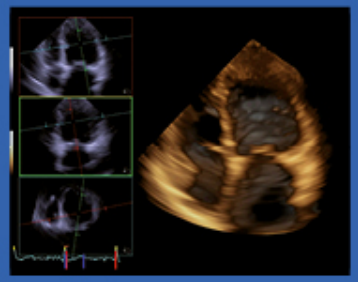


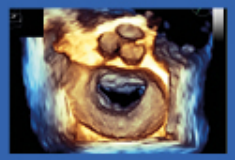
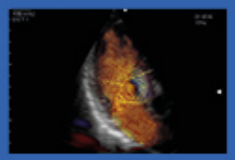
EuroValve

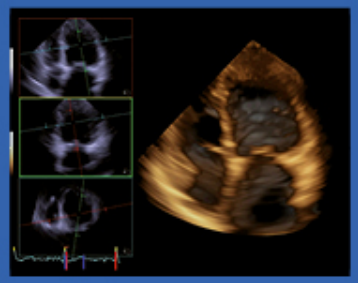
March 27 - 28, 2015

Controversy in Infective Endocarditis Prophylaxis is no Longer Needed Contra

Bernard Iung
Bichat Hospital, AP-HP
Paris Diderot University
DHU FIRE





EuroValve
March 27 - 28, 2015

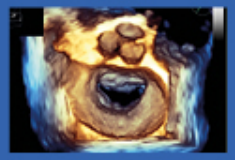
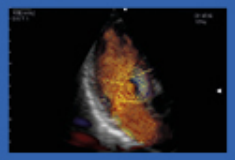
Faculty disclosure

Bernard Iung

I disclose the following financial relationships:

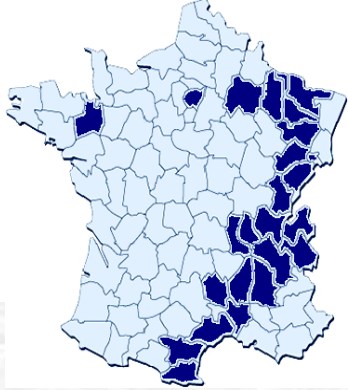
Consultant for Abbott Boehringer Ingelheim, Valtexch
Paid speaker for Edwards Lifesceinces



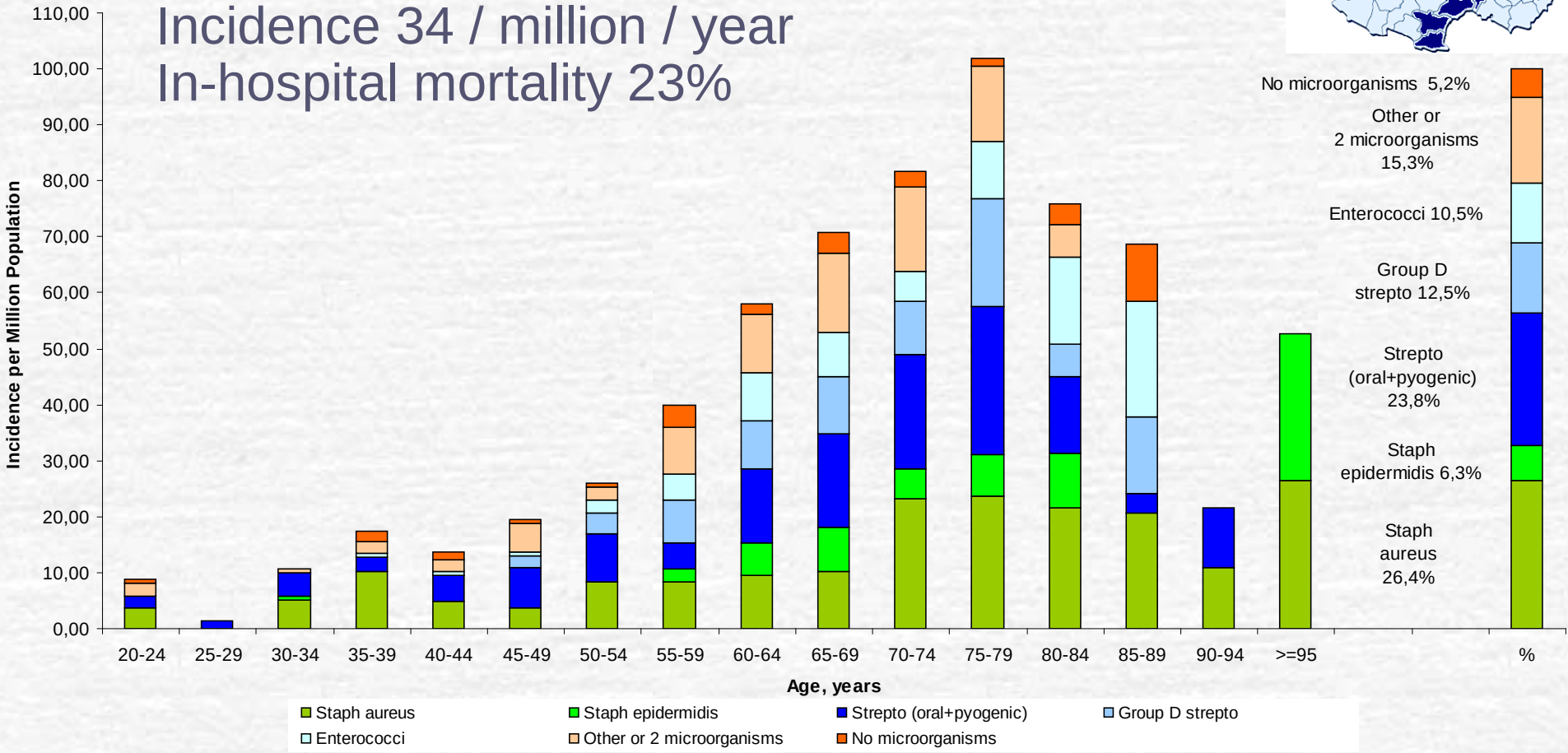



www.eurovalvecongress.com

IE in France in 2008



Incidence 34 / million / year
In-hospital mortality 23%



(Selton Suty et al. Clin Infect Dis 2012;54:1230-9)

Antibiotic Prophylaxis in IE

- Expert guidelines & consensus conferences
  - USA (AHA): 1954, 1965, 1977, 1984, 1990, 1997,
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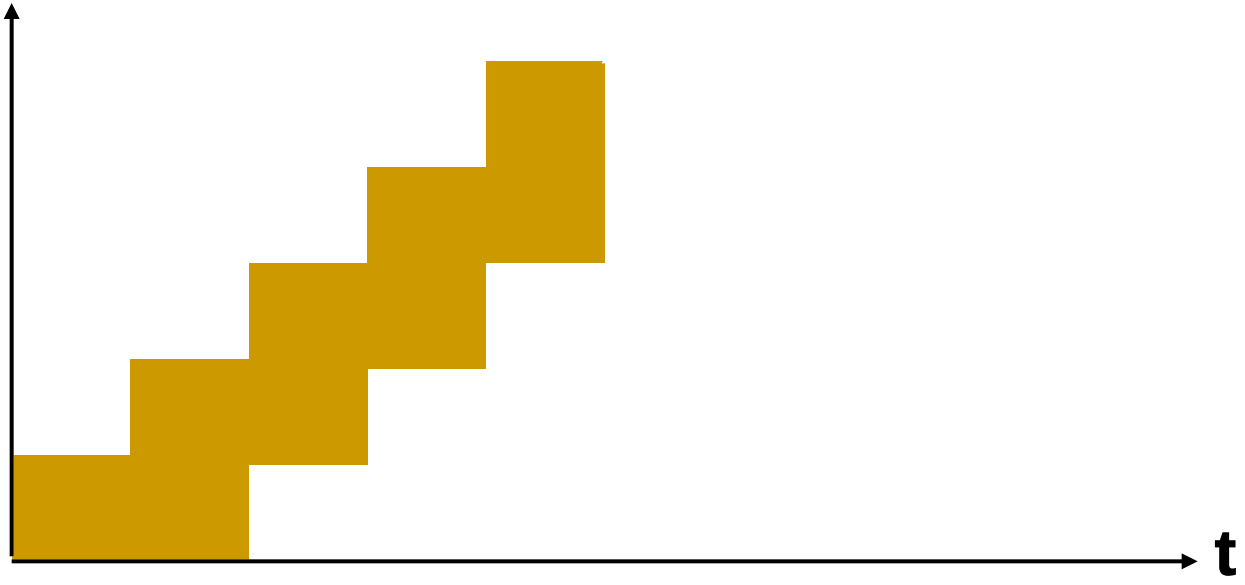
All type of procedure
in any patient at risk



(Duval et al. Lancet Infect Dis 2008;8:225-32)

ELSEVIER

Médecine et maladies infectieuses 32 (2002) 587–595

Médecine et maladies infectieuses

www.elsevier.com/locate/medmal

Short text*

Prophylaxis of infective endocarditis
Revision of the march 1992 French consensus conference
French Recommendations 2002

Supported by the Société de Pathologie Infectieuse de Langue Française (SPILF) with the collaboration of the Société Française de Cardiologie (SFC), with the participation of

Antibiotic Prophylaxis in IE

- Expert guidelines & consensus conferences
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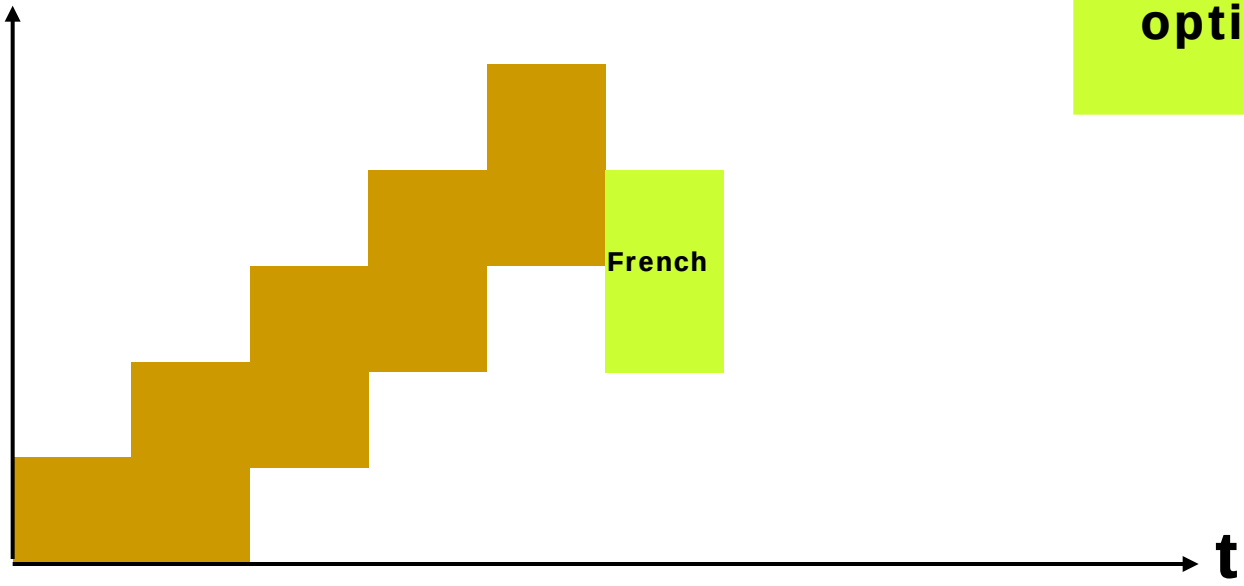
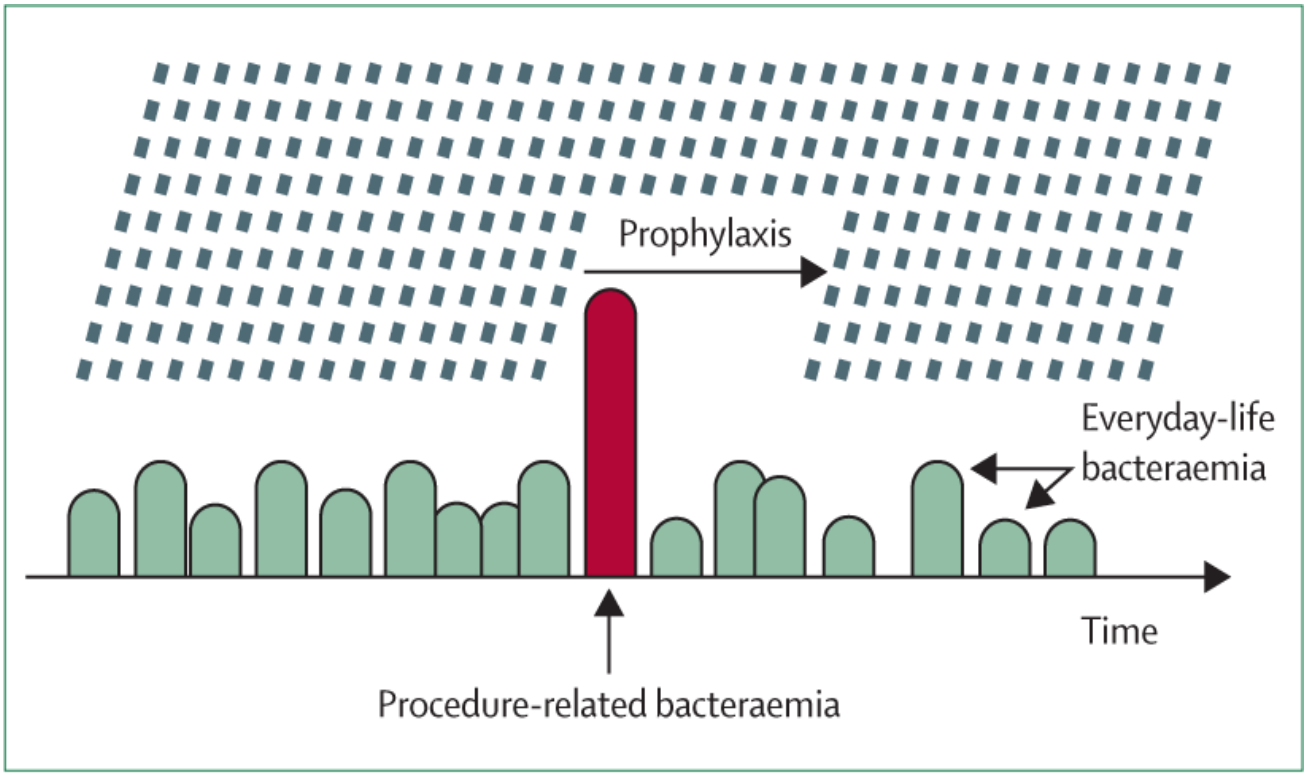
All type of procedure,
optional in intermediate-risk patients



Rationale for restricting antibiotic prophylaxis in IE

- Concerns on bacteraemia as a surrogate endpoint of IE
- Respective roles of:
  - low-dose bacteraemia during daily life
  - vs. high-dose bacteraemia during dental care
- Low risk of IE after dental care in practice
- No convincing proof of the clinical efficacy of prophylaxis
- The potential benefit of antibiotic prophylaxis should be weighed against the risks for the individual and the community

Continuous low-grade vs. transient high-grade bacteraemia



Adapted from P. Moreillon

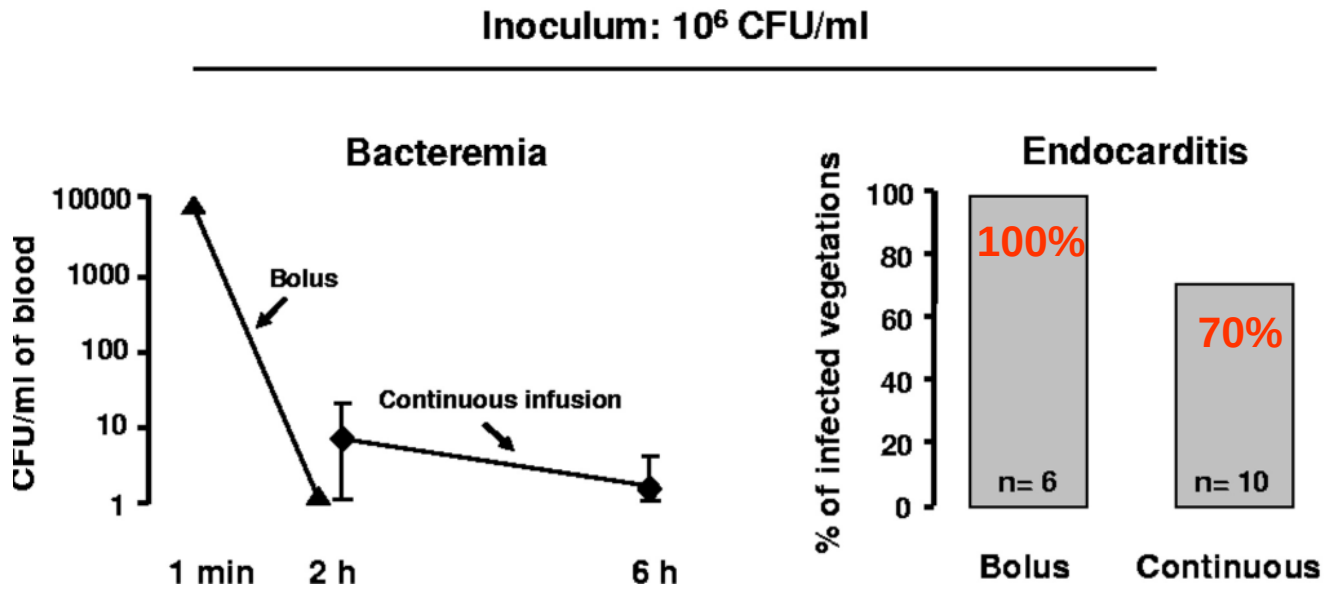
(Duval et al. Lancet Infect Dis 2008;8:225-32)

Induction of Experimental Endocarditis by Continuous Low-Grade Bacteremia Mimicking Spontaneous Bacteremia in Humans[▽]

T. R. Veloso,[1] M. Amiguet,[2] V. Rousson,[2] M. Giddey,[1] J. Vouillamoz,[1] P. Moreillon,[1] and J. M. Entenza[1]*

Rats inoculated with the same Strep intermedius inoculum:

either by **bolus** 1ml in 1 min or by **continous infusion** over 10 h



- Continuous low-grade bacteremia induces experimental IE
- **Bacteremia levels** required to infect vegetation after bolus are much higher than those required after continuous infusion

(Veloso et al. Infect Immun 2011;79:2006-11)

Estimated Risk of IE with or without Antibiotic Prophylaxis

Table 1. Estimated number of known predisposing cardiac conditions (PCCs) among French adults (age, 25–84 years) and of annual at-risk dental procedures among subjects with PCCs.

Characteristic	Adults	At-risk dental procedures per year		
		Total	Protected procedures[a]	Unprotected procedures[b]
Total				
No. (%) of patients or yearly procedures	1,287,296	2,746,384	1,042,189 (38)	1,704,195 (62)
95% CI	999,196–1,575,396	2,304,094–3,188,674	748,978–1,335,399	1,373,064–2,035,327

[a] Protected procedures were defined as invasive procedures in which antibiotic prophylaxis was administered.
[b] Unprotected procedures were defined as invasive procedure in which antibiotic prophylaxis was not administered.

7 EI
1/150.000

37 EI
1/46.000

559 definite IE (French survey 1999)

2805 patients cohorts Paquid Canevas

RRR=82%

(Duval et al. Clin Infect Dis 2006;42:e102-7)

What are the Risks ?

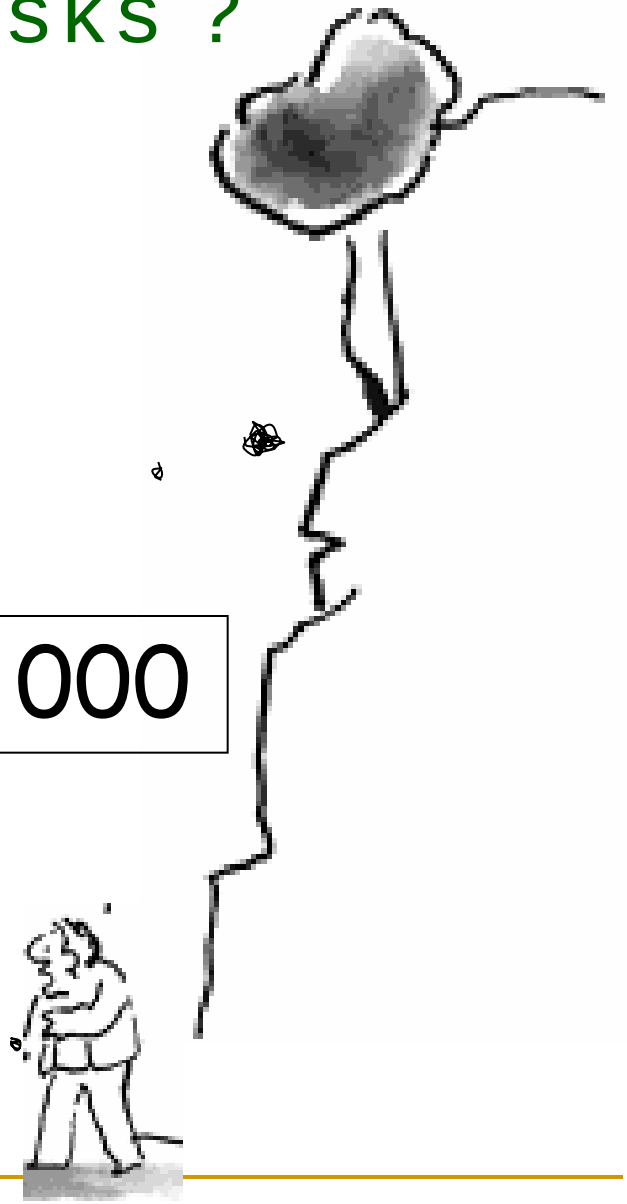
Risk of IE after dental care
without antibiotic prophylaxis

1/50 000

Risk of death after IE

1/ 250 000

20% death



(Duval CID 2006, Hoen JAMA 2002, Chu Circulation 2004, Thuny Circulation 2005)

What are the Risks ?

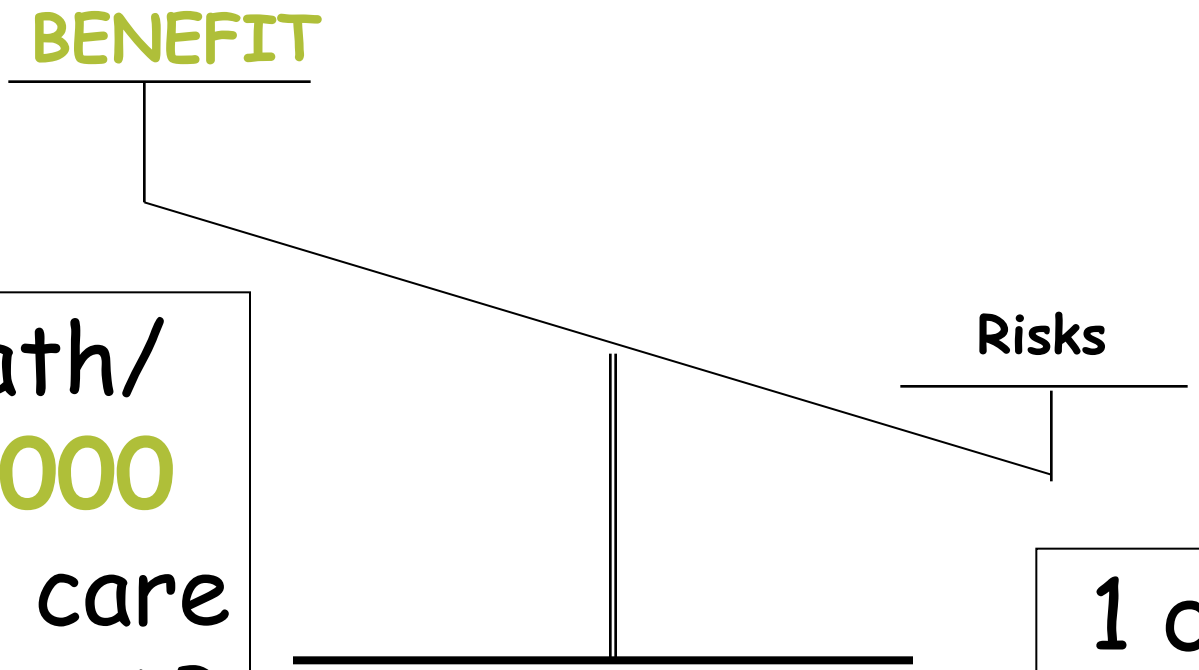
Risk of antibiotic prophylaxis

- Anaphylaxis / death

1 death / 75 000

Benefit-Risk Analysis

Intermediate-risk heart valve disease

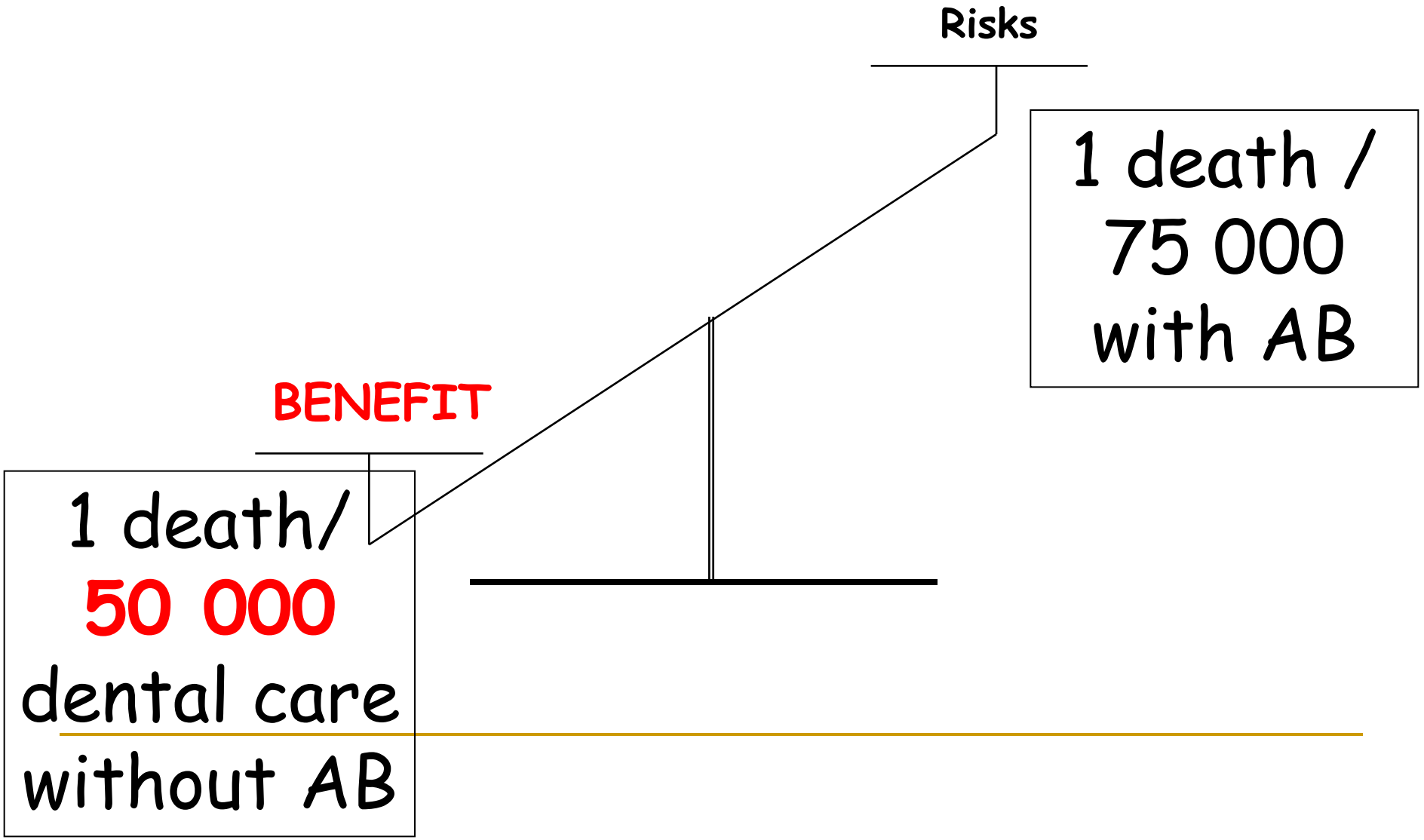


1 death/
250 000
dental care
without AB

1 death /
75 000
with AB

Benefit-Risk Analysis

High-risk heart valve disease

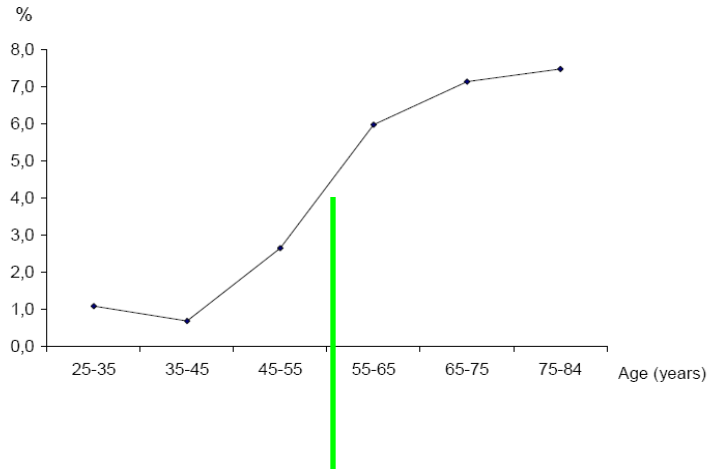


Number of known heart disease at risk

- Telephone poll in France
  - 2805 subjects18-75years
  - Standardized questionnaire
  - Extrapolation to French standardized population

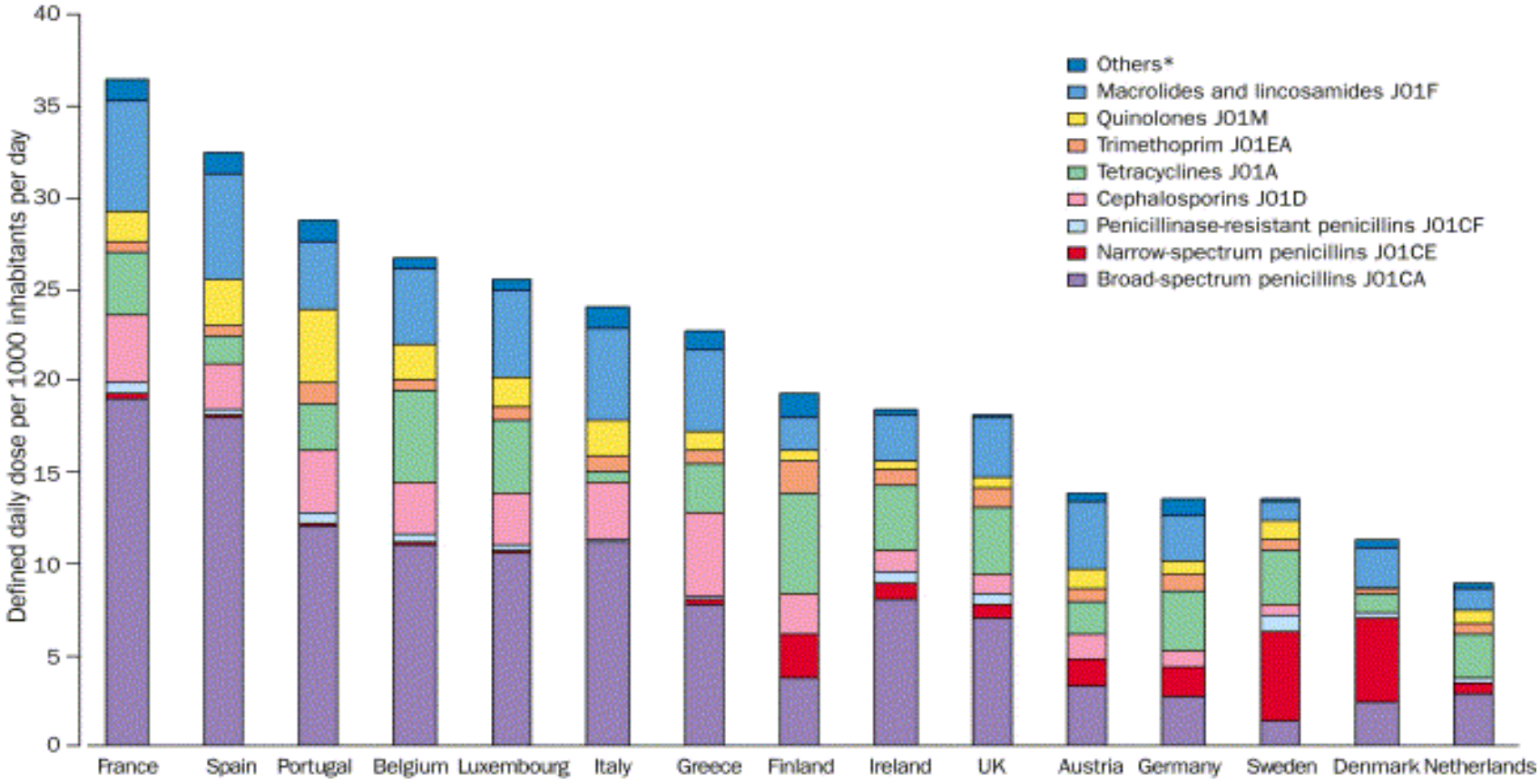
  Native valve diseases : **1 058 726 pts**

  Heart valve prosthesis or repair : **228 570 pts**



(Duval et al. Clin Infect Dis 2006;42:e102-7)

Antibiotics Sales in the European Union



(Cars et al. Lancet 2001;357:1851)

Antibiotic Prophylaxis in IE

- Expert guidelines & conférences de consensus
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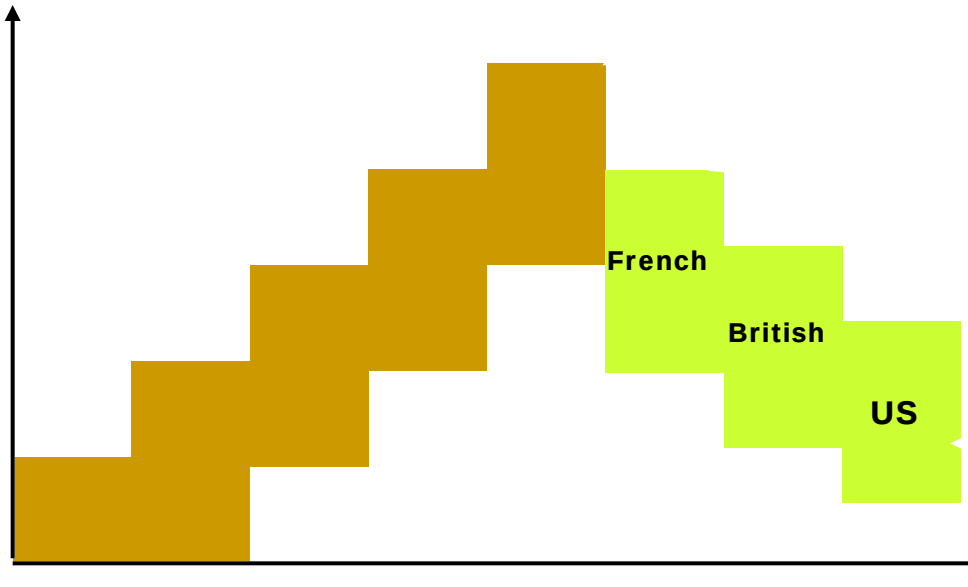

All type of procedure in any patient at risk

All type of procedure, optional in intermediate-risk patients

All type of dental care in any patient at high risk

Only certain dental care in any patient at high risk

Antibiotic Prophylaxis in IE

Expert guidelines & consensus conferences

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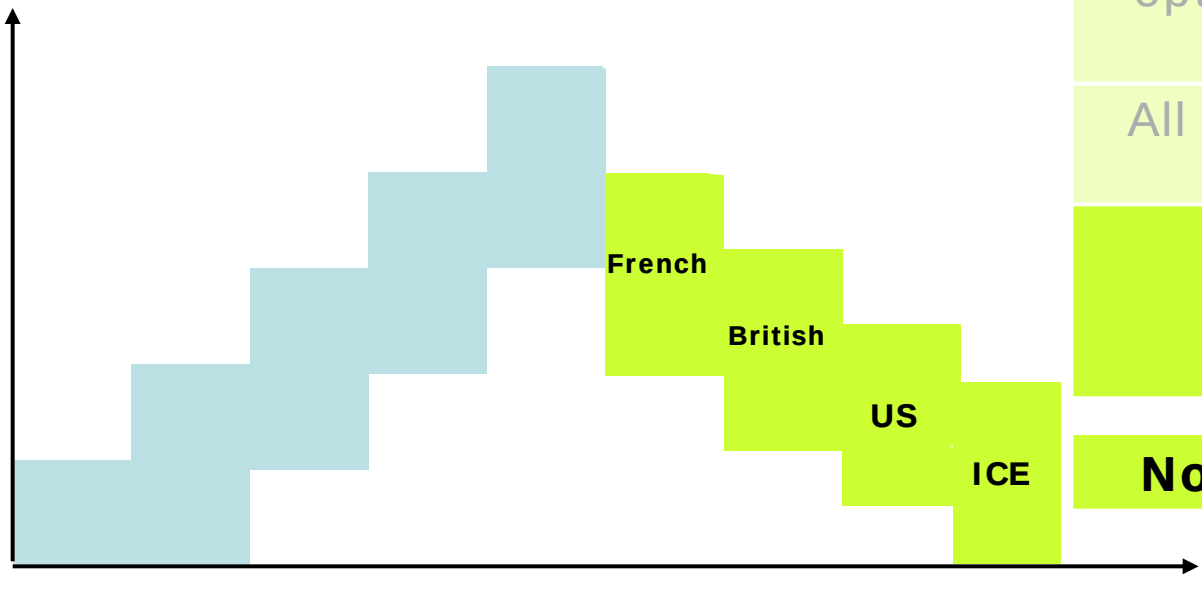

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All type of procedure, optional in intermediate-risk patients

All type of dental care in any patient at high risk

Only certain dental care in any patient at high risk

No antibiotic prophylaxis

Rationale for NICE Guidelines

Downgrading of the risk of IE after dental care

No indication if there is no proof of efficacy

Antibiotic prophylaxis is cost-ineffective

Limitations

Reliability of estimations of the risk of IE after dental care

Antibiotic Prophylaxis in IE

- Expert guidelines & consensus conferences
  - USA (AHA): 1954, 1965, 1977, 1984, 1990, 1997, 2007
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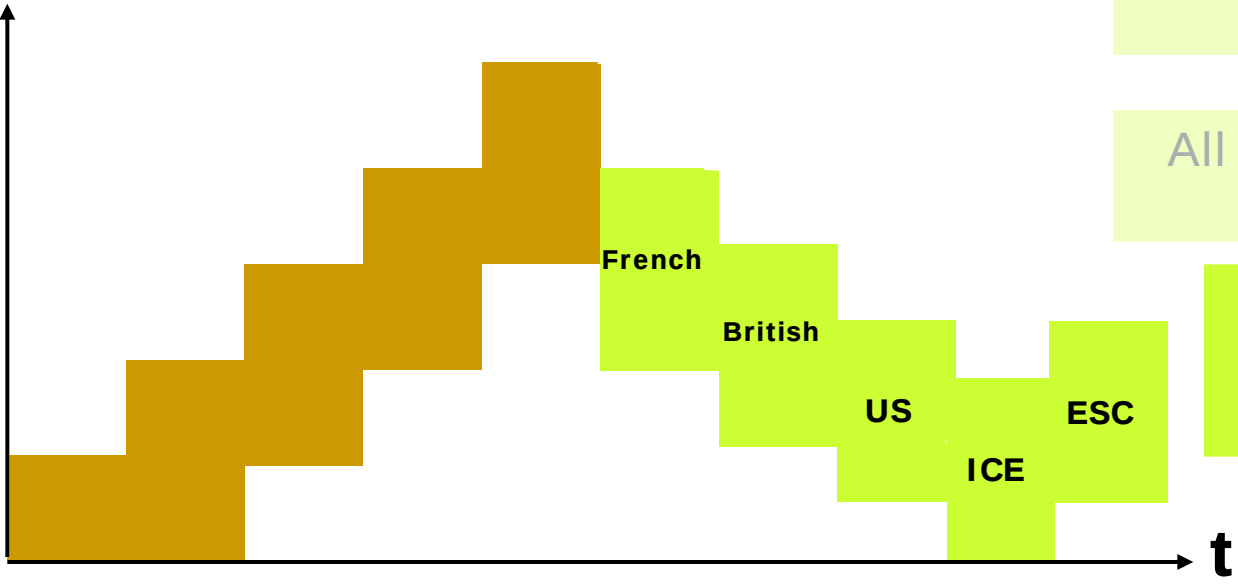
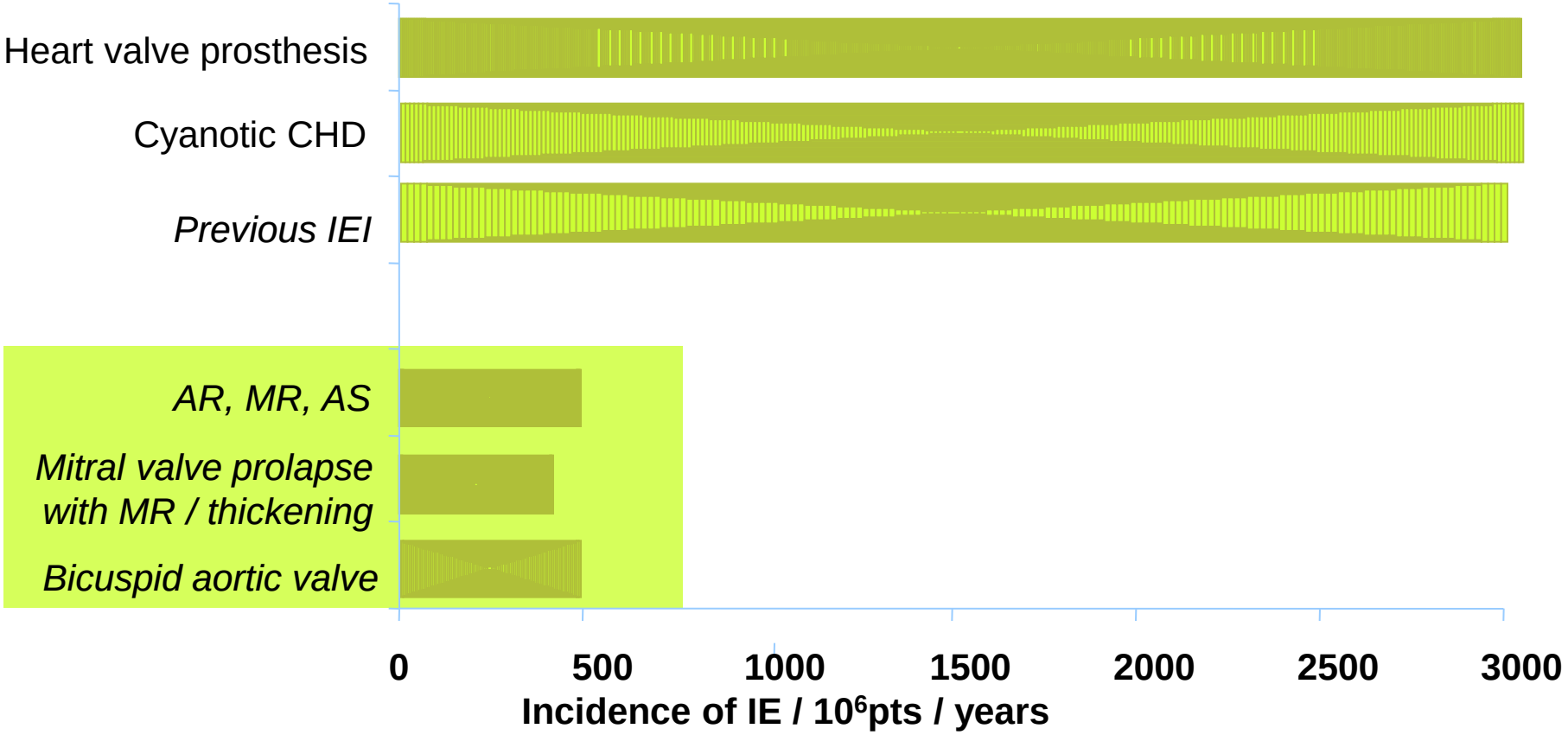


Heart Diseases at Risk for IE

- **Risk of IE (incidence)**



- **Morbidity and mortality in case of IE**

(Duval et al. Lancet Infect Dis 2008;8:225-32)

Cardiac conditions at highest risk of IE

Recommendations	Class	Level
Antibiotic prophylaxis should only be recommended for patients at highest risk of IE:	IIa	C
1. Patients with a prosthetic valve or any prosthetic material used for cardiac valve repair,		
2. Patients with previous IE,		
3. Patients with congenital heart disease (CHD): a. Cyanotic CHD with or without previous interventions, b. CHD with complete repair (surgical or percutaneous) for the next 6 months, c. When a residual defect persists after cardiac surgery or percutaneous technique.		
Antibiotic prophylaxis is no longer recommended in other forms of valvular or CHD.	III	C

European Heart Journal (2009) 30:2369–2413

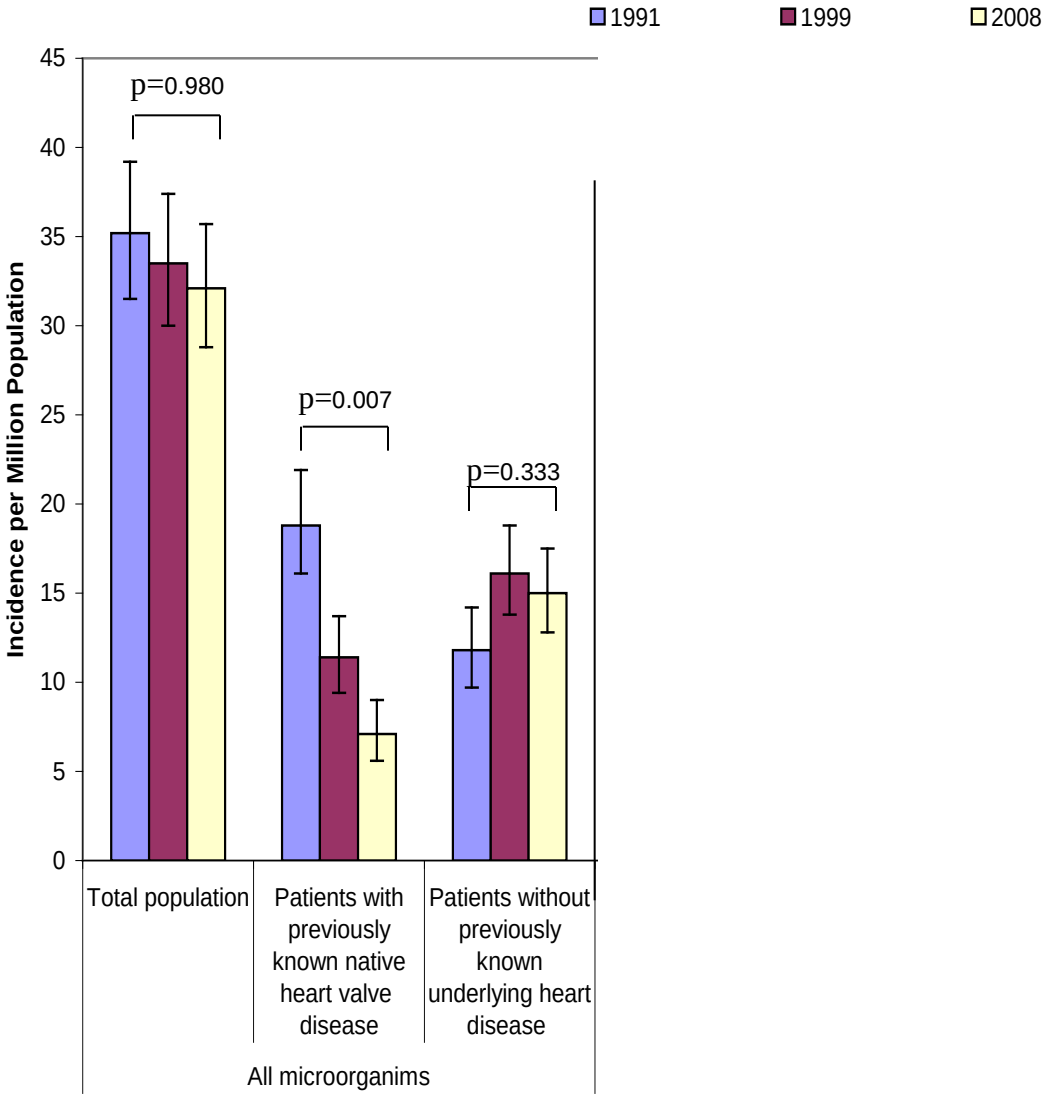
Procedures at highest risk of IE (1)

Dental procedures

Recommendations	Class	Level
AB should be considered only for dental procedures with manipulation of the gingival or periapical region of the teeth or perforation of the oral mucosa.	IIa	C
AB is not recommended for local anaesthetic injections in non infected tissue removal of sutures, dental X-rays. Placement or adjustment of removable prosthodontic or orthodontic appliances or braces. After the shedding of deciduous teeth or trauma to the lips and oral mucosa.	III	C

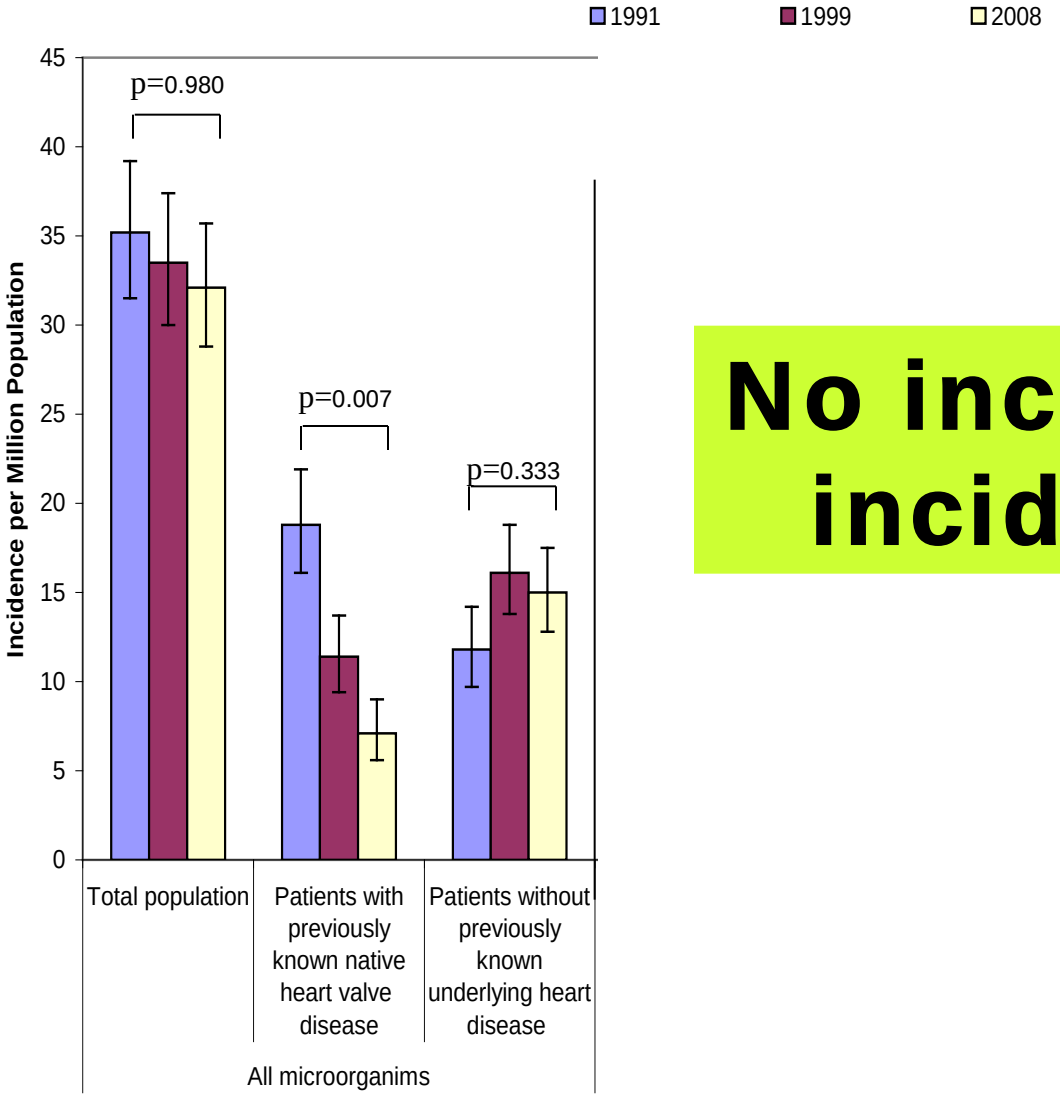
European Heart Journal (2009) 30:2369–2413

Impact of guideline modifications on IE epidemiology



(Duval et al. J Am Coll Cardiol 2012;59:1968-76)

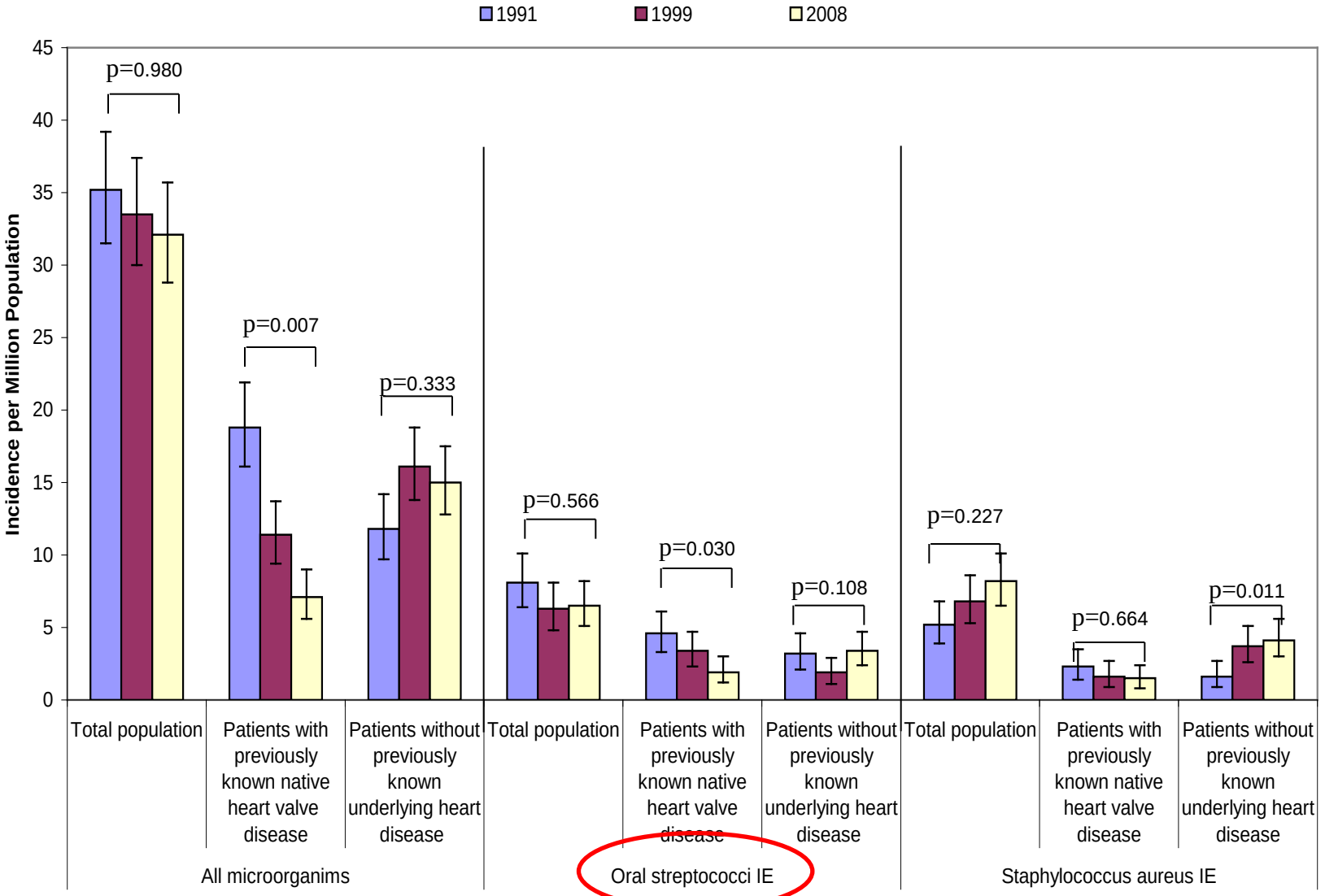
Impact of guideline modifications on IE epidemiology



No increase in the incidence of IE

(Duval et al. J Am Coll Cardiol 2012;59:1968-76)

No increase in the incidence of IE due to oral streptococci between 1999 and 2008



(Duval et al. J Am Coll Cardiol 2012;59:1968-76)

Circulation
JOURNAL OF THE AMERICAN HEART ASSOCIATION

American Heart Association

Incidence of Infective Endocarditis Caused by Viridans Group Streptococci Before and After Publication of the 2007 American Heart Association's Endocarditis Prevention Guidelines

Daniel C. DeSimone, MD; Imad M. Tleyjeh, MD, MSc; Daniel D. Correa de Sa, MD; Nandan S. Anavekar, MBBCh; Brian D. Lahr, MS; Muhammad R. Sohail, MD; James M. Steckelberg, MD; Walter R. Wilson, MD; Larry M. Baddour, MD; for the Mayo Cardiovascular Infections Study Group

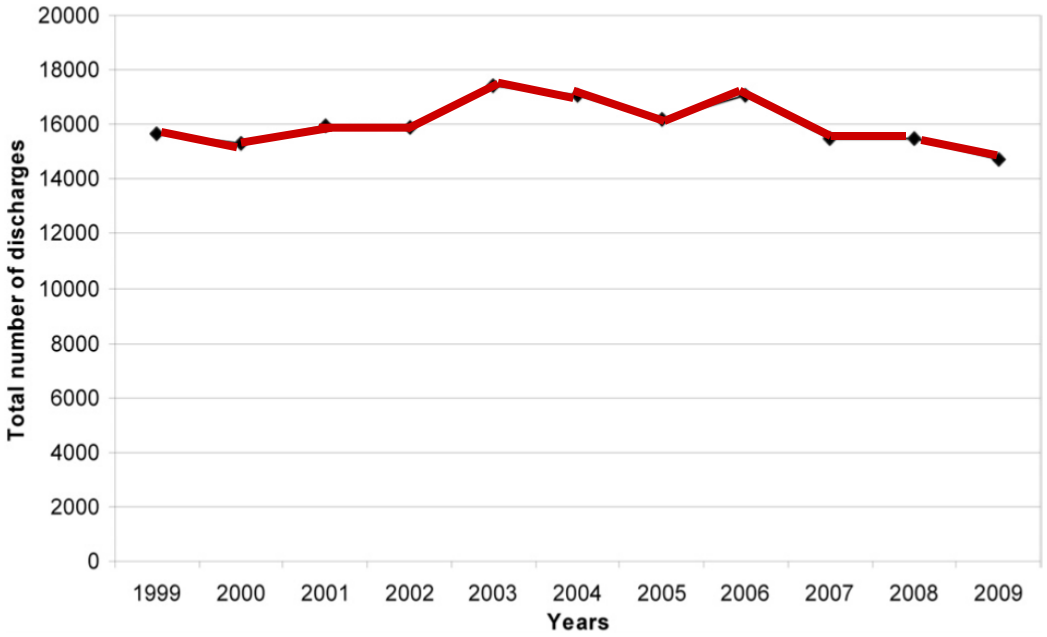


Figure 2. Total number of hospital discharges with *International Classification of Diseases, Ninth Revision, Clinical Modification* discharge diagnosis of 421.0, 041.00, and 041.09 from 1999 to 2009 from the Nationwide Inpatient Sample.

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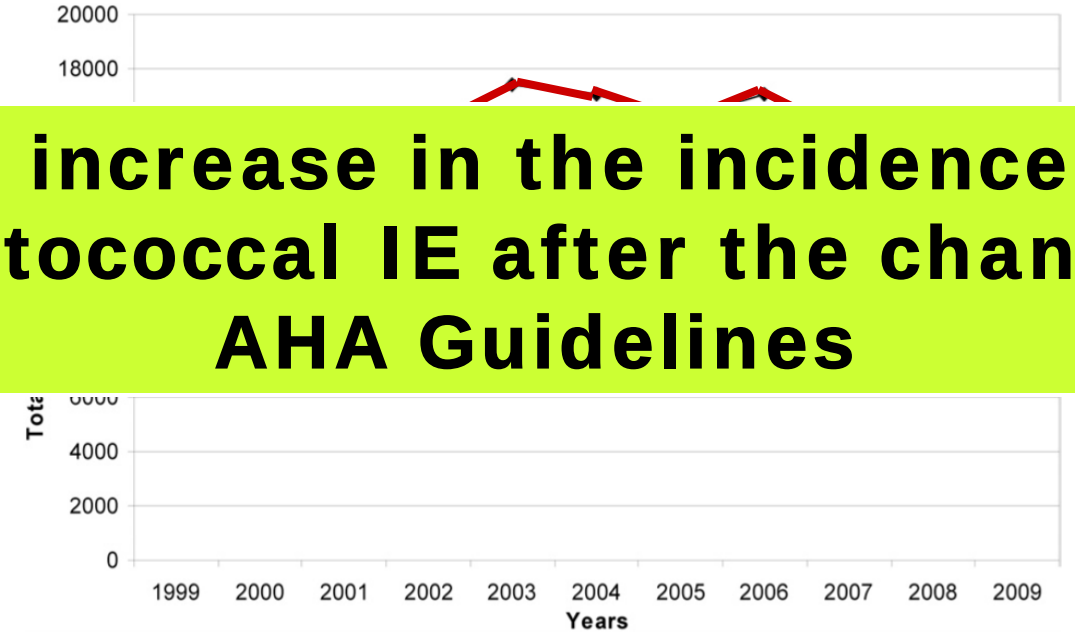
No increase in the incidence of streptococcal IE after the change in AHA Guidelines



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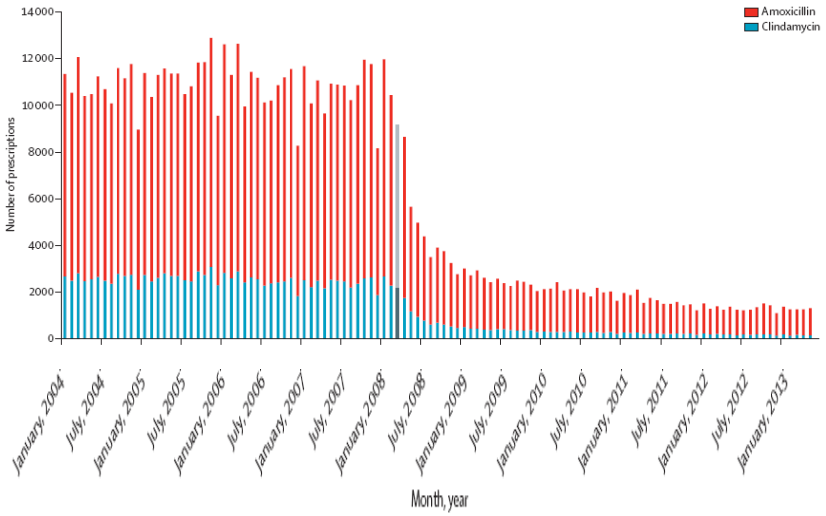
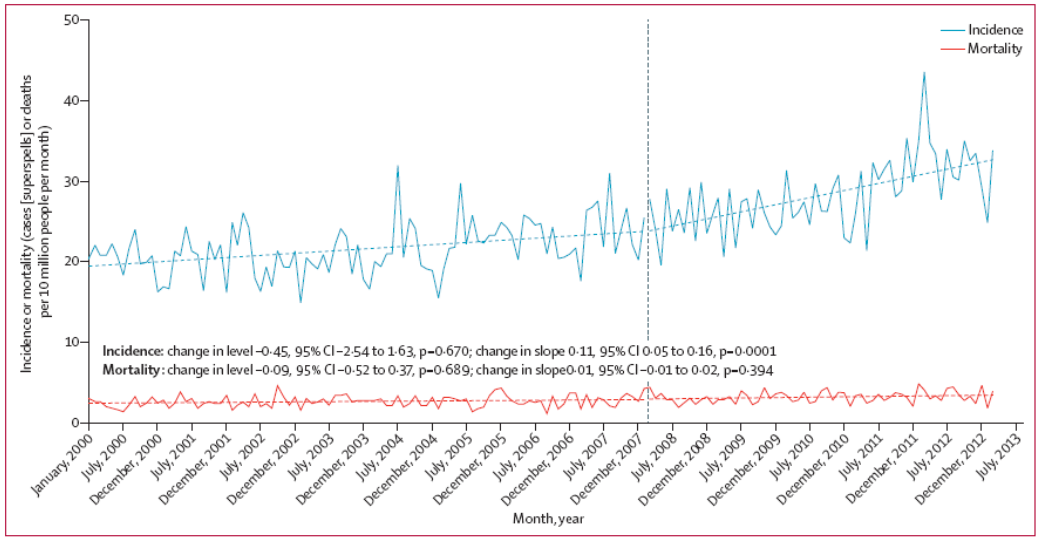
Incidence of IE in England (2000-2013)

Analysis of ICD discharge codes with a primary diagnosis of IE

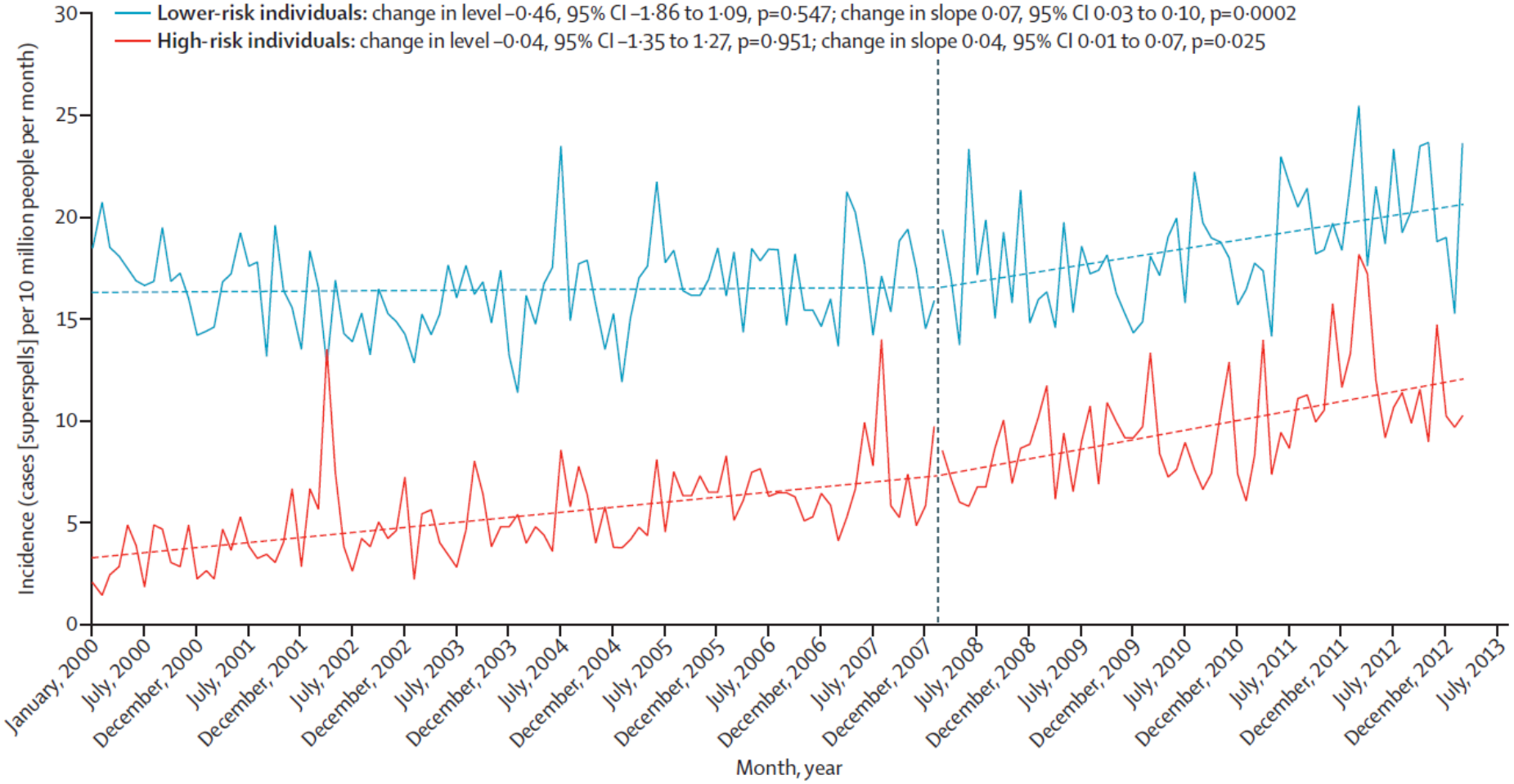




Temporal association but no proof of a causal relationship.

(Dayer et al. Lancet 2014; online first Nov 18)

Incidence of IE in England (2000-2013)



(Dayer et al. Lancet 2014; online first Nov 18)

Conclusions

- The frequency and severity of endocarditis justifiy efforts of prevention
- Risk-benefit analyses do not support antibiotic prophylaxis in intermediate-risk patients
- Estimations of the risk of endocarditis after dental care in high-risk patients justify indications of antibiotic prophylaxis in selected patients
- Non-specific hygiene measures are probably more effective than antibiotic prescription