Health Insurance, a Friend in Need?
Evidence from Financial and Health Diaries Data in Kenya

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Motivation

- Households use informal strategies to cope with (health) shocks
  (Fafchamps & Lund, 2003; De Weerdt & Dercon, 2005)
  - Consumption is however not fully insured (Gertler & Gruber, 2002)
  - Many L&MICs are hence introducing health insurance

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  - ▶ Consumption is however not fully insured (Gertler & Gruber, 2002)
  - ▶ Many L&MICs are hence introducing health insurance
- Informal transfers can crowd out formal insurance and v/v (Jowett, 2003; Ligon *et al.*, 2002; Dercon & Krishnan, 2003)
  - ▶ Mobile money reduced the costs of remitting transfers, providing users of mobile money insurance against shocks (Jack & Suri, 2014)
  - ▶ Non-users may benefit more from health insurance than users

Research questions

Using Health and Financial Diaries, we address the following questions:

1. To what extent is consumption insured from health expenditures?
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Mobile money users with health problems receive more gifts/remittances than non-users; informal transfers can crowd-out formal insurance.

Context: Tanykina Community Health Plan (TCHP)

- Health insurance for Tanykina members and their families
- Launched in 2011, facilitated by the PharmAccess Foundation
- Covers comprehensive primary health care in upgraded facilities
- Premiums deducted from milk payment
- High drop-out rates when milk sold to Tanykina declines (low production and cash needs; Geng *et al.*, 2016)

Context: Mobile money in Kenya

- One of the first and most successful examples of mobile money, with almost 60% of adults having an M-Pesa account by 2014
- Allows individuals to transfer money by simple SMS technology, reducing the cost of sending money across large distances
  - Highly beneficial in Kenya where internal migration is widespread
- Jack and Suri (2014) find that shocks reduce consumption by 7 % for nonusers, but the consumption of user households is unaffected.

Data: Health and Financial Diaries

- Weekly interviews between October 2012 and October 2013 with all financially active adults from 120 households
- Data collection funded in large part by the PharmAccess Foundation
- Financial diary: All financial transactions in last 7 days (income, expenditures, gifts, etc.), incl. transaction mode (cash, M-Pesa, etc.)
- Health diary: Health problems and health-seeking behavior of all household members, incl. children and financially inactive adults
- We collected monthly TCHP enrollment, renewal and suspension for all individuals in the sample.
- At baseline, half of the sample was covered by the TCHP.
- The diaries covered in total 184 respondents and 564 individual household members

Data: Attrition and non-response

	Freq.	%
A. Attrition		
Households dropping out	2	1.7
Respondents leaving the household	8	4.3
B. Non-response		
Missing household-weeks	449	7.3
Incomplete household-weeks	952	15.4
Household-weeks with ≥ 1 respondent	5689	92.2

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In case of incomplete interviews, the health diary is available for all members; we avoid dropping these observations by imputing missing respondents' yearly average for expenditures and gifts/remittances.

Econometric strategy

Estimating equation for household h in week t:

$$Y_{ht} = HealthP_{ht}\beta_0 + Insured_{ht}\beta_1 + HealthP * Insured_{ht}\beta_2 + \eta_h + \epsilon_{ht}$$

- *HealthP*: Household member has health symptoms/problems and cannot carry out daily activities
  - *Current* for specifications with health-seeking behaviors
  - *Lagged* for specifications with household (food) expenditures
- *Insured*: Household is covered by health insurance
- η_h: Fixed effect (control for time-invariance household char's)
- ϵ_{ht}: Robust standard errors clustered by household

Estimated separately for nonusers and users of mobile money

- Usage: Household reports ≥ 1 M-Pesa transaction in full year

Description of the sample (1)

	Mean (1)	M-Pesa user (2)	M-Pesa non-user (3)	Difference (4)	p-value (5)
Demographic characteristics					
HH head age	51.7	50.8	52.7	1.90	0.528
HH head is male (%)	65.5	66.7	64.3	2.40	0.787
HH size	4.89	5.04	4.80	0.24	0.559
Proportion of HH members under 18 years (%)	45.9	47.7	44.0	3.70	0.423
Proportion of HH members who are female (%)	51.1	51.5	50.7	0.80	0.836
Socioeconomic characteristics					
# of mobile phones	1.850	1.985	1.600	0.385	0.014
Ever Insured	0.483	0.515	0.500	0.015	0.699
Average weekly expenditures (KSH)	2530	2850	2139	710	.0500
% weeks receiving remittances	10.4	15.9	3.70	12.2	0.000
Total amount of remittances received (KSH)	6541	9881	2459	7422	0.002
Health characteristics					
% weeks with health problem	17.1	19.6	14.1	5.50	0.036
% health visits when reporting health problems	78.2	84.8	69.4	15.4	0.207
% facility visits when reporting health problems	45.2	50.7	37.8	12.9	0.075
Total out-of-pocket health expenditures (KSH)	915	1239	519	720	0.000
- Average per health visit (KSH)	184.7	196.3	170.5	25.9	0.493
Number of observations	120	60	60		

Description of the sample (2)

	Mean (1)	Never insured (2)	Ever insured (3)	Difference (4)	p-value (5)
Household characteristics					
HH head age	51.7	47.5	56.1	8.66	0.002
HH head is male (%)	65.5	65.6	65.5	0.10	0.995
HH size	4.89	5.30	4.40	0.90	0.014
Proportion of HH members under 18 years (%)	45.9	54.1	37.2	16.9	0.000
Proportion of HH members who are female (%)	51.1	49.5	52.8	3.30	0.377
Socioeconomic characteristics					
# of mobile phones	1.850	1.742	1.966	0.224	0.231
M-Pesa user	0.500	0.532	0.500	-0.032	0.699
Average weekly expenditures (KSH)	2530	2274	2778	504	0.164
% weeks receiving remittances	10.4	10.5	10.3	0.20	0.942
Total amount of remittances received (KSH)	6541	5751	7305	1554	0.528
Health characteristics					
% weeks with health problem	17.1	16.0	18.3	2.30	0.377
% health visits when reporting health problems	78.2	76.5	79.8	3.30	0.784
% facility visits when reporting health problems	45.2	43.9	46.5	2.60	0.710
Total out-of-pocket health expenditures (KSH)	915	1036	798	238	0.218
- Average per health visit (KSH)	185	196	174	22.6	0.547
Number of observations	120	62	58		

Results: Outline

$$Y_{ht} = HealthP_{ht}\beta_0 + Insured_{ht}\beta_1 + HealthP * Insured_{ht}\beta_2 + \eta_h + \epsilon_{ht}$$

1. To what extent is consumption insured from health expenditures?
   - Compare (food) expenses *after* weeks without/with health problems $(\hat{\beta}_0)$
2. Does health insurance improve health-seeking and coping behaviors?
   - Compare effect of health problem *during* weeks without and with insurance $(\hat{\beta}_2)$
3. Are these effects different for users of mobile money?
   - Compare effects of insurance for non-users and users of mobile money $(\hat{\beta}_2^{NonUser} \neq \hat{\beta}_2^{User})$

Effect of health shocks on consumption

	Dependent variable: Household expenditures (difference from household average, measured in inv. hyperbolic since)			
	M-Pesa non-users		M-Pesa users	
	Total expenditures (1)	Food expenditures (2)	Total expenditures (3)	Food expenditures (4)
Insured last week	-0.274	-0.203	0.033	-0.141
	(0.222)	(0.227)	(0.164)	(0.221)
Health problem last week	-0.250*	-0.208*	0.231**	0.176**
	(0.145)	(0.115)	(0.100)	(0.083)
… * Insured	0.408**	0.310	-0.252	-0.112
	(0.197)	(0.230)	(0.167)	(0.161)
p-value Health problem + … *Insured	0.412	0.646	0.881	0.668
Week and Household fixed effects	Yes	Yes	Yes	Yes
Observations	2335	2335	2941	2941
Number of households	56	56	66	66
R-squared within households	0.058	0.040	0.102	0.046
Mean dependent variable	1.414	0.974	1.341	0.938

Insurance and health-seeking behaviors: Any provider

| | Non-user of M-Pesa | | User of M-Pesa | |
| | Any provider | | Any provider | |
	Visits provider (1)	Consultation costs (ihs) (2)	Visits provider (5)	Consultation costs (ihs) (6)
Insured	0.006	0.133*	0.004	0.240**
	(0.023)	(0.069)	(0.022)	(0.095)
Health problem	0.316***	0.169	0.589***	0.271**
	(0.055)	(0.132)	(0.052)	(0.121)
… * Insured	0.044	-0.442**	-0.053	-0.064
	(0.102)	(0.209)	(0.074)	(0.176)
p-value Health problem + … *Insured	0.000	0.079	0.000	0.156
Week and Household fixed effects	Yes	Yes	Yes	Yes
Health visit	No	Yes	No	Yes
Observations	2555	2555	3165	3165
Number of households	54	54	66	66
R-squared within households	0.233	0.651	0.455	0.558
Mean dependent variable	0.054	0.253	0.138	0.717

Insurance and health-seeking behaviors: Health clinics

	Non-user of M-Pesa		User of M-Pesa	
	Health clinic		Health clinic	
	Visits provider	Consultation costs (ihs)	Visits provider	Consultation costs (ihs)
	(3)	(4)	(7)	(8)
Insured	-0.000	0.169***	-0.000	0.164**
	(0.014)	(0.054)	(0.019)	(0.080)
Health problem	0.250***	0.166*	0.340***	0.191***
	(0.045)	(0.086)	(0.036)	(0.069)
... * Insured	0.042	-0.259**	0.070	0.004
	(0.091)	(0.118)	(0.053)	(0.109)
p-value Health problem + ... *Insured	0.001	0.228	0.000	0.032
Week and Household fixed effects	Yes	Yes	Yes	Yes
Health visit	No	Yes	No	Yes
Observations	2555	2555	3165	3165
Number of households	54	54	66	66
R-squared within households	0.209	0.670	0.304	0.554
Mean dependent variable	0.036	0.147	0.078	0.253

Remittances

	M-Pesa non-users		M-Pesa users	
	Receives any remittance	Amount received (diff. from HH mean in ihs)	Receives any remittance	Amount received (diff. from HH mean in ihs)
	(1)	(2)	(3)	(4)
Insured	0.044***	0.014	-0.031	-0.012
	(0.015)	(0.020)	(0.033)	(0.044)
Health problem	0.001	-0.025	0.108***	-0.040
	(0.014)	(0.019)	(0.035)	(0.049)
... * Insured	-0.023	-0.051	-0.026	-0.012
	(0.043)	(0.092)	(0.045)	(0.081)
p-value Health problem + ... *Insured				
Week and Household fixed effect	Yes	Yes	Yes	Yes
Receives any remittance	No	Yes	No	Yes
Observations	2555	2555	3165	3165
Number of households	54.000	54.000	66.000	66.000
R-squared within households	0.052	0.923	0.073	0.949
Mean dependent variable	0.046	0.058	0.170	0.152

Conclusion

Using Health and Financial Diaries, we addressed the following questions:

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Mobile money users receive more gifts/remittances, making formal and informal insurance substitutes.