

Project Title

Reduction in Superficial Incisional Surgical Site Infections for Open Emergency
Abdominal Surgery Patients

Project Lead and Members

Project lead: Dr Liu Huimin

Project members:

- Tan Ming Ngan Aloysius
- Liu Biqun
- Yang Yang
- Poh Bee Lian
- Lee Hwee Hwee
- Goh Cheng Cheng

Organisation(s) Involved

Tan Tock Seng Hospital

Healthcare Family Group(s) Involved in this Project

Medical, Nursing, Ancillary Health

Applicable Specialty or Discipline

General Surgery, Operation Theatre, Pre-Admission Counselling & Evaluation (PACE)

Project Period

Start date: 01 March 2021

Completed date: 28 Feb 2022

Aims

1. Reduce superficial incisional surgical site Infections (SSI) for patients undergoing open emergency abdominal surgery from 23.1% to 8% (stretch goal less than 5%) within 6 months
2. Spreading erythema or purulent discharge in or extruding from wound observed on direct examination.

Project Attachment

See poster attached/below

Background

See poster attached/below

Methods

See poster attached/below

Results

See poster attached/below

Conclusion

See poster attached/below

Additional Information

Accorded the NHG Quality Day 2022 (Category C: Developing a Flexible & Sustainable Workforce) Best Award

Project Category

Care & Process Redesign

Value Based Care, Patient Reported Outcome Measures (PROMs)

Quality Improvement, Workflow Redesign

Keywords

PROMs, Superficial Incisional Surgical Site Infections, Abdominal Surgery

Name and Email of Project Contact Person(s)

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Yang Yang², Poh Bee Lian³, Lee Hwee Hwee³, Goh Cheng Cheng⁴

¹Department of General Surgery, ²Operating Theatre, ³Pre-Admission Counselling & Evaluation (PACE), ⁴Nursing

Mission Statement

Reduce superficial incisional surgical site Infections¹ (SSI) for patients undergoing open emergency abdominal surgery from 23.1% to 8% (stretch goal less than 5%) within 6 months

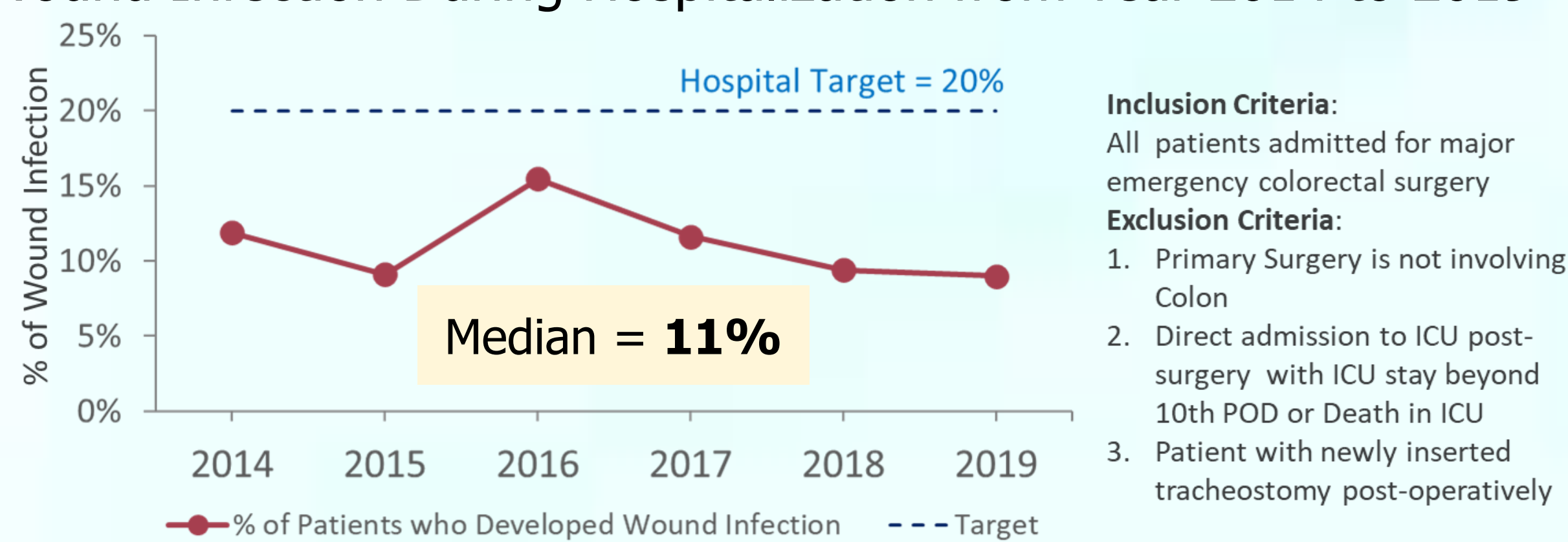
¹ Spreading erythema or purulent discharge in or extruding from wound observed on direct examination

Team Members

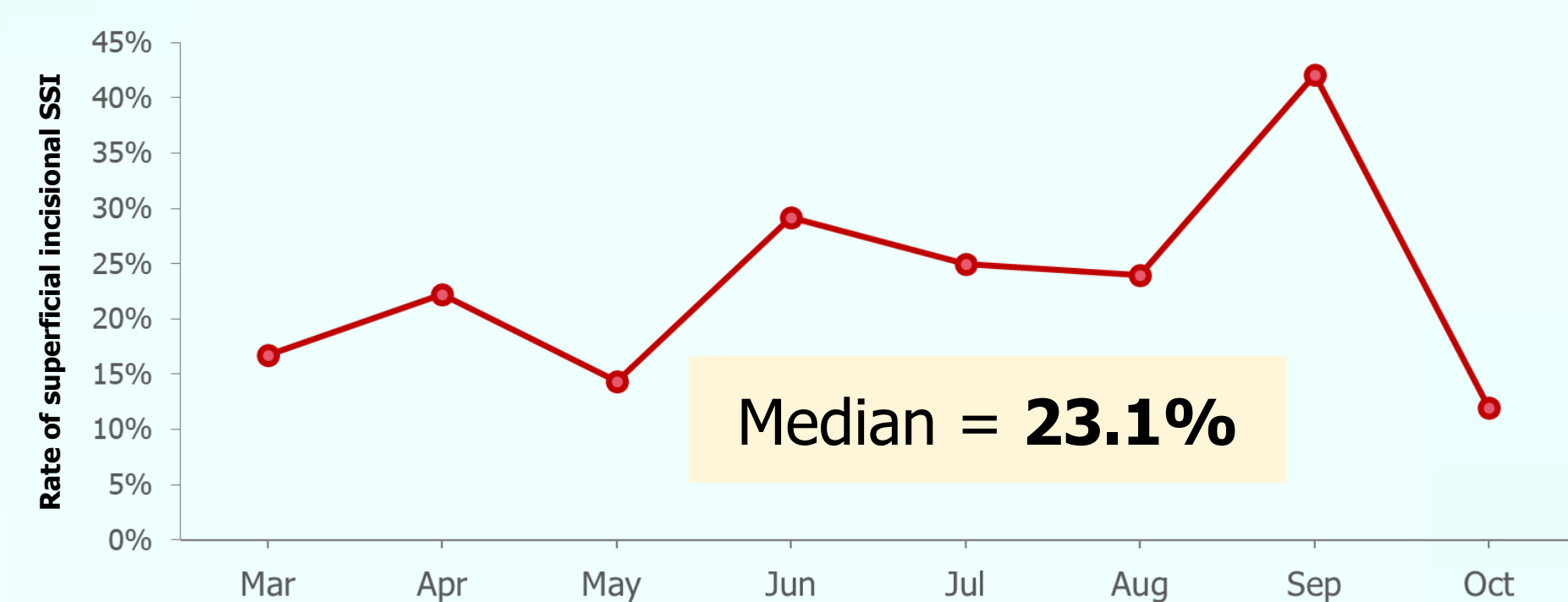
	Name	Designation	Department
Team Leader	Dr Liu Huimin	Consultant	General Surgery
Team Members	Dr Aloysius Tan Ming Ngan	Consultant	General Surgery
	Yang Yang	Nurse Clinician	Operating Theatre
	Poh Bee Lian	Nurse Clinician	PACE
	Lee Hwee Hwee	Senior Staff Nurse	PACE
	Goh Cheng Cheng	Nurse Clinician (Wound Nurse)	Nursing
	Dr Liu Biquan	Resident	General Surgery
Sponsors	Adj A/Prof Glenn Tan (HOD of General Surgery) Dr Tay Guan Sze & Dr How Kwang Yeong (Colorectal Senior Consultants)		
Mentors	Dr Yew Min Sen & Adj A/Prof Chong Yew Lam		

Evidence for a Problem Worth Solving

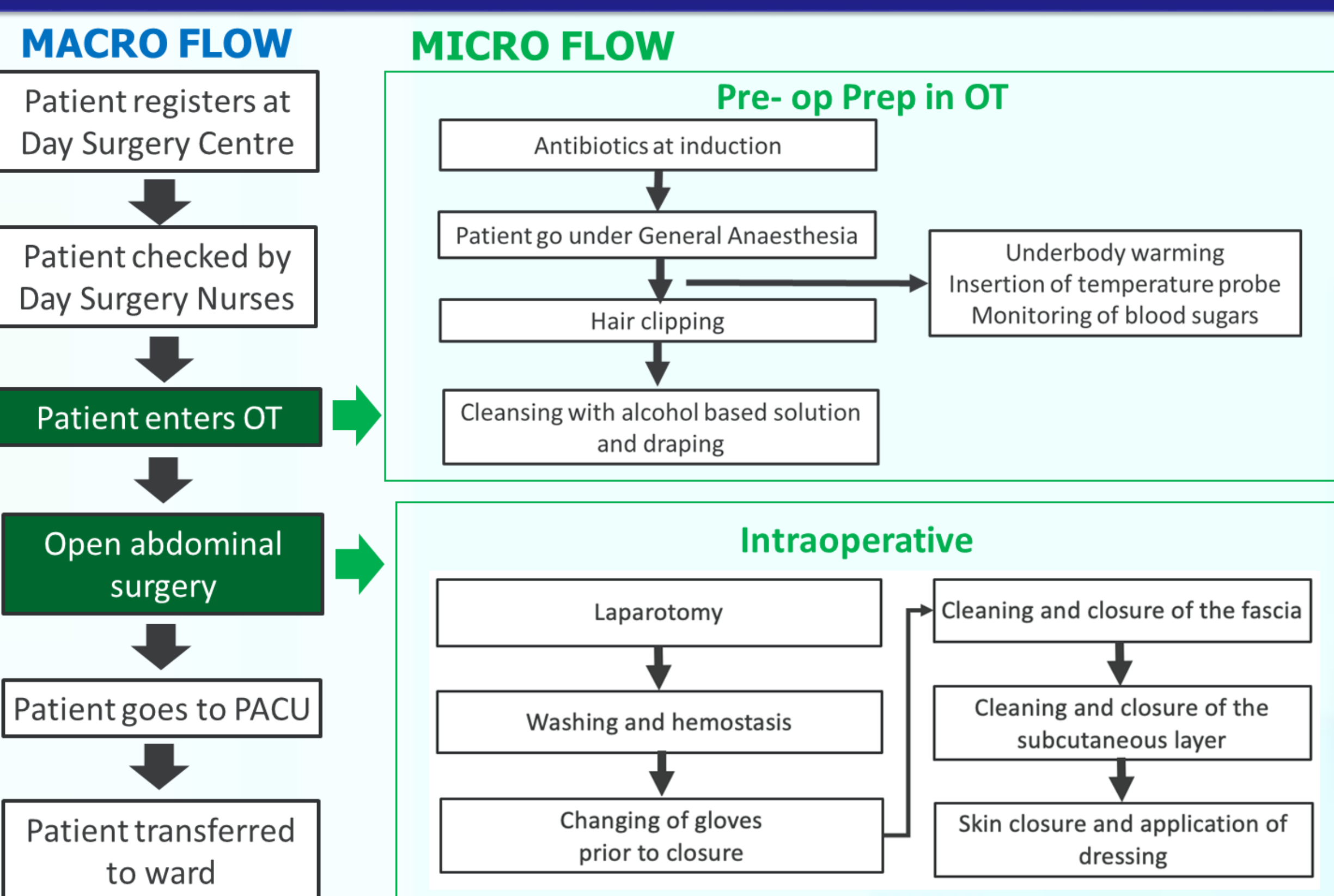
Emergency Colorectal Surgery Clinical Pathway:
Wound Infection During Hospitalization from Year 2014 to 2019



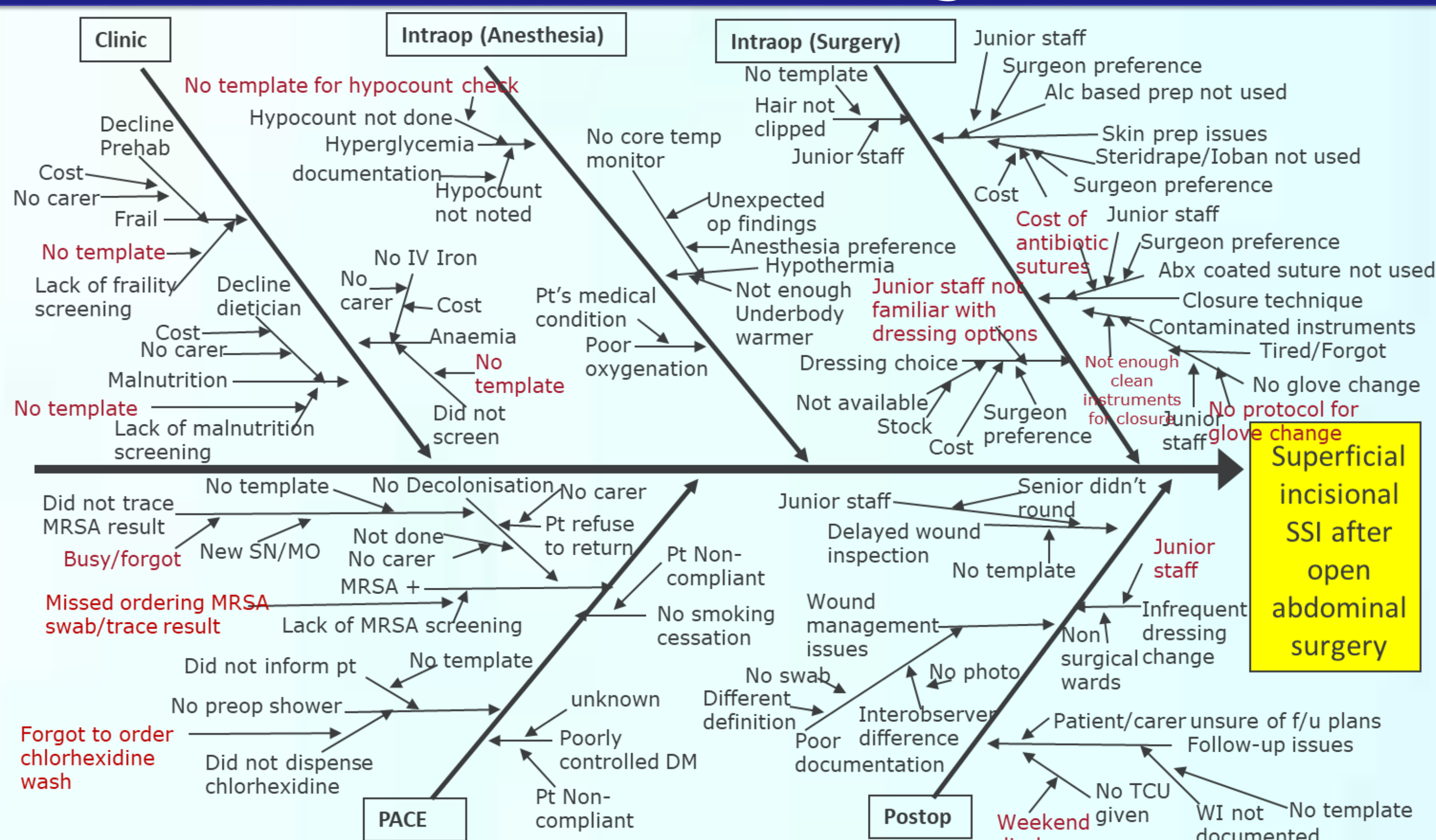
Superficial Incisional Surgical Site Infections (SSI) Rate Baseline Data
(Period: March to October 2021)



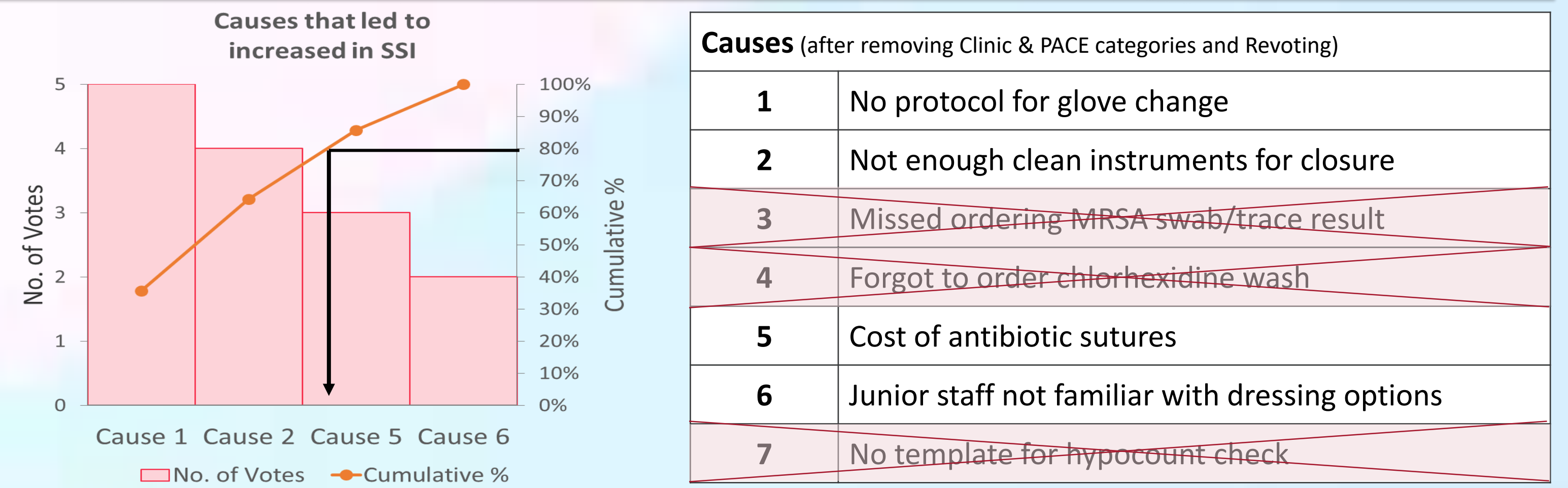
Flow Chart of Process



Cause and Effect Diagram



Pareto Chart

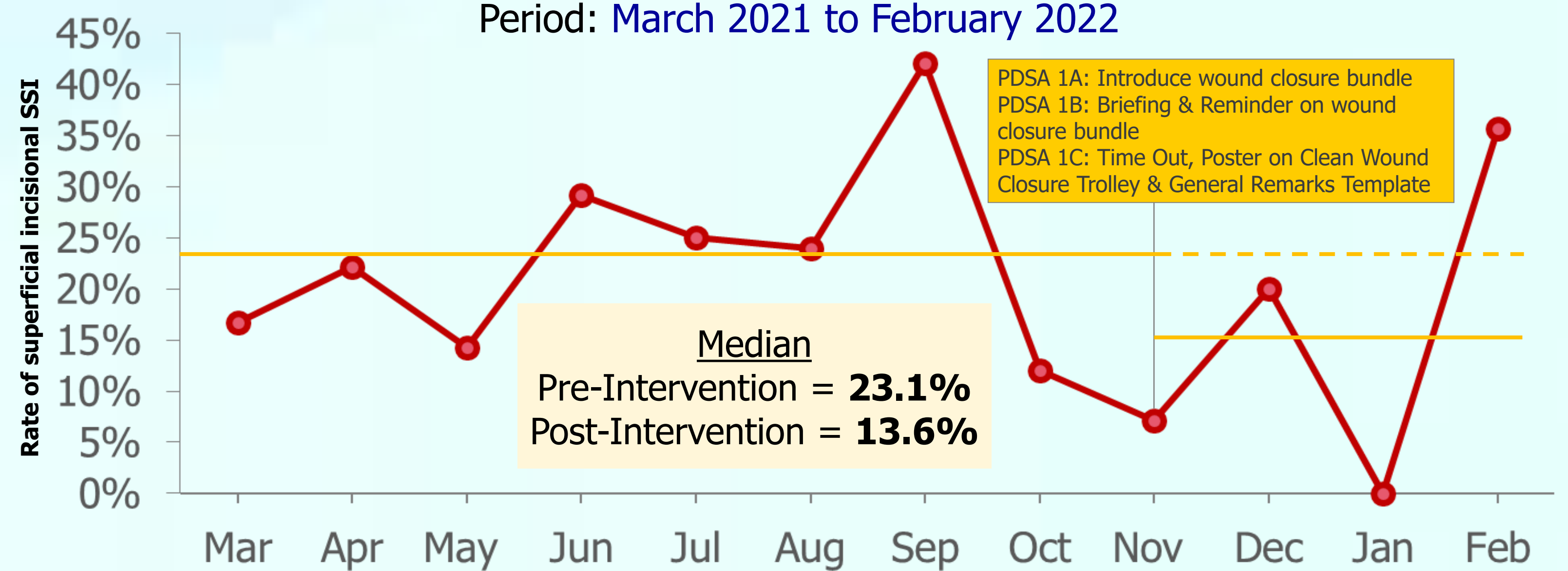


Implementation

Root Cause	Intervention	Implementation Date
Cause 1: No protocol for glove change Cause 2: Not enough clean instruments for closure	Introduce wound closure bundle	1 Nov 2021

Results

Monthly Superficial Incisional Surgical Site Infections (SSI) Rate
Period: March 2021 to February 2022



Month	Mar '21	Apr '21	May '21	Jun '21	Jul '21	Aug '21	Sep '21	Oct '21	Nov '21	Dec '21	Jan '22	Feb '22
No. of Wound Infection	5	4	2	7	8	6	8	3	1	4	0	5
No. of Abdominal Open Surgery Cases	30	18	14	24	32	25	19	25	14	20	16	14

Cost Avoidance & Cost Savings

Cost Avoidance		Cost Savings	Pre-Intervention	Post-Intervention
Dressing cost avoided (Per Patient)	25 x \$14.8 = \$370	Average Length of Stay if SSI present (Per Patient)	25 Days	23 Days
Wound Product Cost Avoided (Per Patient)	25 x 10 = \$250	Bed Days Saved (Per Patient)	25 - 23 = 2 Days	
Total Dressing Cost Avoided (Per Patient)	\$620	Cost of Inpatient Stay (Per Patient)	25 x 1114 = \$27,850	23 x 1114 = \$25,622
Assume: Ave No. of Open Abd Surgery Patients who has SSI pre intervention = 5 patients per month Ave No. of Open Abd Surgery Patients who has SSI post intervention = 3 patients per month		Cost Savings (Per Patient)	\$27,850 - \$25,622 = \$2,228	
Total Dressing Cost Avoided (Annualized)	2 x \$620 = \$1,240	Total Length of Stay Saved (Annualized)	2 x 5 x 12 = 120 Days	
Total Dressing Cost Avoided (Annualized)	12 x \$1240 = \$14,880	Total Cost Savings (Annualized)	120 x \$1114 = \$133,680	

Note: Unit Cost for Inpatient Stay Per Day Per Patient = \$1,114

Problems Encountered

Prototype 1	Prototype 2	Prototype 3
Issues from the Roll Out of Wound Closure Bundle Set	Problem: Retained gauze Improvement of wound closure set: Changed gauzes x10 to penny towels x 5	Problem: Cross contamination Improvement of wound closure bundle: Physical separation of clean and dirty trolleys

Strategies to Sustain

- 1. Creating a new norm**
 - Continuing education (both physicians/nurses)
 - Increasing awareness to separate clean & contaminated equipment
- 2. Data collection - manpower**
 - Surgical department or Infectious disease department
 - Surveillance coordinators
- 3. Regular audit quarterly**
 - HAIE meetings versus GS department meetings