AUDIT TOOLS

FOR INFECTION PREVENTION AND CONTROL TEAMS

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OBJECTIVES

01

Adherence

Importance of adherence to preventive measures for healthcare associated infections (HAI) prevention

02

Measure

Describe practical tools to audit for adherence:

- Infection Risk Scan (IRIS)
- Quick Observation Tools (QUOTS)

Results

Published results and personal experience

03

Conclusions

04


ENVIRONMENT
PRACTICES
SAFE PATIENT (WITHOUT INFECTIONS)
PRODUCTS

SAFE ENVIRONMENT

SAFE design, maintenance, conservation & cleaning of:

- WATER Facilities (pipes, drains, cisterns...)
- AIR Facilities (clean areas, laminar flow...)
- COMMON SURFACES (bathrooms, floor, walls...)
- AREAS for preparation of FOOD / MEDICATION (kitchen, Pharmacy, nursery…)
- WASTE, LINEN…

Legal regulation (frequency, contamination levels)

Economic impact (huge amount of surfaces)

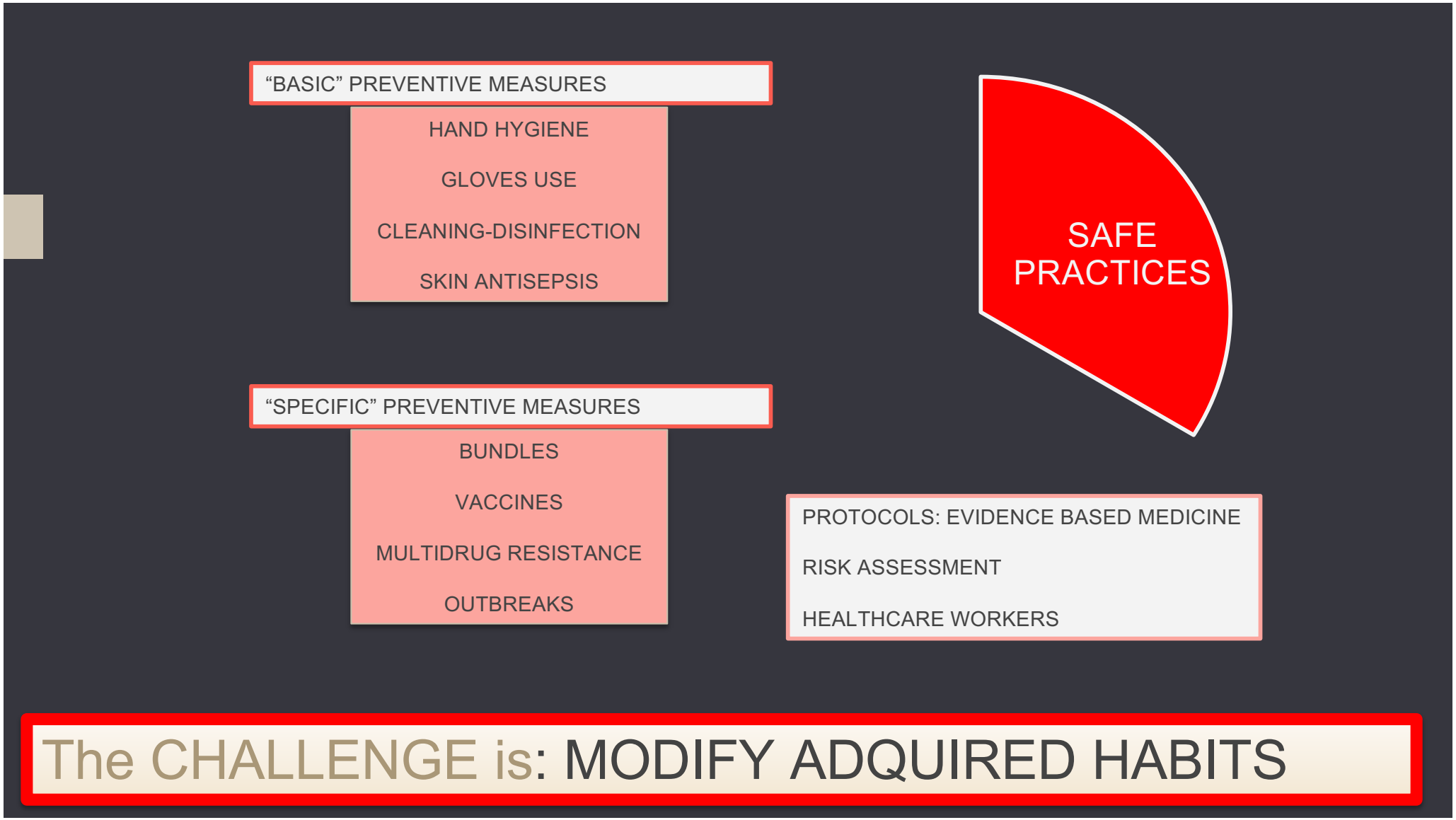
Non healthcare workers

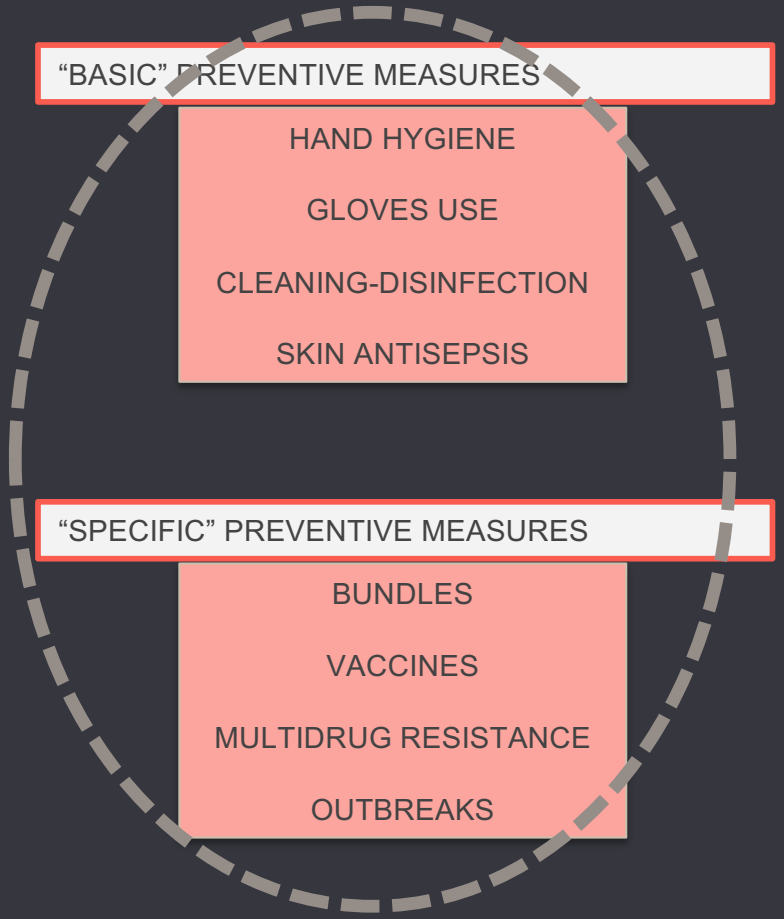
The CHALLENGE is: Find a COMMON language

Reprocessing of reusable medical instruments (CLEANING, DISINFECTION, STERILIZATION)

- Legal regulation (requisites)
- Clinical protocols
- ENVIRONMENTAL impact (dilemma: disposable versus reusable)
- ECONOMICAL impact (adquisition)
- Healthcare workers

The CHALLENGE is:
BALANCING EFFECTIVENESS AND SUSTAINABILITY


"BASIC" PREVENTIVE MEASURES
HAND HYGIENE
GLOVES USE
CLEANING-DISINFECTION
SKIN ANTISEPSIS
SAFE PRACTICES
"SPECIFIC" PREVENTIVE MEASURES
BUNDLES
VACCINES
MULTIDRUG RESISTANCE
OUTBREAKS
PROTOCOLS: EVIDENCE BASED MEDICINE
RISK ASSESSMENT
HEALTHCARE WORKERS
The CHALLENGE is: MODIFY ADQUIRED HABITS



SAFE PRACTICES

PROTOCOLS: EVIDENCE BASED MEDICINE

HEALTHCARE WORKERS

The CHALLENGE is: MODIFY ACQUIRED HABITS

ADHERENCE

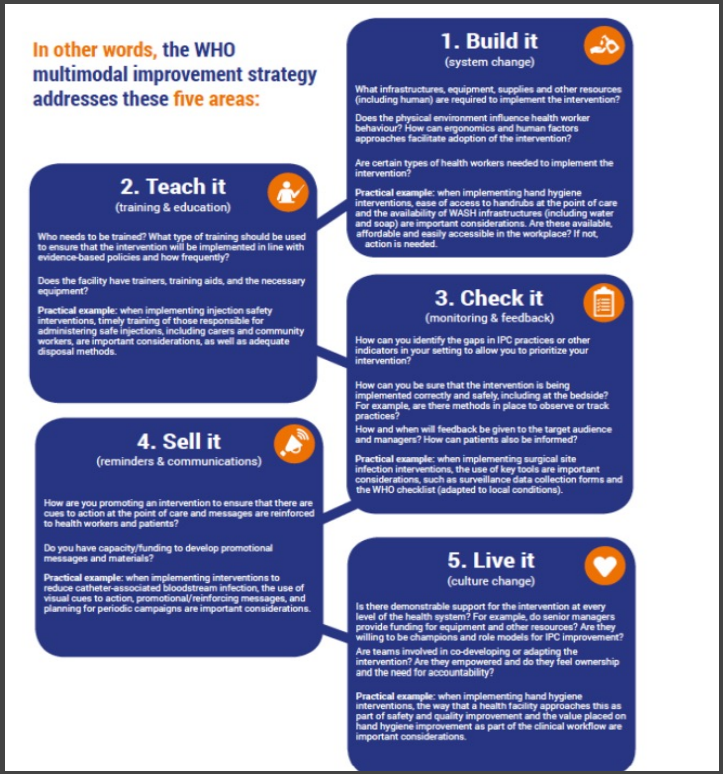
How to modify

acquired habit

in trained healthcare professional?

WHO multimodal improvement strategy

Increase the EFFECTIVENESS in prevention and control of HAI



- **Measures widely known to healthcare professionals.**
- **Modify their usual behavior**
- **MULTIMODAL**
  - 3-5 areas
  - Local context
  - Periodic evaluations

https://cdn.who.int/media/docs/default-source/integrated-health-services-(ihs)/infection-prevention-and-control/core-components/ipc-cc-mis.pdf

WHO multimodal improvement strategy

Requirements & Physical environment

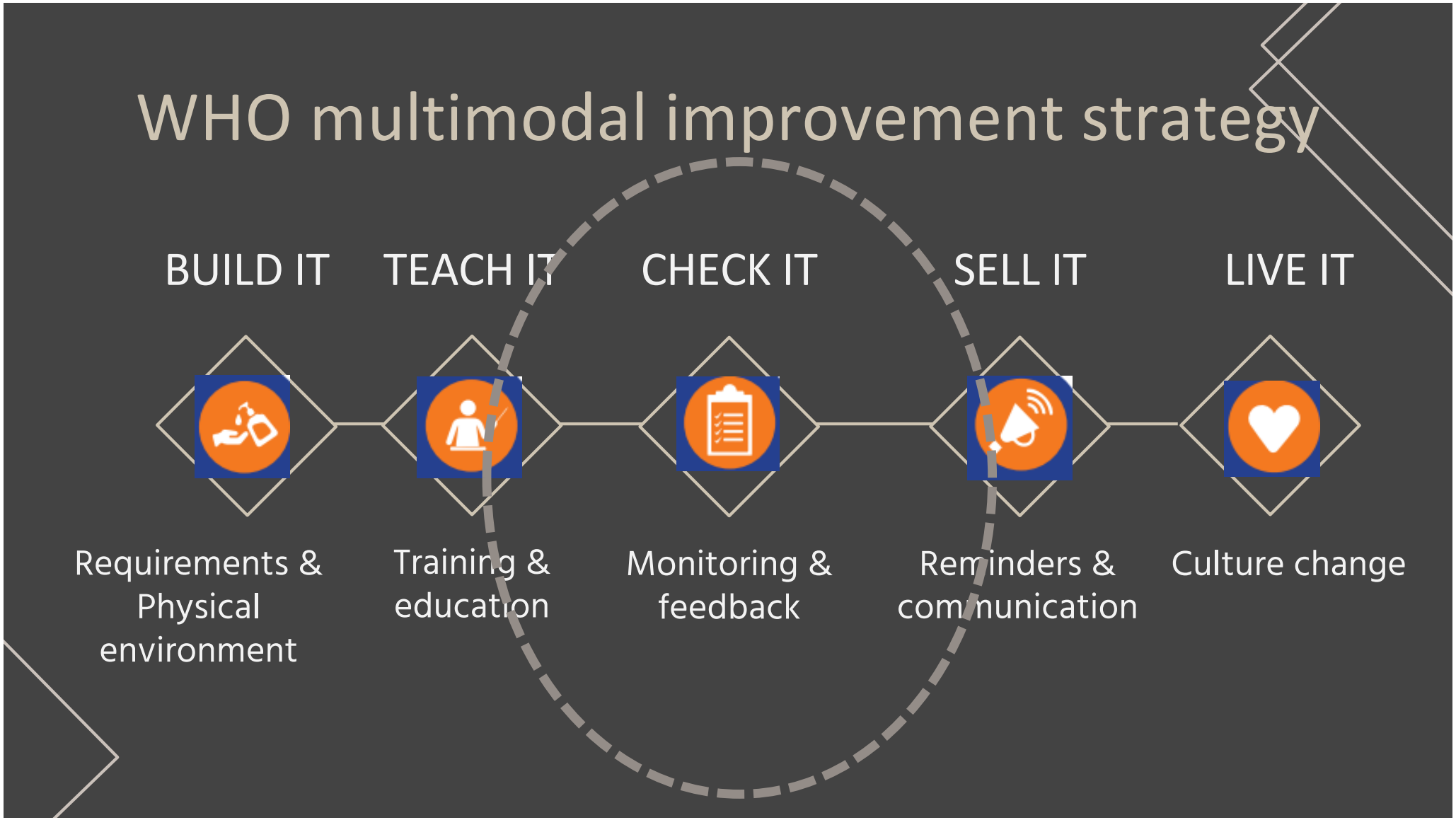
Training & education

Monitoring & feedback

Reminders & communication

Culture change

WHO multimodal improvement strategy



CHECK IT (Monitoring & Feedback)

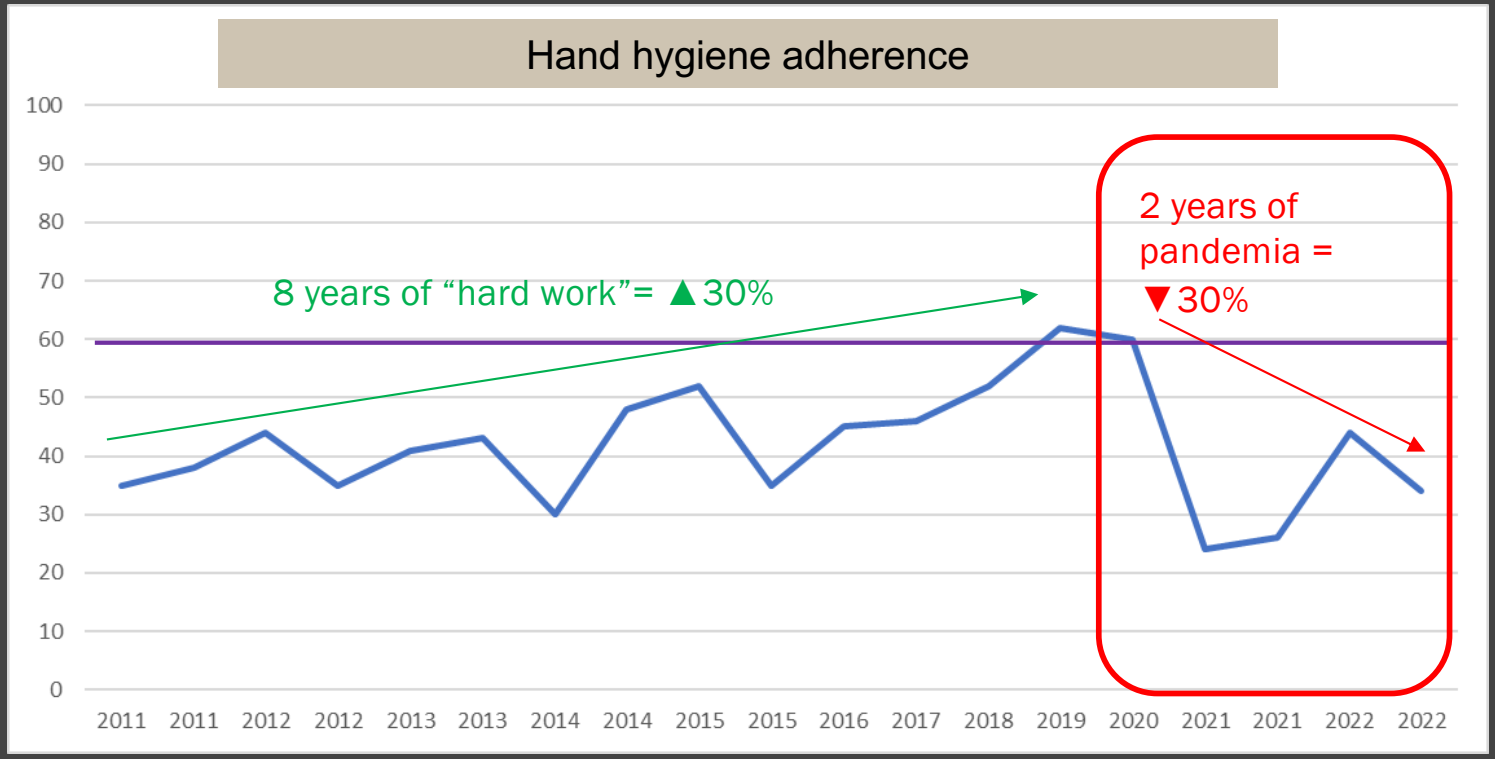
1. Identify gaps in IPC practices → Prioritize intervention
2. Evaluate→ Correct implementation of intervention at bedside
3. Provide feedback→ Target audience & managers

THE LEGACY OF COVID-19 APPROACH

FOCUS ON SURFACES

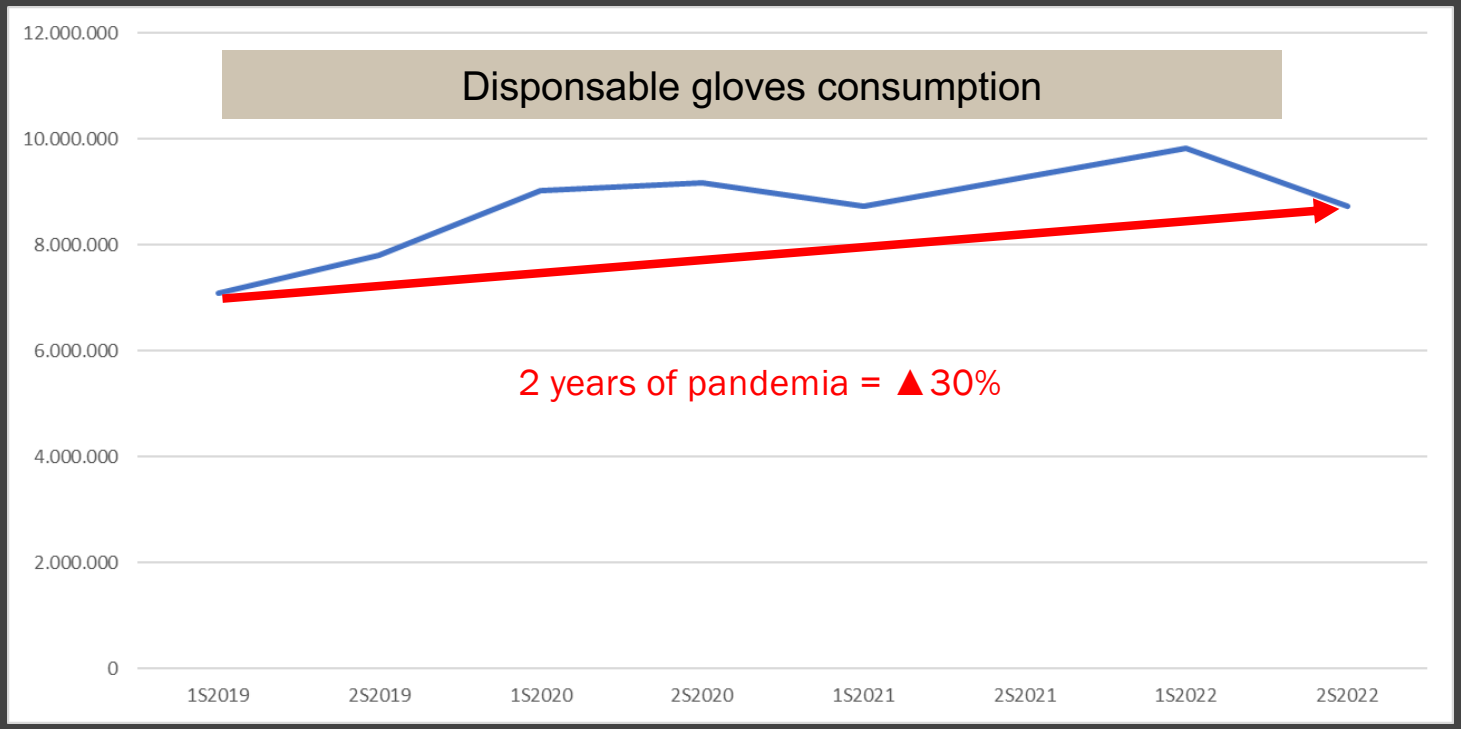
OVERUSE OF GLOVES

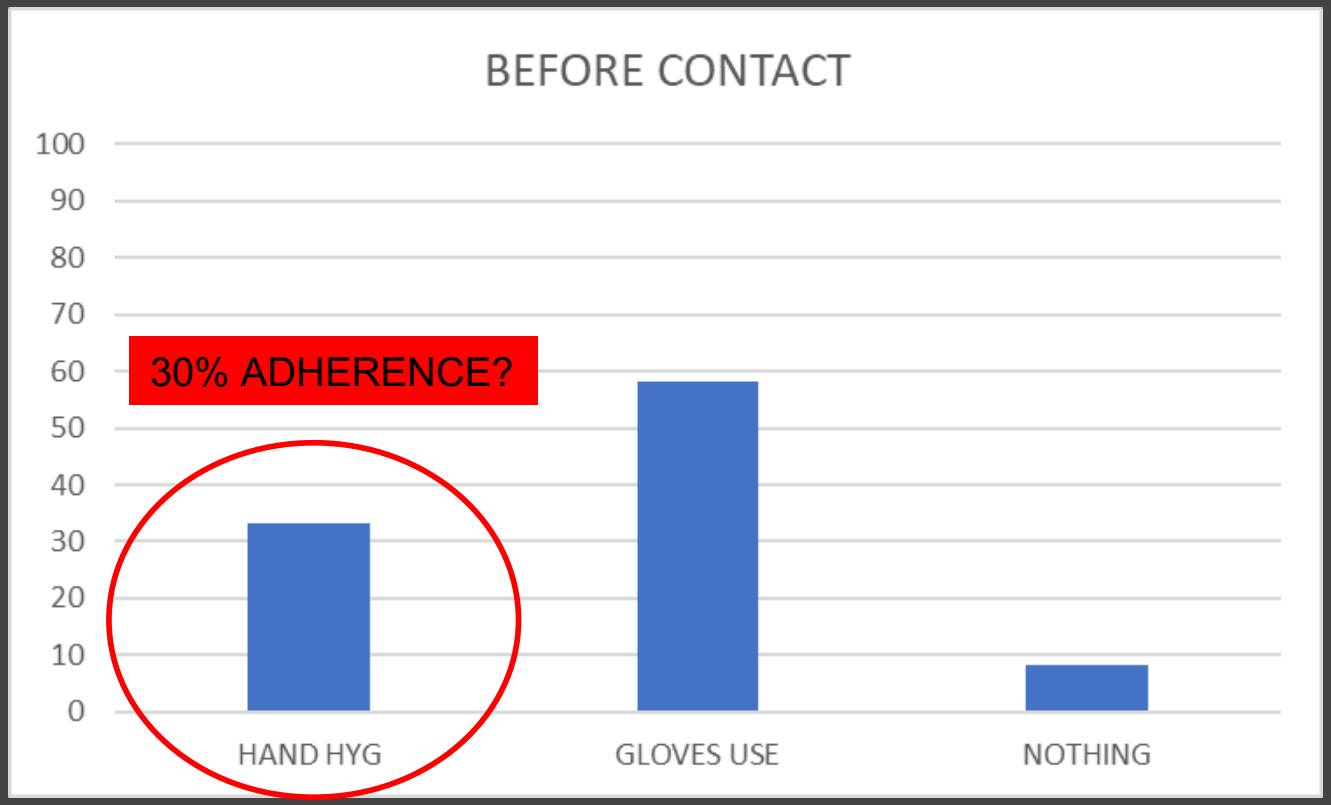
THE LEGACY OF COVID-19 APPROACH

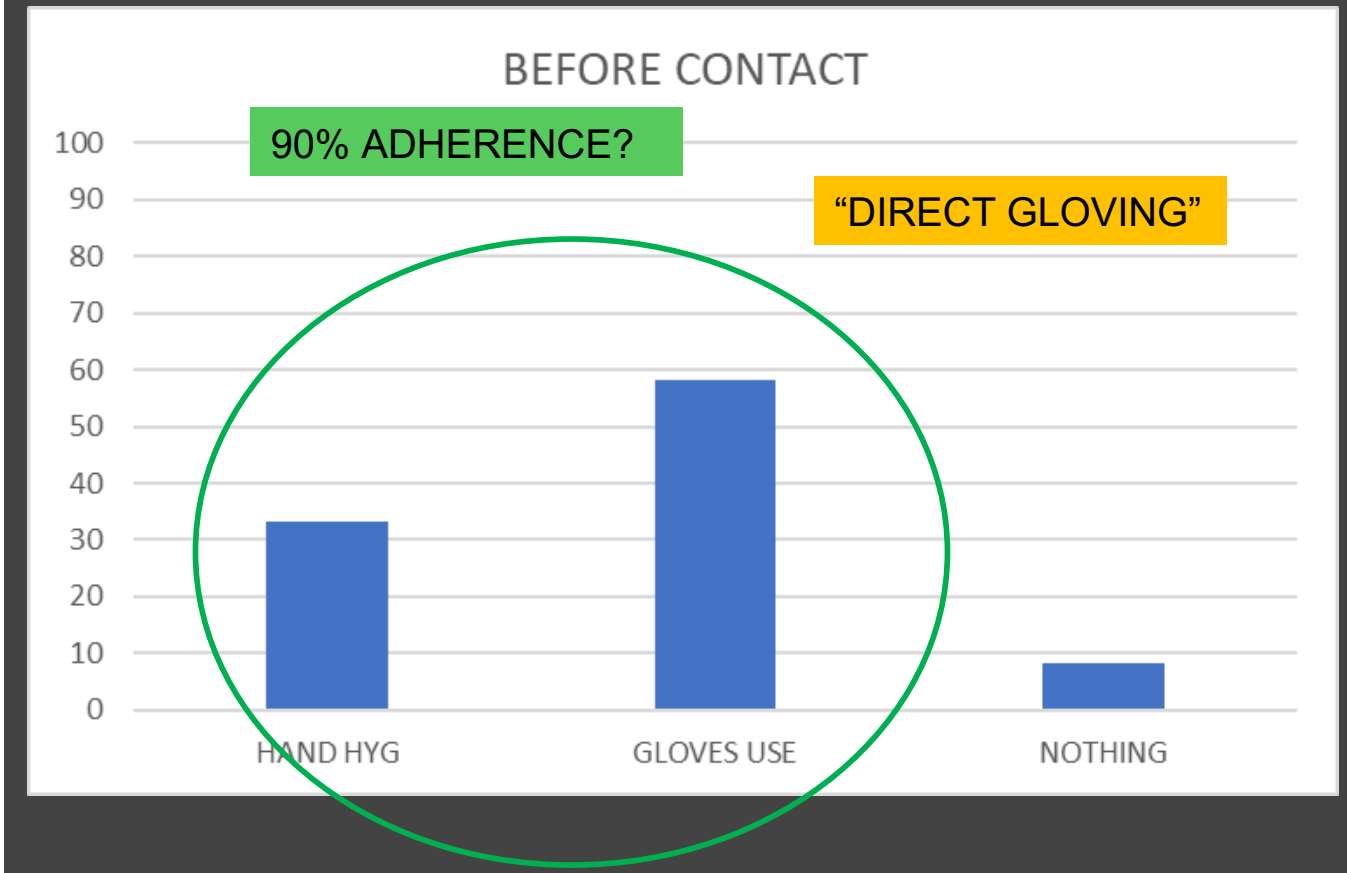


Mouajou V, Journal Hospital Infection 2022: Systematic revision: THRESHOLD For Hand Hygiene adherence: 60% to decrease HAI

THE LEGACY OF COVID-19 APPROACH




BEFORE CONTACT
100
90
80
70
60
50
40
30
20
10
0
30% ADHERENCE?
HAND HYG
GLOVES USE
NOTHING

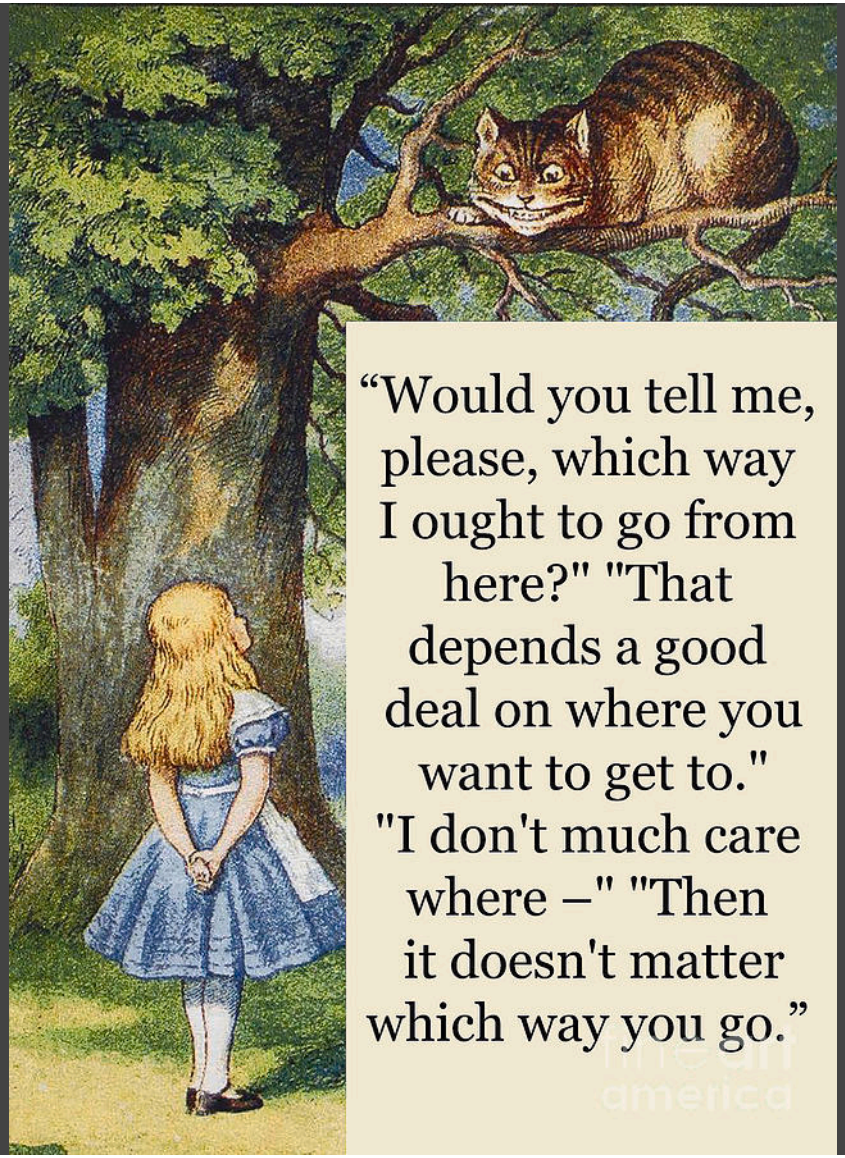


“Infection preventionists and hospital epidemiologists should **evaluate the potential impact** to patient and HCP safety associated with **direct gloving** to determine whether it may be considered compliant according to facility policies”

SHEA/IDSA/APIC Practice Recommendation: Strategies to prevent healthcare-associated infections through hand hygiene: 2022 Update

"Give me something quick, simple, and cheap"

—POST-COVID STATE OF MIND



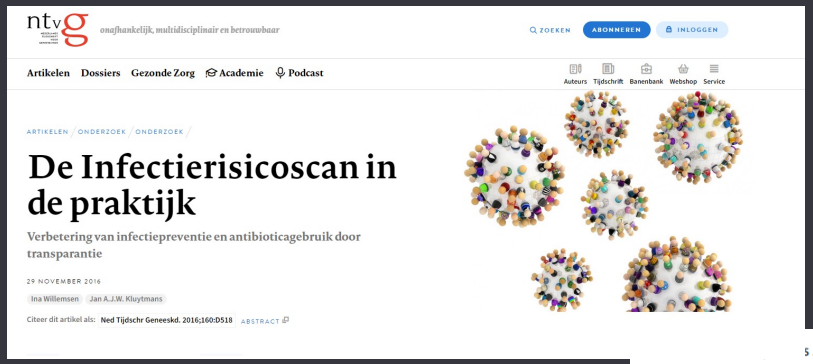
“Would you tell me, please, which way I ought to go from here?" "That depends a good deal on where you want to get to." "I don't much care where –" "Then it doesn't matter which way you go.”

Lewis Carroll, Alice in Wonderland

IRIS

Infection
Risk
Scan

INFECTION RISK SCAN (IRIS)



ntvg onafhankelijk, multidisciplinair en betrouwbaar

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ARTIKELEN / ONDERZOEK / ONDERZOEK

De Infectierisicoscan in de praktijk

Verbetering van infectiepreventie en antibioticagebruik door transparantie

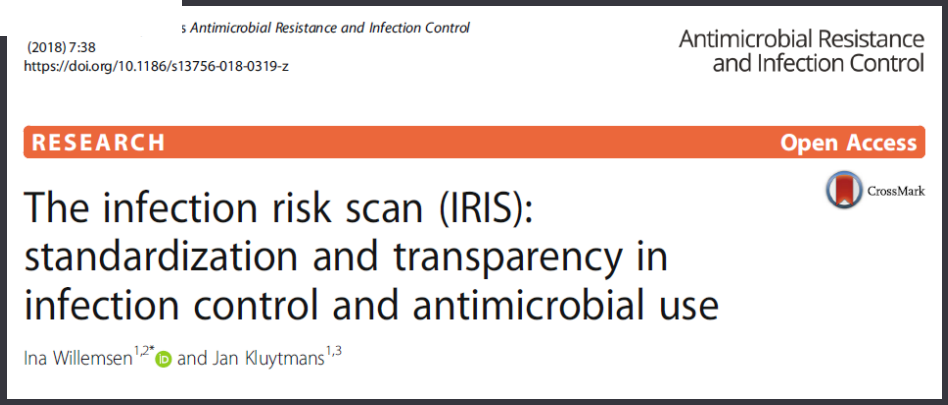
29 NOVEMBER 2016

Ina Willemsen Jan A.J.W. Kluytmans

Citeer dit artikel als: Ned Tijdschr Geneeskd. 2016;160:D518 ABSTRACT

https://www.ntvg.nl/artikelen/de-infectierisicoscan-de-praktijk

Ina Willemsen, Amphia Hospital in Breda (Netherlands)



s Antimicrobial Resistance and Infection Control

(2018) 7:38

https://doi.org/10.1186/s13756-018-0319-z

Antimicrobial Resistance and Infection Control

RESEARCH Open Access

CrossMark

The infection risk scan (IRIS): standardization and transparency in infection control and antimicrobial use

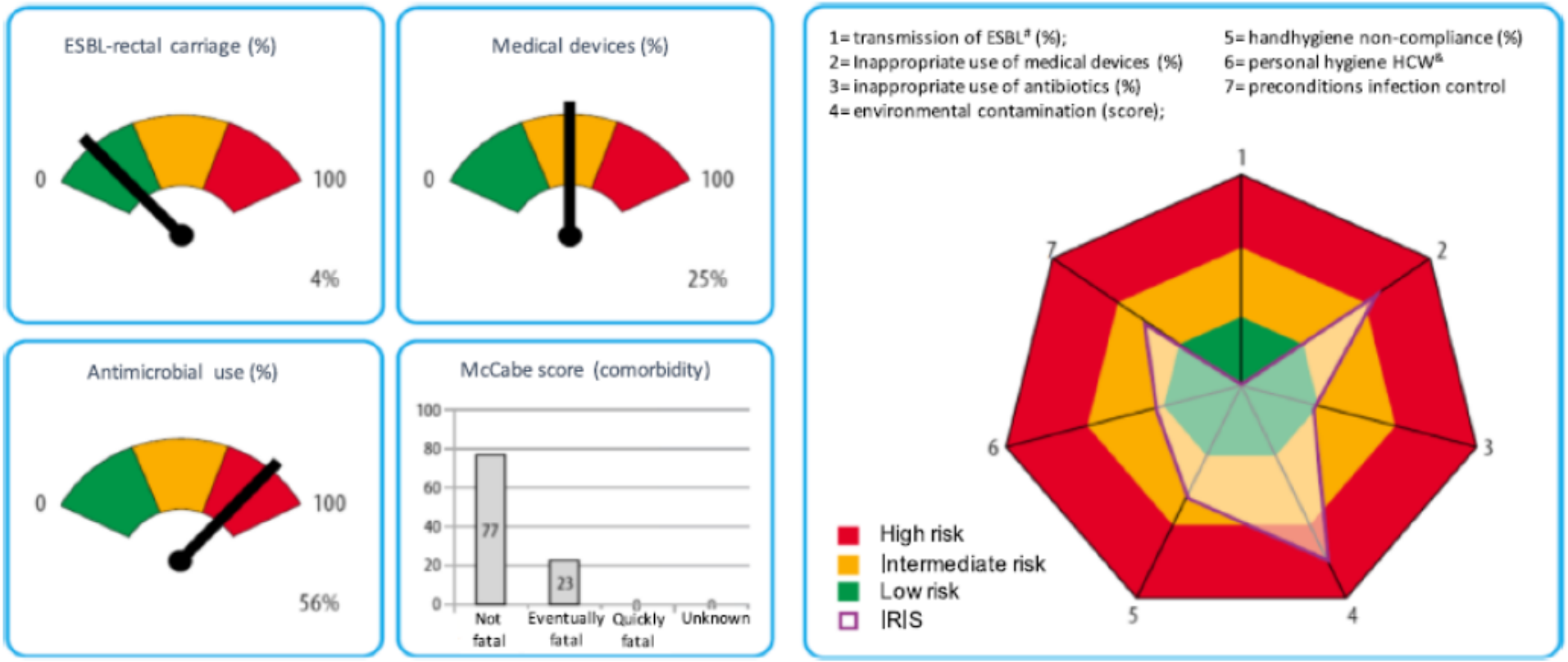
Ina Willemsen[1,2*] and Jan Kluytmans[1,3]

IRIS (Infection Risk Scan)

IRIS provides a standardized method that assesses the **QUALITY** of infection control by measuring different patient -, department- and care related risk factors.

Analizing a "bundle of measurements" provides a complete picture to give healthcare providers insight in the strengths and weakness of their performance.

- Visualized in an easy to understand way
- Adapted to local context (intensive care, hospitalization, nursing home...)



#ESBL = Extended Spectrum Beta-Lactamase

&HCW = Healthcare Worker

Fig. 1 Example of the IRIS for hospitals. The left part of the figure shows the risk-profile, and the right part of the figure shows the improvement-plot

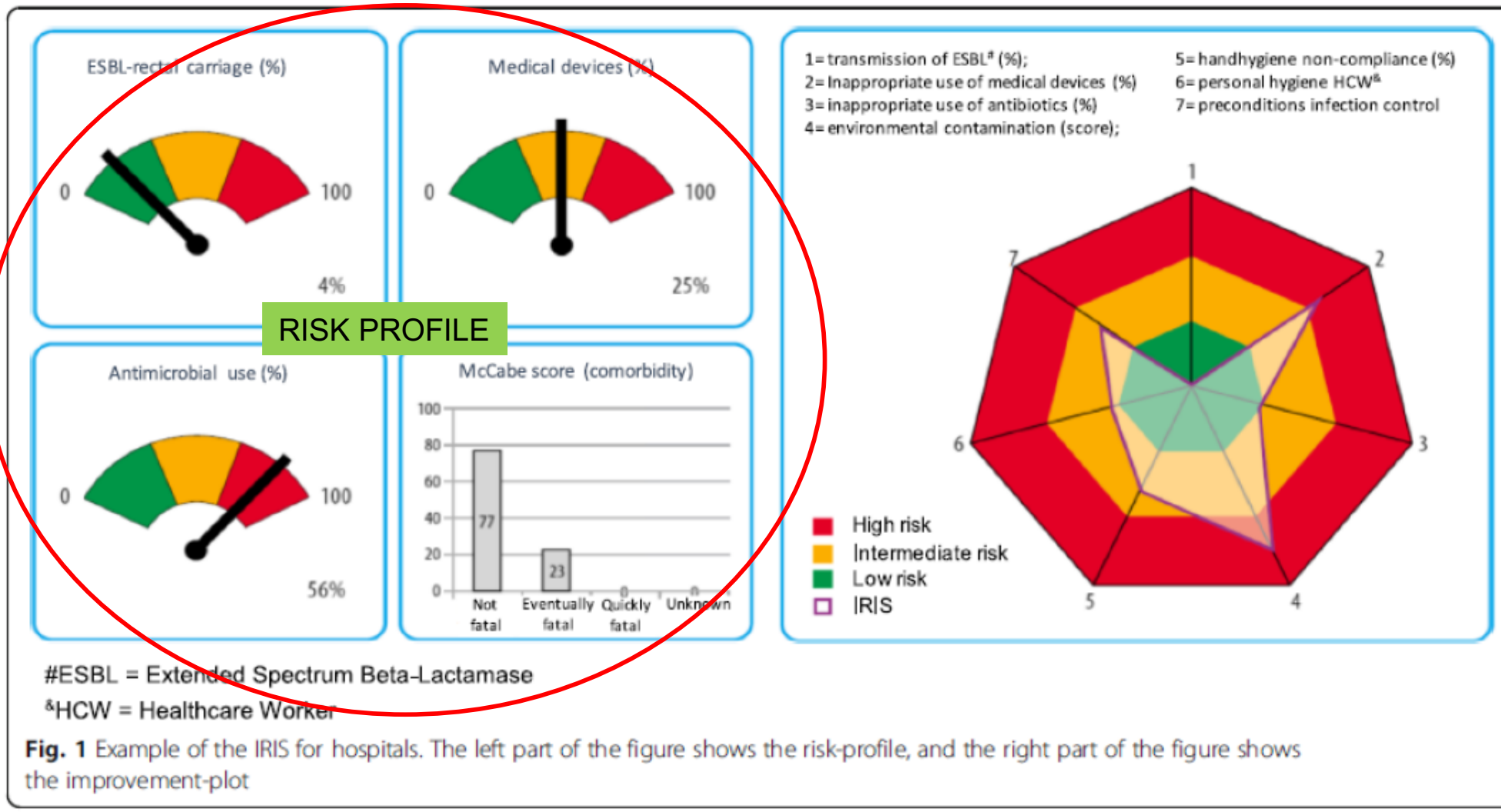


Fig. 1 Example of the IRIS for hospitals. The left part of the figure shows the risk-profile, and the right part of the figure shows the improvement-plot

Patients risk profile (n=50)

1) Score of severity of underlying diseases and Independency scale
2) Existence of a Invasive medical devices
3) Antibiotic use

Prevalence survey (file research & interview)

4) Rectal carriage of Extended Spectrum Beta-Lactamase (ESBL)-producing Enterobacteriaceae (ESBL-E)

At admission (culture of faeces or perianal swab)

Original IRIS 2013-15

Literature review + local agreement

Patients risk profile

1) Severity of underlying diseases (APACHE, Charson-index, NEMS)
2) Invasive medical devices (Central venous catheter, urinary catheter, invasive ventilation)
3) Antibiotic use (carbapenems)
4) Rectal carriage of Carbapenem-resistant Enterobacteriaceae
5) Personal history (<=12 months prior admission):

Prolonged hospitalization >=7 days

Surgery, trasplant, inmunosuppresion

Endoscopy

INTERPRETATION of patient risk profile

Invasive medical devices

<15% LOW RISK 15-50% INTERMEDIATE >50% HIGH

Antibiotic use

<5% LOW RISK 5-10% INTERMEDIATE >10% HIGH

Rectal carriage of ESBL-E

<7% LOW RISK 7-11% INTERMEDIATE >11% HIGH

Original IRIS
2013-15

INTERPRETATION of patient risk profile

Invasive medical devices

<15% LOW RISK 15-50% INTERMEDIATE >50% HIGH

Antibiotic use

<15% LOW RISK 15-50% INTERMEDIATE >50% HIGH

Personal risk exposure <=12m

<15% LOW RISK 15-50% INTERMEDIATE >50% HIGH

Rectal carriage of CPE

<7% LOW RISK 7-11% INTERMEDIATE >11% HIGH

Modification
ICU CHUIMI
2021

WHY “patient risk profile”

Adherence to IPC measures is important ALWAYS

BUT

- Work-load is a alleged as barrier to IPC adherence

→ PROVIDE INTERNAL DATA

- Use reliables comparators when doing benchmark

→ PROVIDE EXTERNAL DATA

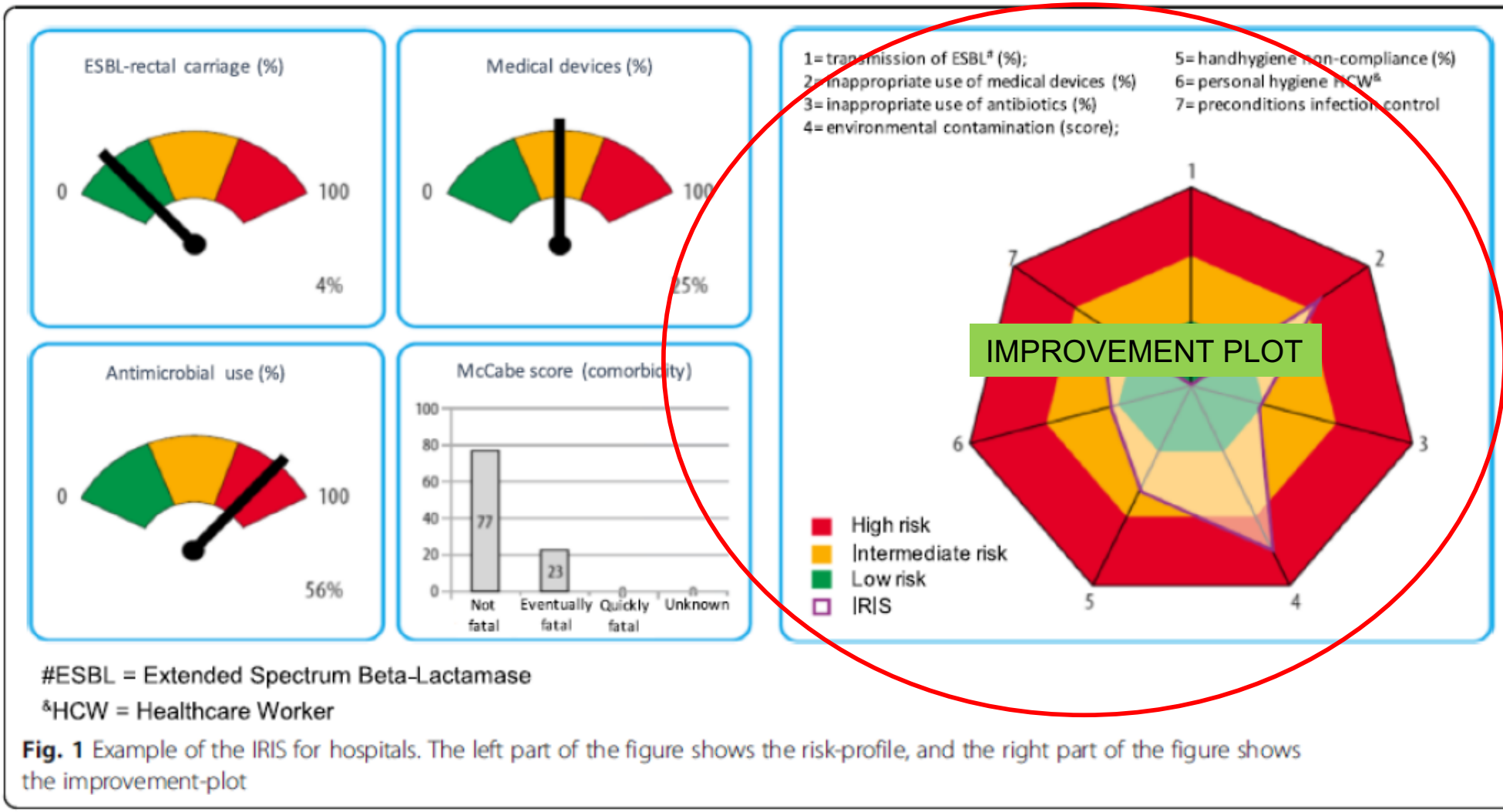
PUBLISHED RESULTS "PATIENT RISK PROFILE"

Study	Mc Cabe score Nonfatal	Invasive medical devices	Antimicrobial therapy	Prevalence MDR (rectal)
2013-15, Netherlands	-	-	-	4%
2013-15, Netherlands (nursing home)	-	-	-	11%
2016, Netherlands	80%	65%	37%	-
2016, USA	60%	93%	32%	-
2017, Belgium	80%	64%	42%	15%
2017, Netherlands	80%	66%	43%	10%

OUR UNPUBLISHED RESULTS "PATIENT RISK PROFILE"

Study	Previous Risk Exposure	APACHE II * (2 to 33)	Indwelling medical devices	Carbapeneme therapy	Prevalence EPC (rectal)
07-2021, ICU					
12-2021, ICU					
05-2022, ICU					
11-2022, ICU					
04-2023, ICU					

* Acute Phisiology And Chronic Health Evaluation



#ESBL = Extended Spectrum Beta-Lactamase

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Fig. 1 Example of the IRIS for hospitals. The left part of the figure shows the risk-profile, and the right part of the figure shows the improvement-plot

IMPROVEMENT PLOT

1) INAPPROPIATE use of:

- invasive medical device: Based on LOCAL guidelines

- antibiotic use (inappropiate USE and / or CHOICE)

→ DIFFICULT find ideal method (Point Prevalence Survey?)

3) Environmental CONTAMINATION (20 surfaces samples frequently touched, innmediate patients surroundings, ítems that should always be clean)

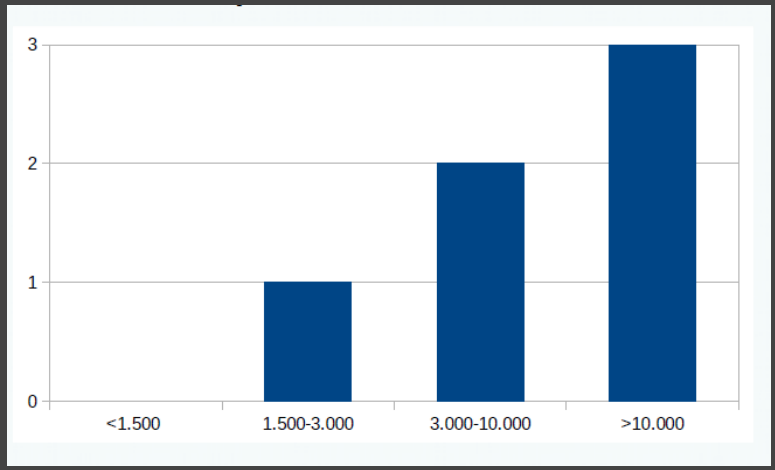
→ Adenosine Triphosphate (ATP): light units

Original IRIS 2013-15

ATP = organic material

Fig. 2. Example of an ATP bioluminescence system. Note: Pictures of the 3M Clean-Trace system are used with permission from FOSS.

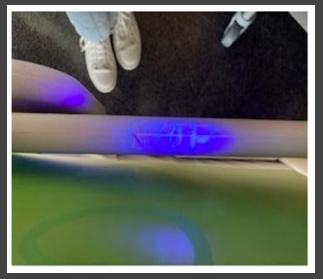
<1,500 relative light units (RLU) were considered clean (0 points)
1,500-3,000 RLU intermediate (1 point)
3,000-10.000 RLU contaminated (2 points);
>10.000 RLU extremely contaminated (3 points)



IMPROVEMENT PLOT

1) INAPPROPIATE use of invasive medical device
2) INAPPROPIATE use of carbapenemes
3) Environmental CONTAMINATION

→ invisible marking of surfaces and visual control with UV lamp (GLOW CHECK)



Modification
ICU CHUIMI
2021

GLOW CHECK = cleaning quality

Marking COMPLETELY removed= Good cleaning result

Marking PARTLY removed = Surface has been cleaned but not thorougly (not wet enought?)

Marking completely VISIBLE: NO wet cleaning has been carried out

IMPROVEMENT PLOT (cont.)

4) Infection prevention PRECONDITIONS (10 essential conditions): trash bins, clean linen stored, closed cabinet for sterile medical devices, surgical masks and hand alcohol dispensers are present…

5) Basic personal hygiene rules (20 health care workers) no rings, no watch or wrist jewelry present, forearms uncovered (bare below the elbow), uniform worn correctly, and coat closed

Original IRIS 2013-15

IMPROVEMENT PLOT (cont.)

4) Infection prevention PRECONDITIONS (10 essential conditions)

5) Basic personal hygiene rules (20 health care workers)

no rings; no watch or wrist jewelry present; NO PAINTED NAILS (artificial, polish/varnish)

Painted Nails

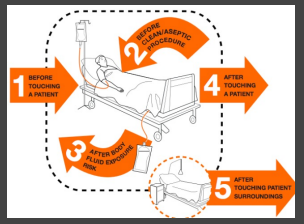
Standard polish and natural nails may be more amenable to hand hygiene than gel polish. Gel nails may be more difficult to clean using alcohol hand gel (Hewlett AL. Am J Infect Control. 2018)

Policies regarding the use of fingernail polish and gel shellac is **at the discretion of the infection prevention program**, except among HCP who scrub for surgical procedures, for whom fingernail polish and gel shellac should be prohibited (SHEA/IDSA/APIC 2022)

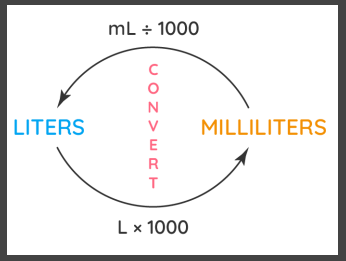
IMPROVEMENT PLOT (cont.)

6) HAND HYGIENE: Estimated hand hygiene actions / patient day

(1) Calculate the amount of product per aplication (mL)



(2) Estimate the average hand hygiene moments should be done per PATIENTS per DAY: 30-50 hand hygiene moments



(3) Request, for a specific PERIOD of time:

- Total amount of hand hygiene products consumption
- Total number of patient-days

Original IRIS 2013-15

Consumption ≠ use

- Use for non direct patient contact actions
- Use by non healthcare workers
- “Externalization” (use outside hospital ☹)
- A lot of differents suppliers (differents ammounts of mL per application: foam, liquid, gel…)
- Uncapable to distinguish Moment 1 (BEFORE patient contact) from Moment 4 (AFTER patient contact)

ADVANTAGES: Easy to generate, reproducible at hospital level, no observer bias, less time-consuming

SHEA/IDSA/APIC 2022: “Monitor adherence to hand hygiene with MULTIPLE methods, considering advantages and limitations of each type of monitoring

IMPROVEMENT PLOT (cont.)

6) HAND HYGIENE in 200 opportunities

DIRECT observation with World Health Organization tool

Including USE OF GLOVES instead of HH

Cat. Prof.		Indicación		Acción
		Antes pac.		PBA
		Antes asép.		Jabón
		Tras fluidos		Guantes
		Tras pac.		G. Inad.
		Tras ambiente		NADA

Modified
IRIS
2016

Modification
ICU CHUIMI
2021

INTERPRETATION of improvement plot

Inappropiate use of Invasive medical devices

<15% LOW RISK 15-25% INTERMEDIATE >25% HIGH

Innapropiate use of Antibiotic

<15% LOW RISK 15-25% INTERMEDIATE >25% HIGH

Environmental contamination

<5 LOW RISK 5-12 INTERMEDIATE >12 HIGH

Original IRIS
2013-15

INTERPRETATION of improvement plot

Inappropiate use of Invasive medical devices

<15% LOW RISK 15-25% INTERMEDIATE >25% HIGH

Innapropiate use of Antibiotic

<15% LOW RISK 15-25% INTERM. >25% HIGH

Environmental contamination (number NO clean surfaces)

ALL or <10% surfaces are dirty LOW RISK

SOME or 10-50% surf. dirty INTERM

NO or >50% surf. dirty HIGH

Modification
ICU CHUIMI
2021

INTERPRETATION of improvement plot

NOT Infection control preconditions (10 preconditions/ward)

Number NO adherence <2 LOW RISK 2-3 INTERM. >3 HIGH

NOT Personal basic hygiene (20 HCW observed)

Number NO adherence <2 LOW RISK 2-4 INTERM. >4 HIGH

% NO adherence <5% LOW 5-20% INTERM. >20% HIGH

NOT hand hygiene Direct observations (200)

% not adherence <40% LOW RISK 40-60% INTERM. >60% HIGH

Published results Improvement plot

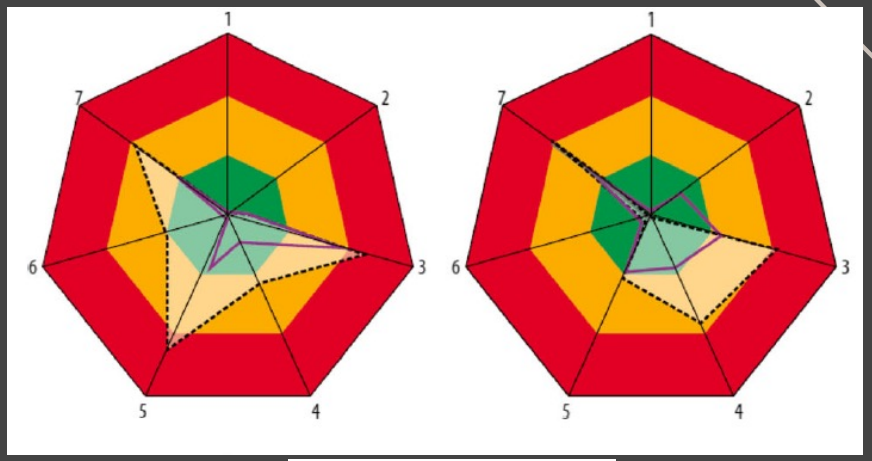
Study	Inapprop device use	Inapprop ATB use	Environment contamination	NOT IP pre-conditions	NOT Personal hygiene	NOT Hand hygiene
2013-15, Netherlands						
2013-15, Netherlands (nursing home)	-	-	-	-	-	-
2016, Netherlands	2%	19%	10	1,5	0	77%
2016, USA	0%	12%	4	3	0	22%
2017, Belgium	10%	19%	431RTU		4,2%	12,5 HHpd
2017, Netherlands	5%	18,9%	793RTU		4,2%	6,3 HHpd

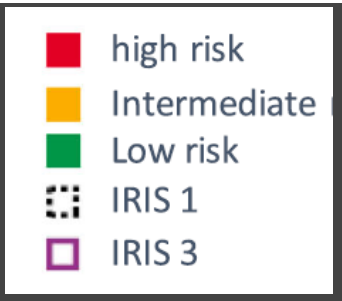
HHpd= hand hygiene actions per patient day

Published results IRIS

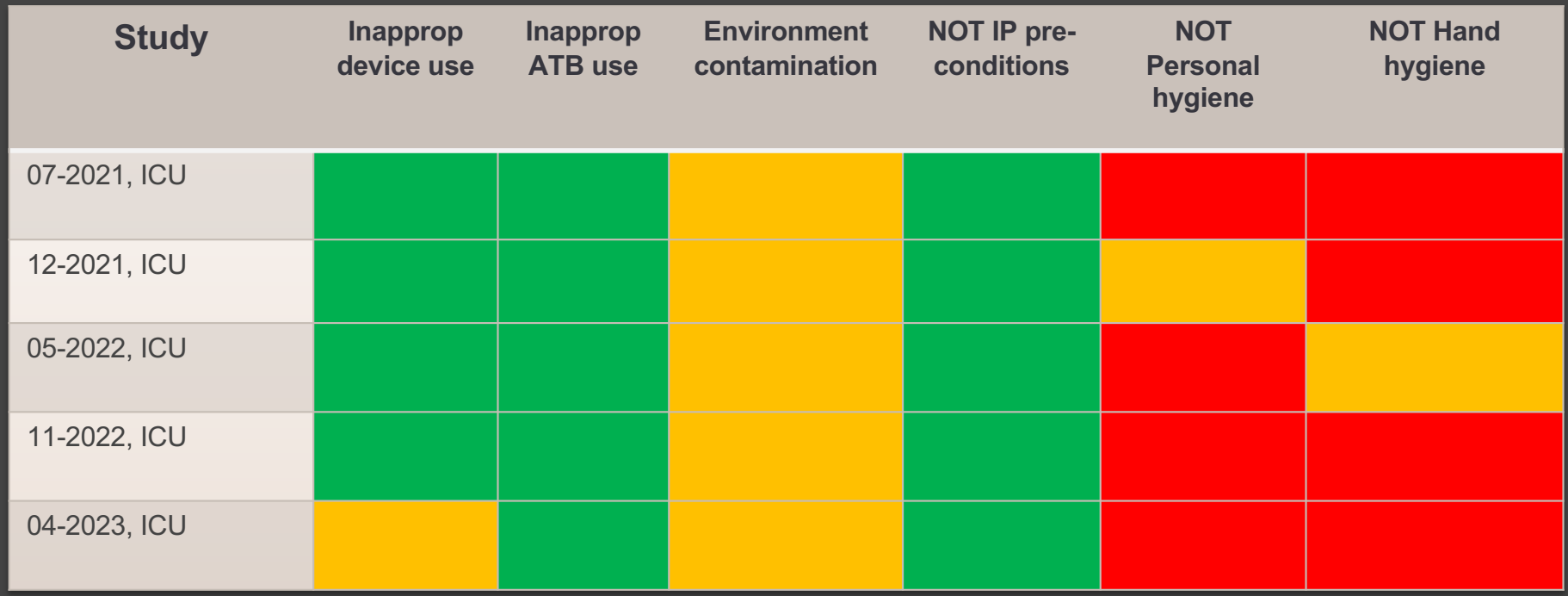
1. Willemsen I. Antimicrob Resist Infect Control 2018;7:38 (5 hospital wards, 1 rehabilitation center, 19 nursing homes)
    a. ▲Hand hygiene adherence: 43% → 66%
    b. ▼Environmental contamination

2. Van Arkel A. Int J Qual Health Care. 2021;33(4): Feedback about contamination in surfaces & equipment
    a. ▼Environmental contamination: 600 RLU → 200 RLU



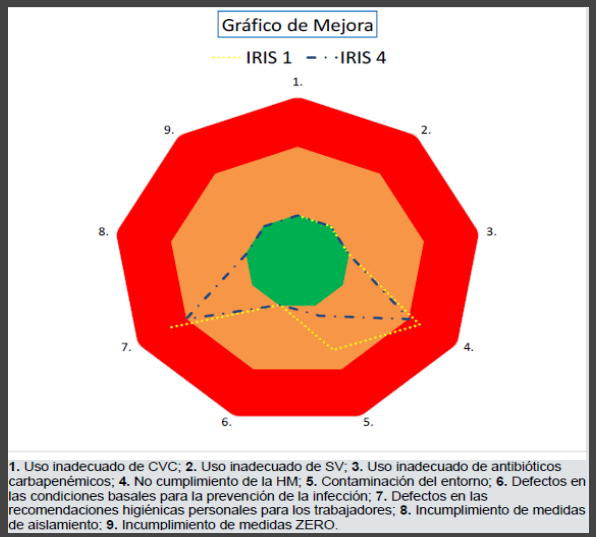


OUR UNPUBLISHED RESULTS "IMPROVEMENT PLOT"



OUR UNPUBLISHED RESULTS "IMPROVEMENT PLOT"

- ▼Environmental contamination
  - "Clean" surfaces 40% → 80%
- ▲ Hand Hygiene adherence
  - 20% → 40% (transient effect ☹)



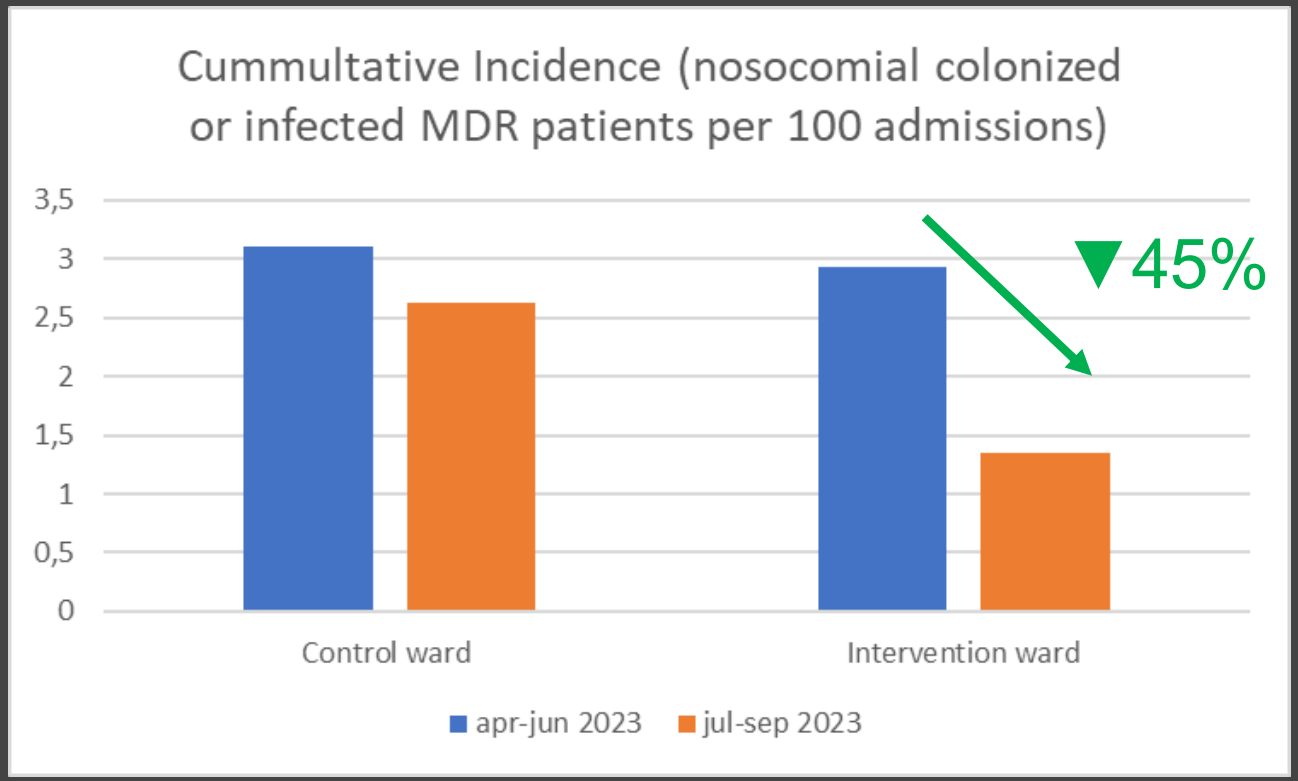
1. Uso inadecuado de CVC; **2.** Uso inadecuado de SV; **3.** Uso inadecuado de antibióticos carbapenémicos; **4.** No cumplimiento de la HM; **5.** Contaminación del entorno; **6.** Defectos en las condiciones basales para la prevención de la infección; **7.** Defectos en las recomendaciones higiénicas personales para los trabajadores; **8.** Incumplimiento de medidas de aislamiento; **9.** Incumplimiento de medidas ZERO.

OUR UNPUBLISHED RESULTS "IMPROVEMENT PLOT"

Study	Environment contamination	NOT IP pre-conditions	NOT Personal hygiene	NOT Hand hygiene
09-2022 UNIT A	21%	10%	50%	
09-2022 UNIT B	10%	10%	100%	
03-2023 **UNIT C**	24%	10%	78%	65%
03-2023 **UNIT B**	9%	0%	91%	45%
06-2023 UNIT D	15%	0%		
08-2023 UNIT D	8%	0%		38%
09-2023 UNIT E	17%	29%	55%	41%
10-2023 **UNIT B**	55%	9%		
10-2023 **UNIT C**	17%	18%	45%	70%

Unit B: Intervention from 03/2023. Unit C = Control

OUR UNPUBLISHED RESULTS



Quick Observation Tools (QUOTS)

Audit tool for Infection Prevention
Developed by CDC & Association for Professionals in Infection Control and Epidemiology (feb. 2019)
Use to:

Establish a baseline: Collect observations over several days or week.

Maintain performance: Periodically ensure continued vigilance and detect problems.

Performance improvement: In the event performance falls below expectations.

Targeted/Risk-based monitoring: If a problem such as healthcare-associated infections occurs or increases unexpectedly.

https://www.cdc.gov/infectioncontrol/tools/quots.html

Quick Observation Tools (QUOTS)

All Infection Prevention QUOTs (19 checklists)

- Central Venous Catheter
- Urinary Catheters
- Ventilators
- Hand Hygiene Provision of Supplies
- Personal Protective Equipment Provision
- Area Exterior to Contact Isolation Rooms
- Area Exterior to Airborne Infection Isolation Rooms
- Needlestick Prevention and Care of Laundry
- Centralized Medication Area
- Portable Medication Systems
- Neonatal Central Venous Catheter
- Isolettes/basinets
- Nutritional Preparation Area
- Visitor Areas
- Dirty Area
- Clean Area
- Cough Courtesy: Waiting Room
- Vaccine Storage Areas
- Point of Care Testing

All Infection Prevention QUOTs [PDF - 39 pages]

https://www.cdc.gov/infectioncontrol/tools/quots.html

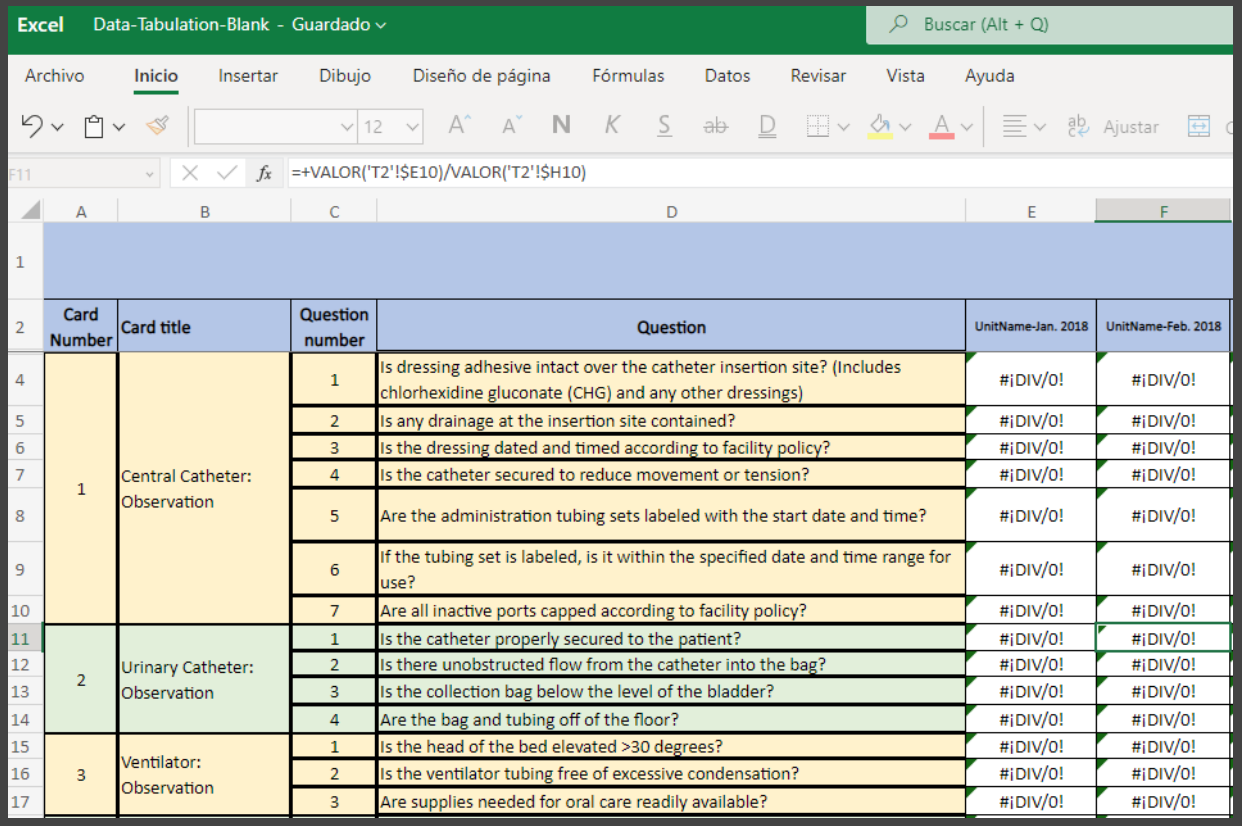
Standard Precautions: Observation of Personal Protective Equipment Provision

5

Instructions: Observe patient care areas or areas outside of patient rooms. For each category, record the observation. In the column on the right, sum (across) the total number of "Yes" and the total number of observations ("Yes" + "No"). Sum all categories (down) for overall performance.

Standard Precautions: Observation Categories		Room 1	Room 2	Room 3	Room 4	Room 5	Summary of Observations	
							Yes	Total Observed
1	Are gloves readily available outside each patient room or any point of care?	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No		
2	Are cover gowns readily available near each patient room or point of care?	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No		
3	Is eye protection (face shields or goggles) readily available near each patient room or point of care?	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No		
4	Are face masks readily available near each patient room or point of care?	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No		
5	Are alcohol dispensers readily accessible and functioning?	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No	❑ Yes ❑ No		
Total YES and TOTAL OBSERVED								

Quick Observation Tools (QUOTS)



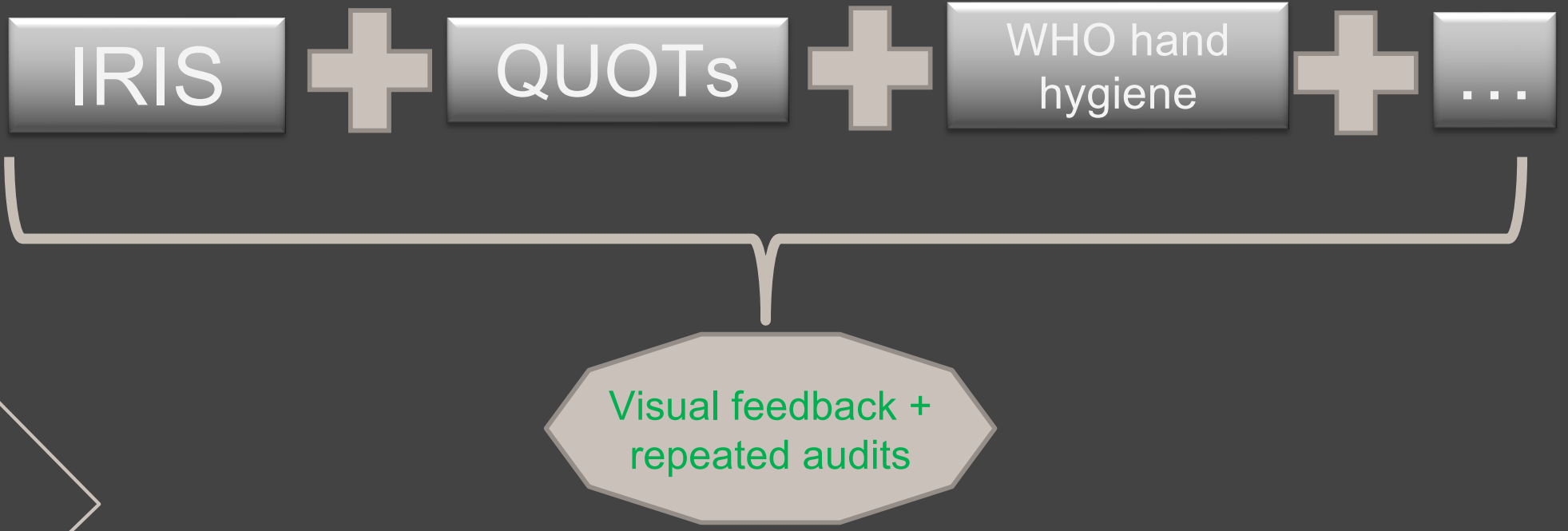
Card Number	Card title	Question number	Question	UnitName-Jan. 2018	UnitName-Feb. 2018
1	Central Catheter: Observation	1	Is dressing adhesive intact over the catheter insertion site? (Includes chlorhexidine gluconate (CHG) and any other dressings)	#¡DIV/0!	#¡DIV/0!
		2	Is any drainage at the insertion site contained?	#¡DIV/0!	#¡DIV/0!
		3	Is the dressing dated and timed according to facility policy?	#¡DIV/0!	#¡DIV/0!
		4	Is the catheter secured to reduce movement or tension?	#¡DIV/0!	#¡DIV/0!
		5	Are the administration tubing sets labeled with the start date and time?	#¡DIV/0!	#¡DIV/0!
		6	If the tubing set is labeled, is it within the specified date and time range for use?	#¡DIV/0!	#¡DIV/0!
		7	Are all inactive ports capped according to facility policy?	#¡DIV/0!	#¡DIV/0!
2	Urinary Catheter: Observation	1	Is the catheter properly secured to the patient?	#¡DIV/0!	#¡DIV/0!
		2	Is there unobstructed flow from the catheter into the bag?	#¡DIV/0!	#¡DIV/0!
		3	Is the collection bag below the level of the bladder?	#¡DIV/0!	#¡DIV/0!
		4	Are the bag and tubing off of the floor?	#¡DIV/0!	#¡DIV/0!
3	Ventilator: Observation	1	Is the head of the bed elevated >30 degrees?	#¡DIV/0!	#¡DIV/0!
		2	Is the ventilator tubing free of excessive condensation?	#¡DIV/0!	#¡DIV/0!
		3	Are supplies needed for oral care readily available?	#¡DIV/0!	#¡DIV/0!

https://ipobservationtools.org/data-gathering-and-summary-reports/

Las Palmas Medical College
Scolarship to promote IRIS use

Canary Institute for Research
Scolarship Research Project

IRIS-CHUIMI



IRIS-CHUIMI Until now

Good source of information

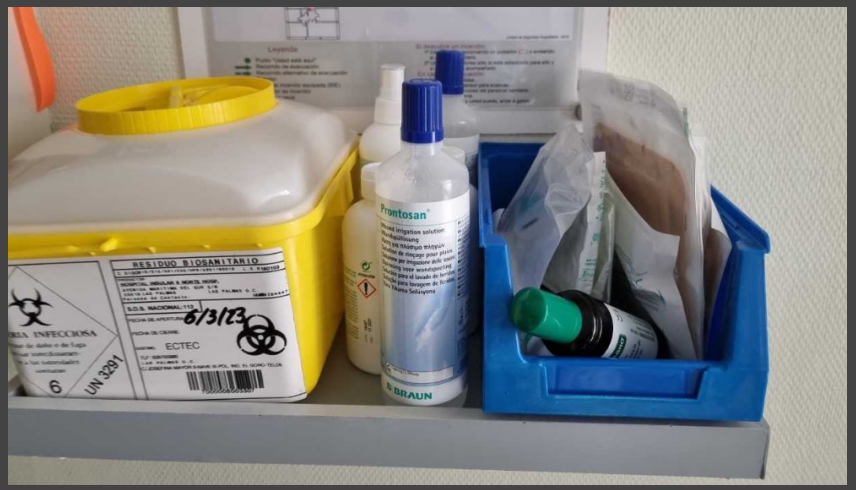
Immediate feedback to HCW and cleaning staff

Detection of opportunities to improve:

- Insufficient education of new cleaning staff
- Excess of furniture without clear assignation of responsabilities

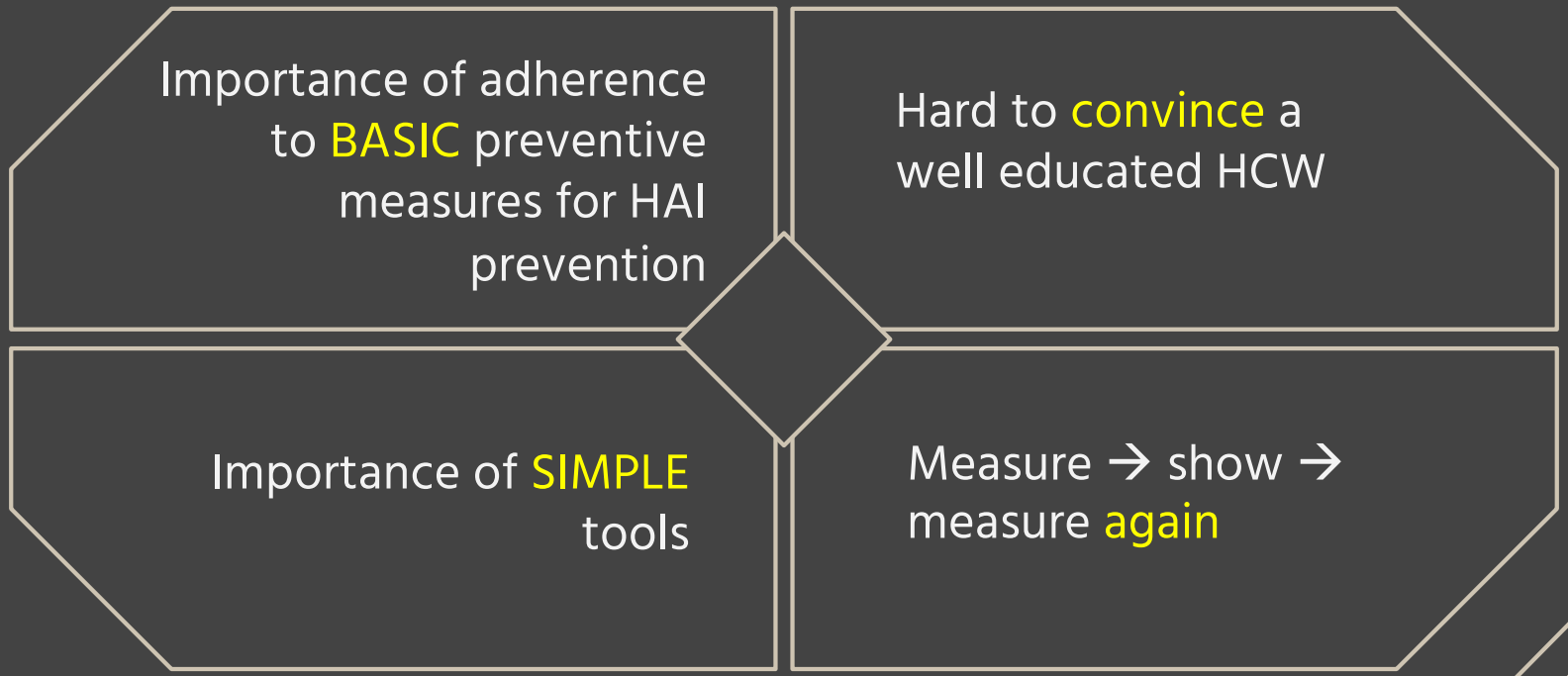
Importance of local leadership

Excess of furniture without clear assignation of cleaning responsabilities



Cleaning staff does NOT move clinical supplies

The post-covid legacy



THANKS

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www.webbertraining.com/schedulep1.php

November 8, 2023	*(South Pacific Teleclass)* **DEVELOPMENT OF A CORE OUTCOME SET FOR STUDIES AIMED AT ANTIMICROBIAL STEWARDSHIP IN CARE HOMES** Speaker: **Prof. Nguyễn Quốc Hòa**, University of Medicine and Pharmacy at Ho Chi Minh City, Vietnam
November 9, 2023	*(FREE European Teleclass)* **SANITATION INTELLIGENCE AND PUBLIC HEALTH** Speaker: **Toilet Board Coalition**, Switzerland
November 16, 2023	**QUATERNARY AMMONIUM-BASED DISINFECTANTS: ADVANTAGES, DISADVANTAGES, AND SAFETY CONCERNS** Speaker: **Dr. John M. Boyce**, J.M. Boyce Consulting
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