SEMPR:
The TSP Software Engineering Measured Performance Repository

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Pittsburgh, PA

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Document Markings

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Agenda

1. Introduction
2. SEMPR data and analysis
3. Conclusion

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Purpose of this presentation

- This presentation tells…

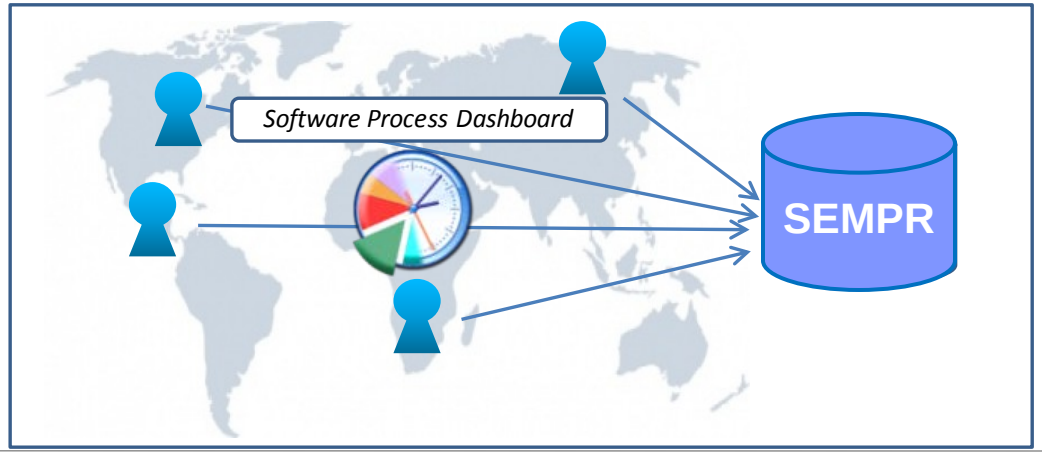
- Project overview in SEMPR
- Benchmark planning parameters in SEMPR
- Benchmark project level performance and work item (component) level performance

About SEMPR

- Software Engineering Measured and Performance Repository

- SEI has collected data from organizations that have adopted TSP in SEMPR

- Stores project data in Tuma Solutions Team Process Data Warehouse
  - From 109 project cycles (in this report)
  - Used the Software Process Dashboard



How did we measure data quality in SEMPR

- Time log and defect log have high correctness and consistency by automatic data recording.

- Size log and task log have low correctness by manual data recording.

What do the data tell us?

1. Introduction
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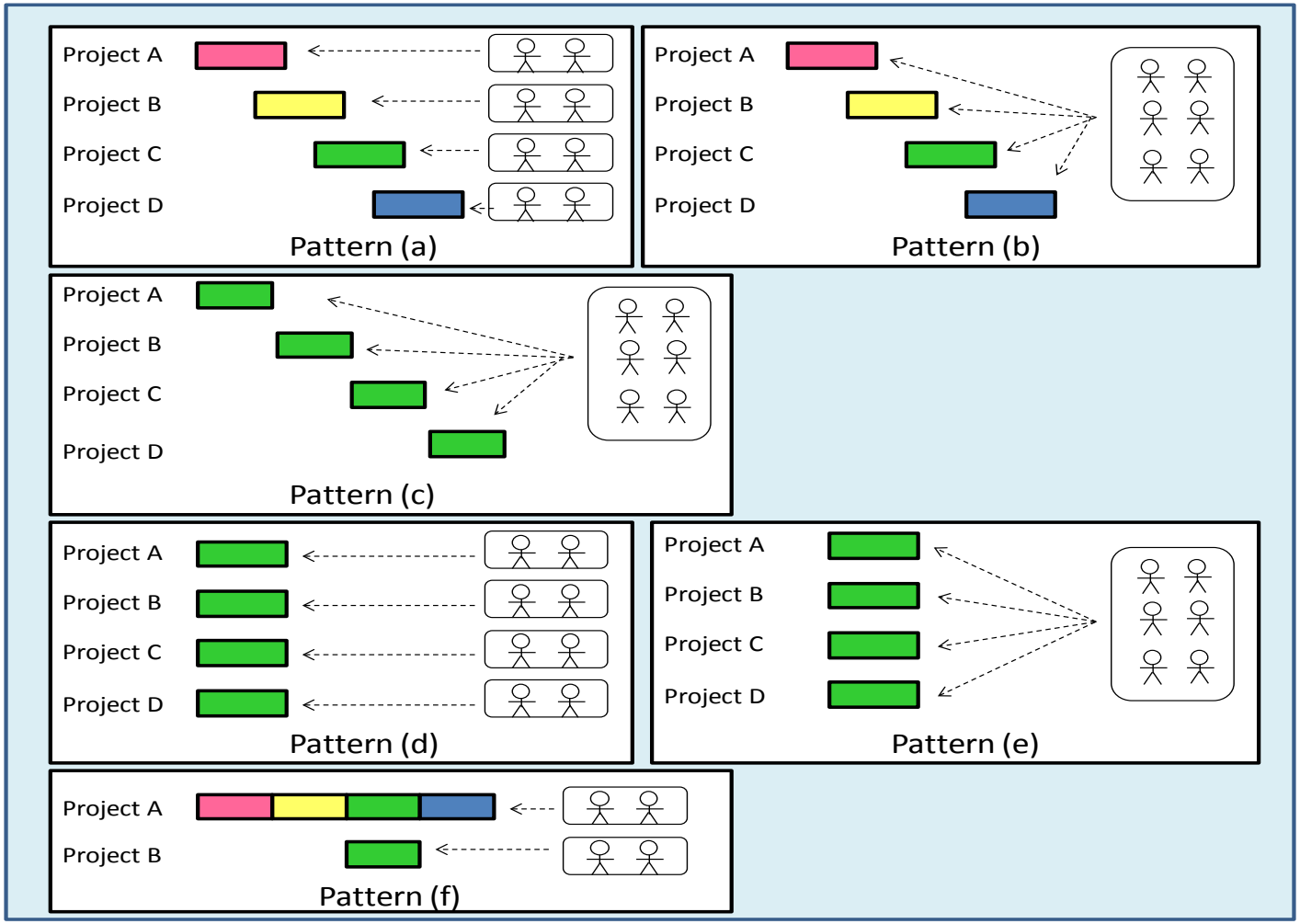
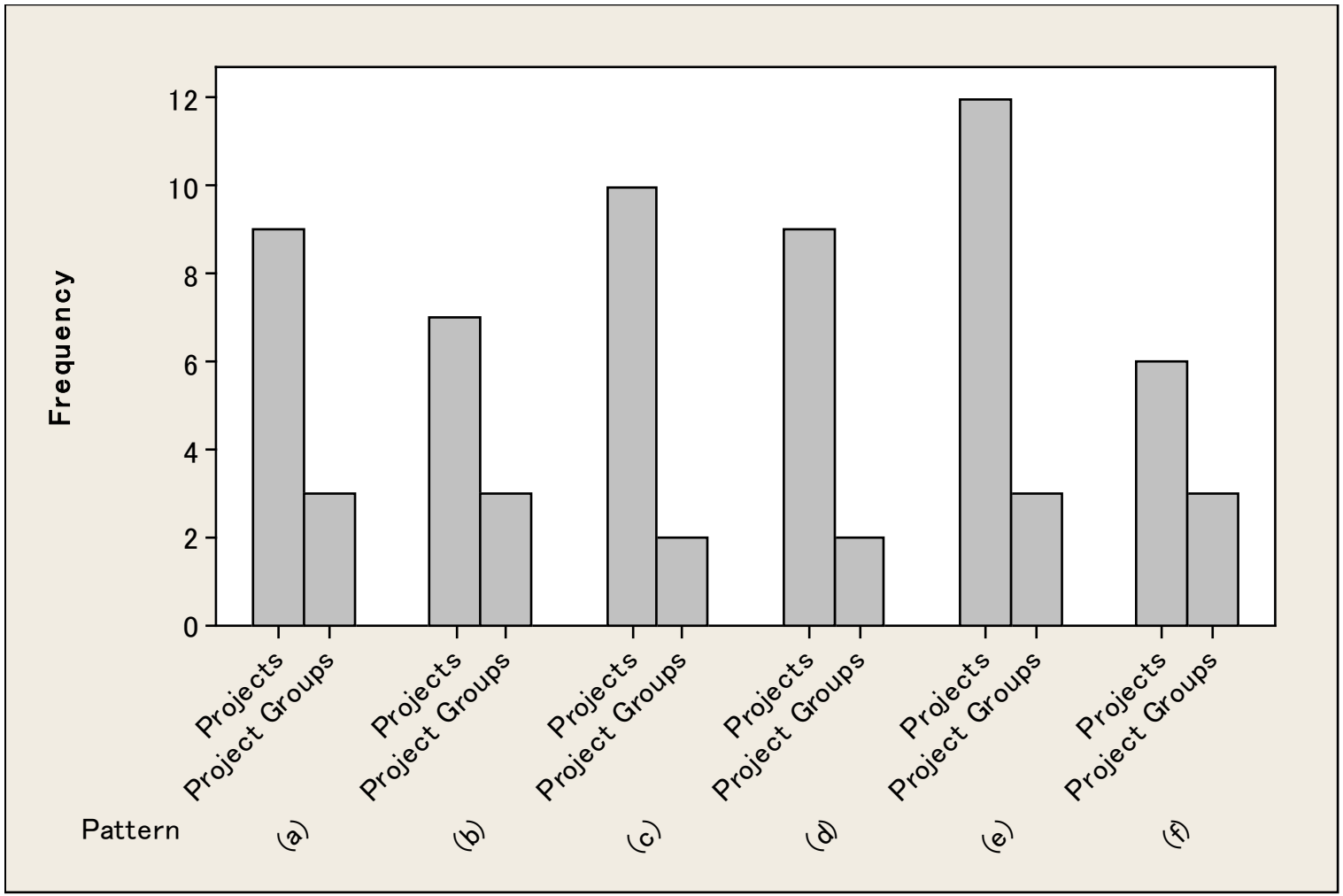
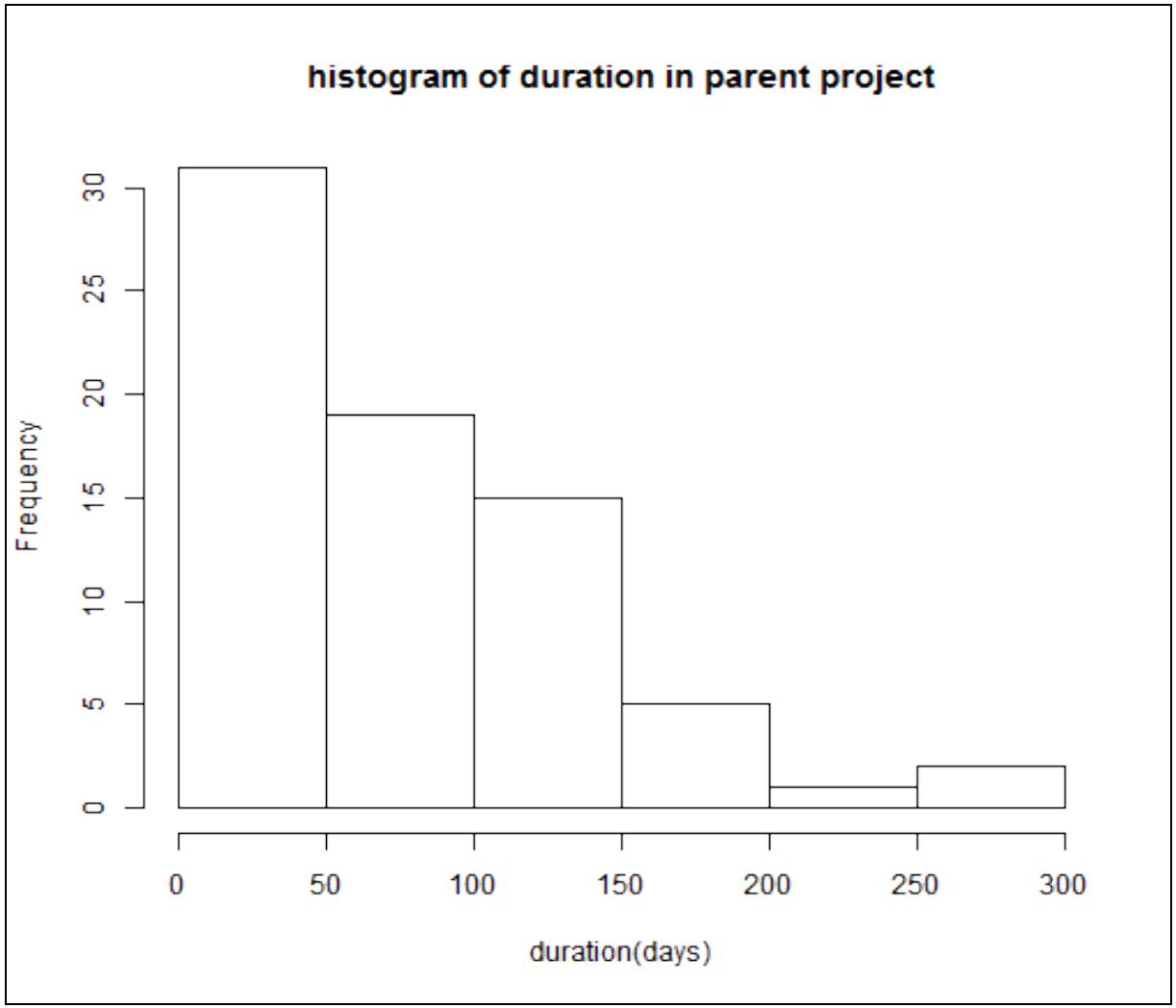
How are projects organized?



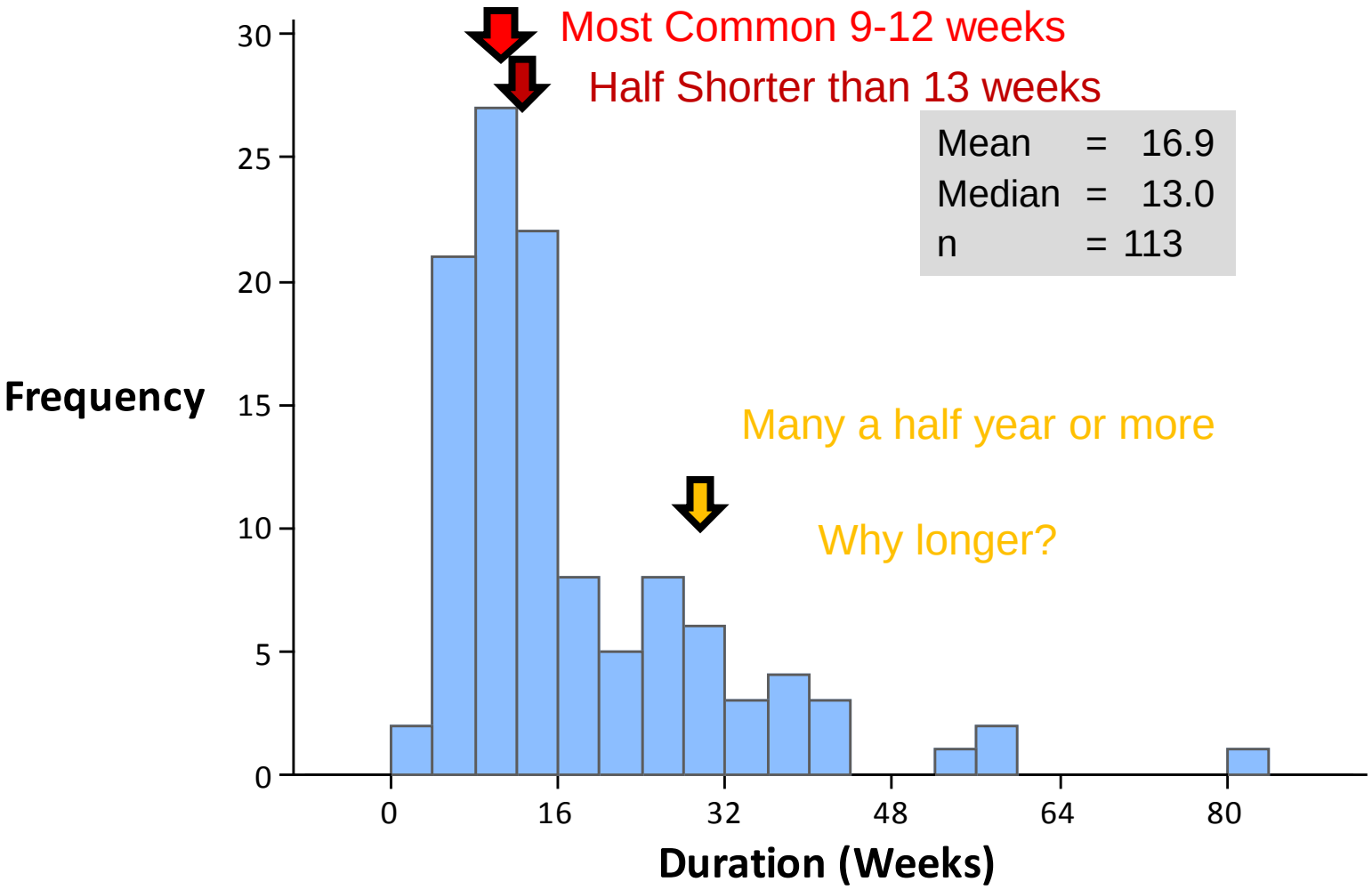
How many projects are found in each pattern?



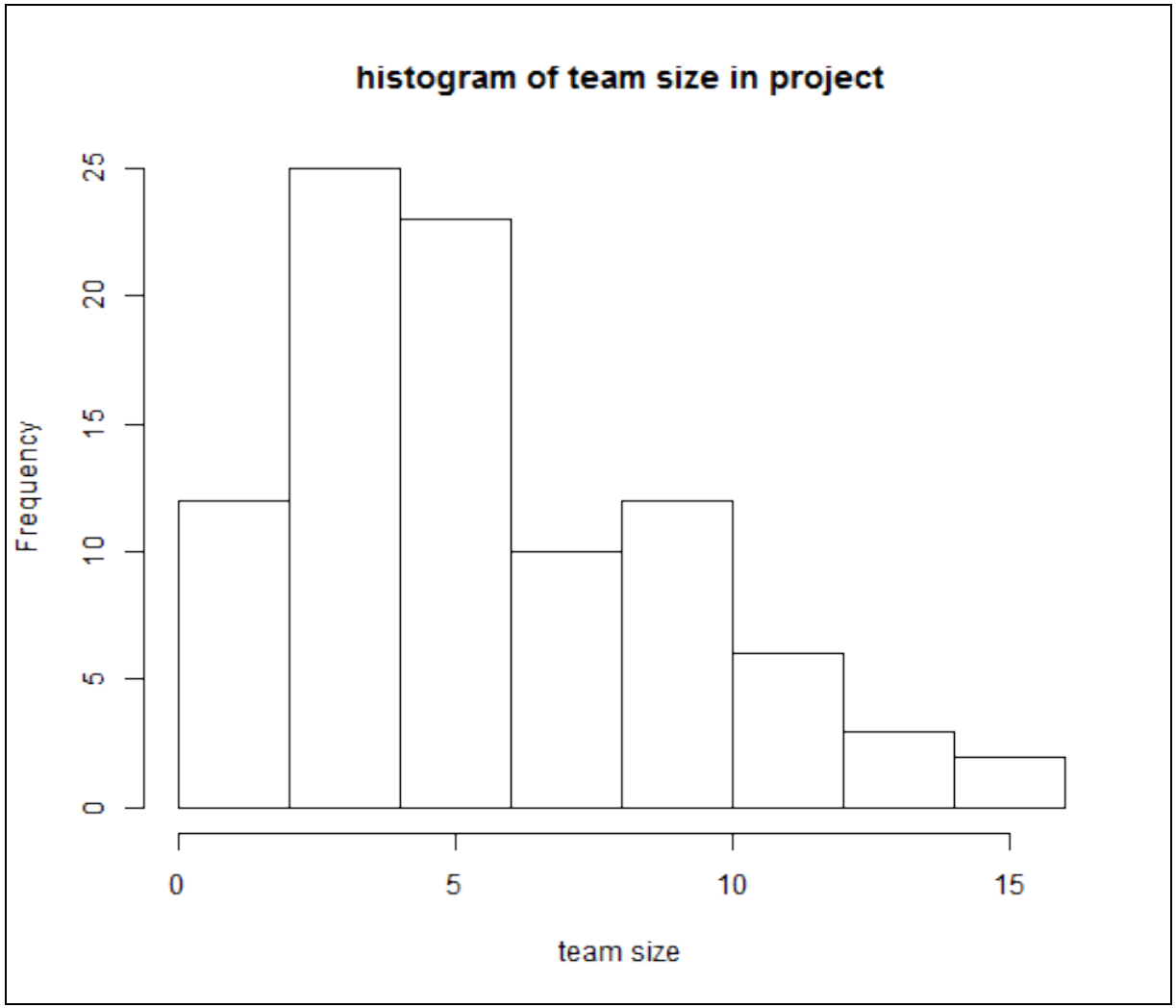
What were the project durations?



What are the planning period durations?

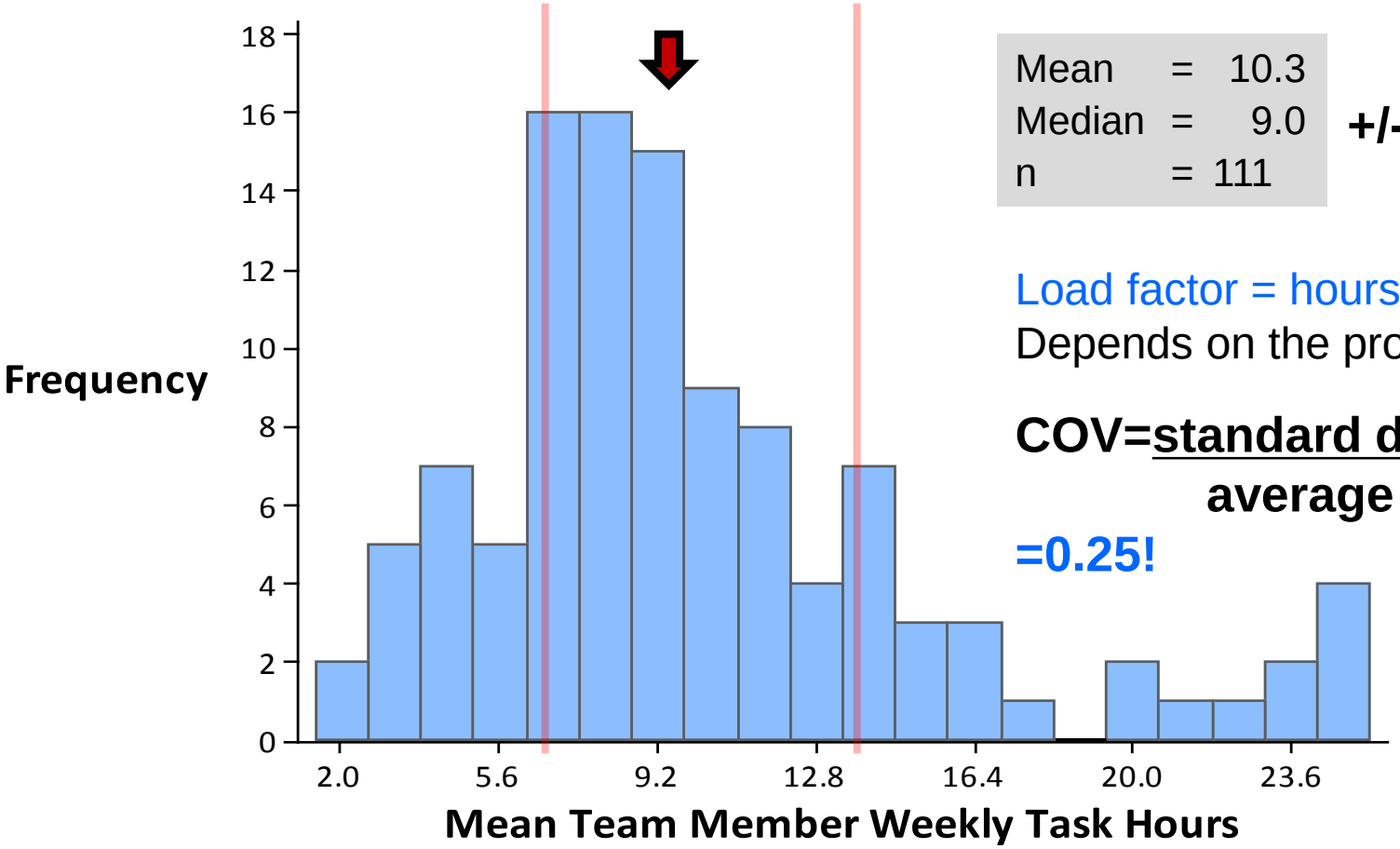


How many team members on projects?



How many task hours per week?

mean Team Member Weekly Direct Hours per Week



Mean	=	10.3
Median	=	9.0
n	=	111

+/- 2.5

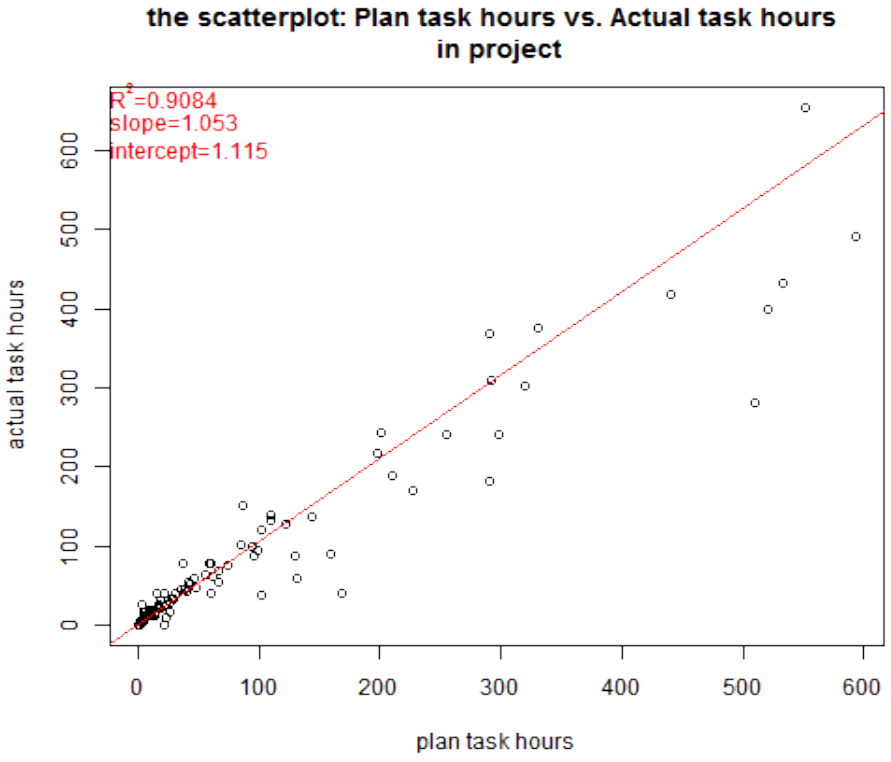
Load factor = hours/40

Depends on the project

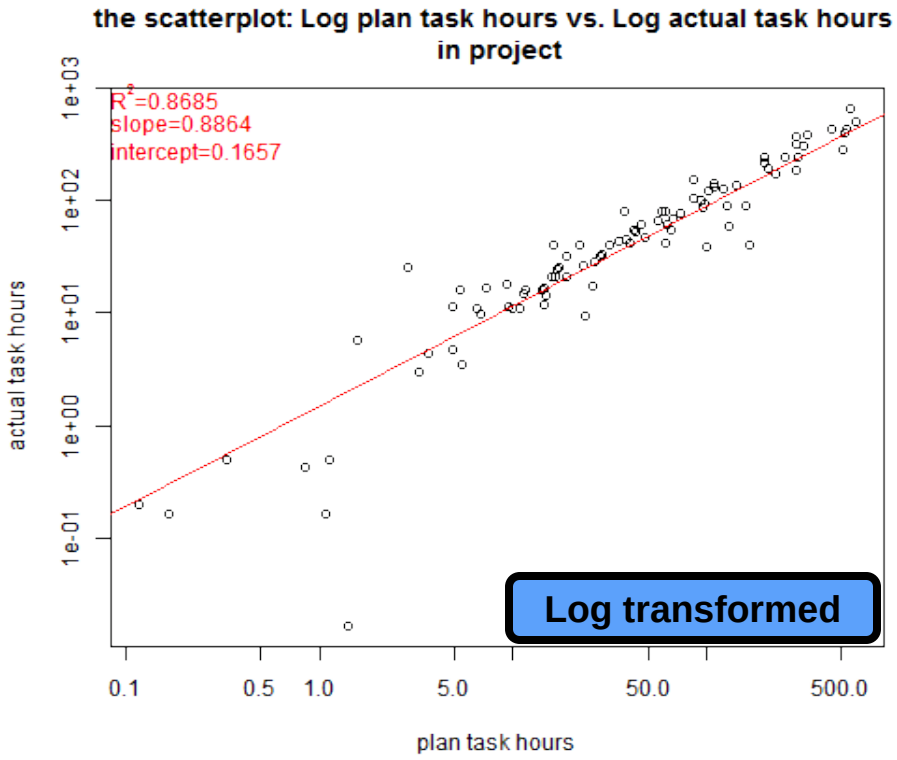
COV=standard deviation / average hours

=0.25!

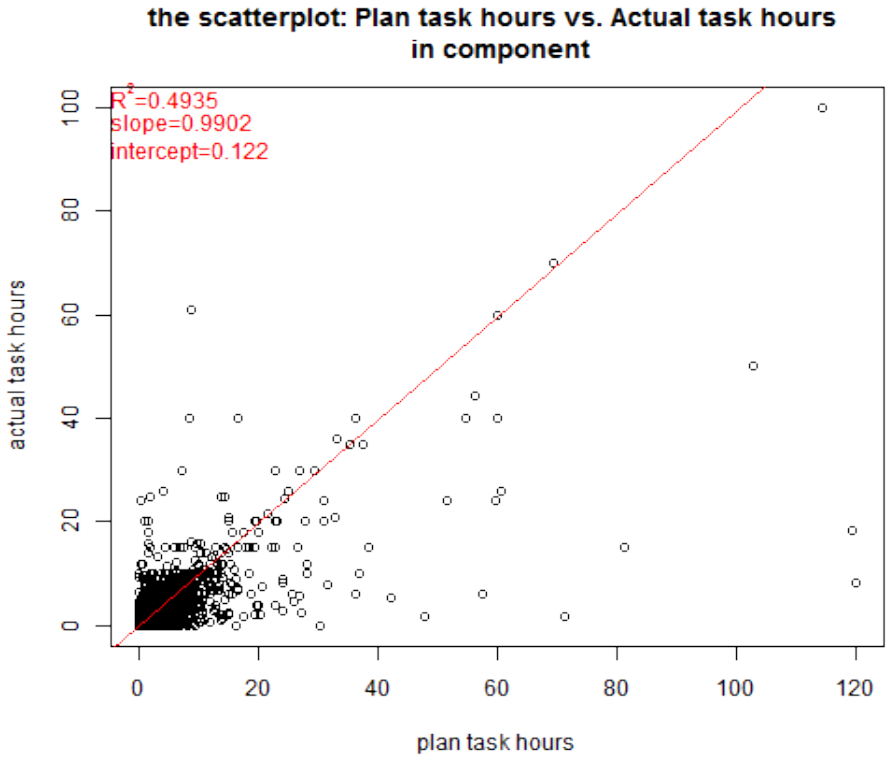
How do Plan and Actual planned project hours compare?



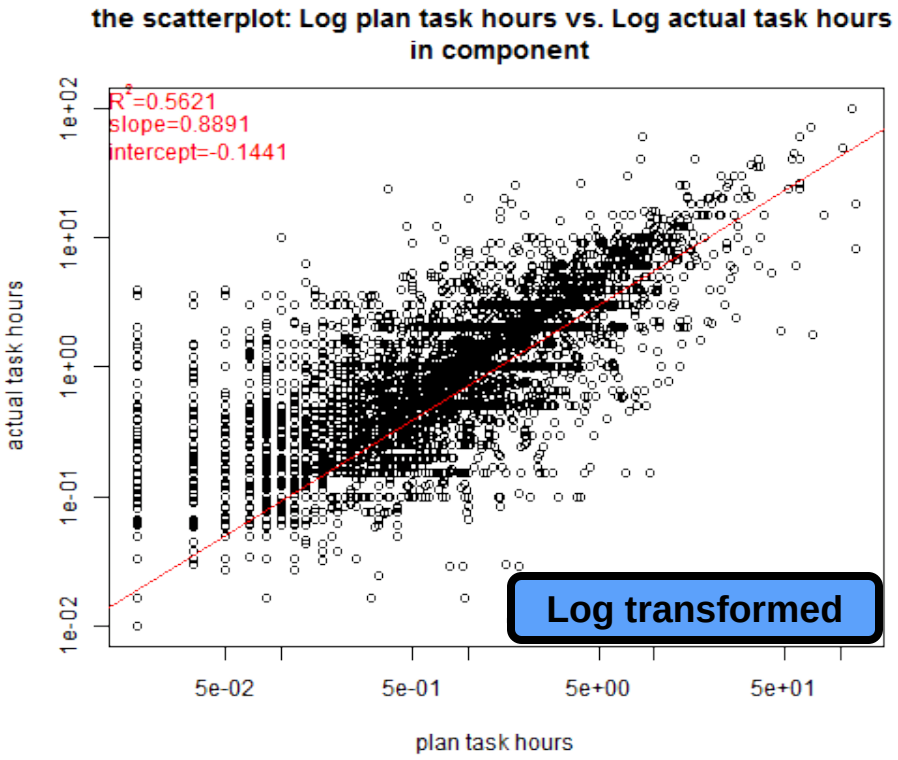
Project level time hours data is high predictable.



How do Plan and Actual component hours compare? (work item)

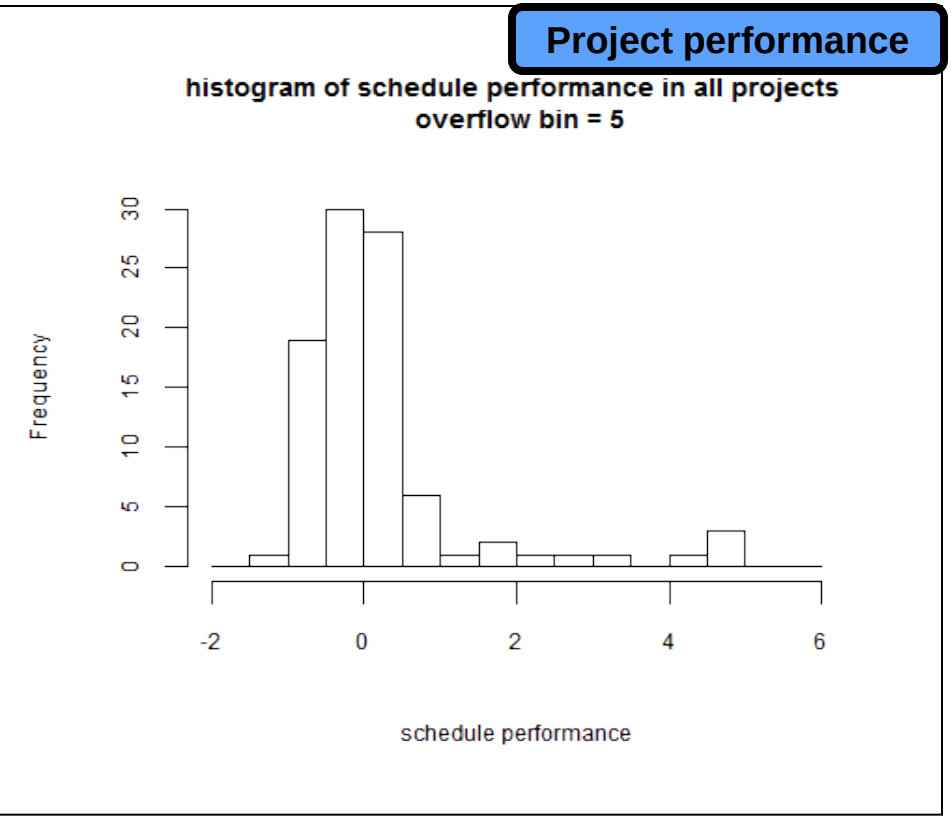


Log transformed work item level time hours data is predictable.



How did they perform to planned schedule?

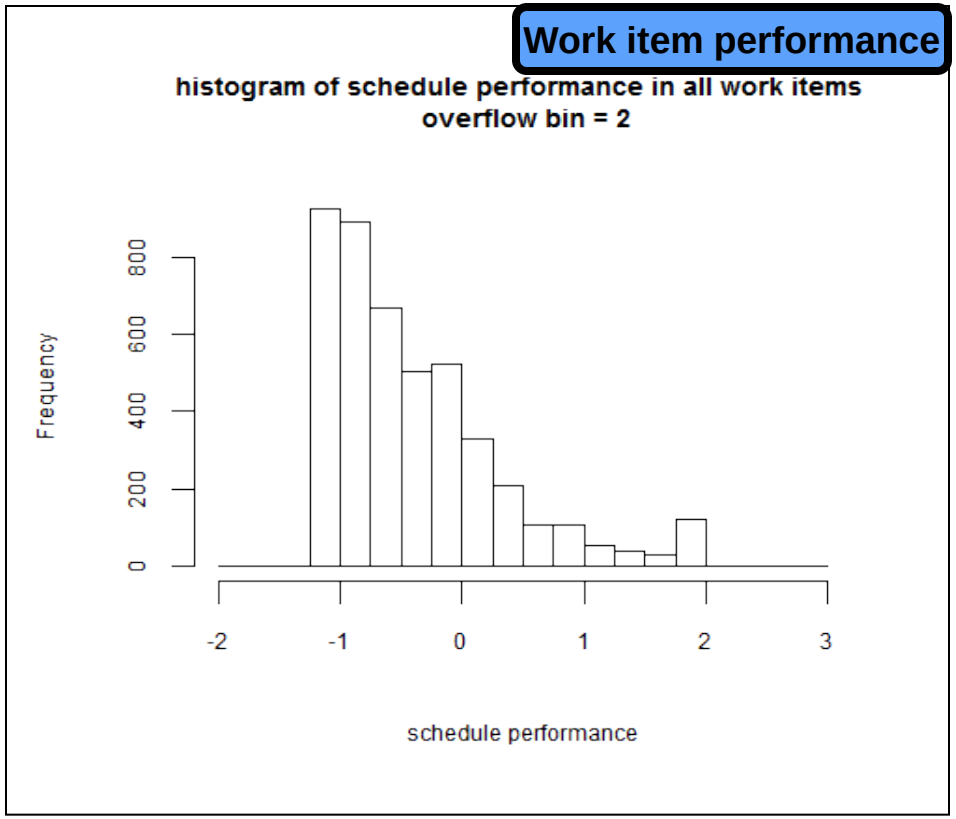
Project performance



schedule performance =

$$\frac{\text{actual duration - plan duration}}{\text{plan duration}}$$

Work item performance

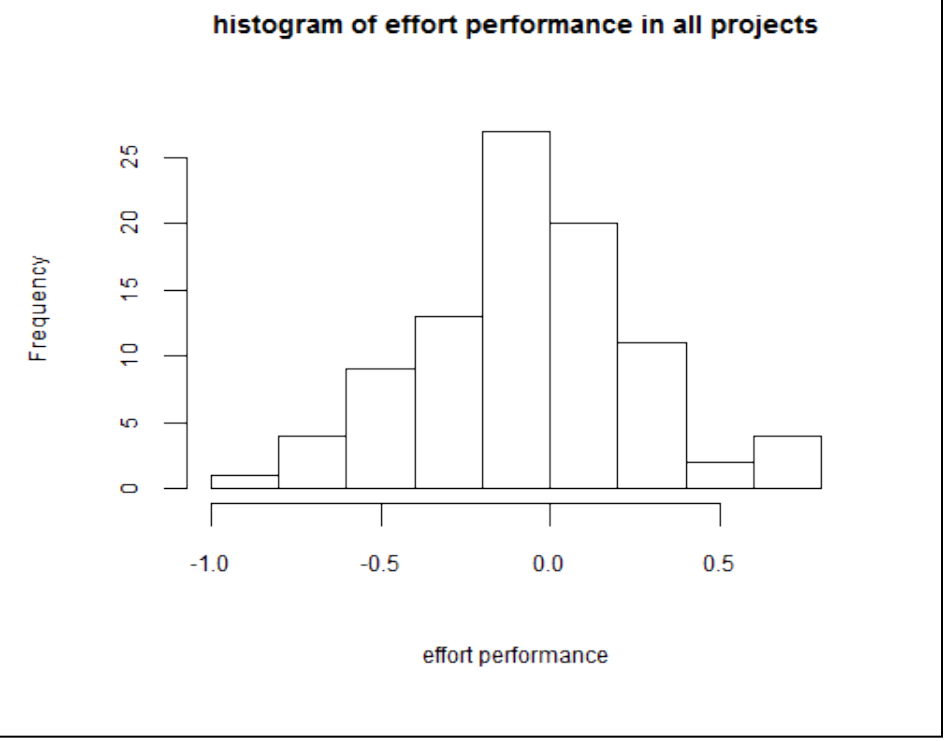


How well did they estimate effort?

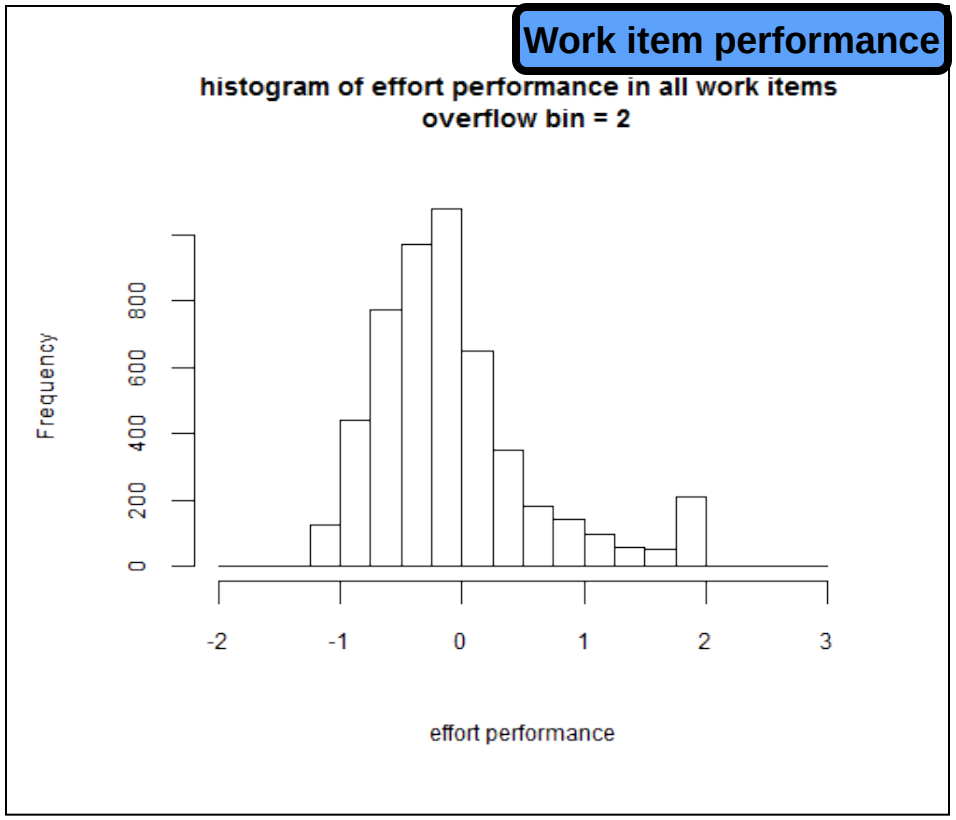
effort performance =

$$\frac{\text{actual effort - plan effort}}{\text{plan effort}}$$

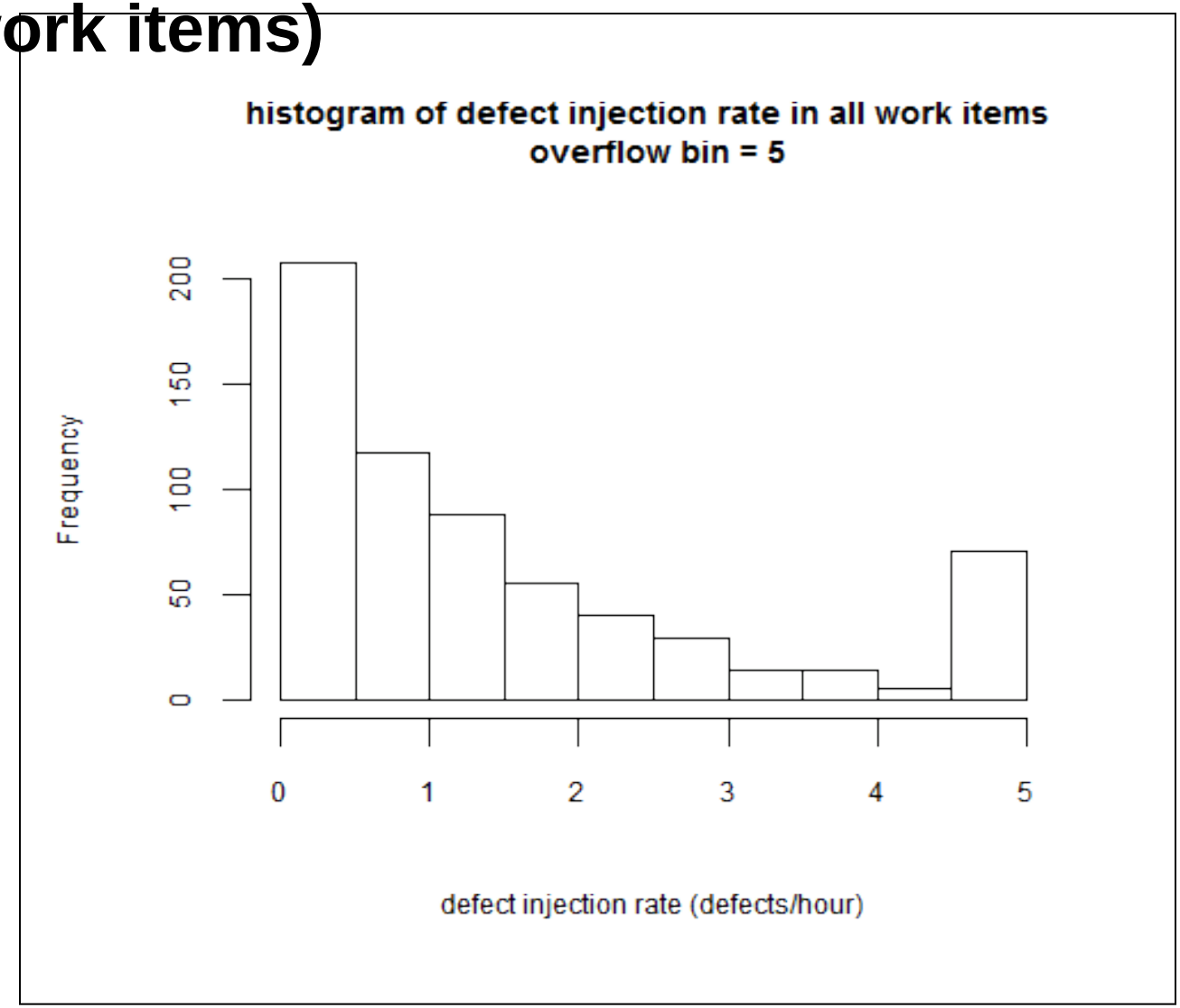
Project performance



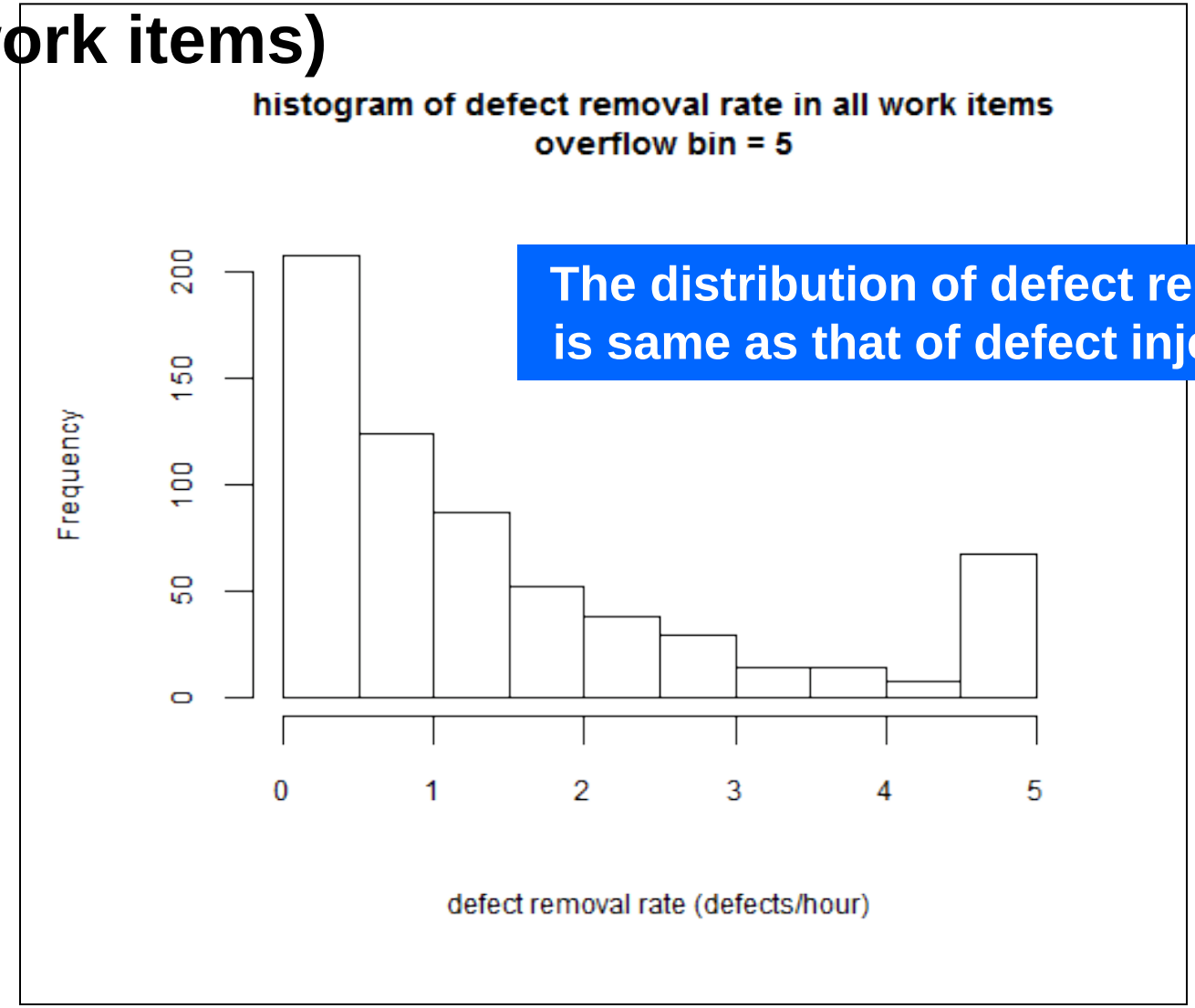
Work item performance



How fast are defects injectioned? (all work items)



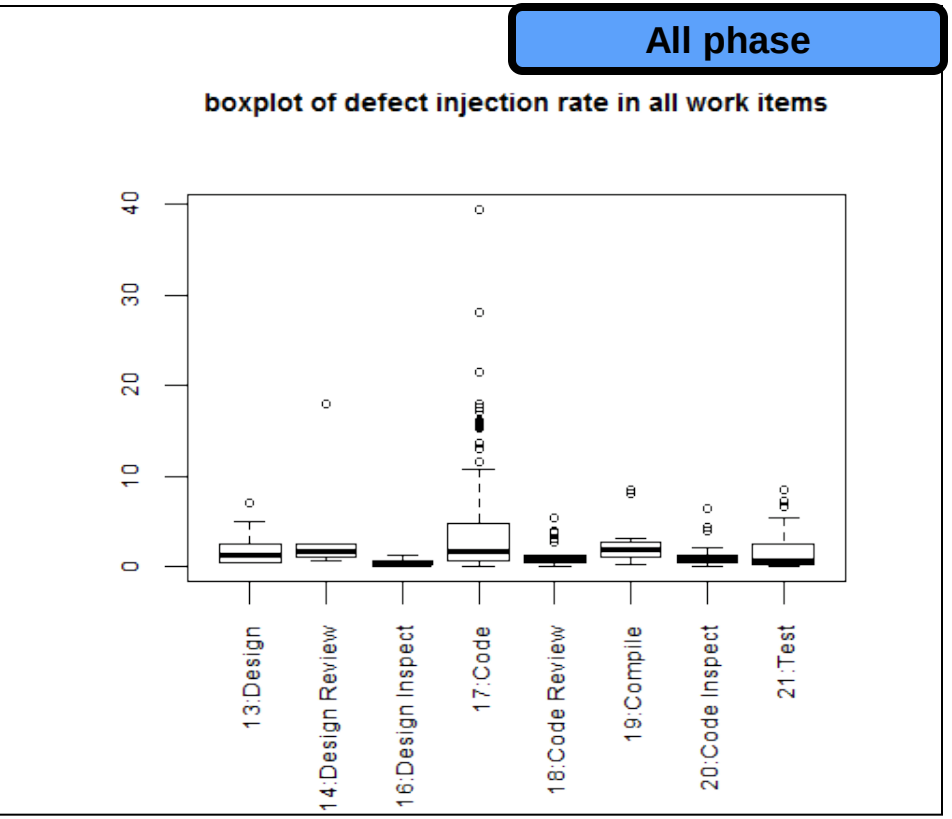
What were the defect removal rates? (all work items)



The distribution of defect removal rate is same as that of defect injection rate

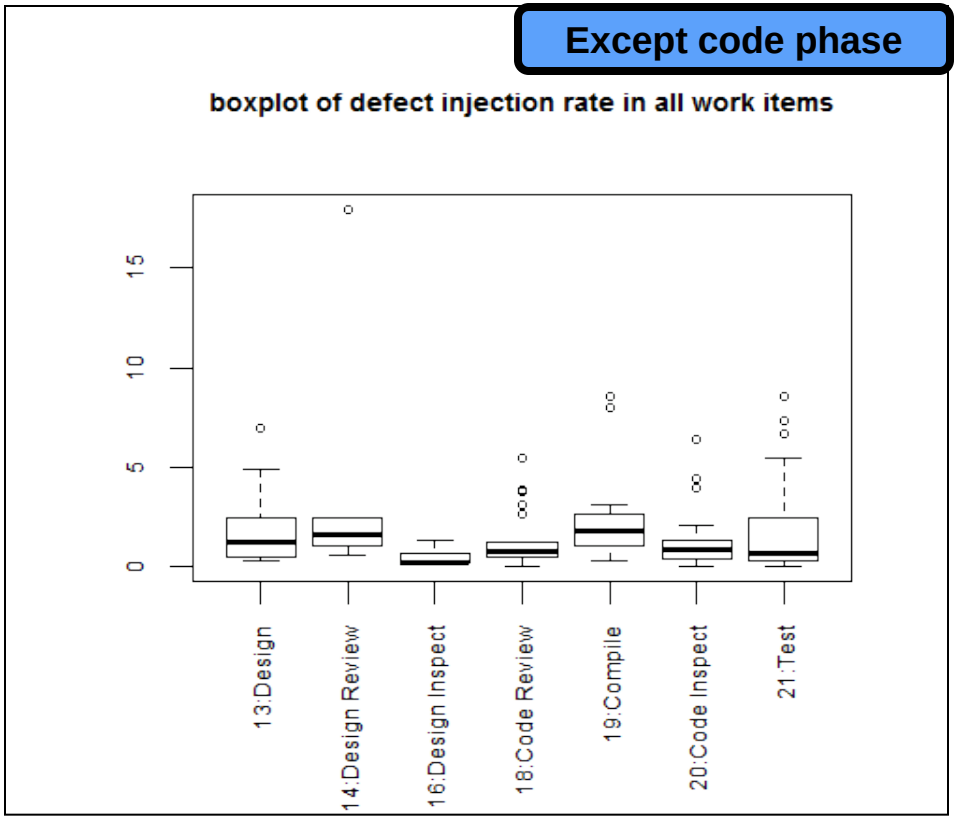
How did defect injection rates differ by phase

All phase



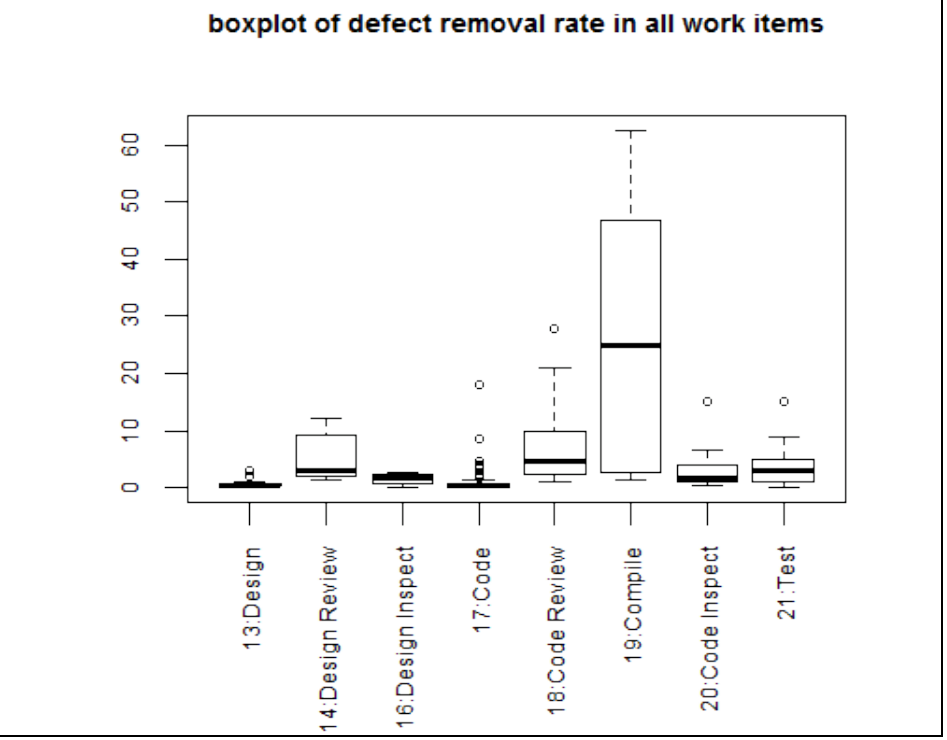
DIR in code review has wide range and highest median.

Except code phase



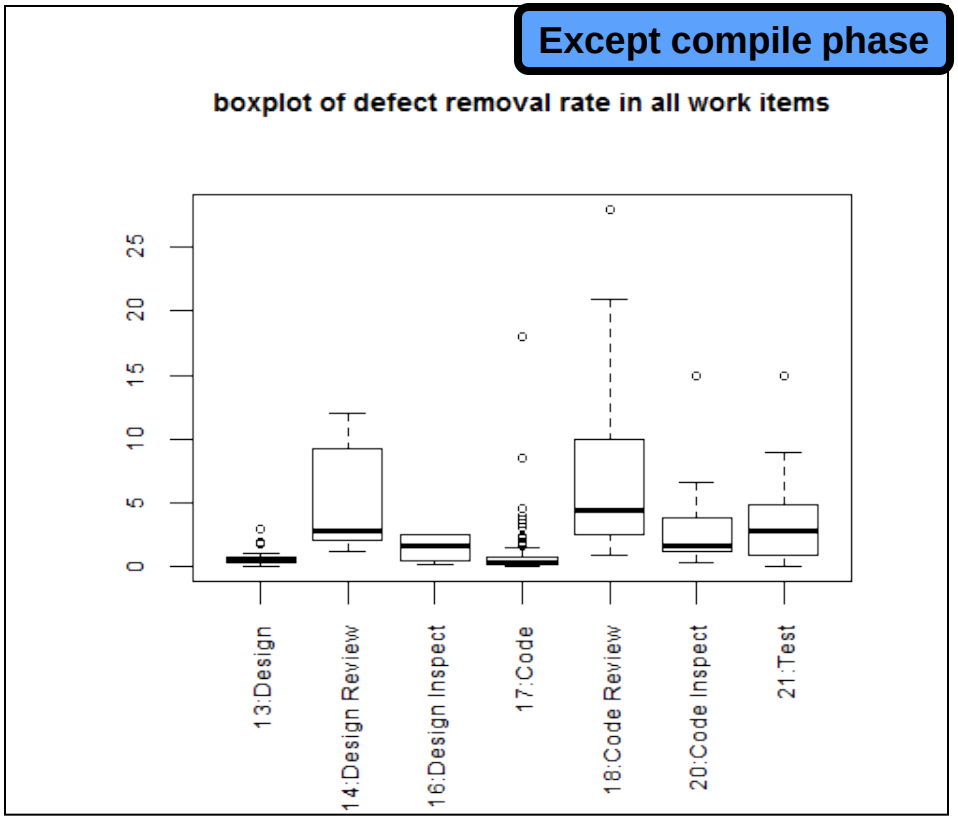
How did defect removal rates differ by phase

All phase

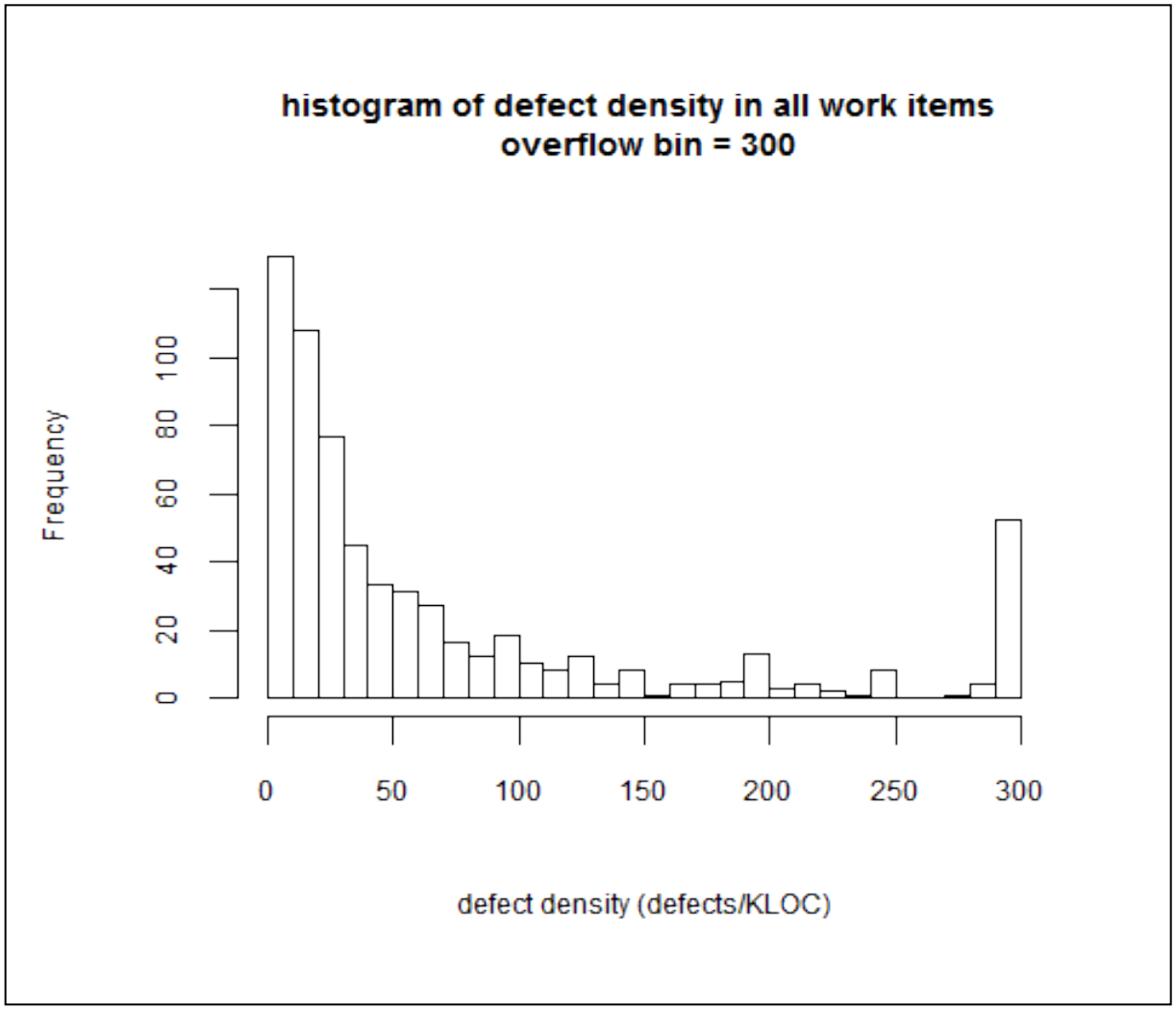


DRR in Compile and DRR in code review are higher than DRR in unit testing.

Except compile phase



What were the total defect densities



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Conclusion

SEMPR collects TSP project data for benchmark and analysis

Projects organize in many ways

Benchmarks include

- distributions for defect injection and removal rates
- Ranges of task hours
- Effort estimation accuracy
- Schedule estimation accuracy

Much work remains

- Include more contextual data
- Continue to add projects the database

Acknowledgement

We thank David Tuma of Tuma Solutions for contributing the process dashboard warehouse software.

http://www.processdash.com/tpdw

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