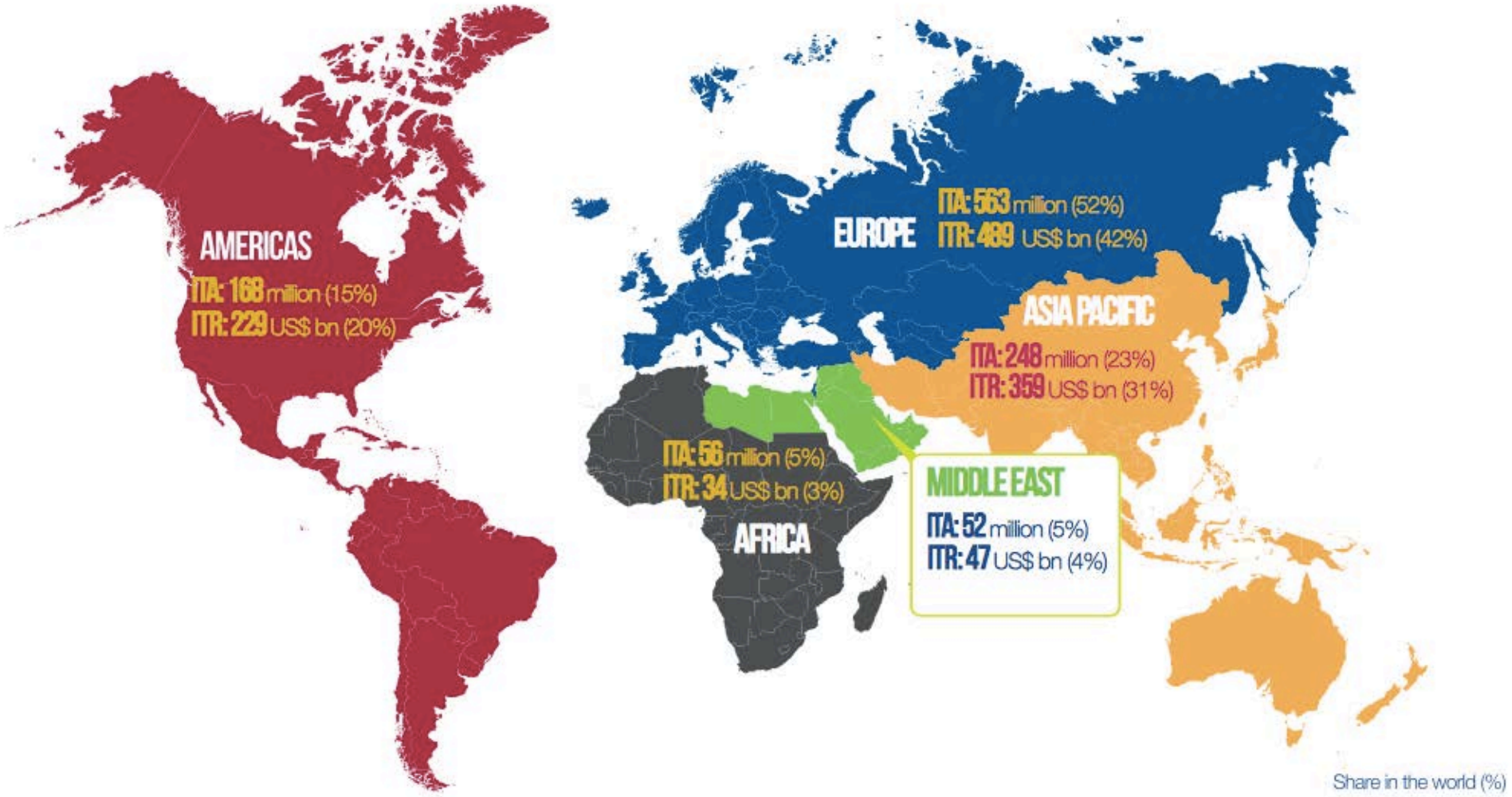
another dimension: rapid dissemination by air travel



Wikimedia commons 2009

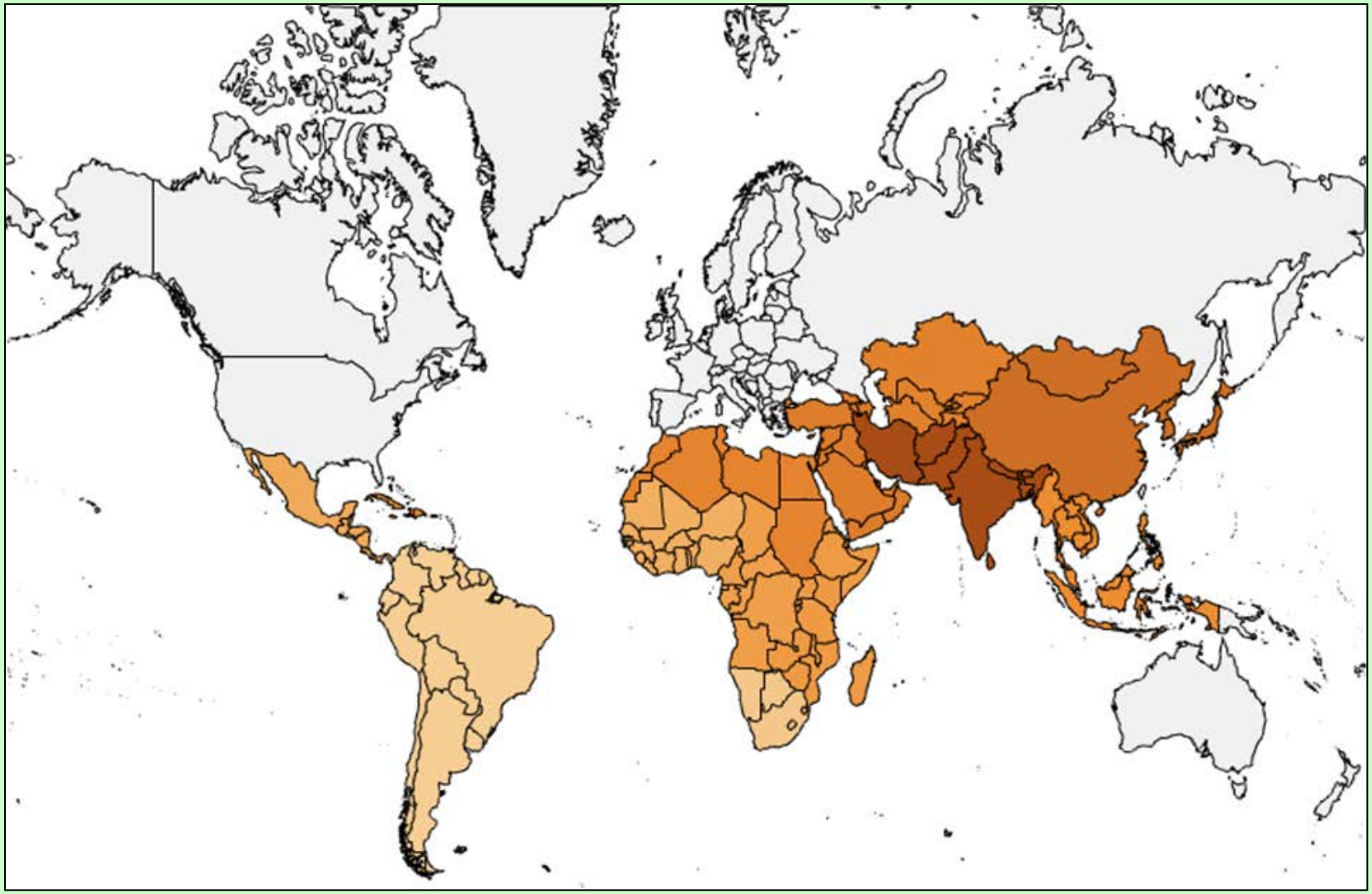
INTERNATIONAL TOURISM 2013

International tourist arrivals (ITA): 1087 million
International tourism receipts (ITR): US$ 1159 billion



UNWTO 2014

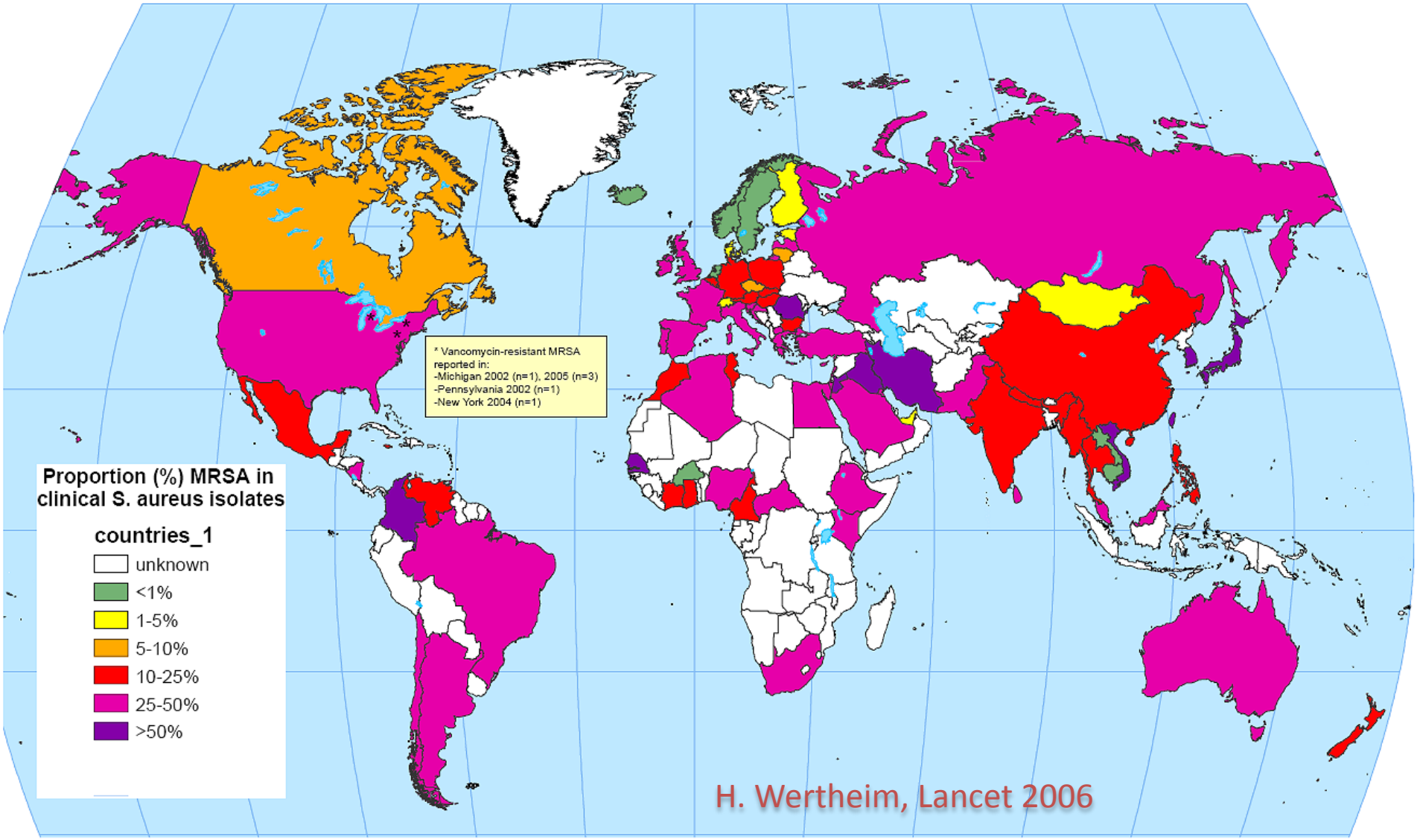
% Dutch travelers returning with ESBL in the gut



Arcilla M, ECCMID 2014

color gradient from 0% to 75%

MRSA world wide prevalence 2006



H. Wertheim, Lancet 2006

Strategies to control *MRSA*

J Hosp Infect. 1984 Dec; 5 Suppl A: 45-9.

Three strategies in the control of staphylococci including methicillin-resistant Staphylococcus aureus.

Spicer WJ.

Three general strategies for the control of Staphylococcus aureus, particularly methicillin-resistant Staph. aureus (MRSA), are described based on experience in Melbourne, Australia from 1975 to 1984, when such strains have been common. The strategies have been named (1) the Scutari Strategy, based on simple hygienic measures and barrier nursing, (2) the search and destroy technique, with strict isolation of all infected and colonized patients, and attempts to eradicate MRSA from the environment, and (3) the SALT strategy (Staph. aureus limitation techniques) with isolation only for non-containable infections, and 'infectious precautions' for other MRSA infections and for colonized patients.

PMID: 6084684 [PubMed - indexed for MEDLINE]

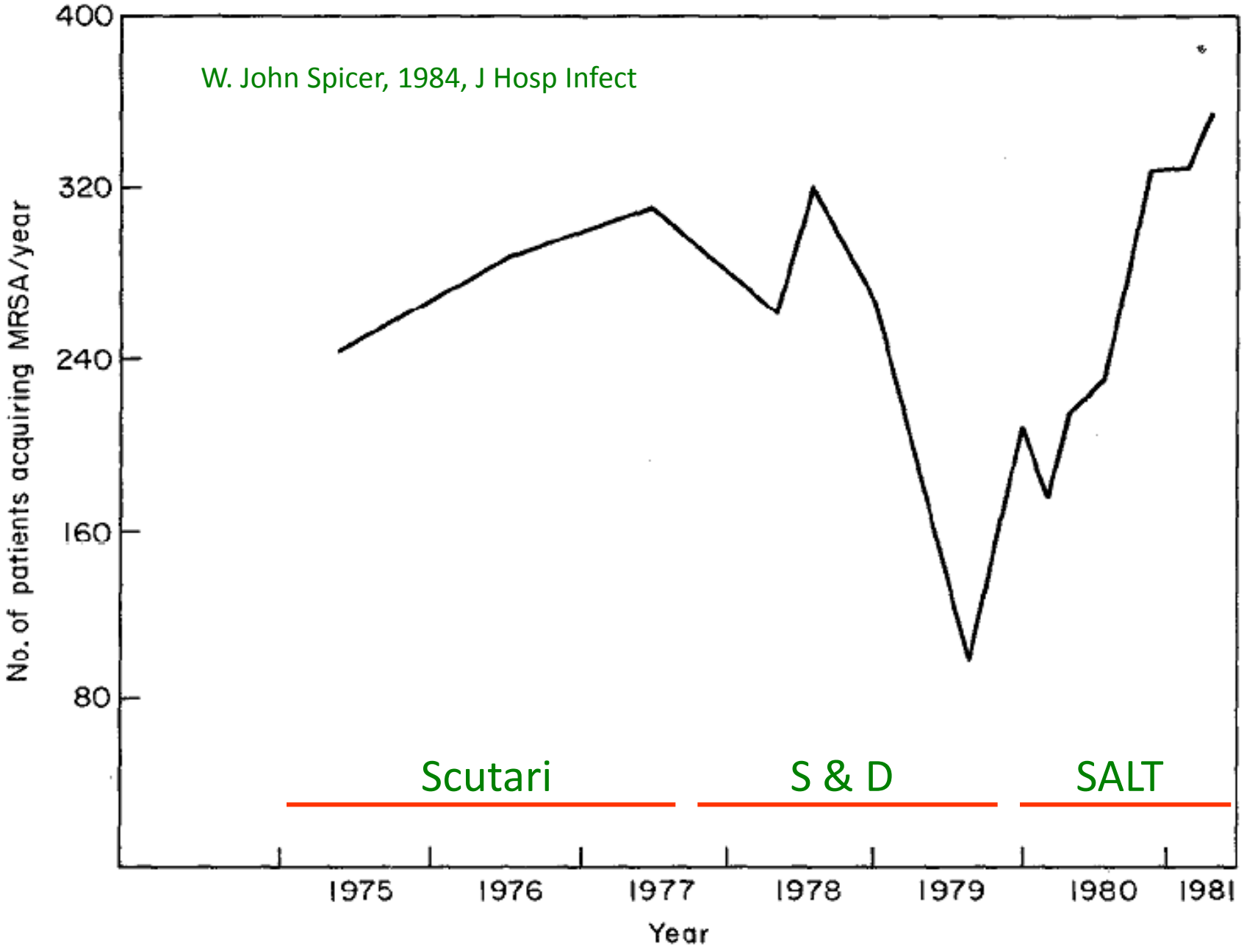
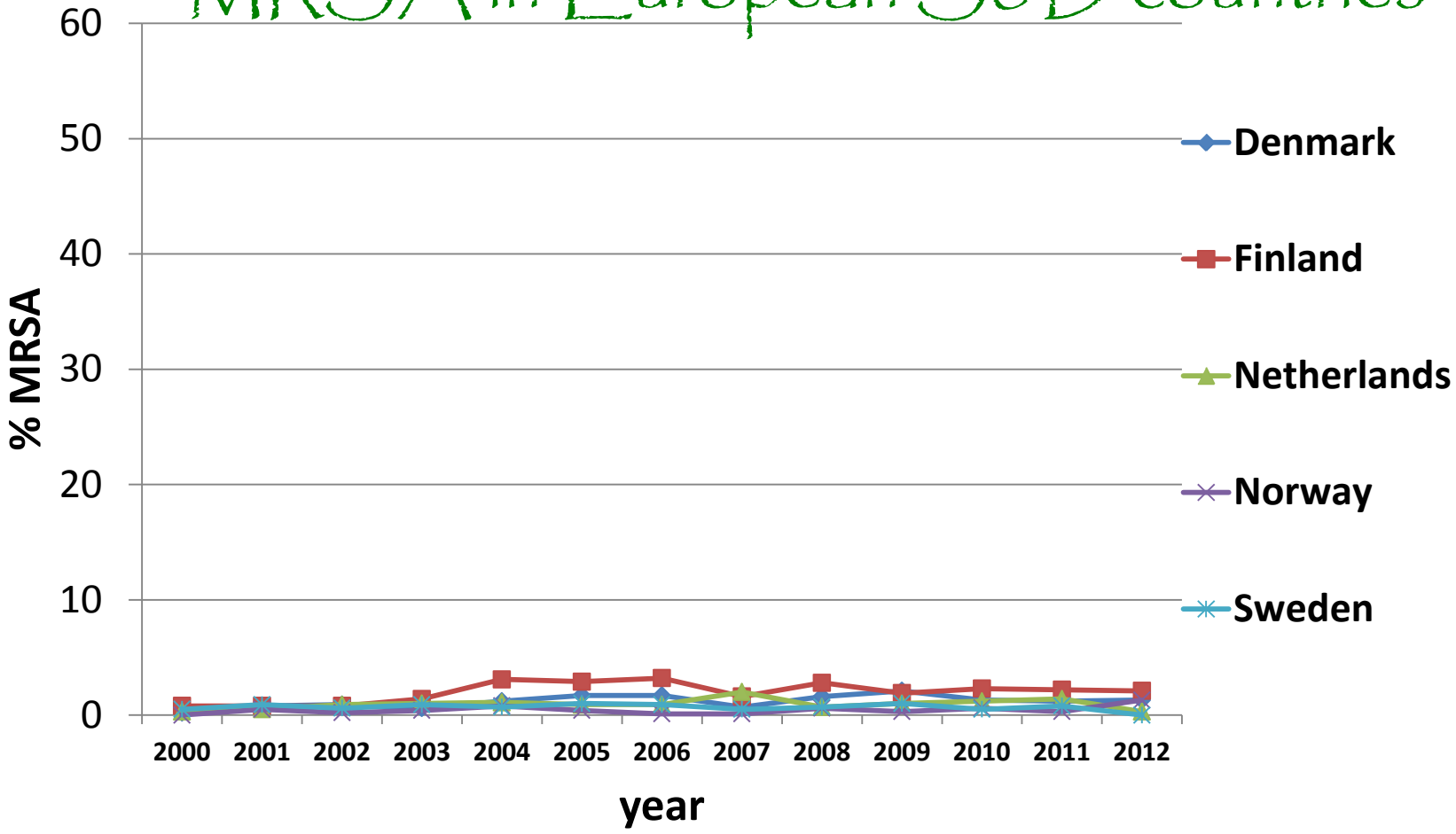
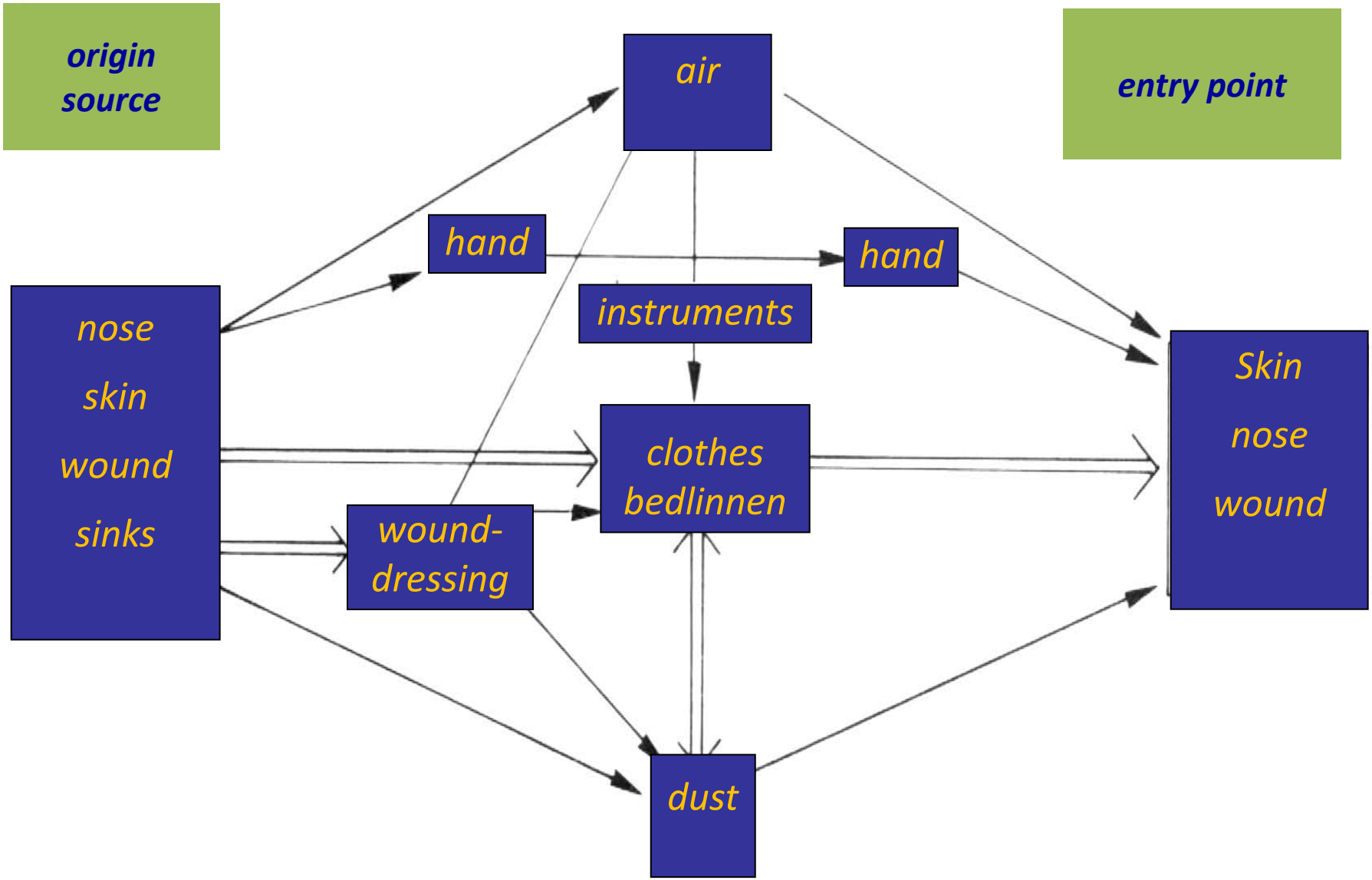


Figure 1. Incidence of patients colonized or infected with methicillin-resistant *Staph. aureus*.

MRSA in European S&D countries



transmission routes of MRSA/MDRO



Maki's paradigm

...colonized and infected patients are but a swoop in the cyclical pattern of overall MRSA burden and recycling. Medical staff and the environment are key components of this cycle...

Those who focus their attention on a single route or source of infection...will not acheive optimal results.. But much can be done if all probable routes of infection are properly assessed and controlled.....i.e. a 'bundle' approach is needed ...

N. Cimolai 2008

sources/reservoirs of *Staphylococcus aureus*

- patients with *S.aureus* infections (skin lesions)
- persistent nasal carriers (patients, personnel)
- Intermittent carriers (patients & personnel)
- contaminated surfaces and innate objects
- domestic animals/pets
- husbandry animals (pigs, poultry, cattle)

Search & Destroy for MRSA
is based on:

risk classification of patients and personnel

- Class A: proven carriers of mrsa
- Class B: high risk* of being mrsa carrier (> 5%)
- Class C: increased risk of carrying mrsa (0.1~5%)
- Class D: neglible risk of carrying mrsa (< 0.1%)

*, this requires local assessment of risk factors!

precautions: patients

- class A (proven) & B(high risk) :
  - strict isolation.
  - cohort nursing.
  - class A patients flagged as mrsa carrier in hospital information systems
  - screen class B patients
- class C (increased risk) :
  - screen and limit contact (separate room)
- class D (neglible risk):
  - standard precautions

precautions: personnel

- class A :
  - not allowed to work in hospital for 3 days.
  - rescreen, treat and rescreen days 10,15, 20
  - back to work on day 3 unless skin lesions
  - follow-up by regular screening for 1 year after incident
- class B :
  - screen and limit work to one unit untill proven negative
- class C :
  - screen only
- class D :
  - standard precautions

Robicsek *et al.*, Ann Int Med 2008; 149: 409-18.

	period 1 (12 mo)	period 2 (12 mo)	period 3 (21 mo)
surveillance	no	icu's only	universal
admissions tested	0	3,334	62,035
positive tests (%)	0	277 (8.3)	3,926 (6.3)
decolonization	no	no	yes
follow up	180 d.p.dis.	same	same
mrsa / 10.000 d.	8.9	7.4	3.9
% reduction	baseline	-36%	-70%

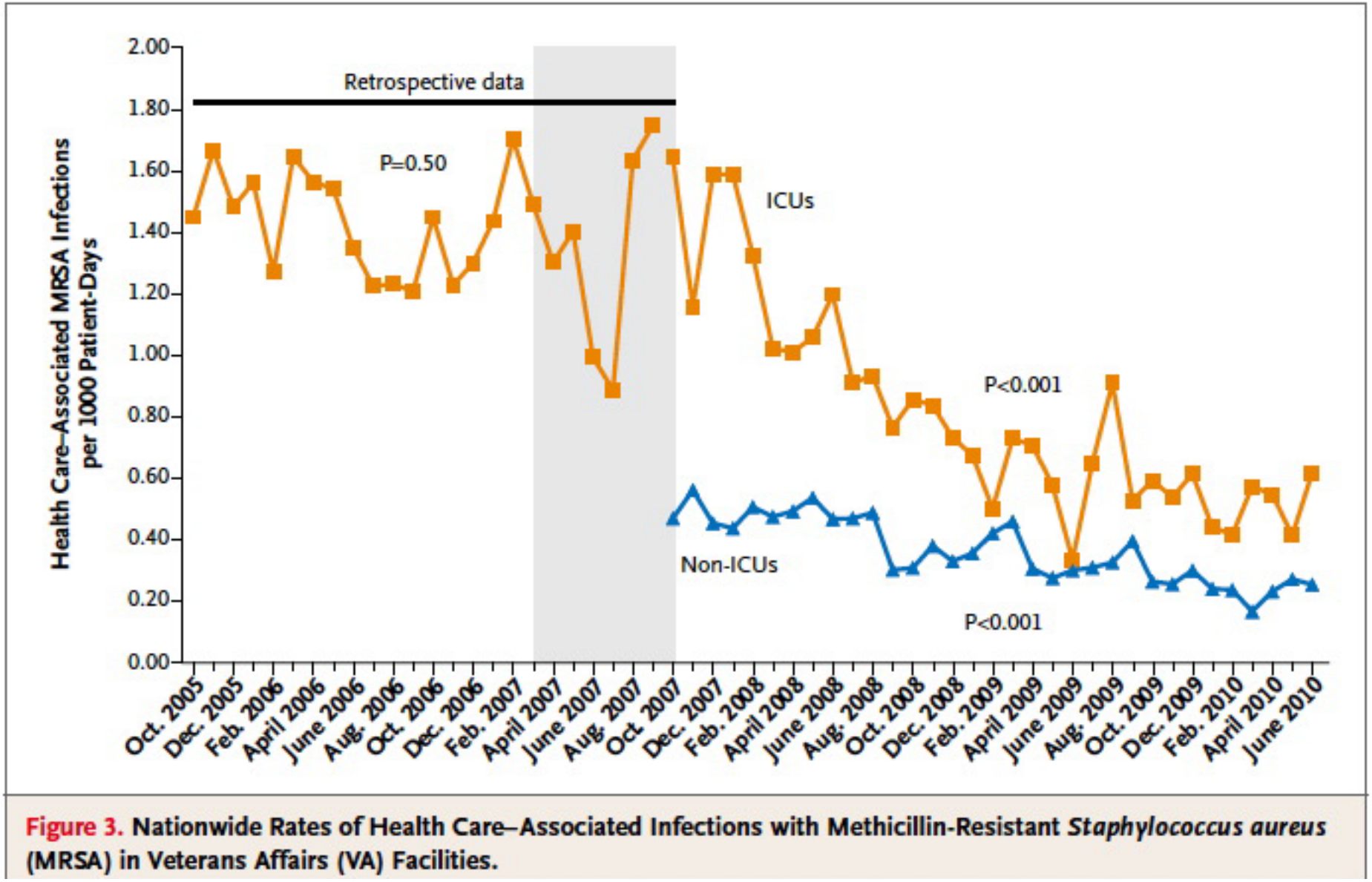


Figure 3. Nationwide Rates of Health Care–Associated Infections with Methicillin-Resistant *Staphylococcus aureus* (MRSA) in Veterans Affairs (VA) Facilities.

Rajiv Jain et al., N Engl J Med 2011;364:1419-30

MDRO containment Netherlands other than MRSA

- Define MDRO
- Screen for MDRO among exposed:
  - Patients sharing same hospital room
  - Health care workers if untractable epidemic
  - Environmental niches if untractable epidemic
- Isolate proven MDRO carriers

MDRO containment Netherlands other than MRSA

- Screen for MDRO in case:
  - patient readmitted within 2 months of discharge
  - patient transfered from hospital with MDRO outbreak/endemicity
  - patient in direct contact with MDRO + patient
  - unexpected MDRO isolate on ICU
  - epidemic spread noted in any ward.
  - environment and healh care workers if untractable epidemic

managing the MDRO menace?

- Change your antibiotic policies:
  - reduce use and include selection pressure when defining policies
- patients with MDRO need barrier nursing (isolation)
- MDRO outbreaks need both antibiotic and infection control interventions
- Screen selectively for MDRO, prioritize high risk patients and settings, define risk categories locally
- Re(search) for niches, sources and transmission routes, and destroy or contain them

BE BRAVE

Perseus and Medusa

J Singer Sargent
1910