

# A Journey Through Safety and Quality

Sean Heng (IHPA)  
Roland Fan (PwC)



IHPA

# Outline

- Overview
- Risk Adjustment
- Data Challenges
- Incremental cost of a Hospital Acquired Complication
- Funding Adjustments

# Overview



# Timeline

2016

2017

Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul

PHASE 1

PHASE 2

PHASE 3



# List of hospital acquired complications

1. Pressure injury
2. Falls resulting in fracture or other intracranial injury
3. Healthcare associated infection
4. Surgical complications requiring unplanned return to theatre
5. Unplanned intensive care unit admission
6. Respiratory complications
7. Venous thromboembolism
8. Renal failure
9. Gastrointestinal bleeding
10. Medication complications
11. Delirium
12. Persistent incontinence
13. Malnutrition
14. Cardiac complications
15. Third and fourth degree perineal laceration during delivery
16. Neonatal birth trauma

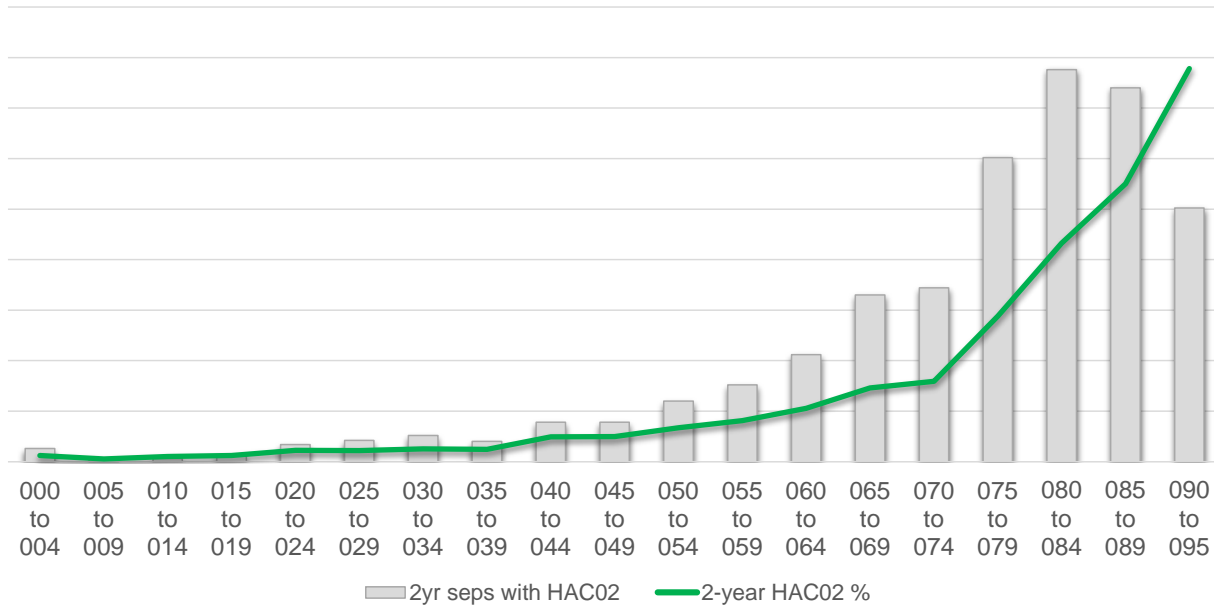
# Risk Adjustment

## The Evolution



# Age Model

## 2. Falls resulting in fracture or other intracranial injury



# Feedback

Did not take into account other risk factors

Over penalised paediatric hospitals

The age only model was simple and easy to understand but did not capture the entire complexity of a HAC episode

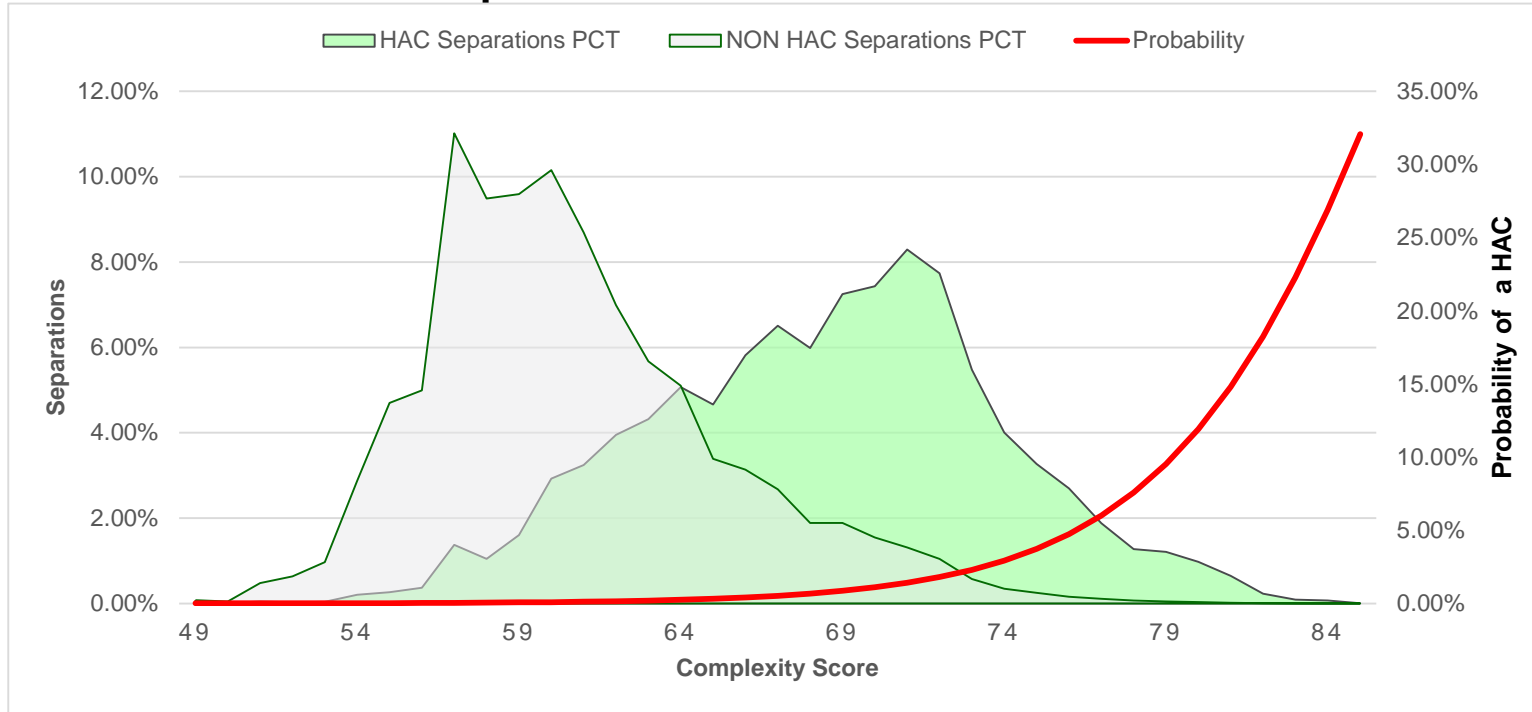


# Complexity Model

Risk Factors	01. Pressure injury	02. Falls resulting in fracture or other intracranial injury	03. Healthcare associated infection	04. Surgical complications requiring unplanned return to theatre	06. Respiratory complications	07. Venous thromboembolism	08. Renal failure	09. Gastrointestinal bleeding	10. Medication complications	11. Delirium	12. Persistent incontinence	13. Malnutrition	14. Cardiac complications
Admission Status	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Patient Age	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MDC	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ICU Status	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DRG Type	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Charlson Score	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Gender	✗	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✗	✗
Transfer Status	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓

# Complexity Distribution

## HAC 10 : Medical Complications



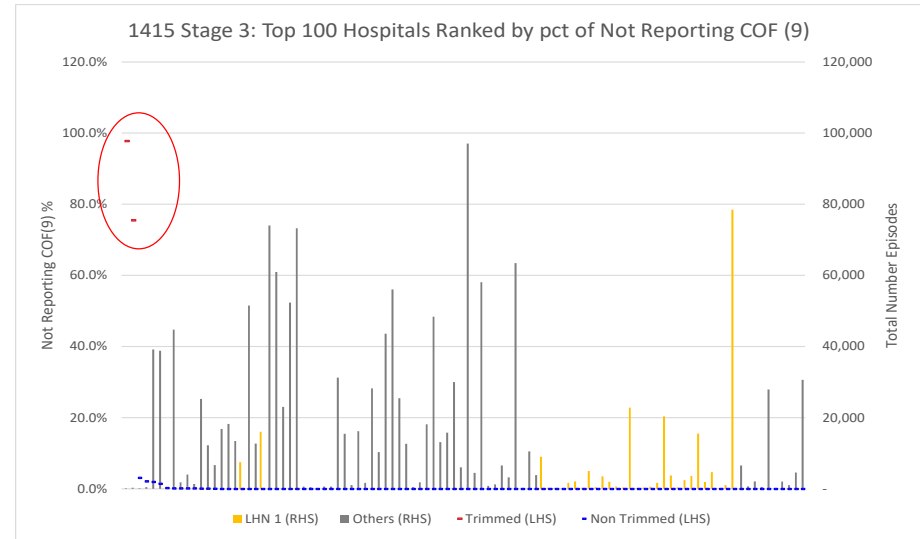
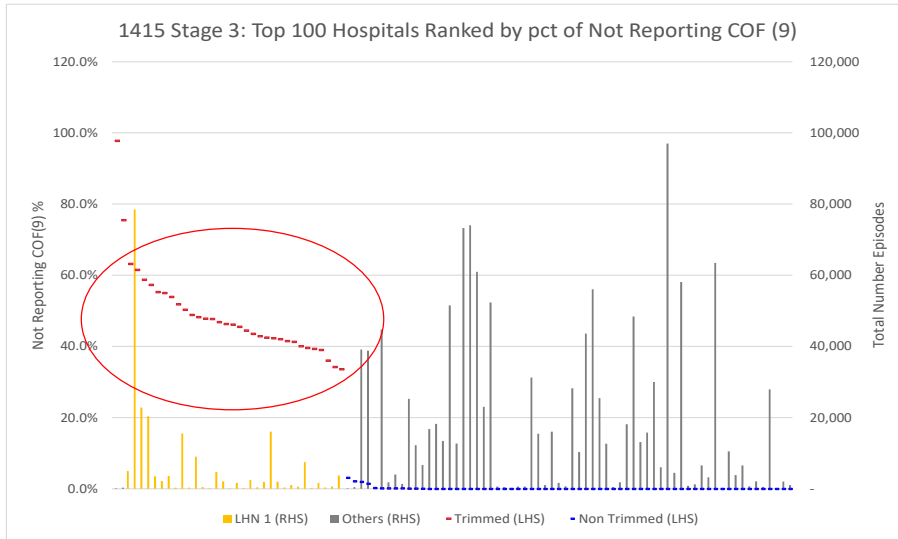
# Data challenge



# Data challenges for HACs

- Condition onset flag (COF) is a critical piece of data in order to identify HACs.
- Trimming rules were developed at a hospital level, taking into account quality of COF reporting.
- Episode level trimming was also carried out to ensure data used in the development of the risk model was robust.

# Condition Onset Flag



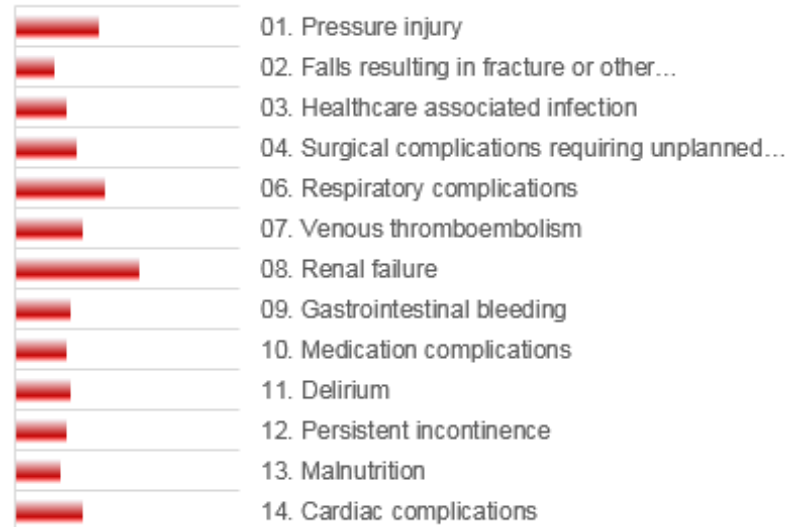
# Incremental cost of a HAC

The challenge



# Determining a HAC adjustment

- The adjustment should reflect the *incremental* cost due the presence of a HAC.
- This is not possible to do directly from cost data and so statistical models were used to compare cost relativities between HAC and non-HAC episodes
- Different HACs had different cost profiles



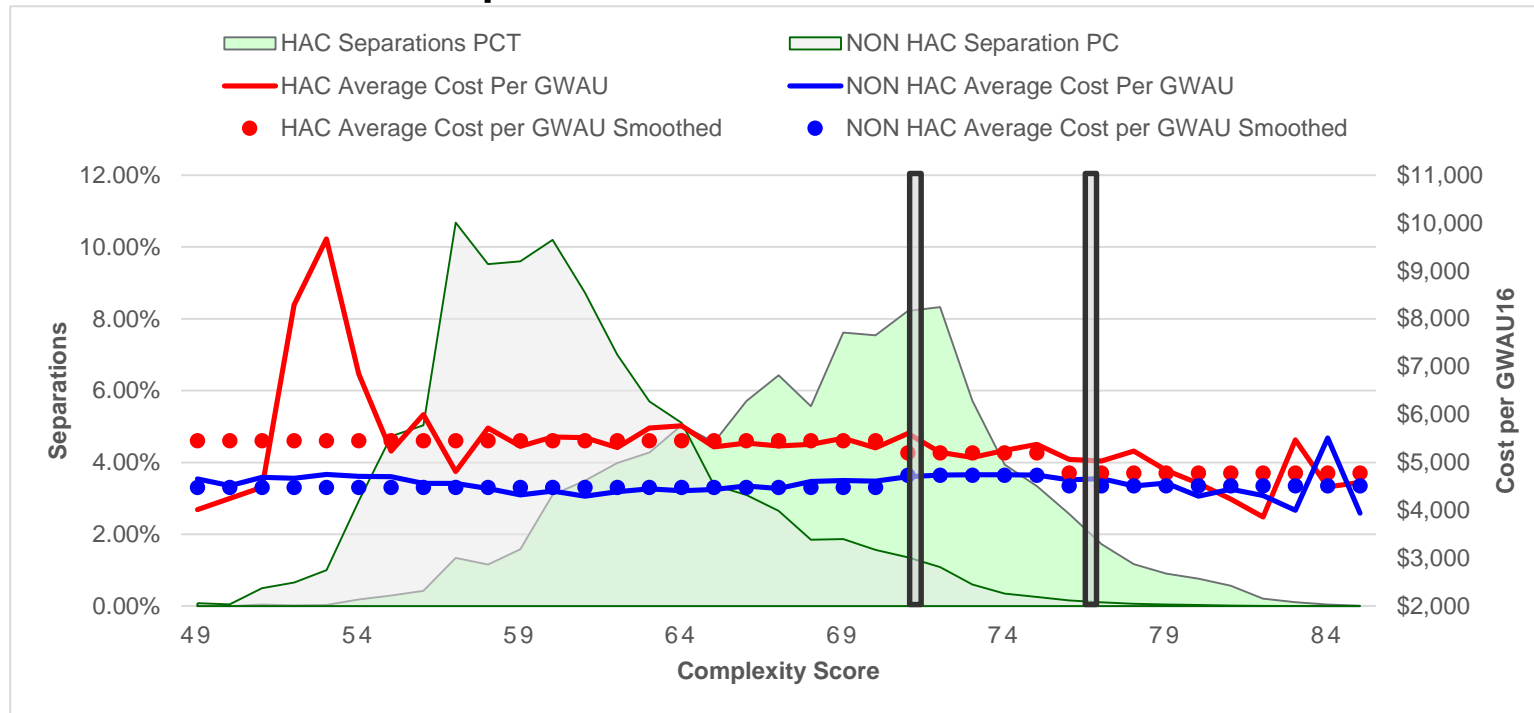
# Dampening

- Episodes were classified into different complexity groups – low, moderate and high based on the complexity score.
- If the episode was a moderate or high complexity, then the adjustment would be dampened i.e. the full reduction in NWAU would not apply.



# Complexity Distribution

## HAC 10 : Medical Complications

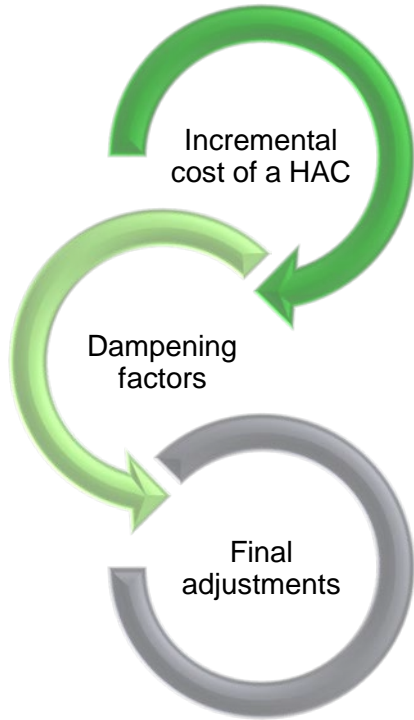


# Calculating the funding adjustment

Bringing it all together



# Structure of funding adjustment



- The incremental cost of each HAC is determined by comparing the cost of episodes containing HACs to those without (this is the maximum possible deduction)
- Dampening factors are calculated based on the complexity, or risk, of a patient having a HAC
- The two are combined to create the final funding adjustments

Adjusted NWAU =  $NWAU \times (1 - \text{adjustment factor})$

# Thank You

