SOFTWARE ENGINEERING SECURITY EFFECTIVENESS

SEAN SCOTT & JOHN BENNINGHOFF

ENTERPRISE ENGINEERING

SECURITY ENGINEERING

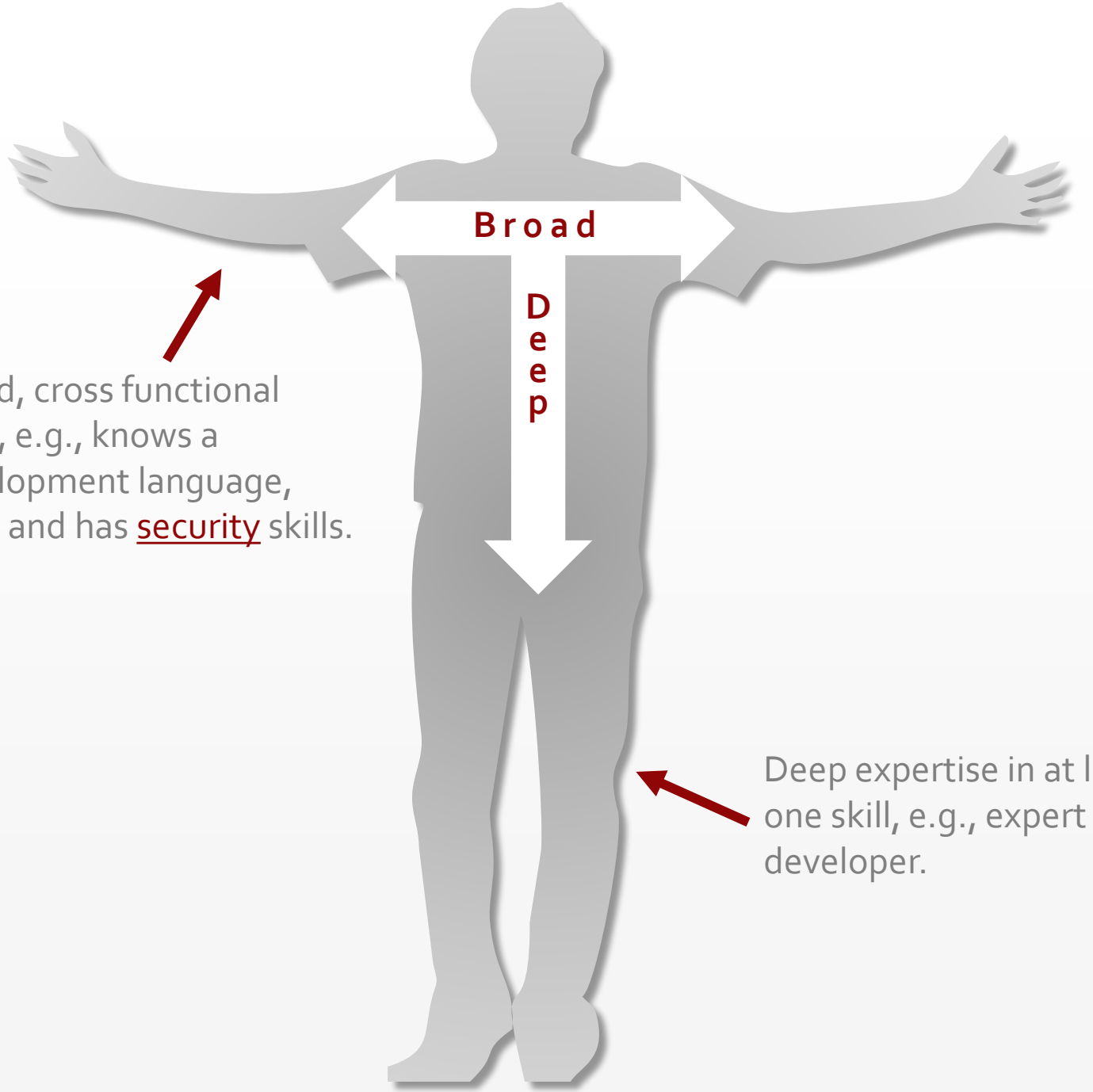
SOFTWARE ENGINEERING SECURITY

Patterns & Practices

Secure Testing

Security Engineering

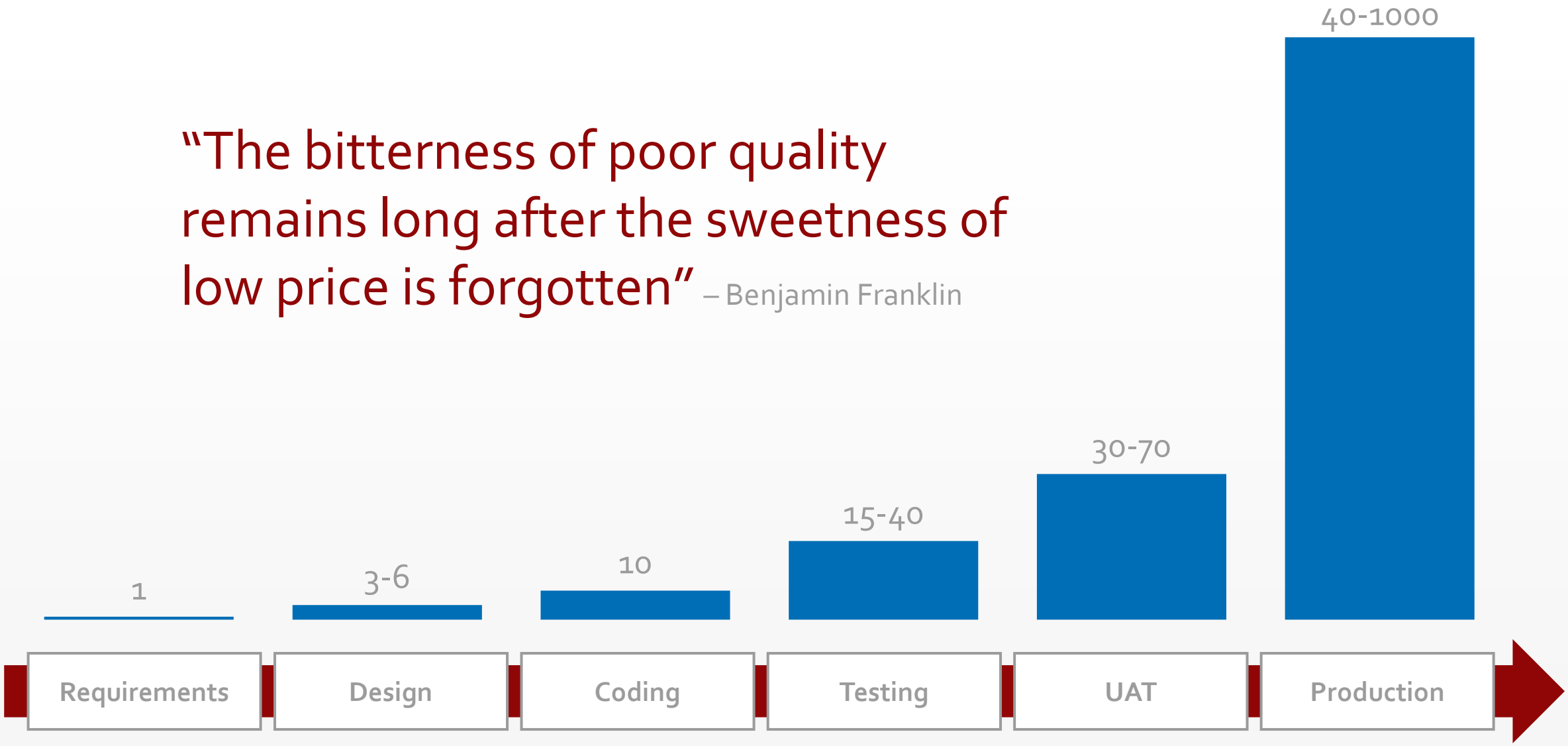
"T"-TYPE TEAM MEMBERS



Broad, cross functional skills, e.g., knows a development language, SQL, and has security skills.

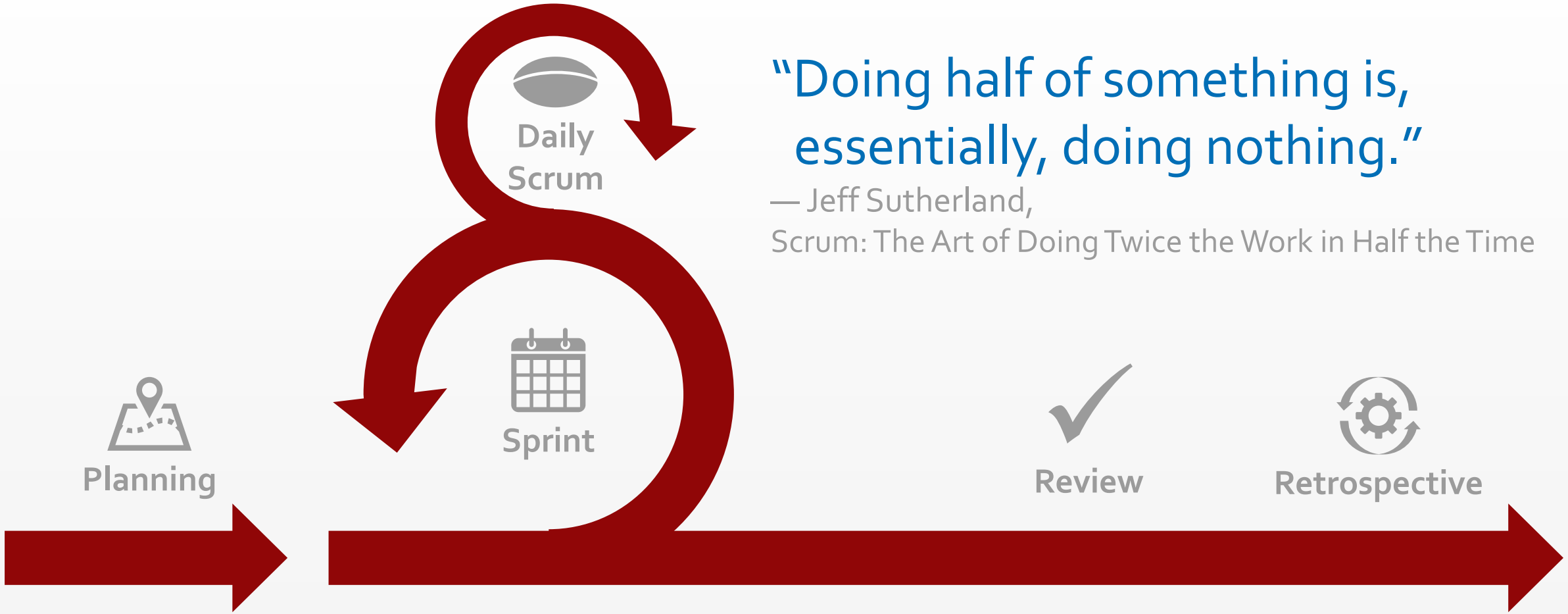
Deep expertise in at least one skill, e.g., expert level developer.

"The bitterness of poor quality remains long after the sweetness of low price is forgotten" – Benjamin Franklin



Relative cost to fix bugs found throughout the SDLC

SCRUM EVENTS



"Doing half of something is, essentially, doing nothing."

— Jeff Sutherland,
Scrum: The Art of Doing Twice the Work in Half the Time

There is no wrong time to ask,

"How will that affect security?"

—Sean Scott

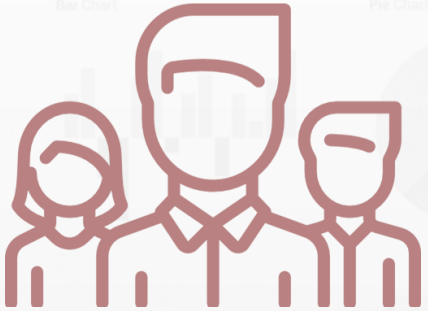
HOW WELL ARE WE DOING?

NULL HYPOTHESIS

The exposure to the training, coaching, and consulting services offered by the Software Engineering Security (SES) group DOES NOT influence the quality of code installed into a production environment, as measured by application security penetration testing.

STUDY DETAILS

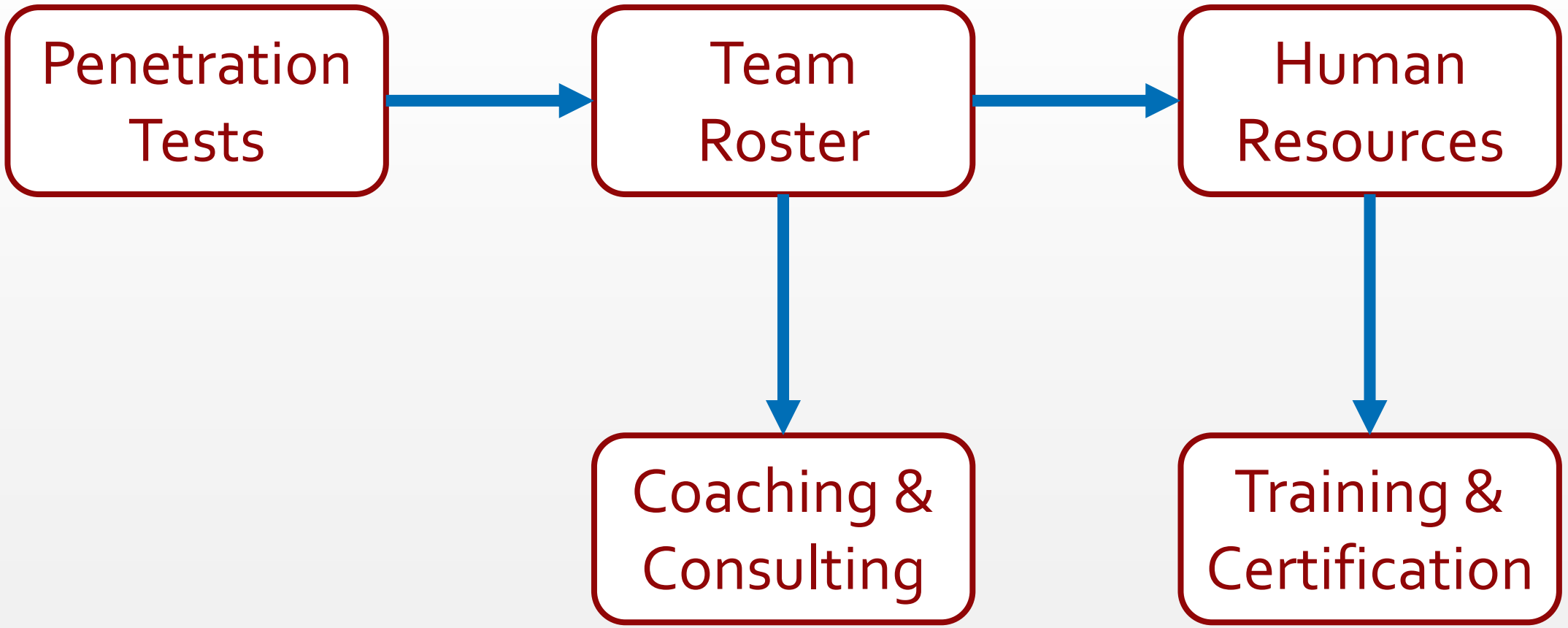
retrospective comparison



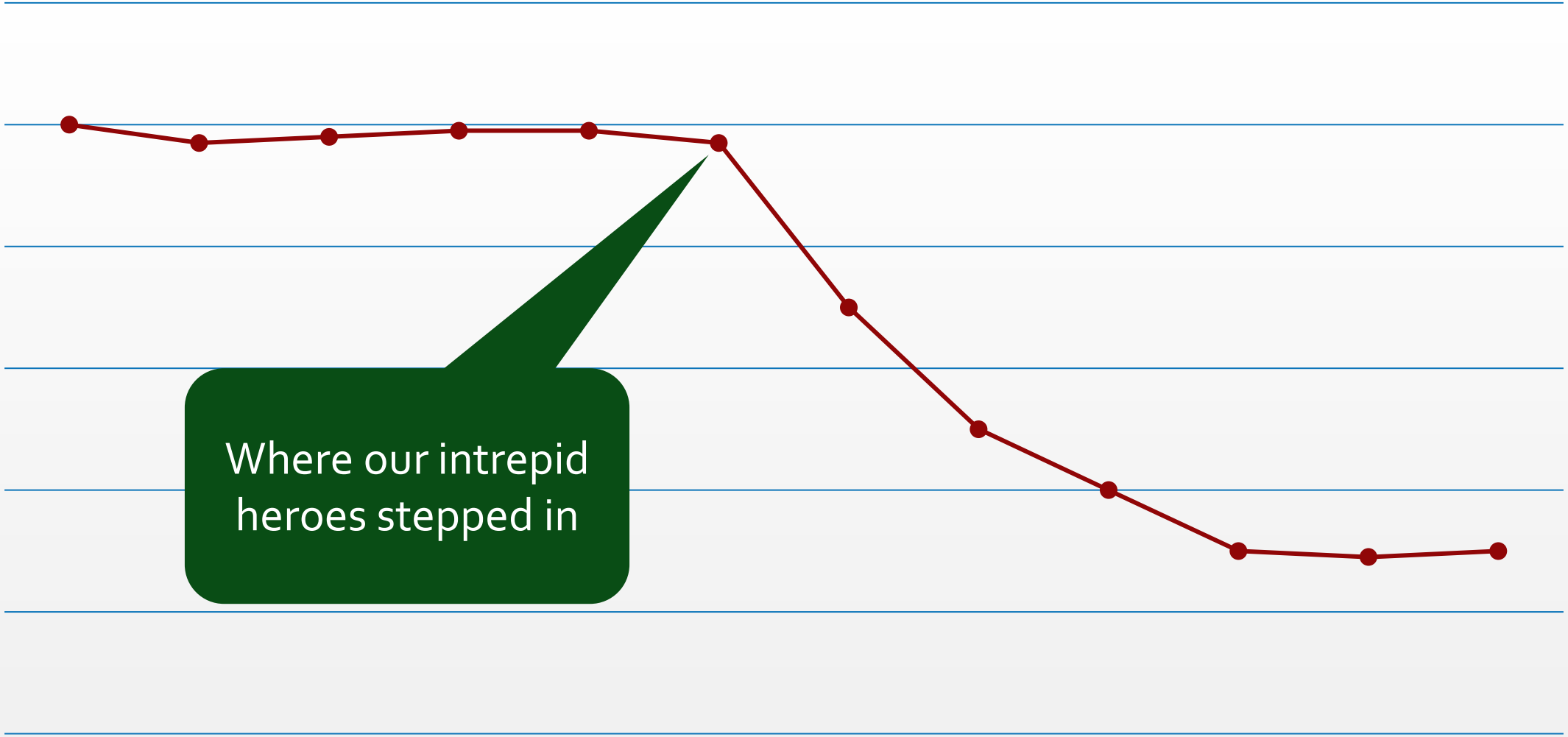
460 Teams

32 months

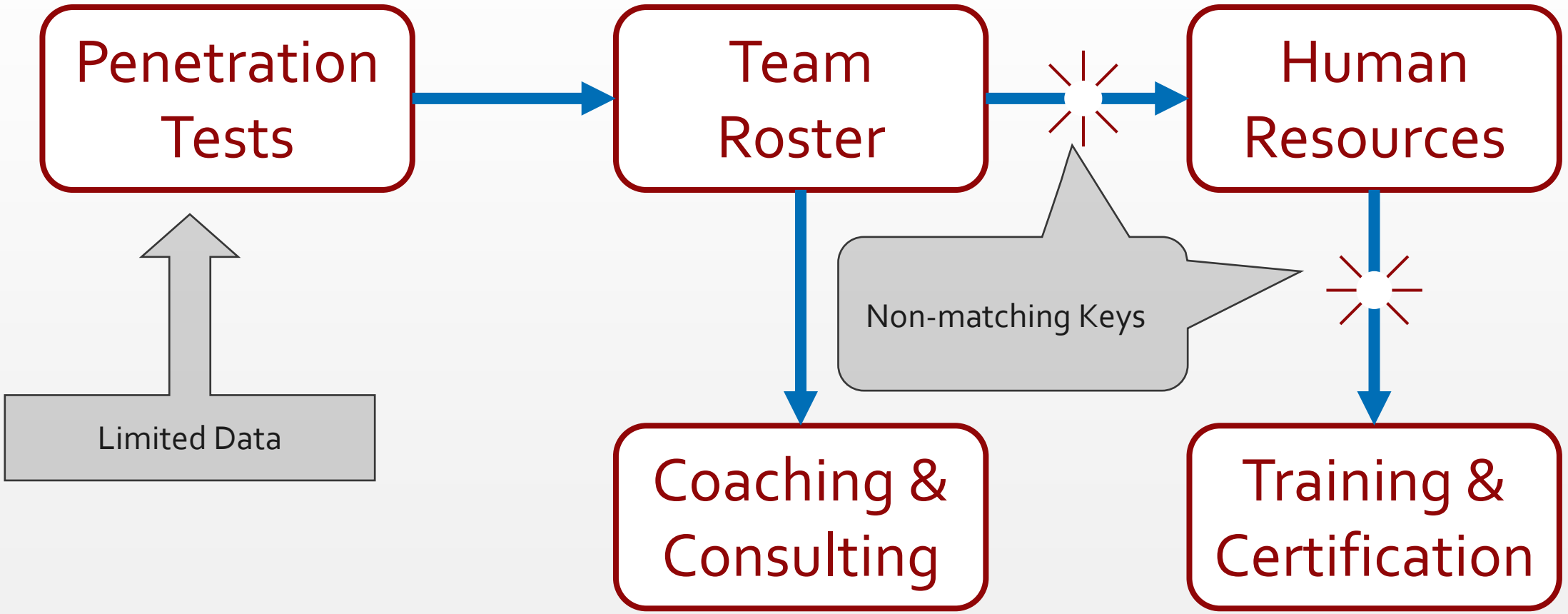
EXPECTED DATA ORGANIZATION



WHAT WE HOPED TO FIND

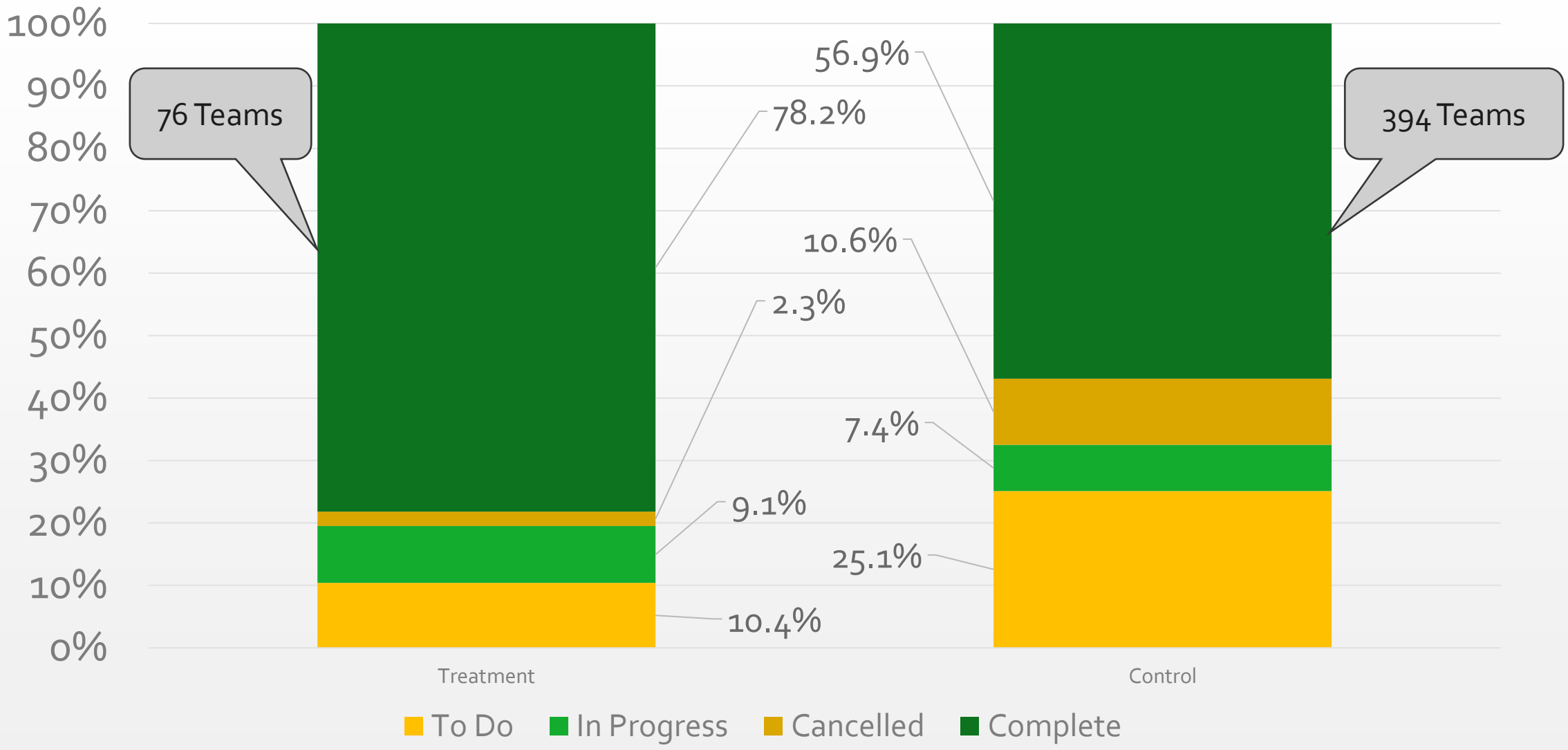


ACTUAL DATA ORGANIZATION

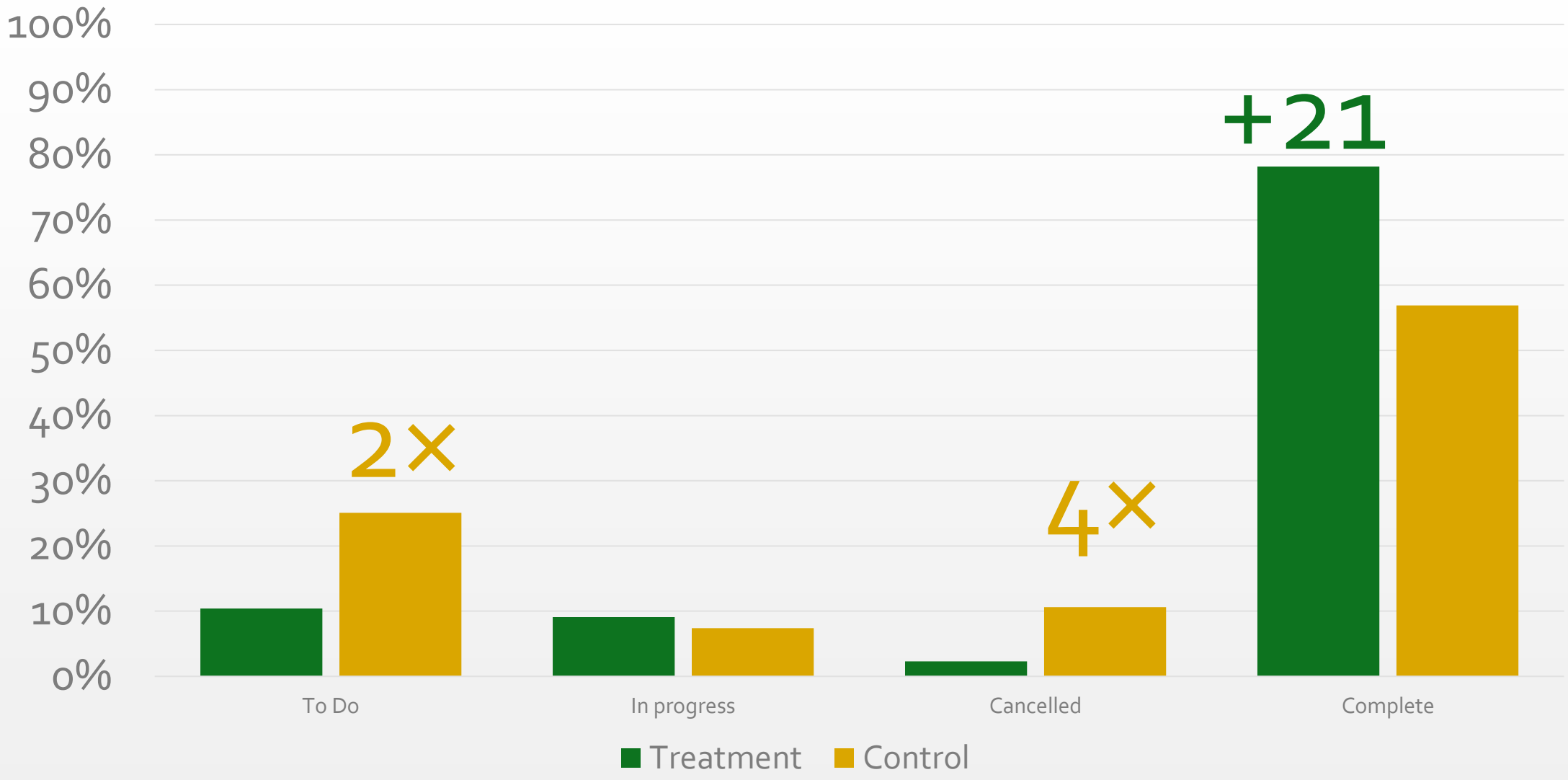


What can the data we have tell us?

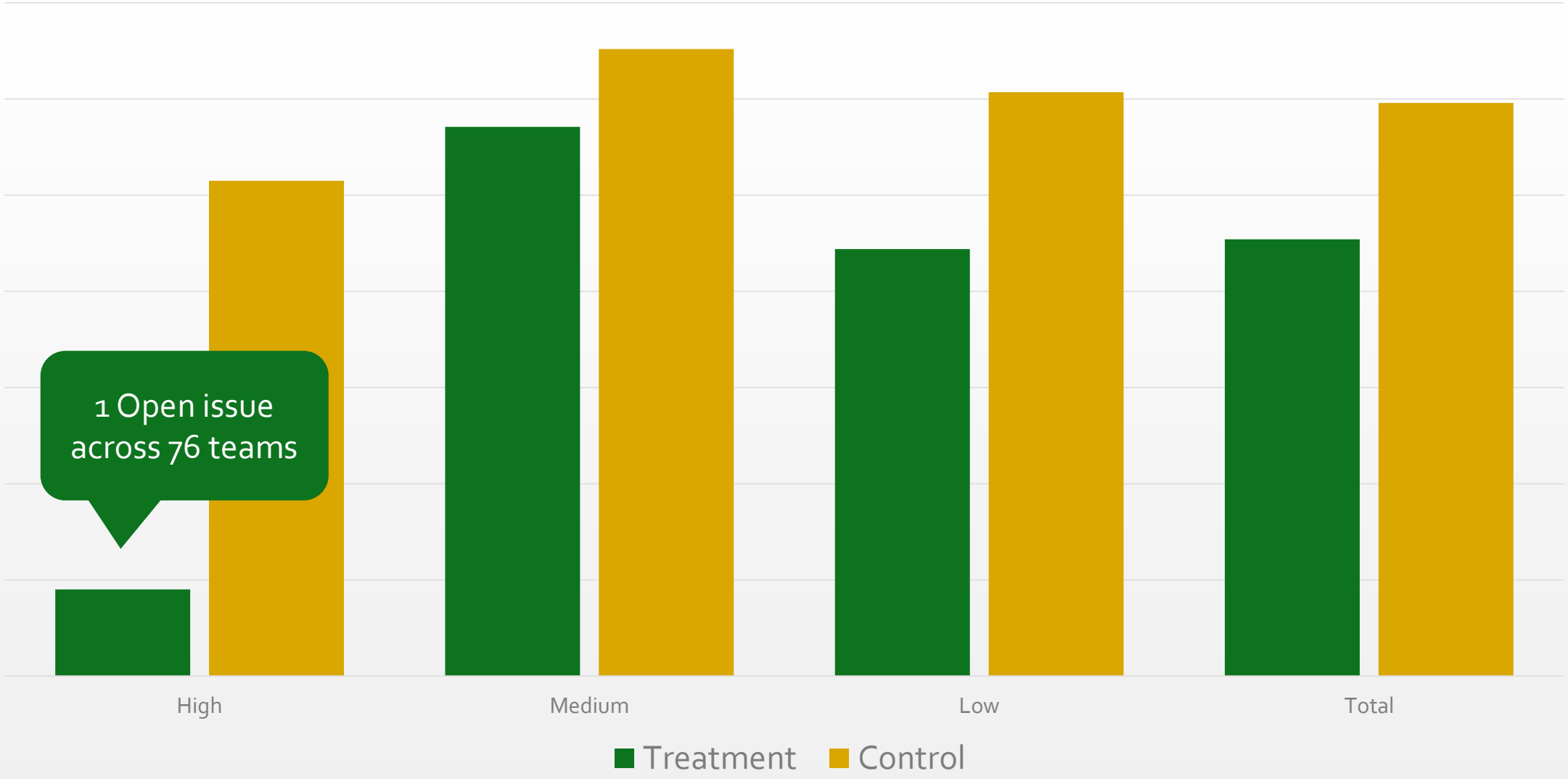
ISSUES BY GROUP



ISSUES BY GROUP—FLIPPED

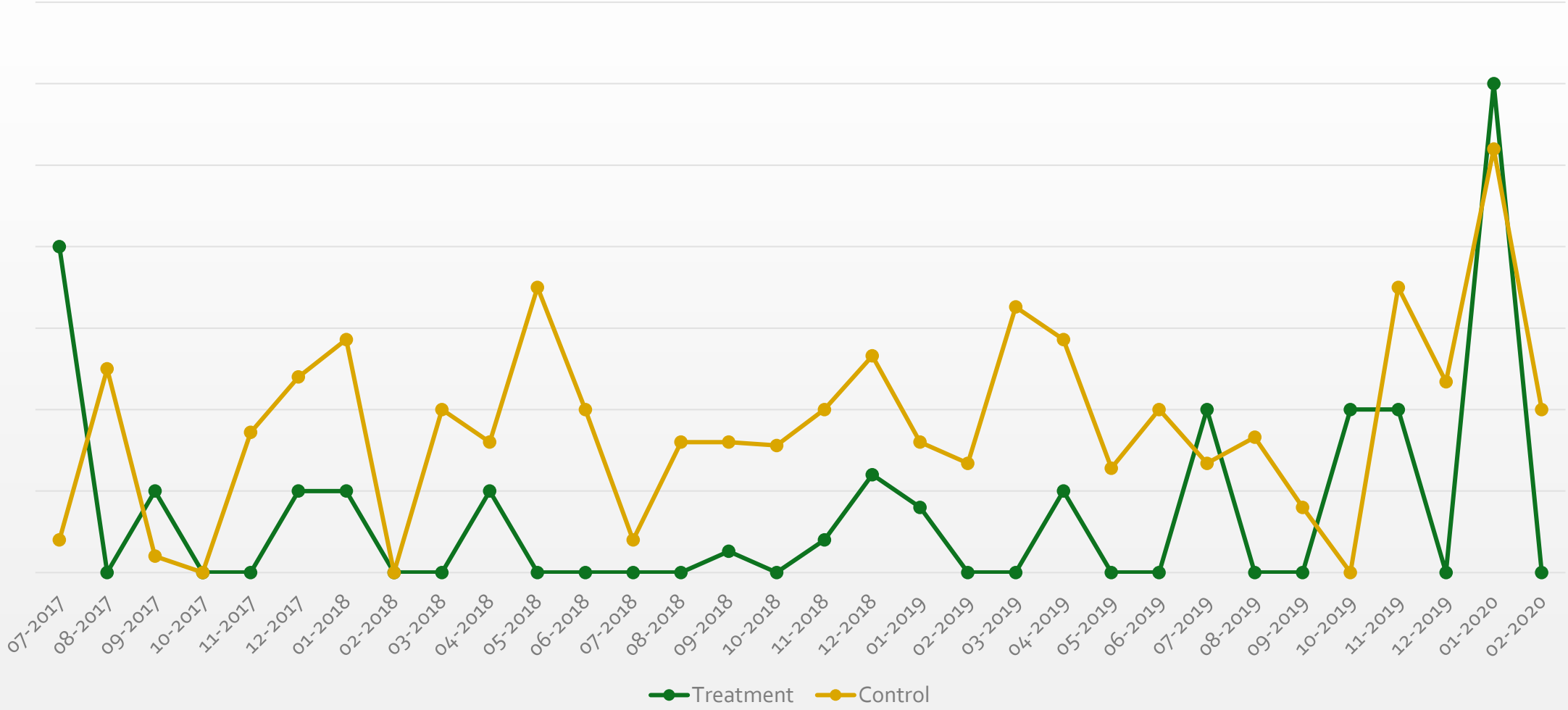


AGING BY SEVERITY IN DAYS

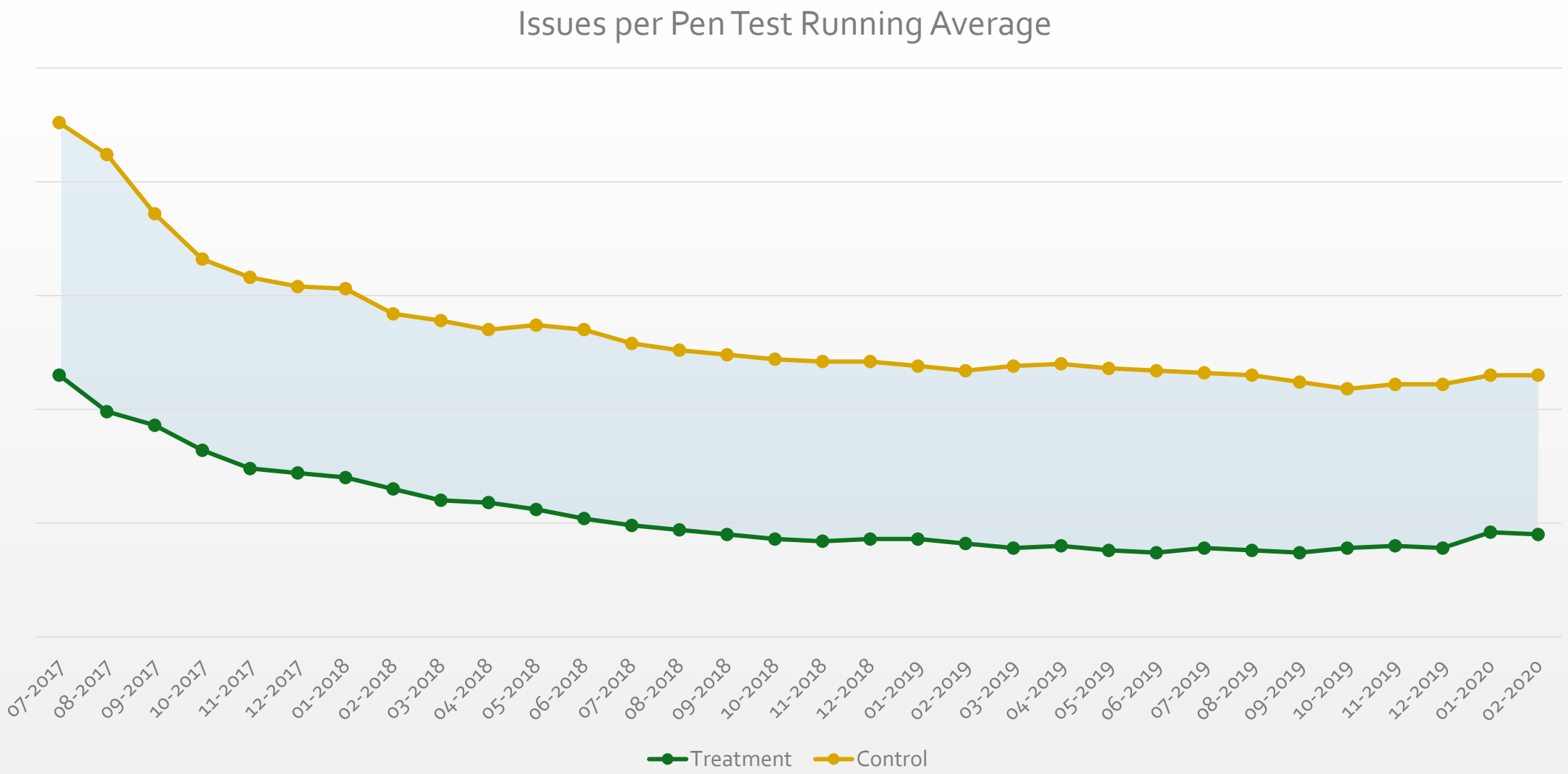


HIGH-RISK ISSUES OVER TIME

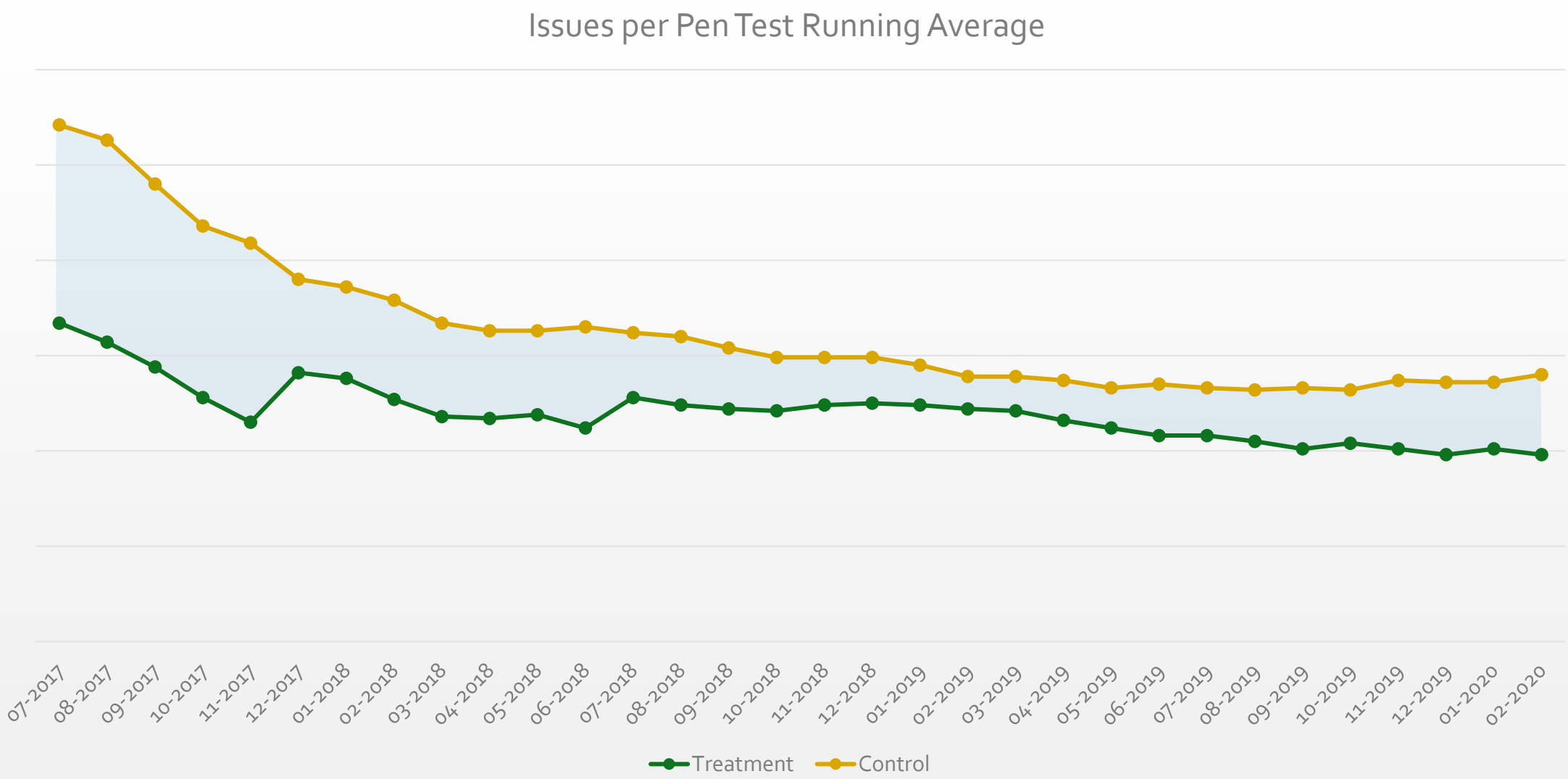
Issues found per penetration test



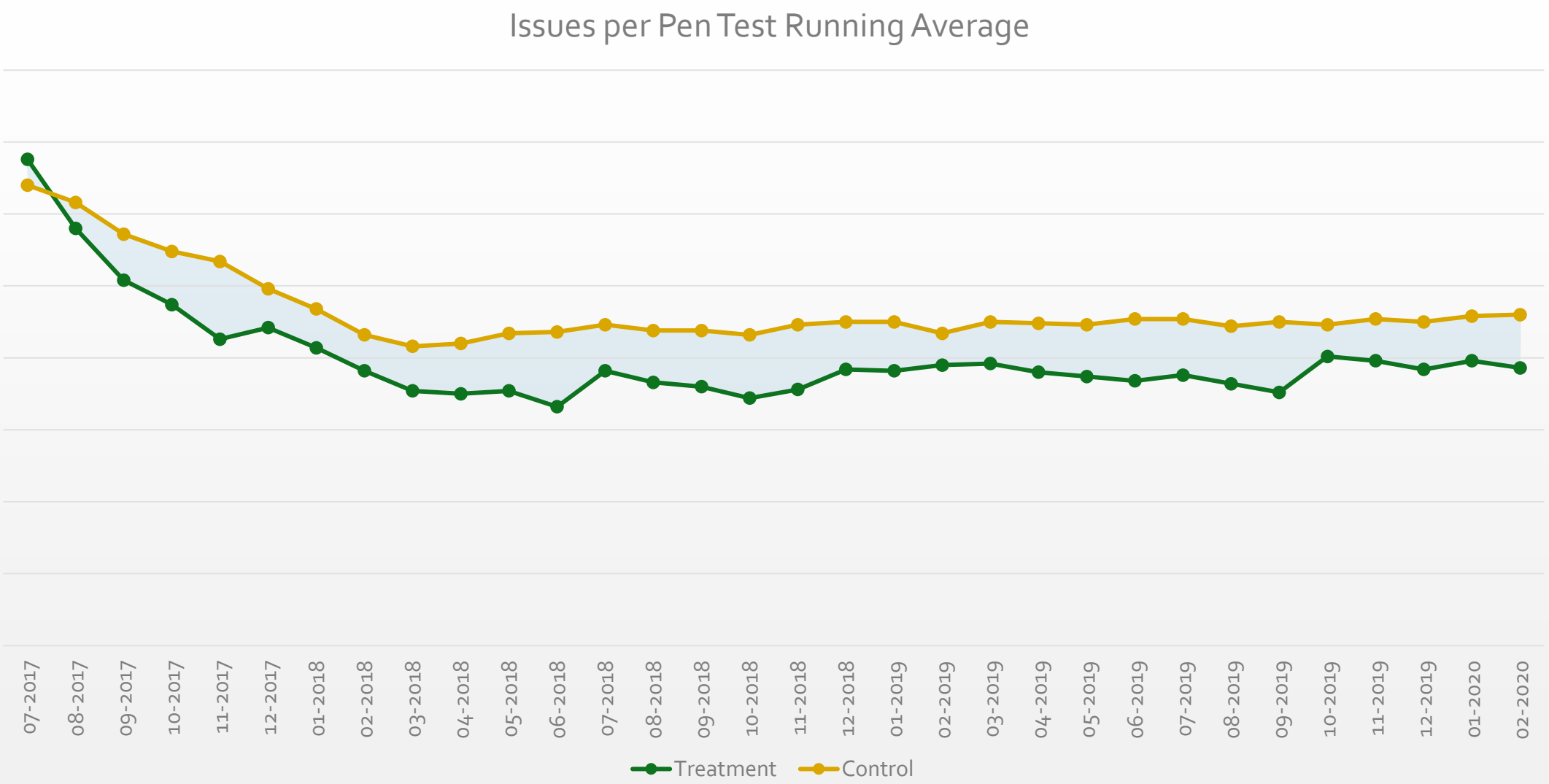
HIGH-RISK ISSUES OVER TIME



MEDIUM-RISK ISSUES OVER TIME



LOW-RISK ISSUES OVER TIME



TREATMENTS

Requirements

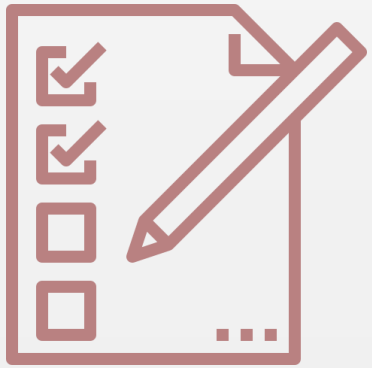
Risk Analysis

Static Scanning

Code Review

Dynamic Scanning

Training and coaching on OWASP Proactive Controls and Risks



TREATMENTS

Requirements

Risk Analysis

Understanding potential problems prior to coding

Static Scanning

Code Review

Dynamic Scanning

TREATMENTS

Requirements

Risk Analysis

Static Scanning

Breaking builds on high was the key to reducing Pen Test findings

Code Review

Dynamic Scanning

TREATMENTS

Requirements

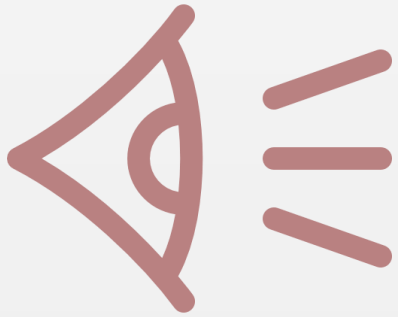
Risk Analysis

Static Scanning

Code Review

Dynamic Scanning

Extra layer of defense and an effective training opportunity



TREATMENTS

Requirements

Risk Analysis

Static Scanning

Code Review

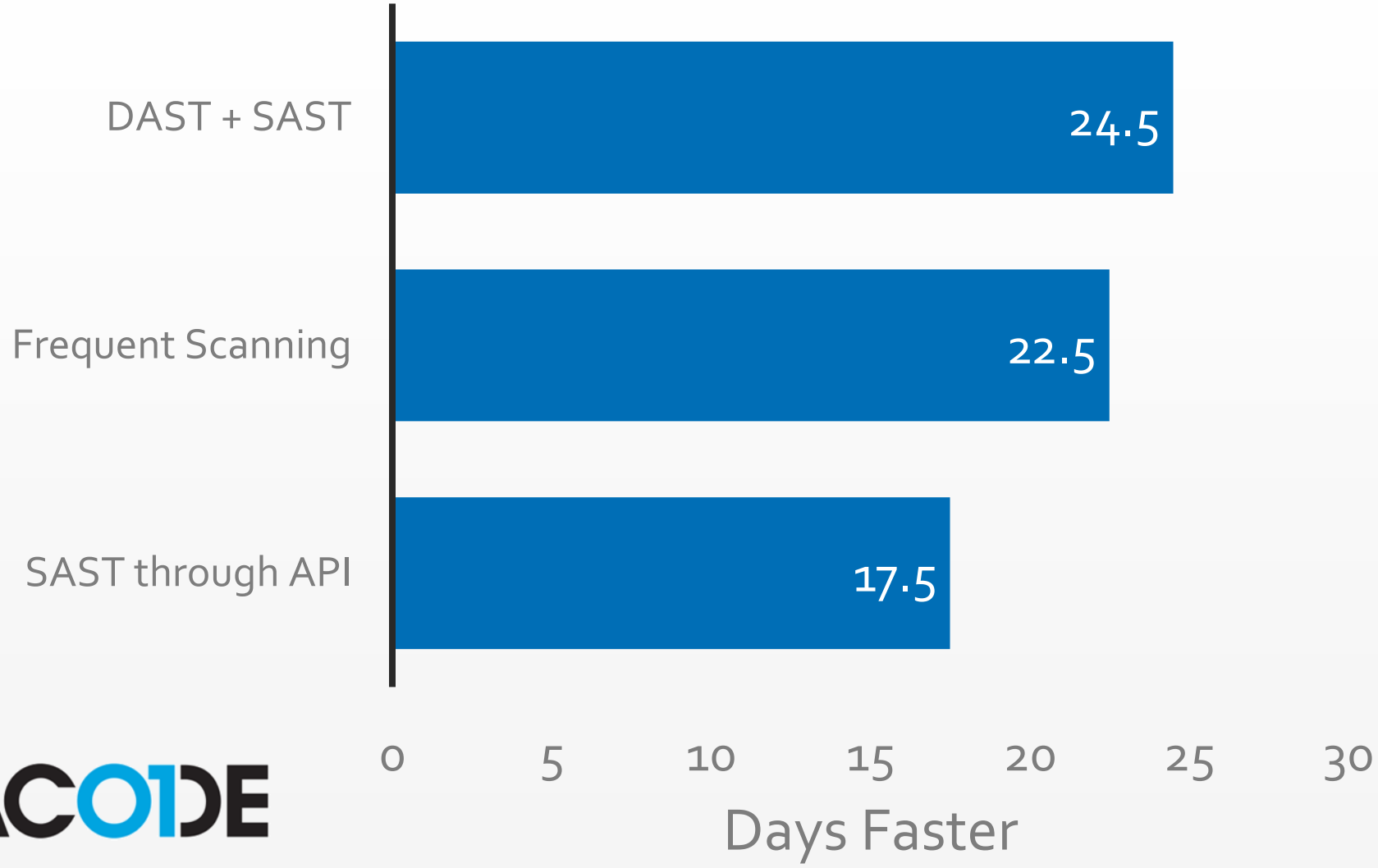
Dynamic Scanning

Final testing prior to promoting code to the production environment

VERACODE

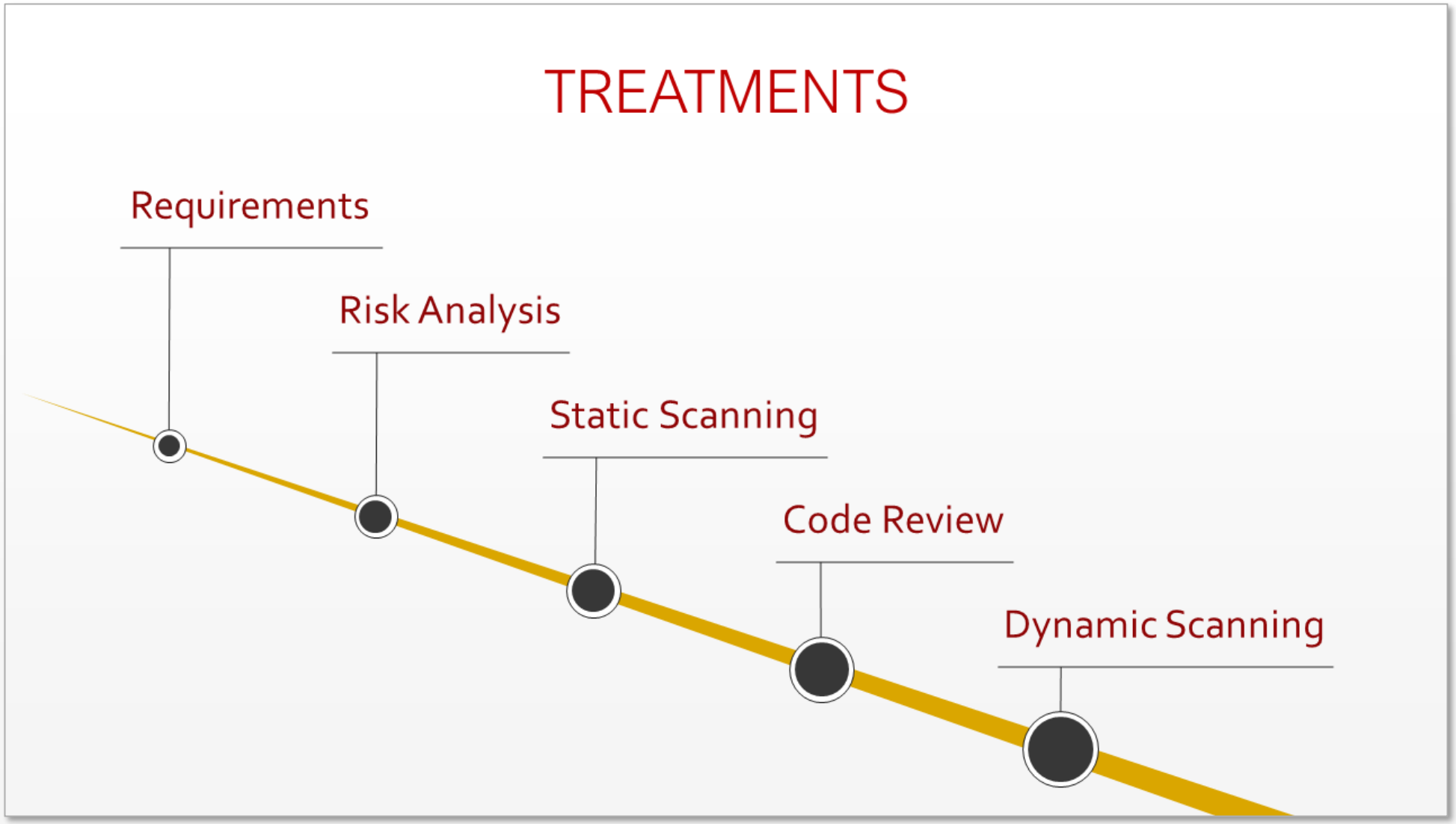
State of Software Security v11

STATE OF SECURITY REPORT



VERACODE

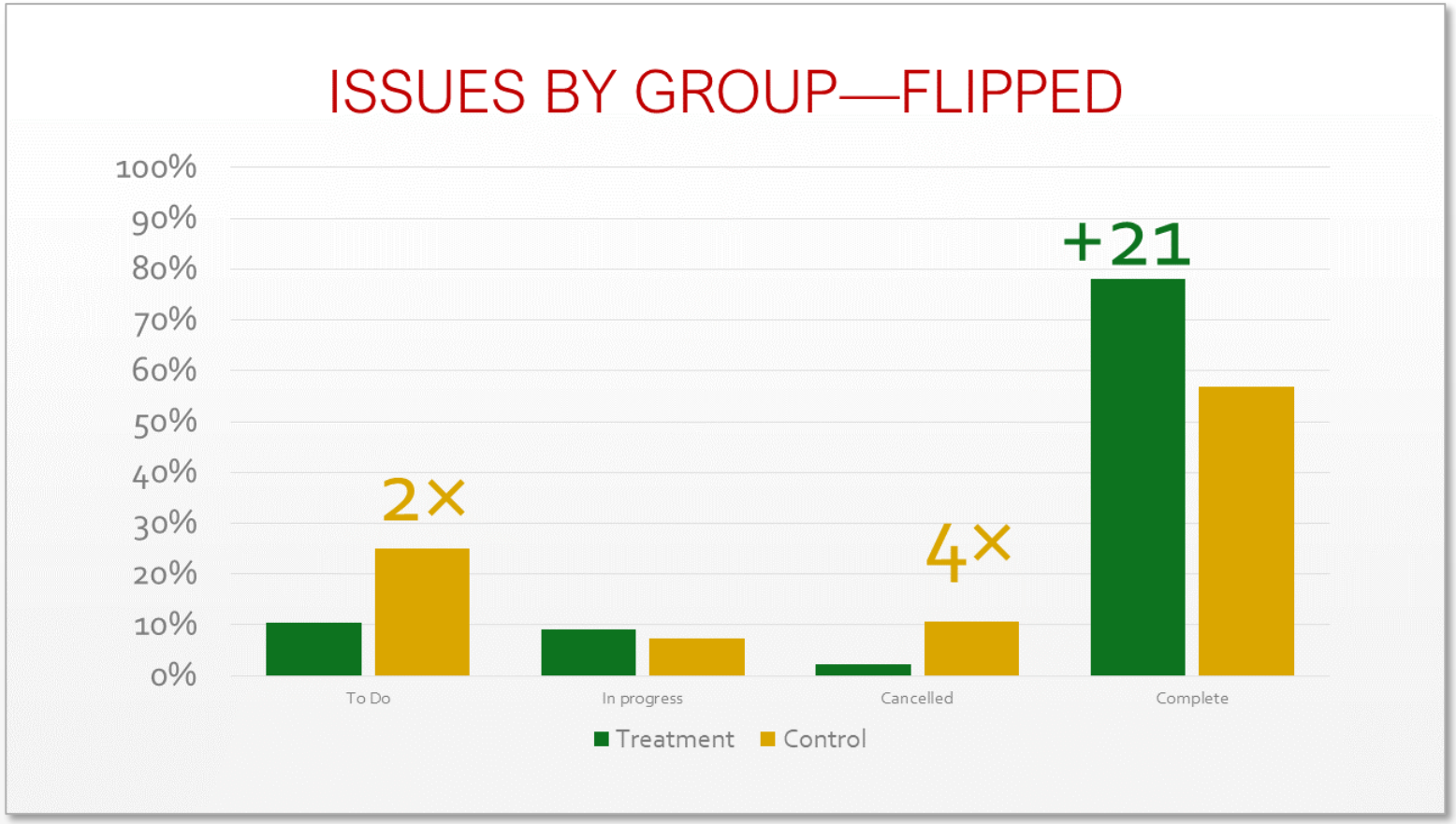
SUMMARY



SUMMARY

Teams which receive coaching and training on application security topics…

Are twice as likely to be working on a security ticket and cancel tickets ¼ as often,

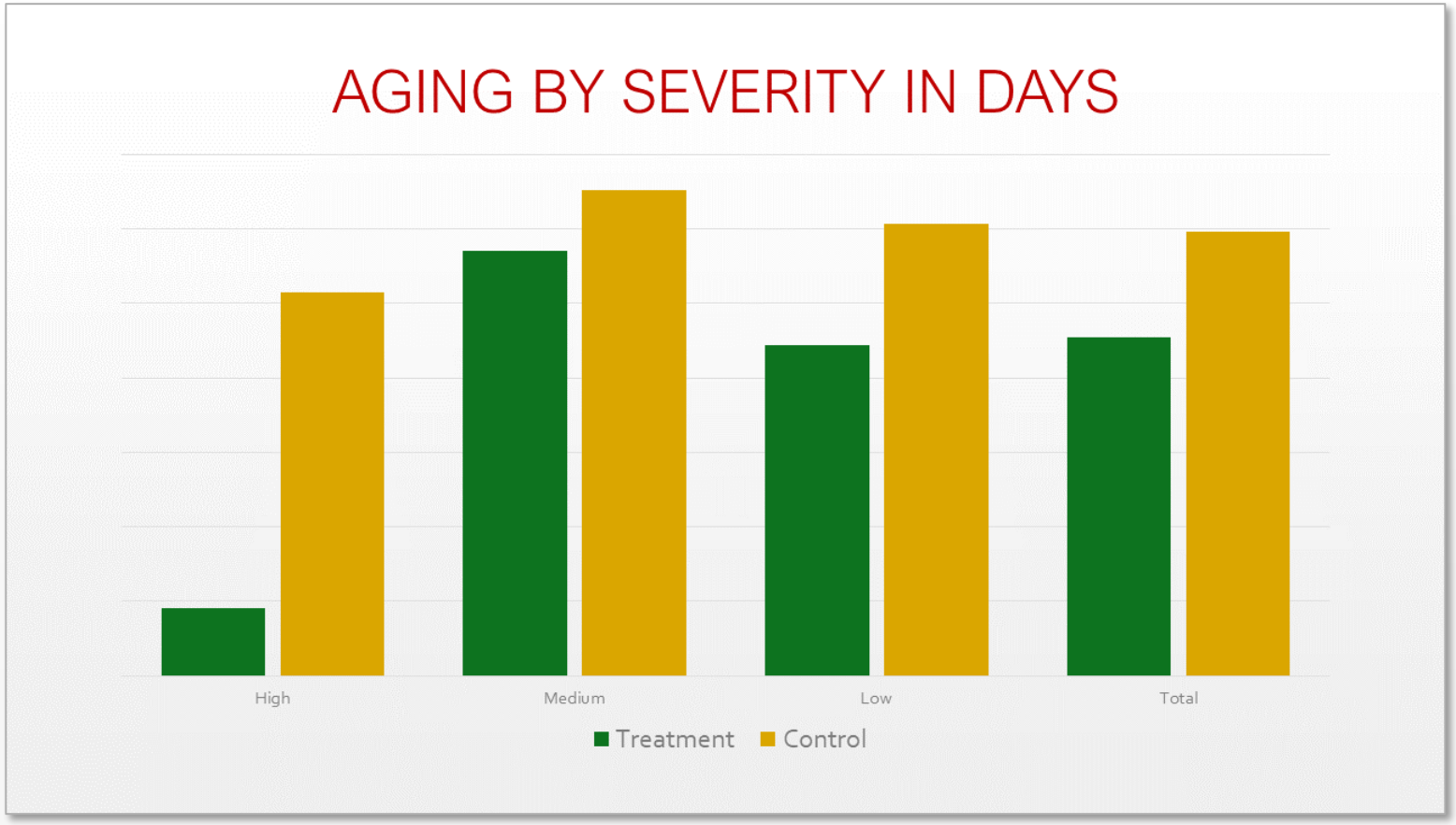


SUMMARY

Teams which receive coaching and training on application security topics…

Are twice as likely to be working on a security ticket and cancel tickets ¼ as often,

Fix security tickets much more quickly, and,



SUMMARY

Teams which receive coaching and training on application security topics…

Are twice as likely to be working on a security ticket and cancel tickets ¼ as often,

Fix security tickets much more quickly, and,

Have fewer security bugs found during pen testing.

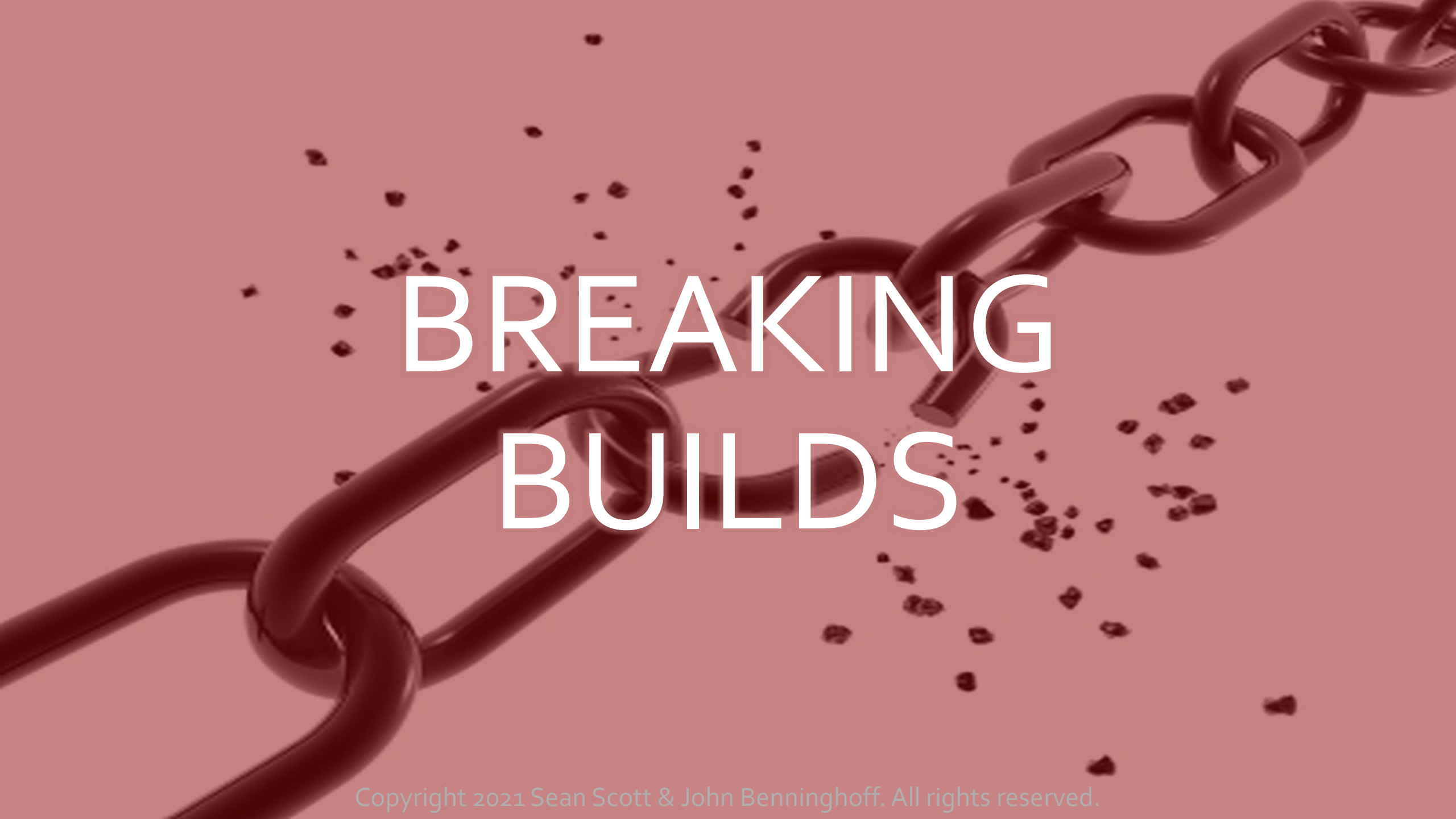
CONCLUSIONS & RECOMMENDATIONS

OWASP

Champions

Opt-in

Break builds

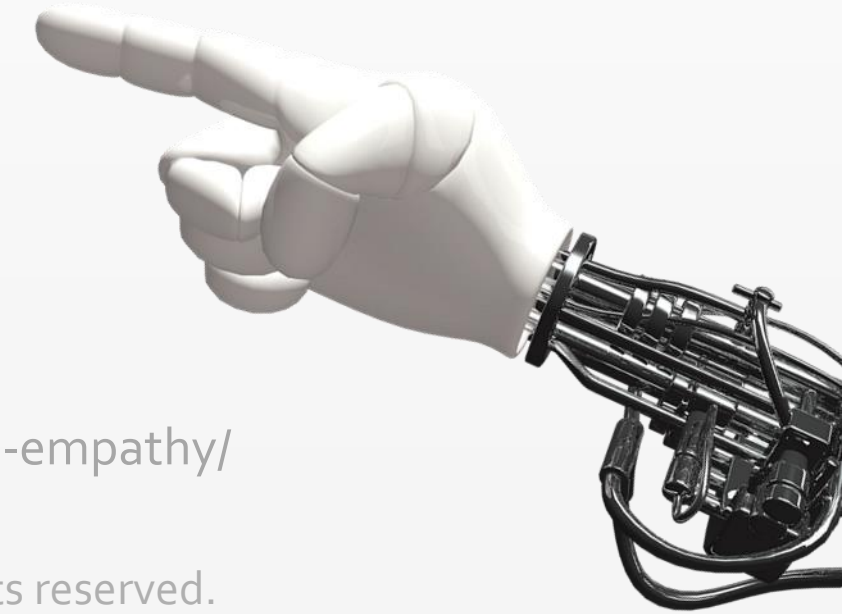


BREAKING BUILDS

ROBOT PEDANTRY, HUMAN EMPATHY

"Seek on your project to automate and codify as much as you possibly can while remembering that the human touch is still necessary"

—Mike McQuaid



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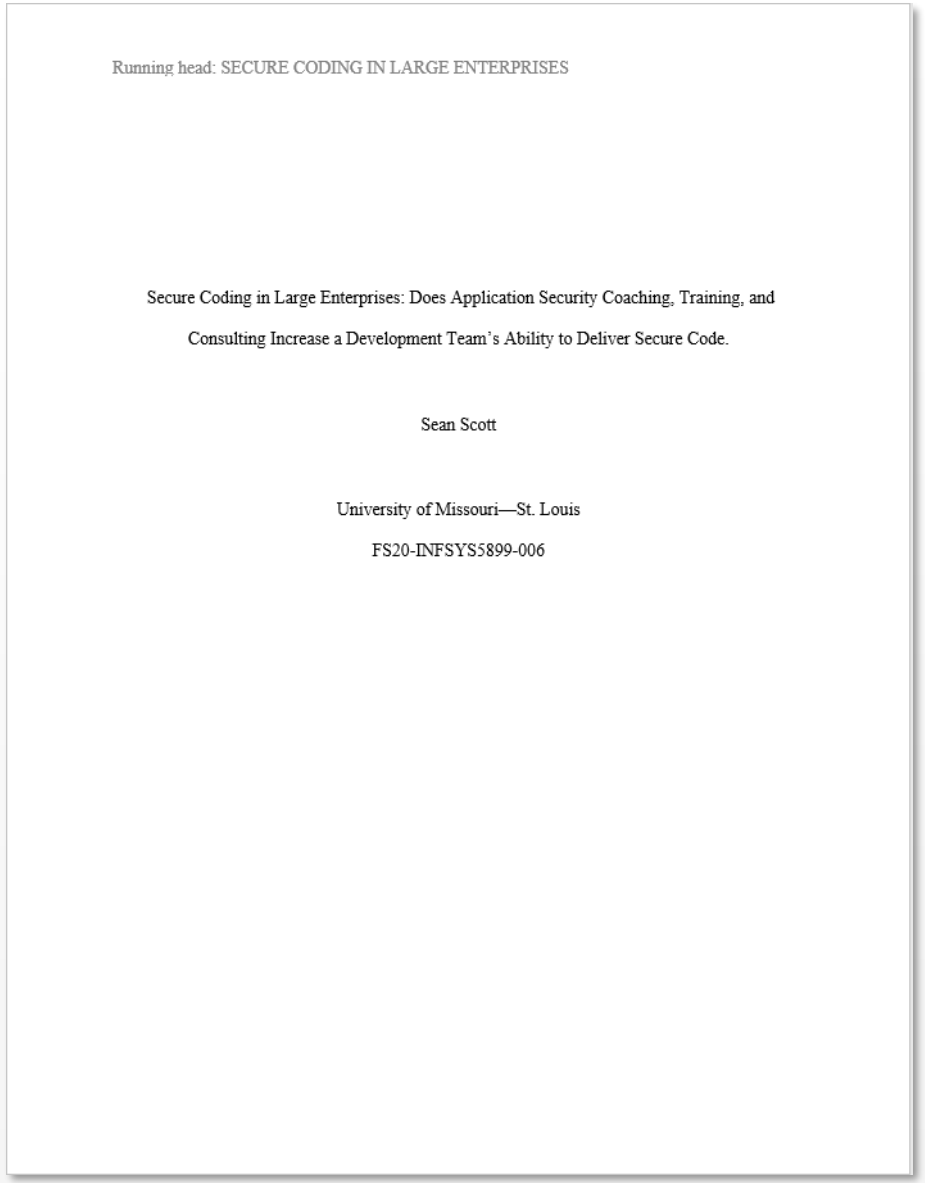

Running head: SECURE CODING IN LARGE ENTERPRISES

Secure Coding in Large Enterprises: Does Application Security Coaching, Training, and Consulting Increase a Development Team's Ability to Deliver Secure Code.

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University of Missouri—St. Louis

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ACADEMIC PAPER

To be submitted for peer review and publishing in third quarter of 2021

seantscott.com

STATISTICS

High-impact vs. Control

T-test significance level: **0.000212**,

Control group (M=.91, SD=.57)

Treatment group (M=.37, SD=.65, t(31)=3.174, p<.05).

High- + Medium-impact vs. Control

T-test significance level: **0.010504**

Control group (M=2.06, SD=1.07)

Treatment group (M=1.23, SD=1.39, t(31)=5.01, p<.05).

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