

# How is the NZ Surgical Site Infection Improvement programme tracking internationally?

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Clinical Lead NZ SSII Programme

Reducing the Harm of Healthcare  
Associated Infection Workshop

9 August 2016



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Improvement Programme

# Declaration

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- I am employed as Clinical Lead for the NZ SSII programme
- I provide advice to private surgical providers



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# Outline

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- Timeline NZ SSII Programme
- Quality and Safety Markers (QSMs) over time
- International Programmes:
  - Australia: WA and Victoria
  - UK: England, Scotland
  - USA: CDC
- Caveats
- Future for NZ SSII Programme
- Conclusions

# SSI Improvement programme

- Quality Improvement Programme
  - Capture clinical data, surgeon-specific , procedure-specific and adherence to best practice interventions
  - CDC NHSN SSI definitions
  - Measurement and Evaluation
    - ‘process measures’, Quality & Safety Markers (QSMs),and
    - ‘outcome markers’ captured
  - Quarterly report to DHBs
  - Commission QSM public reporting

# Timeline – SSI Improvement Programme

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- August 2012 Canterbury and Auckland DHBs contracted to deliver SSIIIP in partnership with the Commission
- ICNet-based national data warehouse (National Monitor)
- Orthopaedics initial focus
- March 2013 – 8 DHB pilot; October 2013 all 20 DHBs
- Cardiac surveillance commenced October 2014
- February 2016 ACC announced \$1.1m investment over 2.5 years to provide support in developing & embedding SSIIIP
- July 2016 clinical leadership and operational management transitioned from Auckland DHB to the Commission

# SSI Improvement Programme

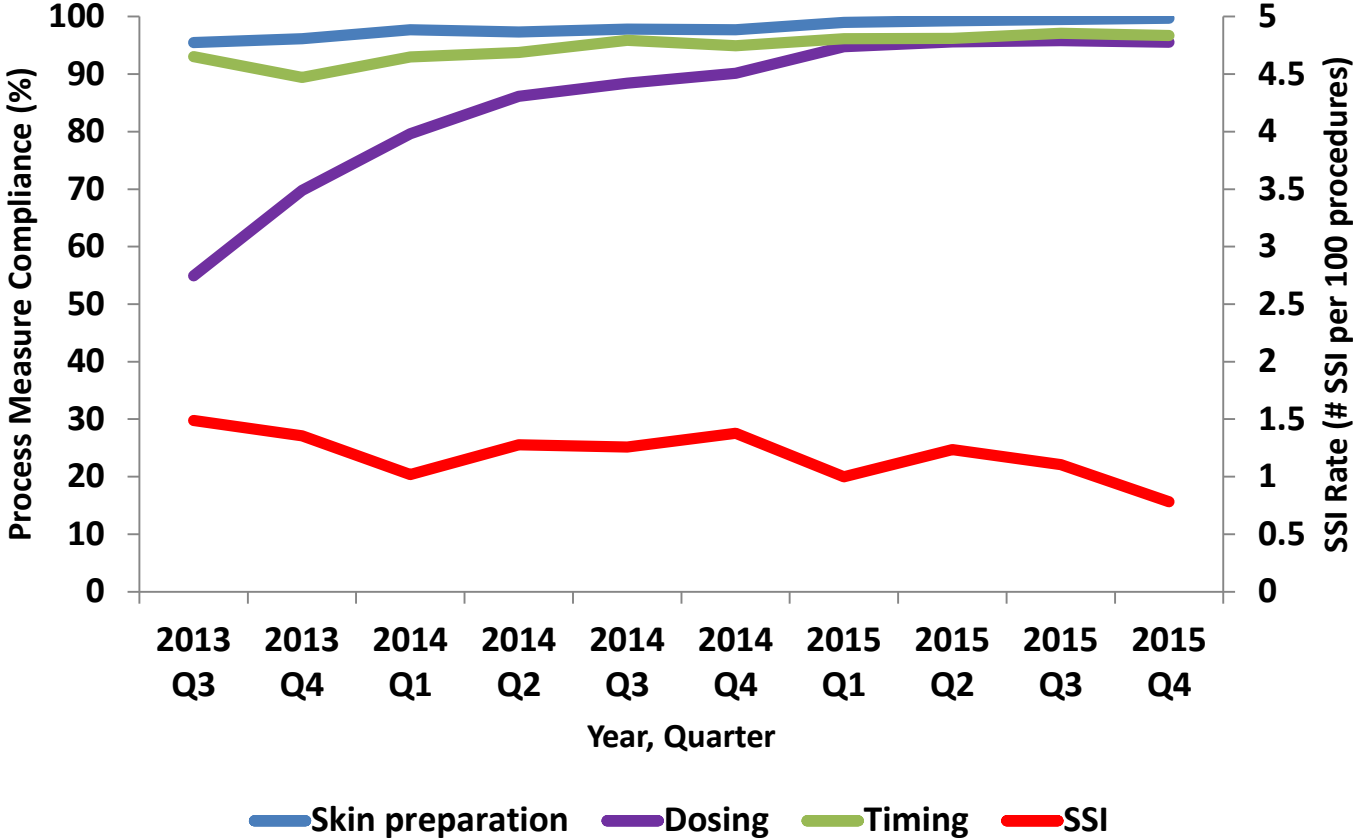
## Quality & Safety Markers (QSMs)

Marker	Target
•% receiving $\geq$ 2g cefazolin or cefuroxime or 1.5g cefuroxime	> 95%
•% receiving prophylaxis 0-60 mins before knife to skin	100%
•% having skin antisepsis with alcohol containing chlorhexidine or povidone-iodine	100%



# Orthopaedic SSIIIP: Jul 2013-Dec 2015

## Quality and Safety Markers Orthopaedic SSIIIP



# Tracking against international SSI programmes

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- Enables comparison with established national and state-based programmes
- Clarifies key differences between SSI surveillance programmes using Centers for Disease Control and Prevention (CDC) National Health and Safety Network (NHSN) definitions
- Opportunity to identify approaches for improvement



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# Comparable surveillance programmes

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- Australia
  - Western Australia (HISWA)
  - Victoria (VICNISS)
- United Kingdom
  - England (PHE)
  - Scotland (SSHAIP)
- United States
  - CDC/NHSN

# Challenges of comparing data

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- All use NHSN definitions, **BUT**:
  - **Contexts differ**, e.g. private vs public hospital systems, voluntary vs mandatory reporting
  - **Reporting approaches differ**, e.g. some programmes only report risk-adjusted SSI rates; some follow up for 30 days or 1 year not 90 days
  - **NHSN definitions differ over time**, e.g. 90 day vs 1 year follow up from Jan 2013

# Characteristics of surveillance programmes that report SSI

Characteristic	SSIIP	HISWA	VICNISS	SSHAIP	PHE	NHSN
Uses NHSN definitions	✓	✓	✓	✓	✓	✓
Includes <u>all</u> SSIs detected $\leq$ 30 days	✓	✓	✓	✓	✓	✗ Deep only
Includes all <u>deep</u> SSIs detected 30 to 90 days	✓	✓	✓	✗	✓	✓
Includes all <u>deep</u> SSIs detected $>90$ days – 1yr	✗	✗	✗	✗	✓	✗
Includes SSIs detected on readmission	✓	✓	✓	✓ Up to 30 days	✓	✓ Deep only
Includes all revision procedures	✗	✓	✓	✓	✓	✓
Reports deep/OS SSI as single 'deep' SSI rate	✓	✓	✓	✓	✓	✓
Reports unadjusted SSI rate /100 procedures	✓	✓	✗	✓	✓	✗

# NZ SSI Improvement Programme reports:

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- Superficial SSIs up to 30 days post-procedure
- Deep/organ space up to 90 days post-procedure
- Admissions only
- All revision procedures except those for infection
- Unadjusted hip and knee SSI rates by DHB
- Risk stratified SSI rates using standard NHSN methodology



# HISWA- Western Australia

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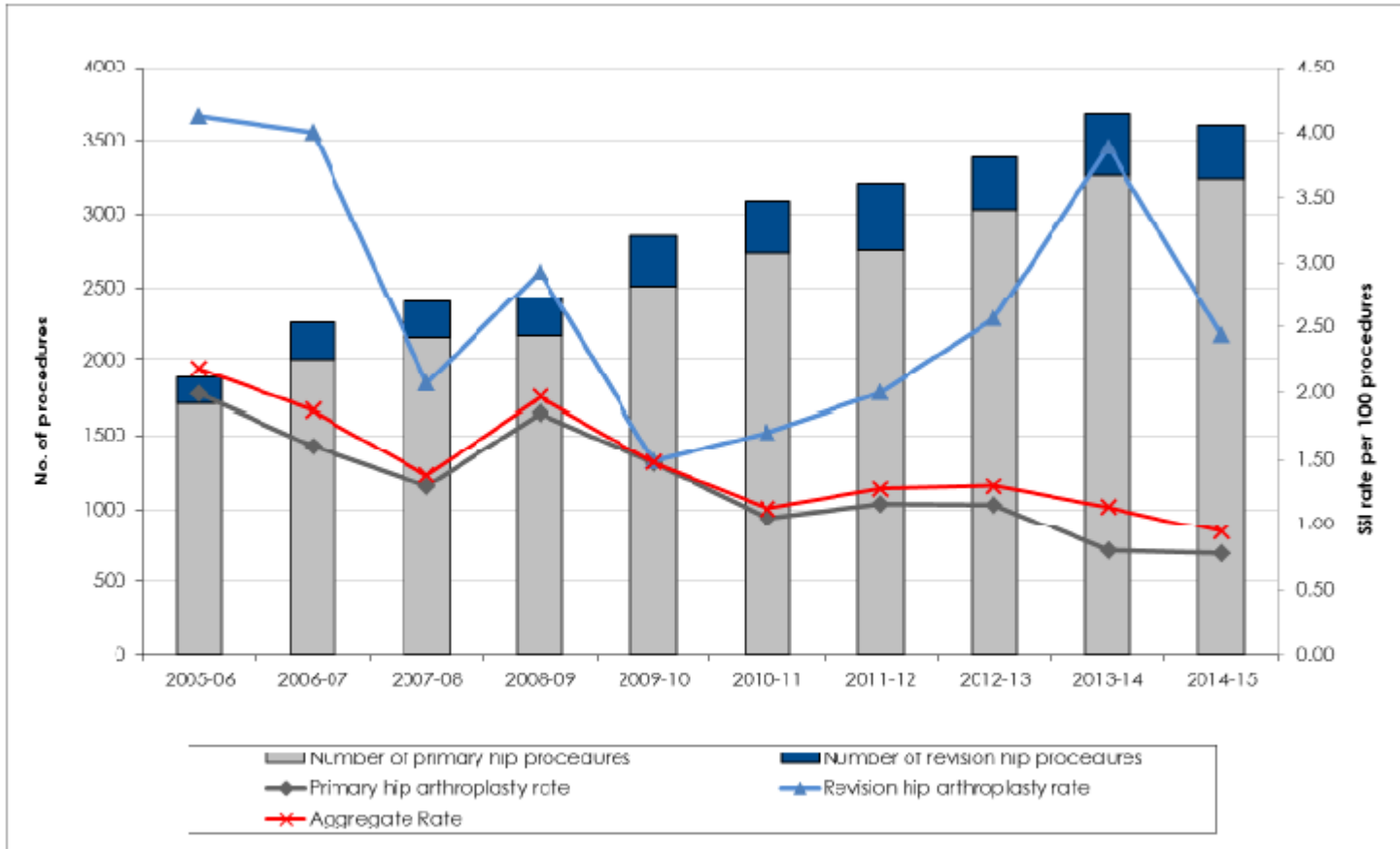
- SSI surveillance established mid-2005
- Orthopaedic surveillance mandatory from Oct 2007
- >70% procedures performed by private hospitals
- Hip SSI rate: **0.94**/100 procedures in 2014-15 (**2.18**/100 procedures in 2005-06)
- Knee SSI rate: **0.51** in 2014-15 (**1.55**/100 procedures in 2005-06)
- Superficial, deep/organ space SSI reported as one rate
- Manual data entry; moving to web based system



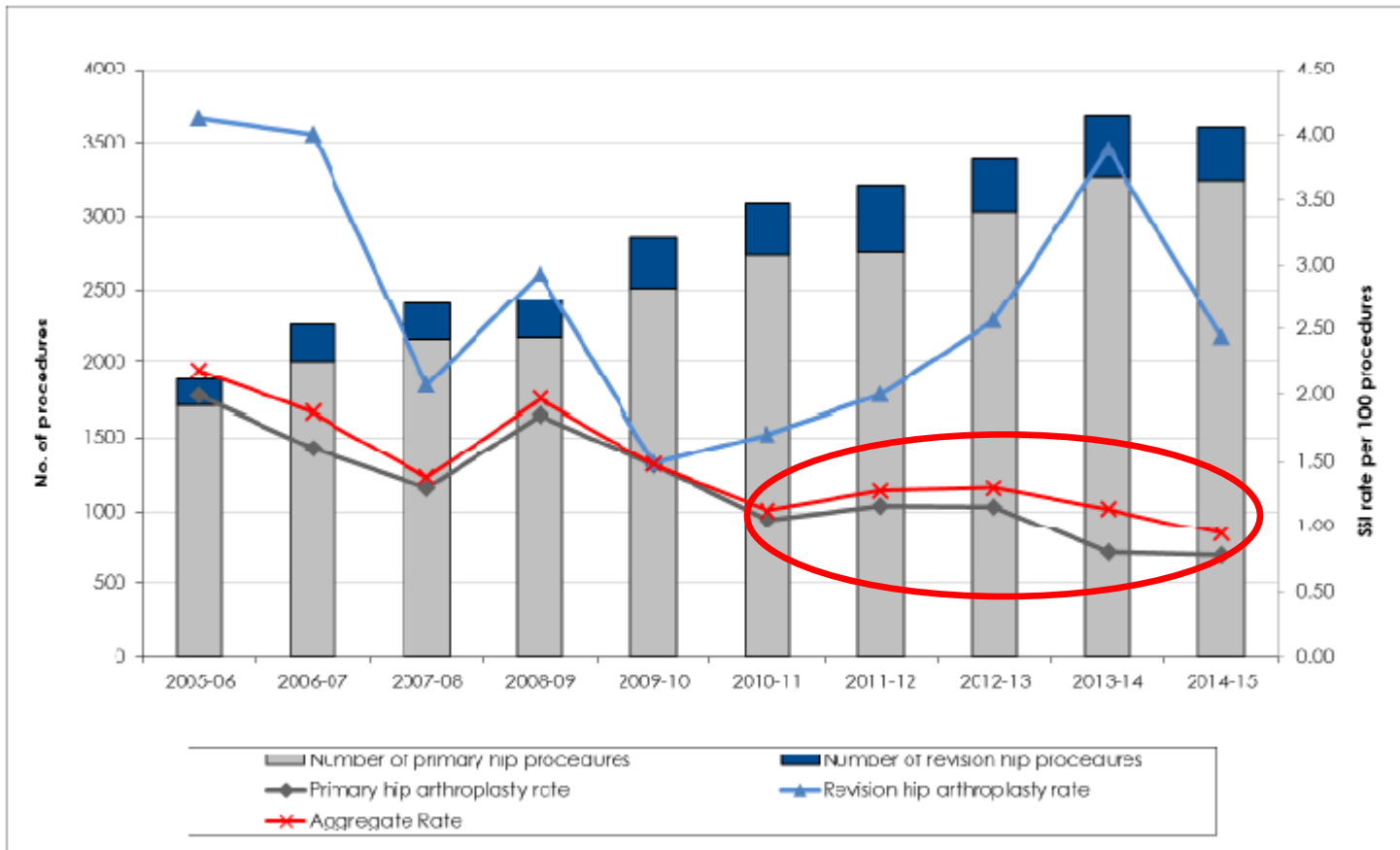
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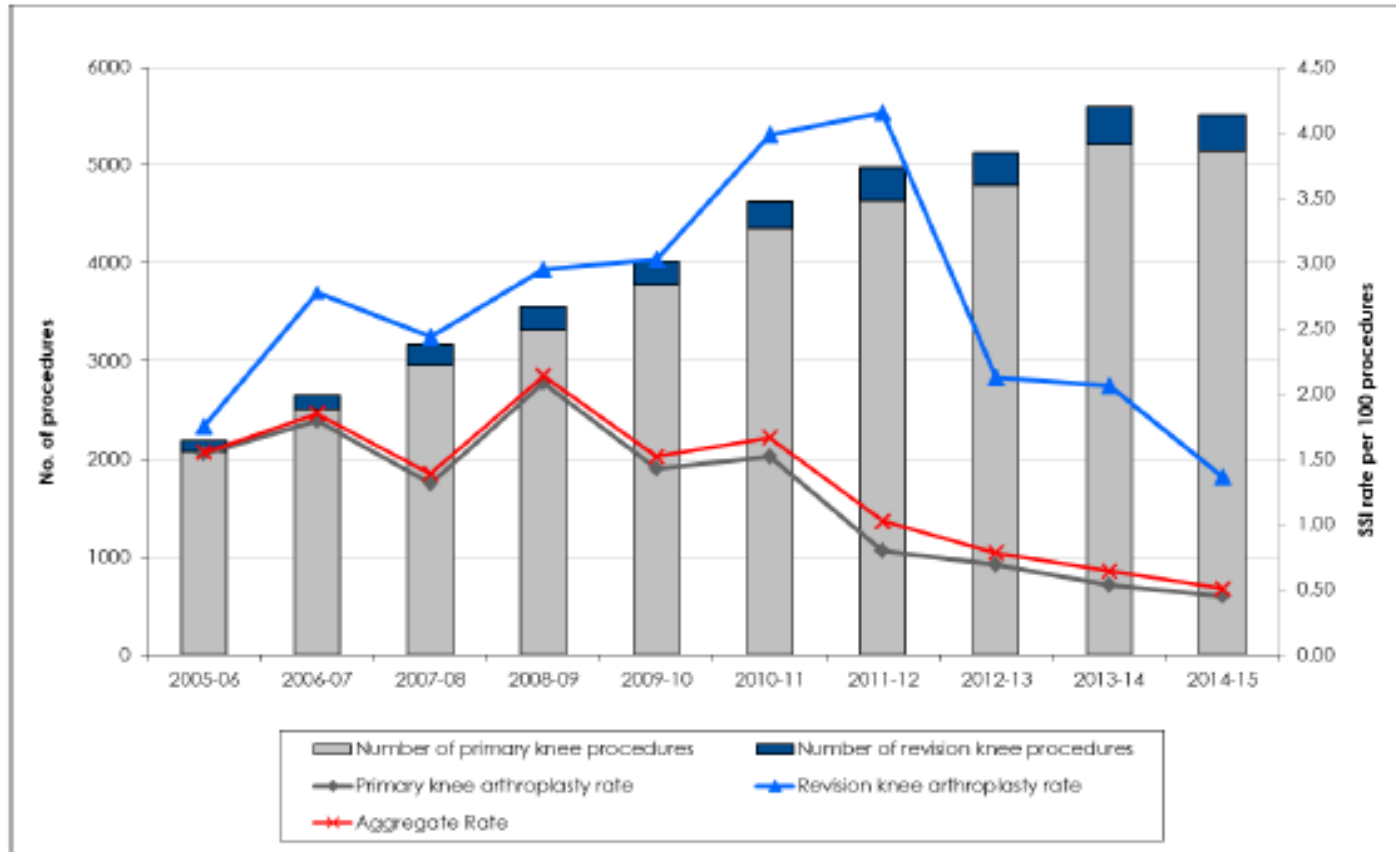
# HISWA: hip arthroplasty rate 2005/06 - 2014/15



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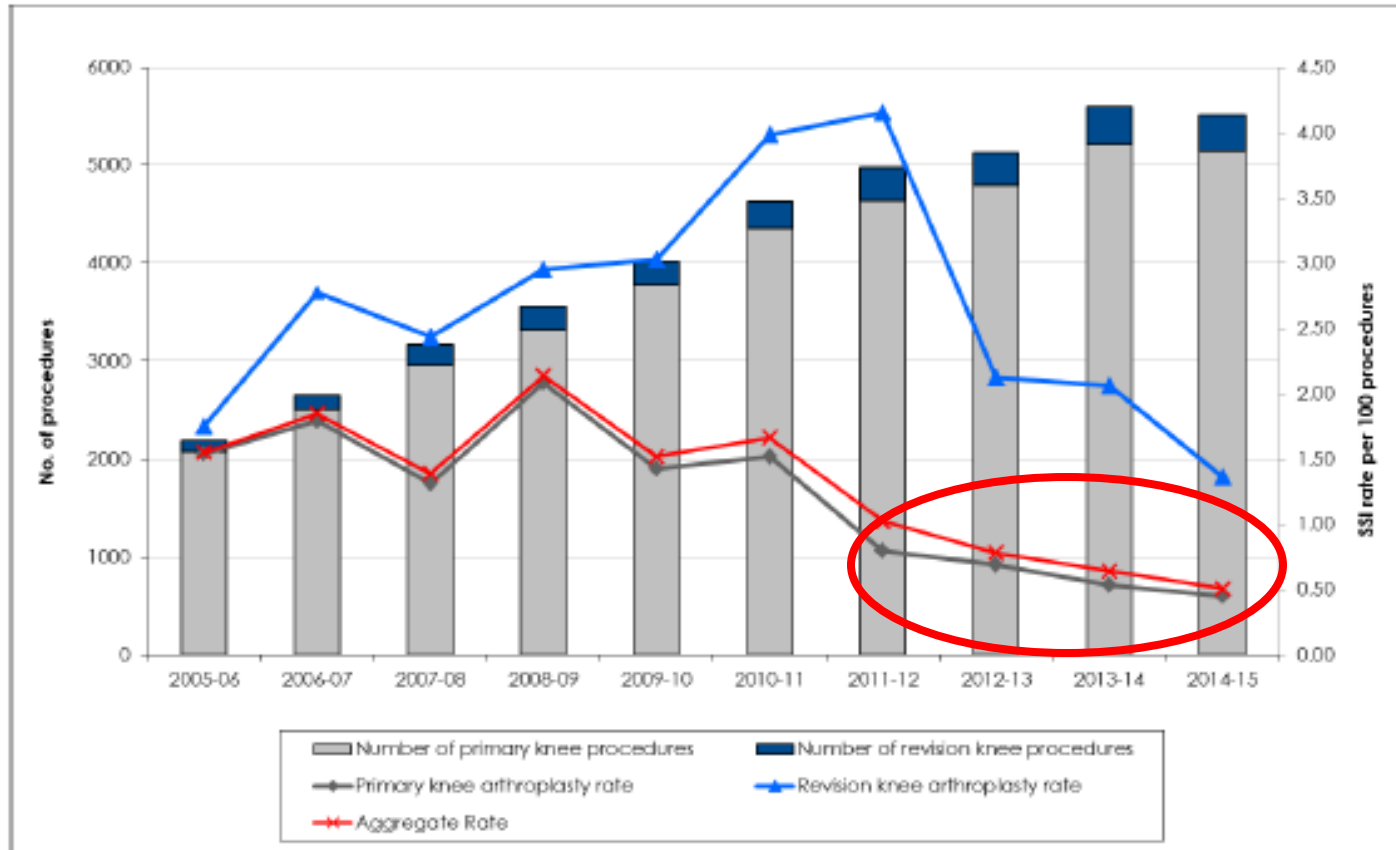


# HISWA: knee arthroplasty rate 2005/06 - 2014/15





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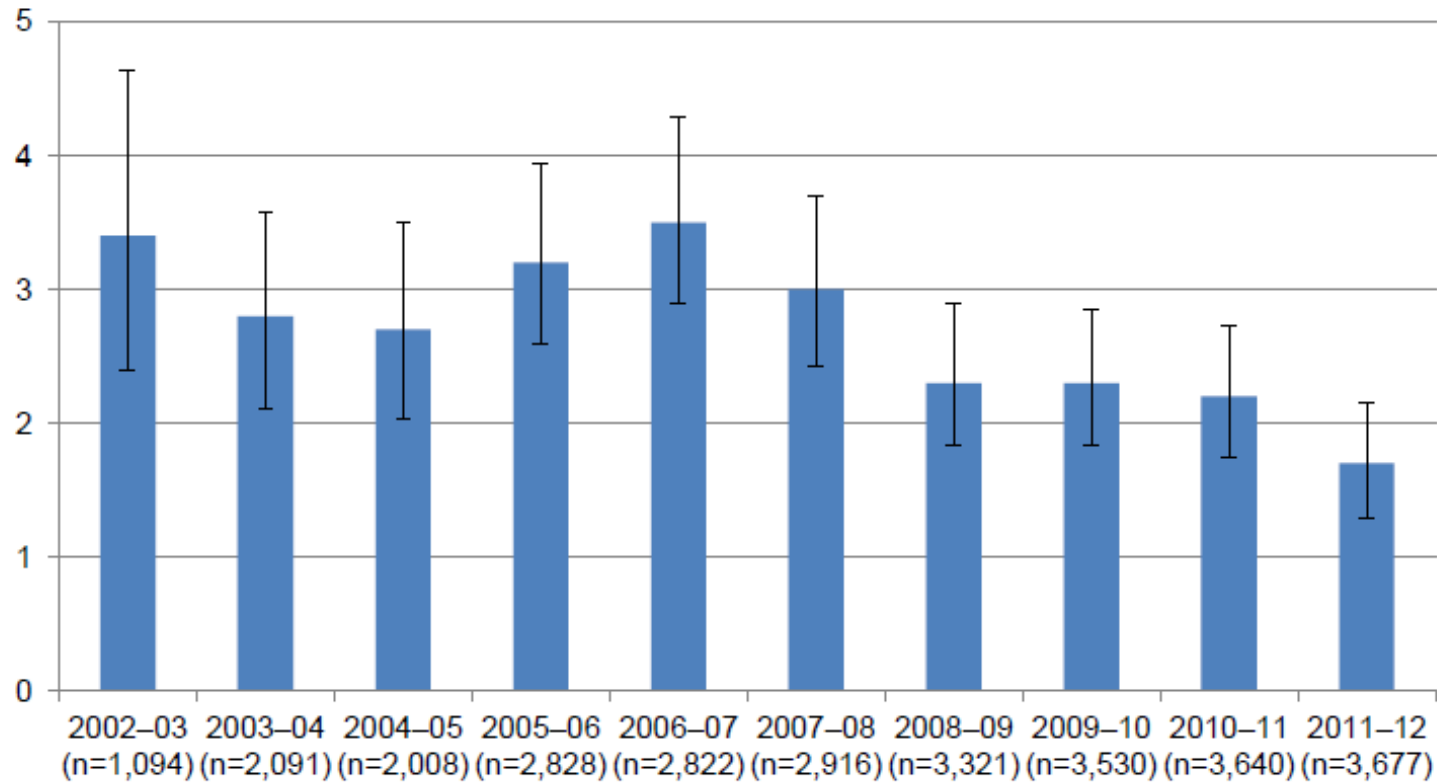


# VICNISS: Victoria

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- SSI surveillance established 2002 – 15 categories
- Continuous surveillance mandated for orthopaedic surgery in public hospitals >100 procedures/ annually
- Private hospital participation voluntary
- Hip SSI rate: **1.7/100** procedures in 2011-12 ( **3.2/100** procedures in 2002-03)
- Knee SSI rate: **1.2/100** procedures in 2011-12 (**2.2/100** procedures in 2002-03)
- Paper forms, web forms; SHINe software

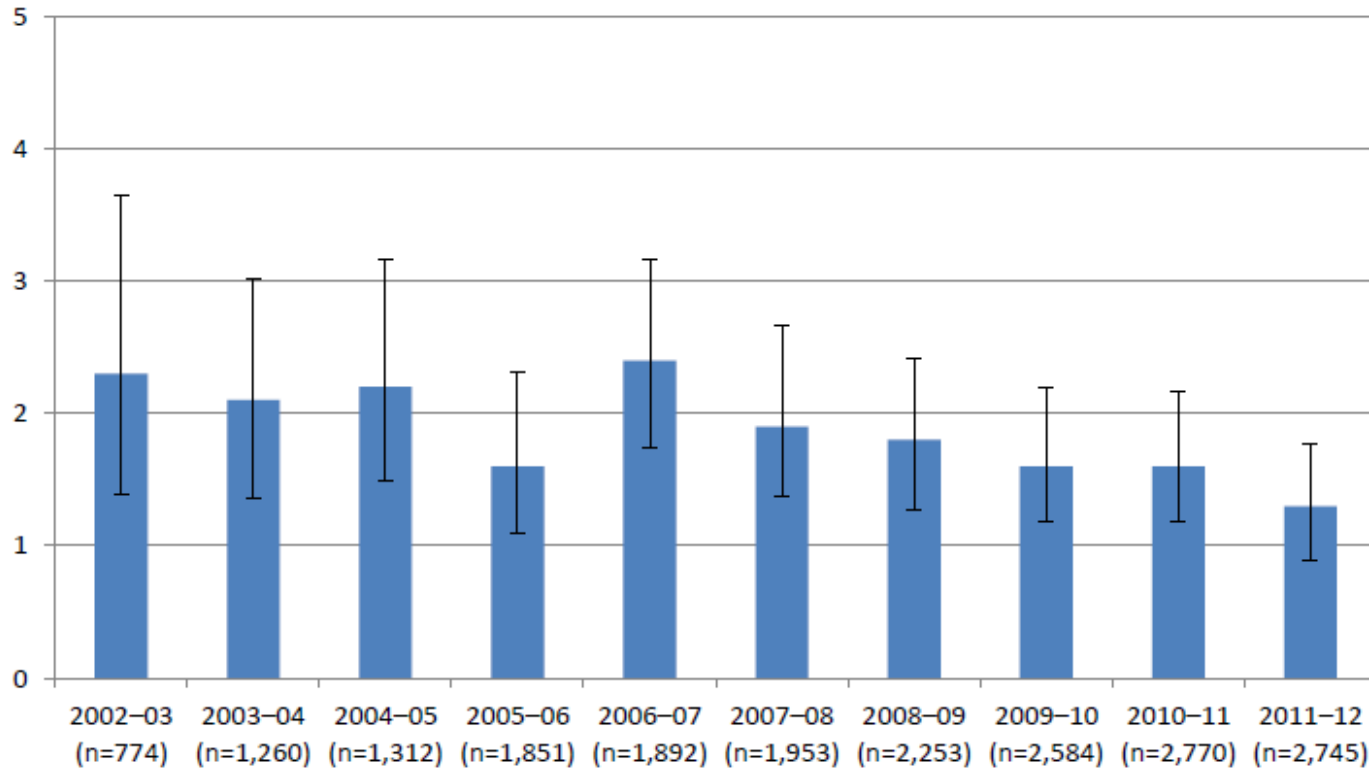
# VICNISS – unadjusted hip arthroplasty SSI rates 2002–12



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# Public Health England (PHE)

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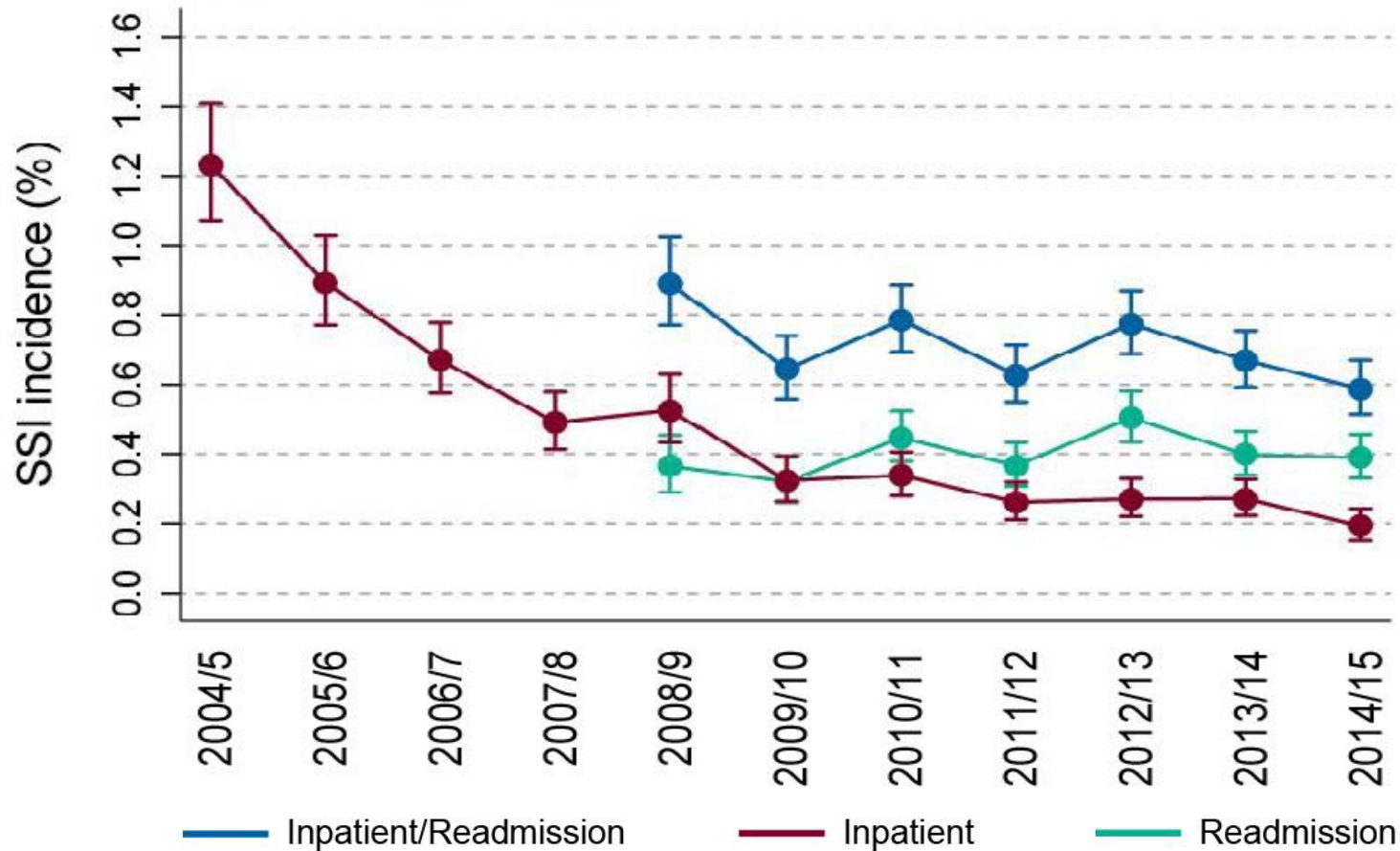
- SSI surveillance programme established 2002; orthopaedic surveillance mandatory from 2004
- 17 categories of surgery in national data set
- Follow-up period is 30 days for non-implant procedures; 1 year for prosthetic implant procedures
- SSI rate is reported by 100 procedures and by incidence density per 1,000 patient days of follow-up
- Manual entry of web-based form



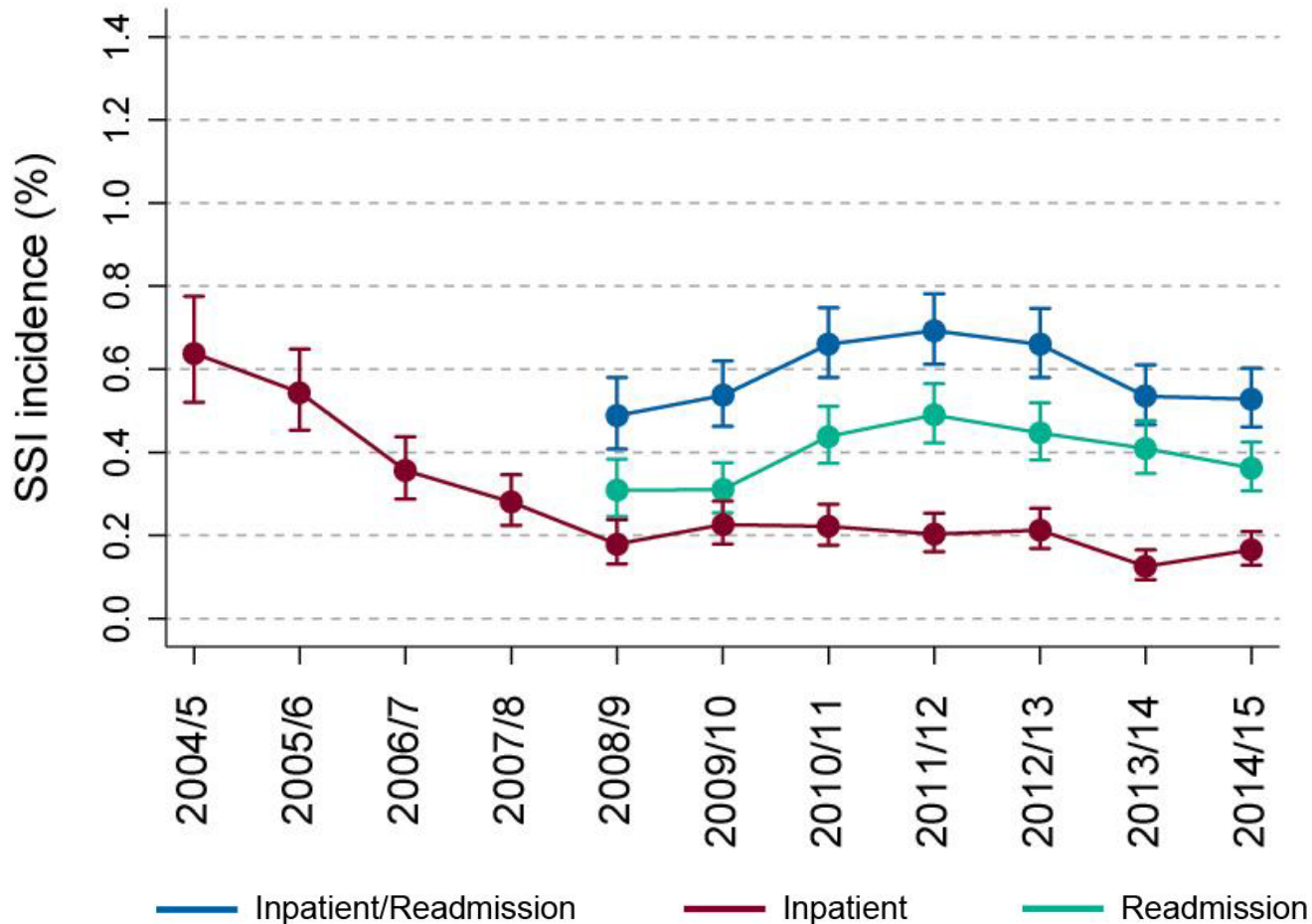
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# PHE: Hip arthroplasty SSI 2004-15



# PHE: Knee arthroplasty SSI 2004-15



# SSHAIP: Scotland

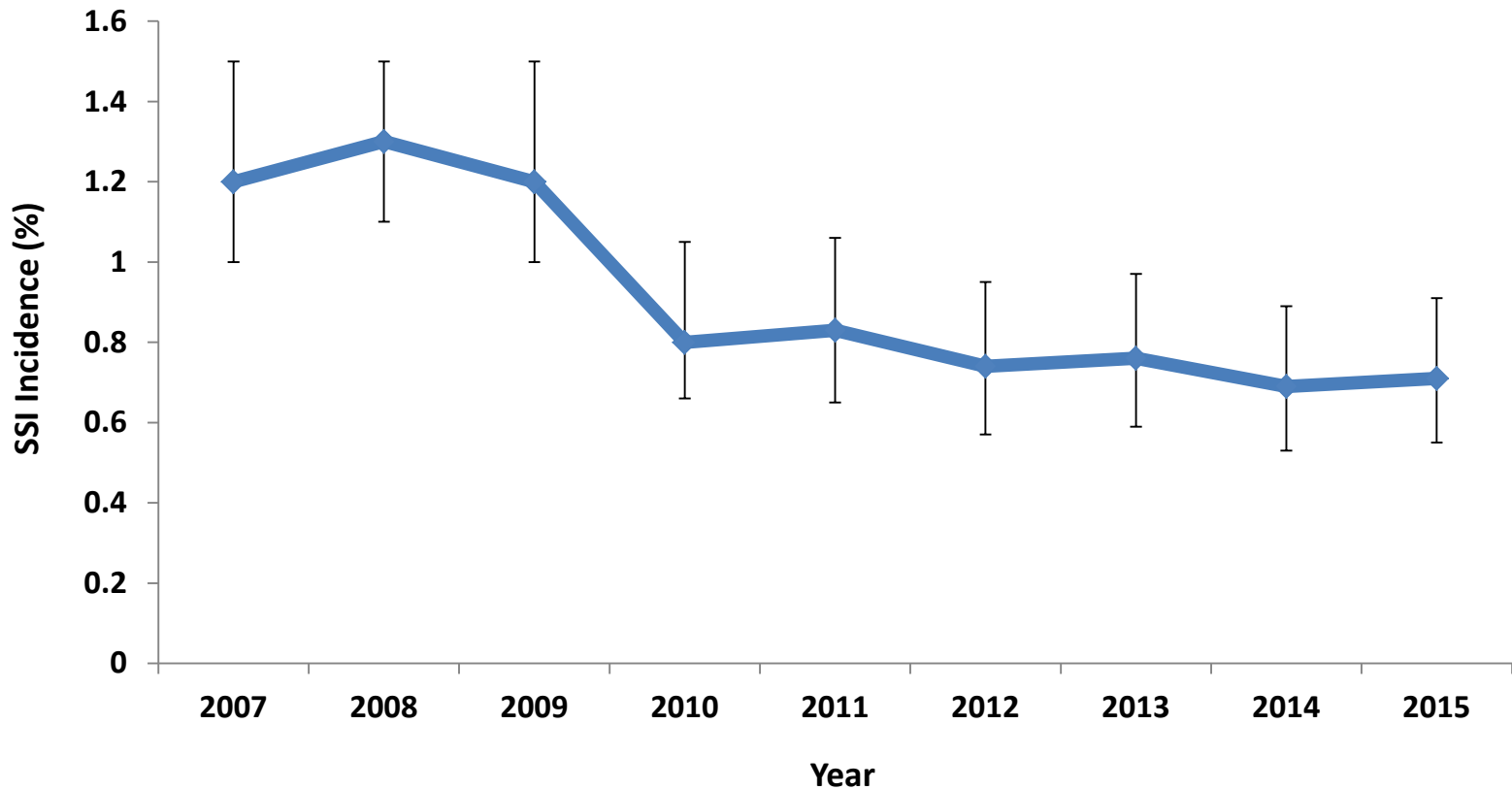
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- SSI surveillance programme established 2002; with mandatory surveillance hip arthroplasty from 2004
- Initially only inpatient surveillance extended to include readmission to 30 days in Jan 2007
- All Trusts submit continuous hip & LSCS data
- Web based data collection system



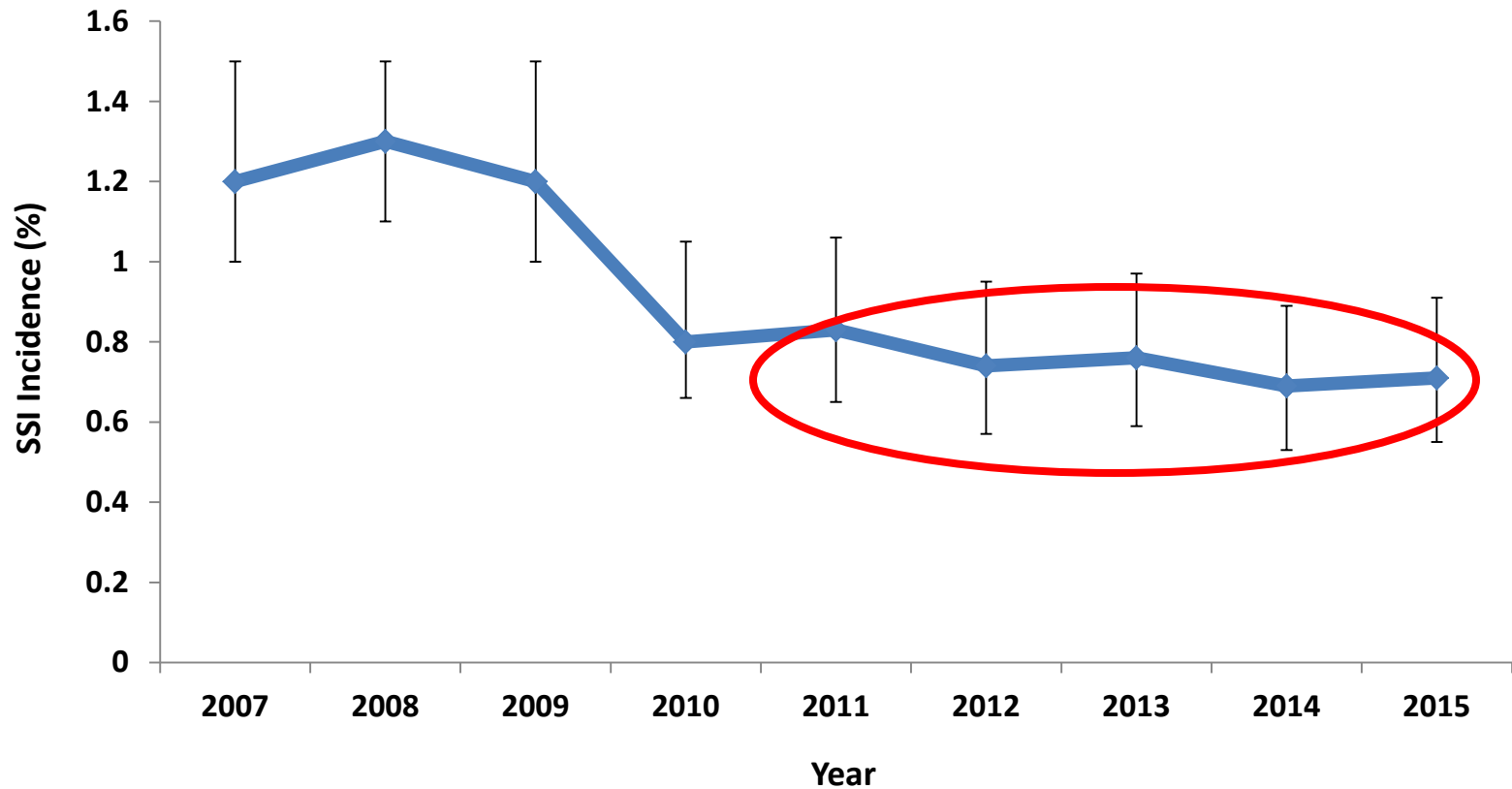
# SSHAIP: Hip arthroplasty SSI 2007-2015

Incidence of SSI following hip arthroplasty procedures in Scotland  
(inpatient and readmission to day 30) 2007-2015



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Incidence of SSI following hip arthroplasty procedures in Scotland  
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# CDC/NHSN – US

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- SSI surveillance definitions established 1994
- Continuous surveillance mandated for orthopaedic surgery in specific states; other states are voluntary
- Deep hip SSI rate: **0.69**/100 procedures in 2014 (**0.85**/100 procedures 2010; **1.27**/100 procedures 2006-08; **1.51**/100 procedures 1992-2004)
- Deep knee SSI rate: **0.37**/100 procedures in 2014 (**0.56**/100 procedures 2010; **0.89**/100 procedures 2006-08; **1.22**/100 procedures 1992-2004)
- Manual entry or interface of web-based form



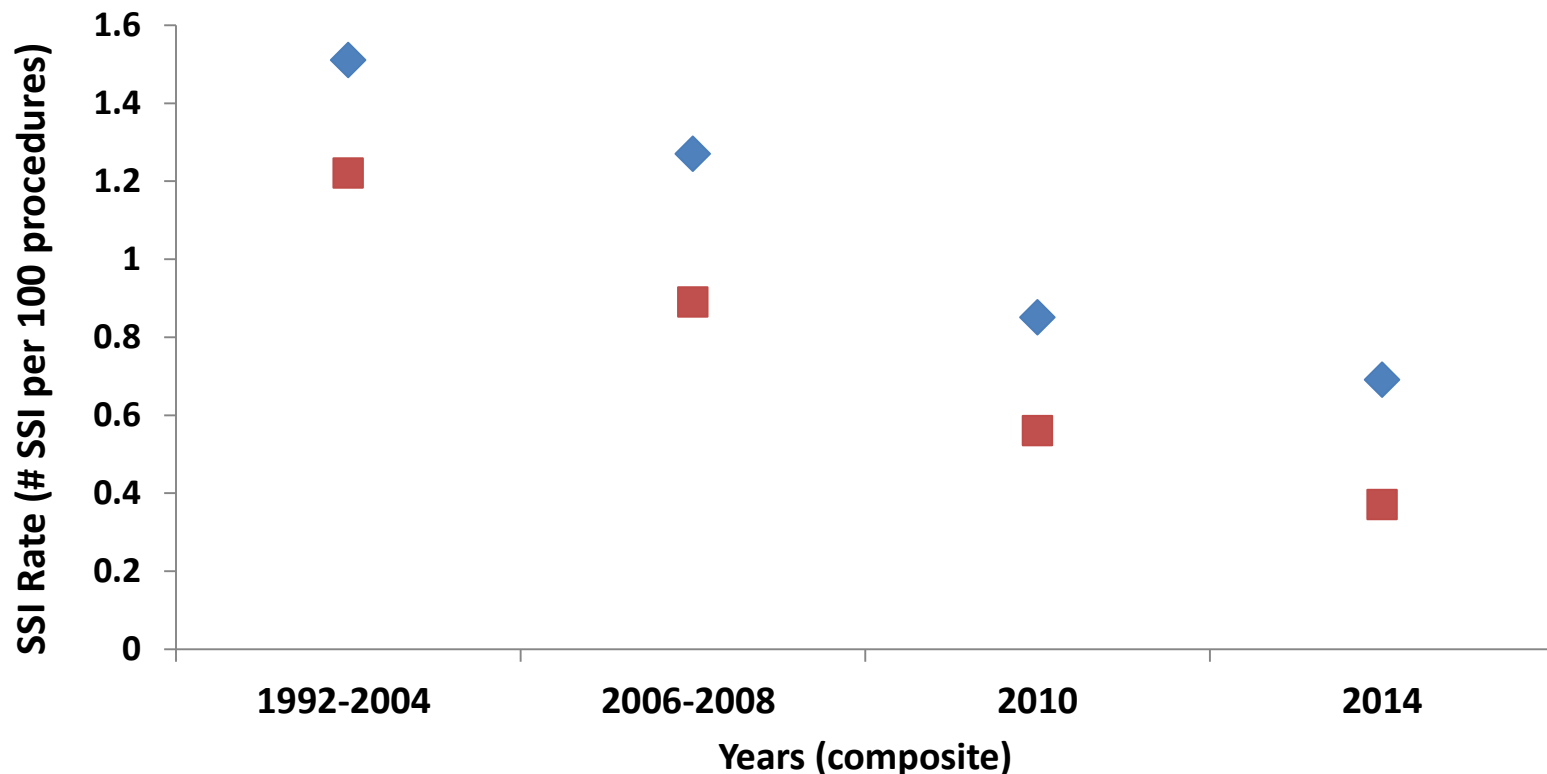
# CDC/NHSN – US

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- SCIP measures
  - Process measures for surgical care improvement project
    - Antibiotic selection
    - Antibiotic timing
    - Antibiotic dosing
  - Initiated 2010 by all acute care hospitals
  - Retired January 2015



# CDC/NHSN Hip & Knee Arthroplasty SSI (Unadjusted SSI Rates; 1992-2014)



◆ Hip Arthroplasty SSI Rate

■ Knee Arthroplasty SSI Rate



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# NATIONAL SSIs BY PROCEDURE TYPE

## ACUTE CARE HOSPITALS

SURGICAL SITE INFECTIONS

SSIs: 10 SELECT PROCEDURES

↓ 17% LOWER COMPARED TO NAT'L BASELINE\*

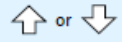
- U.S. hospitals reported a significant increase in SSIs from 10 select procedures between 2013 and 2014.
- 8% Among the 2,580 U.S. hospitals with enough data to calculate an SIR, 8% had an SIR significantly higher (worse) than 0.83, the value of the national SIR.
- Almost all U.S. hospitals report SSI data following colon surgeries and abdominal hysterectomies to NHSN.

PROCEDURE CATEGORY	# HOSPITALS REPORTING	# PROCEDURES REPORTED	2014 NAT'L SIR VS. NAT'L BASELINE	2014 NAT'L SIR
Hip arthroplasty	1,928	291,628	↓ 22%	0.78
Knee arthroplasty	1,907	417,937	↓ 41%	0.59
Colon surgery	3,377	300,526	↓ 2%	0.98
Rectal surgery	329	6,561	↓ 40%	0.60
Abdominal hysterectomy	3,225	307,648	↓ 17%	0.83
Vaginal hysterectomy	822	30,961	↕ 14%	0.86
Coronary artery bypass graft	755	117,972	↓ 45%	0.55
Other cardiac surgery	379	44,713	↓ 58%	0.42
Peripheral vascular bypass surgery	295	8,755	↓ 30%	0.70
Abdominal aortic aneurysm repair	273	2,121	↓ 72%	0.28
These 10 procedures combined	3,618	1,528,822	↓ 17%	0.83

### LEGEND



2014 national SIR is significantly lower (better) than the 2008 SSI national baseline



Change in 2014 national SIR compared to the 2008 SSI national baseline is not statistically significant



2014 national SIR is significantly higher (worse) than 2008 SSI national baseline




\* Statistically significant

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





## ACUTE CARE HOSPITALS

SURGICAL SITE INFECTIONS





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**LEGEND**

-  2014 national SIR is significantly lower (better) than the 2008 SSI national baseline
-  2014 national SIR is significantly higher (worse) than 2008 SSI national baseline
-  or  Change in 2014 national SIR compared to the 2008 SSI national baseline is not statistically significant



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\* Statistically significant



# USA SSI reduction over time

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- Hips 22% reduction
- Knees 41% reduction
- 2014 vs. 2008
- 2013: follow-up reduced to 90 days
- 90 days detects ~85% of SSIs
- “Corrected” reduction more like 6% and 26%



# International SSI Rates

PROGRAMME	Hips	(base line)	Knees	(base line)	Interval, years
HISWA	0.9	(2.2)	0.5	(1.6)	8
VICNISS	1.7	(3.2)	1.2	(2.2)	8
PHE	0.6	(0.9)	0.5	(0.5)	6
SSHAIP	0.8	(1.2)			8
USA: CDC (deep only)	0.7	(1.3)	0.4	(0.9)	10+
NZ SSII Programme	1.3		1.0		
NZ SSII deep only	1.0		0.5		



# NZ SSII Programme Future

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- Understand our data
- IT solutions
- Consult on burden of staphylococcal infection:
  - 36% SSIs have *S. aureus*
  - 23% SSIs have other staph species
  - Anti-staph bundle: ~50% reduction
- Continue **Quality Improvement** focus to reduce harm



# References

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  - Government of Western Australia Department of Health. 2016. Healthcare Infection Surveillance Western Australia Annual Summary Report 2014-15.
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  - 2014 National and State HAI Progress Report. Full series of tables for all national and state-specific data. Centers for Disease Control and Prevention, United States [Report].
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  - <http://www.hqsc.govt.nz/our-programmes/infection-prevention-and-control/projects/surgical-site-infection-improvement/>

# Conclusions

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- Caution needed when comparing data
- NZ SSI rates within range of other programmes
- Sustained improvement takes time
- Further analysis/risk adjustment of NZ SSI data will provide additional value for providers and ultimately **patients**



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# QUESTIONS



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