

# Economic spillover effects of HIV treatment on rural South African households and communities

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# Outline

- **Background**

- Study site and empirical approach
- Household members' labor supply
- Household assets
- Human capital investment
- Discussion

# Evaluating the economic effects of ART

## I. What we know...

- ART delays morbidity and mortality of people with HIV, and
- ART enables HIV patients to work
  - Bor, et al. 2012; Thirumurthy et al. 2008, 2011; Rosen et al 2008, 2010; Habyarimana et al 2010; Larson et al. 2008, 2009

## II. Where evidence is limited...

- Impact of ART on household and community welfare
- Reallocation of household resources
- Household = decision-making unit and safety net
- Only two studies: Thirumurthy et al 2008; Graff Zivin et al 2009

## III. Critical for understanding full welfare benefits of ART; design of clinical and social programs

# Household welfare

- HIV illness as a negative economic shocks for households
  - Treatment for opportunistic infections (Nachega et al. 2010)
  - Employment and income loss (Bor et al. 2012, Rosen et al. 2010, and others)
  - Family-based care (D'Adda et al. 2009)
  - Funerals (Case et al. 2008)
- Does ART enable households to avoid these losses?
- Even with ART...
  - Significant out of pocket health spending (Chimbindi et al. 2012)
  - Full recovery of incomes uncertain

# Household resource allocation

- How do households reallocate resources to adapt to health shocks and treatment?
  - Time can be spent in market labor, home production, or leisure
  - Money (from earnings or grants) can be consumed or invested
  - Context: formal credit markets inaccessible, informal credit expensive, low savings
- In response to HIV illness, other household members may
  - Work more, due to income loss (**income effect**)
  - Work more if person with HIV can take over home production tasks (**cross substitution effect**)
  - Work less, to care for person with HIV (**caregiving hypothesis**)
- ART may reverse these effects, but extent of reversal unclear

# Community life expectancy and human capital investment

- With increasing life expectancy following ART scale-up we would expect
  - Increasing investment in education (Kalemli-Ozcan et al. 2001; Jayachandran and Lleras-Muney 2008)
  - Increasing investment in health
  - Decreasing health risk behaviors

# Study questions

*What is the effect of ART on household and community welfare and resource allocation?*

- Labor supply
- Household assets
- Human capital investments (community life expectancy)

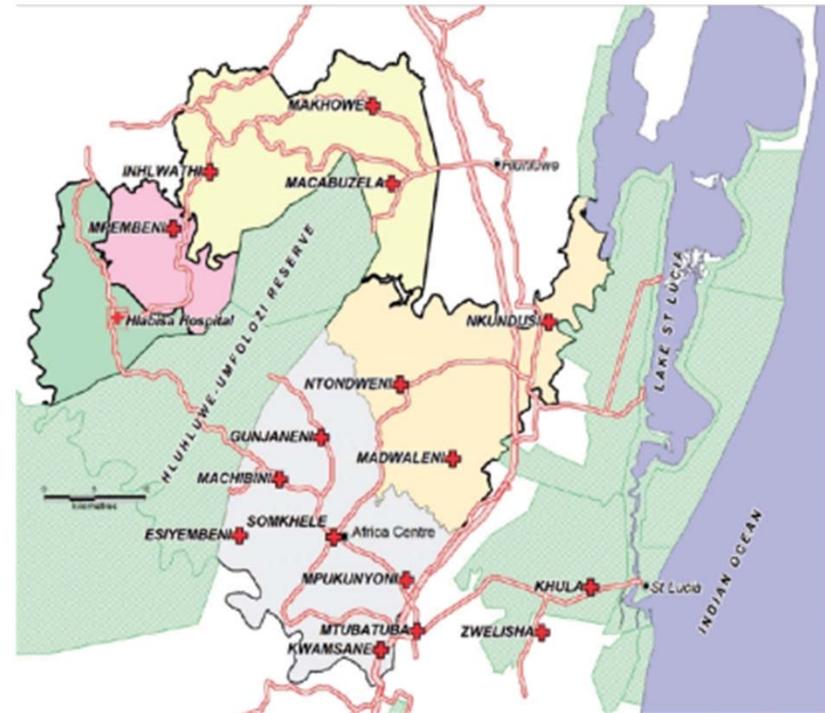
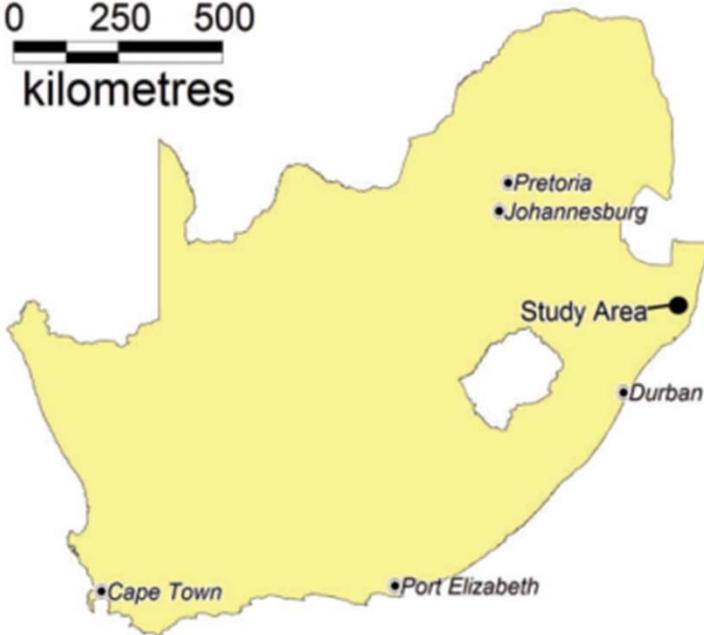
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# Africa Centre for Health and Population Studies (UKZN)

432 km<sup>2</sup> surveillance area

0 250 500  
kilometres

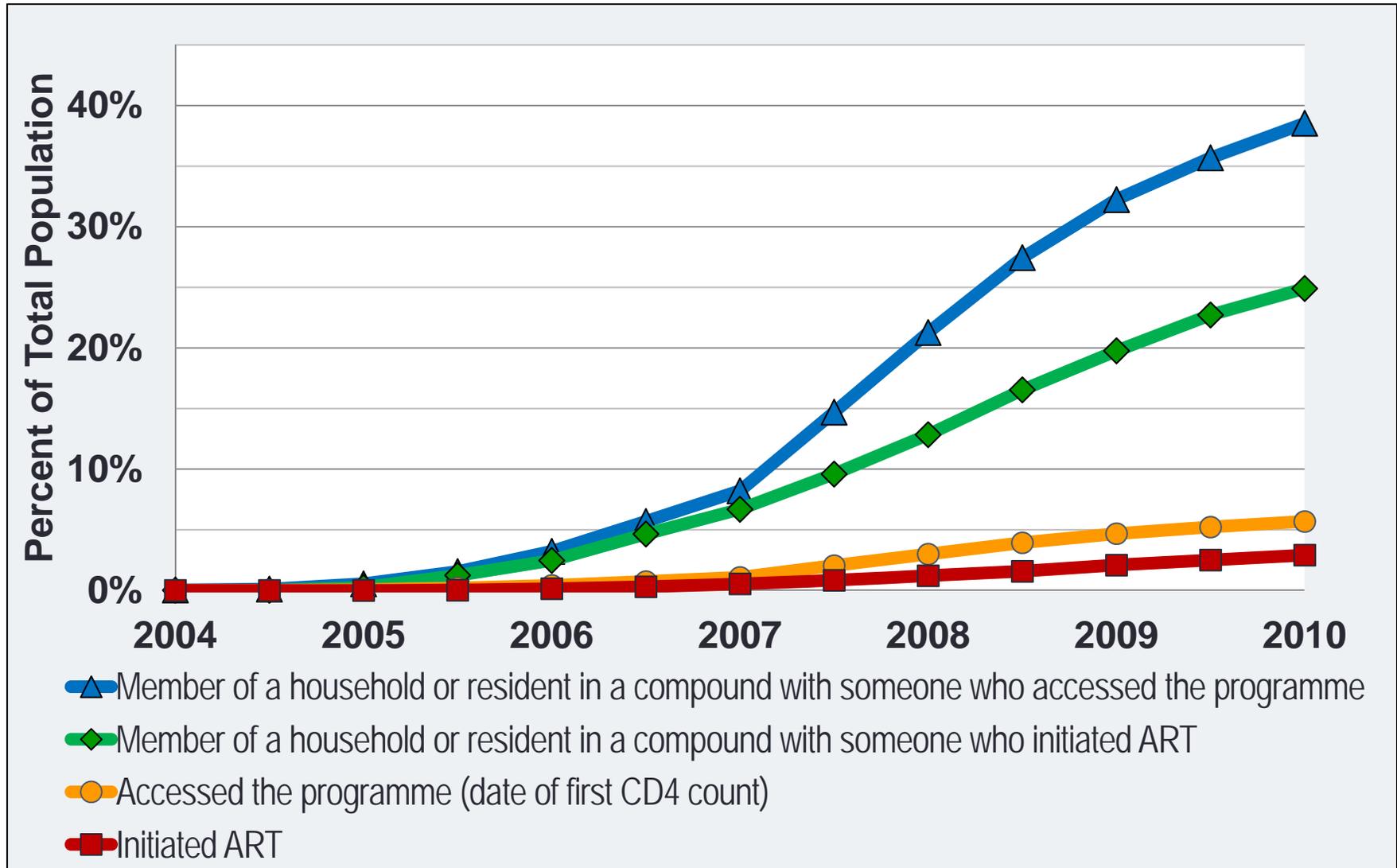


Source: Tanser et al. 2008, Houlihan et al. 2010

# Study site

- Africa Centre for Health and Population Studies
  - Community-based population surveillance system
    - 140,000 members, 2001-2010
    - 60,000 in residence at any given time
  - Multilevel data structure
    - Household membership
    - Place of residence
  - Annual socioeconomic surveys
- Hlabisa HIV Treatment and Care Programme
  - 2011, >8000 people sought care; 4490 had initiated ART
  - Treatment is “free” in the public sector

# 25% of population lives with ART patient



Adapted from Bor et al (2011) *TMIH*

# Empirical approach

- Individual level panel data
  - Repeated observations of economic outcomes
  - Individuals linked to all household members who initiated ART
  - Exposure of interest: *time since ART initiation*
  - Only first date of initiation in household included
  - People who initiated ART themselves excluded from analysis
- Linear probability models
  - Fixed effects for household member-ART initiator pairs
  - Controls for age, sex, education, year, month, day of visit and two- and three-way interaction effects
  - Standard errors clustered at household level

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# Household spillovers: employment

- Decline in employment for women prior to ART initiation
- Employment recovers, but slowly; no effect for men

Time since index person's ART initiation	Women	Men
Baseline (8-4 years pre initiation)	0.35	0.50
4-2 years pre initiation	0.003	0.011
2-0 years pre initiation	-0.022**	0.010
0-2 years post initiation	-0.018	0.011
2-4 years post initiation	-0.010	0.009
4-6 years post initiation	0.001	0.019
Observations	143,210	133,717
Individuals	35,274	33,076

Notes: Regression coefficients from fixed-effects linear probability model, \*\*  $p < .05$

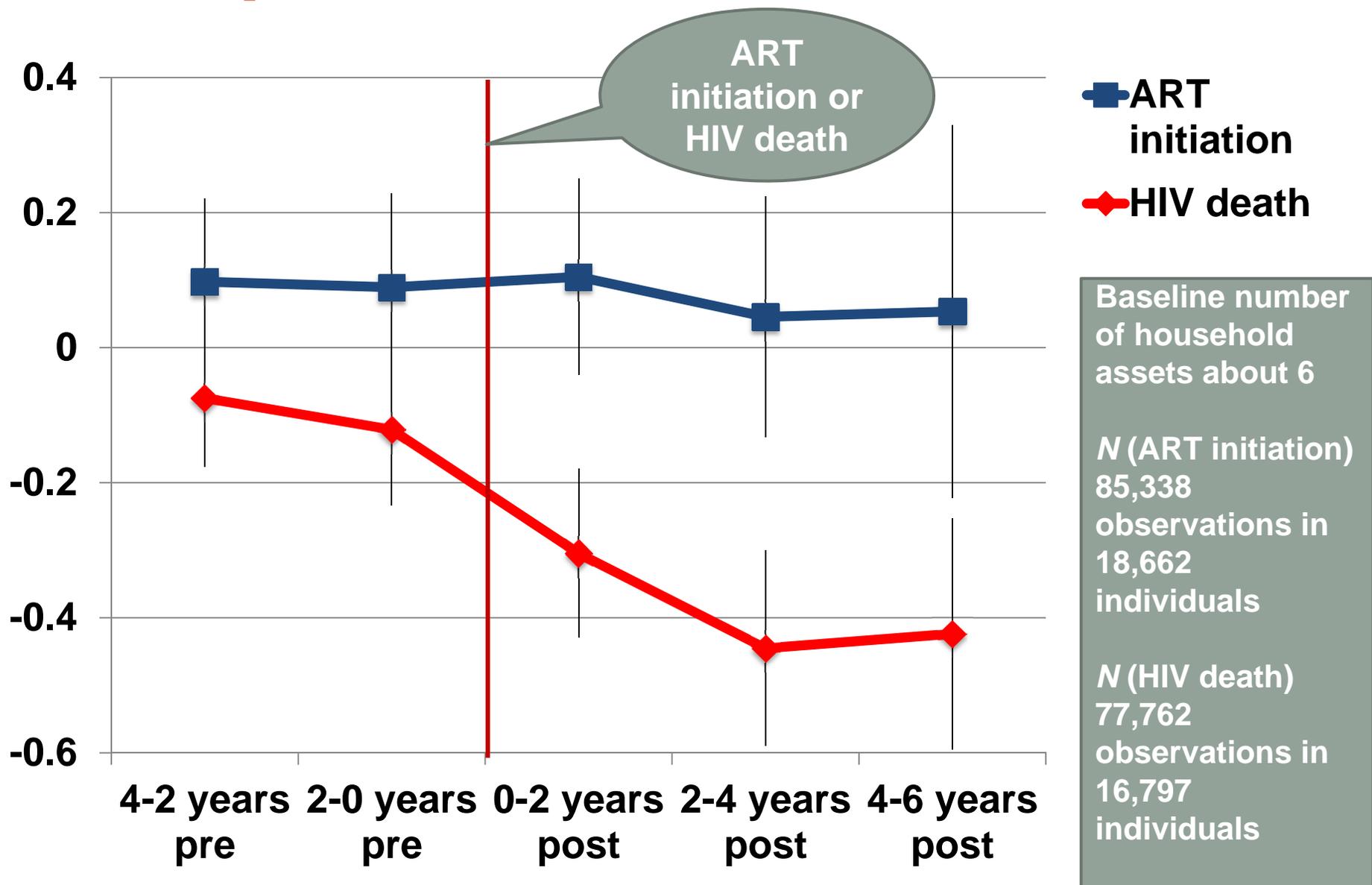
# Household spillovers: employment

- Evidence for **caregiving hypothesis** for women
  - Women have lower labor supply during a HH member's HIV illness
  - Employment recovers following ART initiation
- No evidence for **income** or **cross-substitution effects**
  - No evidence of temporary increase in labor supply as future ART patients become ill, incurs non-ART costs, and loses employment
  - No long run increases in labor supply due to ART costs or home production from ART patient
- Slack labor market in rural South Africa?
  - Changes in reservation wage may have little impact for unemployed and must be very large to affect the employed

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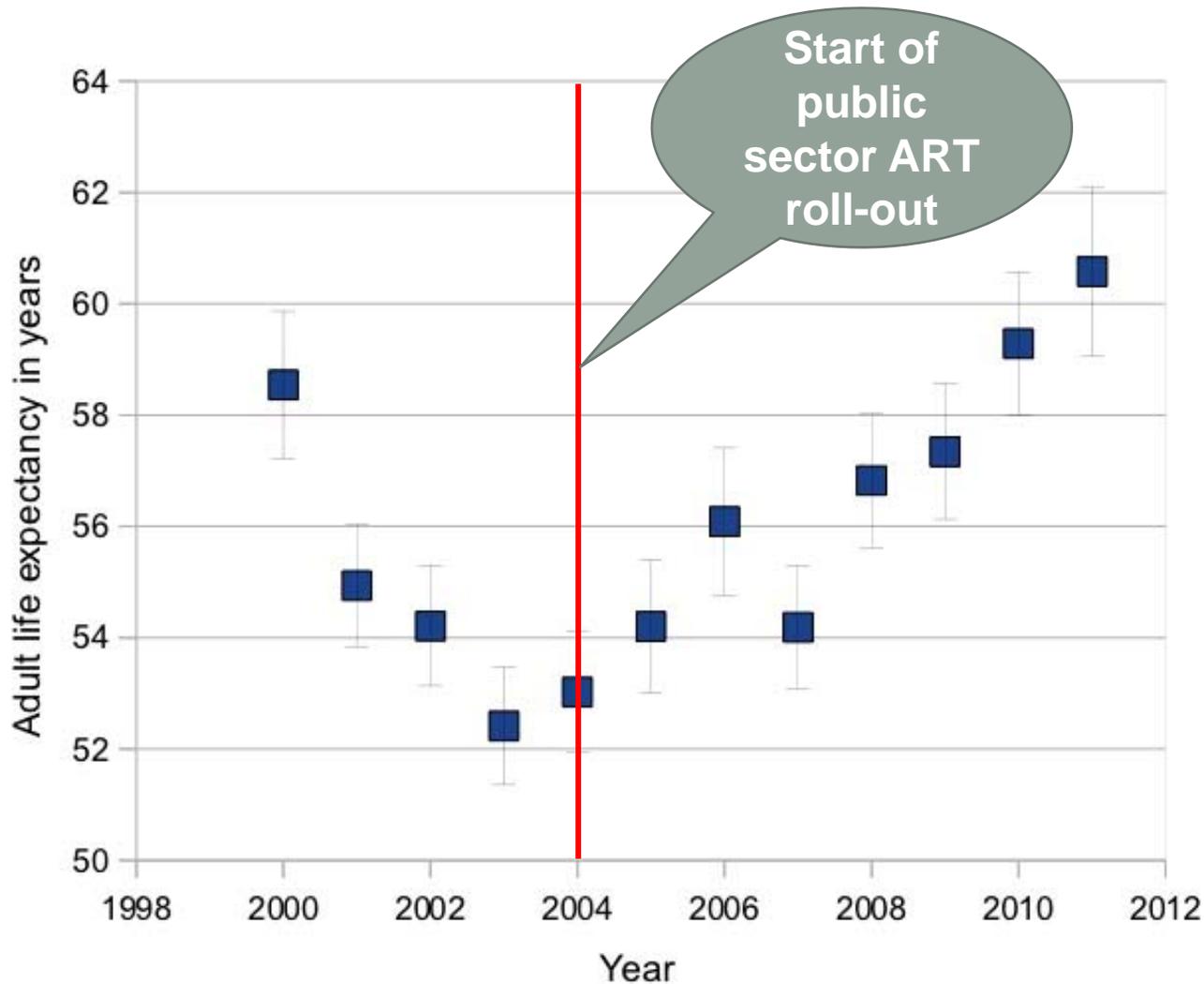
# ART protects household assets



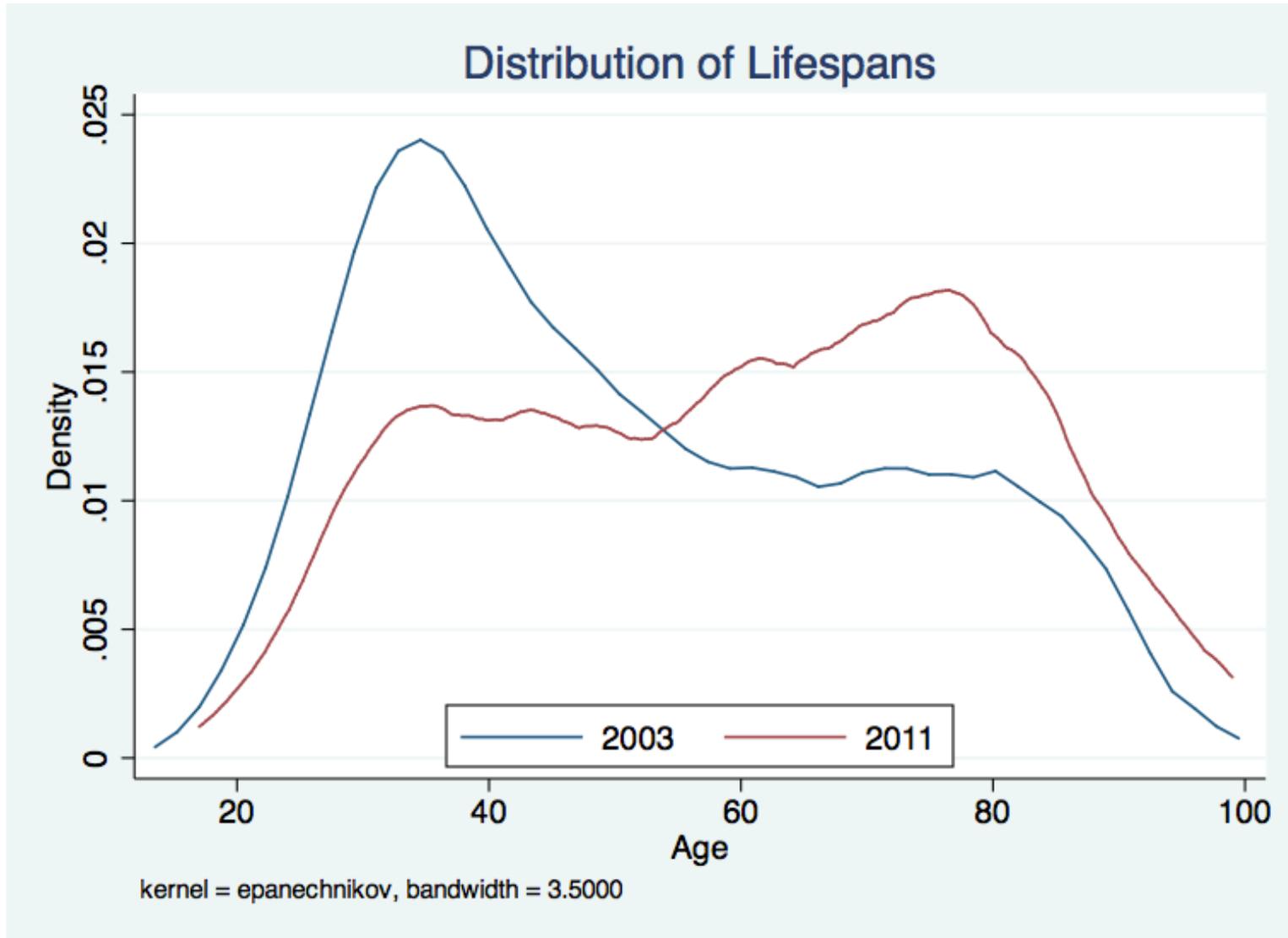
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# Life expectancy in a rural community in SA



# Lifespan distributions before and after ART scale-up in a rural community in SA



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# Discussion

- Household members' labor supply
  - Consistent with **care-giving hypothesis**, with employment of carers recovering with health of ART patients
  - No evidence of rising labor supply due to **income** or **cross-substitution effects**
- Household assets
  - ART enables households to avoid large negative shock to assets associated with severe HIV illness and death
- Human capital investment
  - Large life expectancy increases following ART scale-up in a high HIV prevalence community in rural SA
  - Effects on schooling and health investments, and risk behavior?

# Acknowledgments

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