

Causal Impact of India's COVID-19 Vaccination Rollout on National Mortality

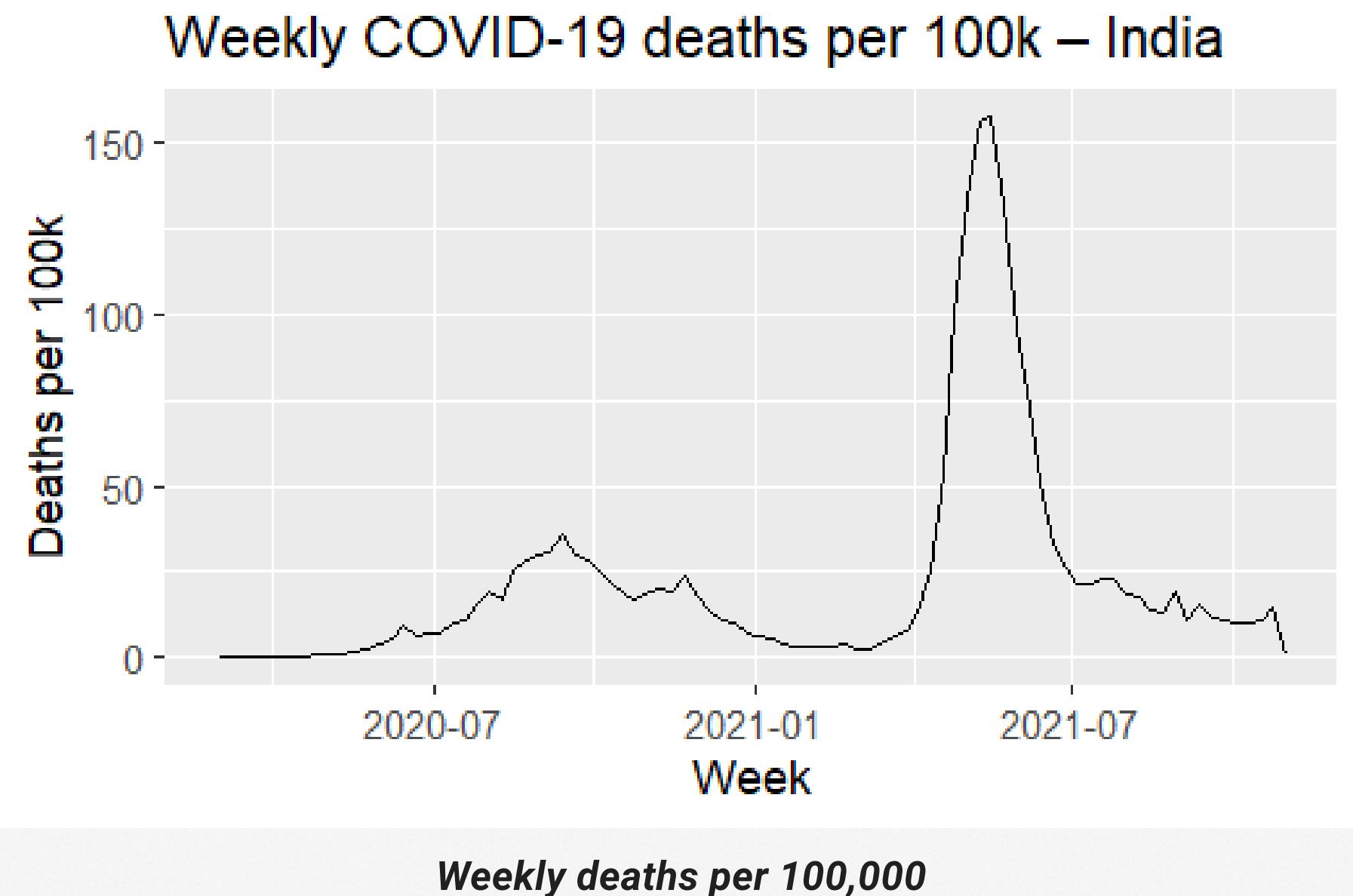


Presented by
Gaurav Mahajan



Data and Cleaning

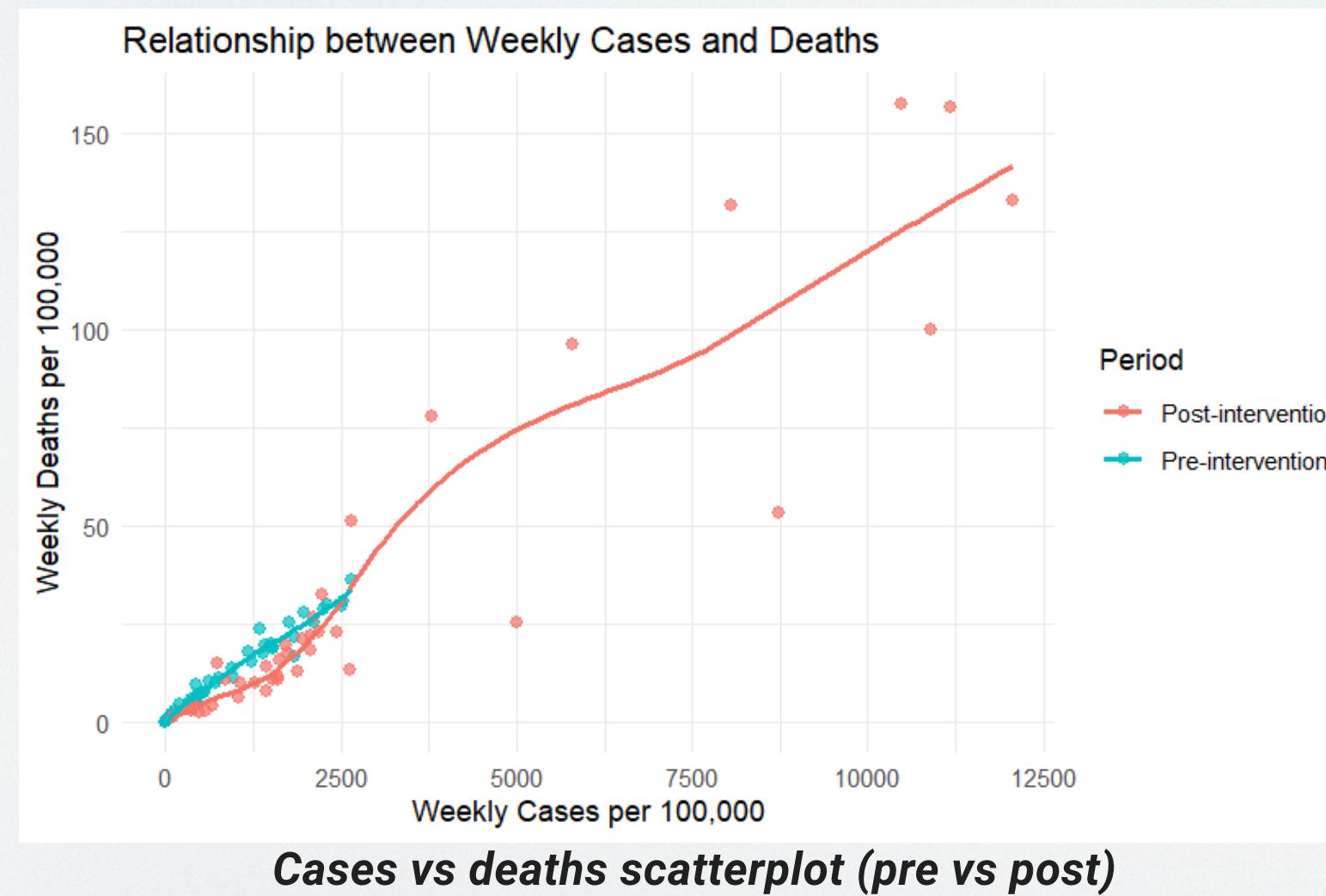
- **Dataset**
- COVID-19 Data Hub
- State-level ($20,998 \times 47$)
- India, 2020–2022
-
- **Cleaning**
- Corrected backfilled cumulative counts
- Handled structural missingness
- Transformed daily → weekly metrics
- Scaled all indicators per 100,000
-



Exploratory Patterns & Modeling

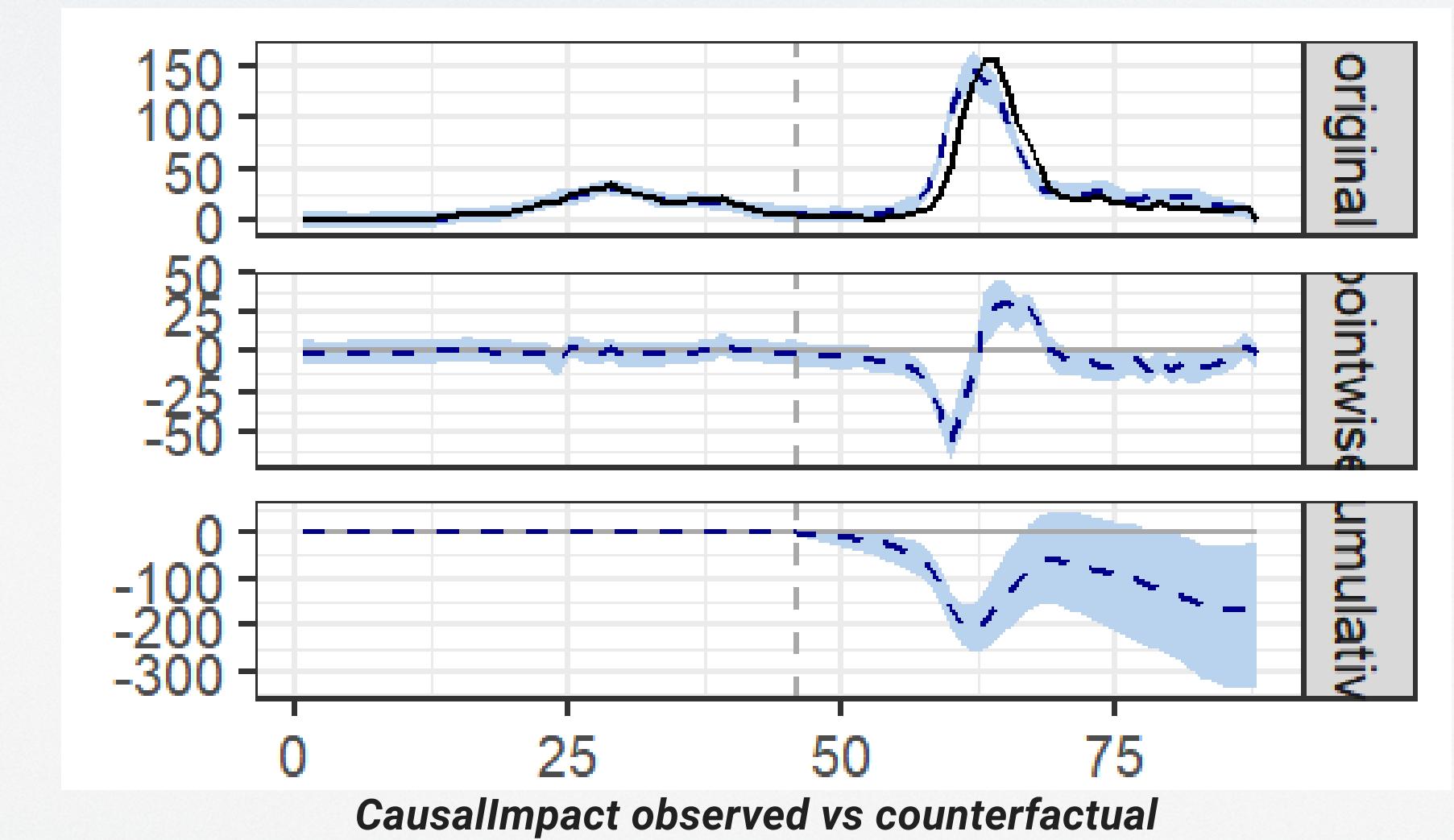
Exploratory Findings

- Strong case–fatality coupling before vaccination
- Clear decoupling afterward



Model

- Bayesian Structural Time Series (CausalImpact)
- Outcome: Weekly deaths per 100k
- Covariates: Cases, testing, stringency



Results and Conclusion

Causal Impact Results

- Observed mean: 32.5 / 100k
- Counterfactual: 36.4 / 100k
- Average causal effect: $-3.9 / 100k$ per week
- Cumulative effect: $-165 / 100k$

Conclusion

- Vaccination causally reduced mortality in India
- Weakened the link between infections and severe outcome

