

# Literature Review on Modeling of Lifeline Infrastructure Restoration Using Empirical Quantitative Data

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Acknowledgement: NSF CMMI-1824681

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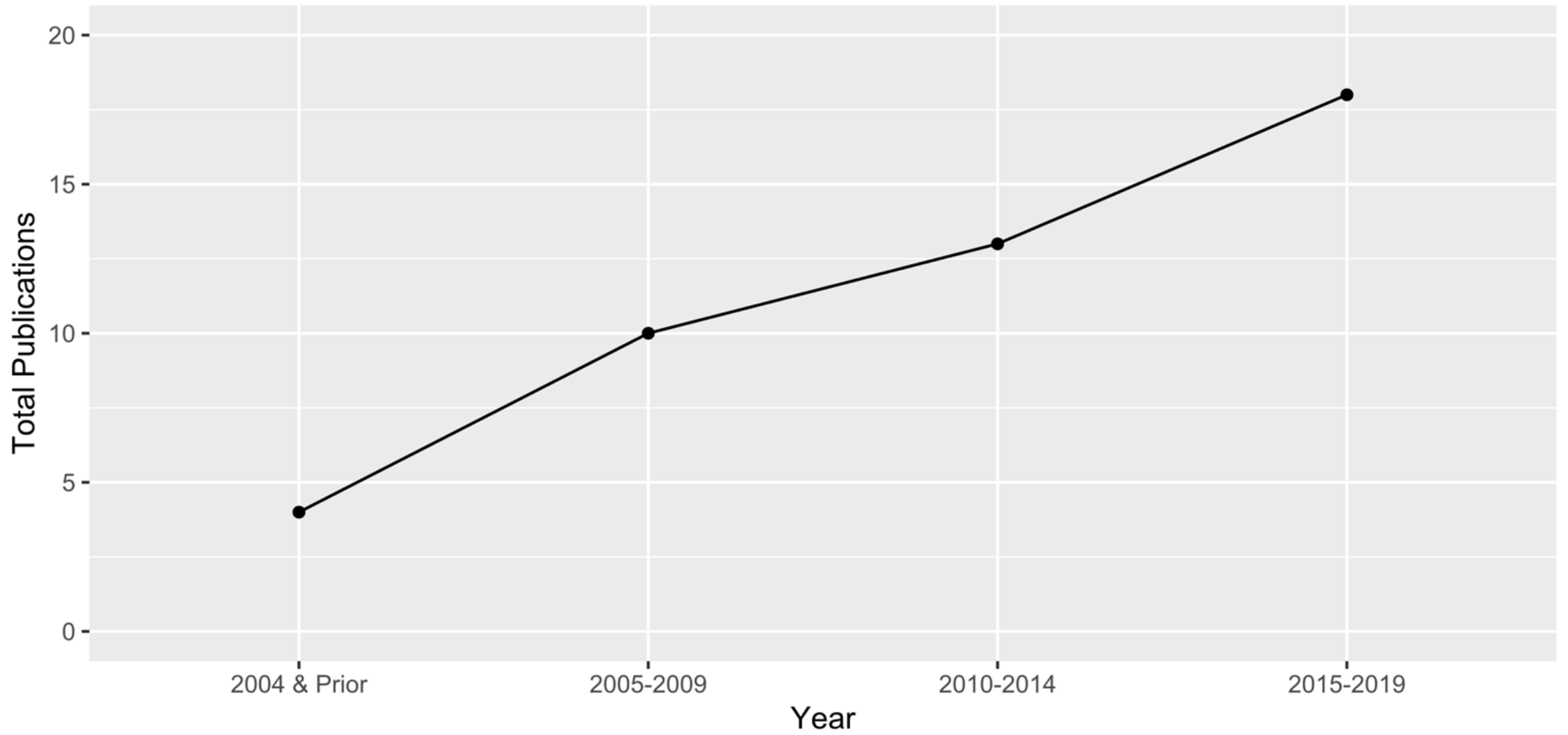
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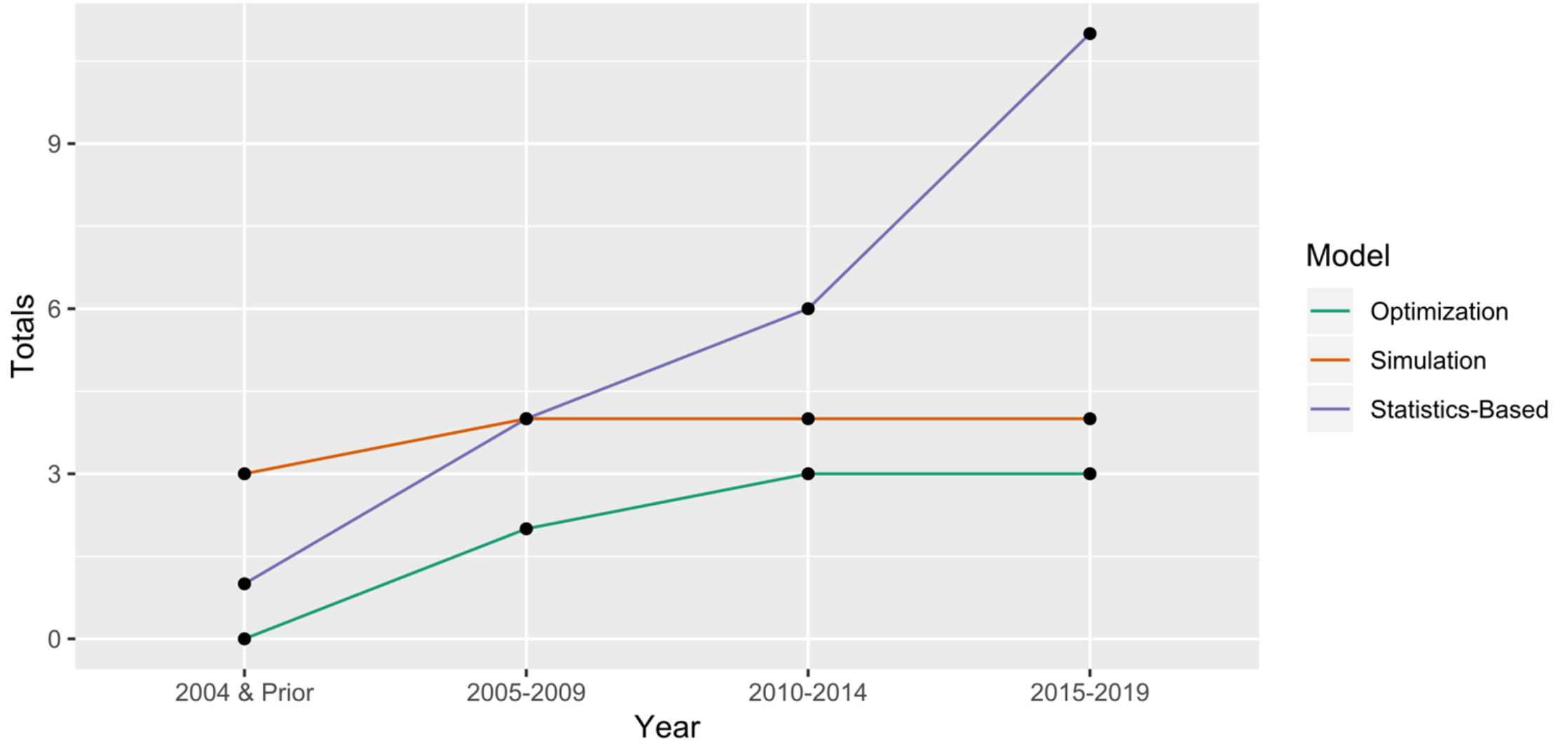
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# Publications Over Time

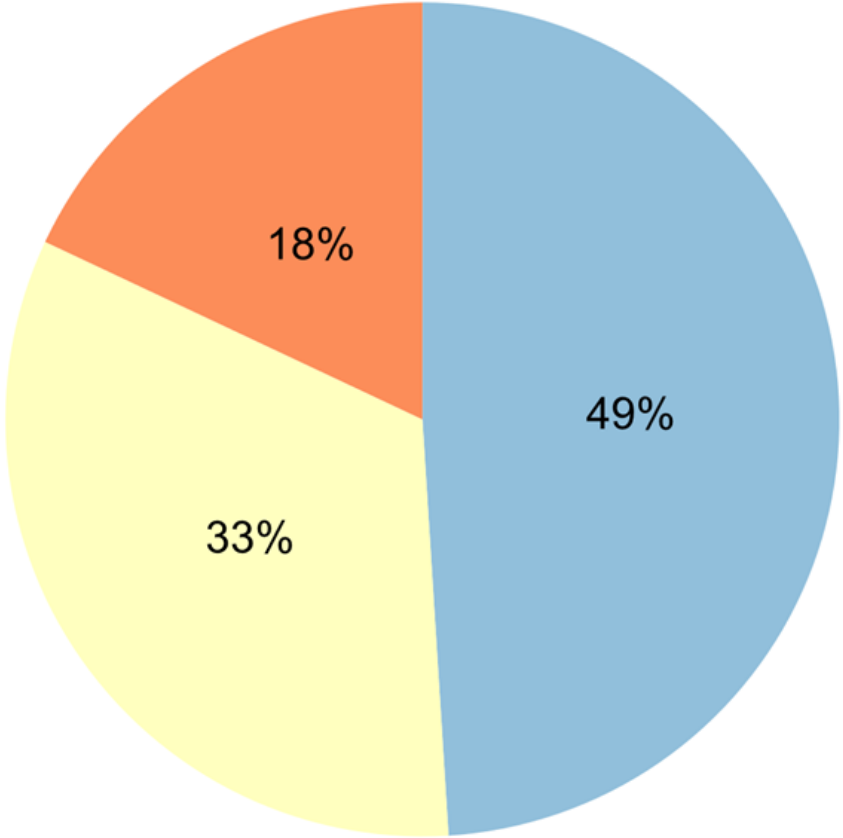
Total: 45



# Modeling Type Over Time



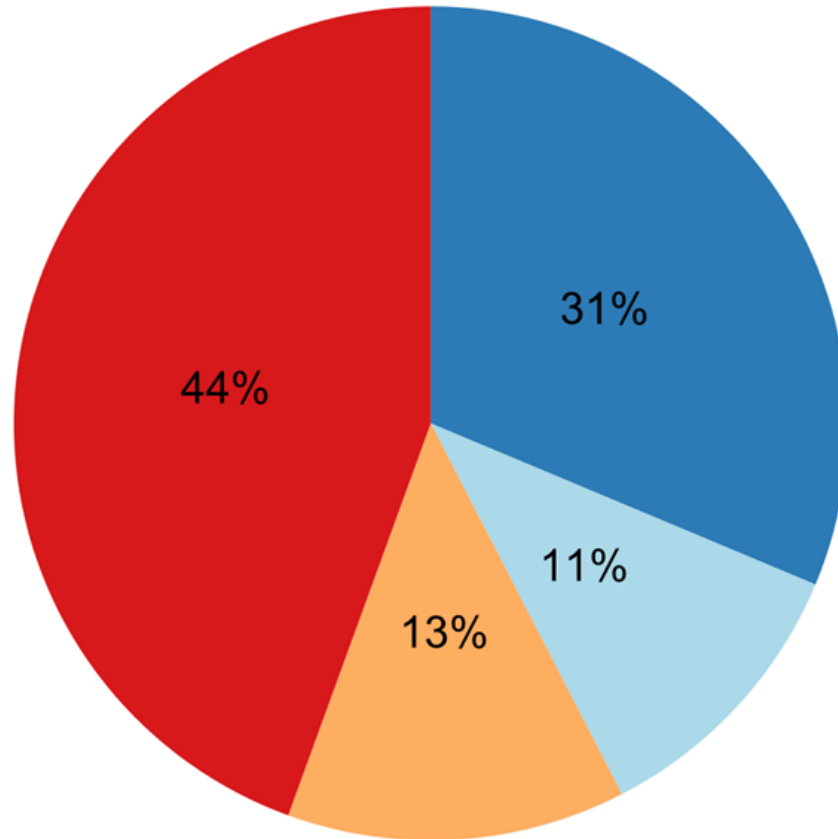
# Data Breakdown By Modeling Approach







## Modeling Approach

- Optimization
- Simulation
- Statistics-Based

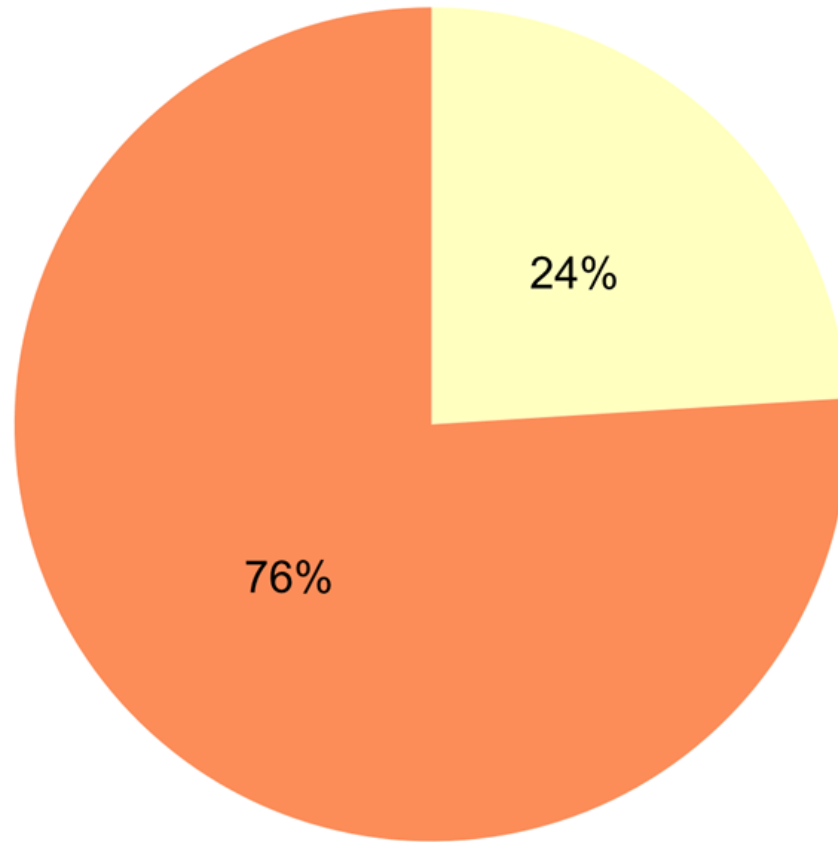
## Data Breakdown By Hazard Type



## Hazards Modeled

-  Earthquake
-  Hurricane
-  Other Wind
-  Multiple/Unspecified

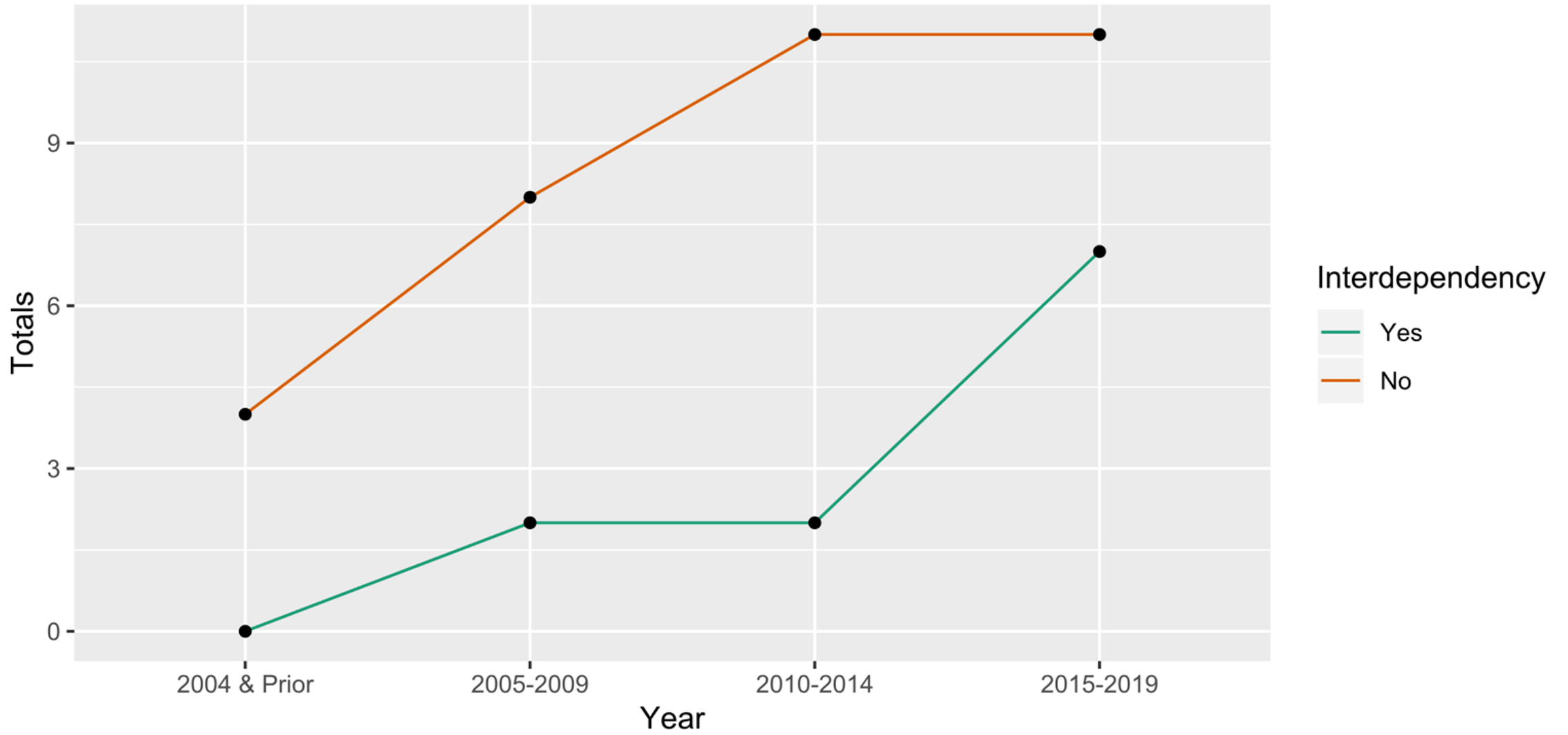
## Data Breakdown By Interdependency



### Interdependency

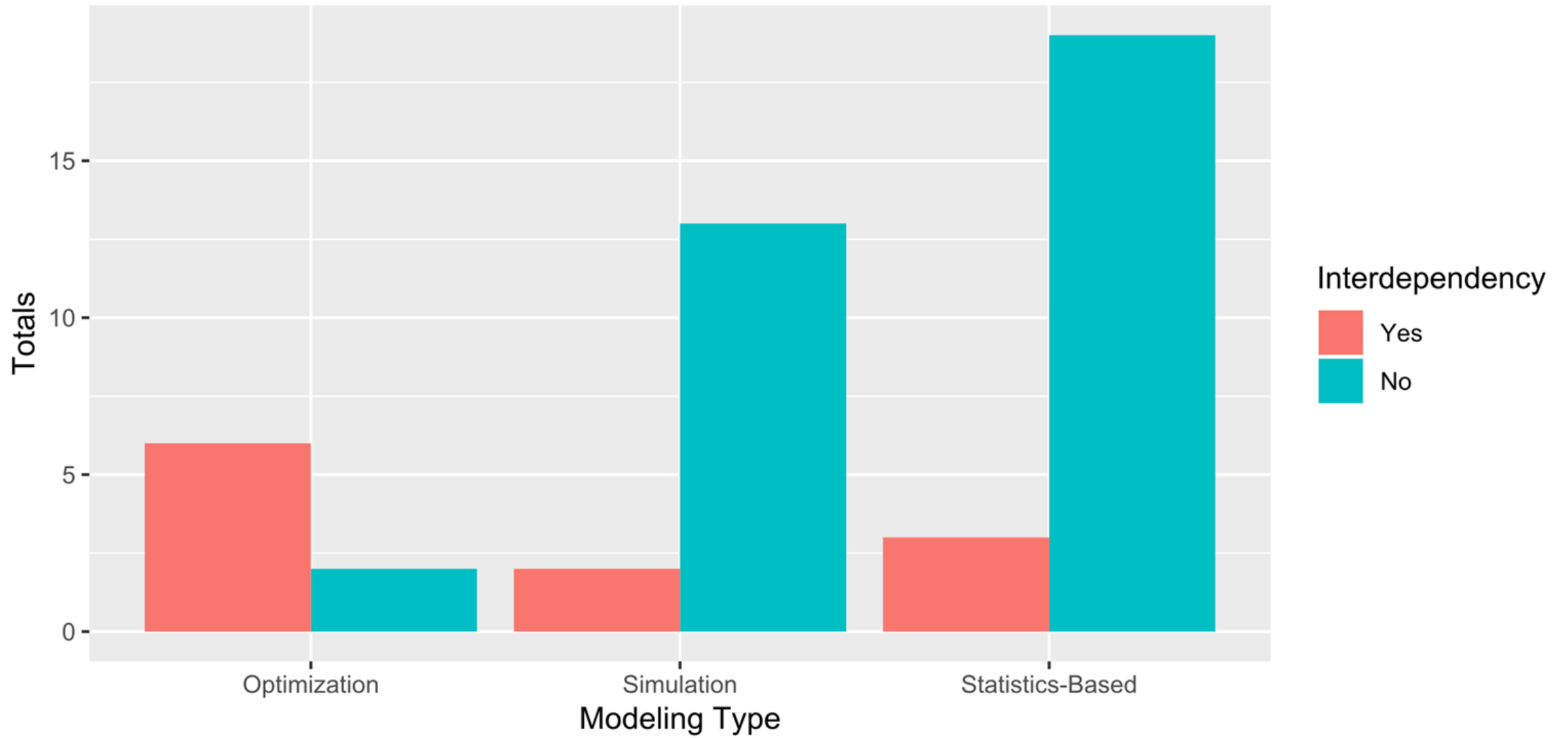


# Interdependency Inclusion Over Time

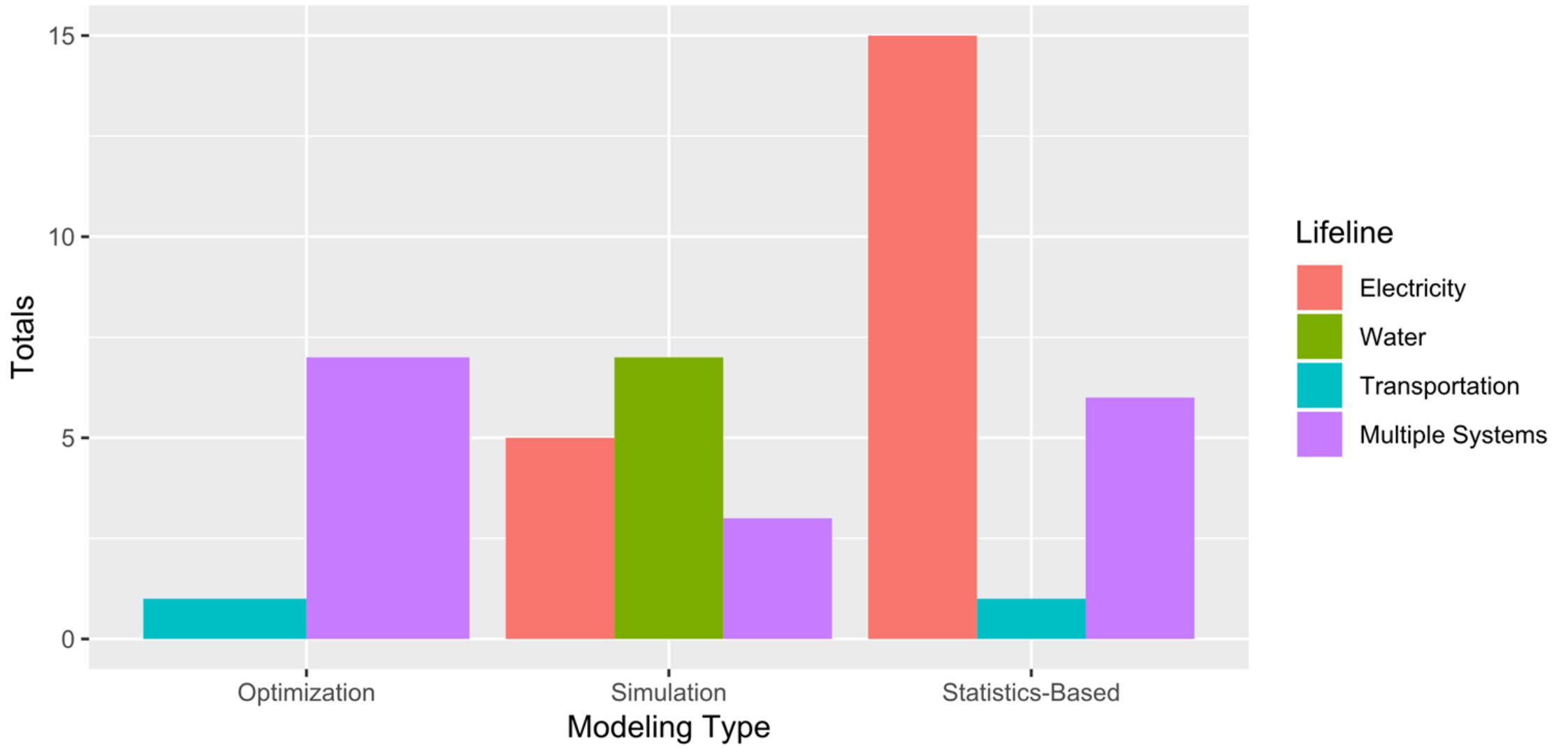




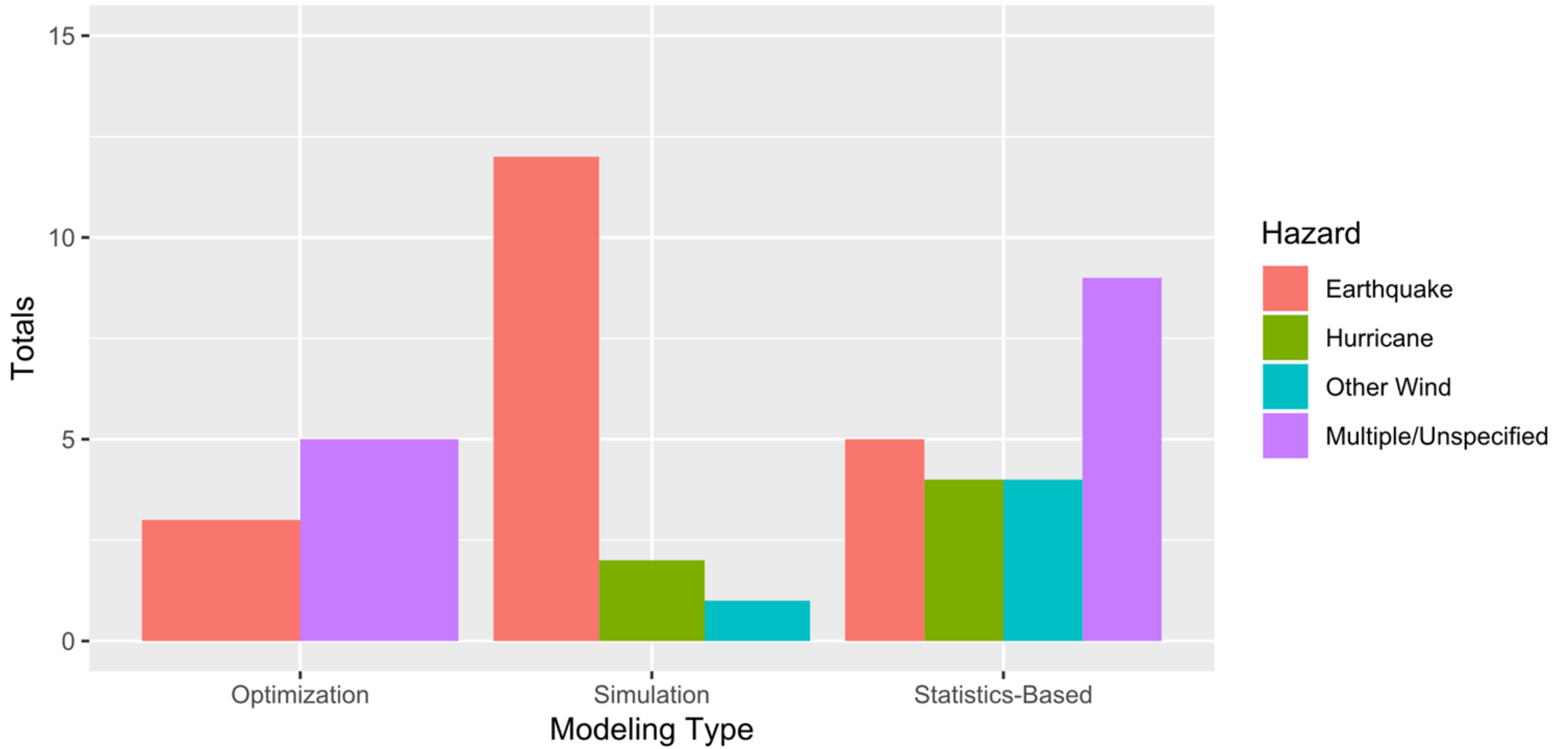
# Interdependency by Modeling Type



# Lifeline by Modeling Type



# Hazard by Modeling Type



Loggins, R., Little, R. G., Mitchell, J., Sharkey, T., & Wallace, W. A. (2019). CRISIS: Modeling the restoration of interdependent civil and social infrastructure systems following an extreme event. *Natural Hazards Review*, 20(3), 04019004.

- Customizable Artificial Community (CLARC) County
- Challenges with lifeline data
  - Time-consuming & expensive data collection
  - Security concerns on vulnerability data
- Model evaluation by subject-matter experts

## Last thoughts

- How can we use empirical data to (partially) validate modeling results on testbeds?
- How would other researchers use the models?
- How would practitioners use the models or findings?

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