

# Signal versus Noise: Antibiotics, Endocarditis, and the NHS

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No conflicts of Interest



# The story so far

Mar 2008

Mar 2013

NICE recommends against antibiotic prophylaxis for endocarditis

Antibiotic prescriptions for endocarditis prophylaxis decline by 88%

420 additional hospitalizations and 18 additional deaths related to endocarditis a year compared with expectations from a historical trajectory

## Interpreting observational analyses:

1. Is the association real?
2. Is the association causal?
3. What are the implications?



# Q1. Is the observed association real?

## For

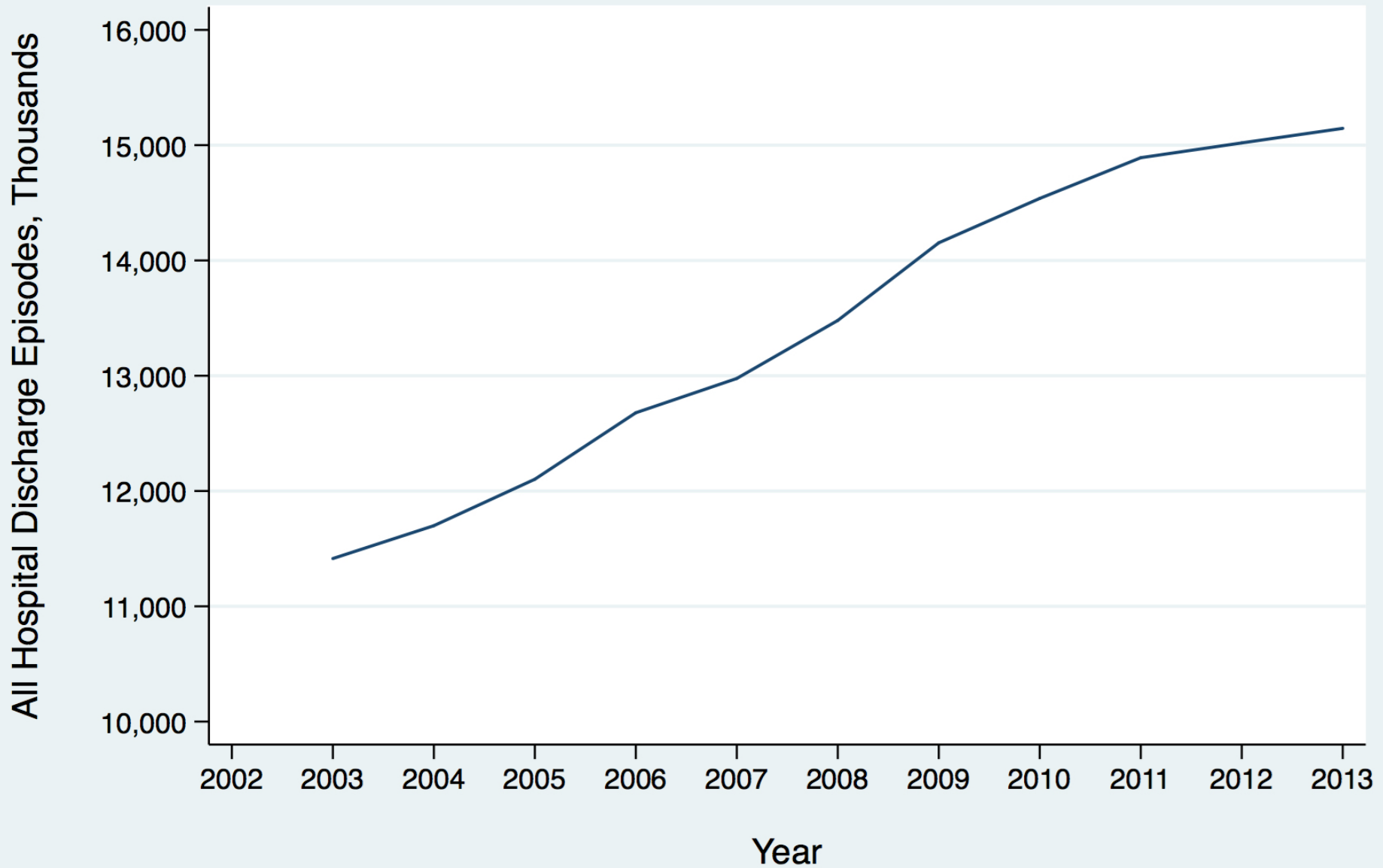
- Nation-wide database with stable coding patterns
- Temporal association

## Against

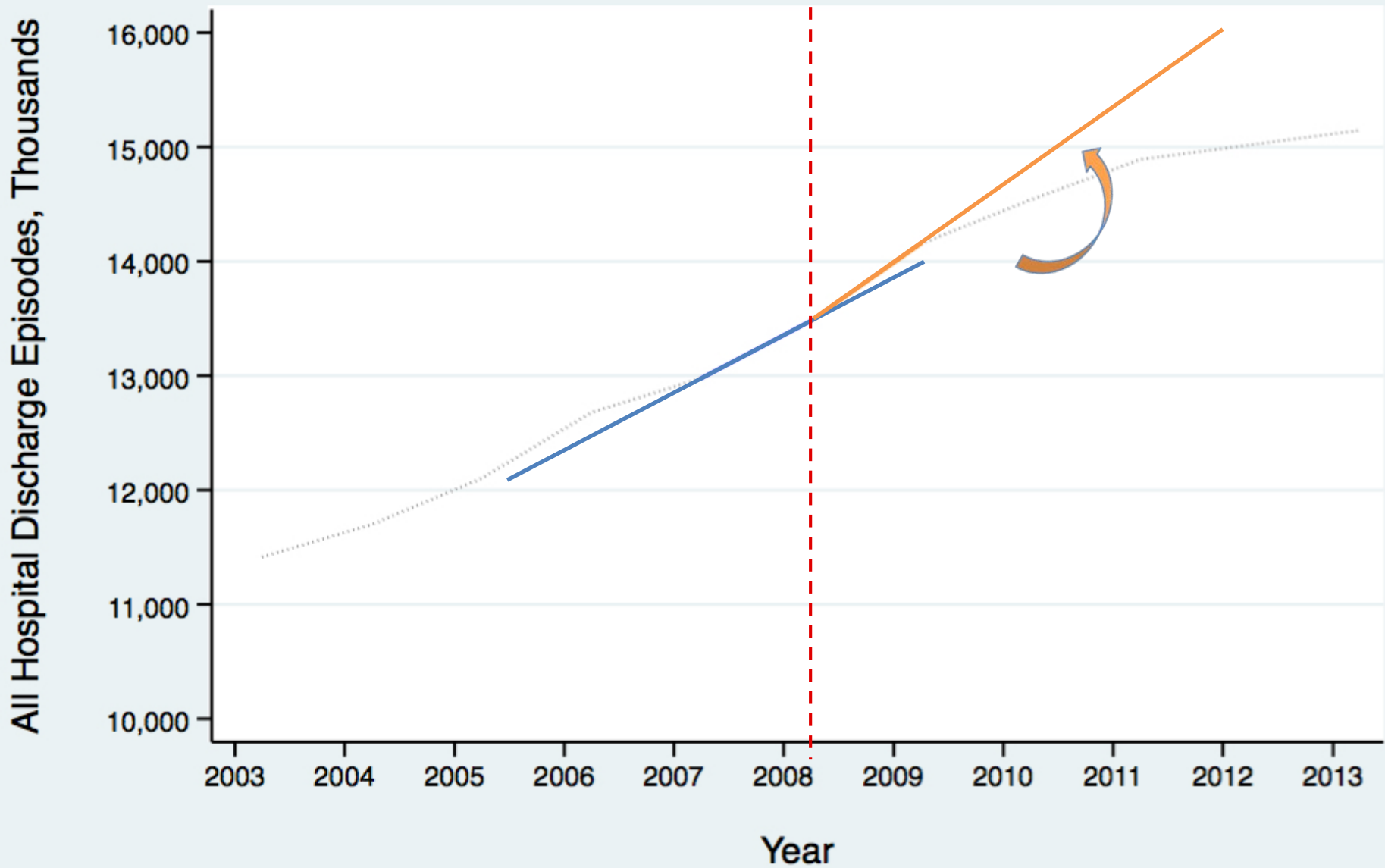
- Absence of a contemporaneous control
- Imperfect adjustment for secular trends:
  - Population estimates
  - Hospitalization rates



# NHS Hospitalizations (England, 2002-2013)

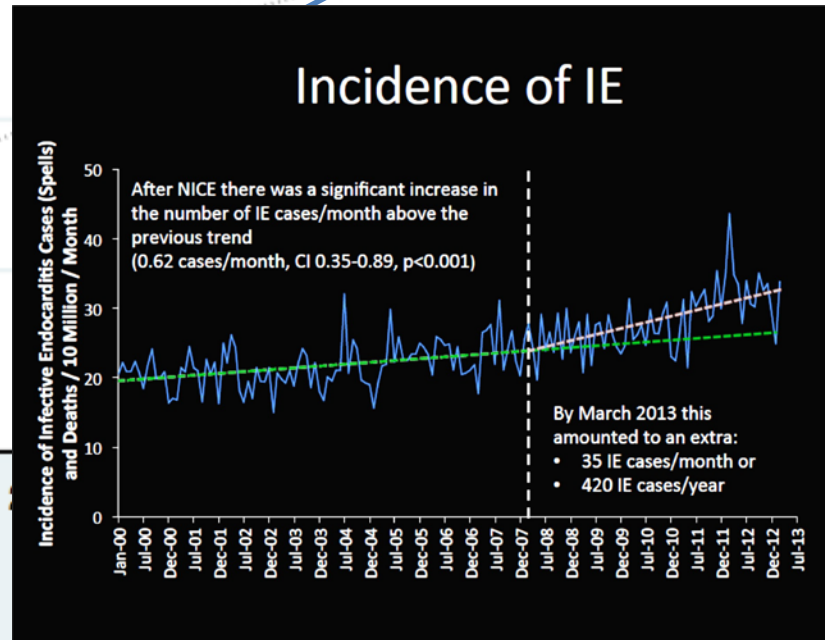
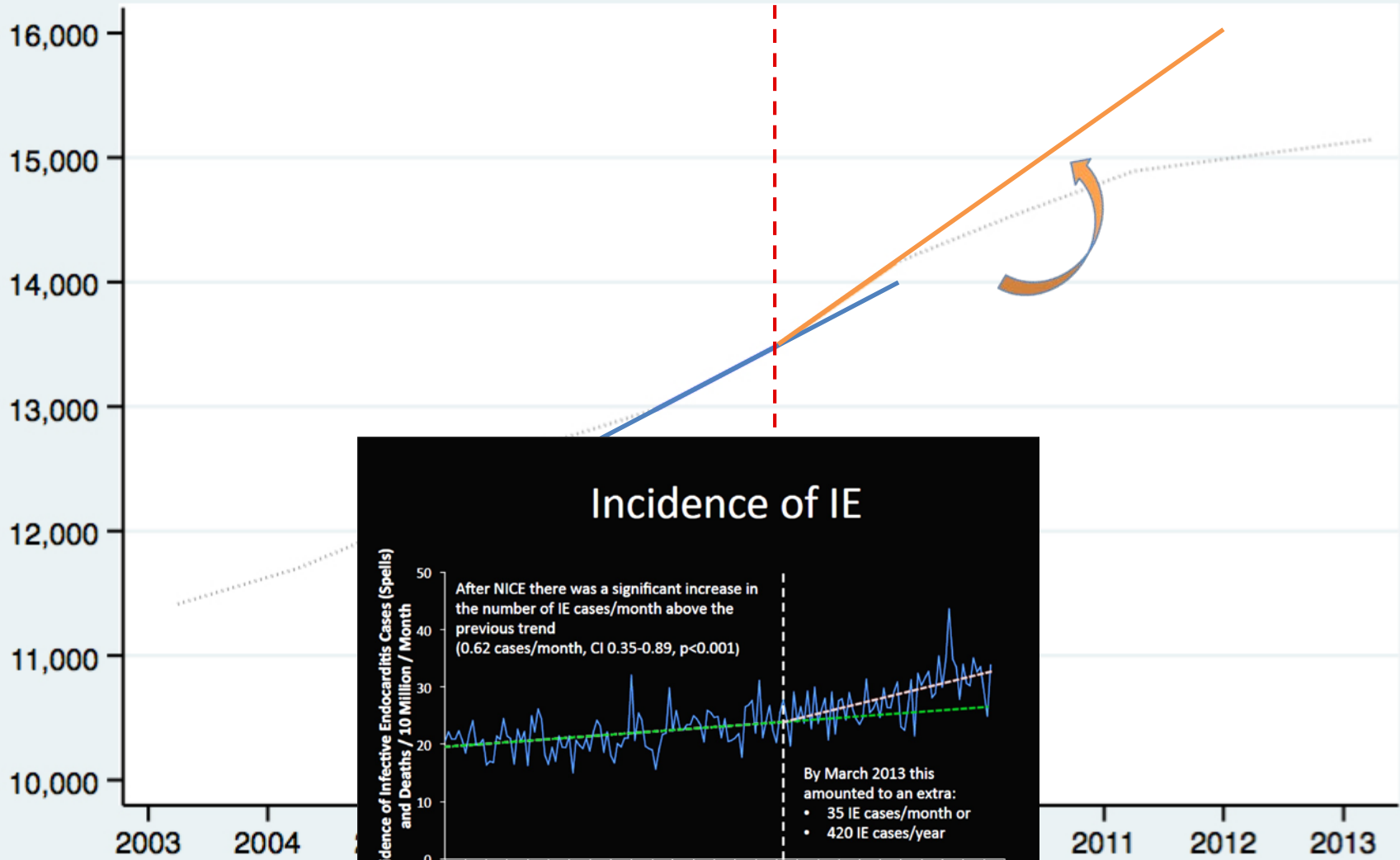


# All NHS Hospitalizations (England, 2003-13)



# All NHS Hospitalizations (England, 2003-13)

All Hospital Discharge Episodes, Thousands



## Q2. Is the observed association causal?

### For

- Biologic plausibility:
  - Fewer antibiotics → More endocarditis

### Against

- No rise in endocarditis noted in other settings
  - US adults <sup>1</sup>
  - US children <sup>2</sup>
- Case fatality = 4.3%  
(18 additional deaths/420 cases)

<sup>1</sup> Bor, et al. PLoS ONE 8(3):e60033

<sup>2</sup> Pascuali, et al. Am Heart J . 2012 May ; 163(5): 894–899



## Q3. What are the implications?

- Additional analyses before these data can inform guidelines:
  - Endocarditis rates to all-cause hospitalizations
  - Temporal or geographic variation (is there a dose-response curve?)
  - Bacteriology
- As presented, these data are inadequate to alter the weight of evidence on which the prophylaxis guidelines are based, and should not prompt changes in prescribing practice at this time.





Thank You!

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