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Outline

Introduction

Motivation

- worries about level/growth healthcare expenditures
- demand side cost sharing contains expend.
- currently 385 euros mandatory deductible in NL
- trade off demand side cost-sharing:
  - lower expenditures
  - higher out-of-pocket for "sick" people
- find *form* of demand side cost sharing to alleviate this trade off?

forms of cost sharing

- popular with Dutch policy makers:
  - deductible
  - co-payment (say 25%)
  - shifted deductible ("donut")
- CPB is supposed to "predict" healthcare expenditures under different schemes

Literature

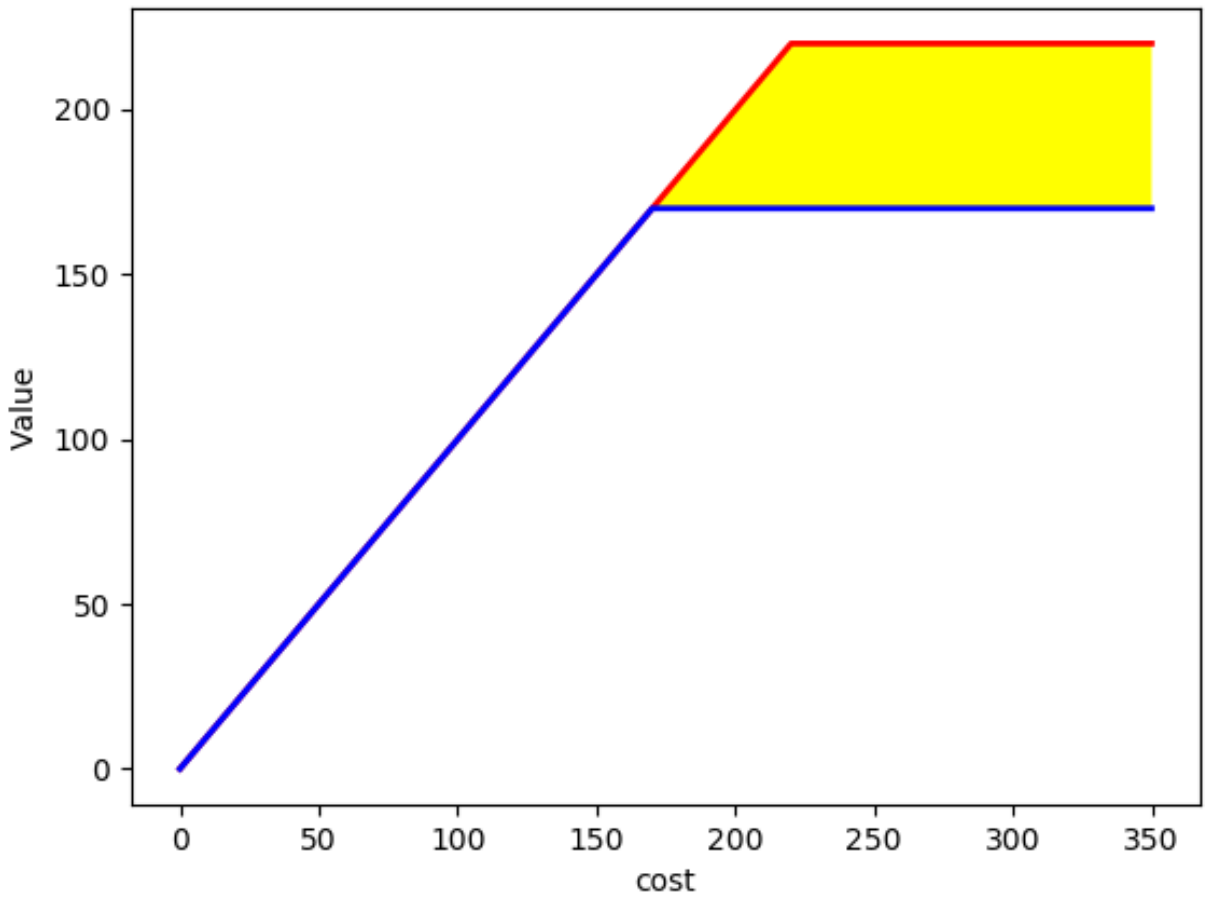
Modeling healthcare expenditures

- Einav et al. (2013)
- Hayen et al. (2019)
- Remmerswaal et al. (2019)

Model

Simple model

- one treatment per period: cost and value



Data

Dutch healthcare expenditure

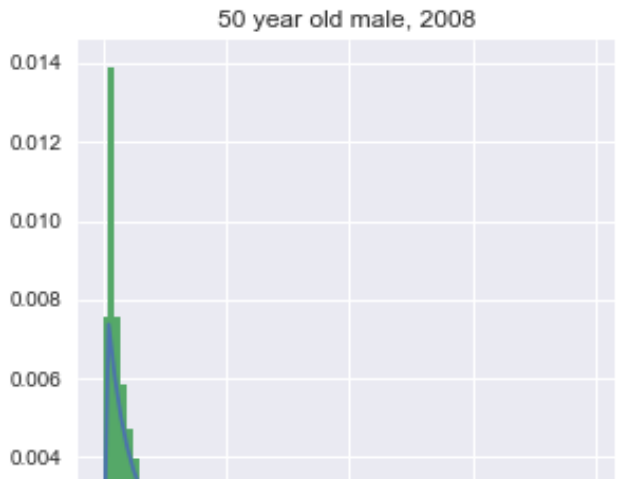
- expenditures per individual for 2008-2013
- we use indiv.'s age and gender
- later add income, indicators for health status
- expenditures are for basic insurance under the deductible (e.g. not GP)
- basic insurance is mandatory in the Netherlands
- coverage is set by the government
- we ignore people with voluntary deductible (for the moment)
- deductible "kicks in" at 18

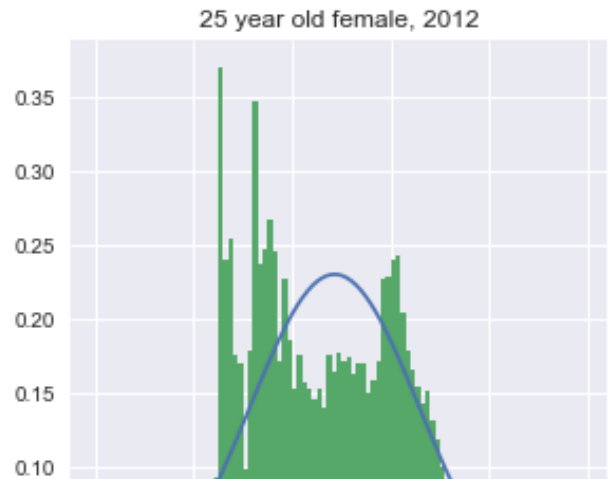
Estimation

Parametric specification

- "everybody knows" that healthcare expenditures are log-normally distributed:
  - log transformation of positive healthcare costs are normally distributed
  - we model the propability of zero healthcare costs
  - benefits of log-normal distribution:
    - analytical expression for OOP with deductible (estimation)
    - analytical expression for distribution of $x + y$

Two distributions





Fit

How to measure fit

- not obvious how to measure the fit of the model
- we can compare:
  - average expenditure per age-gender category (fit vs validation data)
  - expenditure distributions per age-gender categories
  - predicted vs realized (validation) zero-expenditures per category

Fit on average (log) costs by age and year: Men

Fit on average (log) costs by age and year: Women

Expenditure distributions

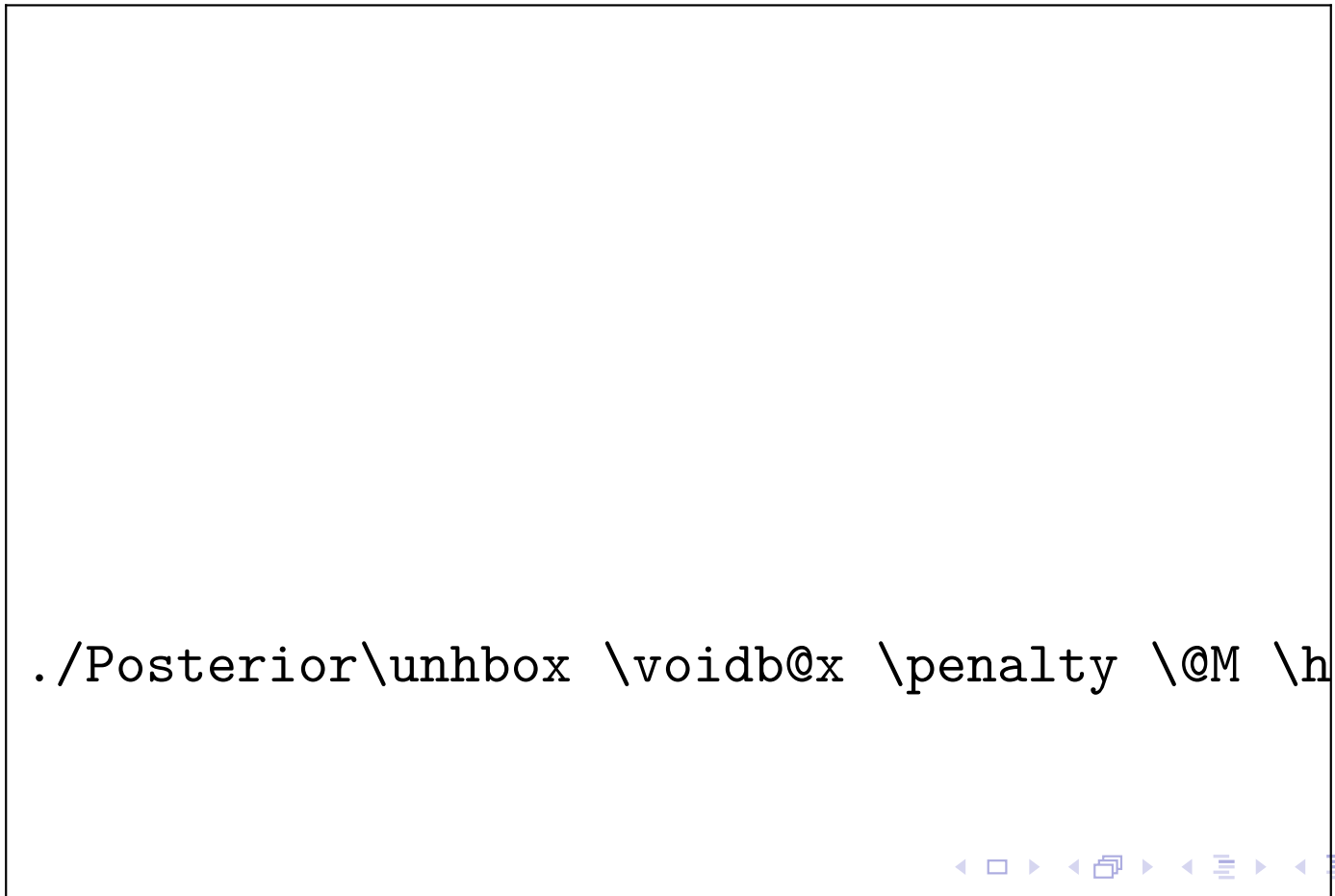
_healthy_Male.png

Simulations

Samples

- we use $F(OOP) = 1 - \zeta e^{-\nu OOP}$
- is the estimate for ν "significant"?

_nu_y_healthy_Female.png



Conclusion

Summary

- in order to determine healthcare expenditures under different cost sharing schemes:
  - we estimated the distributions of healthcare expenditures
  - split expenditures up in exogenous and endogenous expenditures

Summary (cont)

- determined expected OOP for endogenous expenditures under different schemes
- estimate the value distribution of these endog. expenditures
- the higher OOP, the more likely an (endogenous) treatment is rejected
- allows us to simulate effects of different *schemes*

Policy recommendations

- Bayesian analysis allows us to: