



LATE-ONSET SEPSIS IN NICU

Jodie Simich
Mariam Buksh

Outline



DATA



KEY CHALLENGES



ACTION PLAN

Some definitions

- **Early-onset sepsis** – an episode of sepsis where the initial symptoms occurred within the first 48 hours after birth (i.e. 0 - 47 hours)
- **Late-Onset Sepsis** – an episode of sepsis where the initial symptoms occurred in babies aged ≥ 48 hours
- Episodes of sepsis caused by the same organism at least 14 days apart are considered separate episodes of sepsis
- **CLABSI** – central-line associated blood stream infection - positive blood culture in patients with central lines where the infection is attributed to the central line and not another source (e.g. pneumonia)
- **Non-CLABSI** – an episode of infection in a patient without an indwelling central line
- Culture positive sepsis versus culture negative sepsis

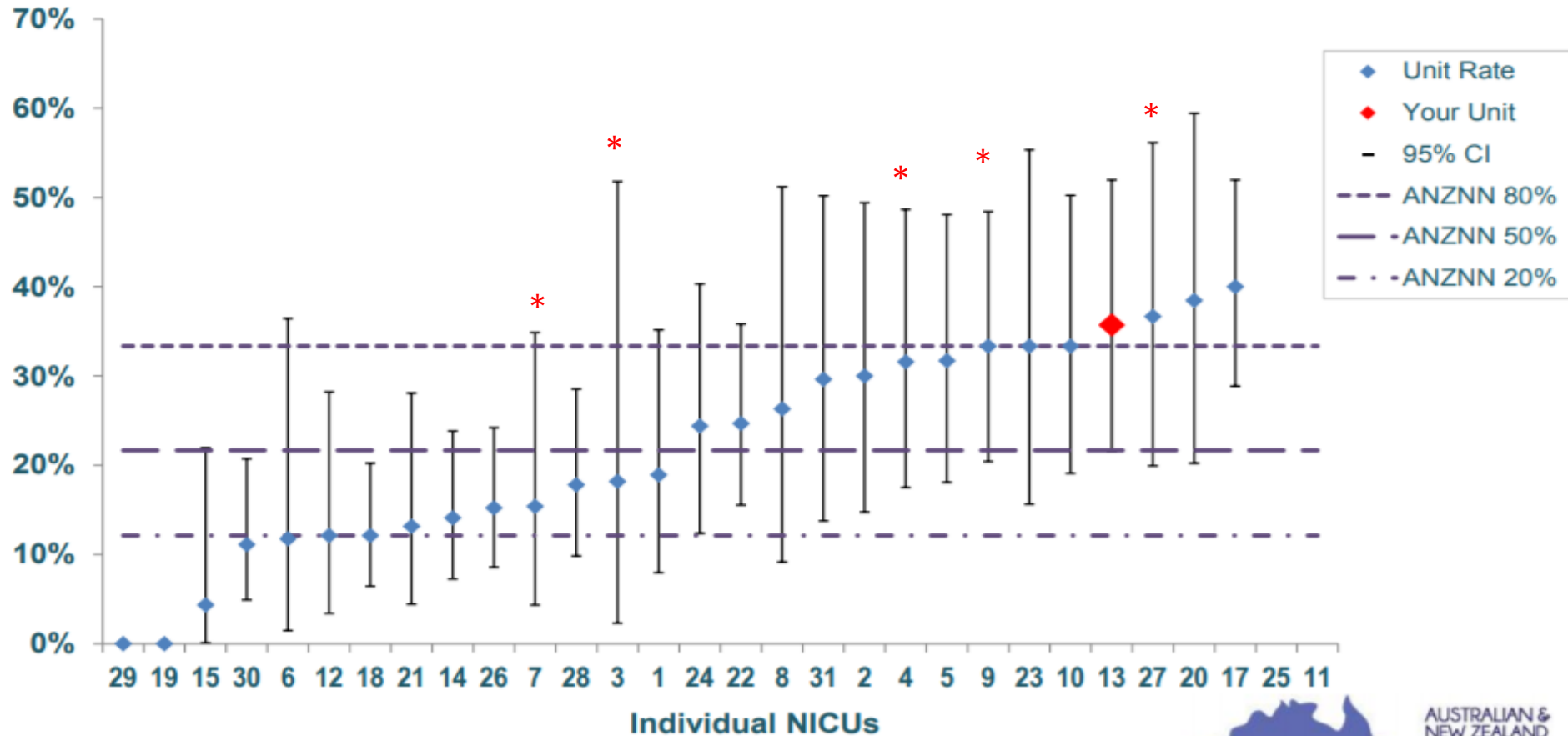
Late-onset sepsis

		ANZNN	Your Unit
Population:	Babies born at specified GA group and survived to day 2		
Numerator:	Babies with late-onset sepsis born at <28 weeks GA	22.6%	35.7%
Denominator:	All babies in population		
Numerator:	Babies with late-onset sepsis and born at 28-31 weeks GA	3.4%	3.1%
Denominator:	All babies in population		
Numerator:	Babies with late-onset sepsis born at ≥32 weeks GA	1.2%	1.4%
Denominator:	All babies in population		



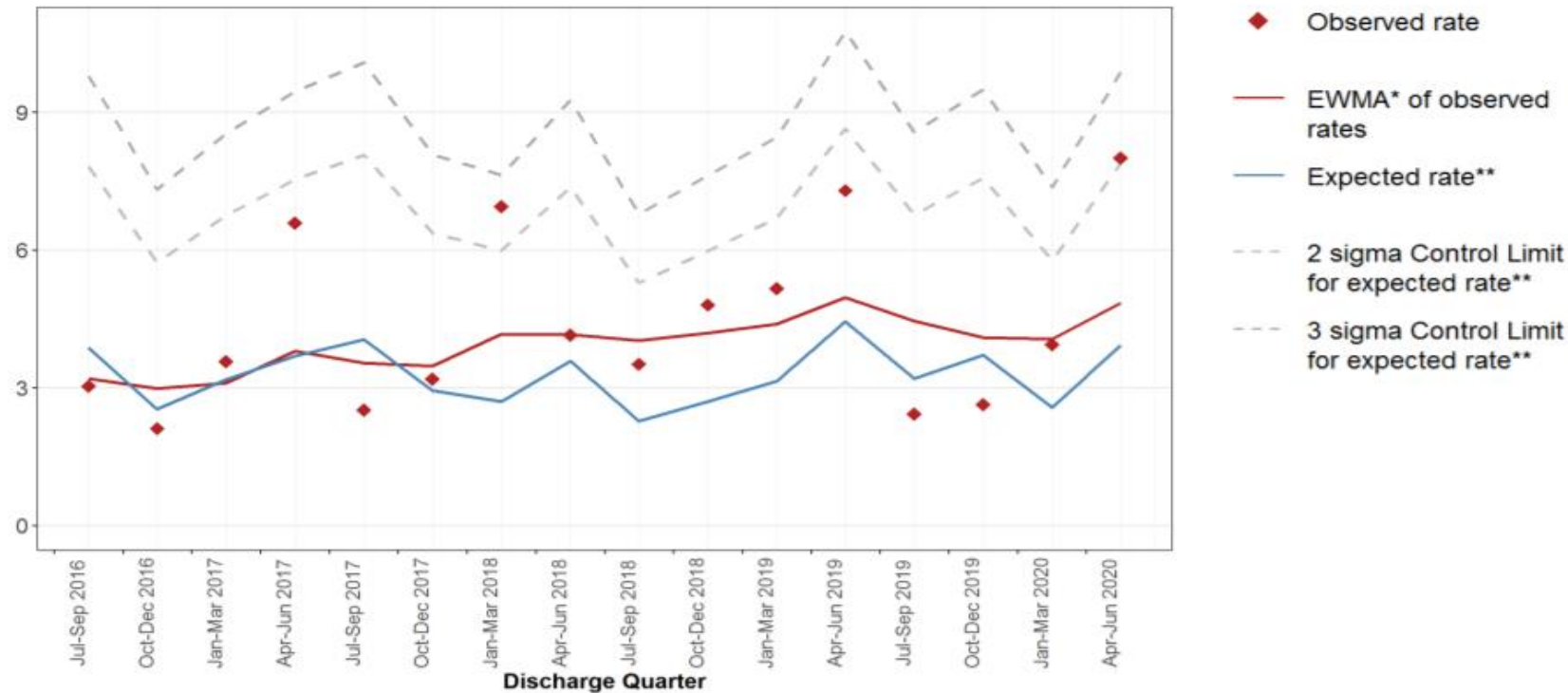
Late-onset sepsis

Babies born <28 weeks GA and survived >2 days



Late onset sepsis rate[^] (p-chart)

Babies born at <32 weeks who survived to day 2^{^^}



[^]Episodes per 1,000 patient days occurring during the period to first transfer or discharge to home, truncated to first 35 days of life.

^{^^}Babies with unknown exposure time (missing date of transfer, death or discharge to home) are assumed to stay at least 35 days.

*Exponentially Weighted Moving Average

**Adjusted for GA, standardised to rates in Australian and NZ NICUs 2014-2018



Neonatal sepsis for level III registrants by gestational age, ANZNN 2018

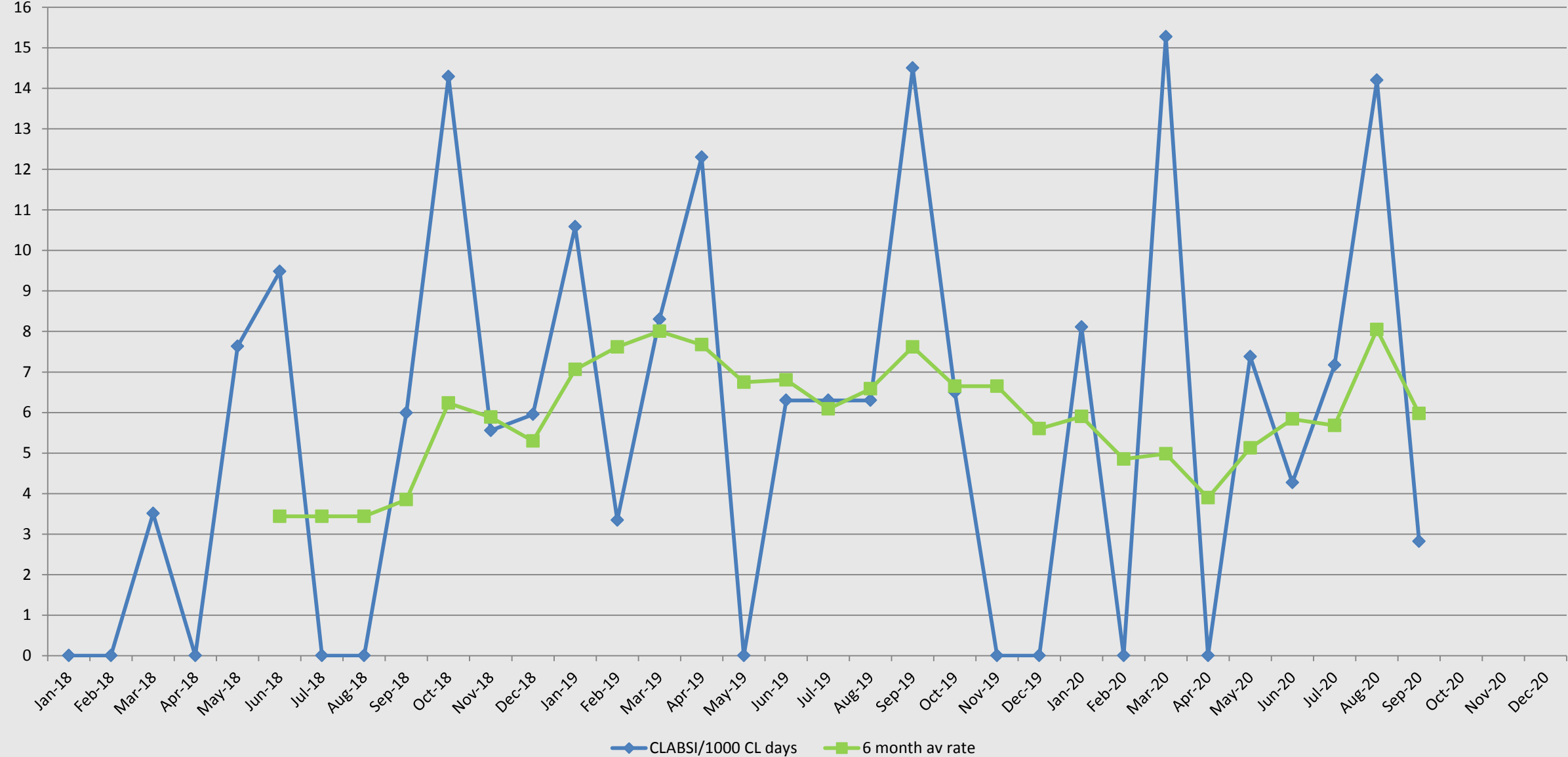
Sepsis	Gestational age (weeks)								Total
	<24	24–25	26–27	28–29	30–31	32–33	34–36	37–44	
Number									
No sepsis	52	271	546	795	1,388	1,363	1,999	3,716	10,130
Sepsis at <48 hrs ^(a)	7	10	13	8	15	13	10	53	129
Sepsis at ≥48 hrs ^(a)	37	129	87	34	32	13	27	44	403
Babies alive on day 2	81	397	638	830	1,426	1,381	2,022	3,791	10,566
Babies who did not survive to day 2	14	11	6	5	9	7	14	19	85
Total in each age group	95	408	644	835	1,435	1,388	2,036	3,810	10,651
Per cent									
No sepsis ^(b)	54.7	66.4	84.8	95.2	96.7	98.2	98.2	97.5	95.1
Sepsis at <48 hrs ^(b)	7.4	2.5	2.0	1.0	1.0	0.9	0.5	1.4	1.2
Sepsis at ≥48 hrs ^(c)	45.7	32.5	13.6	4.1	2.2	0.9	1.3	1.2	3.8

(a) Groups are not mutually exclusive.

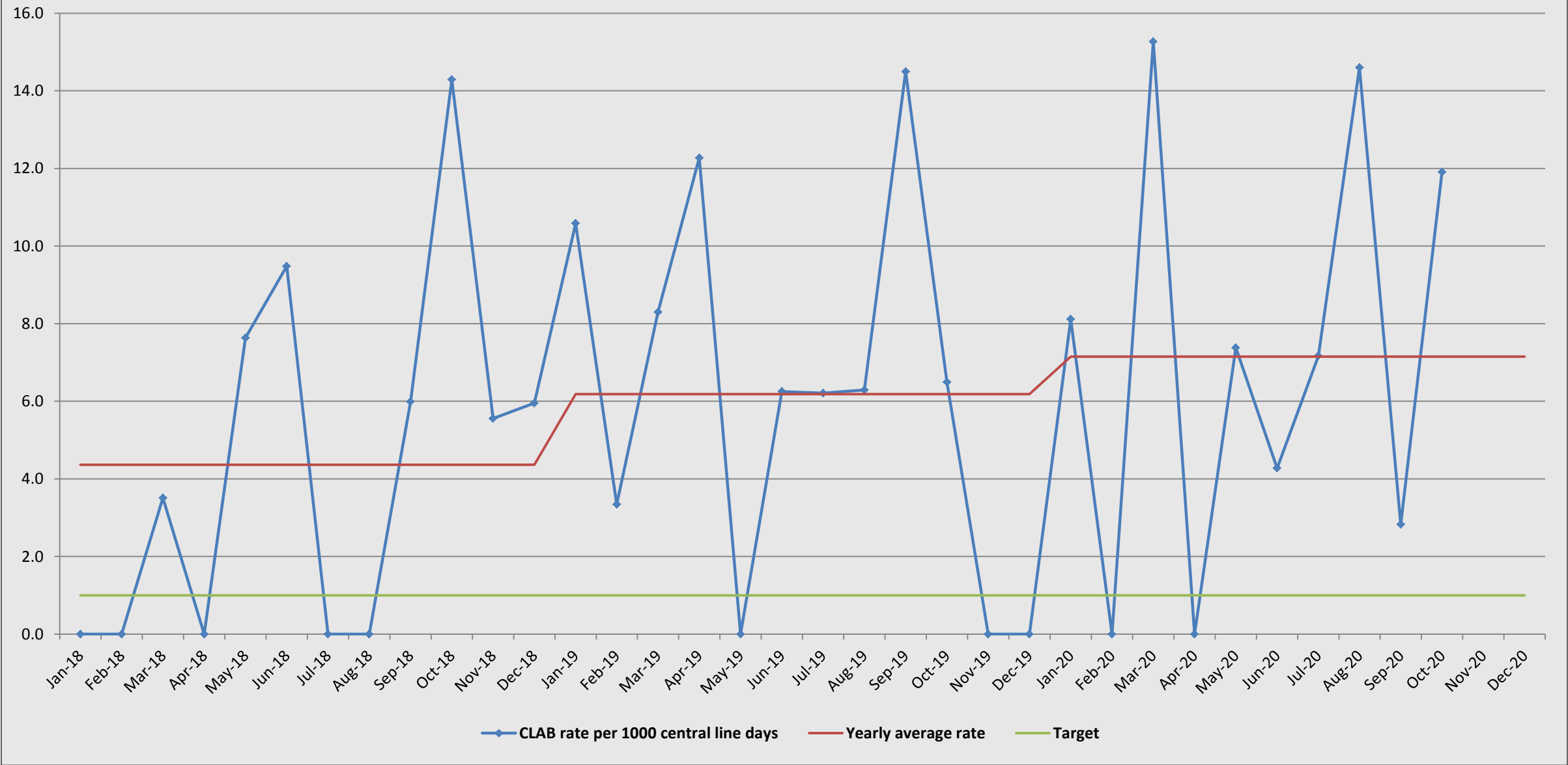
(b) Denominator is all registrants.

(c) Denominator is registrants alive at 48 hours.

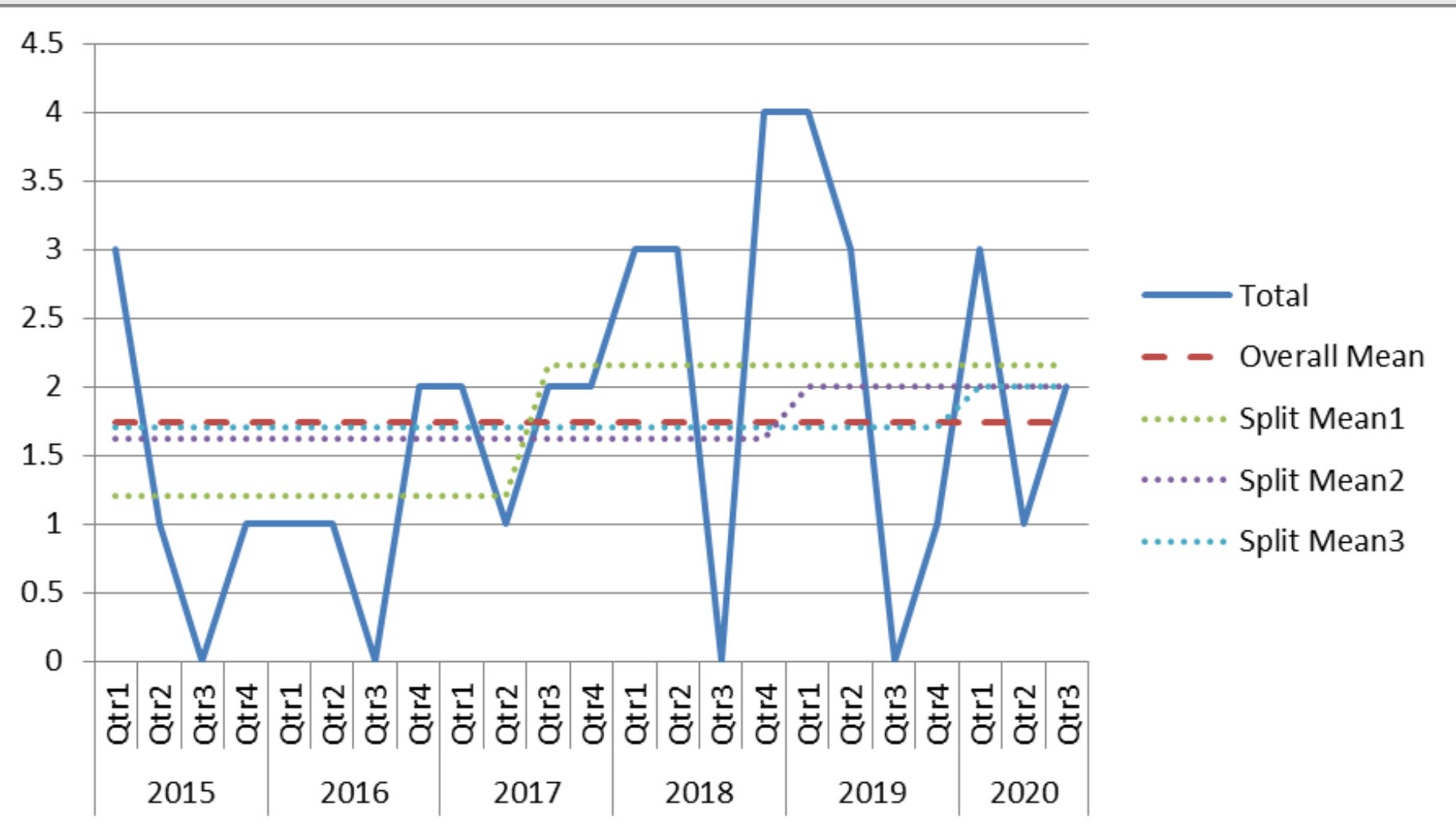
NICU CLABSI rate per 1000 CVC days



CLABSI rates per 1000 central line days - NICU



Staphylococcus aureus bacteraemia in NICU 2015 - 2020





KEY CHALLENGES

- INCREASE IN STAPHYLOCOCCUS AUREUS INFECTION RATE
- INCREASE IN CENTRAL LINE ASSOCIATED BACTERAEMIA (CLABSI)
- **Extreme prematurity (<28 weeks GA) seems to be the biggest underlying risk factor**



ACTIONS

ACTIONS TO DATE

- Hand hygiene team in NICU
- CLAB team (2015)
 - CLAB Bundle
 - CLABSI 'tracker' in workroom
 - Audits
- Use of alcohol caps
- Minimise duration of long-line use – stop TPN when >120 ml/kg enteral feeds
- Change IV medications to oral as soon as tolerated
- Review of sepsis episodes

Future Plans - BACK TO BASIC



HAND HYGIENE



ENVIRONMENT

Which clean do you require on discharge?

RED clean

TYPE: Deprox HPV

Note: This clean is only suitable for rooms or clinical areas where no patients are present

Infectious status of patient

- COVID-19 suspected or positive
- C.diff (Clostridium difficile) *
- Hepatitis *
- CPE (Carbapenem-resistant Enterobacteriaceae)
- MRSA (Multi-drug resistant Acinetobacter)
- Measles

AMBER clean

TYPE: Germicide Solution

Infectious status of patient

- COVID-19 suspected and cleared by COVID-19 or Infectious Disease teams
- MRSA
- ESBL
- Shingles
- Chikungunya
- TB (tuberculosis)
- Other infections as directed by Infection Prevention or Clinical Microbiology Teams.

GREEN clean

TYPE: Detergent/standard solution

No known infections

NURSING RESPONSIBILITIES

- Remove bed linen
- Clean clinical/medical equipment using approved detergent/disinfectant
- Clean mattresses and pillows using approved detergent/disinfectant
- Following cleaning and Deprox process, prepare room for admission
- Cleaning services will arrange for Vent to be shut off if required
- Cleaning services to remove curtains and Taylor's linen replaces curtains

- Remove bed linen
- Clean clinical/medical equipment using approved detergent/disinfectant
- Clean mattresses and pillows using approved detergent/disinfectant
- Following cleaning process, prepare room for admission
- Request curtains to be changed. Exception: MRSA, ESBL and COVID-19 cleaned by COVID-19 or ID teams – request change only when patient has occupied the room more than 7 days, or curtains are visibly soiled.

- Remove bed linen
- Clean clinical/medical equipment using approved detergent/disinfectant
- Clean mattresses and pillows using approved detergent/disinfectant
- Following cleaning process, prepare room for admission

CLEANING SERVICE RESPONSIBILITIES

- Cleaning services to remove curtains and Taylor's linen replaces curtains (After hours between 2230 – 0600 hrs Cleaning Services will replace curtains)
- Carry out high dusting
- Remove any residual adhesive tape from surfaces
- Remove waste sack from room
- Using approved 7 step cleaning methodology:
 1. Wipe down bed frames
 2. Wipe down hand wash basin
 3. Wipe down soap and paper towel dispensers
 4. Wipe doors, handles and frames
 5. Wipe down walls
- Clean windows
- Damp mop floor
- Run Deprox process

- Cleaning services to remove curtains and Taylor's linen replaces curtains (After hours between 2230 – 0600 hrs Cleaning Services will replace curtains)
- Carry out high dusting
- Remove any residual adhesive tape from surfaces
- Remove waste sack from room
- Using approved 7 step cleaning methodology:
 1. Wipe down bed frames
 2. Wipe down hand wash basin
 3. Wipe down soap and paper towel dispensers
 4. Wipe doors, handles and frames
- Spot clean windows and walls
- Damp mop floor

- Carry out high dusting
- Remove any residual adhesive tape from surfaces
- Remove waste sack from room
- Using approved 7 step cleaning methodology:
 1. Wipe down bed frames
 2. Wipe down hand wash basin
 3. Wipe down soap and paper towel dispensers
 4. Wipe doors, handles and frames
- Spot clean windows and walls
- Damp mop floor

ESTIMATED TIME FOR CLEAN

4 hours

45 minutes

15 minutes

TO REQUEST ONE OF THESE CLEANS FOR A BED SPACE OR ISOLATION ROOM ON YOUR WARD

* CDI, AED, CED, ORL, DCCM, CIVICU, PICU & NICU – Deprox single rooms – Manual Red Clean shared rooms. Contact 29539.

Contact: 29539 between 0900 and 2400. Outside of these hours, Amber cleaning can be requested through ward cleaner or supervisor as per the palm card.

Contact: Cleaning supervisor / ward cleaner.

IMPORTANT: Any de-escalation of a clean must be authorised by the Infection Prevention team or on-call microbiologist



TO REQUEST A RED OR AMBER (ISOLATION) CLEAN PLEASE CONTACT:
Extension 29539

©2020 Hygiene & Infection 4/2020



TARGET CLAB ZERO



CASE
REVIEW

AUDIT OF
PRACTICE

CLUSTERING
LINE ACCESS
TIMES



MUST ATTACH PATIENT LABEL HERE

SURNAME: _____ NHI: _____

FIRST NAMES: _____ DOB: _____

Please ensure you attach the correct visit patient label

DEMOGRAPHICS

Reviewer:		Date of review:	DOB:	Time of birth:
Gestational age:		Organism isolated:	Same organism from other site?	If yes, what site?
Corrected age:				

REVIEW ELEMENTS

Comments
(e.g. Time if applicable)

Peri-event management practices

Intravascular device(s) in place 48 hrs before event?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown/NA	
If yes, what device(s)?	<input type="checkbox"/> UAC	<input type="checkbox"/> UVC	<input type="checkbox"/> PICC	<input type="checkbox"/> Surgical CVL <input type="checkbox"/> PIVL
If yes, was an insertion checklist used?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown/NA	
If yes, was a copy available for review?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown/NA	
Was there >2 insertion attempts?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown/NA	
Number of catheter entries in 48 hrs before event?				
Any catheter-related complications in 48 hrs before event?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown/NA	
If yes, what complication(s)	<input type="checkbox"/> Leakage	<input type="checkbox"/> Infiltration	<input type="checkbox"/> Blockage	<input type="checkbox"/> Dressing change
Was the device removed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown/NA	
Was there a chest tube in situ 48 hrs before event?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown/NA	
Was baby on respiratory support 48 hrs before event?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown/NA	
If yes, was it invasive ventilation (with ETT)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown/NA	
Was there NEC >stage 2 within a week before event?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown/NA	
Was there any surgical procedure within a week?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown/NA	
Has baby received antibiotic >2d for culture negative sepsis	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown/NA	
Did baby receive colostrum within 24 hrs of birth?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown/NA	
Has baby received probiotics?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown/NA	

Unit issues (2 weeks prior to event)

Was there any infectious outbreak? If yes, details	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown/NA
Was there declining hand hygiene compliance rate?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown/NA
Were there any staffing issues (i.e. high occupancy / acuity) if yes, details	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown/NA
Were there any equipment / supply issues re: vascular devices? If yes, details	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown/NA
Were the records reviewed adequate for proper evaluation?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown/NA



MUST ATTACH PATIENT LABEL HERE

SURNAME: _____ NIH: _____

FIRST NAMES: DOB:

Please ensure you attach the correct visit patient label

ROOT CAUSE ANALYSES

Proposed Explanations for Sentinel Event:

[illegible]**Action Plan:**[illegible]

Comments:

Reviewer(s) _____

TARGET CLAB ZERO

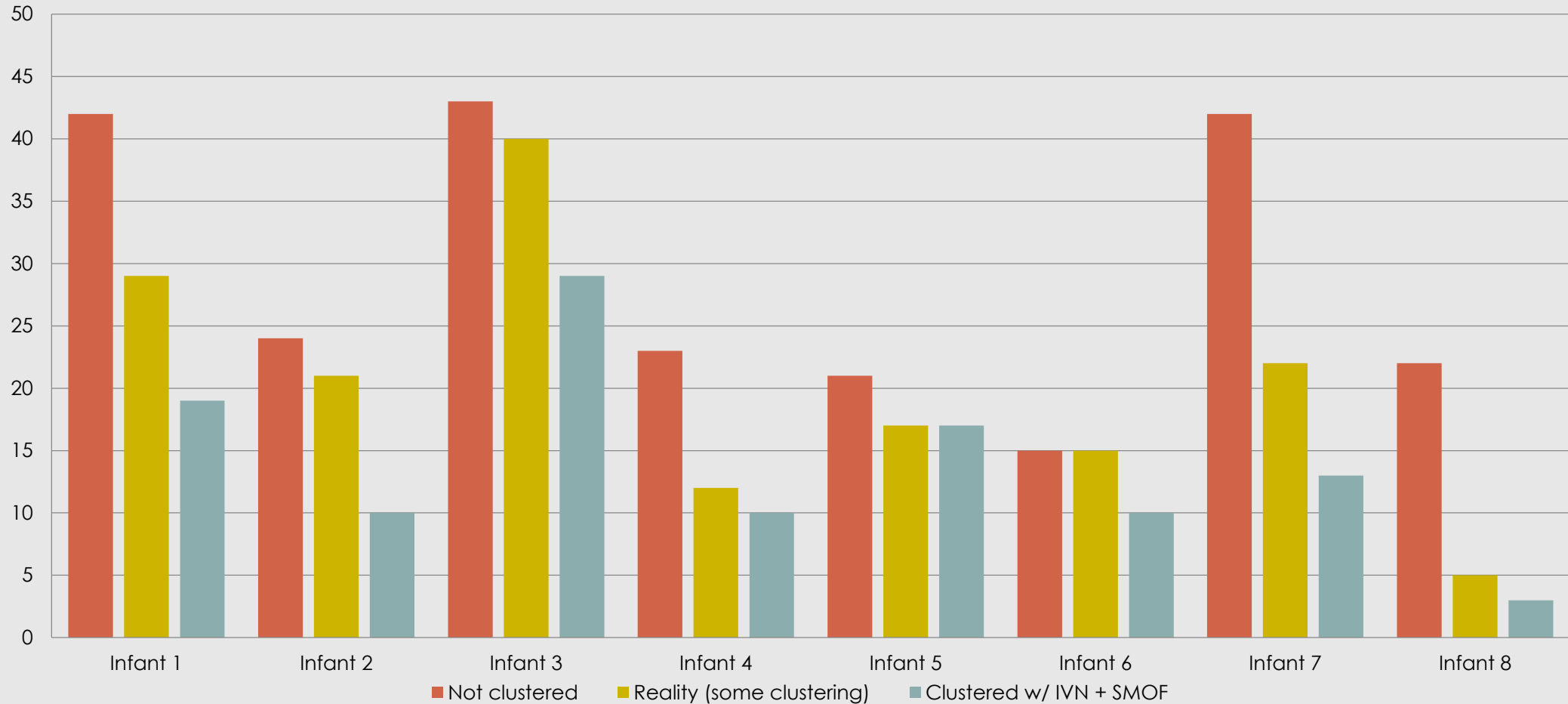


CASE
REVIEW

AUDIT OF
PRACTICE

CLUSTERING
LINE ACCESS
TIMES

Number of times line accessed






WHAT BARRIERS DO
WE PERCEIVE?

MULTIFACTORIAL

- Culture
- COVID-19 Pandemic
- Resources (Auditors for hand hygiene and CLAB maintenance)
- Communication



QUESTIONS/COMMENTS
?