
CLINICAL IMPACT AND ECONOMIC OUTCOMES OF BONE AND JOINT INFECTIONS IN FRANCE

L. GRAMMATICO-GUILLON, S. BARON,
S. GETTNER, A.I. LECUYER, C. GABORIT,
P. ROSSET, E. RUSCH, L. BERNARD

Univ. Hosp. of Tours, France

**NO CONFLICT of
INTEREST**

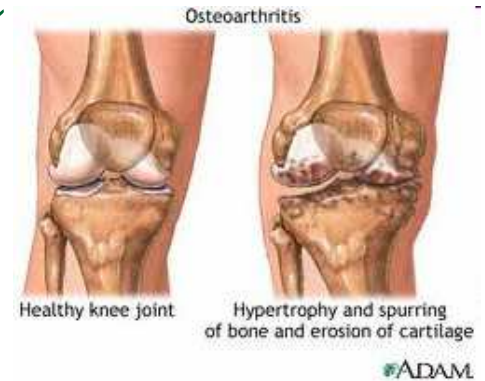
INTRODUCTION

- Continuation of the epidemiological work on bone and joint infections (BJI) from the French hospital discharge database *

Bone and joint Infection Literature

- Partial and scattered data

- UK : septic arthritis prevalence 2/100 000
- Norwegian or Canadian registry : device associated BJI
- Lipsky *et al* : BJI from US hospital discharge data



Nade *Best Pract Res Clin Rheumatol* 2003
Margaretten *ME JAMA* 2007
Espehaug *et al Registre norvegien* 2006

- In France : few national surveys

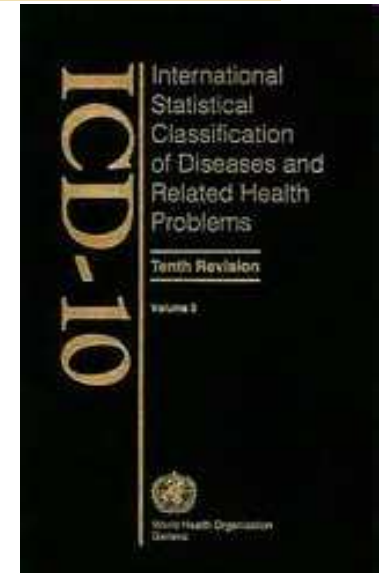
- Data from the National Health Agency (*Institut de Veille Sanitaire*), or French infection control center
- National survey network for surgical site infection (*ISO-Raisin*) : data for device associated BJI infection, but only 30 days of follow up
- French prosthesis registry



Dubost *JJ et al Ann. Rheum. Dis* 2002; 61:267-269
Dumaine *et al. Rev Chir Orthop Reparatrice Appar Mot.* 2007 Feb;93(1):30-6
Debarge *et al. Rev Chir Orthop Reparatrice Appar Mot.* 2007 Oct;93(6):582-7

French Hospital Discharge Database

- National and perennial database
- Medico - administrative data
- Data are collected for each stay, regardless of public or private French hospital
- Anonymised and linked data, merging hospital stays to patients



Aim of the study

- To describe the clinical impact and economic outcomes of BJI using 2008 national hospital discharge database (NHDD)
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Methods

Extraction

- All the hospitalization with at least one ICD-10 code:
 - ❑ Septic arthritis (M00+;M01+)
 - ❑ Osteomyelitis (M86+;M90+; A180)
 - ❑ Spondylodiscitis (M46+; M49+)
 - ❑ Device associated bone and joint infection (T84+)
 - Irrespective of the position in the coding (principal or secondary diagnosis)
 - We created a case definition, based on an algorithm in consultation with surgeons and medical practitioners
-

Methods

Analysis

- Validation of case definition
 - Se 99%, Sp 94%, PPV 97% and PNV 98%

 - Patient and hospital stays analysis
 - Annual prevalence
 - Comorbidities, coded microorganisms
 - Type and length of stay (LOS)
 - Discharge destination
 - Hospital costs (€/€)
-

Results

- In 2008, there were 16 million hospitalizations
 - 28,453 patients met the case definition
 - Corresponding to 36,252 hospital stays
-

Demographic characteristics of BJI, France 2008

Patient' characteristics	Patients without device N (%)	Patients with device N (%)	p
Age mean (median, range)	62.4 (65, 15-105)	64.6 (69, 15-105)	p<0.001
Sex male	12,188 (63.8)	5,043 (53.2)	p<0.001
Case Fatality	912 (4.8%)	410 (4.4%)	NS
Bone and Joint infection type			
septic arthritis (53%)	8,463 (44.3)	6,558 (70.1)	
osteomyelitis (34%)	8,157 (42.7)	1,525 (16.3)	
spondylodiscitis (10%)	2,480 (13.0)	212 (2.3)	
imprecise device associated BJI (11%)	0	1,058 (11.3)	p<0.001
TOTAL	19,100 (67)	9,353 (33)	

RR Relative risk and 95% CI*

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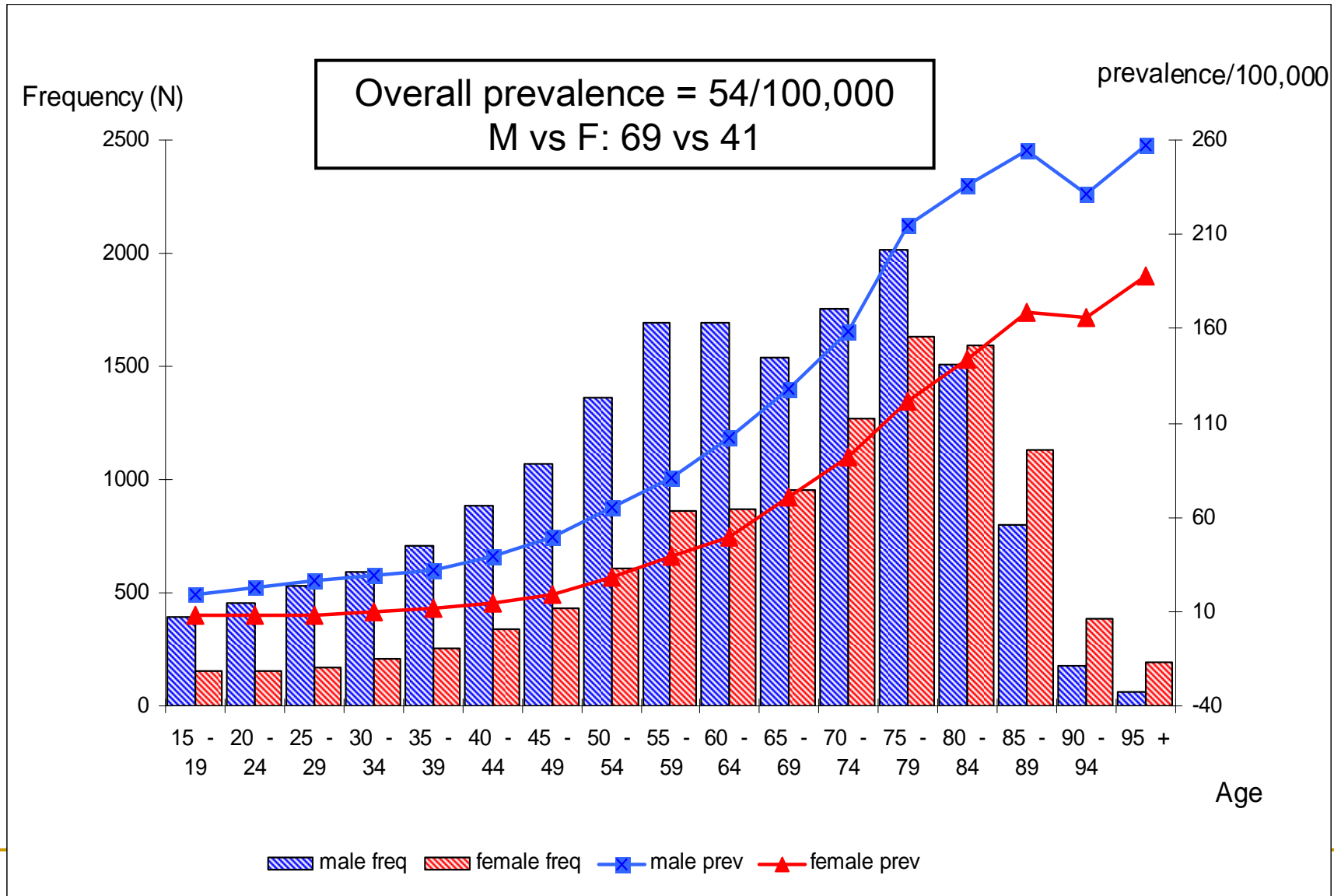
RR* Relative risk and 95% CI

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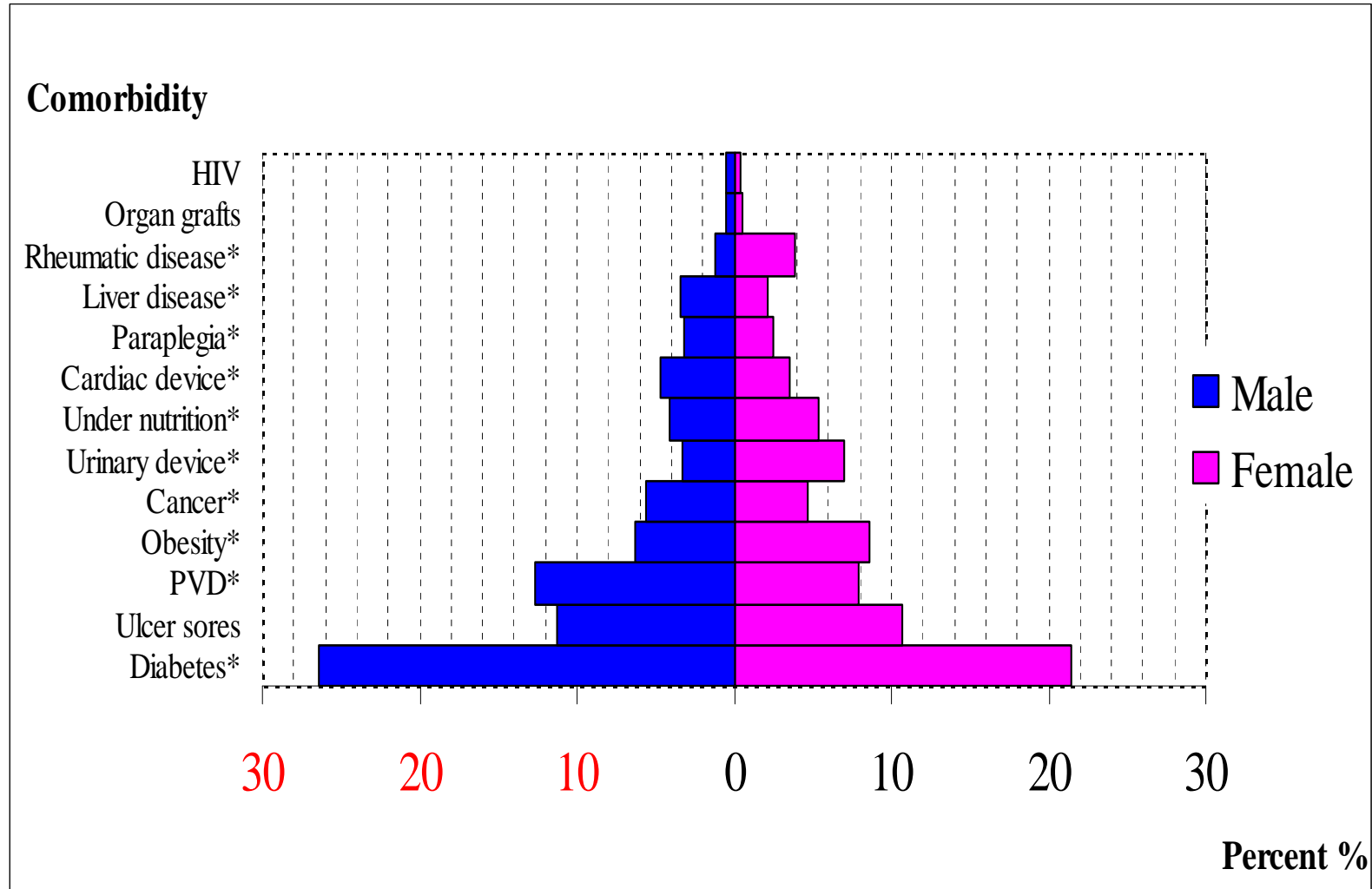
Socio-démographic data

- **Sex ratio M:F = 1.54**
 - **Mortality rate = 2.5 / 100,000**
 - 2.9 in male vs. 2.1 in female
 - **Case fatality = 4.6%**
 - **Rehospitalization rate = 19.3%**
 - 72% single rehospitalization
 - Higher in device associated BJI (RR1.11, 95% CI 1.06-1.16)
-

BJI Prevalence in France in 2008

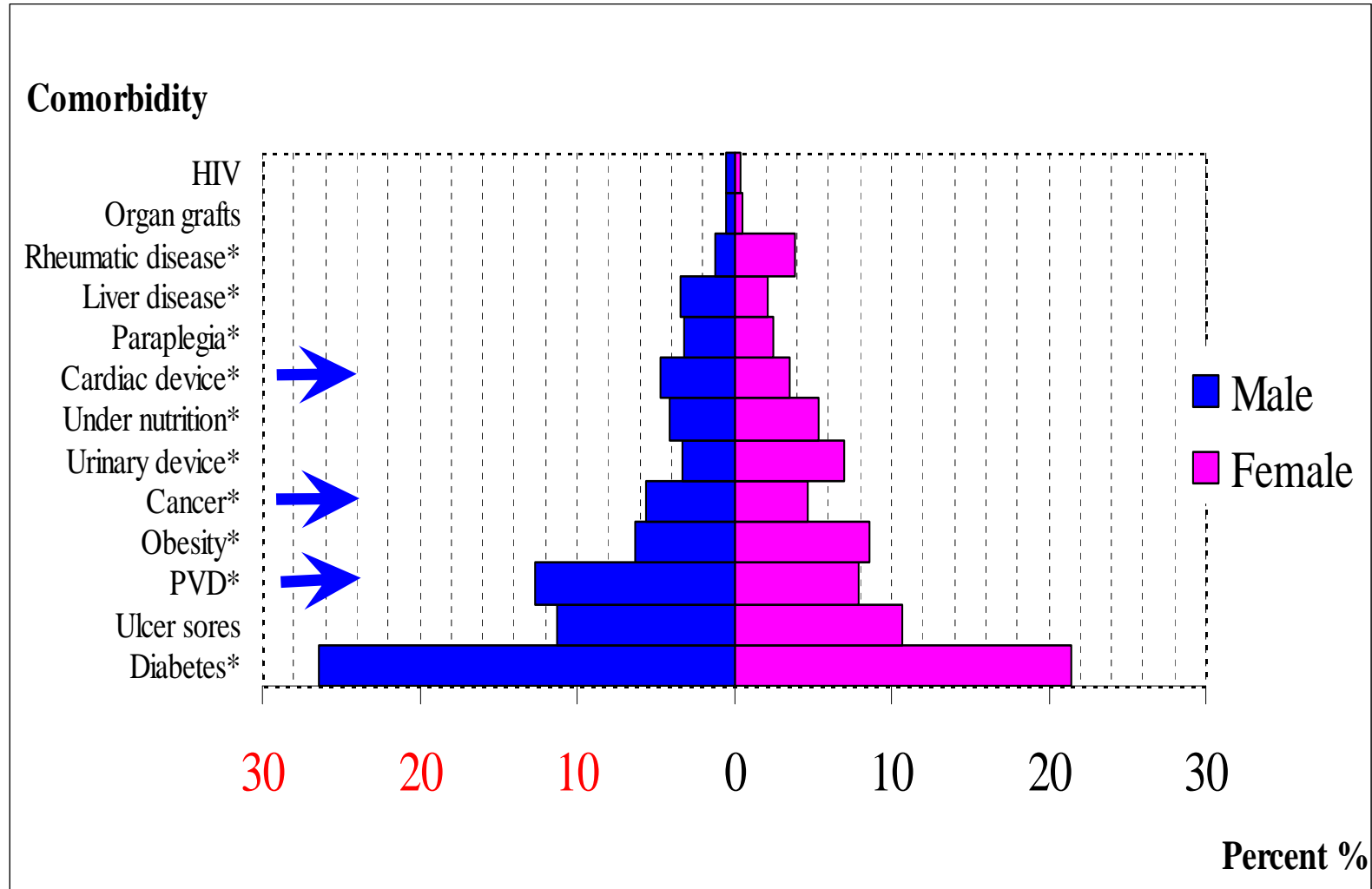


Comorbidity by sex for BJI, France 2008



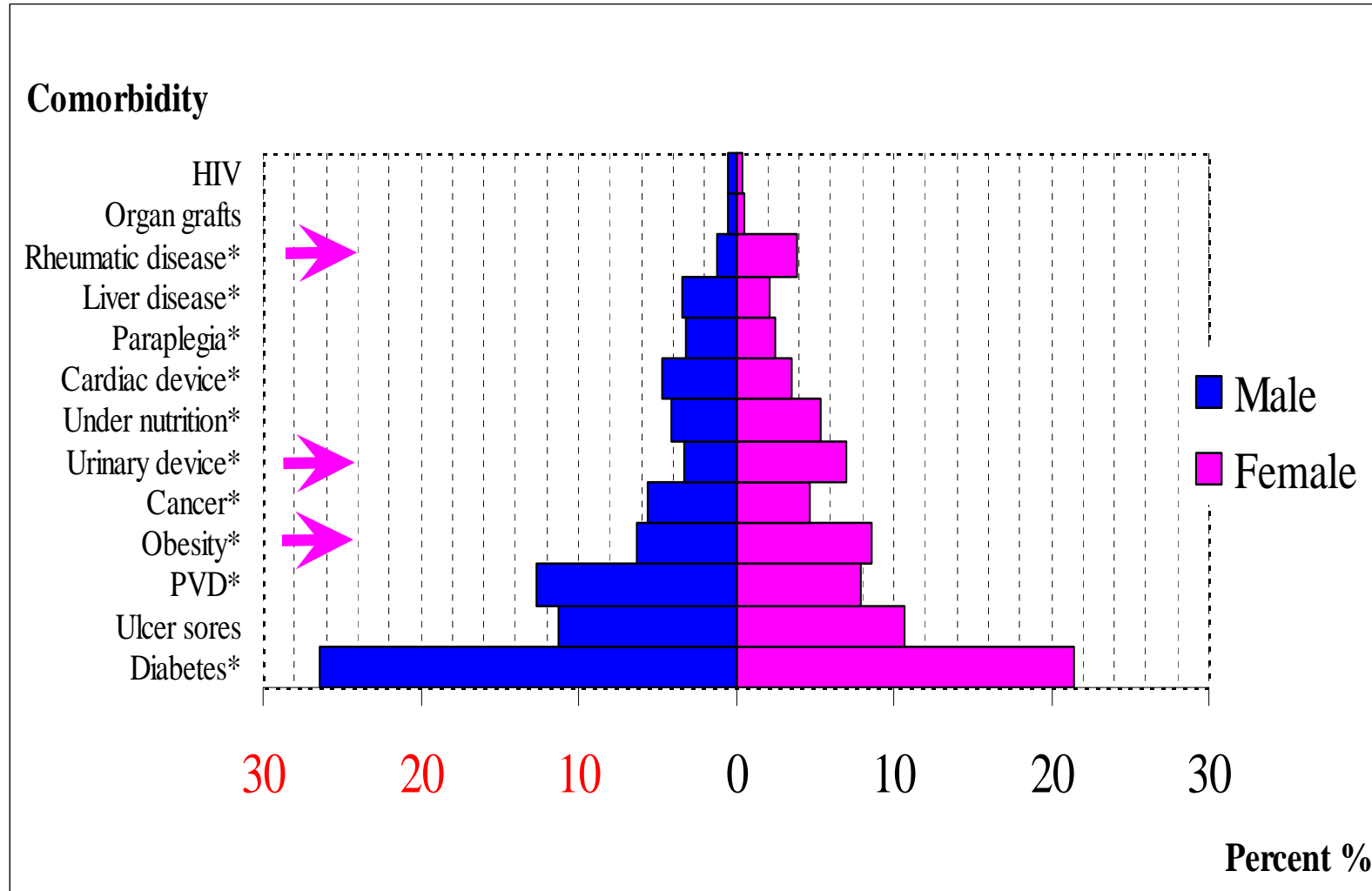
* $p < 0.001$; HIV: Human Immunodeficiency Virus ; PVD : peripheral vascular disorder

Comorbidity by sex for BJI, France 2008



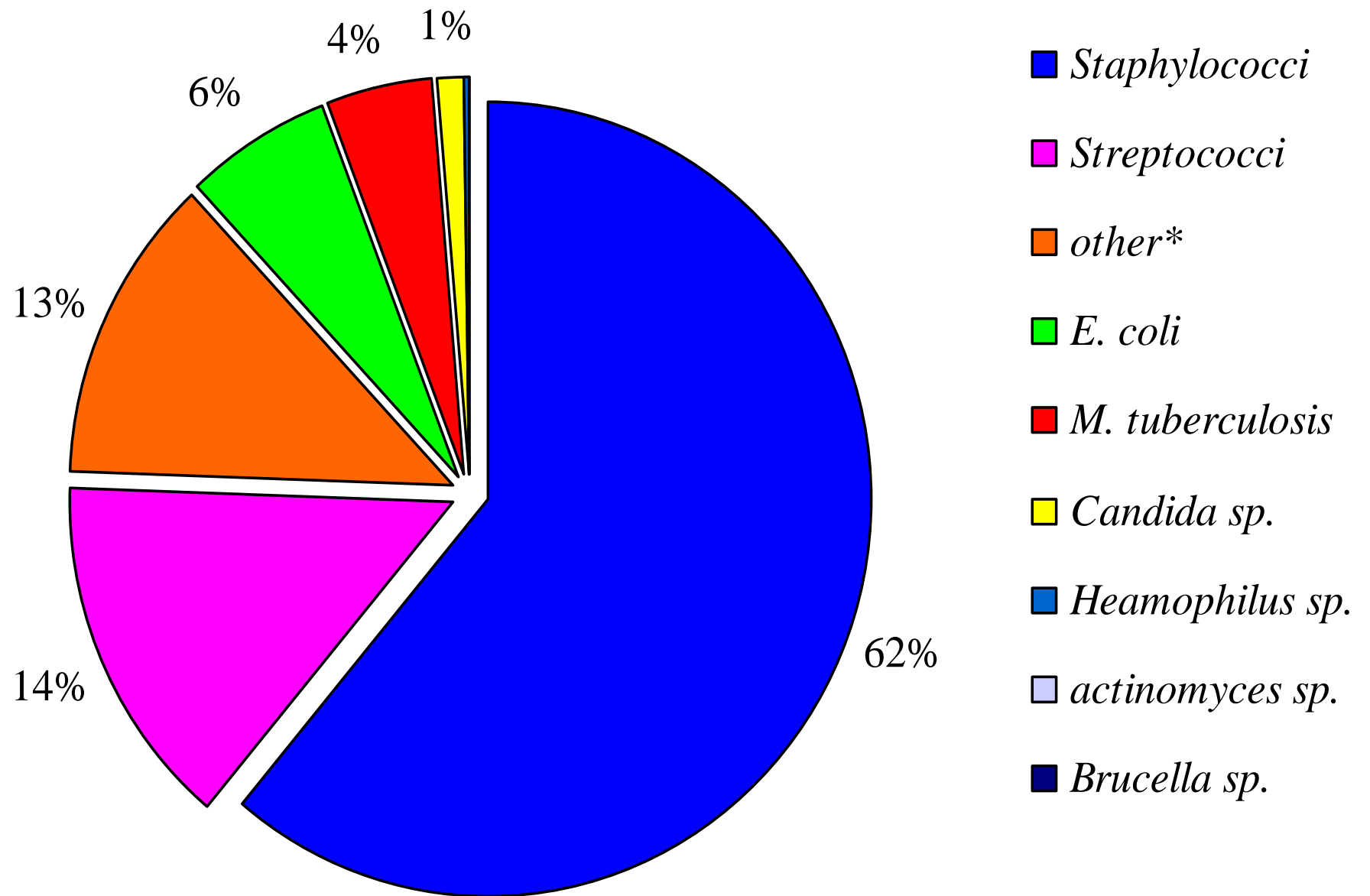
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Comorbidity by sex for BJI, France 2008



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Distribution of coded microorganisms, France 2008



Economical impact of BJI, France 2008

	Native BJI		Device-associated BJI		p value
	N	%	N	%	
Public sector	20,514	83,2	7,919	69,2	NS
Surgical stay	11,334	46,0	8,513	74,4	0,001
Intensive care unit	1,552	6,3	689	6,0	NS
Transfer/ destination					
home	17,447	70,8	6,711	58,6	0,001
died	931	3,8	391	3,4	NS
long term stay	216	0,9	111	1,0	NS
rehabilitation centres	3,485	14,1	3,004	26,2	0,001
LOS [days (95% CI)]	16.8 d (16.6-17.1)		18.9 d (18.5-19.3)		0,001
Total	24,643	100,0	11,448	100,0	

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Total BJI-related costs in France

- Costs to the National Health Insurance
 - €259 millions (\$368 millions)
- Mean cost
 - € 7,178 for one BJI stay (\$10,325)
- Device-associated costs were significantly higher than native BJI costs
 - + €1,500 (\$2,158) for one hospital stay with device associated BJI ($p < 0.002$)



Conclusion

- Prevalence estimation
 - 54.6 / 100,000, ↑ ↑ with age
- Male predominance, regardless of age
- Comorbidities
 - diabetes, ulcer sores, vascular disorders
- Mortality rate = 2.5 / 100,000
- Case fatality = 4.5%



Thank you for your attention !

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DISEASES, CHU de Tours;

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PUBLIC HEALTH, CHU de
Tours

and RoCeLesToine



French National hospital discharge database, 2008: 16 millions

↓ extraction of stays for BJI, identified by ICD-10 codes

BJI hospital discharge Database, 2008: 48,007 stays

↓ exclusion of 3 outliers, 8,859 ambulatory stays (18.4%), 2,893 (7.4%) pediatric stays

Final BJI hospital discharge Database, 2008 : 36,252 stays

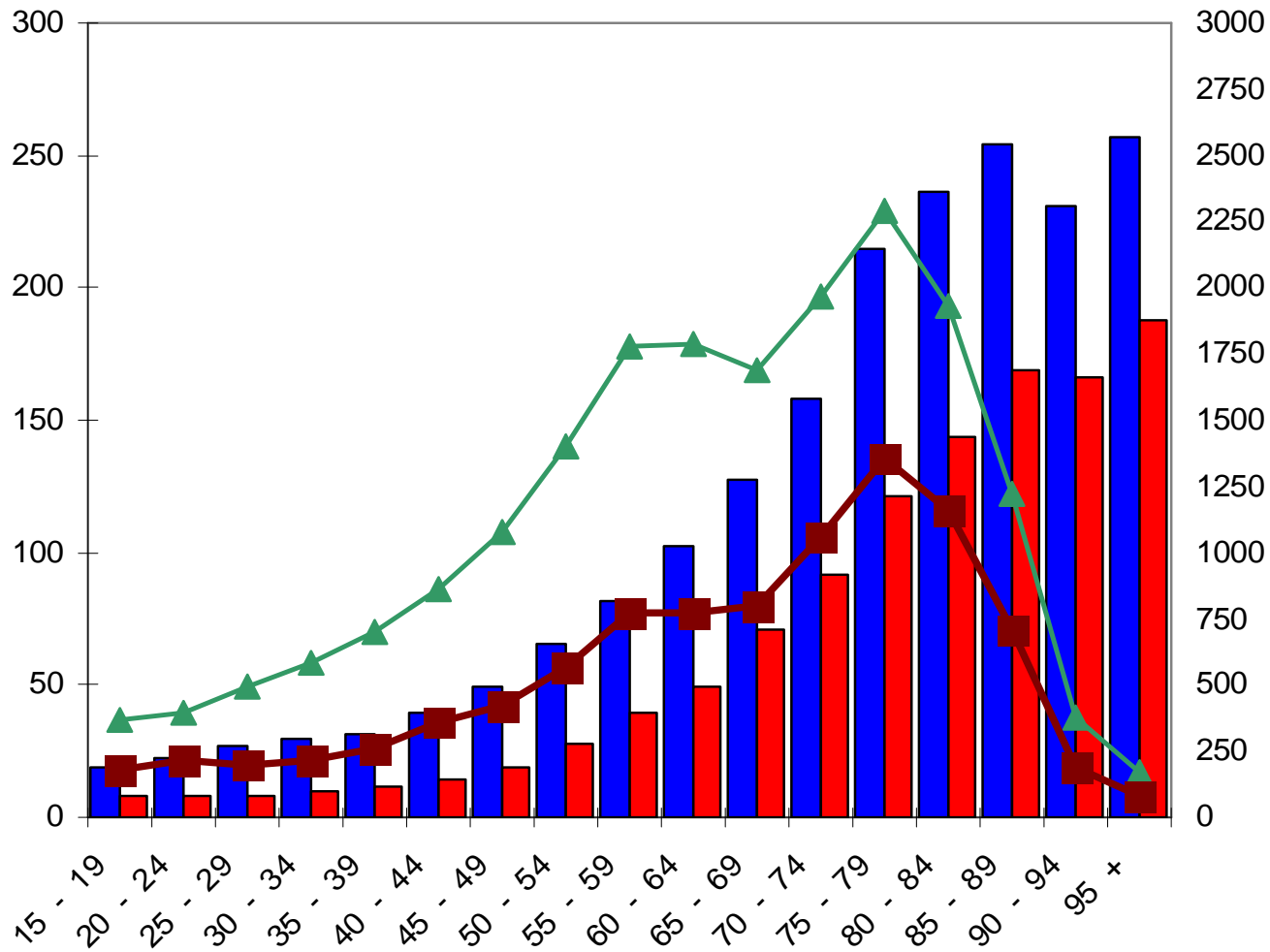
↓ via the unique anonymous patient number

French BJI patient Database, 2008: 28,453 patients

Algorithm of case definition

Algorithm of case definition			
BJI	Primary Diagnosis	Secondary Diagnosis	Procedure's code
Definite Case	BJI Infection - -	- BJI BJI + Infection BJI	- - - Specific BJI surgical procedures
Possible Case	-	BJI	-

Prevalence (per 100,000)



Frequency (N)

Age (years)



Prevalence and device frequency of BJI, France, 2008