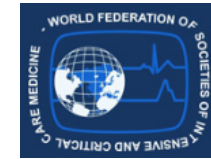




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DE SANTÉ PUBLIQUE



Society of  
Critical Care Medicine  
The Intensive Care Professionals



# Prevention of Central Line associated Bloodstream Infections (CLABSI) in ICUs

## *An international online survey*

WIV-ISP, 13<sup>th</sup> June, 2016

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# Background (1)

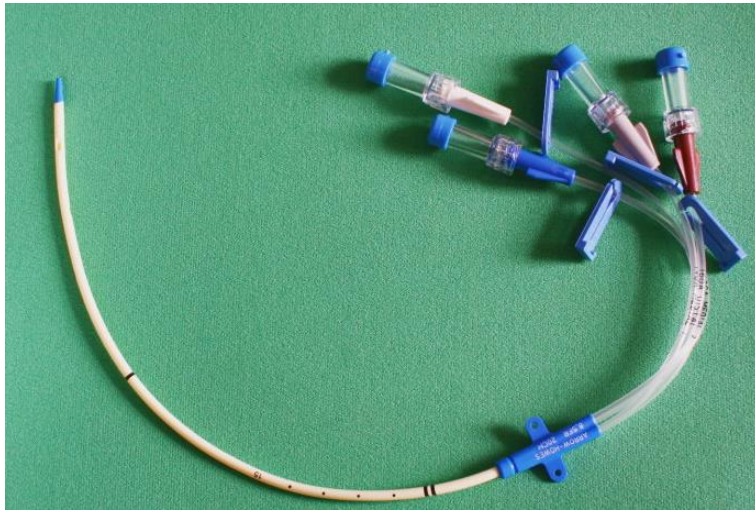
## *Definitions*

### *Central line:*

- ✓ long, thin, flexible tube used to give medicines, fluids, nutrients, or blood products over a long period of time
- ✓ inserted in the arm or chest through the skin into a large vein..

# Background (1)

## *Definitions*



# Background (1)

## Definitions

### *Central line associated bloodstream infection* (CLABSI):

- ✓ serious infection that occurs when germs (usually bacteria or viruses) enter the bloodstream through the central line.
- ✓ strict protocols when inserting the line to make sure the line remains sterile and a CLABSI does not occur.

# Background (2)

## *CLABSI Epidemiology*

- ✓ Based on 2011 Belgian data:
  - ✓ 80% of patients in ICU have a central line
  - ✓ Incidence rate:
    - ✓ 2.5/1000 catheter days

# Background (2)

## *CLABSI Epidemiology*

- ✓ Based on 2014 US data:
  - ✓ 28% of acute care patients have a central line
  - ✓ 14% of Healthcare associated infections are bloodstream infections
  - ✓ 41,000 CLABSI annually hospital-wide *f*
  - ✓ 18,000 CLABSI annually in ICUs ‰

# Background (3)

## *CLABSI Prevention*

- ✓ Prevention practices at ***insertion***:
  - ✓ hand hygiene before insertion

# Background (3)

## *CLABSI Prevention*

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  - ✓ **adhere to aseptic technique**



# Background (3)

## CLABSI Prevention

- ✓ Prevention practices at **insertion**:
  - ✓ hand hygiene before insertion
  - ✓ adhere to aseptic technique
  - ✓ use maximal sterile barrier precautions (i.e., mask, cap, gown, sterile gloves, and sterile full body drape)

# Background (3)

## CLABSI Prevention

- ✓ Prevention practices at *insertion*:
  - ✓ hand hygiene before insertion
  - ✓ adhere to aseptic technique
  - ✓ use maximal sterile barrier precautions (i.e., mask, cap, gown, sterile gloves, and sterile full body drape)
  - ✓ Perform skin antisepsis with >0.5% chlorhexidine with alcohol

# Background (3)

## CLABSI Prevention

- ✓ Prevention practices at *insertion*:
  - ✓ hand hygiene before insertion
  - ✓ adhere to aseptic technique
  - ✓ use maximal sterile barrier precautions (i.e., mask, cap, gown, sterile gloves, and sterile fullbody drape)
  - ✓ Perform skin antisepsis with >0.5% chlorhexidine with alcohol
  - ✓ Choose the best site to minimize infections and mechanical complications
    - ✓ Avoid femoral site in adult patients

# Background (3)

## CLABSI Prevention

- ✓ Prevention practices at *insertion*:
  - ✓ hand hygiene before insertion
  - ✓ use maximal sterile barrier precautions (i.e., mask, cap, gown, sterile gloves, and sterile full body drape)
  - ✓ Perform skin antisepsis with >0.5% chlorhexidine with alcohol
  - ✓ Choose the best site to minimize infections and mechanical complications
    - ✓ Avoid femoral site in adult patients
  - ✓ Cover the site with sterile gauze or sterile, transparent, semipermeable dressings

# Background (3)

## *CLABSI Prevention*

- ✓ Prevention practices at ***maintenance***:
  - ✓ Comply with hand hygiene requirements

# Background (3)

## *CLABSI Prevention*

- ✓ Prevention practices at ***maintenance***:
  - ✓ Comply with hand hygiene requirements
  - ✓ Scrub the access port or hub immediately prior to each use with an appropriate antiseptic

# Background (3)

## *CLABSI Prevention*

- ✓ Prevention practices at ***maintenance***:
  - ✓ Comply with hand hygiene requirements
  - ✓ Scrub the access port or hub immediately prior to each use with an appropriate antiseptic
  - ✓ **Access catheters only with sterile devices**

# Background (3)

## CLABSI Prevention

- ✓ Prevention practices at ***maintenance***:
  - ✓ Comply with hand hygiene requirements
  - ✓ Scrub the access port or hub immediately prior to each use with an appropriate antiseptic
  - ✓ Access catheters only with sterile devices
  - ✓ **Replace dressings that are wet, soiled, or dislodged**



# Background (3)

## *CLABSI Prevention*

- ✓ Reduction of **exposure**:
- ✓ Daily assessment of the need for CL

# Background (3)

## *CLABSI Prevention*

- ✓ Reduction of **exposure**:
  - ✓ Daily assessment of the need for CL
  - ✓ Timely remove of unnecessary CL

# Background (3)

## *CLABSI Prevention*

- ✓ ***Measurement systems:***
  - ✓ For monitoring and evaluation of any improvement intervention

# Background (3)

## *CLABSI Prevention*

- ✓ ***Measurement systems:***
  - ✓ For monitoring and evaluation of any improvement intervention
  - ✓ **Process (compliance with guidelines)**

# Background (3)

## *CLABSI Prevention*

- ✓ ***Measurement systems:***
  - ✓ For monitoring and evaluation of any improvement intervention
  - ✓ Process (compliance with guidelines)
  - ✓ Outcomes (CLABSI)

# Background (3)

## *CLABSI Prevention*

- ✓ ***Measurement systems:***
  - ✓ For monitoring and evaluation of any improvement intervention
  - ✓ Process (compliance with guidelines)
  - ✓ Outcomes (CLABSI)
  - ✓ Can be the intervention itself, or a major component of it

## Background (4)

*Compliance with guidelines*

- ✓ How to ensure compliance with guidelines?....

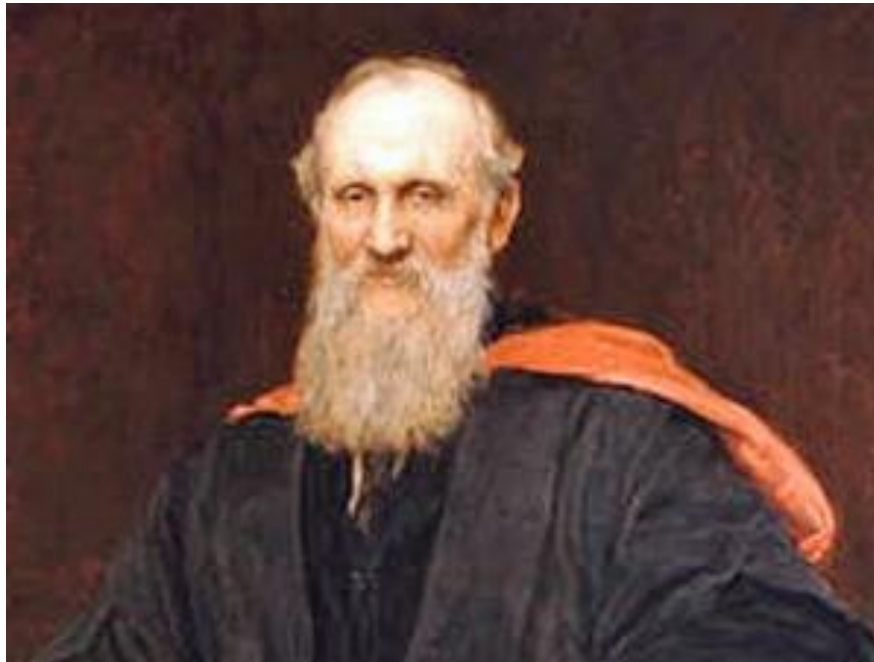
*...Very complex field of research*

# Background (4)

*Compliance with guidelines*

✓ *“If you cannot measure it, you cannot improve it”*

*Lord Kelvin 1824-1907*





# Objective

- ✓ To document attitudes and practices (clinical and measurement) regarding CLABSI prevention in intensive care units worldwide in order to assess compliance with CLABSI prevention guidelines, its measurement and identify priorities for interventions.

# Target Group

- ✓ Medical Doctors and Nurses working in intensive care units worldwide

**The survey was not intended for infection control practitioners**

# Methods (1)

## Data Collection

### The Questionnaire

- ✓ Short (15 minutes)
- ✓ 4 parts
  - Characteristics of ICU and respondent
  - Clinical Practices for CLABSI prevention (as per 2014 CDC guidelines)
  - Measurement of CLABSI-related outcomes and processes
  - Attitudes towards measurement as a tool for improvement

# Methods (2)

## *Data Collection*



- ✓ Online June 2015-October 2015
- ✓ 10 Languages (including Russian, Chinese and Japanese)

# Methods (2)

## *Dissemination*



- ✓ **Endorsed by 5 international Societies:**
  - ✓ European Society of Intensive Care Medicine (ESICM)
  - ✓ Society of Critical Care Medicine (SCCM)
  - ✓ World Federation of Societies of Intensive Care and Critical Medicine (WFSICCM)
  - ✓ International Symposium of Intensive Care and Emergency Medicine (ISICEM)
  - ✓ Middle East Critical Care Assembly
  
- ✓ **Endorsed by 1 local society**
  - ✓ Japanese Society of Intensive Care medicine

# Methods (3)

## Data Analysis



- ✓ Categorized countries\* as high, middle and low income
- ✓ Weighted estimates\*\* for high, middle and low income countries
  - ✓ Countries with >10 replies
  - ✓ Descriptive statistics (+standard errors)
- ✓ Country specific results

\* Based on the 2015 World Bank classification

\*\* Using total country population as a weight

# Results

## *Responses*

- ✓ **3,407 complete responses** (from 95 countries)

# Results

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- ✓ **3,407 complete responses** (from 95 countries)
  - ✓ **3,250 responses from 41 countries** with at least 10 completed replies
    - 27 high, 14 middle, 0 low income



# Results

## *Responses*

- ✓ **3,407 complete responses** (from 95 countries)
  - ✓ **3,250 responses from 41 countries** with at least 10 completed replies
    - 27 high, 14 middle, 0 low income
  - ✓ **157 responses from 54 countries** with less than 10 completed replies

# Results

## Country of Practice



### ✓ *Top respondents for High Income Countries (HIC)* *(Countries with >10 replies)*

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	<b>Replies</b>	<b>%</b>
United States	401	17
Belgium	226	9
Spain	207	9
Russia	199	8
France	183	8
Japan	175	7
United Kingdom	135	6
Switzerland	120	5
Australia	110	5
Canada	103	4
Other	555	22
<b>Total (27 high income countries)</b>	<b>2414</b>	<b>100</b>

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# Results

## Country of Practice



✓ *Top respondents for Middle Income Countries (MIC)*  
(Countries with >10 replies)

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	<b>Replies</b>	<b>%</b>
China	379	50
India	130	16
Brazil	92	11
Jordan	38	5
Colombia	38	5
Mexico	24	3
Costa Rica	20	2
Lebanon	19	2
Sudan	19	2
South Africa	18	2
Other	59	7
<b>Total</b> (14 middle income countries)	<b>836</b>	<b>100</b>

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# Results

## Setting (1/3)



### Type of Hospital ...

	MIC* (N= 836)	SE	HIC** (N= 2414)	SE
University	65%	2.0	59%	1.5

\* MIC: Middle Income Country  
\*\* HIC: High Income Country

# Results

## Setting (2/3)



*“In my ICU, we have written clinical guidelines for the prevention of (CLABSI)....”*

	MIC* (N= 836)	SE	HIC** (N= 2414)	SE
Yes	80%	1.5	81%	1.0

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\*\* HIC: High Income Country

# Results

## Setting (3/3)



*“In my ICU, hand hygiene is done using alcohol-based handrubs....”*

	MIC* (N= 836)	SE	HIC** (N= 2414)	SE
Always/Most of the times	92%	1.9	94%	1.5

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\*\* HIC: High Income Country

# Results

*Respondent*



## *Years working in ICU....*

	MIC* (N= 836)	SE	HIC** (N= 2414)	SE
Mean	8	0.3	16	0.3

\* MIC: Middle Income Country  
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# Results

## Respondent



### Years working in ICU....

	MIC*	SE	HIC**	SE
	(N= 836)		(N= 2414)	
Mean	8	0.3	16	0.3

### Gender....

	MIC*	SE	HIC**	SE
	(N= 836)		(N= 2414)	
Females	55%	2.0	44%	2.0

\* MIC: Middle Income Country  
\*\* HIC: High Income Country



# Results

## Respondent



### Years working in ICU....

	MIC* (N= 836)	SE	HIC** (N= 2414)	SE
Mean	8	0.3	16	0.3

### Gender....

	MIC* (N= 836)	SE	HIC** (N= 2414)	SE
Females	55%	2.0	44%	2.0

### Profession....

	MIC* (N= 836)	SE	HIC** (N= 2414)	SE
Doctors	59%	2.0	70%	1.4

\* MIC: Middle Income Country

\*\* HIC: High Income Country

# Results

## *Procedures at insertion*



*“The following procedures were used during the last catheter insertion I did or assisted with in my ICU.....”*

	MIC*	SE	HIC**	SE
Hand hygiene before CL insertion	(N= 836) 97%	0.7	(N= 2414) 98%	0.3

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# Results

## *Procedures at insertion*



*“The following procedures were used during the last catheter insertion I did or assisted with in my ICU.....”*

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Hand hygiene before CL insertion	(N= 836) 97%	0.7	(N= 2414) 98%	0.3
Using mask, cap, sterile gloves and sterile gown	93%	1.0	96%	0.5

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# Results

## *Procedures at insertion*



*“The following procedures were used during the last catheter insertion I did or assisted with in my ICU.....”*

	MIC*	SE	HIC**	SE
	(N= 836)		(N= 2414)	
Hand hygiene before CL insertion	97%	0.7	98%	0.3
Using mask, cap, sterile gloves and sterile gown	93%	1.0	96%	0.5
Using chlorhexidine >0.5% in alcohol for skin preparation	58%	2.1	85%	0.9

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# Results

## *Procedures at insertion*



*“The following procedures were used during the last catheter insertion I did or assisted with in my ICU.....”*

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Hand hygiene before CL insertion	97%	0.7	98%	0.3
Using mask, cap, sterile gloves and sterile gown	93%	1.0	96%	0.5
Using chlorhexidine >0.5% in alcohol for skin preparation	58%	2.1	85%	0.9
Using sterile drapes to cover patient from head to toes	51%	2.1	82%	0.9

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# Results

## Procedures at insertion



*“The following procedures were used during the last catheter insertion I did or assisted with in my ICU.....”*

	MIC*	SE	HIC**	SE
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Hand hygiene before CL insertion	97%	0.7	98%	0.3
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Using chlorhexidine >0.5% in alcohol for skin preparation	58%	2.1	85%	0.9
Using sterile drapes to cover patient from head to toes	51%	2.1	82%	0.9
Using antimicrobial ointment at insertion (not recommended)	14%	1.4	9%	0.7

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# Results

## Procedures at insertion



*“The following procedures were used during the last catheter insertion I did or assisted with in my ICU.....”*

	MIC*	SE	HIC**	SE
	(N= 836)		(N= 2414)	
Hand hygiene before CL insertion	97%	0.7	98%	0.3
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Using sterile drapes to cover patient from head to toes	51%	2.1	82%	0.9
Using antimicrobial ointment at insertion (not recommended)	14%	2.1	9%	0.9
<b>Administering systemic antimicrobial prophylaxis (not recommended)</b>	<b>24%</b>	<b>1.8</b>	<b>8%</b>	<b>0.7</b>

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# Results

## Procedures at insertion



*“The following procedures were used during the last catheter insertion I did or assisted with in my ICU.....”*

	MIC*	SE	HIC**	SE
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Using sterile drapes to cover patient from head to toes	51%	2.1	82%	0.9
Using antimicrobial ointment at insertion (not recommended)	14%	2.1	9%	0.9
Administering systemic antimicrobial prophylaxis (not recommended)	24%	1.8	8%	0.7

Four recommended practices and none of not recommended 23% 1.7 62% 1.4

\* MIC: Middle Income Country

\*\* HIC: High Income Country



# Results

## *Procedures at insertion*



*“In my ICU, the femoral vein is used....”*

	MIC*	SE	HIC**	SE
	(N= 836)		(N= 2414)	
Always/Most of the times	15%	1.3	11%	0.9

\* MIC: Middle Income Country

\*\* HIC: High Income Country

# Results

## *Procedures at maintenance*



*“If dressing is NOT soiled, damped or loose, subsequent dressings are changed...”*

# Results

## *Procedures at maintenance*



*“If dressing is NOT soiled, damped or loose, subsequent dressings are changed...”*

➤ *Dry Dressing*

# Results

## Procedures at maintenance



“If dressing is NOT soiled, damped or loose, subsequent dressings are changed...”

### ➤ Dry Dressing

Every 2 days (recommended)

MIC*	SE	HIC**	SE
(N= 836)		(N= 2414)	
20%	1.7	15%	1.0

\* MIC: Middle Income Country  
\*\* HIC: High Income Country

# Results

## Procedures at maintenance



“If dressing is NOT soiled, damped or loose, subsequent dressings are changed...”

### ➤ Dry Dressing

	MIC*	SE	HIC**	SE
	(N= 836)		(N= 2414)	
Every 2 days (recommended)	20%	1.7	15%	1.0
More Often	31%	1.9	24%	1.2

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# Results

## Procedures at maintenance



“If dressing is NOT soiled, damped or loose, subsequent dressings are changed...”

### ➤ Dry Dressing

	MIC*	SE	HIC**	SE
	(N= 836)		(N= 2414)	
Every 2 days (recommended)	20%	1.7	15%	1.0
More Often	31%	1.9	24%	1.2
Less Often	34%	2.0	29%	1.1

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\*\* HIC: High Income Country

# Results

## *Procedures at maintenance*



*“If dressing is NOT soiled, damped or loose, subsequent dressings are changed...”*

➤ *Transparent Dressing*

# Results

## Procedures at maintenance



“If dressing is NOT soiled, damped or loose, subsequent dressings are changed...”

➤ *Transparent Dressing*

	MIC*	SE	HIC**	SE
	(N= 836)		(N= 2414)	
Every 5-7 days (recommended)	22%	1.7	41%	1.5

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\*\* HIC: High Income Country



# Results

## Procedures at maintenance



“If dressing is NOT soiled, damped or loose, subsequent dressings are changed...”

➤ *Transparent Dressing*

	MIC*	SE	HIC**	SE
	(N= 836)		(N= 2414)	
Every 5-7 days (recommended)	22%	1.7	41%	1.5
More Often	70%	1.9	40%	1.2

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# Results

## Procedures at maintenance



“If dressing is NOT soiled, damped or loose, subsequent dressings are changed...”

### ➤ Transparent Dressing

	MIC*	SE	HIC**	SE
	(N= 836)		(N= 2414)	
Every 5-7 days (recommended)	22%	1.7	41%	1.5
More Often	70%	1.9	40%	1.2
Less Often	2%	0.5	2%	0.4

\* MIC: Middle Income Country

\*\* HIC: High Income Country

# Results

## *Procedures at maintenance*



*“In my ICU, patients with a central line are assessed daily for the need or removal of it...”*

	MIC*	SE	HIC**	SE
	(N= 836)		(N= 2414)	
Yes	60%	2.0	73%	1.2

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\*\* HIC: High Income Country

# Results

## Measurements



*“In my ICU, data is collected at unit level (**at least once a year**) on compliance with recommendations related to....”*

	MIC*	SE	HIC**	SE
	(N= 836)		(N= 2414)	
Central line insertion	72%	2.0	66%	1.5

\* MIC: Middle Income Country

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# Results

## Measurements



“In my ICU, data is collected at unit level (*at least once a year*) on compliance with recommendations related to....”

	MIC*	SE	HIC**	SE
	(N= 836)		(N= 2414)	
Central line insertion	72%	2.0	66%	1.5
Daily assessment of need for a central line	72%	2.0	59%	1.5

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\*\* HIC: High Income Country

# Results

## Measurements



*“In my ICU, data is collected at unit level (at least once a year) on compliance with recommendations related to....”*

	MIC*	SE	HIC**	SE
	(N= 836)		(N= 2414)	
Central line insertion	72%	2.0	66%	1.5
Daily assessment of need for a central line	72%	2.0	59%	1.5
Disinfection practices when accessing the central line	73%	2.0	59%	1.5

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\*\* HIC: High Income Country

# Results

## Measurements



*“In my ICU, data is collected at unit level (at least once a year) on compliance with recommendations related to....”*

	MIC*	SE	HIC**	SE
	(N= 836)		(N= 2414)	
Central line insertion	72%	2.0	66%	1.5
Daily assessment of need for a central line	72%	2.0	59%	1.5
Disinfection practices when accessing the central line	73%	2.0	59%	1.5
Compliance with hand hygiene recommendations	81%	2.1	73%	1.5

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\*\* HIC: High Income Country

# Results

## Measurements



“In my ICU, we count and record, routinely...” (% saying “yes”)

	MIC*	SE	HIC**	SE
.... CLABSI	(N= 836) 73%	1.8	(N= 2414) 81%	0.9

\* MIC: Middle Income Country

\*\* HIC: High Income Country



# Results

## Measurements



*“In my ICU, we count and record, routinely...” (% saying “yes”)*

	MIC* (N= 836)	SE	HIC** (N= 2414)	SE
.... CLABSI	73%	1.8	81%	0.9
.... Days since last CLABSI	39%	2.0	57%	1.4

\* MIC: Middle Income Country

\*\* HIC: High Income Country

# Results

## Measurements



*“Clinical staff in my ICU is aware of CLABSI-related data, and their trends....”*

	MIC* (N= 836)	SE	HIC** (N= 2414)	SE
Agree/Strongly agree	76%	2.0	67%	1.4

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\*\* HIC: High Income Country

# Results

## *Attitudes towards implementation of a measurement system*



*To what extent do you agree with the following statements...*

➤ *“If you cannot measure it you cannot improve it“*

	MIC*	SE	HIC**	SE
	(N= 836)		(N= 2414)	
Agree/Strongly agree	81%	2.0	80%	1.5

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# Results

## Attitudes towards implementation of a measurement system



To what extent do you agree with the following statements...

- “If you cannot measure it you cannot improve it“

	MIC*	SE	HIC**	SE
	(N= 836)		(N= 2414)	
Agree/Strongly agree	81%	2.0	80%	1.5

- “CLABSI-related data in my ICU (if any) is reliable”

	MIC*	SE	HIC**	SE
	(N= 836)		(N= 2414)	
Agree/Strongly agree	74%	2.0	68%	1.5

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\*\* HIC: High Income Country

# Results

## Attitudes towards implementation of a measurement system



To what extent do you agree with the following statements...

- “If you cannot measure it you cannot improve it“

	MIC* (N= 836)	SE	HIC** (N= 2414)	SE
Agree/Strongly agree	81%	2.0	80%	1.5

- “CLABSI-related data in my ICU (if any) is reliable”

	MIC* (N= 836)	SE	HIC** (N= 2414)	SE
Agree/Strongly agree	74%	2.0	68%	1.5

- “I am willing to implement, or support, a CLABSI data collection system”

	MIC* (N= 836)	SE	HIC** (N= 2414)	SE
Agree/Strongly agree	92%	2.0	88%	1.5

\* MIC: Middle Income Country

\*\* HIC: High Income Country

# Results

## Heterogeneity between countries

Compliance with four recommended practices and none of not recommended....

### CLABSI prevention: clinical practices during insertion

	N	Compliance with all four recommendations at insertion site	
		N "Yes"	%
BELGIUM	226	72	32%
UNITED KINGDOM	135	95	70%
UNITED STATES	401	323	81%

← Low

\* MIC: Middle Income Country

\*\* HIC: High Income Country

# Results

## Heterogeneity between countries

Compliance with four recommended practices and none of not recommended....

### CLABSI prevention: clinical practices during insertion

	N	Compliance with all four recommendations at insertion site	
		N "Yes"	%
BELGIUM	226	72	32%
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← High

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# Results

## Heterogeneity between countries

*“In my ICU, patients with a central line are assessed daily for the need or removal of it...”*

### CLABSI prevention: clinical practices during maintenance

	N	Patients assessed	
		Daily	
		N "Yes"	%
BELGIUM	226	76	34%
CHINA	379	215	57%
UNITED KINGDOM	135	121	90%
UNITED STATES	401	354	88%

← Low

\* MIC: Middle Income Country

\*\* HIC: High Income Country



# Results

## Heterogeneity between countries

*“In my ICU, patients with a central line are assessed daily for the need or removal of it...”*

### CLABSI prevention: clinical practices during maintenance

	N	Patients assessed	
		Daily	
		N "Yes"	%
BELGIUM	226	76	34%
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UNITED KINGDOM	135	121	90%
UNITED STATES	401	354	88%



High

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# Discussion

## Key Findings (1/2)



- ✓ 80% report the existence of CLABSI prevention guidelines in their ICU
- ✓ Combined compliance to **4 recommended practices** without the use of the **2 not-recommended** practices (such as antimicrobial prophylaxis) at central-line insertion was low (23%) particularly in middle income countries
- ✓ Only a minority (15%) report the **not recommended femoral vein** as the most used insertion site for central line

# Discussion

## *Key Findings (2/2)*



- ✓ Dressings are changed **more often** than recommended
- ✓ Assessment of need of the CL is **not always done** on a daily basis
- ✓ 16% were able to report the actual CLABSI rate in their unit.

# Discussion

## *Limitations (1/2)*



- ✓ Selection bias (1):
  - ✓ Non-random sample of respondents
  - ✓ Overrepresentation of some categories of ICU doctors and nurses
- ✓ Reporting bias (2):
  - ✓ Reported practices are likely to differ from actual practices and be biased towards what is considered desirable

# Discussion

## *Limitations (1/2)*

- ✓ Selection bias (1):
  - ✓ Non-random sample of respondents
  - ✓ Overrepresentation of some categories of ICU doctors and nurses
- ✓ Reporting bias (2):
  - ✓ Reported practices are likely to differ from actual practices and be biased towards what is considered desirable

*(1) and (2) = overestimation of results*

# Discussion

## *Limitations (2/2)*



- ✓ Given **heterogeneity** between countries, our summary estimates have limited meaning
- ✓ Most relevant data can be found in the **country-specific results**

# Conclusions

- ✓ Clear interest is shown in the ICU community for CLABSI prevention
  
- ✓ Areas for improvement in practices
  - ❖ Clinical
    - ✓ full barrier precaution at central line insertion
    - ✓ reduction of device exposure through daily assessment of CL
  - ❖ Measurement
    - ✓ utilisation of data to monitor progress in preventive actions.
  
- ✓ Address factors that affect adoption and consistent use of CLABSI prevention guidelines
  
- ✓ Close monitoring of infection rates, giving feedback to staff, and establishing a reliable data collection system.

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# Supplementary File

## Country-specific results



### ***Prevention of Central line-associated bloodstream infections: an international online survey***

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#### Supplementary File

[Online Database](#)

Country specific results (not aggregated)

Data collection: June 2015-October 2015



Introduction Page

# Supplementary File

## *Country-specific results*



- ✓ More variables available per country
  
- ✓ 5 Sections
  - ✓ Introduction
  - ✓ Respondent and setting
  - ✓ Central-line insertion
  - ✓ Central-line maintenance
  - ✓ Attitudes and Barriers

# Supplementary File

## Country-specific results



### ✓ Example of section 1: respondents and setting

#### Respondents and setting

Country	N	Profession (doctors)		Females		Years working in intensive care (Median)	Beds in ICU (Median)	Admissions / year (Median)	Type of Hospital (University)		Written guidelines for CLABSI prevention (answer yes)	
		N	%	N	%				N	%	N	%
AFGHANISTAN	4	0	0%	4	100%	7	22	–	3	75%	4	100%
ALGERIA	2	1	50%	1	50%	5	7	2000	1	50%	1	50%
ALBANIA	1	1	100%	0	0%	19	6	23	1	100%	0	0%
ANGOLA	2	2	100%	0	0%	11	9	500	0	0%	0	0%
ARGENTINA	37	30	81%	16	43%	16	12	598	24	65%	24	65%
ARMENIA	1	1	100%	1	100%	36	24	2614	1	100%	1	100%
AUSTRALIA	110	54	49%	61	55%	15	20	1499	83	75%	97	88%
AUSTRIA	10	7	70%	2	20%	18	10	514	7	70%	7	70%
BAHRAIN	1	0	0%	0	0%	9	9	–	107	10700%	0	0%
BANGLADESH	5	5	100%	0	0%	6	11	627	3	60%	5	100%
BELARUS	2	2	100%	0	0%	4	15	–	1	50%	1	50%
BELGIUM	226	36	15%	137	61%	15	13	826	107	47%	162	72%
BELIZE	1	0	0%	1	100%	20	14	–	1	100%	1	100%
BOLIVIA	9	9	100%	1	11%	16	8	253	7	78%	5	56%
BRAZIL	92	76	83%	37	40%	12	16	828	40	43%	66	72%
BULGARIA	2	2	100%	0	0%	23	12	861	1	50%	0	0%
CANADA	103	15	15%	84	82%	15	19	1128	71	69%	91	88%
CHILE	14	11	79%	5	36%	13	11	570	11	79%	13	93%
CHINA	379	180	47%	251	66%	8	23	936	283	75%	317	84%
COLOMBIA	38	25	68%	16	42%	7	15	793	16	42%	31	82%
COSTA RICA	20	7	35%	8	40%	12	12	400	12	60%	16	80%
CROATIA	2	2	100%	1	50%	12	9	475	0	0%	2	100%
CUBA	9	8	89%	1	11%	20	12	488	7	78%	8	89%

# Supplementary File

## Country-specific results



### ✓ Example of section 3: central line maintenance

CLABSI prevention: clinical practices during maintenance, as reported by ICU doctors and nurses

	N	Change of Dressing (if not soiled, damped or loose)				Patients assessed explicitly for need or removal of CL						When I last accessed a central line, I....								Catheter securement	
		Dry Dressing (every 2 days)		Transparent Dressing (every 5-7 days)		Daily		At least once a week		Not on a regular basis		Disinfected Central-line hubs		Disinfected hands before		Used gloves		All three practices		Non suture adhesives	
		N "Yes"	%	N "Yes"	%	N "Yes"	%	N "Yes"	%	N "Yes"	%	N "Yes"	%	N "Yes"	%	N "Yes"	%	N "Yes"	%	N "Yes"	%
NORWAY	28	4	14%	13	46%	8	29%	5	18%	10	36%	24	86%	27	96%	18	64%	15	54%	3	11%
OMAN	4	0	0%	1	25%	2	50%	0	0%	2	50%	2	50%	2	50%	4	100%	1	25%	1	25%
PANAMA	2	0	0%	0	0%	2	100%	0	0%	0	0%	2	100%	2	100%	2	100%	2	100%	0	0%
PARAGUAY	3	2	67%	1	33%	0	0%	1	33%	2	67%	3	100%	3	100%	3	100%	3	100%	0	0%
PERU	16	4	25%	3	19%	10	63%	3	19%	2	13%	7	44%	15	94%	15	94%	7	44%	3	19%
PHILIPPINES	1	0	0%	0	0%	1	100%	0	0%	0	0%	1	100%	1	100%	1	100%	1	100%	1	100%
POLAND	20	1	5%	1	5%	8	40%	3	15%	7	35%	12	60%	19	95%	20	100%	12	60%	1	5%
PORTUGAL	53	18	34%	17	32%	23	43%	9	17%	21	40%	43	81%	43	81%	32	60%	24	45%	1	2%
PUERTO RICO	2	0	0%	1	50%	2	100%	0	0%	0	0%	2	100%	2	100%	2	100%	2	100%	0	0%
QATAR	56	3	5%	19	34%	53	95%	2	4%	1	2%	50	89%	52	93%	53	95%	50	89%	2	4%
ROMANIA	6	1	17%	3	50%	2	33%	2	33%	2	33%	4	67%	5	83%	5	83%	3	50%	1	17%
RUSSIAN FEDERATION	199	21	11%	21	11%	115	58%	50	25%	21	11%	88	44%	186	93%	191	96%	82	41%	35	18%
SAUDI ARABIA	29	3	10%	8	28%	21	72%	4	14%	4	14%	21	72%	27	93%	27	93%	20	69%	1	3%
SERBIA	1	1	100%	1	100%	0	0%	1	100%	0	0%	0	0%	1	100%	1	100%	0	0%	0	0%
SINGAPORE	5	0	0%	2	40%	4	80%	0	0%	1	20%	3	60%	3	60%	1	20%	1	20%	0	0%

# What's next...

- ✓ Open Access publishing
  - ✓ Main Article
  - ✓ Country Specific Results (as supplementary file)
  
- ✓ Open Data
  - ✓ After publication of first article, data will be made available via a repository
  - ✓ “Intelligent Open data”- encouragement of data use by others
  
- ✓ Second Publication
  - ✓ Comparison of doctors vs. nurses

# Thank You

## Questions

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