

# Demographic Response to Economic Crisis: Yesterday and Today

Ronald Lee  
University of California at Berkeley  
ALAP,  
November 18, 2010

Trabajo presentado en el IV Congreso Internacional de la Asociación Latinoamericana de Población (ALAP), La Habana, Cuba, 16 al 19 de noviembre de 2010.

# Plan of my talk

- I will summarize estimates from demographic history
  - Time series analysis of aggregate data
  - Micro analysis of household registers
- I will finish by summarizing some studies of the modern world.

# Historical studies: Aggregate time series

- A long tradition in historical demography
  - Statistical time series analysis of fertility and mortality.
- Economic variables used
  - Food prices
  - Real wages
  - GDP per capita
  - Unemployment rate
- We remove the level and trend in the variables and look only at variations or fluctuations around the trend.
- Study effects of **all** economic variations,
  - large or small, positive or negative
  - Not just the worst ones that we might call “crises”.
- Results are similar to historical studies of individual episodes of terrible famines (Dyson IUSSP volume).

# Impact of crisis on *fertility*: What pattern do we expect to see?

- In year of the economic shock, the effect will be small because there is a lag between conception and birth (but depends on abortions).
- In the following year, the negative effect will be biggest.
- In year after that, more women than usual will be ready to give birth, including those who postponed in previous year.

Results are “elasticities” by year  
since economic shock

$$\text{Elasticity} = \frac{\% \text{ Change in Fertility}}{\% \text{ Change in Real Income}}$$

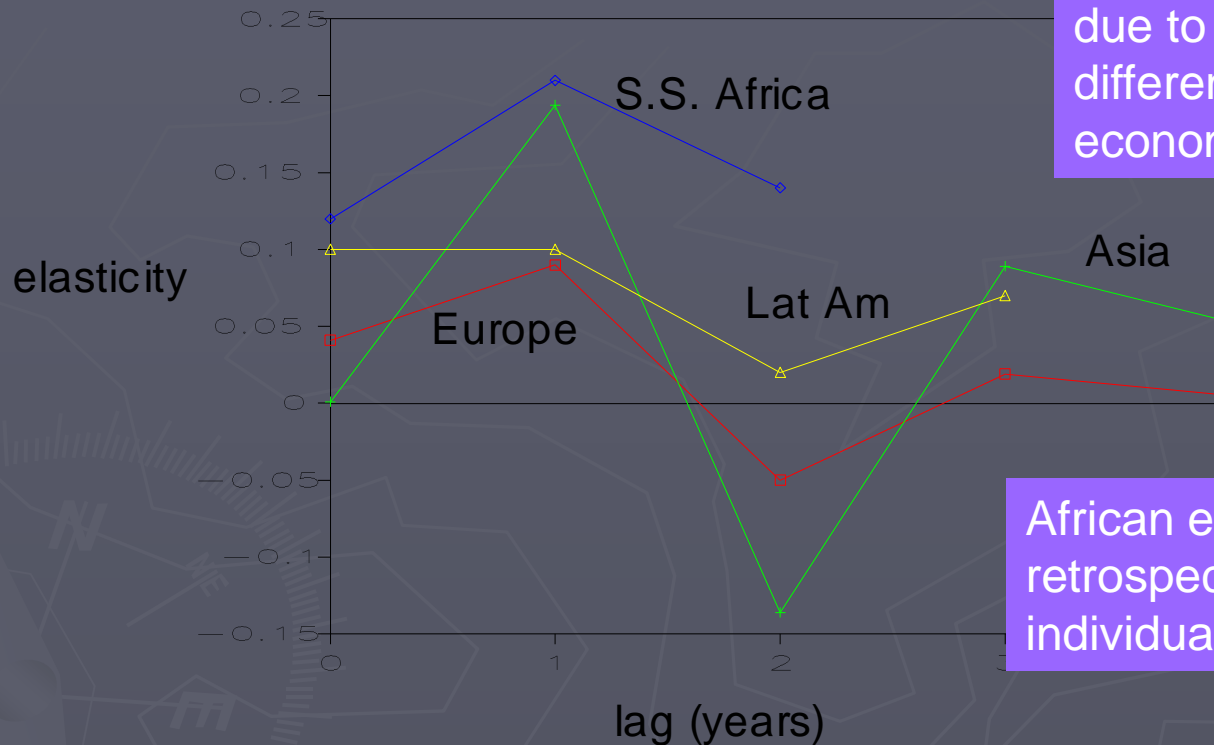
Elasticity is estimated for year of shock, one year after, two years, three years and four years after.

In next slide, the shock is ***positive***, that is, it is an unusually good year. Just take negative for a bad year.

# The Response of Fertility to Real Income Variations by Lag for Four Regions: Median Elasticity from Sets of Studies

All regions except Latin America show a small effect at lag 0.

Is large Latin American effect due to abortion? Or due to different definition of the economic year?



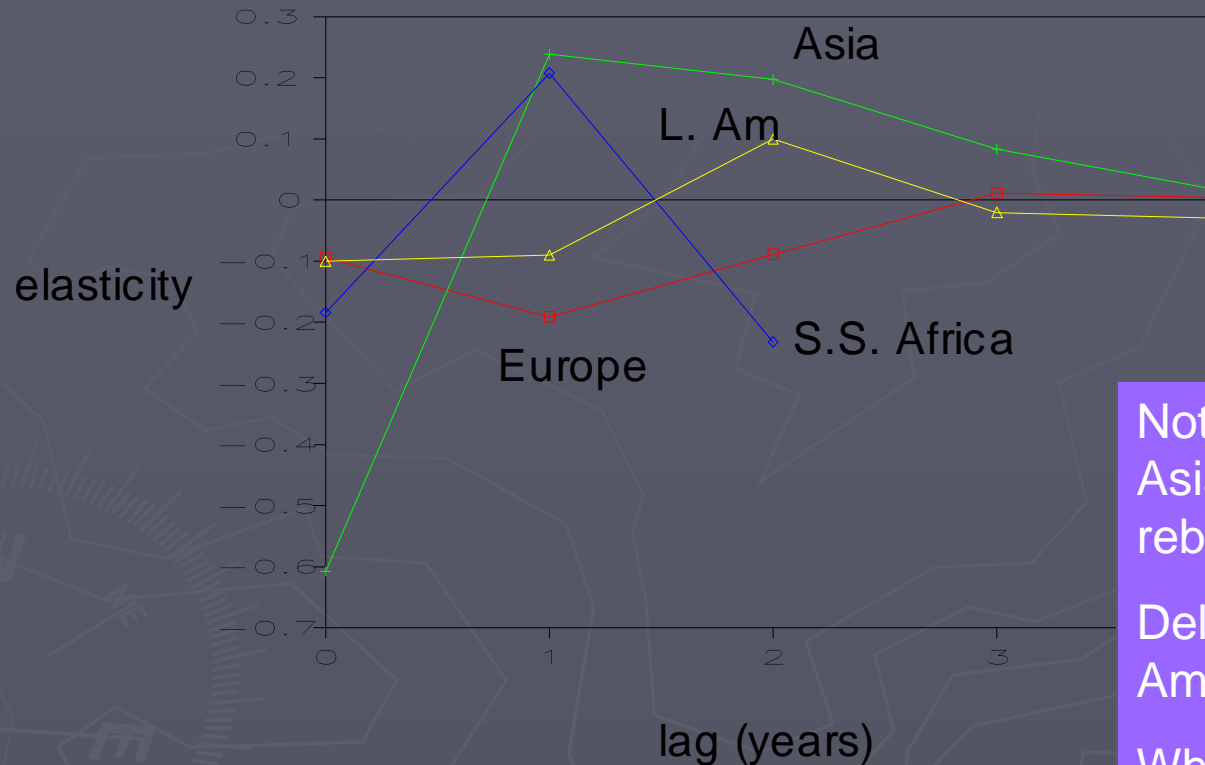
African estimates use retrospective DHS data, so individual level.

- ▶ Medians of many studies for each region. Converted to elasticities.
- ▶ Europe (Galloway, 1988); SS Africa (Hill and Foster, 1993); Asia (Lee, 1990); Latin America (Reher and Ortega-Osona, 1992).

# Impact of crisis on *mortality*

- Some effects might be immediate, but others might be delayed.
- What pattern do we expect to see?
  - Are the effects on health immediate or are they delayed?
  - Is there a rebound, when there are fewer deaths than usual?

# The Response of Mortality to Real Income Variation by Lag for Four Regions: Median Elasticity from Sets of Studies



Note the huge impact in Asia, followed by a huge rebound.

Delayed pattern in Latin America and Europe.

Why so much delay?

- ▶ Medians of many studies for each region. Converted to elasticities.
- ▶ Europe (Galloway, 1988); SS Africa (Hill and Foster, 1993); Asia (Lee, 1990); Latin America (Palloni and Hill, 1992).



# Do all these lagged effects cancel out?

- We sum the estimated responses from year 0 to year 4 to get the “cumulated response”, or total effect.
- If total is zero, it all cancels out.

## Cumulative Elasticities of Fertility and Mortality with Respect to Real Incomes: Median Values for Sets of Studies For Four Regions

	Fertility	Mortality
Preindustrial Europe (14)	+.12	-.15
Asia (7)	+.26	-.19
Latin America (9)	+.31	-.20
subSaharan Africa (7)	+.32	-.30

- Some studies use macro time series, some are micro.
- Number in parenthesis after region is the number of country studies used to find the median.

# Historical studies: Micro level from historical household registers

- More recently, some historical demographers use microdata on individuals and households from household registers.

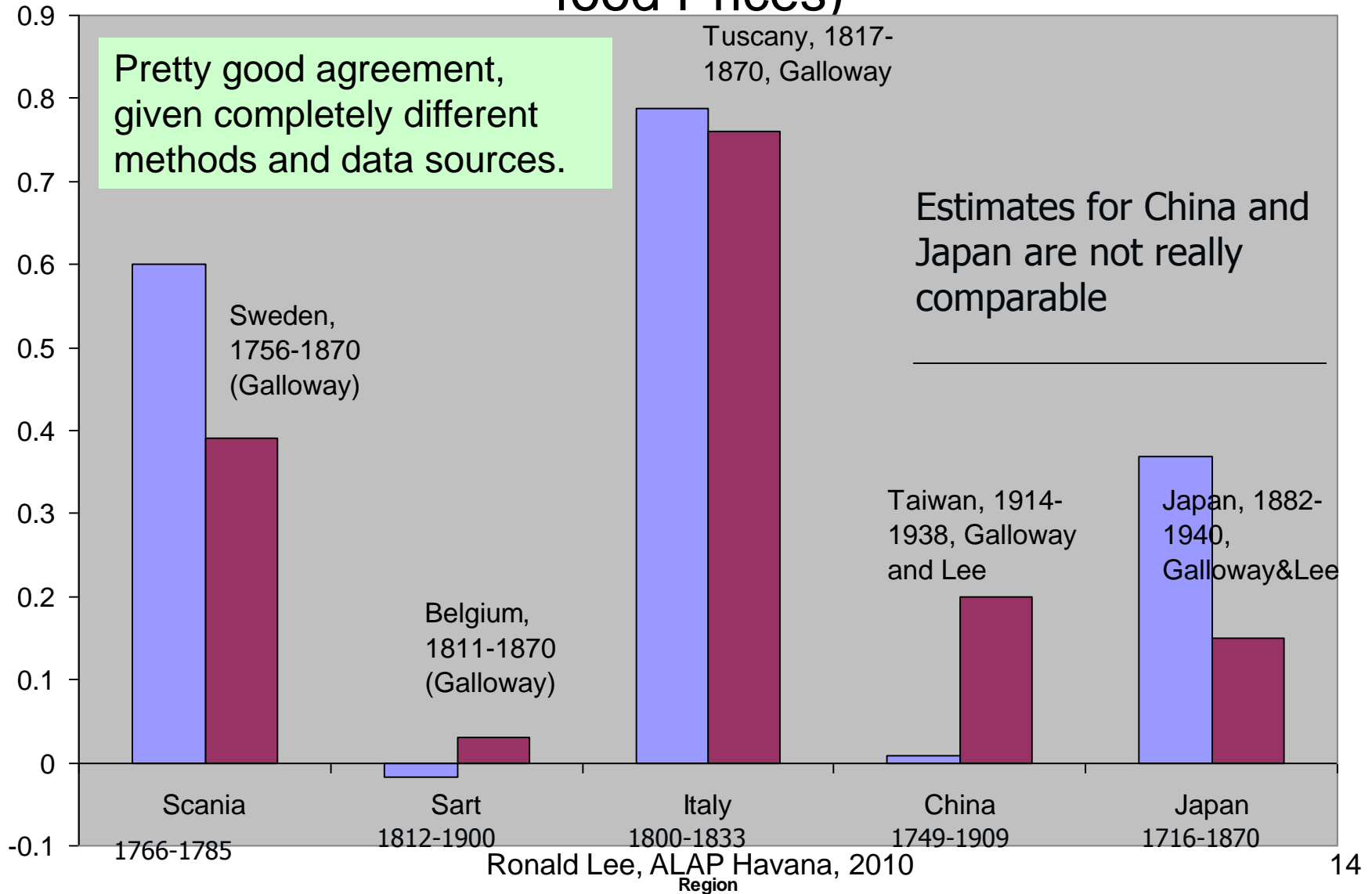
# The EurAsian Study: *Life Under Pressure*, by Bengtsson et al

- Detailed studies by country teams in China, Japan, Belgium, Sweden, Italy.
- Response of mortality to food price variations.
- Interesting details.

First, compare the results from these micro studies to the aggregate time series results.

Next slide shows the cumulative elasticities (total effects).

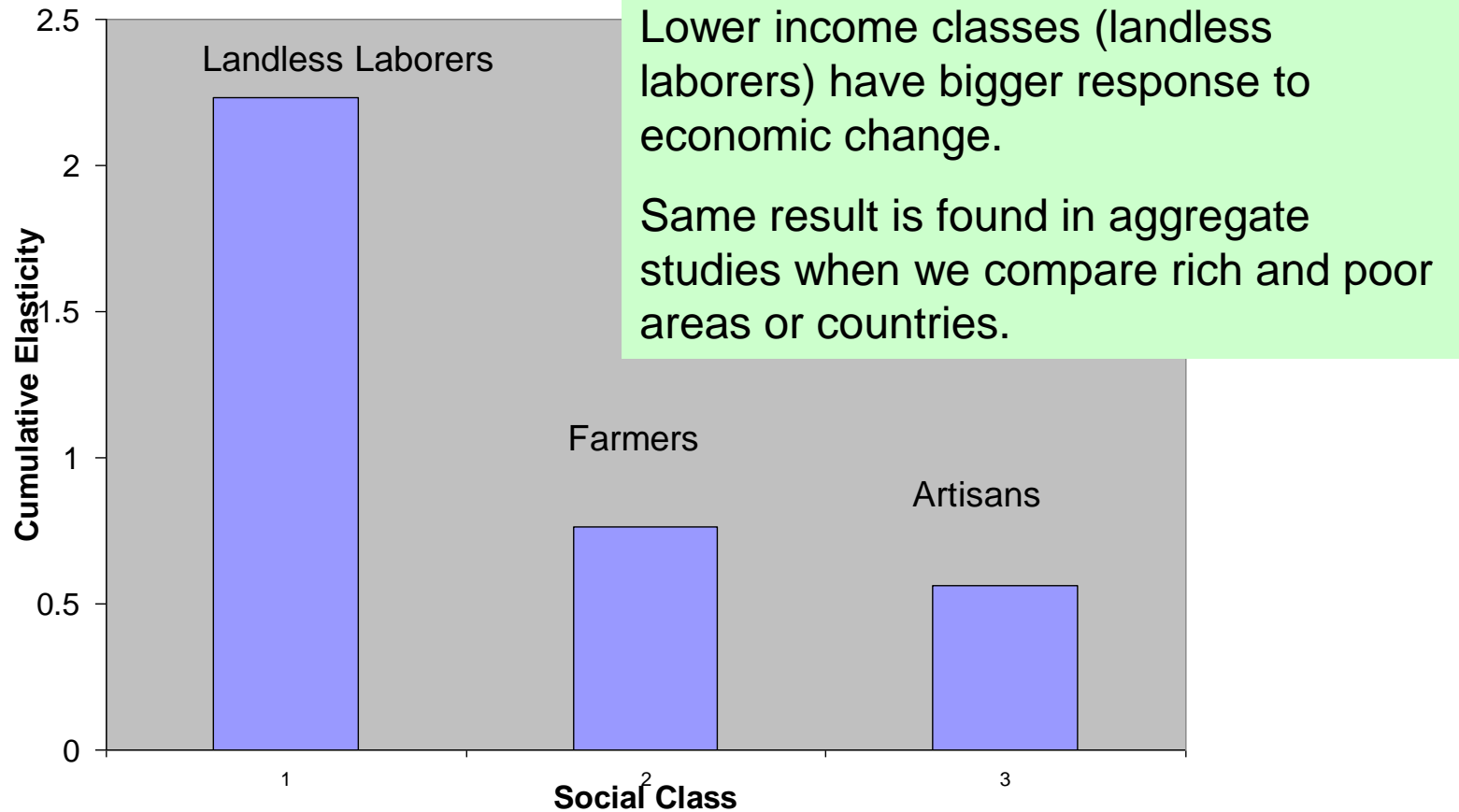
# Comparison of Micro Estimates and Aggregate Time Series Estimates (Elasticity of mortality with respect to food Prices)



# Conclusions from these comparisons

- Reassuring that *Life Under Pressure* estimates are highly consistent with aggregate time series ests for European populations
  - Very different statistical methods
  - Very different demographic data
- LUP estimates add rich detail to the existing aggregate analysis, rather than contradicting it.

# How Price Sensitivity Varies by Social Class (Elasticity of Mortality of Adults, Averaged across community and sex)

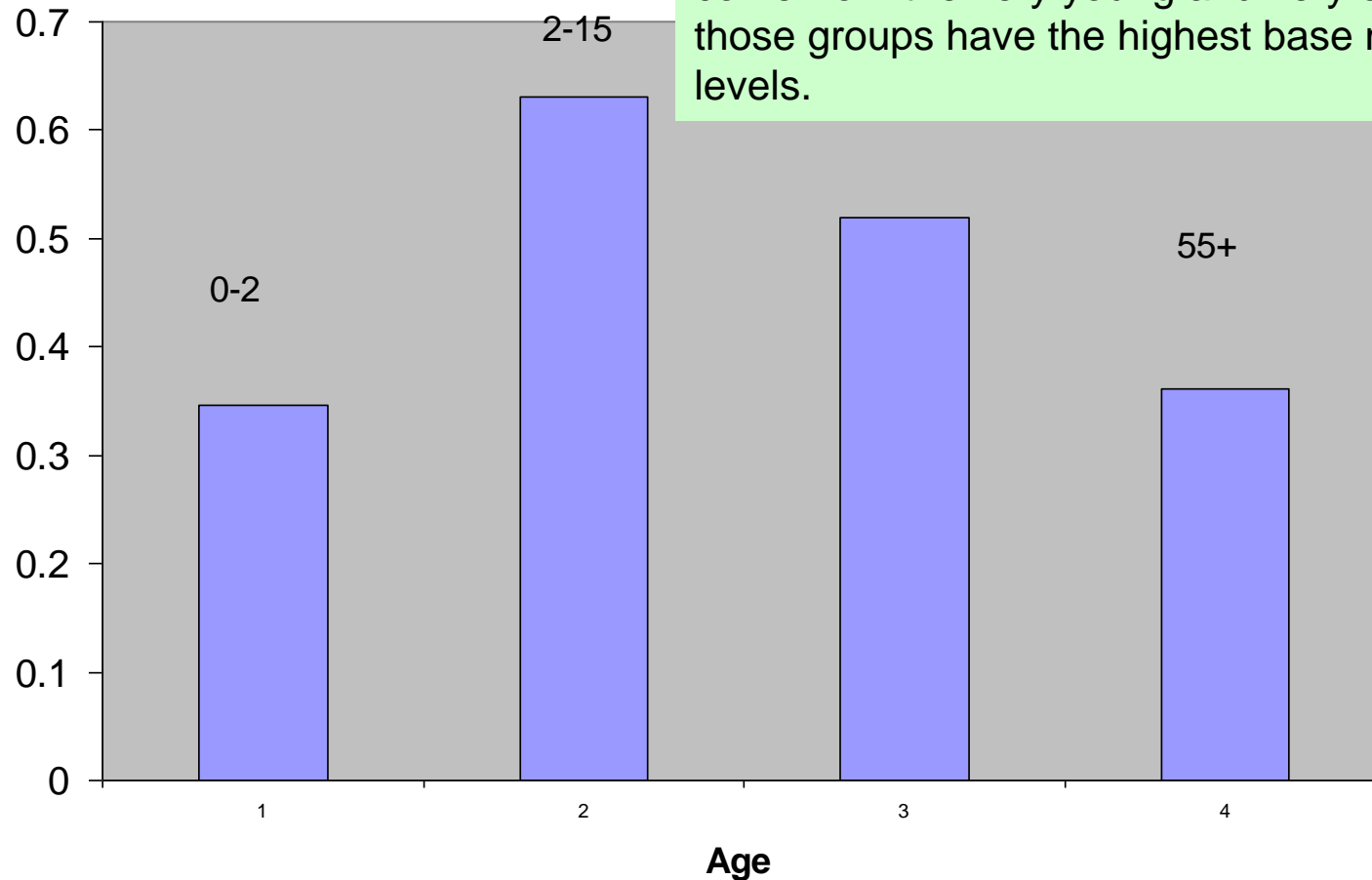




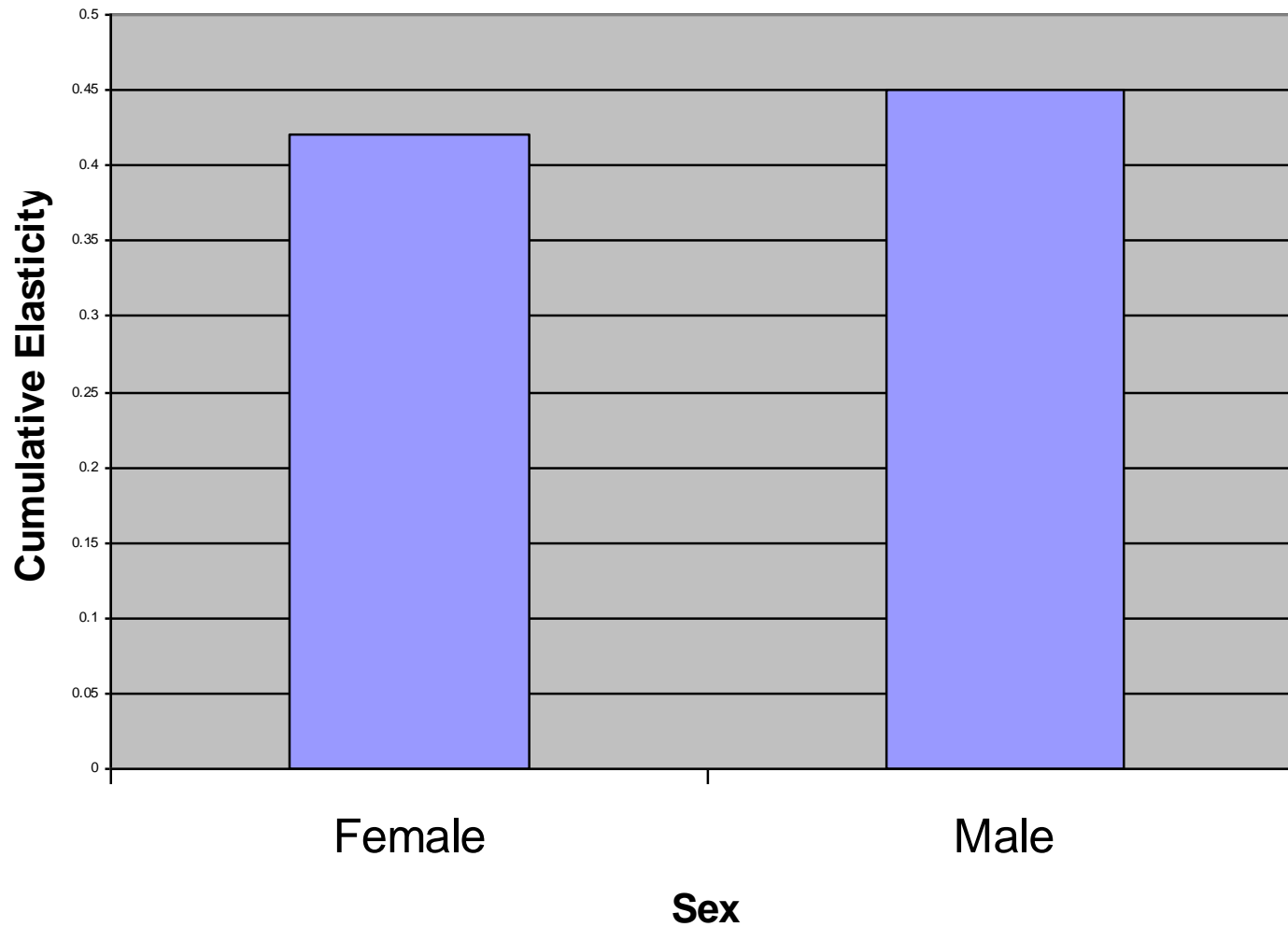
# Elasticities of Mortality with respect to Food Prices, by Age, averaged across sex and local study

These elasticities are all relative to base level.

The greatest number of new deaths would still come from the very young and very old, because those groups have the highest base mortality levels.



**Sex difference in cumulative elasticity of response of mortality to food prices (averages across five countries and all ages)**



# Mortality and Economic Downturns

## ***Today*** (in the US, at least)

- Careful recent studies in the US have found that mortality is ***lower*** during bad economic times! (Ruhm, various papers)
- How possible? unemployed people experience
  - experience many hardships
  - stress that damages their health
  - may fall into poverty,
  - lose their health insurance
  - perhaps lose their homes.

# But...in recessions people

- Have healthier behaviors
  - Smoke less
  - Drink less
  - Lose weight, become less obese
  - Exercise more
  - Drive less so have fewer accidents
  - Experience less air pollution
- Ruhm finds that a one percentage point increase in a state's unemployment rate is associated with a 0.54% *reduction* in that state's mortality rates.

# Other research on US finds that mortality of individuals rises soon after they receive government payments

- Social Security checks
- Military pay checks
- US income tax rebates
- Similar others

# Does mortality really fall in recessions?

- It seems to be true in the US.
- Might it be true elsewhere?
  - Perhaps true in rich societies with few people at very low levels of consumption
  - Probably not true in really poor countries
  - Uncertain about middle income countries.

# How does fertility respond to economic crisis today?

- Very few studies.
- Some argue that in modern world with high female labor force participation
  - a recession reduces the opportunity cost of childbearing for women
  - this leads to higher fertility in a crisis
- I am not persuaded by the evidence.

# Argentina economic crisis of 2002

- This crisis led to lower birth weights by 30 grams, on average.
- Births for about 6 months were affected.
- Particularly affected babies born to mothers of low socioeconomic status.
- This low birth weight may affect the babies' health for the rest of their lives.



- In the past, and in poor countries today, economic crises were lethal.
  - Fertility fell
  - Mortality rose
  - Both followed general patterns of response and rebound
- Today in rich states with social safety nets economic crises and job losses may still be traumatic for individuals, but
  - The overall effect may reduce mortality by protecting us from our worst excesses
  - Not so clear what the effect on fertility may be

**END**