

# **Analysis of Accident Severity Factors in Drilling Rigs and Recommended Controls**

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# Outline

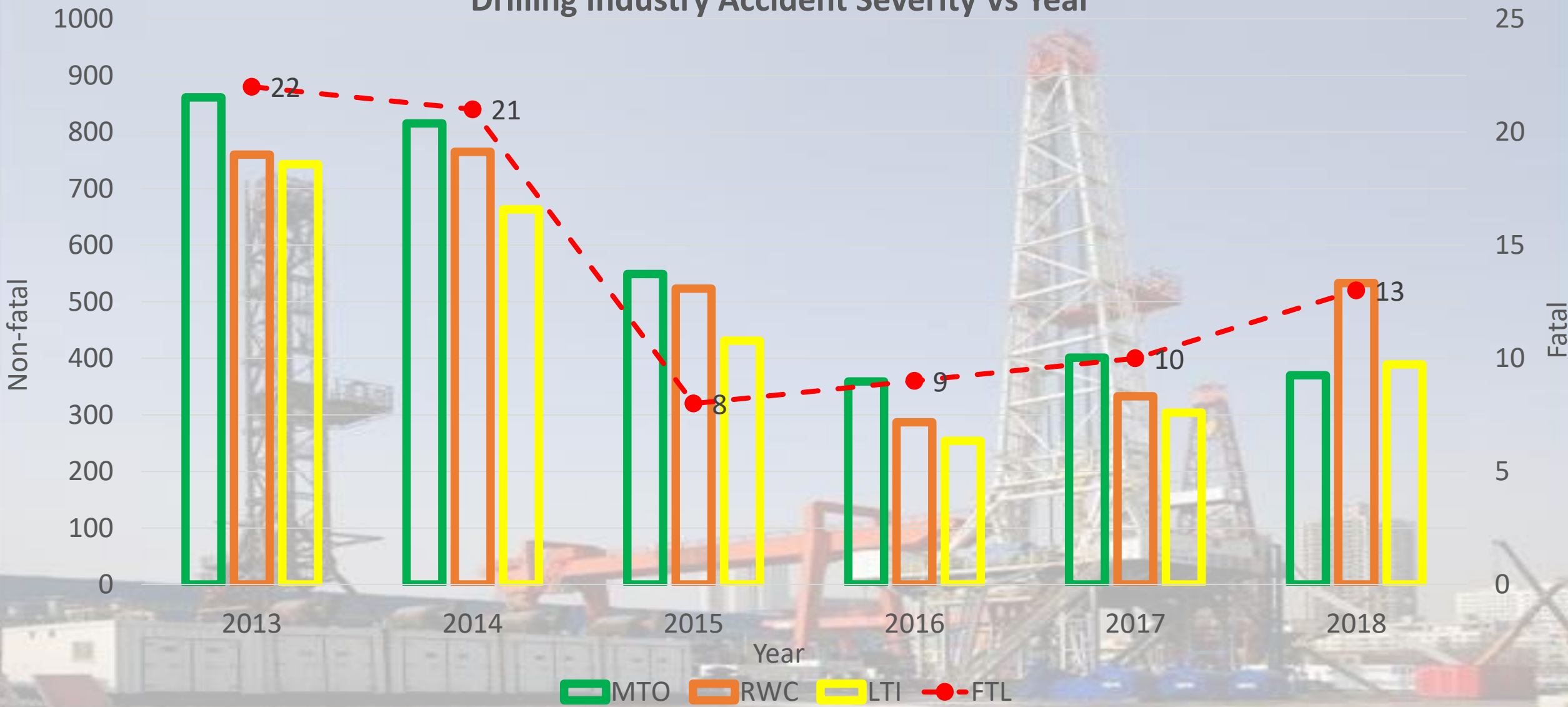
The background image shows an industrial drilling or mining site. Several workers in blue uniforms and hard hats are visible, some operating large machinery. The scene is somewhat hazy, suggesting an outdoor or semi-enclosed industrial environment. The machinery includes a large vertical drill bit or tool joint, various pipes, and structural supports. The overall tone is industrial and technical.

- Introduction
- Objectives
- Findings
- Recommendations

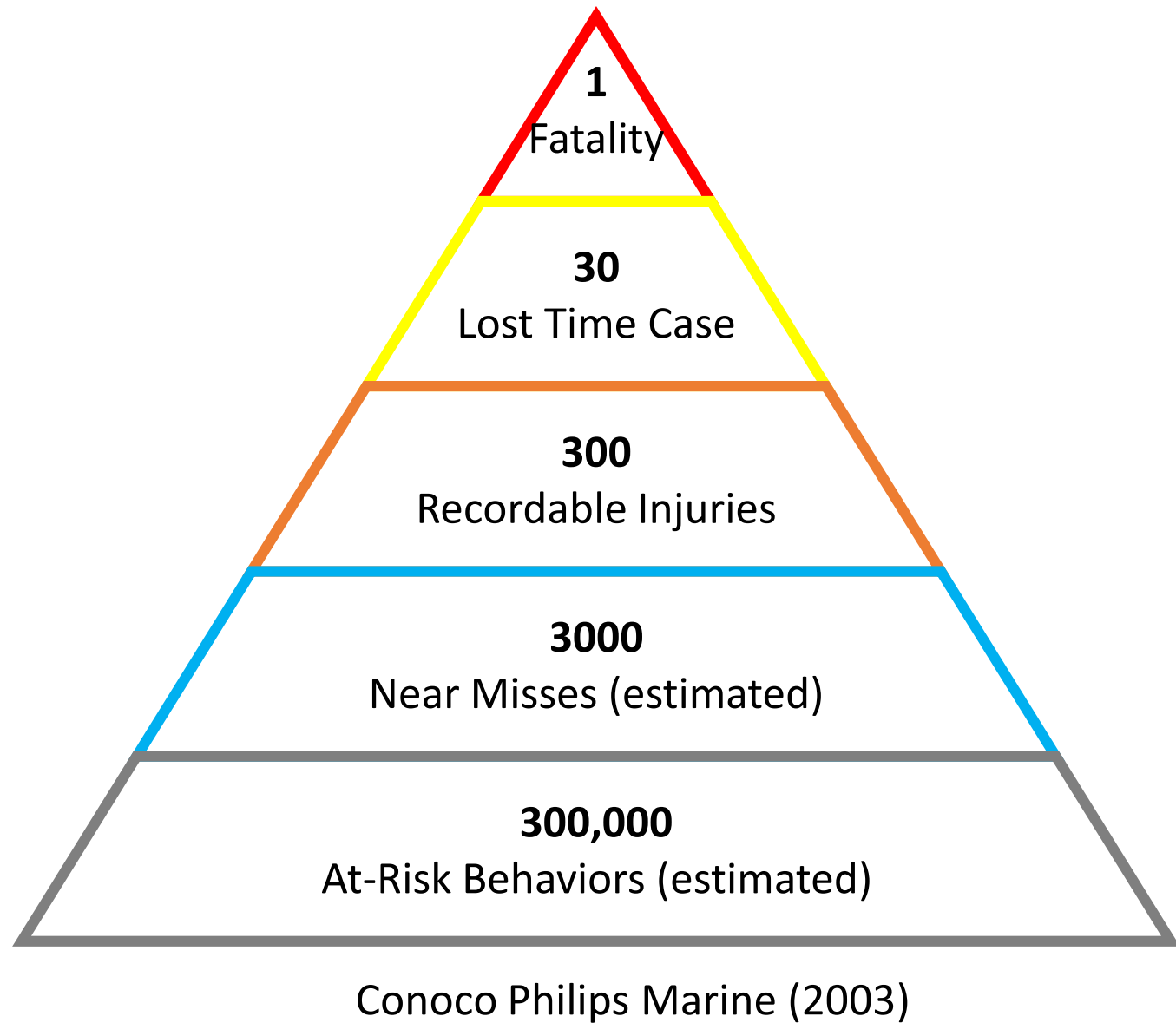
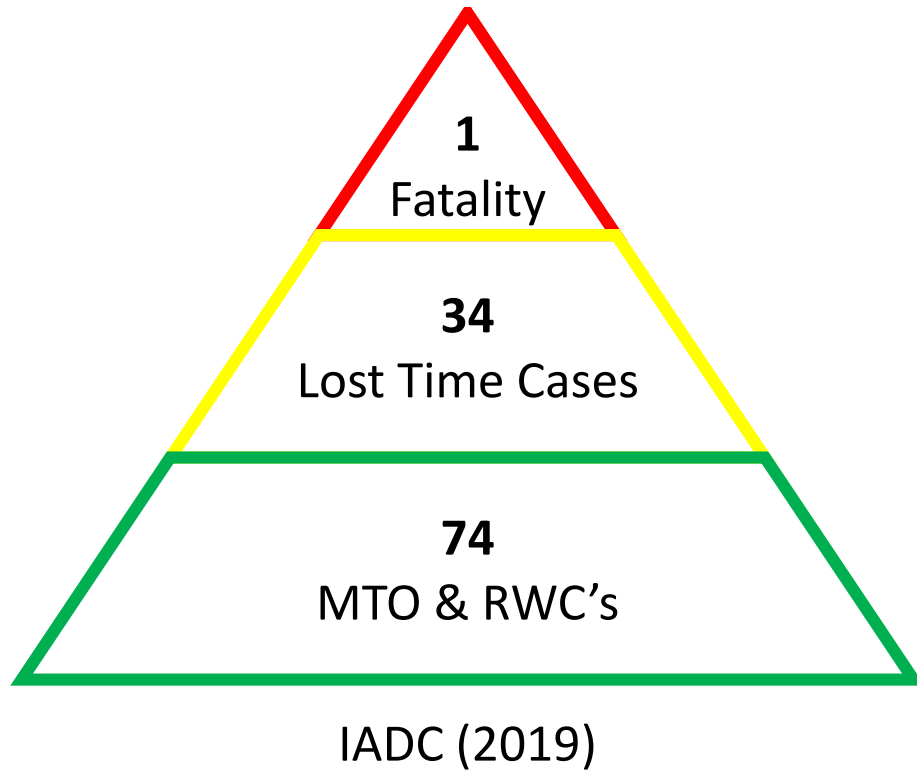
# Introduction

## Drilling Industry Accident Severity Vs Year

n=9423



# Introduction

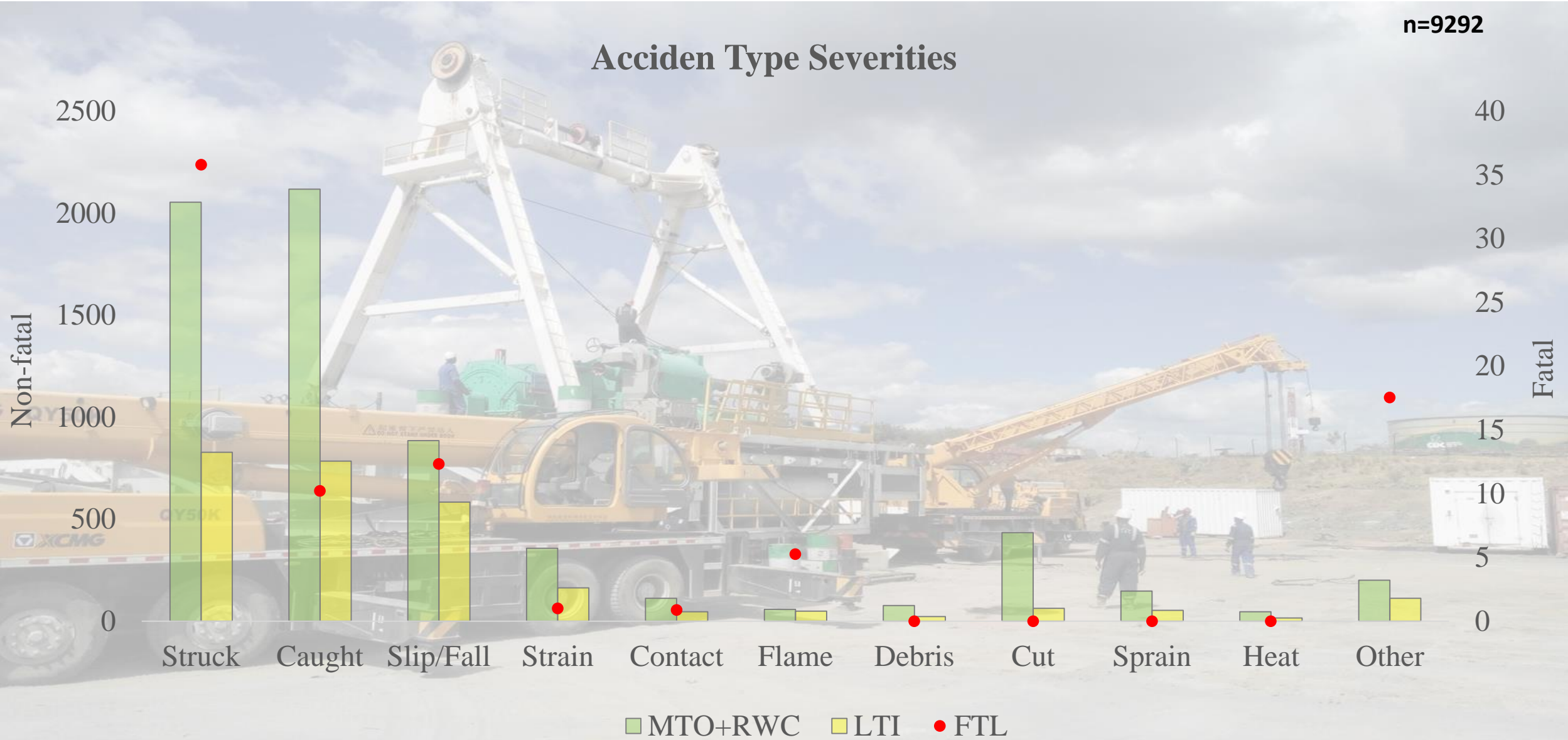


# Objectives

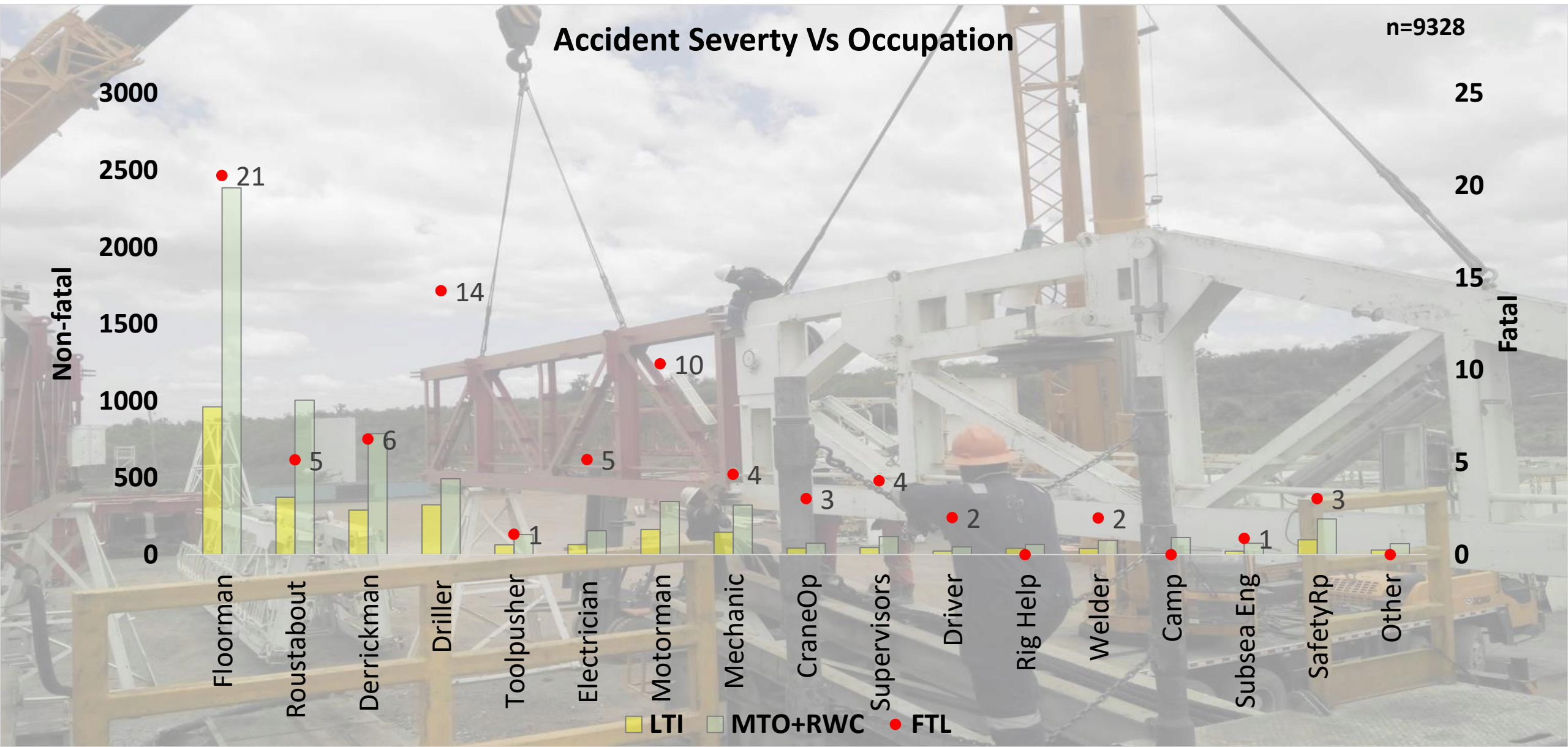
| No | Variable        | Categories  |   |   |
|----|-----------------|---|---|---|
| 1. | Accident Type   | i. Stuck by/Against<br>ii. Caught on/between<br>iii. Shock<br>iv. Slip/Fall | v. Strain<br>vi. Contact<br>vii. Heat                 | viii. Vehicle<br>ix. Gas<br>x. Other              |
| 2. | Occupation      | i. Floorman<br>ii. Roustabout<br>iii. Derrickman<br>iv. Toolpusher          | iv. Motorman<br>v. Crane Operator<br>vi. Truck Driver | vii. Welder<br>viii. Subsea Engineer<br>ix. Other |
| 3. | Activity        | i. Routine drilling<br>ii. Cementing<br>iii. Material handling              | iv. Maintenance<br>v. Well control<br>vi. Transport   | vii. Mud mixing<br>viii. Other                    |
| 4. | Time in Service | i. < 3 Months<br>ii. > 3 Months < 6 Months                                  | iii. > 6 Months < 1 Year<br>iv. > 1 Year < 5 Years    | v. >5 Years < 10 Years<br>vi. > 10 Years          |

- Chi-squared and Cramer's V

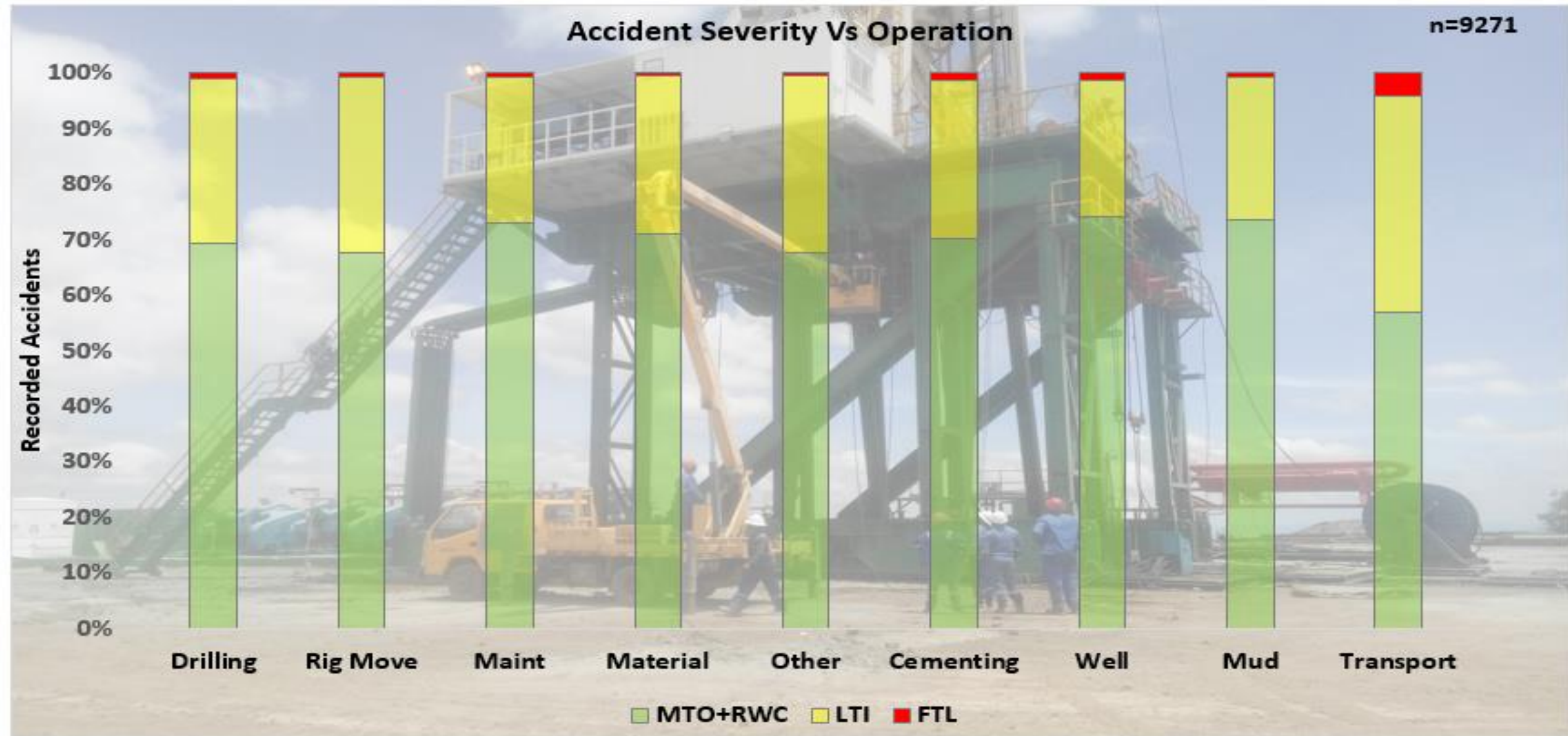
# Findings – Injury Type



# Findings – Occupation

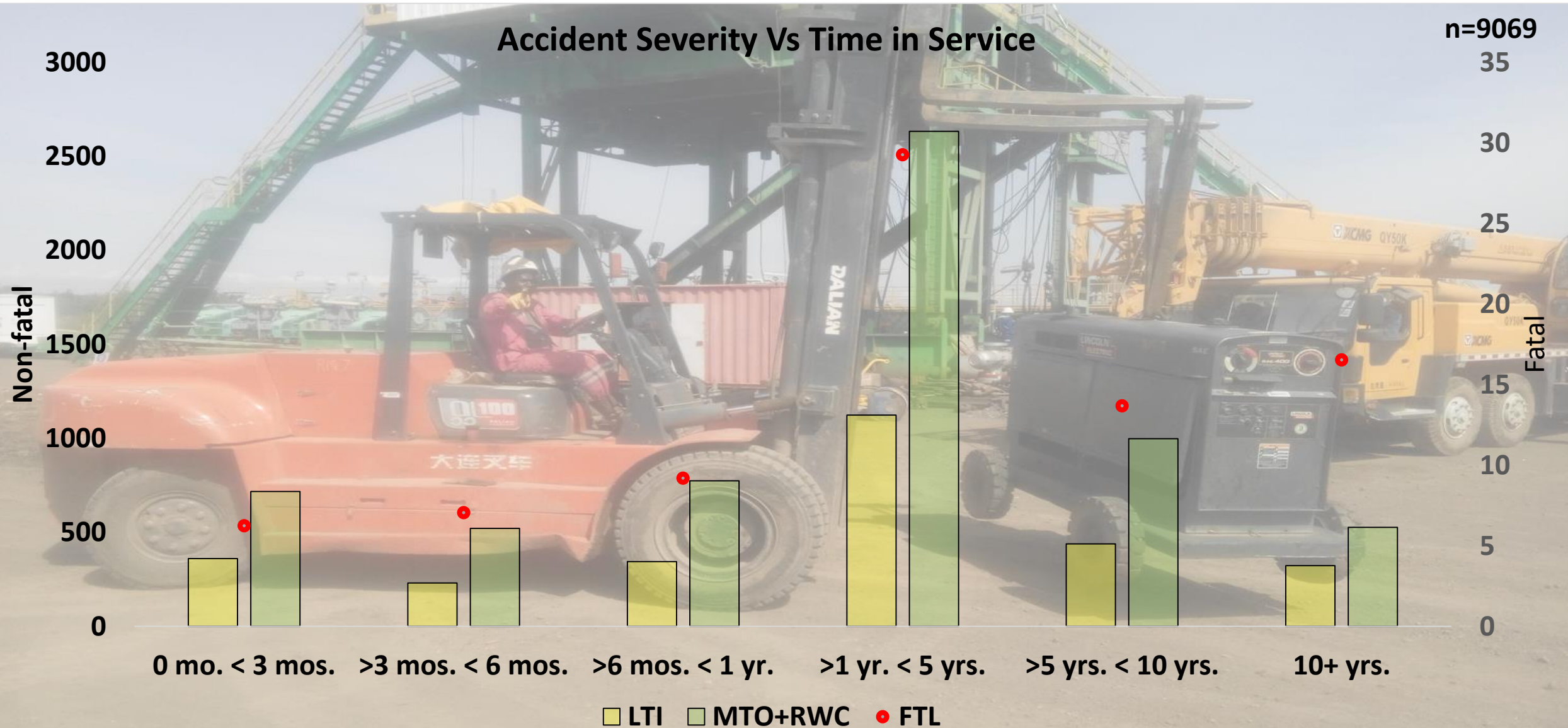


# Findings – Operation





# Findings – Time in Service



# Statistical Test Results

| Variable             | Association      | Interpretation  |
|----------------------|------------------|---|
| <b>Accident Type</b> | <b>Weak</b>      | <ul style="list-style-type: none"><li>▪ Zero fatalities in 1/3 injury types</li><li>▪ Varying fatalities in other types of accidents</li></ul>  |
| <b>Occupation</b>    | <b>Weak</b>      | <ul style="list-style-type: none"><li>▪ Zero fatalities in 3/8 occupation types</li><li>▪ Incident severity not solely a function of occupation type.</li></ul>   |
| <b>Operation</b>     | <b>Very Weak</b> | <ul style="list-style-type: none"><li>▪ All operations average MTO:LTI:FTL ratio of 0.70:0.29:0.01</li><li>▪ Control measures that address specific hazards unique to different operations are required</li></ul>   |
| <b>Service Time</b>  | <b>Very Weak</b> | <ul style="list-style-type: none"><li>▪ All experiences considered average MTO:LTI:FTL ratio of 0.67:0.32:0.01</li><li>▪ Both experienced and inexperienced staff at risk pf suffering severe injury</li><li>▪ Experienced personnel stuck to using unsafe procedures form the start can be caught up with fatal accidents in later years of work</li></ul> |

# Recommendations

| ENGINEERING                     | ADMINISTRATIVE                           | PPE                    |
|---------------------------------|--|------------------------|
| Emergency stop controls         | Conspicuous mark restricted access zones | Fall arrest system     |
| Mechanical & proximity barriers | Job specific risk assessments            | Respiratory protection |
| Audio visual alarms             | Safe work procedures                     |                        |
| Equipment layout                | LOTO & PTW                               |                        |
| Support stands and whip checks  | Mark remotely operated equipment         |                        |
|                                 | Restricted access procedures             |                        |
|                                 | Trained and competent staff              |                        |
|                                 | Stop work authority procedure            |                        |
|                                 | Equipment manuals                        |                        |
|                                 | Pre use inspections                      |                        |
|                                 | Behavior based safety                    |                        |
|                                 | Emergency rescue procedures              |                        |

