# BONE AND JOINT INFECTIONS (BJI) SINCE LABELLING OF COMPLEX BJI REFERENCE CENTRES IN FRANCE: BEFORE/AFTER STUDY

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## Introduction

- BJI are associated with morbi-mortality and high economic impact
- First BJI national study through French Hospital Discharge Database (HDD) in 2008:
  → validation of a BJI case definition
  → 1st prevalence estimation: 54/100,000 inhabitants[1]
- Labelling of French Reference Centres (FRC) for adult Complex BJI (CBJI) from 2008 onwards

## Objectives

- **Epidemiologic and medico-economic evolution of BJI between 2008 and 2013**
- **Focus on CBJI in 2013**

## Methods

- Extraction of BJI stays of patients ≥15 from French national HDD
- Identification of native and device-associated BJI (DBJI) with the validated algorithm using specific:
  - ICM-10 diagnosis codes
  - surgical procedure codes according to the French Common Classification of Medical Acts[1]
- CBJI Identification: Z76800 code:
  - created in 2011
  - coded after a multidisciplinary consultation in FRC
- Stay HD → patient HD (linkage with the unique and encrypted patient number)

## Results

➢ ↗ **BJI Prevalence between 2008 and 2013, from 54/100,000 to 70/100,000 inhabitants (37,252 inpatients)**

**Table** *Evolution of BJI and DBJI hospitalisations 2008-2013, CBJI hospitalisations 2013, France*

| | Overall BJI | | | | Device-associated BJI | | | | Complex BJI | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2008 | | 2013 | | 2008 | | 2013 | | 2013 | |
| | N | % | N | % | N | % | N | % | N | % |
| **Hospital stays** | **36,097** | ***43*** | **48,386** | ***57*** | **11,451** | ***32***** | **16,214** | ***34***** | **3,301** | ***6.8***** |
| **Public sector hospitalization** | 28,441 | *78.8* | 39,797 | *82.2* | 7,923 | *69.2* | 12,102 | *74.6* | 3,234 | *98.0* |
| **FRC hospitalization** | 11,170 | *30.9* | 15,888 | *32.8* | 3,448 | *30.1* | 5,448 | *33.6* | 3,002 | *90.9* |
| **Surgical stay wards** | 19,847 | *55.0* | 27,308 | *56.4* | 8,513 | *74.3* | 12,087 | *74.5* | 2,715 | *82.3* |
| **Resuscitation/ICU stays*** | 2,106 | *5.8* | 3,350 | *6.9* | 624 | *5.4* | 991 | *6.1* | 236 | *7.2* |
| **Z76800 code (2013 only)** | - | - | 3,301 | *6.8* | - | - | 2,033 | *12.5* | | |
| **Device-associated BJI** | 11,451 | *31.7* | 16,214 | *33.5* | | | | | 2,033 | *61.6* |
| **Microorganisms** | 14,407 | *39.9* | 30,833 | *63.7* | 4,708 | *41.1* | 11,077 | *68.3* | 2,542 | *77.0* |
| Bacteria | 14,071 | *97.7* | 30,311 | *98.3* | 4,668 | *99.2* | 10,998 | *99.3* | 2,522 | *99.2* |
| Polybacteria | 1,591 | *11.0* | 6,116 | *19.8* | 502 | *10.7* | 1,716 | *15.5* | 576 | *22.7* |
| *Staphylococci* | 9,425 | *65.4* | 20,837 | *67.6* | 3,570 | *75.8* | 8,484 | *76.6* | 1,961 | *77.1* |
| *Streptococci* | 2,208 | *15.3* | 5,678 | *18.4* | 687 | *14.6* | 1,636 | *14.8* | 452 | *17.8* |
| Gram negative *Bacilli* | 2,370 | *16.5* | 8,104 | *26.3* | 788 | *16.7* | 2,373 | *21.4* | 656 | *25.8* |
| Resistance | 485 | *3.4* | 7,974 | *25.9* | 183 | *3.9* | 2,925 | *26.4* | 918 | *36.1* |
| **LOS (days), mean (median [min-max])** | 17.5 (11 [1-421]) | | 17.5 (12 [1-442]) | | 18.9 (13 [1-421]) | | 18.2 (13 [1-442]) | | 22.2 (15 [1-386]) | |

* Intensive Care Unit

** % overall BJI

### BJI (Table)

➢ **Similarities 2008-2013**:
- o Type: 50% septic arthritis, 37% osteomyelitis, 10% spondylodiscitis
- o ↗ prevalence with age and sex (SR M/F 1.5) (Fig. I)
- o 1 comorbidity or more for 2/3 of inpatients (cardiac disease, diabetes, Fig. II)
- o Hospital case-fatality rate 5%
- o Rehospitalisations 20%
- o Mean length of stay (LOS) 17.5 days

➢ **Differences 2008-2013**:
- o ↗ coded microorganisms: 40 to 64%
- o ↗ costs (Fig. III)

### DBJI (Table)

➢ 34% of BJI, stable
➢ Microorganisms: *Staphylococci* 77%
➢ Differences 2008-2013:
- o ↗ hospitalisations in public sector
- o ↗ costs (Fig. III)
- o ↘ mean LOS from 18.9 to 18.2 days (p<0,01)

**Figure I** *All BJI / DBJI Prevalence, France, 2008-2013*

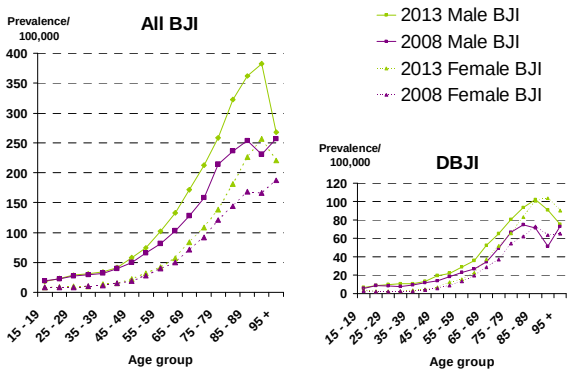
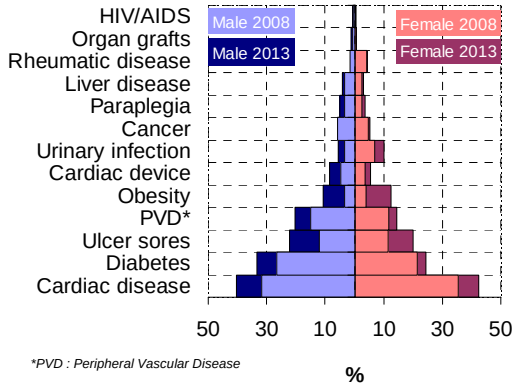
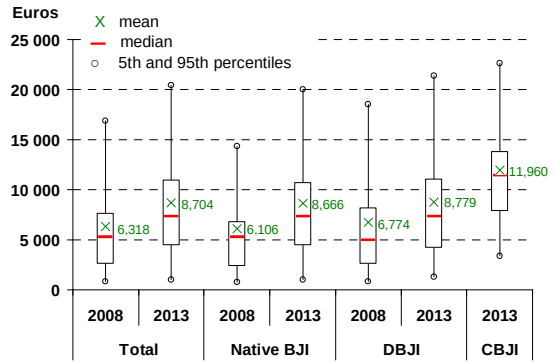



**Figure II** *BJI Comorbidities, France, 2008-2013*




*PVD : Peripheral Vascular Disease

**Figure III** *BJI costs (euros), France, 2008-2013*




### CBJI (Table)

➢ Z76800 code sparsely used: 7% of hospital stays
- o More used in DBJI (12.5%) than in native BJI (3.5%).
- o Used in 20% of BJI stays and 34 % of DBJI stays in FRC.

## Discussion

- Increasing prevalence of BJI and DBJI.
- DBJI more frequent in men, elderly people, with comorbidities, as in 2008.
- Increasing prevalence could be due to:
  - o Better knowledge + financial incentive since the labelling of FRC.
  - o An ageing population with more comorbidities, undergoing more arthroplasties.
  - o A global activity increase.
- Estimation of CBJI prevalence, required for FRC monitoring, complicated by:
  - o the absence of clinical consensus about CBJI definition.
  - o An underuse of the Z76800 code, recently created and needing a multidisciplinary consultation.
- Could CBJI epidemiology be approached by the study of DBJI ?

[1] Grammatico-Guillon L *et al.* Bone and joint infections in hospitalized patients in France, 2008: clinical and economic outcomes. *J. Hosp. Infect.* **82,** 40–48 (2012)

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