Comparing RTW outcomes between vocational rehabilitation providers after adjusting for case mix using statistical models

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Context

WorkCover SA Non-exempt claims expenditure 2008/09

- Total = $575m

- Income maintenance = $198m

- Vocational rehabilitation = $22m

- 60% of IM claims have vocational rehab
    > % of IM cost much more

based on 2007/08 IM claims vocational rehabilitation to date

Judging provider performance

Who is best at achieving RTW?

- RTW adjusted for case mix
  = performance + residual bits
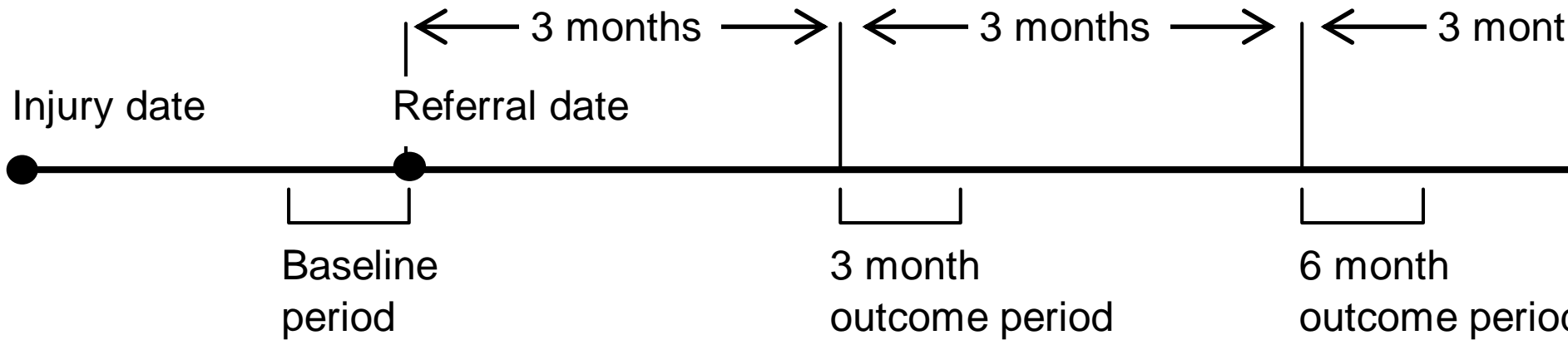
- Other information
  > e.g. file reviews, service costs

Measuring RTW

- income maintenance reduction

- except retirement, redemption and death
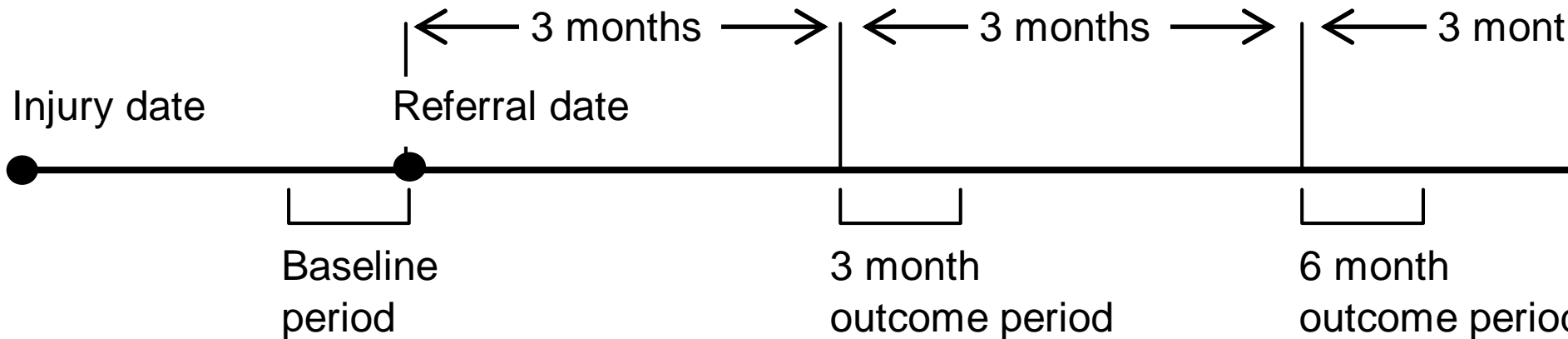
"Reduction" includes full and partial RTW

Measuring RTW

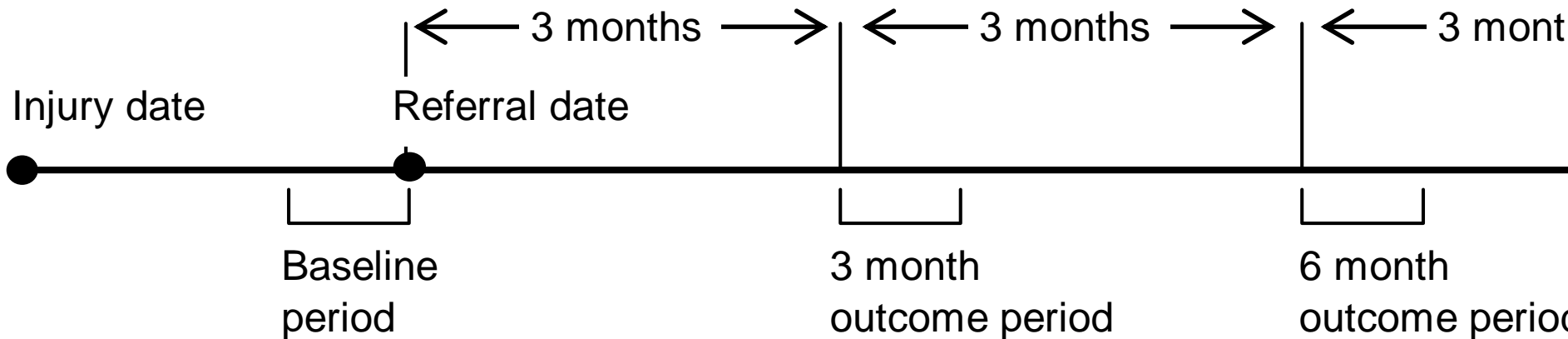Outcomes measured 3, 6, 9 and 12 months after referral date

Measuring RTW

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          ←—— 3 months ——→   ←—— 3 months ——→   ←—— 3 mont
Injury date      Referral date

●————————————————●——————————————————|——————————————————|————————
         └─────┘                └────┘              └────┘
         Baseline                3 month             6 month
         period                  outcome period      outcome perio
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"Incapacity" = IM paid ÷ Full IM entitlement

"RTW"   = Baseline incapacity *minus*
                 Outcome period incapacity

Measuring RTW

Timeline showing: Injury date, Referral date (with 3 months, 3 months, 3 months intervals), Baseline period, 3 month outcome period, 6 month outcome period.

Special treatment of redeemed claims

- Outcome IM at pre-redemption level
- pre-redemption partial RTW recognised

Measuring RTW

Measures are driven by

1. provider performance
   > full, partial and sustained RTW

2. claim characteristics

3. other

Adjusting for claim characteristics

Measures are driven by

1. provider performance
   > full, partial and sustained RTW

2. claim characteristics

3. other

2/3 of variation between providers
from claim characteristics

Adjusting for claim characteristics

Measures are driven by

1. provider performance
   > full, partial and sustained RTW

2. claim characteristics

3. other

Remove 2. => better indicator of 1.

Adjusting for claim characteristics

For each provider ...

- Expected RTW
  = predicted (or "scheme average")
     given the claim characteristics

- Performance indicator ("CAPO")
  = Actual RTW *minus* Expected RTW

Adjusting for claim characteristics

For each provider ...

- Expected RTW
  = predicted (or "scheme average")
    given the claim characteristics

- Performance indicator ("CAPO")
  = Actual RTW *minus* Expected RTW

"CAPO" stands for
"Characteristic Adjusted Performance Outcome"

Adjusting for claim characteristics

For each provider ...

- Expected RTW
  = predicted (or "scheme average")
    given the claim characteristics

- Performance indicator ("CAPO")
  = Actual RTW *minus* Expected RTW

An indicator of *relative* performance
Relative to the average of other providers

Adjusting for claim characteristics

Positive CAPO = better than average
Negative CAPO = worse than average

<u>given</u> the claim characteristics

Adjusting for claim characteristics

Actual RTW = Baseline Incapacity *minus* Actual Outcome Incapacity

Expected RTW = Baseline Incapacity *minus* Expected Outcome Incapacity

Calculating Expected RTW

For an individual claim ...

Expected RTW =

Baseline Incapacity – Expected incapacity $\nearrow$ outcome

Expected incapacity $\nearrow$ outcome $= \dfrac{e^{\eta}}{1+e^{\eta}}$

$\eta = f\,(\text{Claim characteristics at referral date})$

Calculating Expected RTW

For an individual claim ...

Expected RTW =
Baseline Incapacity – Expected incapacity ↗ outcome

Expected ↗ outcome incapacity = $\dfrac{e^{\eta}}{1+e^{\eta}}$

$\eta = f(\text{Claim characteristics at referral date})$

Expected outcome incapacity constrained between 0 and 1

Calculating Expected RTW

For an individual claim ...

Expected RTW =
Baseline Incapacity – Expected$\nearrow^{\text{outcome}}$incapacity

Expected$\nearrow^{\text{outcome}}$incapacity $= \dfrac{e^{\eta}}{1+e^{\eta}}$

$\eta = f(\text{Claim characteristics at referral date})$

Provider result is an average over all their claims

Calculating Expected RTW

Claim characteristics must be

- recorded on administrative database

- measured accurately and consistently

- available for all in-scope claims

- measurable as at referral date

Calculating Expected RTW

Variables analysed -

- Baseline incapacity

- Worker age

- Sex

- Occupation

- Claim duration

- Nature of injury

- Body location

- RTW objective: Pre-injury vs New employer

- Employer size

- Employer industry

- Metro vs country

- Expenditure by type

Calculating Expected RTW

Criteria to select variables

- Statistical significance

- Practical significance

- Significance judged by partial residual plots

- Improved fit judged by partial residual plots

Calculating Expected RTW

Variables selected -

- Baseline incapacity

- Worker age

- Claim duration (log transformation)

- Selected nature of injury / body location

- Income maintenance last 6 months

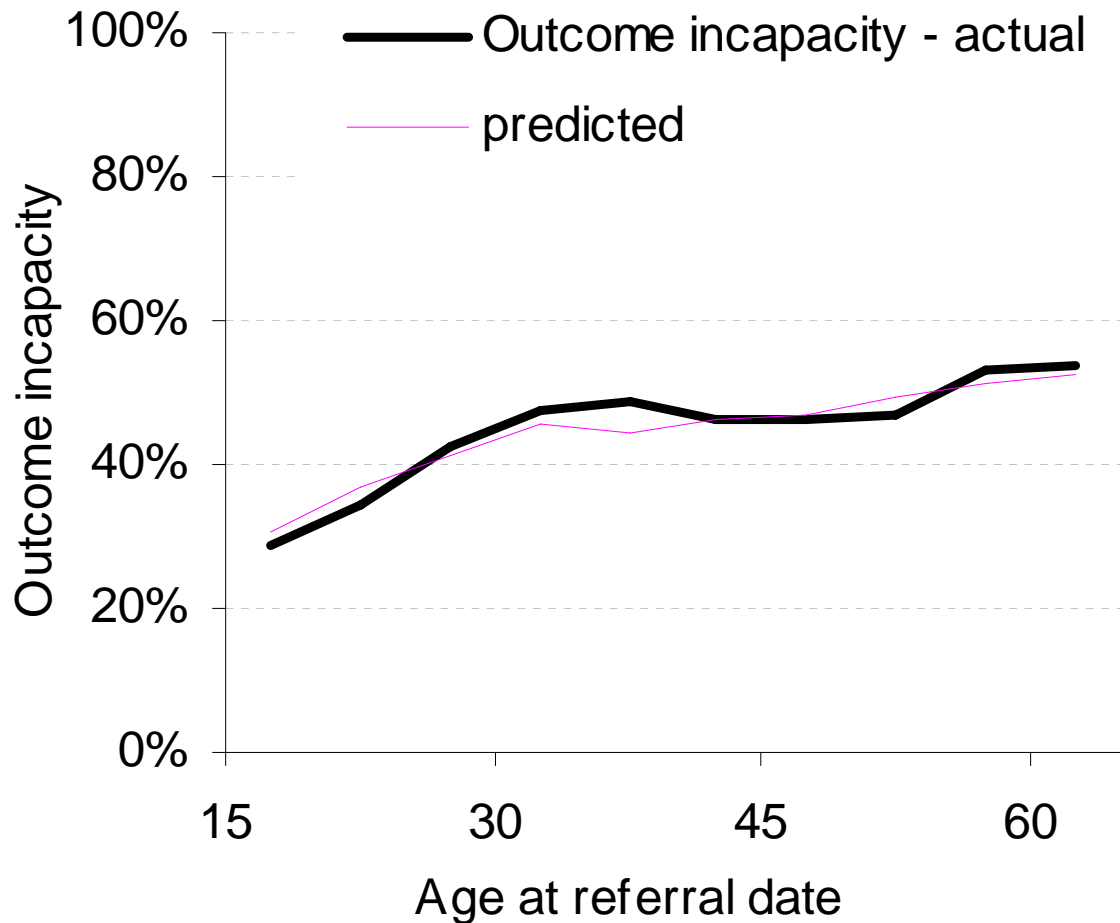- Medical costs last 6 months

- RTW objective: Pre-injury vs New employer

Calculating Expected RTW
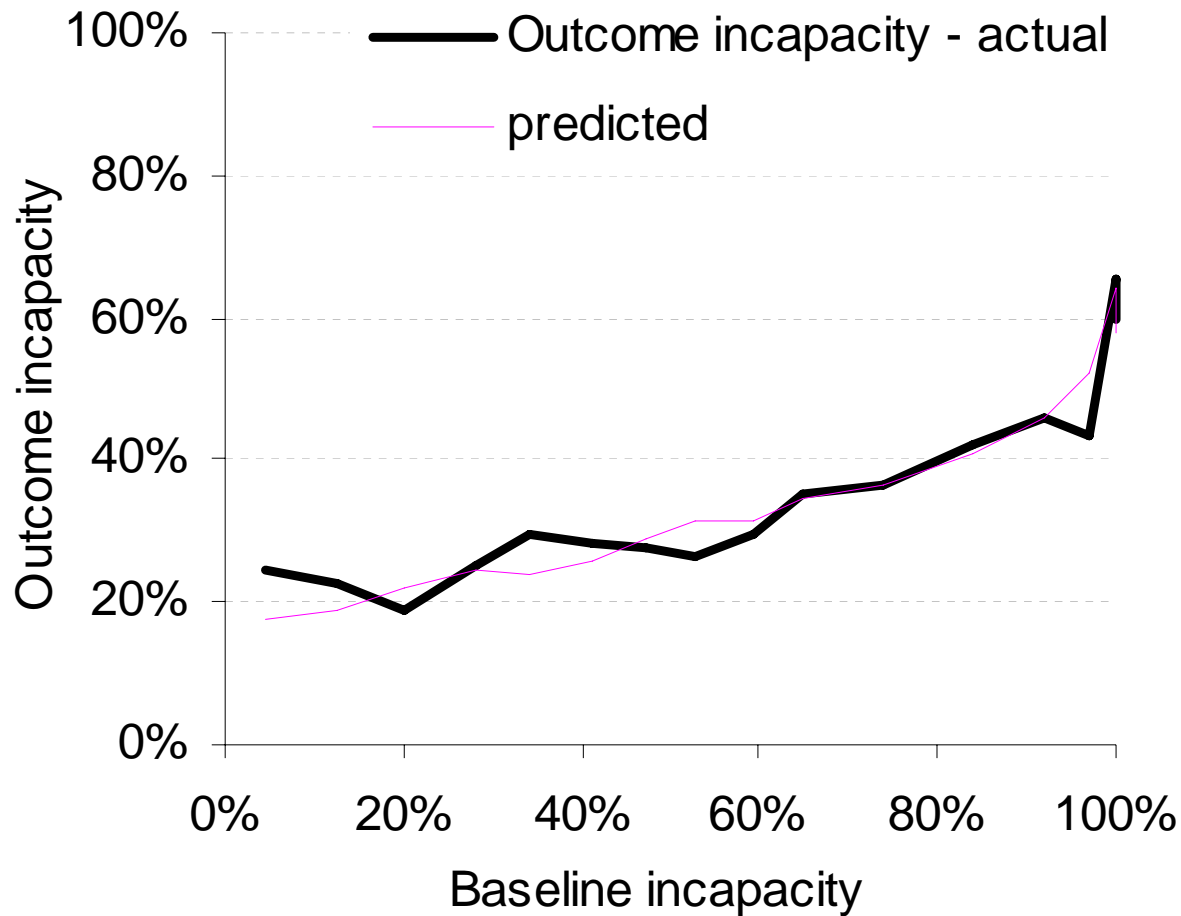
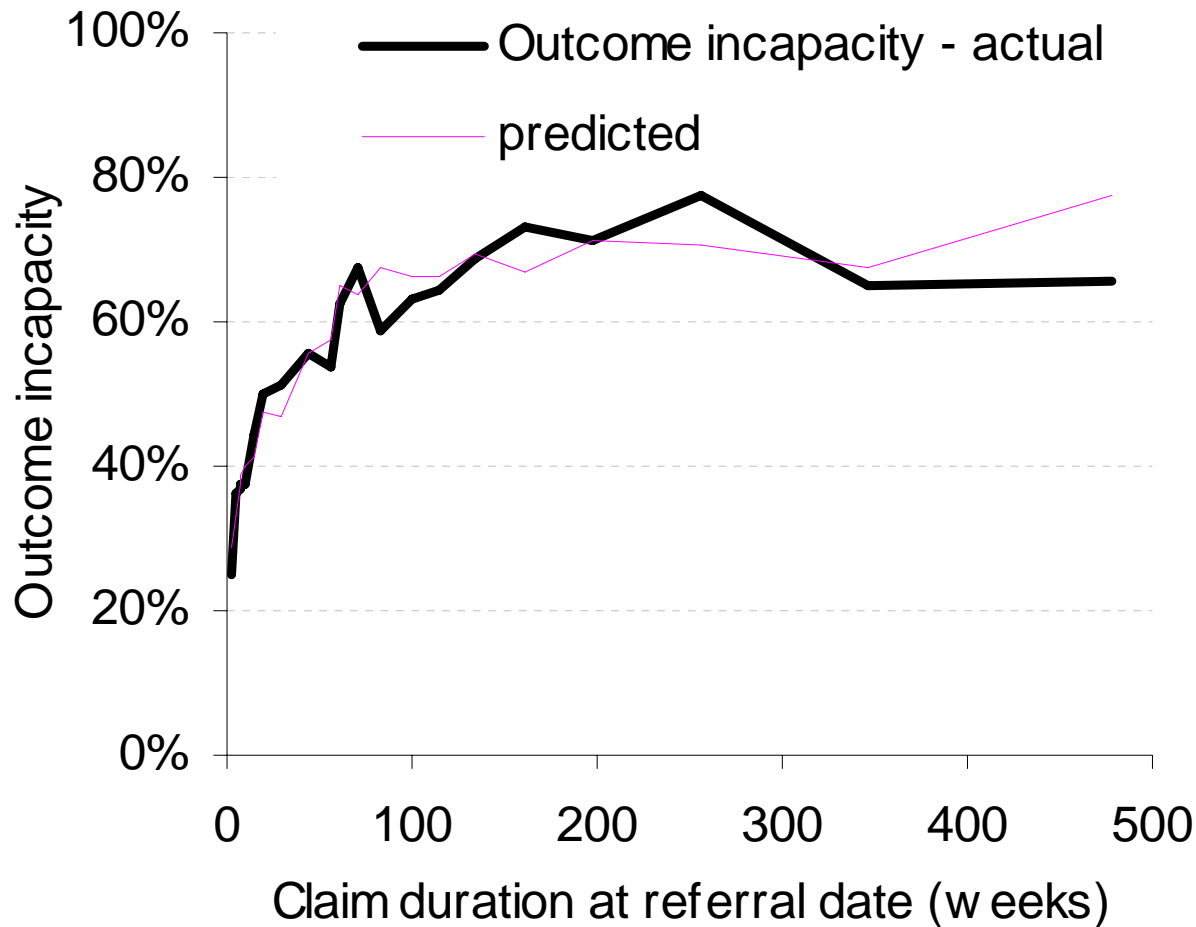Example: 6 month outcome, Pre-injury employer

Calculating Expected RTW
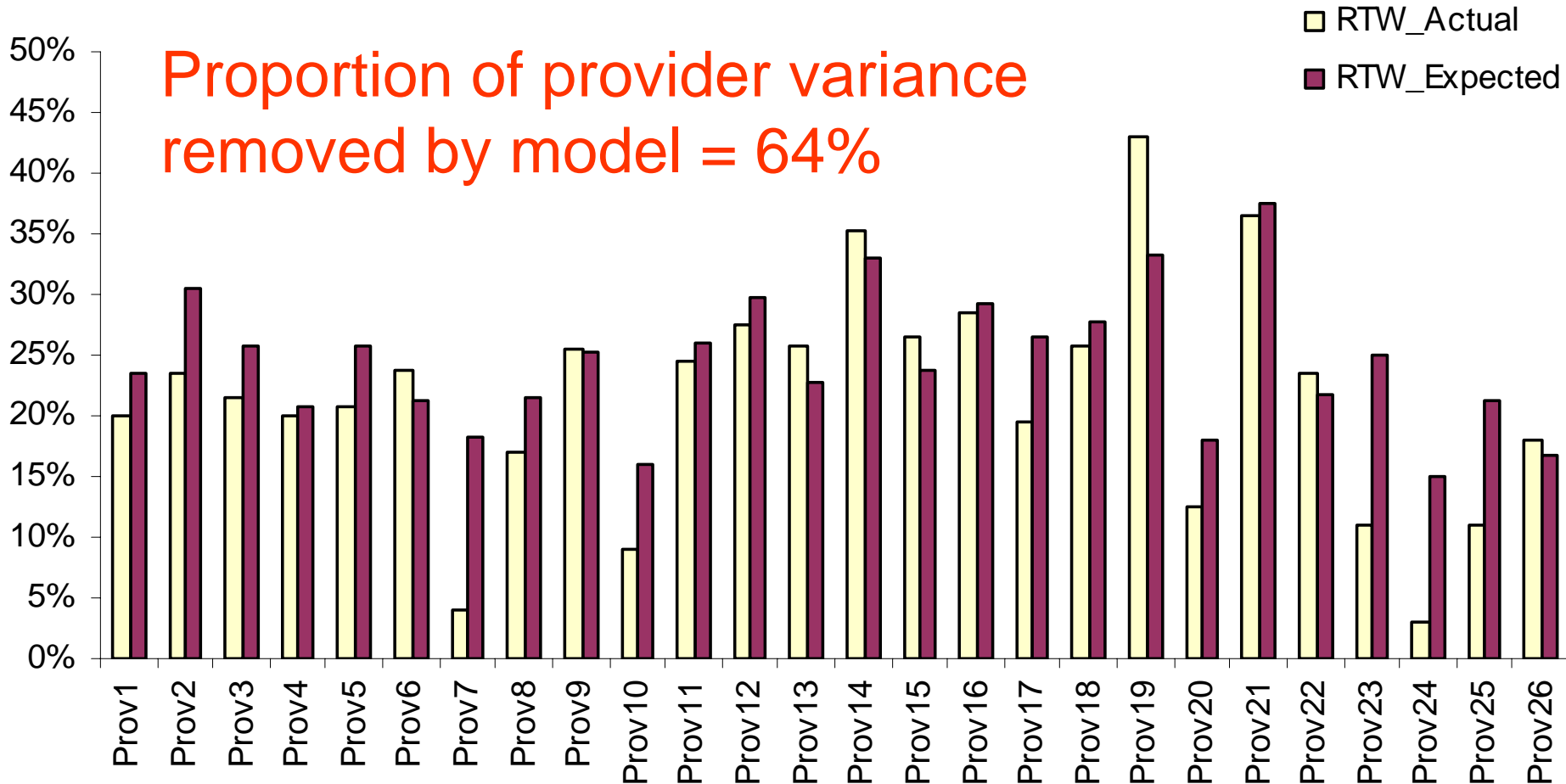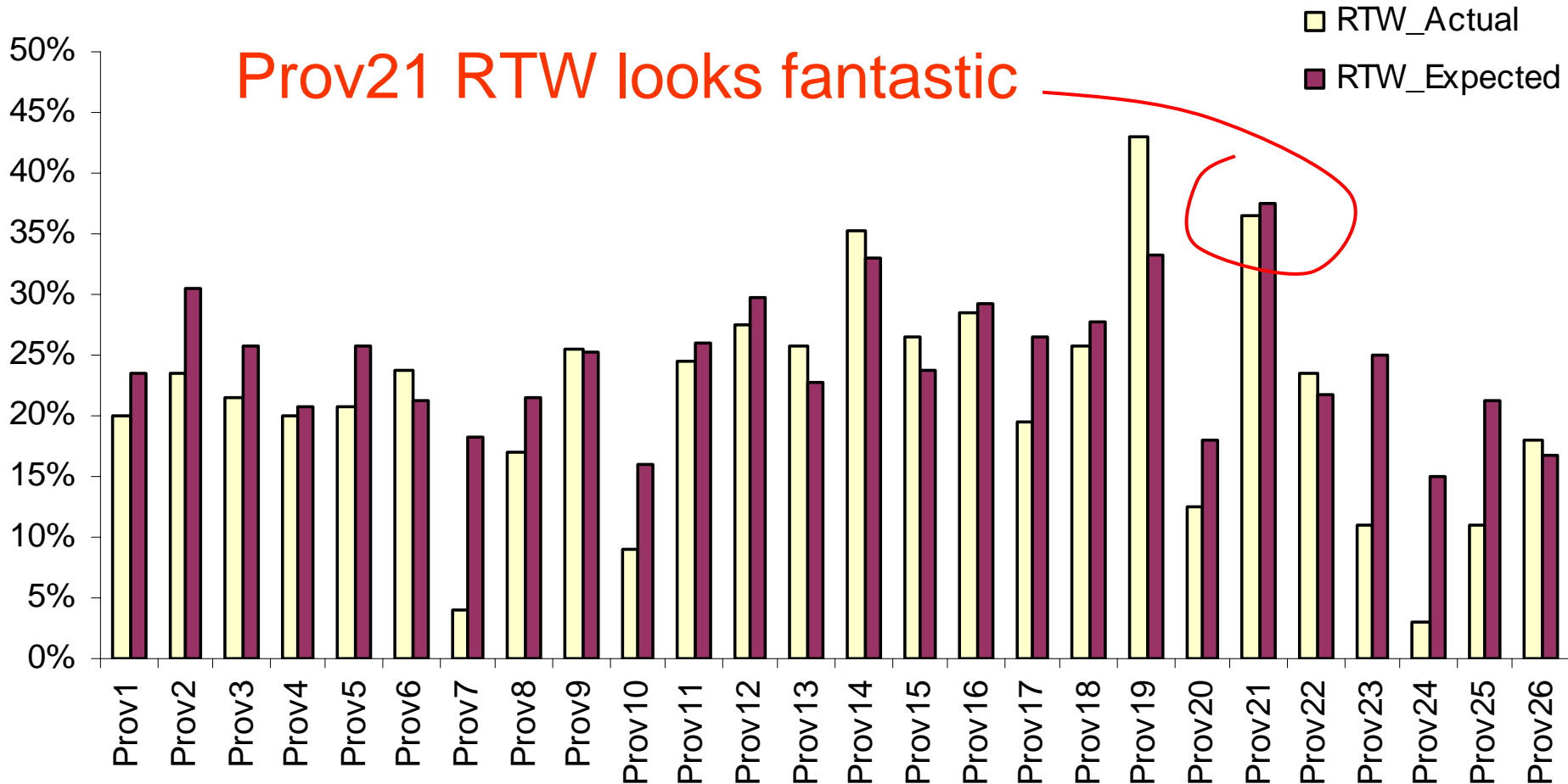
Example: 6 month outcome, Pre-injury employer

Calculating Expected RTW

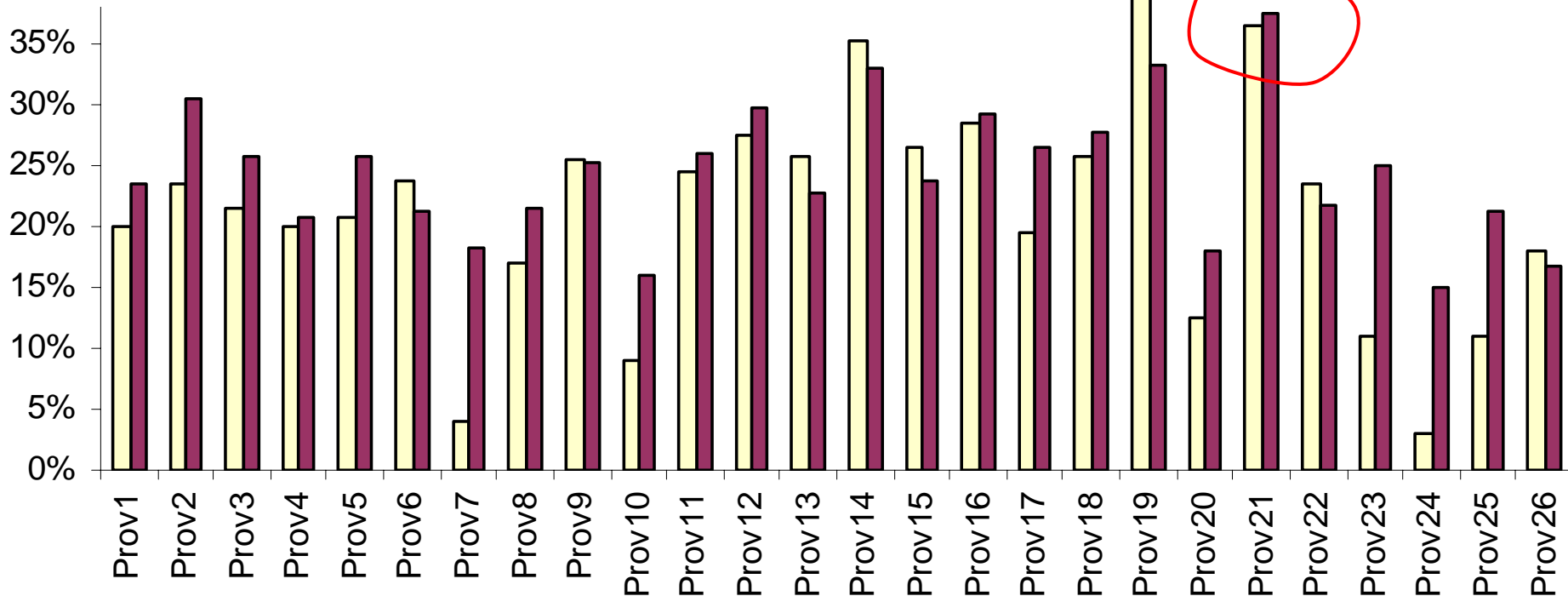Example: 6 month outcome, Pre-injury employer

Application

Proportion of provider variance removed by model = 64%

Legend: RTW_Actual, RTW_Expected

Example: 6 month outcome, Pre-injury employer

Application

Prov21 RTW looks fantastic

Legend:
- RTW_Actual
- RTW_Expected

Example: 6 month outcome, Pre-injury employer

Example: 6 month outcome, Pre-injury employer

Application

Prov19 is the only one with significantly (barely) good CAPO *(p-value = 0.078)*

Example: 6 month outcome, Pre-injury employer

Application

Several significantly poor

Legend: RTW_Actual, RTW_Expected

Example: 6 month outcome, Pre-injury employer
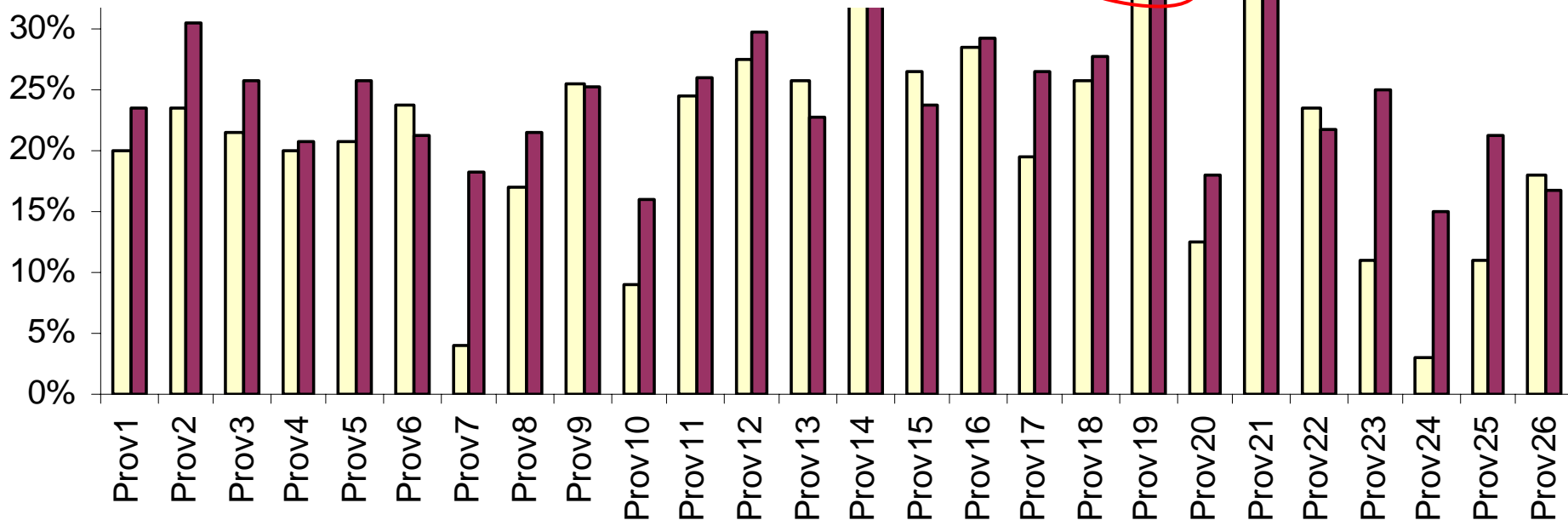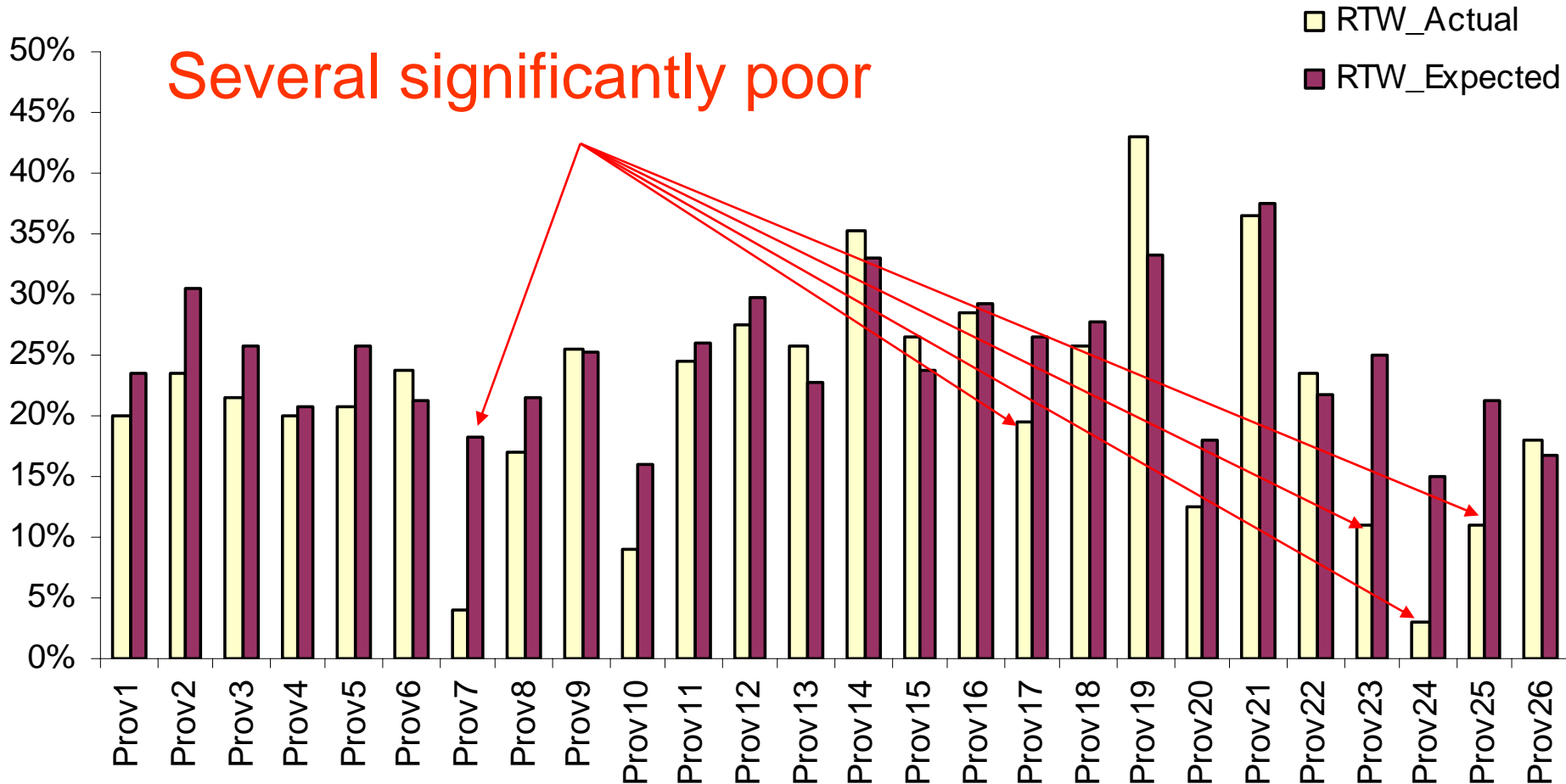
Conclusions

- Objective comparison of providers

- Measures full, partial and sustained RTW

- Much non-performance variation removed

- Must be supplemented by other information

- Influences referral patterns

- Overall system rewards best performance and checks poor performance