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Understanding clinician EHR data quality to determine reuse in predictive modelling

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Objectives

To assess the consistency of chiropractors' data entry, to determine fitness for use in ML.

Secondly, to engage senior clinicians in the findings, to address sources of inconsistency and suggest improvements.

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The EHR datasource

Structured EHR

Highly structured and high amount of mandatory fields

Clinicians

1 organisation
61 Chiropractors, Physiotherapists and Osteopaths

7yrs

Data collection
2014-2021

57570

Patient care plans

Value based care

Focus on measuring outcomes

Client/Clinician Reporting

Reporting on health trends and outcomes

The data analysis

Variable Selection

Literature review
Used past ML model variables

Clinician Consulting

Consultation with senior clinicians to inform analysis and determine areas for improvement

Data analysis

Missingess
Distribution comparisons and outlier analysis
Alignment to local knowledge

Findings

15921 records

Missingness

All mandatory fields were missing <0.01

Non mandatory field completion depends on perceived value

Findings

15921 records

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Findings

15921 records

Missingness

All mandatory fields were missing <0.01

Non mandatory field completion depends on perceived value

Plausibility comparisons

Dependent on clarity of field definitions, clinician training and clinician skills

Alignment

Less alignment on patient interview questions and those seen as unimportant for reporting/decision making

Improvement Suggestions

Update to gold standards, standardisation of questions, definitions and clinician training

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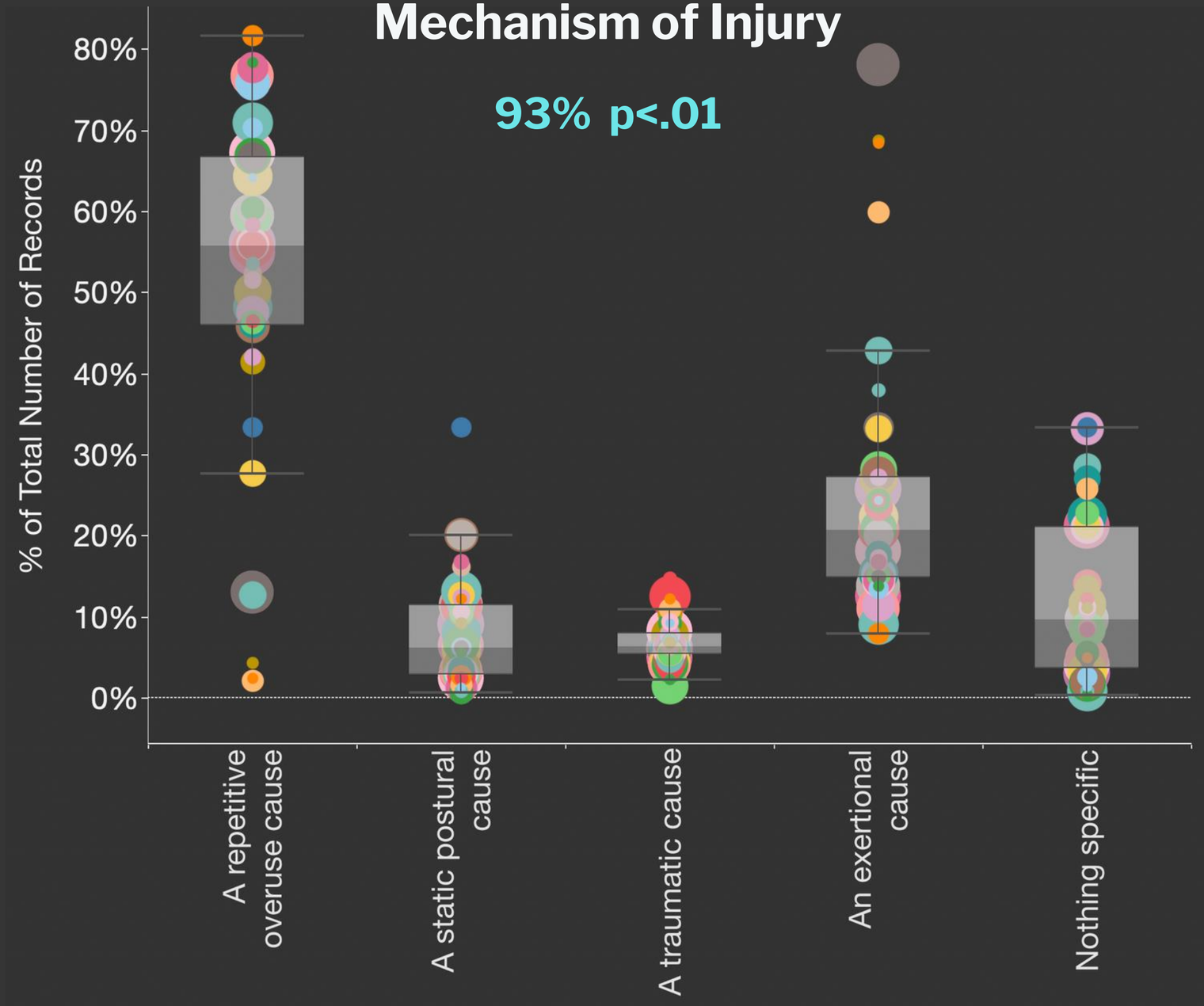
Clinician Data Variation



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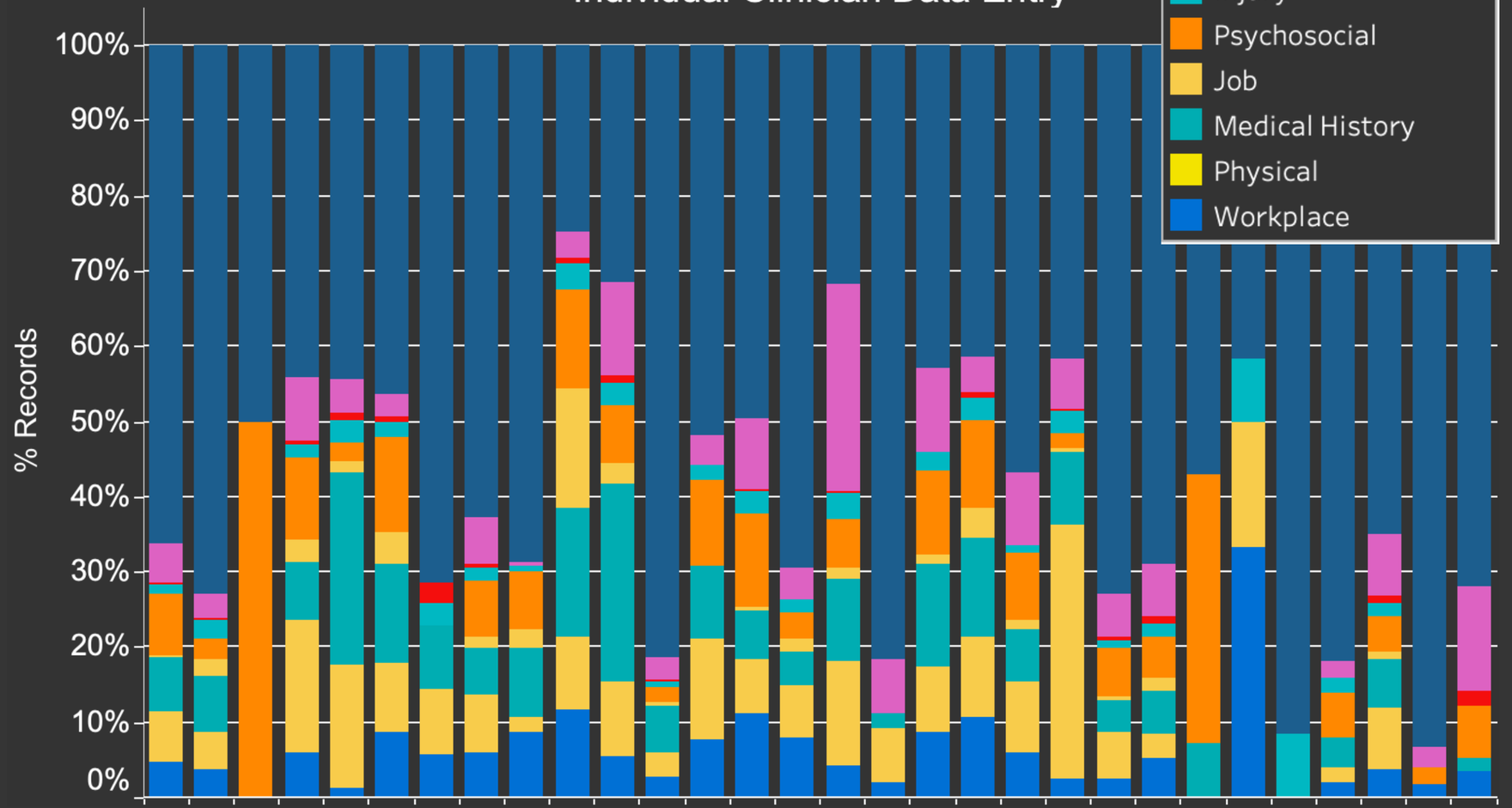
Clinician Data Variation

Obstacles to recovery

Individual Clinician Data Entry



Columns = individual clinicians, color = category of obstacle
70% practitioner p values <.01

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Conclusions

Statistically relevant for reuse vs clinically trusted for reuse.

Clinicians are EHR user subject matter experts - involve them to achieve better analysis

Take aways

The more governance, the more focus

Clinical outcomes improvement is more exciting that 'data quality analysis project'

How can we make this valuable for the clinician right now?

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Thank you

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