



## ABSTRACT

**Objectives:** A multi-centre evaluation was performed in order to compare activities and procedures in microbiology laboratories of 5 hospitals with similar activities in Belgium. This evaluation was considered a first step towards standardisation of microbiology procedures.

**Methods:** Five microbiology laboratories were provided with a questionnaire including parameters measuring hospital size, staffing, organisation and activities (2004). Consecutively, labs were visited and the provided data were discussed. Two well defined procedures (MRSA screening and blood culture) were observed and compared. Participation was voluntary and based on a network of collaborating microbiologists.

**Results:** The number of hospital beds in the 5 centres ranged from 460 to 939 (median 822, day care included). All hospitals had a medical/surgical intensive care unit (range 20-34 beds). Although three centres were multi-site hospitals, all of them had their microbiology activities centralised in one laboratory. Activities resorting under microbiology were bacteriology (n=5), molecular biology (n=4), fertility (n=2), serology (n=1) and virology (n=1). The total number of aerobic cultures performed (2004) ranged from 26040 to 59218 (median 44285) or 0.17 to 0.28 culture/hospital day, and 0.6 to 1 culture/hospitalisation period. Work load per laboratory technician ranged from 3219 to 5401 aerobic cultures/full time equivalent/ year. The proportion of aerobic cultures with AST (antimicrobial susceptibility testing) performed, ranged from 17 to 32 %. The number of blood cultures in each centre was 0.03 - 0.04 samplings/ hospital day, and 0.10- 0.15 samplings/hospitalisation period. All centres used automated blood culture systems, 1 centre used automation for AST reading, 2 centres for identification & AST.

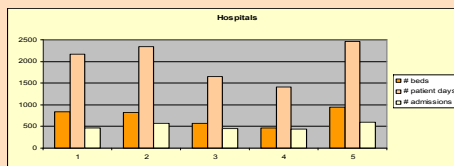
For MRSA screening all centres used a chromogenic agar, three of them had a procedure of enrichment. The number of screening samples/ year ranged from 1885 to 9597 (median 6670), with 7 to 20% new positive patients/ total number of patients screened.

Fast results and close consultation with the clinicians concerning AB therapy were key points in all centres.

**Conclusions:** Numbers and procedures were compared in five microbiology labs of Belgian hospitals with similar activities. Some data were remarkably comparable while other parameters differed widely. Labour-intensity of different tests should be considered when comparing numbers as a reflection of productivity rates.

## Results

**Hospital activity (2004): number of beds, patient days (\*1000) and admissions (\*1000); Hospitals 1, 2 and 5 are multi-site hospitals**



**Laboratories (2004): organisation**

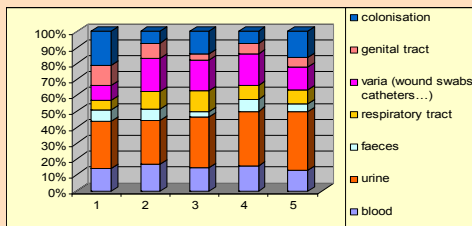
	1	2	3	4	5
# FTE lab technician	37.65	46.25	43.03	24.85	53.02
Working areas microbiology	BMF	BM	BV	BM	BMFS
# FTE microbiology	9.2	13	10.75	5.5	15.75
# FTE bacteriology	8.2	12.5	10.75	5.4	11.6
Rotation bacteriology	complete	complete	complete	complete	partial
Sampling by lab	blood cultures	A	not systematic	H	A + H

FTE fulltime equivalent; B bacteriology, M molecular biology, F fertility, V virology, S serology; A ambulatory; H hospitalised

**Microbiology laboratories (2004): aerobic cultures**

	1	2	3	4	5
Total #	44285	40242	46725	26040	59218
% ambulatory pts	10	<10	10-20	NA	27%
# aerobic cultures/ hospital day	0.20	0.16	0.28	0.17	0.24
# aerobic cultures/ admission	0.9	0.7	1.0	0.6	1.0
# aerobic cultures/ FTE bacteriology	5401	3219	4347	4822	5105

**Aerobic cultures (2004): proportion different sample types**



## INTRODUCTION

**Few consensus guidelines** exists in microbiology laboratories

Daily practice defined by - training of technologists and microbiologists

- 'historical' background of each laboratory
- structure and organisation of the hospital
- textbooks in microbiology.



Start up of an **observational study** in 5 Belgian microbiology laboratories

## METHODS: multi-centre observational study

Participants: 5 microbiology laboratories from hospitals with similar activities.

First part = **questionnaire**. Collecting general information on the **hospital**, and specific information on the **microbiology lab**.

Second part = **observational part**. Between **january and june 2006**, **one** microbiologist visited each site during 2 or 3 days.

## Results (2)

**Microbiology laboratories (2004): antibiograms performed**

	1	2	3	4	5
# aerobic culture	44285	40242	46725	26040	59218
# antibiograms performed	7538	NA	15118	8487	11976
# antibiograms billed	6526	6582	11558	NA	9069
% AB performed/ AB billed	87	NA	76	NA	76
% AB performed/ aerobic culture	17	NA	32	32	20

**Microbiology laboratories (2004): blood cultures**

	1	2	3	4	5
# samplings	6188	6687	6794	4144	7778
% positive samplings	12	16	12	19	13
# samplings/ hospital day	<b>0.03</b>	<b>0.03</b>	<b>0.04</b>	<b>0.03</b>	<b>0.03</b>
# samplings/ admission	0.13	0.12	0.15	0.10	0.13
Blood culture system	BacTec	BacTAlert	BacTec	BacTAlert	BacTec
<b>Results</b>	<b>Fast results and close consultation with the clinicians concerning AB therapy</b>				

**Microbiology laboratories (2004): screening for MRSA**

	1	2	3	4	5
# screening samples	8994	2891	6670	1885	9597
# patients screened	3247	1146	2223	628	4799
Method	NTP apart, direct plating	NTP together, enrichment	NTP apart, enrichment and direct plating	NTP apart, enrichment	NP apart, direct plating
New MRSA pts/ # pts screened	7	10	9	20	8

N nose, T throat, P perineum

## Conclusions:

Numbers and procedures were compared in five microbiology labs of Belgian hospitals with similar activities:

Fast results and close consultation with the clinicians concerning AB therapy were key points in all laboratories.

Some data were remarkably comparable (as the blood culture samplings/ hospital day), while other parameters differed widely (number of MRSA screening samples and new positive patients/ screened patients).

When comparing numbers as a reflection of productivity rates in microbiology labs (as the workload/FTE), labour-intensity of the different sample types should be considered