



# Provision of streamlined HIV care associated with reduced economic burden of care-seeking among HIV-infected adults

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# Background

- Despite free treatment, patients face various costs associated with healthcare utilization
  - Transportation, time away from work, out-of-pocket expenditures
- Alternative models of delivering ART have potential to reduce economic burden of receiving care
- In communities that began receiving streamlined HIV care, we examined changes in healthcare costs incurred by patients

# SEARCH trial

- SEARCH: HIV test-and-treat cluster randomized trial in Kenya and Uganda (NCT:01864603)
- Key interventions
  - Population-based testing
  - Supported linkage
  - ART irrespective of CD4
  - Streamlined HIV care



# SEARCH Streamlined Care Model

## 1. Efficient Visits for Patients and Staff

- ART start at first clinic visit as indicated
- Triage by nurse or other extender at all follow-up visits
- Clinic visits and ART dispensation every 3 months rather than every 1-2 months
- Integration of services: HIV care, NCD care, general medical care

## 2. Patient-centered approach to care

- Welcoming environment
- Fostering trust, connection, and a sense of investment in the patient
- Flexible clinic hours
- Tiered tracking
- Multi-disease chronic care model

## 3. Telephone hotline access for patients

- Easy triage of medical questions
- Appointment/scheduling logistics for retention

## 4. Appointment reminders by phone/SMS

- One week to few days in advance
- Retention tool

## 5. Viral Load Counseling

- Structured format for discussion of undetectable and detectable results

# Methods

- Longitudinal surveys conducted among a random sample of households with HIV+ and HIV- adults
  - 200 households enrolled in each community, revisited each year
  - 100 with & without HIV+ adults
  - July 2013 – Aug. 2014: after SEARCH baseline testing
  - Oct. 2014 – Sept. 2015: follow-up year 1

# Methods

- Survey questionnaires obtained information on various dimension of healthcare costs
  - Adapted from Living Standards Measurement Surveys
- Survey data from linked to SEARCH data on HIV status and ART status of individuals

# Outcomes

- Outcomes selected to characterize multiple dimensions of healthcare burden
  - Number of hours spent seeking healthcare in past month
  - Number of hours lost from work in past month
  - Reported being hospitalized in past year
  - Healthcare expenditures in past month (US\$)

# Statistical analyses

- Baseline data analyzed to compare outcomes for various sub-populations
  - HIV+ and HIV- adults
- Trends between baseline and follow-up year 1 analyzed for HIV+ adults receiving ART
  - Regression models that included data for HIV- adults were used to adjust for temporal patterns
- Values above 95<sup>th</sup> percentile replaced with 95<sup>th</sup> percentile to limit effect of outliers



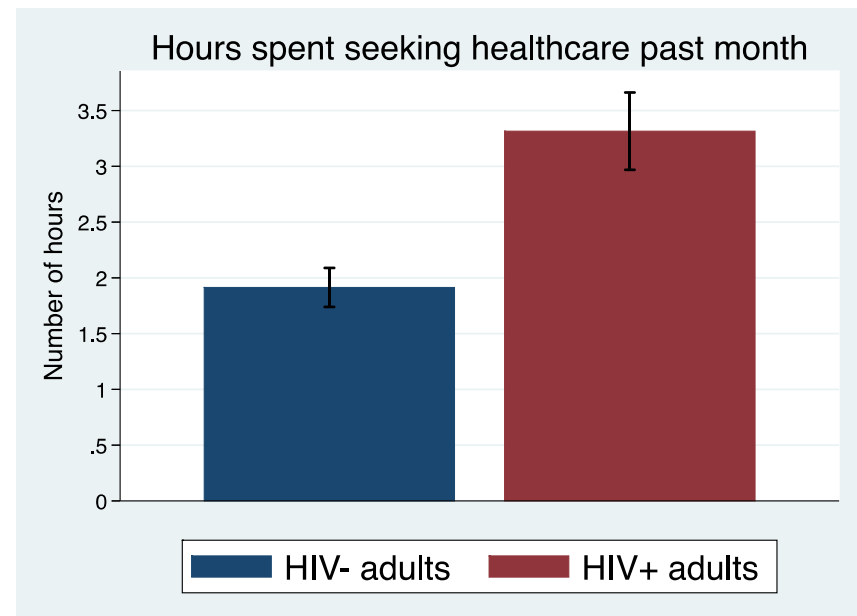
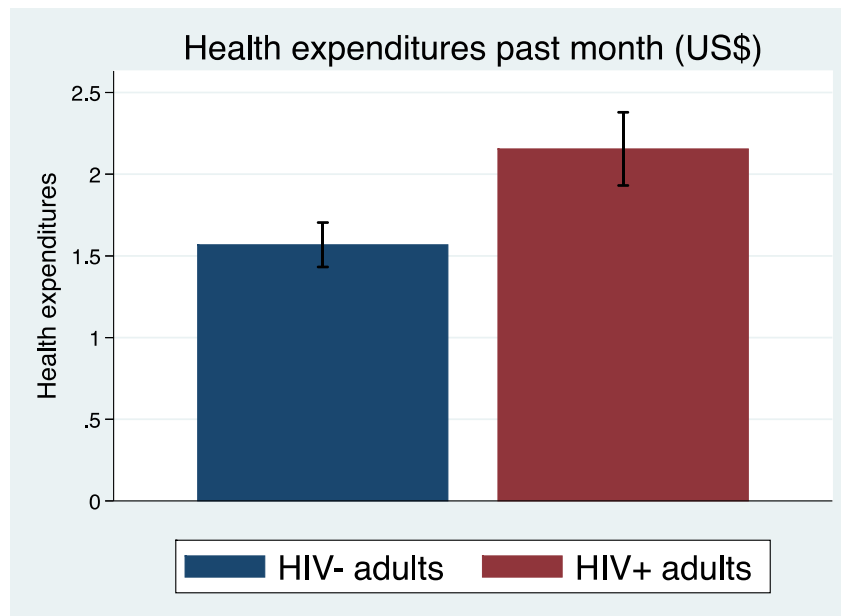
# RESULTS

# Adult participants in household survey – intervention communities

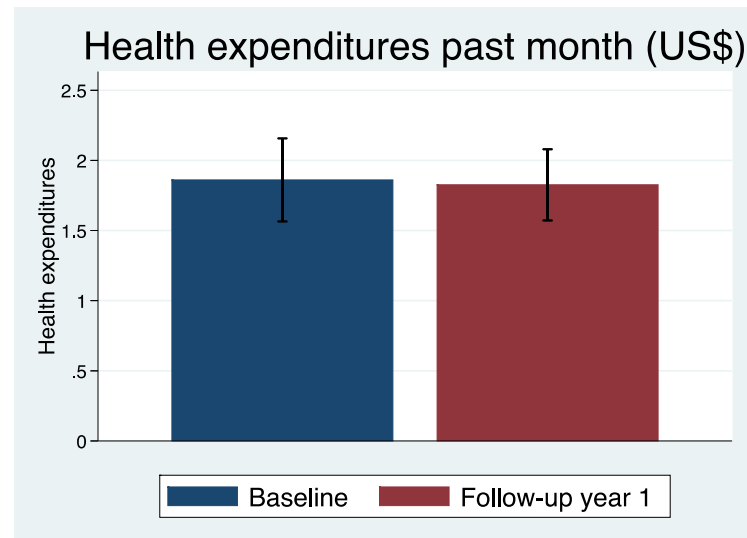
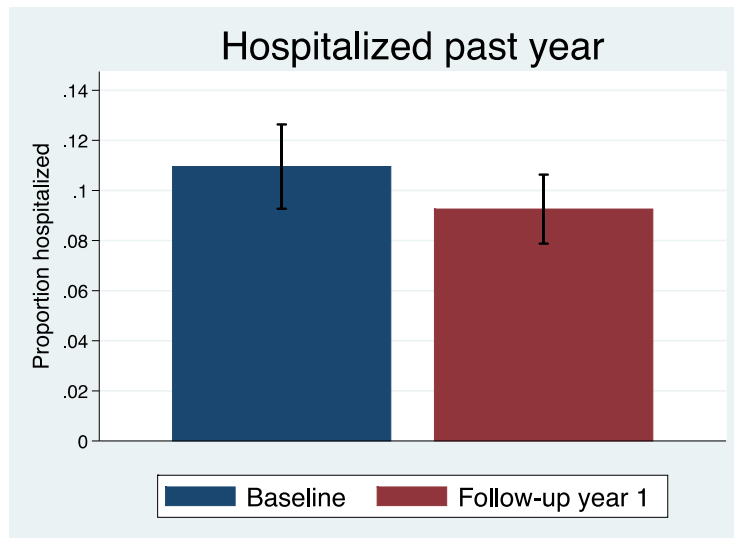
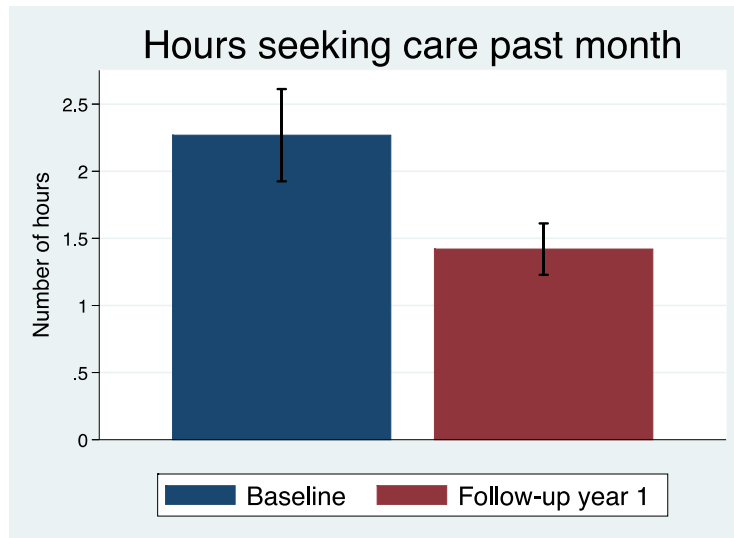
- HIV- adults
  - 4,562 at baseline
  - 4,229 at follow-up year 1
- HIV+ adults on ART
  - 1,324 on ART at baseline
  - 1,707 on ART at follow-up year 1

# Non-financial costs are a significant component of healthcare burden

- At baseline, health expenditures and time seeking care 30-50% higher for HIV+ adults

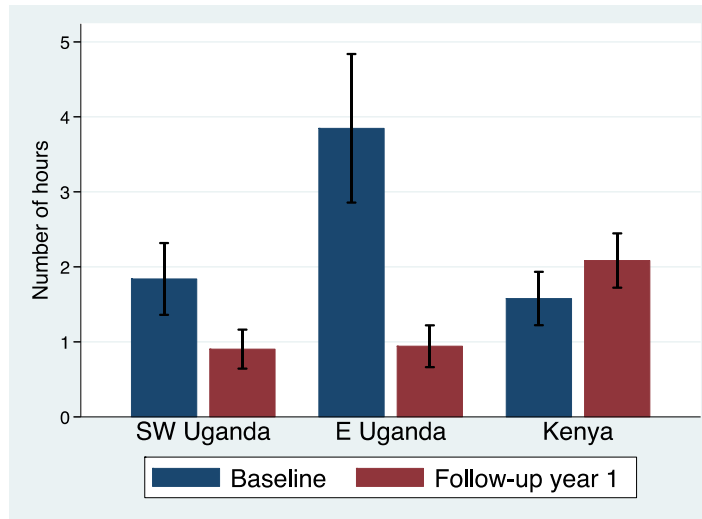


# Among all HIV+ adults receiving ART, economic burden of healthcare tended to decline over time



Data for adults receiving ART

## Time spent seeking healthcare



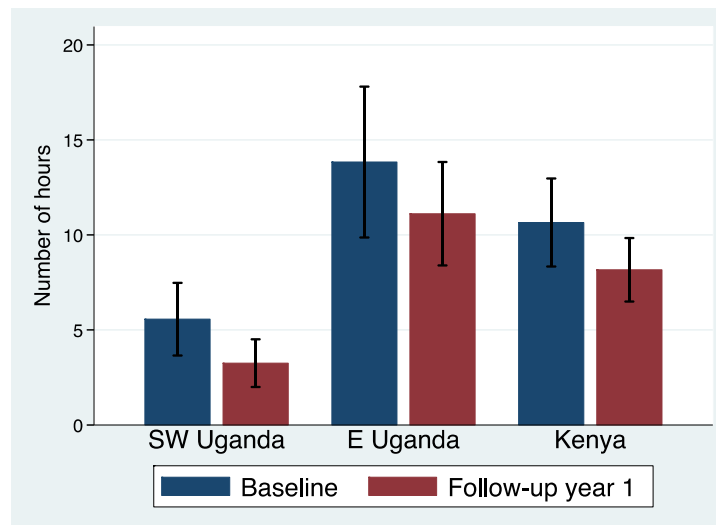
	SW Uganda	E Uganda	Kenya	All regions
On ART * Follow-up year 1	-0.94** (0.36)	-2.76*** (0.72)	0.12 (0.38)	-0.92*** (0.28)
Observations	3,760	3,797	3,865	11,422

Robust standard errors in parentheses.

P-value notation: \*\*\* p<0.001, \*\* p<0.01, \* p<0.05

Relative to baseline levels for those on ART, ~40% decline in hours seeking care

## Time lost from work



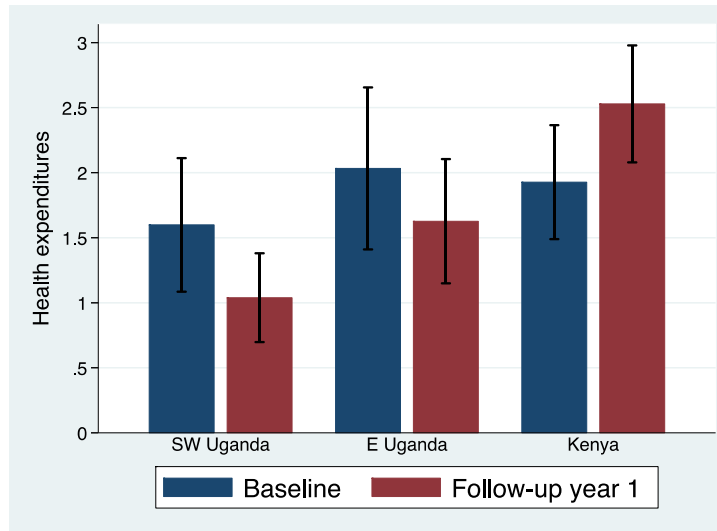
	SW Uganda	E Uganda	Kenya	All regions
On ART * Follow-up year 1	-1.66 (1.27)	-2.98 (2.53)	-1.99 (1.69)	-2.46* (1.05)
Observations	3,760	3,797	3,865	11,422

Robust standard errors in parentheses. Models were adjusted for gender, age, age, education, wealth, community and month of interview. Outliers censored at 95<sup>th</sup> percentile.

P-value notation: \*\*\* p<0.001, \*\* p<0.01, \* p<0.05

Relative to baseline levels for those on ART, ~25% decline in hours lost from work

# Healthcare expenditures (US\$)



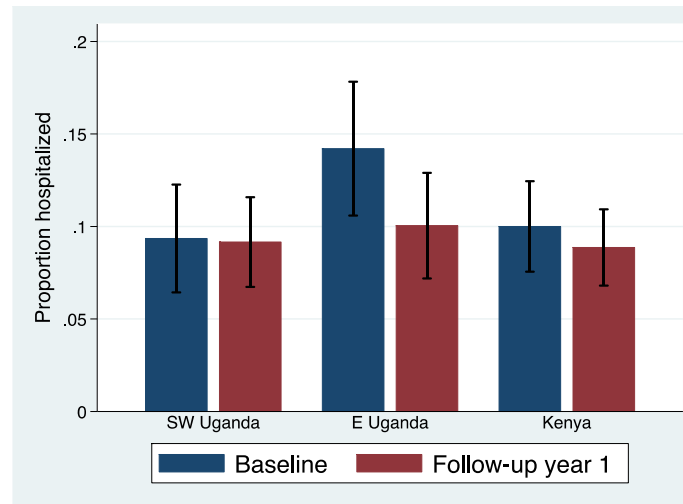
	SW Uganda	E Uganda	Kenya	All regions
On ART * Follow-up year 1	-1.31*** (0.38)	-0.95* (0.45)	0.18 (0.40)	-0.64** (0.24)
Observations	3,760	3,797	3,864	11,421

Robust standard errors in parentheses. . Models were adjusted for gender, age, age, education, wealth, community and month of interview. Outliers censored at 95<sup>th</sup> percentile.

P-value notation: \*\*\* p<0.001, \*\* p<0.01, \* p<0.05

Relative to baseline levels for those on ART, 47% reduction in healthcare expenditures

# Probability of hospitalization in past 12 months



	SW Uganda	E Uganda	Kenya	All regions
On ART * Follow-up year 1	-0.02 (0.02)	-0.04 (0.03)	-0.02 (0.02)	-0.03* (0.01)
Observations	3,760	3,797	3,865	11,422

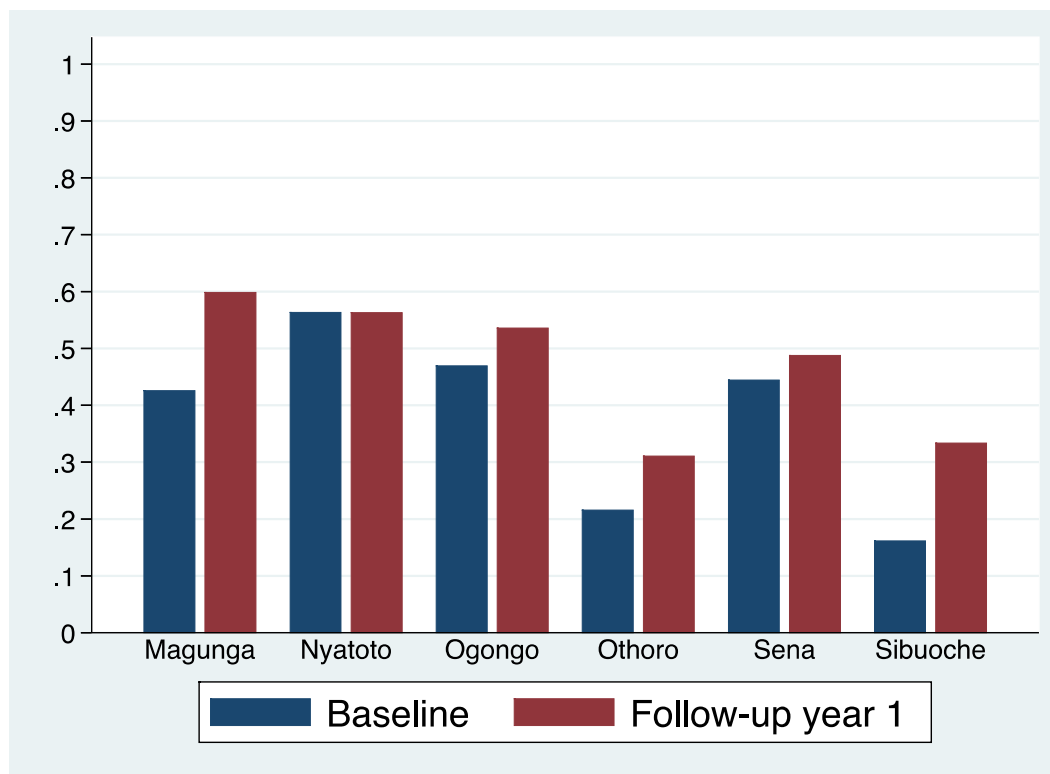
Robust standard errors in parentheses. Models were adjusted for community and month of interview. Outliers censored at 95<sup>th</sup> percentile. P-value notation: \*\*\* p<0.001, \*\* p<0.01, \* p<0.05

Relative to baseline levels for those on ART, 30% reduction in hospitalizations



# In Kenyan communities, rising wealth may contribute to higher healthcare utilization

- ART households more likely to be in top 3 wealth quintiles in follow-up year 1



# Summary

- Costs incurred by patients receiving ART declined 1 year after introduction of streamlined care
  - Largest reductions seen in time costs of care
- Results likely to be due to lower frequency & duration of visits as well as improved health

# Summary

- Substantial heterogeneity in costs and time trends across communities
  - In Kenya, no significant change in costs of care
  - Higher wealth for those on ART may have increased healthcare utilization
  - Other potential explanatory factors: (a) rainfall variation; and (b) inclusion of ART initiation costs at baseline

# Conclusions

- While there is heterogeneity between communities, results consistent with hypothesis that streamlined care delivery model can reduce the economic burden on patients receiving ART
- Further research using additional longitudinal data and comparison to non-intervention communities and households needed to verify these findings

# COLLABORATING ORGANIZATIONS



UNC  
GILLINGS SCHOOL OF  
GLOBAL PUBLIC HEALTH

UCSF



# Acknowledgments

- *Research reported in this presentation was supported by Division of AIDS, NIAID of the National Institutes of Health under award number U01AI099959 and in part by the President's Emergency Plan for AIDS Relief and Gilead Sciences.*
- *The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH, PEPFAR, or Gilead.*
- *The SEARCH project gratefully acknowledges the Ministries of Health of Uganda and Kenya, our research team, collaborators and advisory boards, and especially all communities and participants involved.*