Change • Challenge • Opportunity
Injury & Disability Schemes Seminar

12 - 14 November 2017 • Sofitel • Brisbane

Actuaries Institute
Predictors of Return to Work: Experience from Workers Compensation Insurance in NSW

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Catherine Day
SIRA-(State Insurance Regulatory Authority)
To present:

• Return to Work experience of NSW
• Research findings on predictors of RTW
• Analysis results based on 3 robust data cohorts

Analysis:

• Analysis 1: Pre 2012 Claims data: Nominal Insurer
• Analysis 2: Post 2012 Claims data: NSW System
• Analysis 3: 2016 RTW Survey data : NSW System

Analysis Methods:

• Regression Analysis
• Machine Learning Model : Random Forest
SIRA as a new regulator

- SIRA regulates **workers compensation** insurance delivered by:
  - Nominal Insurer (icare)
  - SiCorp Treasury Managed Fund (icare)
  - Other 59 Self-insurers
  - 6 Specialised insurers
- SIRA regulates **motor accidents compensation** insurance delivered by private CTP insurers
- SIRA also regulates the **Home Building Compensation Fund** which is administered by SiCorp in icare
- SIRA provides assurances to government and community:
  - that the system is fair and equitable
  - achieves the aim of getting injured workers back to work
SIRA as a new regulator

- Perceived conflict of interest
- Prescriptive – influence via rules
- Leveraging legislation
- Compliance focus
- Reactive, opaque methods
- Data rich but analytics poor
- Perceived ‘Defender’ mindset
- Poor stakeholder engagement
- Distant from customer
- Culture not enabling innovation

- Impartial
- Performance based – influence via data and leadership
- Leveraging licensing conditions – insurer/provider supervision
- Outcome focus
- Proactive, transparent, and accountable methods
- Rapid data analytics tools & culture – evidence and risk
- Open to improvement mindset
- Excellent stakeholder engagement
- Strong customer understanding and impact
- Encouraging innovation

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Why is RTW important

- For most individuals, working improves general health and wellbeing and reduces psychological distress
- An unnecessary delay in returning to work after injury is often associated with delayed recovery
- Long term work absence has a negative impact on:
  - an individual’s health and wellbeing
  - an employer’s workplace culture and bottom line
  - the cost of the workers compensation system

Sources:
Feuerstein et.al., Pain, 2003, 102,51-61
RTW Rates – NSW Workers compensation System

There is a continuing improvement in return to work rates in NSW over the past three years.
There is an exponential increase in average and median claim cost with the increase of time away recovering from an injury.
Multi-Dimensional Aspects of RTW

Factors associated with RTW outcomes

• **Employer, Workplace & Environment:**
  • Employer support
  • Systems in place (policies and procedures)

• **Claim & Claimant Characteristics:**
  • Health status and severity of the injury
  • Claimant demographics
  • Psychosocial - job satisfaction, job demand, job control

• **System and legislative framework:**
  • Dispute resolution
  • Customer experience

• **Health care system and providers:**
  • Effective medical care and Rehab
## Areas for Analysis – NSW Workers Compensation System

<table>
<thead>
<tr>
<th>Item</th>
<th>Pre 2012 Claims data</th>
<th>Post 2012 Claims data</th>
<th>2016 RTW Survey data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model</strong></td>
<td>Claimant model</td>
<td>Claimant model</td>
<td>Injured Worker model</td>
</tr>
<tr>
<td></td>
<td>Macro-economic Model</td>
<td>Chi Square and Logistic regression Model and Machine Learning Model_ Random Forest</td>
<td>Chi Square and Logistic regression Model</td>
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<tr>
<td></td>
<td>Claimant model</td>
<td>ANOVA , Chi Square and Multiple regression Models</td>
<td></td>
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<tr>
<td></td>
<td>RTW based on duration on benefits – 26 week measure</td>
<td>RTW based on Work Status code – 26 week measure</td>
<td>RTW based on Work Status</td>
</tr>
<tr>
<td></td>
<td>Number of weeks on weekly benefits</td>
<td>Work Status code - 1,2,3,4/1 or more day time lost claims</td>
<td>Injured worker reported as RTW at the time of the survey</td>
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<tr>
<td><strong>Measure</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Source data</strong></td>
<td>Number of claims: 38,231</td>
<td>Number of claims: 209,128</td>
<td>Number of claims: 812</td>
</tr>
<tr>
<td></td>
<td>Claims reported from June 2010 to November 2011</td>
<td>Claims reported from July 2012 to June 2016</td>
<td>RTW Survey data (2016) National RTW Survey: Injured worker interviews</td>
</tr>
</tbody>
</table>
Analysis 1: Pre 2012 Analysis: Claimant & macro economic models

- **Dependent variable:** Proxy measure of RTW (duration)
- **Predictive variables:** limited number available from claims data
  - Claimant demographics, e.g. age, gender, occupation, income, NESB (interpreter required)
  - Employer characteristics: size, rehab provider involvement
  - Macro economic: unemployment rate, participation rate
- Interdependence and normality analysis conducted
- **Method of analysis:** ANOVA, Chi square & Multiple regression
Analysis 1: Pre 2012 Analysis:
Multiple Regression Model: Overall findings

- 18% of RTW outcomes is influenced by claimant characteristics
- 39% of duration results is influenced by macro-economic factors
- No clear relationship between predictor variables and duration
- Following variables had strong relationship with duration:
  - Non-English Speaking Background
  - Workplace rehabilitation program usage
  - Percentage of medical payments
### Pre 2012 Analysis:
**Claimant model: Chi square (χ2) results**

<table>
<thead>
<tr>
<th>Claim/Workplace Characteristics</th>
<th>Degrees of freedom</th>
<th>$\chi^2$ obtained (test statistic)</th>
<th>$\chi^2$ (critical)</th>
<th>P value</th>
<th>Cramer’s V</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>26 Week Outcome</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employer Size</td>
<td>10</td>
<td>931.9867</td>
<td>18.307</td>
<td>&lt;.0001</td>
<td>0.1104</td>
</tr>
<tr>
<td>Gender</td>
<td>5</td>
<td>139.6885</td>
<td>11.07</td>
<td>&lt;.0001</td>
<td>0.0605</td>
</tr>
<tr>
<td>Required interpreter flag</td>
<td>5</td>
<td>470.5903</td>
<td>11.07</td>
<td>&lt;.0001</td>
<td>0.1110</td>
</tr>
<tr>
<td>Received rehabilitation flag</td>
<td>5</td>
<td>4739.5109</td>
<td>11.07</td>
<td>&lt;.0001</td>
<td>0.3522</td>
</tr>
<tr>
<td>Bodily location</td>
<td>40</td>
<td>437.5755</td>
<td>&gt; 43.773</td>
<td>&lt;.0001</td>
<td>0.0479</td>
</tr>
<tr>
<td>Industry Division</td>
<td>80</td>
<td>567.4529</td>
<td>&gt; 43.773</td>
<td>&lt;.0001</td>
<td>0.0545</td>
</tr>
<tr>
<td>Nature of Injury</td>
<td>5</td>
<td>1265.7116</td>
<td>11.07</td>
<td>&lt;.0001</td>
<td>0.1820</td>
</tr>
<tr>
<td>Occupation</td>
<td>40</td>
<td>520.6599</td>
<td>&gt; 43.773</td>
<td>&lt;.0001</td>
<td>0.0522</td>
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<tr>
<td>Region</td>
<td>70</td>
<td>158.5855</td>
<td>&gt; 43.773</td>
<td>&lt;.0001</td>
<td>0.0288</td>
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</table>
Pre 2012 Analysis:
Claimant & macro economic model: ANOVA results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number of categories</th>
<th>Degrees of freedom</th>
<th>Kruskal-Wallis $\chi^2$</th>
<th>P Value</th>
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</thead>
<tbody>
<tr>
<td><strong>26 Week Outcome</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Claimant award rate</td>
<td>9</td>
<td>8</td>
<td>291.75</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Current age of claimant</td>
<td>12</td>
<td>11</td>
<td>273.62</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Hours worked per week</td>
<td>2</td>
<td>1</td>
<td>79.19</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>% Medical to Total Payments</td>
<td>8</td>
<td>7</td>
<td>1362.43</td>
<td>&lt;.0001</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number of categories</th>
<th>Degrees of freedom</th>
<th>Welch F value</th>
<th>Welch P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>26 Week Outcome</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployment rate - Male</td>
<td>2</td>
<td>1</td>
<td>19.51</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Unemployment rate - Female</td>
<td>2</td>
<td>1</td>
<td>54.59</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Unemployment rate - Person</td>
<td>2</td>
<td>1</td>
<td>51.03</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Participation rate - Male</td>
<td>2</td>
<td>1</td>
<td>29.11</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Participation rate - Female</td>
<td>4</td>
<td>3</td>
<td>12.12</td>
<td>&lt;.0001</td>
</tr>
</tbody>
</table>
Pre 2012 Analysis:
Multiple regression model results – 26 week measure

| Label                                                      | Parameter estimate (β) | Standard error | t Value | Pr > |t| |
|------------------------------------------------------------|------------------------|----------------|---------|------|---|
| Intercept                                                  | 4.69456                | 1.91272        | 2.45    | 0.0141 | |
| Weekly wage rate                                           | 0.00281                | 0.000621       | 4.52    | <.0001 | |
| Hours work per week                                        | 0.70421                | 0.03471        | 20.29   | <.0001 | |
| Legal GIC ($)                                              | 0.00524                | 0.000257       | 20.35   | <.0001 | |
| percent Medical to Total Payments                          | -24.39321              | 0.94961        | -25.69  | <.0001 | |
| Received rehabilitation flag                               | 27.10412               | 0.44735        | 60.59   | <.0001 | |
| Required interpreter flag                                  | 19.06685               | 1.52285        | 12.52   | <.0001 | |
| Current age of claimant                                    | 0.19986                | 0.01519        | 13.16   | <.0001 | |
| Nature of injury/diseases                                  | 0.01754                | 0.0011         | 15.93   | <.0001 | |
| Bodily location of injury/diseases                         | 0.00277                | 0.00137        | 2.02    | 0.0432 | |
| Occupation types (ASCO 1)                                  | 0.44595                | 0.08437        | 5.29    | <.0001 | |
| Gender (Male/Female)                                       | -1.25518               | 0.45794        | -2.74   | 0.0061 | |
| Employer size                                              | -5.04262               | 0.30881        | -16.33  | <.0001 | |
| Region (used defined)                                      | 0.14882                | 0.04803        | 3.1     | 0.0019 | |
Analysis 2: Post 2012 Analysis

Claimant model

Aim: To see any variation between pre/post periods

- Used claimant model to see the relationship between factors having affecting RTW outcomes

- **Dependent variable:** RTW Measure based on Work Status Code

- **Predictive variables:** limited number available from source
  - Claimant demographics, e.g. age, gender, occupation, income, NESB (Non-English Speaking Background: interpreter required)
  - Claim Characteristics: Psychological claim, Surgical claim, Delay to reporting
  - Employer characteristics: size
  - Provider involvement: workplace rehabilitation provider

- **Method of Analysis:** Chi square, Logistic regression & Random Forest Model
Post 2012 Analysis: Findings

Logistic regression and Random Forest model

- 14% of RTW outcomes is influenced by characteristics of injured worker together with workplace environment.

- Similar to pre 2012 model that claim characteristics explain small variance.

- Model fit statistics showed that the Regression model performed well with an overall performance of 74% as shown by the ROC curve.

- To both validate and augment the results from the logistic regression Machine learning model-Random Forest was also developed for the 26 week RTW measure.

- Variables highly impacted on RTW are:
  - Psychological claim
  - Nature of Injury
  - Body location
  - Workplace Rehabilitation
Post 2012 Analysis

Claimant model results: Logistic regression

Statistically significant results: Likelihood ratio shows significance at Pr < .0001

<table>
<thead>
<tr>
<th>Effect</th>
<th>DF</th>
<th>Wald Chi-Square</th>
<th>Pr &gt; ChiSq</th>
</tr>
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<tbody>
<tr>
<td>Gender</td>
<td>1</td>
<td>50.2887</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Age</td>
<td>5</td>
<td>601.9139</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Nature</td>
<td>3</td>
<td>184.9605</td>
<td>&lt;.0001</td>
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<tr>
<td>Work size</td>
<td>2</td>
<td>160.3554</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Body location</td>
<td>6</td>
<td>92.1586</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Industry</td>
<td>2</td>
<td>101.0163</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Occupation</td>
<td>1</td>
<td>225.1555</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Pre-injury earnings</td>
<td>2</td>
<td>34.889</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Delay in reporting</td>
<td>5</td>
<td>1728.4193</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Interpreter payments</td>
<td>1</td>
<td>411.2473</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Legal payments</td>
<td>1</td>
<td>607.1722</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Rehab payments</td>
<td>1</td>
<td>4246.6209</td>
<td>&lt;.0001</td>
</tr>
</tbody>
</table>

Model Fit Statistics

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Intercept Only</th>
<th>Intercept and Covariates</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIC</td>
<td>134976.20</td>
<td>120286.21</td>
</tr>
<tr>
<td>SC</td>
<td>134986.42</td>
<td>120603.20</td>
</tr>
<tr>
<td>-2 Log L</td>
<td>134974.20</td>
<td>120224.21</td>
</tr>
</tbody>
</table>

R-Square: 0.0698
Max-rescaled R-Square: 0.1441

Testing Global Null Hypothesis

<table>
<thead>
<tr>
<th>Test</th>
<th>Chi-Square</th>
<th>DF</th>
<th>Pr &gt; ChiSq</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likelihood Ratio</td>
<td>14749.9844</td>
<td>30</td>
<td>&lt;.0001</td>
</tr>
</tbody>
</table>
Post 2012 Analysis
Claimant model results: Logistic regression
Post 2012 Analysis
Regression vs Random Forest

• **Logistic Regression**
  • Powerful parametric model
  • Assumes linearity between the predictors and the logit transformed target
  • Easy to interpret
  • Limitation: Highly correlated predictor variables confound parameter interpretation

• **Random Forest Model**
  • Flexible and non-parametric in nature and therefore more able to capture non-linear structure.
  • Could be difficult to interpret
  • Able to include highly correlated variables (surgery and psychological claims)
Post 2012 Analysis
Random Forest Model – The Method

• Popular choice for classification problems
• Large number of decision trees are developed on bootstrapped resampled versions of the original dataset
• Only uses a subset of predictors at any time
• The results are averaged to get an ensemble learner. This reduces over-fitting – a potential problem with machine learning models.
• However, importantly, since the growth of ROC is relatively modest from the random forest model we retain confidence in our regression results
Post 2012 Analysis: Results

This result is an improved predictive performance and shown the ROC chart.

Additional predictive power of random forest model.
Post 2012 Analysis: Random Forest Model
Estimate of the error rate and loss reduction

Estimate of the error rate 7.8%
Analysis 3: RTW Survey 2016

- Results of Logistic regression and Random Forest Models show limited influence of claim characteristics in explaining RTW
- Key characteristics of RTW are not all captured in traditional workers compensation data
- Supplement with RTW Survey
RTW Survey 2016

• National RTW Survey 2016 for NSW- Co-ordinated by Safe Work Australia conducted by Social Research Centre April 2016
• 2 cohorts: ‘Historic Return to Work Cohort’ (10 or more days compensated) and ‘Balance Cohort’
• Eligible for the current survey_2016 Balance cohort
• The survey sample selection is based on the injured workers in NSW who:

  • had at least one day away from work
  • submitted a claim in the two years (March 2014-January 2016) prior to the interview period
  • had or did not have payment-related activity within 6 months prior to the sample being drawn, and
  • worked in either premium paying or self insurance (including the government sector)
RTW Survey: Sample selection

- 812 injured workers (66% male) selected for the sample
- Survey includes questions on:
  - claimant characteristics (Average age 45 years)
  - employer support and involvement
  - claim experience
  - medical care
  - claimant psycho-social factors
- 3 measures of RTW:
  - Any time RTW
  - RTW at the time of the Survey
  - RTW and at work for a period of 3 months
2016 RTW Survey Analysis:
Predictors not in other models but used in the Survey Model

- **Psychosocial**
  - Job satisfaction
  - Job control
  - Job demand

- **Worker Health**
  - Injured worker’s perspective of their recovery

- **Medical Care**
  - Access to a GP and medical treatment
  - Communication with GP

- **Claims Experience**
  - Open and honest processes and communication
  - Good system

- **Employer support**
  - Policies and procedures
  - Employer commitment

42 questions grouped into 5 major categories
Psychosocial factors impacting RTW: Research Findings

• Hartvigsen et al., (2004)* defined a psycho-social factor as a ‘measurement that potentially relates psychological’.

• Broader categories:
  ➢ Perception of work: job security, time pressure, Job control e.g. job demands, pace, work content, work control, work tempo, quantitative/qualitative
  ➢ Social support at work (including recognition and respect, social support, co-worker support, social relations, work relations, external relations, supervisor support)
  ➢ Stress at work (including stress, over strain, job strain, level of distress, total mental exertion)

*Occup Environ Med 2004;61:e2 (http://www.occenvmed.com/cgi/content/full/61/1/e2)
Composite Indicator Scores by category

Survey based data revealed that medical care and worker psychosocial well being as foremost contributors to return to work following an injury.

Composite Scores based on different factors

- Worker Health Index
- Psychosocial Index
- Employer Index
- Medical Index
- Claims Experience Index

Not RTW | RTW | Total
Binary Logistic Regression: Results

Results revealed that medical care, psycho-social factors and workplace environment can explain about 63% of factors conducive to return to work outcomes in NSW sample.

<table>
<thead>
<tr>
<th>Model Fit Statistics</th>
<th>Intercept Only</th>
<th>Intercept and Covariates</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIC</td>
<td>739.052</td>
<td>453.328</td>
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<tr>
<td>SC</td>
<td>743.751</td>
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<tr>
<td>-2 Log L</td>
<td>737.052</td>
<td>353.328</td>
</tr>
</tbody>
</table>

R-Square  | 0.3766       | Max-rescaled R-Square | 0.6313 |

Testing Global Null Hypothesis: BETA=0

<table>
<thead>
<tr>
<th>Test</th>
<th>Chi-Square</th>
<th>DF</th>
<th>Pr &gt; ChiSq</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likelihood Ratio</td>
<td>383.7241</td>
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<td>&lt;.0001</td>
</tr>
<tr>
<td>Score</td>
<td>428.2220</td>
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<td>&lt;.0001</td>
</tr>
<tr>
<td>Wald</td>
<td>143.6594</td>
<td>49</td>
<td>&lt;.0001</td>
</tr>
</tbody>
</table>
Model: Results and Validity

- Statistically significant results: Likelihood ratio, Score and Wald tests ($Pr < .0001$)
- Variables in the model improve the model fit: Chi-square test statistics and $p$-values ($Pr < .0001$)
- 63% of variance is explained by predictor variables
- Predictor variables influencing RTW outcomes:
  - Medical Care: Access to GP and medical care
  - Psychosocial: Job satisfaction, Job control
  - Employer Support: Fair treatment, communication, and access to information
  - Claims experience: Open and honest process, good communication
Model Results: Odds Ratios

- **b1**: Overall health rating
- **b3**: Are you recovered as much as you are going to?
- **g1a**: The work you are doing is important to you
- **g1e**: The work you are doing is valued by others at work
- **g3a**: Feel you are part of a community at work
- **g1d**: Your opinions and suggestions are considered at work
- **g2b**: Your skills and abilities are used appropriately
- **g2d**: You are physically capable of doing your job
- **g3b**: Employees and management are generally supportive
- **l3b**: Employer provided enough information
- **l3d**: Employer helped you with your recovery
- **g3c**: Your supervisor is committed to workplace safety
- **n9a**: You were able to easily get an appointment with a GP
- **n9c**: Did the GP contact your employer about you?
- **n9e**: You had confidence in the GP you were speaking with
- **n9g**: GP issued medical certificates that stated when you could return to work
- **n9i**: GP explained to you the physical benefits of RTW ASAP
- **n10a**: Able to easily access medical treatment
- **n10c**: Medical treatment helped you recover
- **l1b**: Good communication between various people I dealt with
- **l1d**: I believe the system treated me fairly
- **pc**: Has a previous claim or not?
- **mpsize**: Employer size
- **rehab**: Rehab payments
- **delay**: Delay in reporting

![Odds Ratios with 95% Wald Confidence Limits](image)
RTW Survey Data: Model Performance

Claimant Survey Logistic regression; Significant performance (92%) of the data model
# Summary of Findings

## Post 2012 claimant model and 2016 Survey Model

<table>
<thead>
<tr>
<th>Post 2012 Claimant Model</th>
<th>RTW 2016 Survey Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large dataset: Claimant details from Claims Database 209,128 Claims</td>
<td>Sample Survey: Injured worker 812 Injured workers</td>
</tr>
<tr>
<td>Ability to merge payment transactional data to RTW outcome variable</td>
<td>Ability to look into data not available through claims data</td>
</tr>
</tbody>
</table>

### Static Variables:
- Age, Nature, body location, Gender, Occupation, NESB, Wage rate, hours worked, employer size, Psych injury,
- Dynamic variables:
  - Rehab involvement
  - Legal cost
  - Medical payments
  - Surgical involvement

### Findings:
- Variables influencing RTW outcomes:
  - Psych injury
  - Nature of injury
  - Body location
  - Workplace rehabilitation

<table>
<thead>
<tr>
<th>Survey questions grouped under 5 broader categories:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- IW Health</td>
</tr>
<tr>
<td>- Medical care</td>
</tr>
<tr>
<td>- Psychosocial</td>
</tr>
<tr>
<td>- Claims experience</td>
</tr>
<tr>
<td>- Employer involvement and support</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Findings:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variables influencing RTW outcomes:</td>
</tr>
<tr>
<td>- Medical care- access to GP, medical treatment</td>
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<tr>
<td>- Psychosocial- Job satisfaction, job demand</td>
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<tr>
<td>- Employer support-commitment, support</td>
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<td>- Claims experience- Open/honest process, Good communication</td>
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Conclusions

Multifactorial nature of predictors of RTW

- Claim and claimant characteristics available in traditional workers compensation statistics explain only small proportion of variance in the data.
- Psychological injury and workplace rehabilitation explain variance from claimant models.
- Medical Care and Psychosocial factors explain a large variance from survey data.
- Employer support and claim experience also significantly associated with RTW outcomes.
- Data for some other factors are not currently available.
- Data items required to measure RTW outcomes need to be reviewed and multiple methods of collections need to be explored.
- Need more in-depth analysis using advanced analytical methods.
Interventions

• **Medical Care - Access to GP**: GP capability building strategy

• **Psychosocial - Job Satisfaction**: Working with Safework NSW on the Mentally Healthy Workplace Strategy

• **Employer support**: Building employer capability by identifying employers (small and large) that require assistance and tailoring interventions to suit their needs, developing online training modules for RTW Coordinators

• **Psychological injury**: Developing a Psychological injury strategy

• **Workplace rehabilitation**: Reviewing the regulatory approach to achieve improved RTW outcomes without a significant cost burden

• **Claims Handling**: Audit program, developing new Claims Handling Guidelines, undertaking co-design strategies with insurers to address claims hot spots
Data, Digital and Analytics

• **New BI tools and Dashboards on RTW** to monitor and act on Performance

• **Project on “Measure Well”:**
  - Develop Systematic measurement of RTW outcomes, health outcomes and claimant experience in NSW to understand the impacts of policy levers, of reforms and regulatory activity
  - Robust multi-layered measures of RTW, health and experience

• **Deploy Machine Learning Models to supplement statistical models**

• **Analytics on relative performance of providers for benchmarking**
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