ReachUHC

Research to Improve Resilience in Major African Cities through Universal Health Coverage

DGGÖ, 25 March 2025, Paderborn

Funded by
Bundesministerium für Bildung und Forschung

Agenda

1. Background
2. Understanding health insurance uptake – baseline studies
3. Increasing health insurance uptake – the intervention
4. Evaluating impact – the trial
5. Assessing transferability – transferability research

The NHIS – how to be insured?

2003 | 75% earmarked taxes, donations +

Formal sector	Informal sector	<18 years	Exempted
Social security contributions (SSNIT)	Premiums	None	None
Annual renewal (registration fee)			Annual

Saleh, 2013; Duku et al, 2016; Khalid et al, 2018; Osei-Boateng & Ampratwum, 2011; GSS, 2012; NHIA, 2021

Mobile Renewal Intervention

In 2018, the Mobile Renewal service was launched

- Alternative to in-person renewal process at an NHIS office.
- Allows individuals to avoid long waiting times, travel time, travel cost.
- Renew and pay premium via mobile phone and mobile money
- Improved renewal rates; using the mobile renewal increased chances of renewing by 17.4% compared to the office renewal (Nsiah-Boateng et al., 2023)

The NHIS – how to be insured?

2003 | 75% earmarked taxes, donations +

Formal sector	Informal sector	<18 years	Exempted
Social security contributions (SSNIT)	Premiums	None	None
Annual renewal (small renewal fee)			Annual

54% insured

→stagnating insurance uptake despite the effective use of mobile interventions

Saleh, 2013; Duku et al, 2016; Khalid et al, 2018; Osei-Boateng & Ampratwum, 2011; GSS, 2012; NHIA, 2021

ReachUHC!

Increase NHIS uptake in urban areas in Ghana through user-focused mobile technology solutions

Baseline research:

Understanding health insurance uptake and mobile technology within the National Health Insurance Scheme (NHIS)

Research – facing the challenge

Research aims

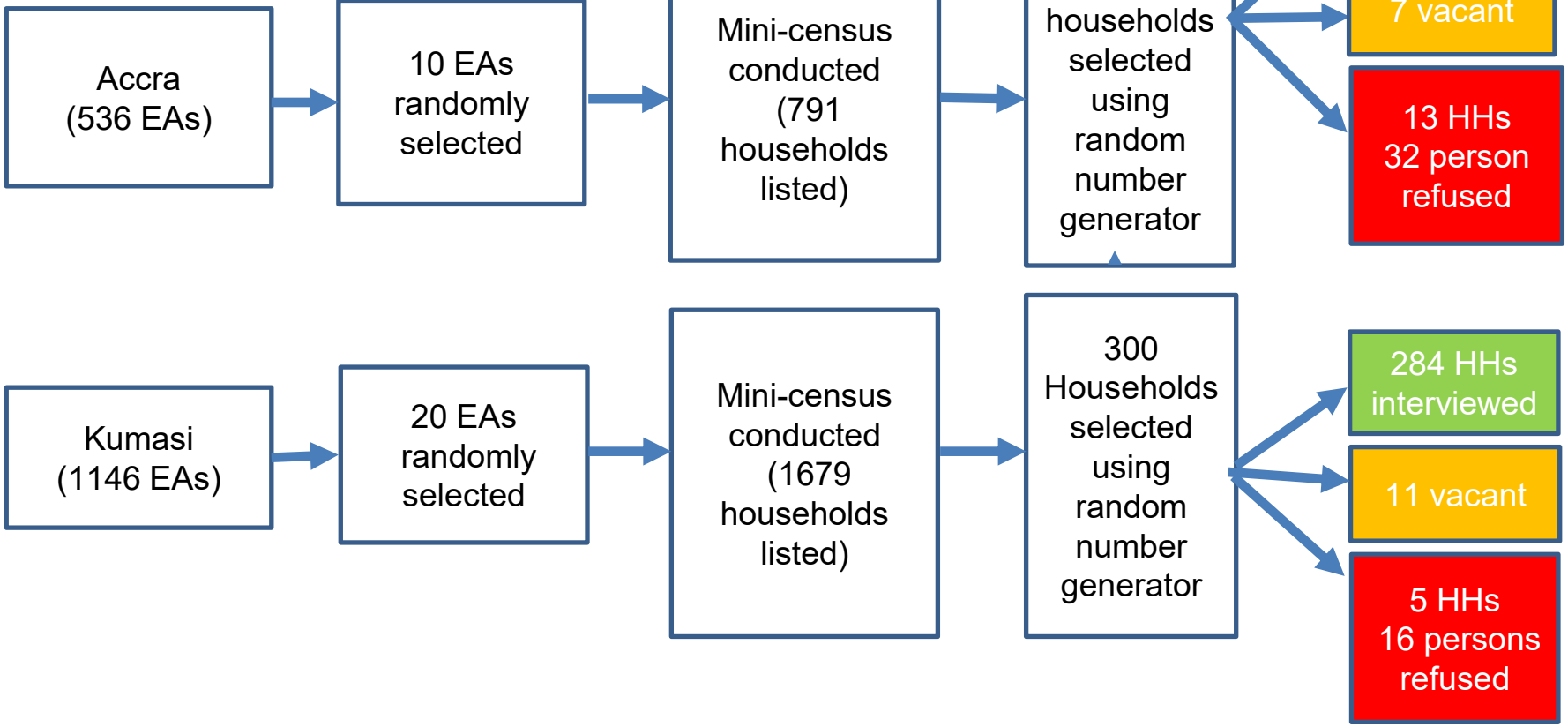
(1) to ascertain the determinants of national health insurance uptake and inform potential solutions for improvement

(2) to explore how perceptions, experiences, and socio-economic characteristics interact in shaping NHIS uptake decisions

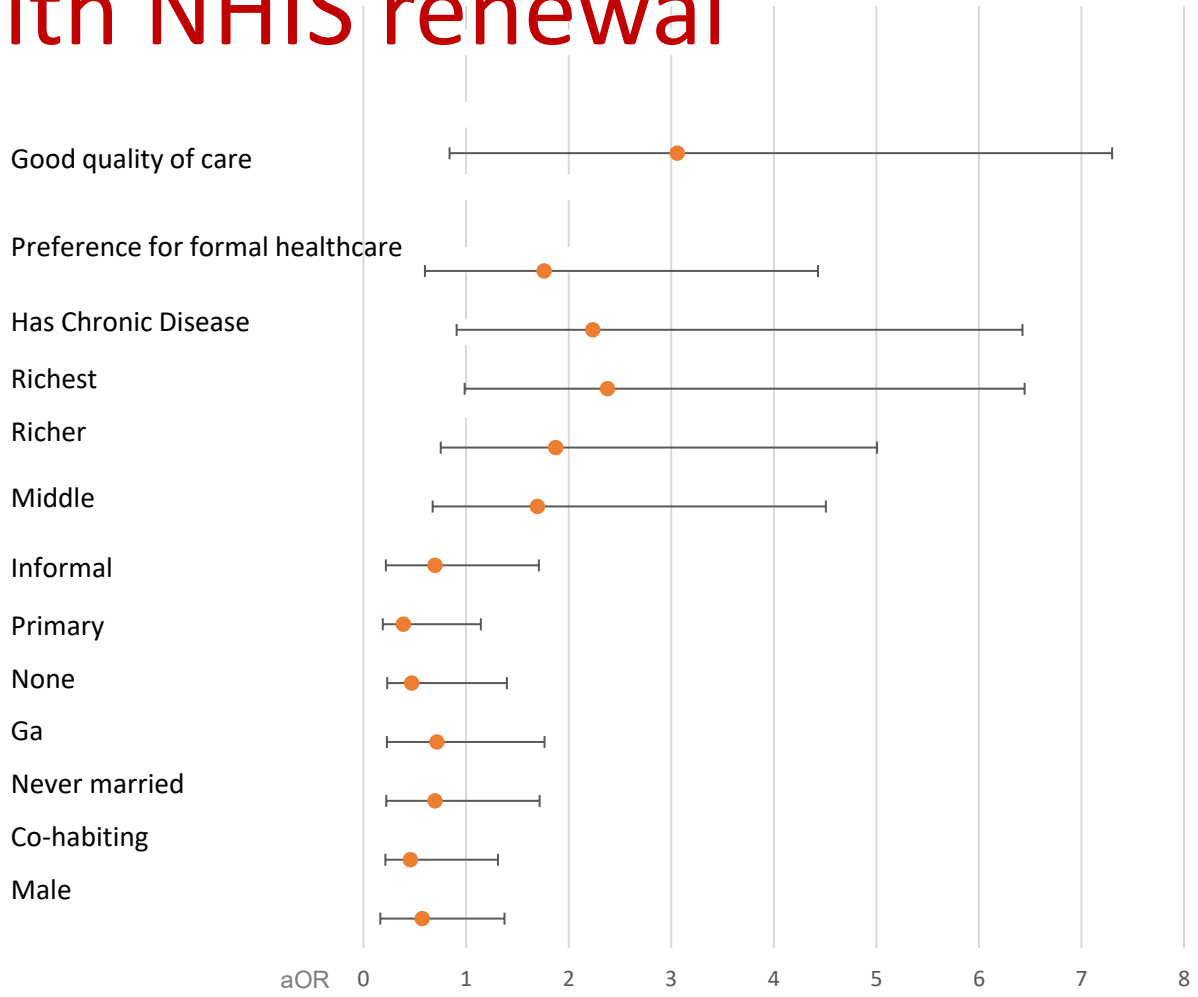
(3) to explore the feasibility and design features of implementing an add-on with the potential of promoting the use of the mobile renewal and increase insurance rate

(1) to ascertain the determinants of national health insurance uptake and inform potential solutions for improvement

Methodology: household survey



Forest plot: factors associated with NHIS renewal



- Those who experienced good quality care, have a chronic disease, prefer formal healthcare and in the richer wealth quintiles were more likely to have an active health insurance
- Those with a lower level of education , never married or cohabiting and males are less likely to renew their health insurance

Chei-square tests: reasons for non renewal

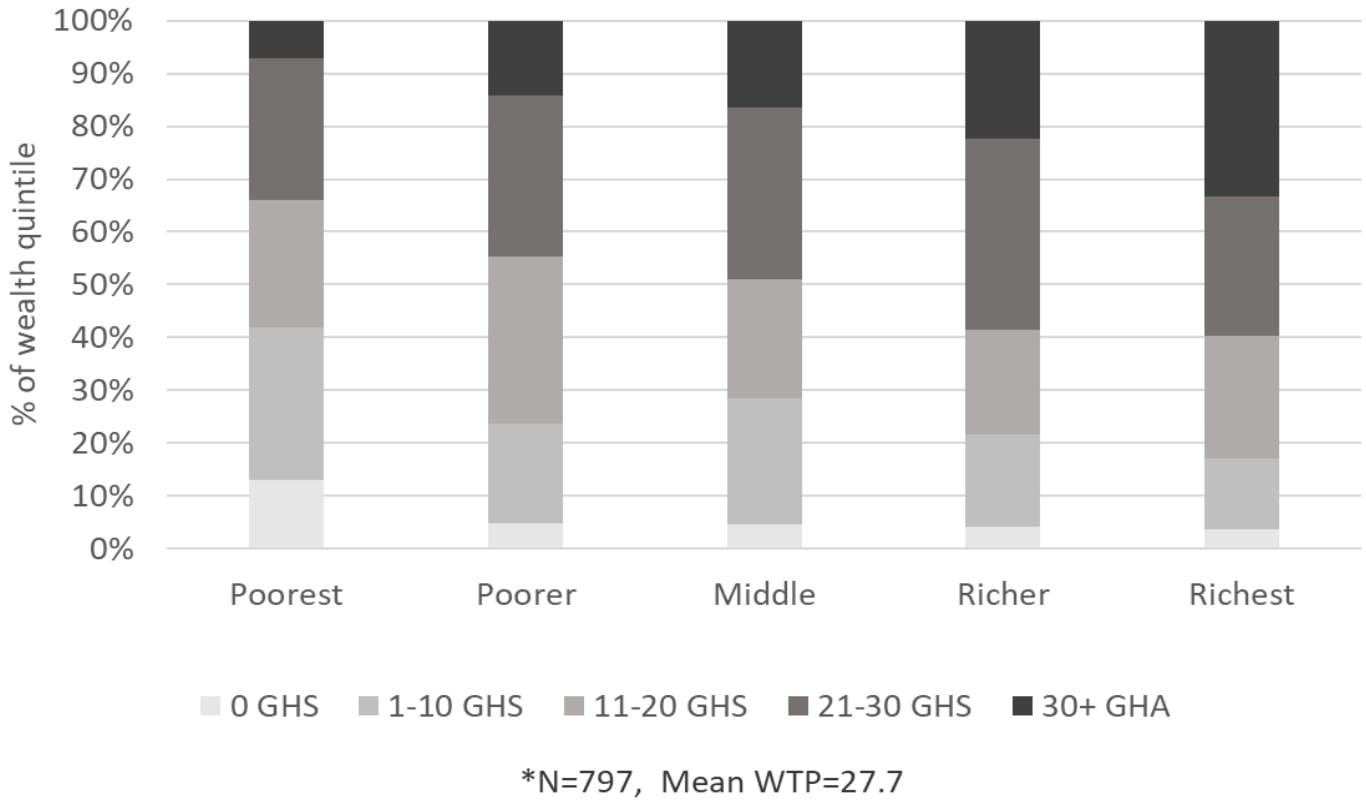
	N	I rarely get sick / Don't need insurance	I forgot or didn't know to renew	No con-fidence in scheme	Can't afford premium	Doesn't cover my services/ facilites	Don't want to pay premium	Member-ship negatively affects care
GENDER								
Female	159	0.49	0.51	0.14	0.22	0.11	0.1	0.04
Male	120	0.61	0.46	0.28	0.11	0.16	0.1	0.11
χ2 (p-value)		0.059*	0.431	0.004***	0.011**	0.144	0.991	0.020**
AGE								
16-19	11	0.4	0.6	0.1	0.3	0.1	0.3	0.1
20-29	70	0.56	0.47	0.2	0.1	0.13	0.04	0.06
30-39	77	0.65	0.49	0.18	0.18	0.14	0.06	0.08
40-49	61	0.51	0.51	0.24	0.18	0.08	0.14	0.05
50-59	31	0.63	0.47	0.22	0.25	0.19	0.19	0.09
60-69	29	0.24	0.45	0.21	0.21	0.17	0.07	0.07
χ2 (p-value)		0.006***	0.097	0.903	0.379	0.709	0.026**	0.953
EMPLOYMENT								
Unemployed	76	0.39	0.51	0.16	0.25	0.12	0.14	0.05
Informal	157	0.6	0.46	0.21	0.17	0.13	0.08	0.06
Formal	46	0.6	0.54	0.23	0.06	0.17	0.1	0.1
χ2 (p-value)		0.007***	0.553	0.502	0.029**	0.701	0.263	0.5
WEALTH QUINTILE								
Poorest	62	0.38	0.65	0.21	0.24	0.08	0.13	0.06
Poorer	63	0.53	0.53	0.16	0.25	0.09	0.09	0
Middle	57	0.57	0.52	0.22	0.17	0.16	0.09	0.09
Richer	54	0.65	0.24	0.22	0.09	0.13	0.09	0.09
Richest	43	0.64	0.46	0.18	0.07	0.21	0.07	0.09
χ2 (p-value)		0.029**	0.000***	0.869	0.035**	0.317	0.883	0.188
EDUCATION								
None/Primary	48	0.44	0.5	0.19	0.31	0.08	0.14	0.04
Middle	99	0.48	0.47	0.12	0.24	0.09	0.11	0.05
Secondary	96	0.63	0.5	0.26	0.1	0.17	0.1	0.06
Tertiary	36	0.63	0.47	0.26	0	0.21	0	0.16
χ2 (p-value)		0.057*	0.97	0.078*	0.000***	0.118	0.161	0.105
TOTAL	**279**	**0.54**	**0.49**	**0.2**	**0.17**	**0.13**	**0.1**	**0.07**

Significance levels from Pearson χ2 test are denoted as (p<0.1, ** p<0.05, *** p<0.01)

Key insights from heat map

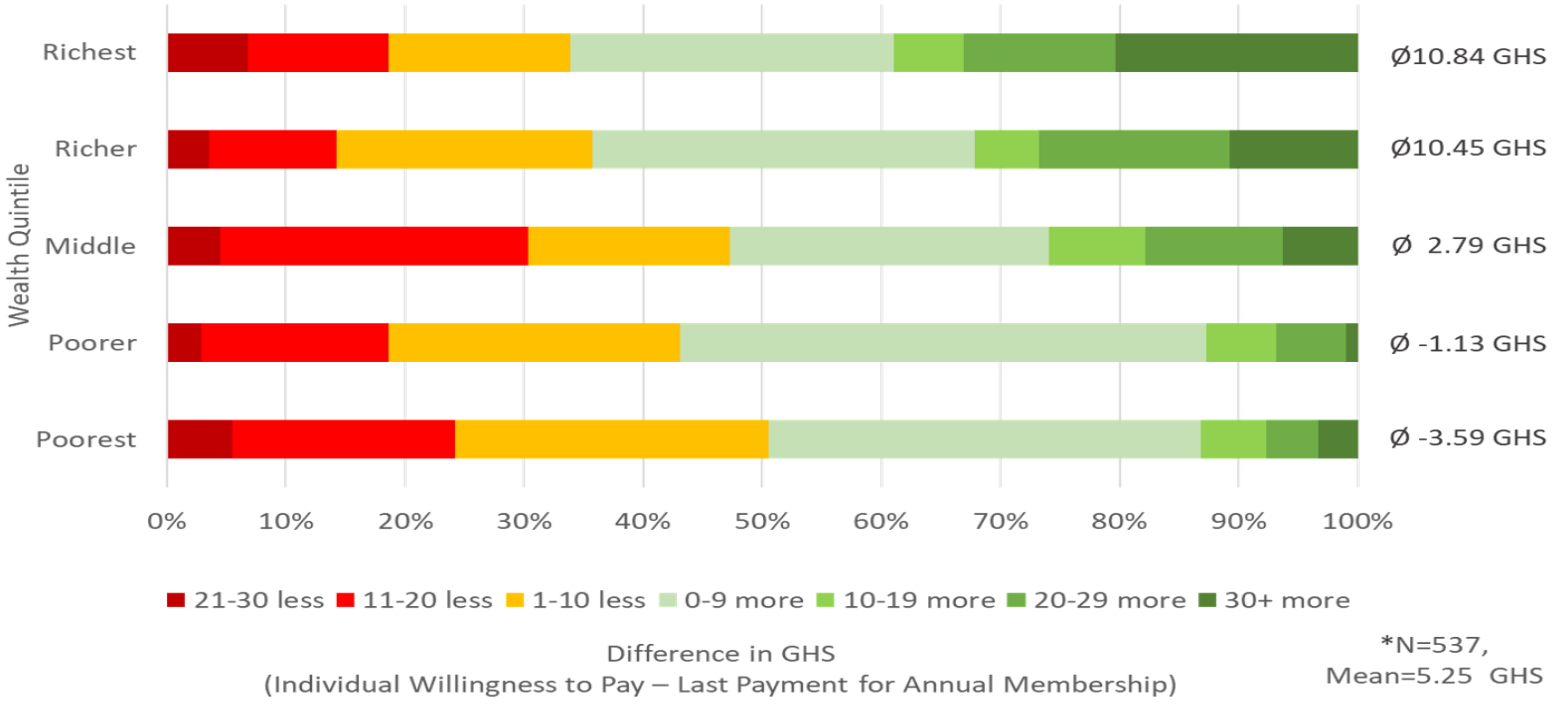
Gender Differences	More males (61%) cited "Rarely Sick" than females (49%). Lack of confidence in the scheme was significantly higher for men (28%) than women (14%).
Age Trends	The youngest (16-19) were most likely to forget to renew (60%). Older adults (50-59) had the highest financial barriers (25%).
Employment Status	Unemployed individuals cited affordability (25%) and forgetting to renew (51%) as major reasons. Formal workers had the least financial difficulty (6%) in renewing.
Wealth Quintiles	The poorest group forgot to renew the most (65%) and had the highest financial barriers (24%). Richer & richest groups cited “rarely sick” most (65% & 64%).
Education Levels	Tertiary-educated individuals cited lack of confidence (26%) and service coverage (21%) more often. Lower-educated individuals had the most financial barriers (31%).

Willingness to pay for health insurance



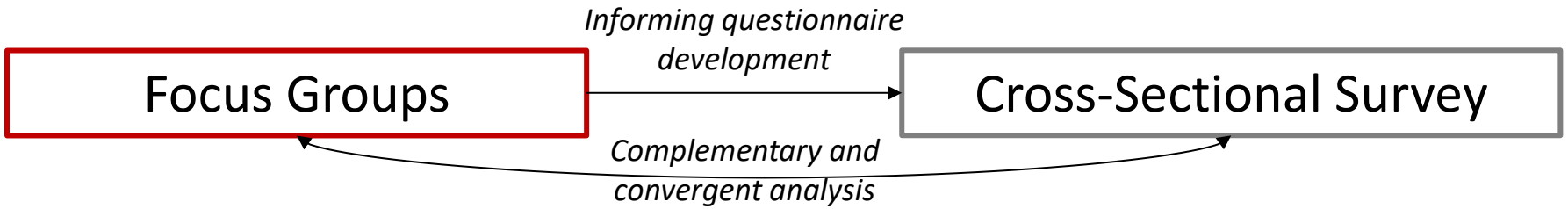
*N=797, Mean WTP=27.7

Reported willingness to pay vs last annual payment



(2) to explore how perceptions, experiences, and socio-economic characteristics interact in shaping NHIS uptake decisions

NHIS decisions – mixed methods



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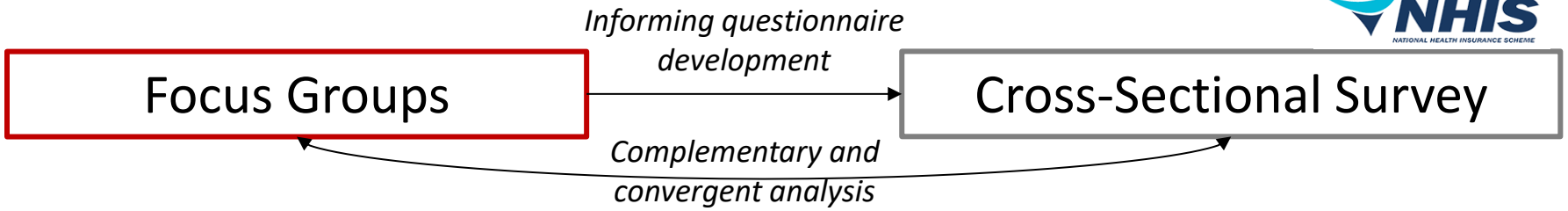
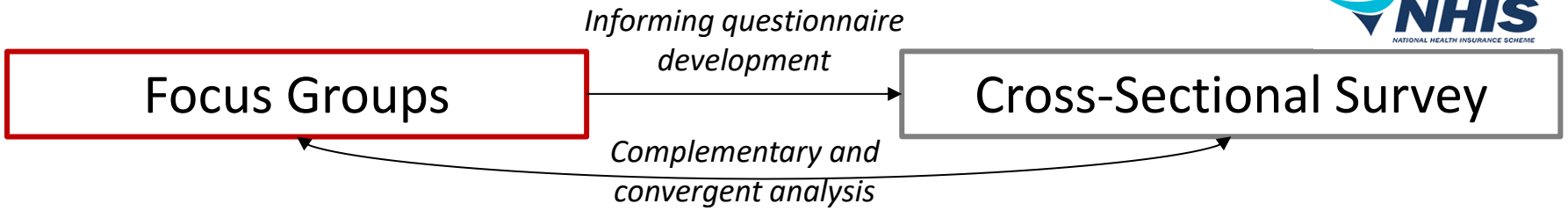


- Informal sector workers in Kumasi and Accra
- Purposive maximum variation and convenience sampling
- Semi-structured focus group discussions
- Analysis: reflexive thematic analysis

→17 focus groups, 96 participants, 45% female, 18-67 years old, 51% active insurance

Braun & Clarke, 2019; 2021

NHIS decisions – mixed methods

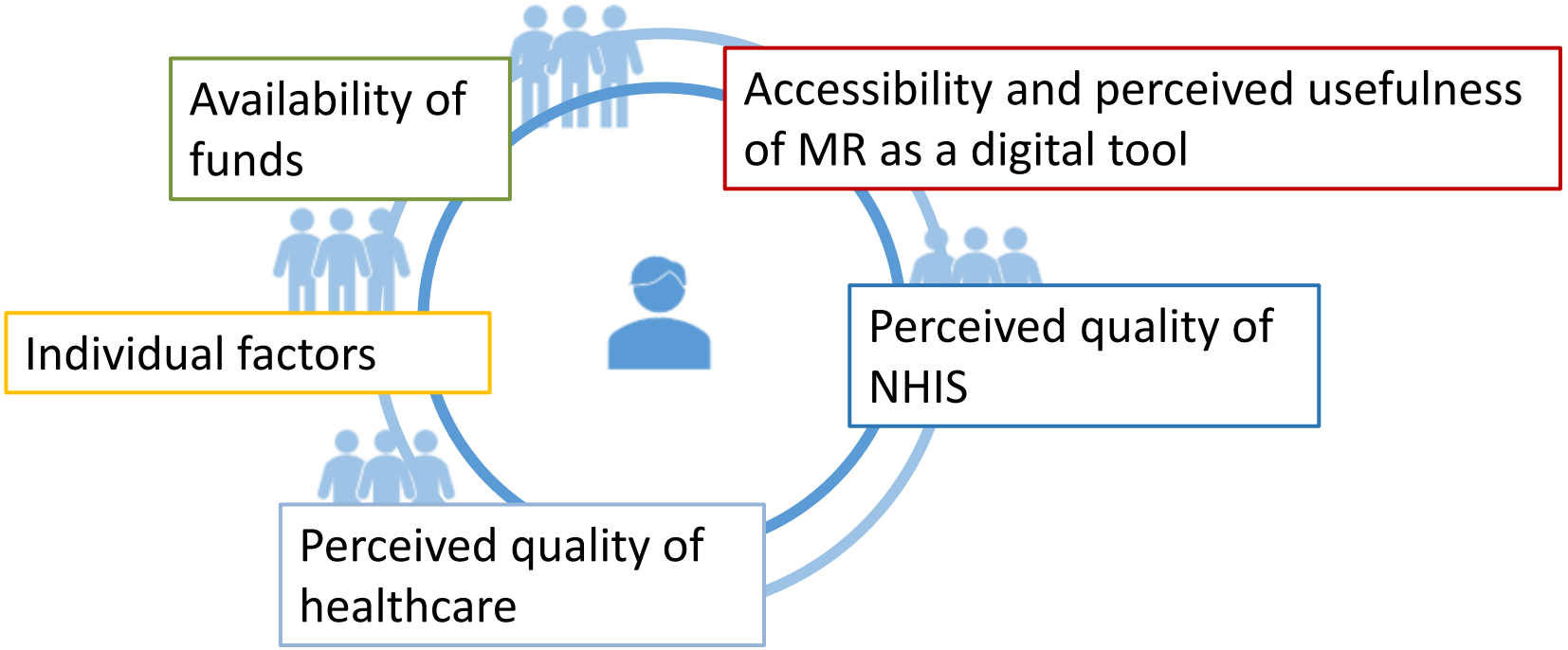


- Descriptive statistics
- Structural equation model (sem): simultaneous analysis of direct and indirect effects + better accounting for endogeneity

→focus on the notion of willingness to pay between perceptions of NHIS and quality of care, the availability of funds and socio-demographic factors

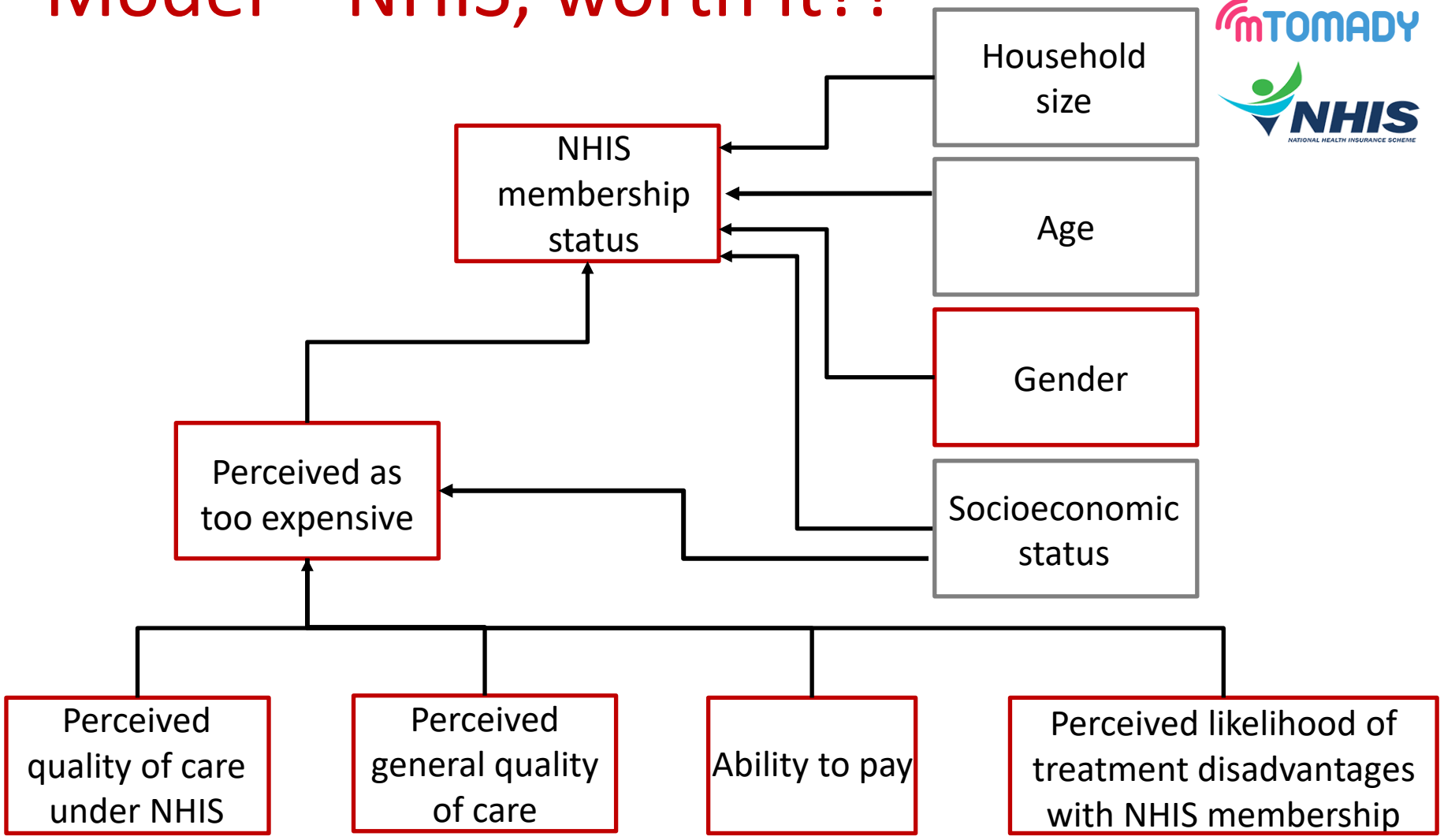
Beran & Violato, 2010; Mueller & Hancock, 2008; Hu and Bentler, 1999

Nuances of NHIS uptake decisions



→NHIS uptake decisions are based on experiences and perceptions of the individual and within their social network

Model – NHIS, worth it?!



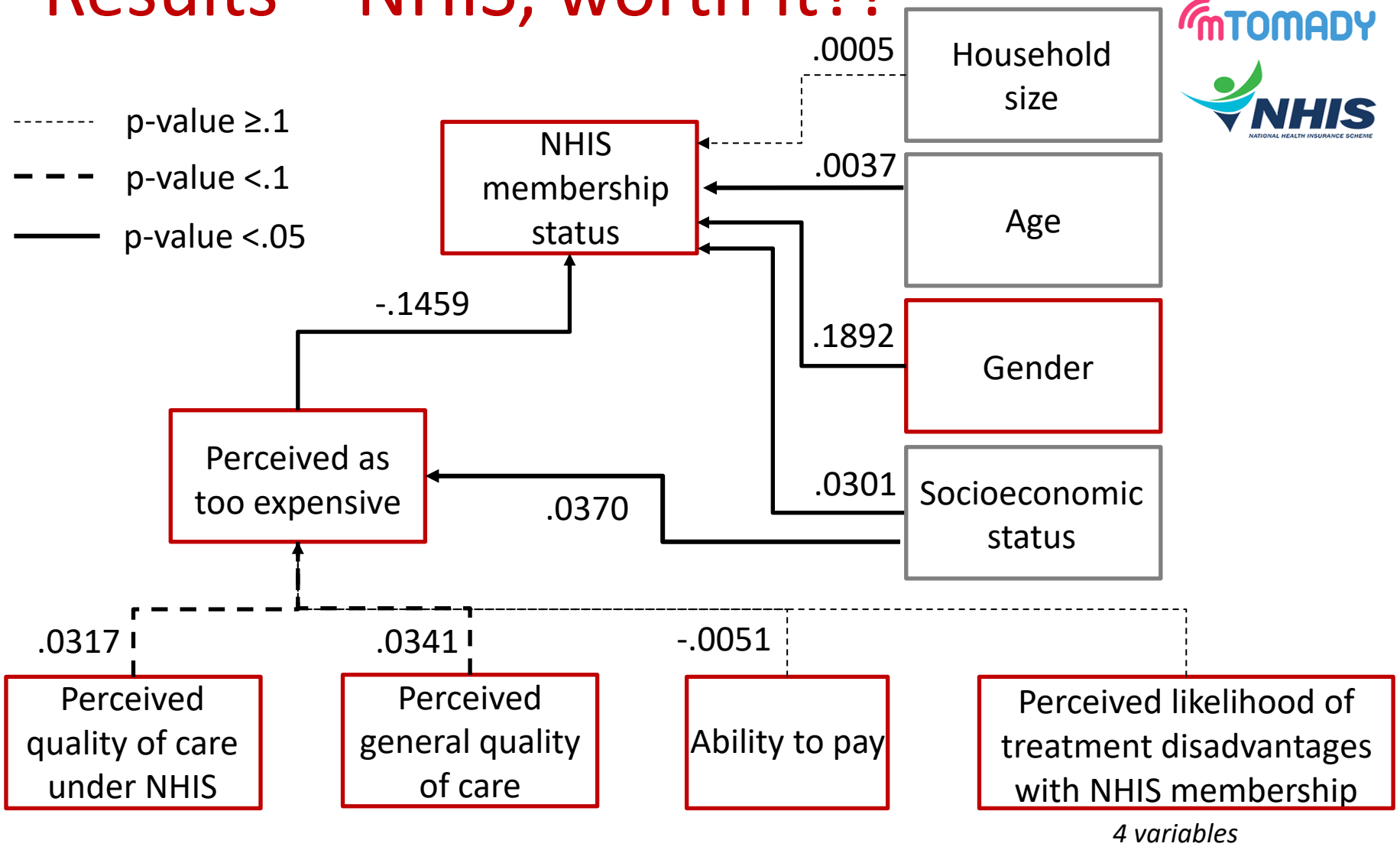
4 variables

Model fit

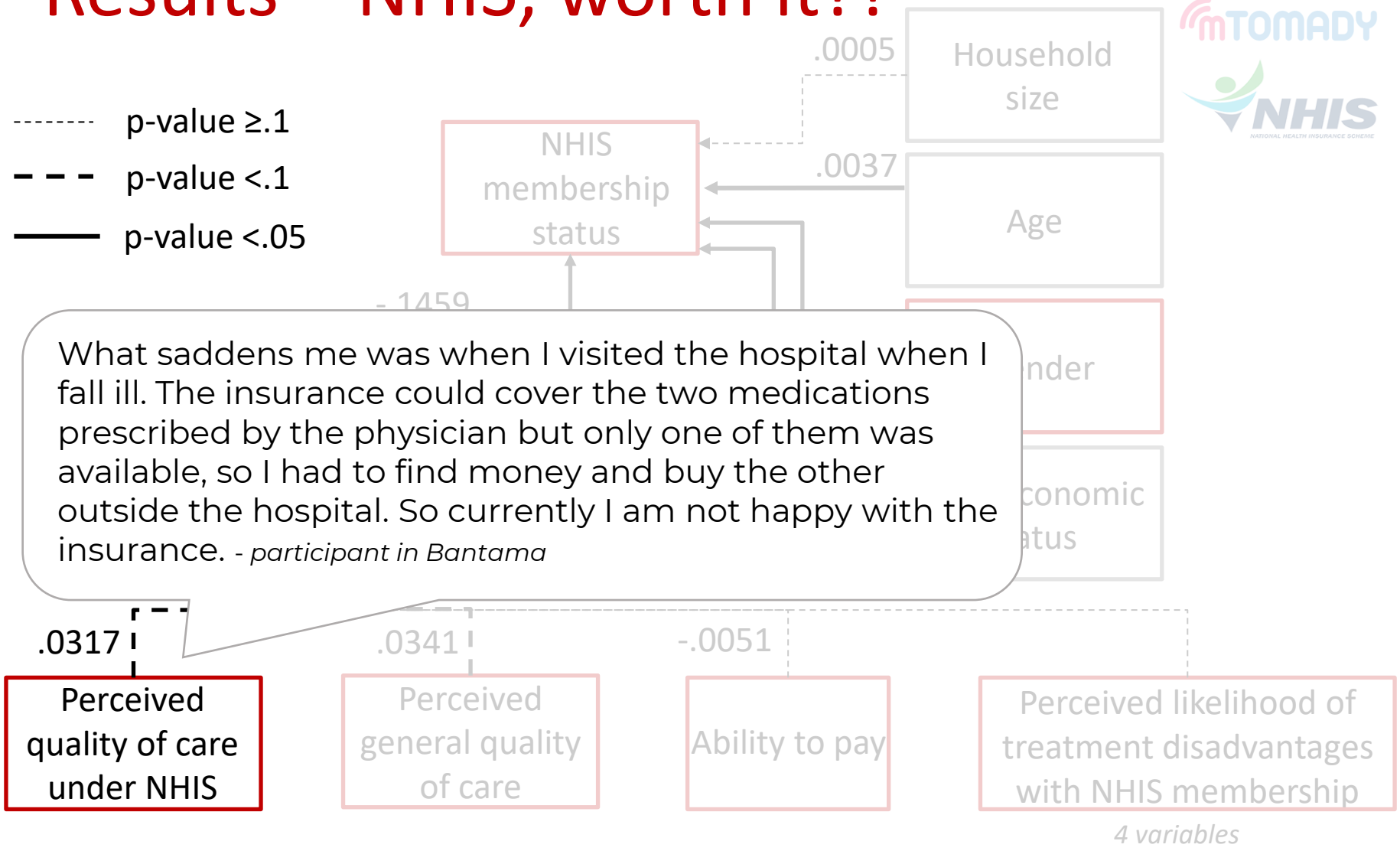
Goodness of fit index	Primary model value	Goal value
Chi2	10.9	
p-value	.3655	>.05
Degrees of freedom	10	
SRMR	.013	<.08
TLI	.980	>.95
CFI	.991	>.95

Hu & Bentler, 1999

Results – NHIS, worth it?!



Results – NHIS, worth it?!



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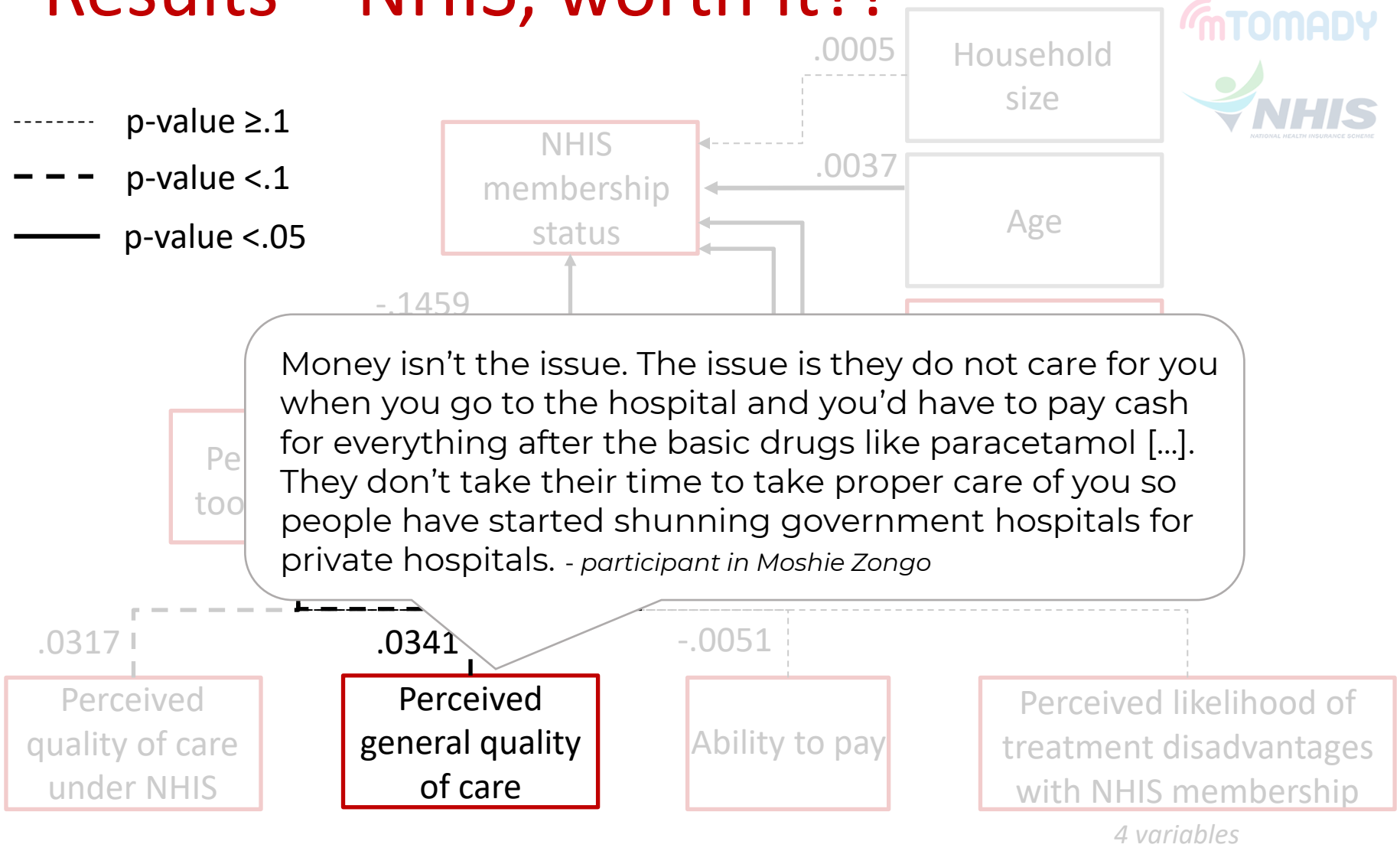

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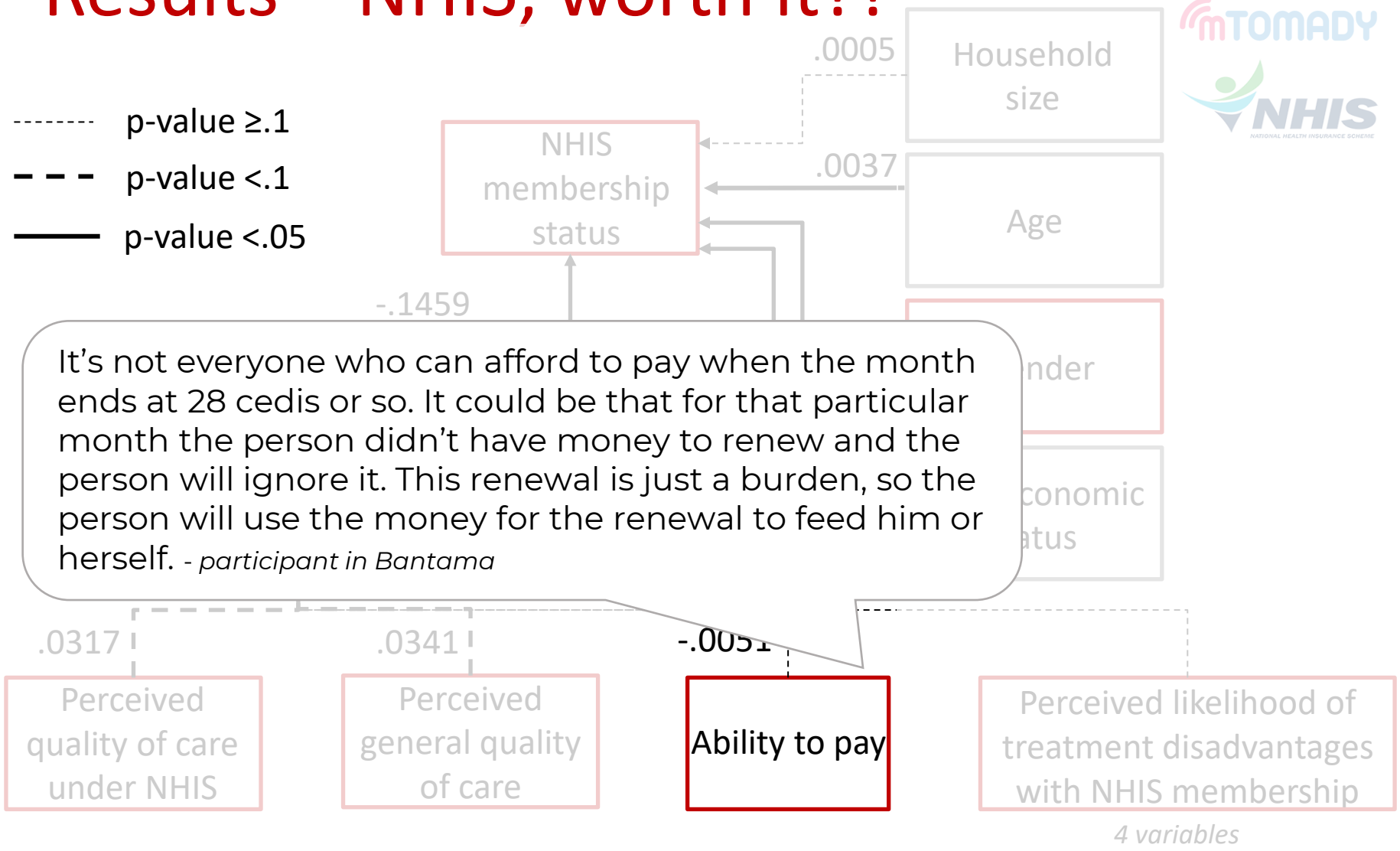


(3) to explore the feasibility and design features of implementing an add-ons with the potential of promoting the use of the mobile renewal and further increase insurance rate

Mobile renewal add-on(s)

FGDs + in-depth interviews

- Technical experts involved in the implementation of the existing MRS (internal and external)
- Purposive and convenience sampling
- Semi-structured in-depth interviews
- Analysis: deductive and inductive analysis

Off the 13 experts interviewed, three were females, age ranging 40-59 years, 6 managers in their respective units.

Mobile renewal add-on

Ideas

- Reminder
- NEW registration
- Automatic renewal
- Savings wallet
- Facility Locator

Mobile renewal add-on

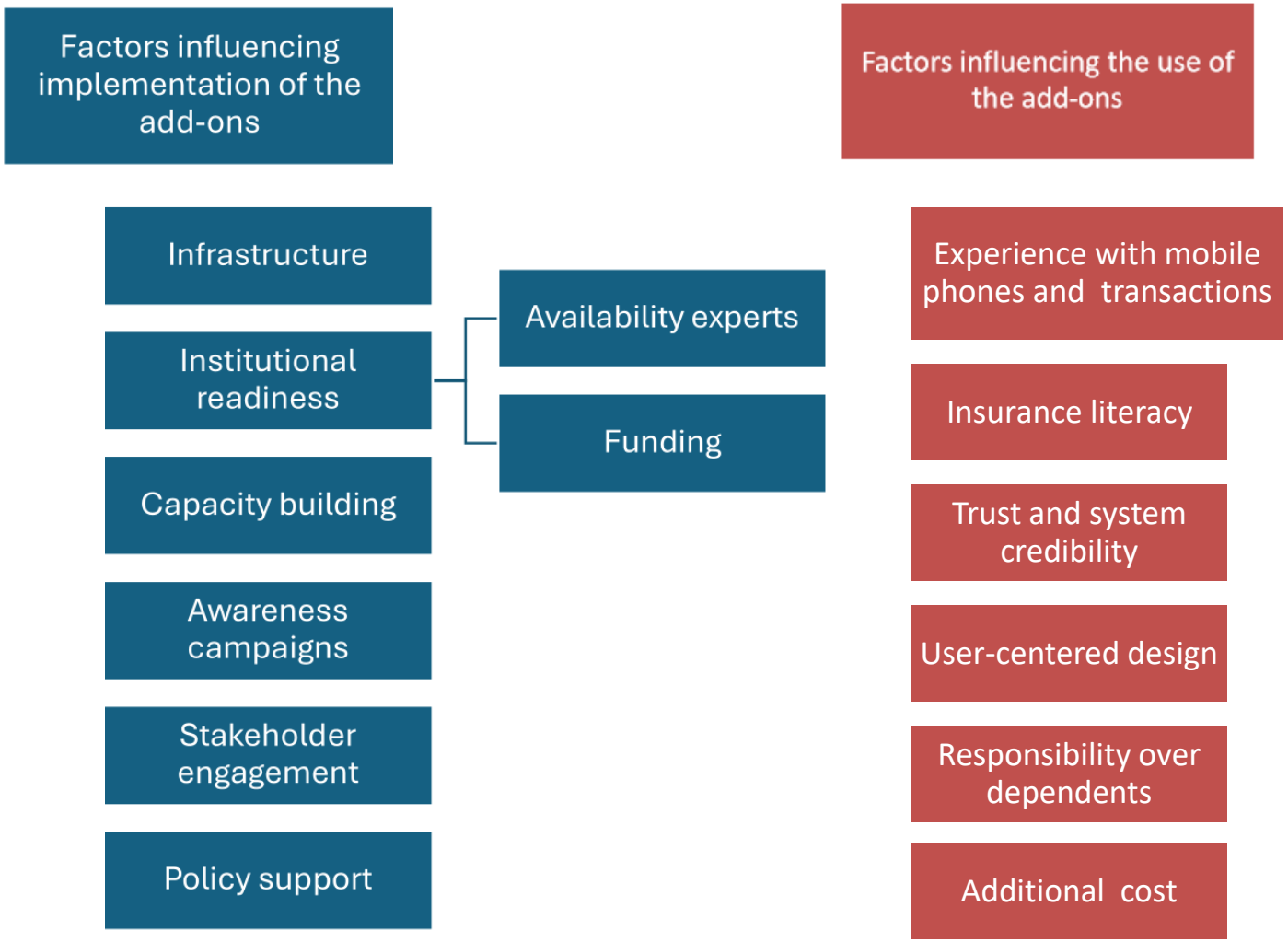
Ideas

- Reminder
- NEW registration
- Automatic renewal
- Savings wal
- Facility Loca

"A reminder will be a good idea because sometimes you may not know whether the insurance has expired unless you go to the hospital"
(participant in Anloga)

"If you have money in your Momo account there should be an automatic renewal something that will automatically "kick in", so that will remove the "human factor" and the problem with "I don't know how to do it" will be a thing of the past" (Technical expert 007E)

Factors impacting use and implementation



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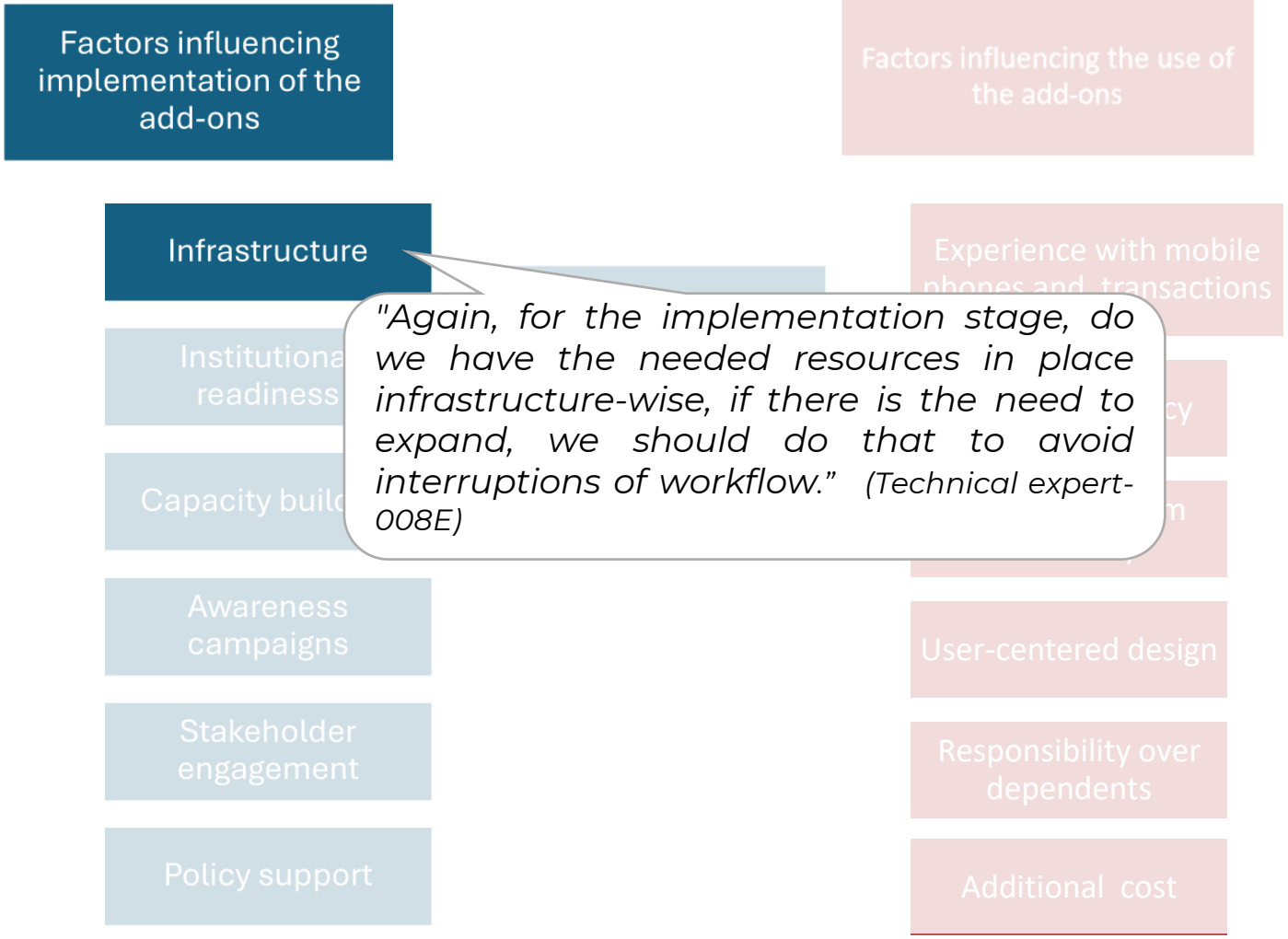

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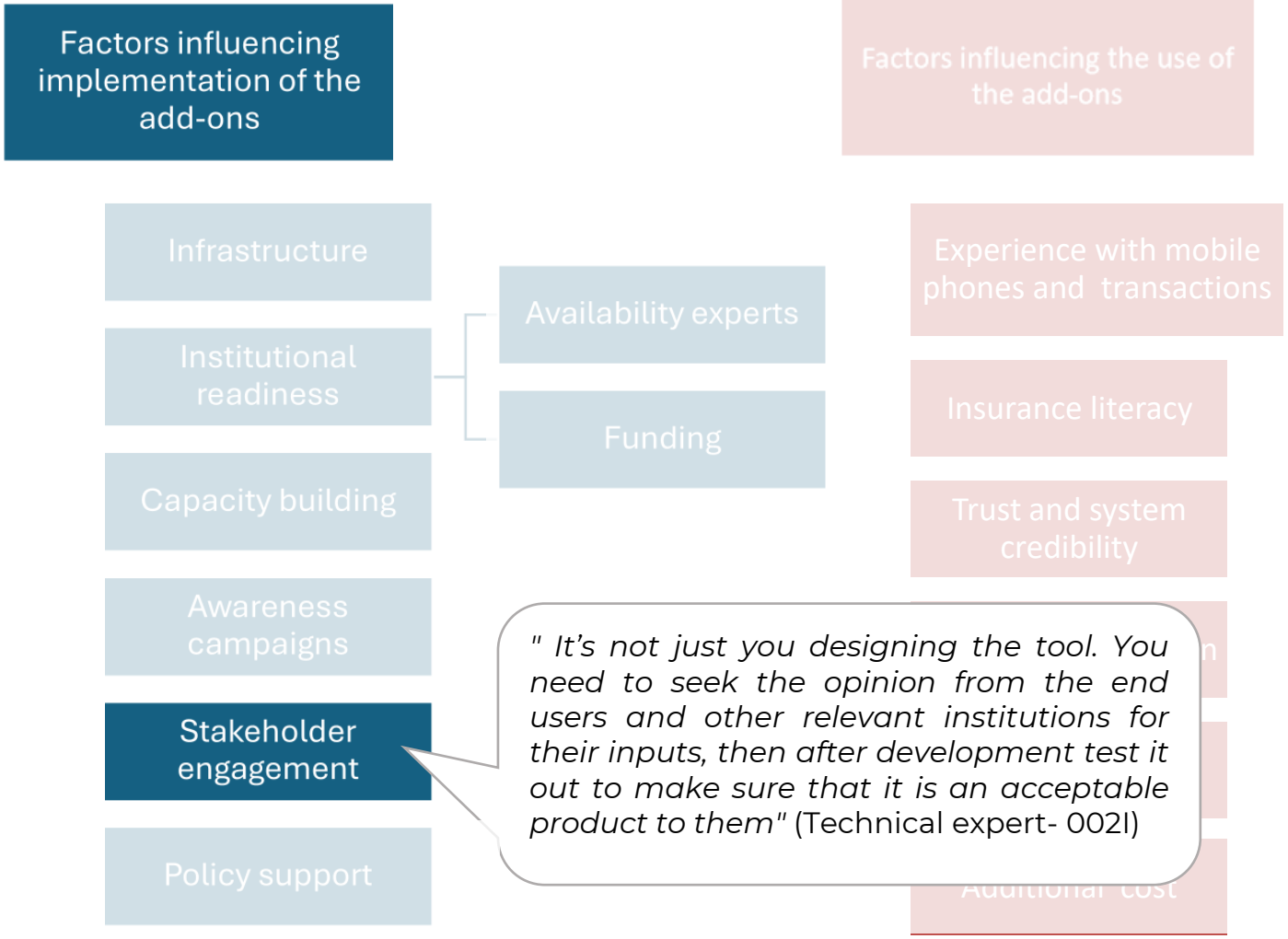

Factors impacting use and implementation

Factors influencing implementation of the add-ons

- Infrastructure
- Institutional readiness
  - Availability experts
  - Funding
- Capacity building
- Awareness campaigns
- Stakeholder engagement
- Policy support

Factors influencing the use of the add-ons

- Experience with mobile phones and transactions

> *"If you've ever been a victim of mobile money fraud, that alone is enough to prevent you from trusting such initiative [saving wallet]. Experience with fraudsters will deter people from using it" (technical expert- 010E)*

- Responsibility over dependents
- Additional cost

Factors impacting use and implementation

Factors influencing implementation of the add-ons

- Infrastructure
- Institutional readiness
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- Capacity building
- Awareness campaigns
- Stakeholder engagement
- Policy support

Factors influencing the use of the add-ons

- Experience with mobile phones
- Insura
- Trust / credibility
- User-centered design
- Responsibility over dependents
- Additional cost

"The system should be simple and easier for people to follow. It should be concise and easy for everyone whether you are well-educated or not. so that you can do it yourself". (participant in Nima)

The intervention design

Applying evidence to policy

Considerations

- Already implemented during the study period: facility locator + digital registration
- Stakeholder engagement
- Evidence from user-side barriers: targeting the poorest, reducing opportunity costs, increasing flexibility

Design

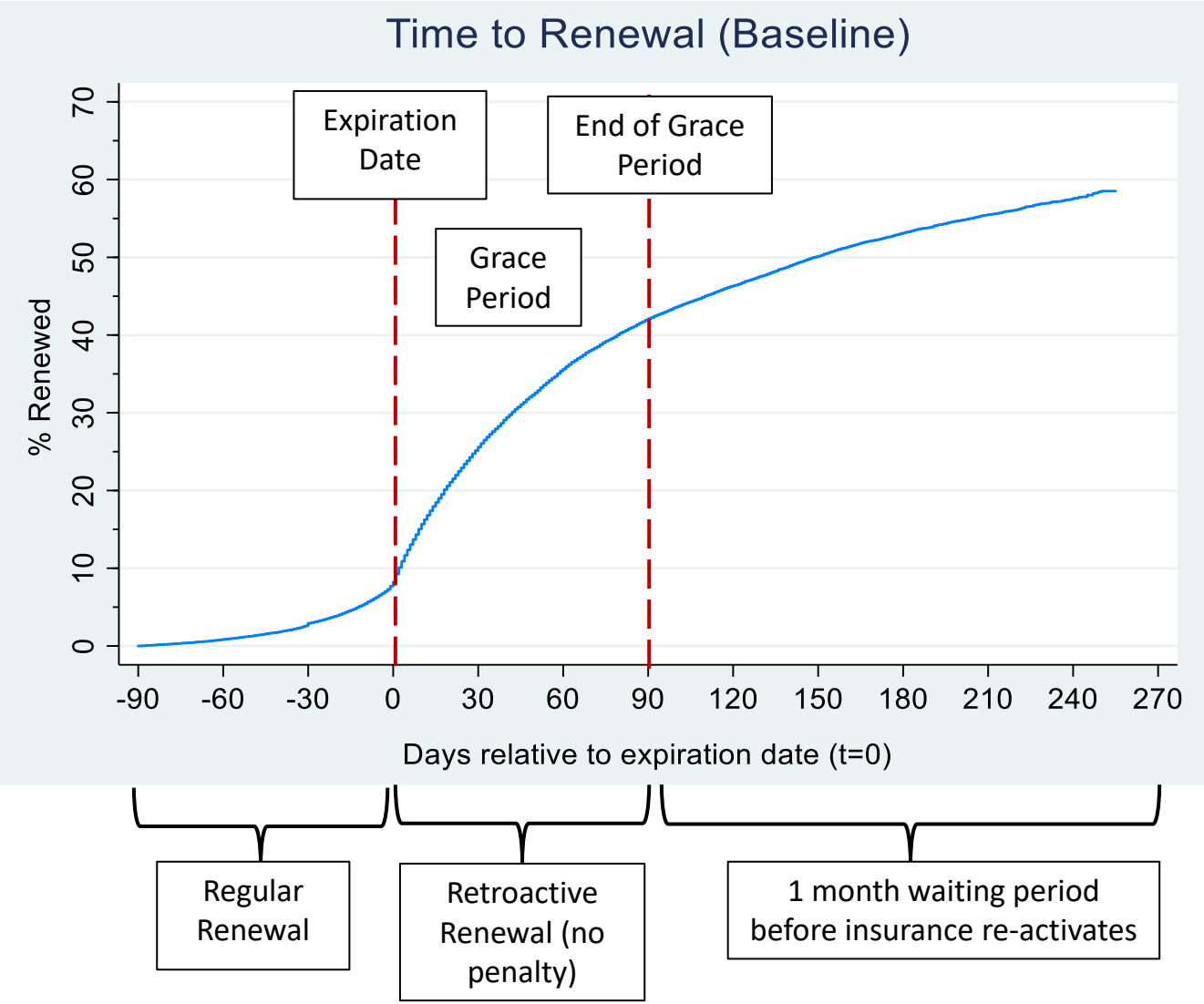
(1) Reminders: sent out (3 months to expiration - day of expiration then – up to 3 months after expiration) → target forgetting and increase awareness of there being a *period* for renewal

(2) Autorenewal: opt-in option for registered members → target flexibility and comfortability of renewal

The intervention:

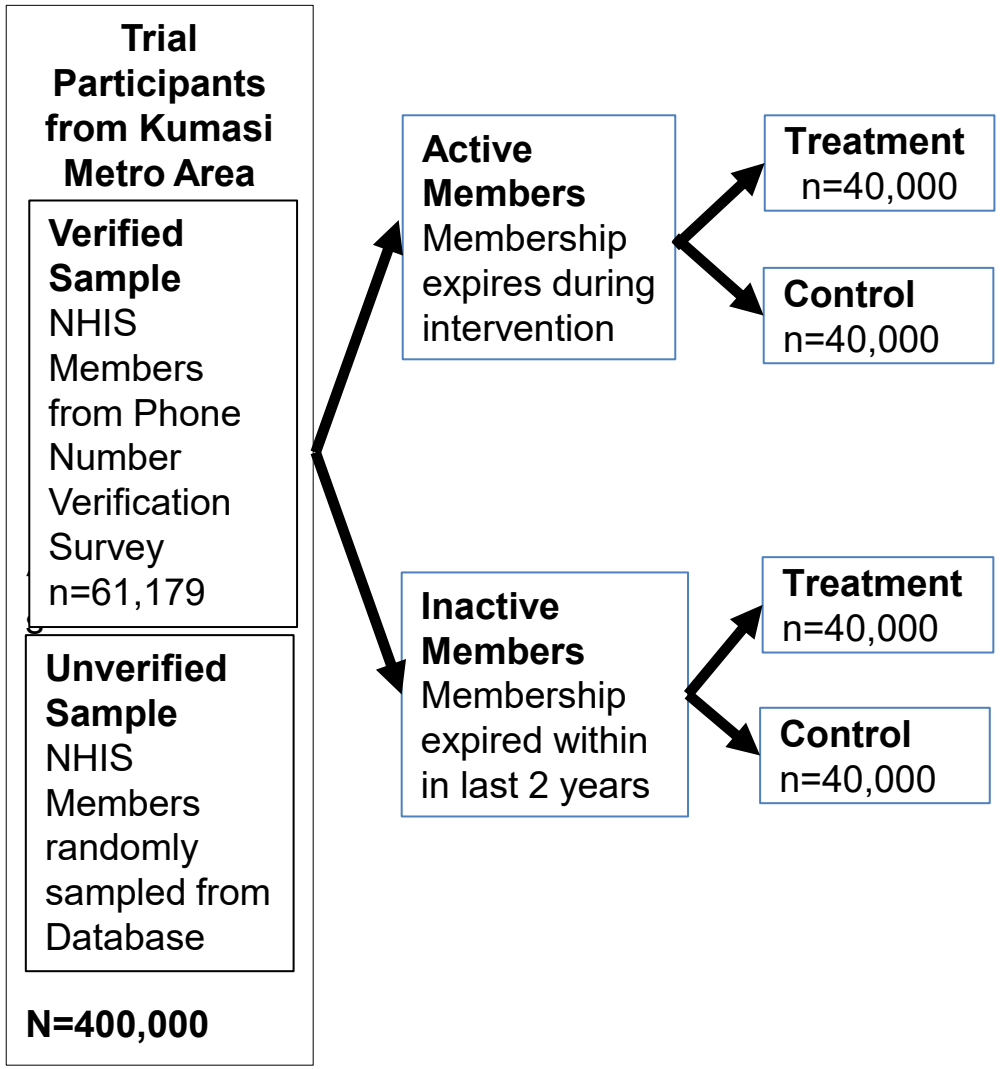
Increasing health insurance uptake through mobile technology

Renewal Process



- 1-year insurance period
- Requires annual renewal (+ payment)

Randomized Controlled Trial Design



Treatment 1: Reminder SMS
Tested from May – December 2024

Active Members receive SMS reminder to renew at regular intervals before & after expiration (t-28, -7, 0, 30, 60, 89).
Inactive Members receive Reminder to Renew on Day 1 and Day 14 of the trial.

Treatment 2: Autorenewal SMS
Tested from September – December 2024

Active and Inactive Members
- 2 Invitation SMS (Day 1 & 14)
- Once Signed Up: Money Balance Reminder

(Ensure MoMo account contains sufficient money before renewal.)

Platform White-List
- Only invited members can sign up
- Invited members can add other household members to account

The trial:

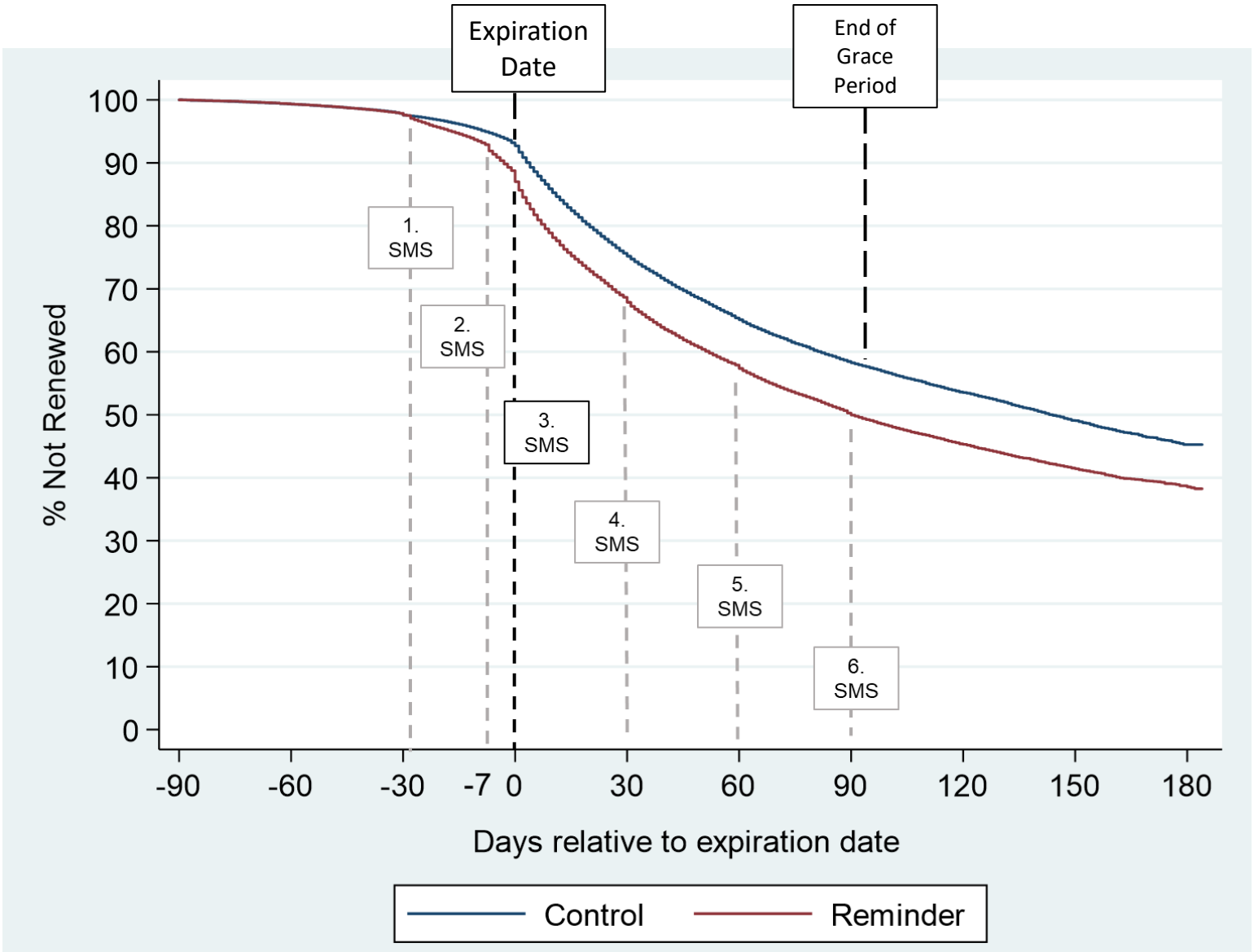
Evaluating the impact of reminders and an autorenewal option on health insurance uptake

Treatment Effects (Likelihood of Renewal)

Group	Odds Ratio	Notes
Reminders for Active Members	OR: 1.33***	
Reminders for Inactive Members	OR: 1.01	
Autorenewal for Active Members	OR: 1.04*	After 2 months, only 154 Trial Participants had registered. → Confirms need for large-scale community outreach, trust building, sensitization
Autorenewal for Inactive Members	OR: 0.98	
Autorenewal for Active Members After Advertisements	OR: 1.07*	Slightly higher effectiveness of SMS after public campaigns from NHIS.

Reminder Effect, since Sign-Ups too low

REMINDER SMS for Active Members

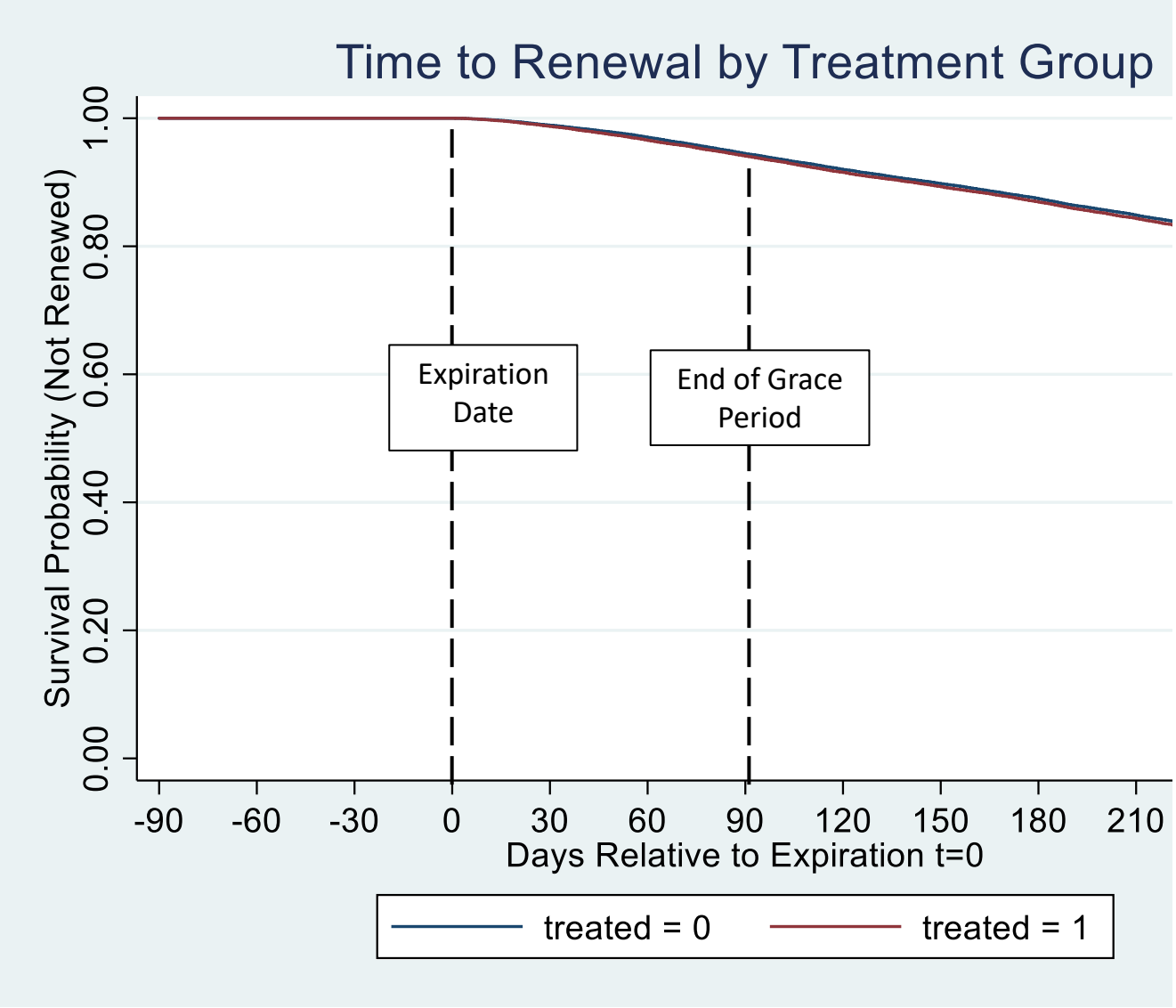


By the end of their grace period,
51% of treated and
43% of untreated had renewed

Log-rank test
p=0.0000

N=80,000

Reminder SMS for Expired Members

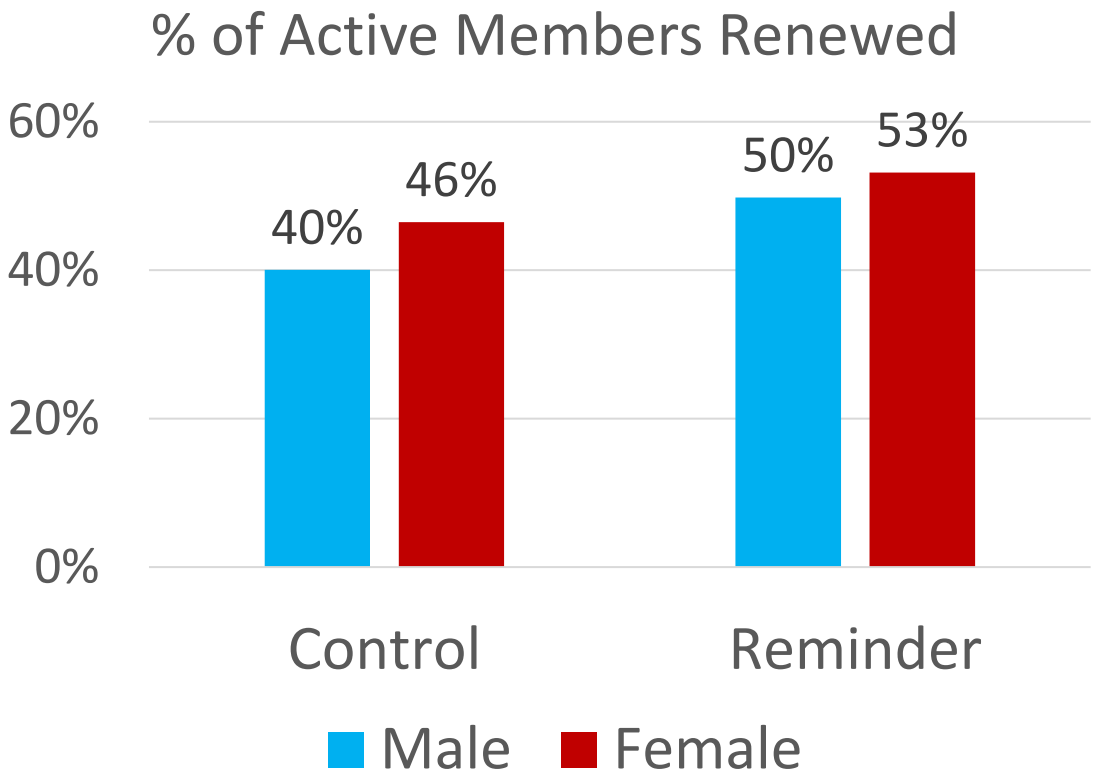


2 SMS received independent of expiration date (Day 1 and 14 of trial)

Log-rank test
p=0.0997

N=80,000

Renewal Rates by Gender (Active Members)



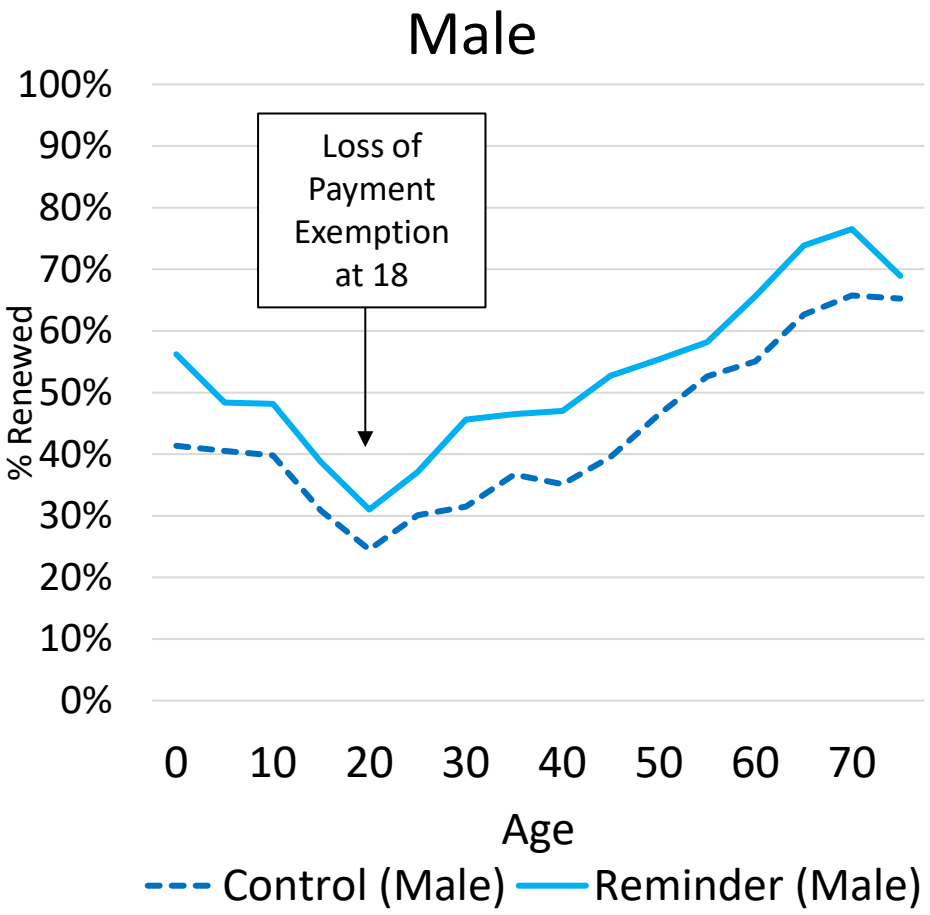
- Men have lower baseline likelihood of renewal than women (OR: 0.781***)

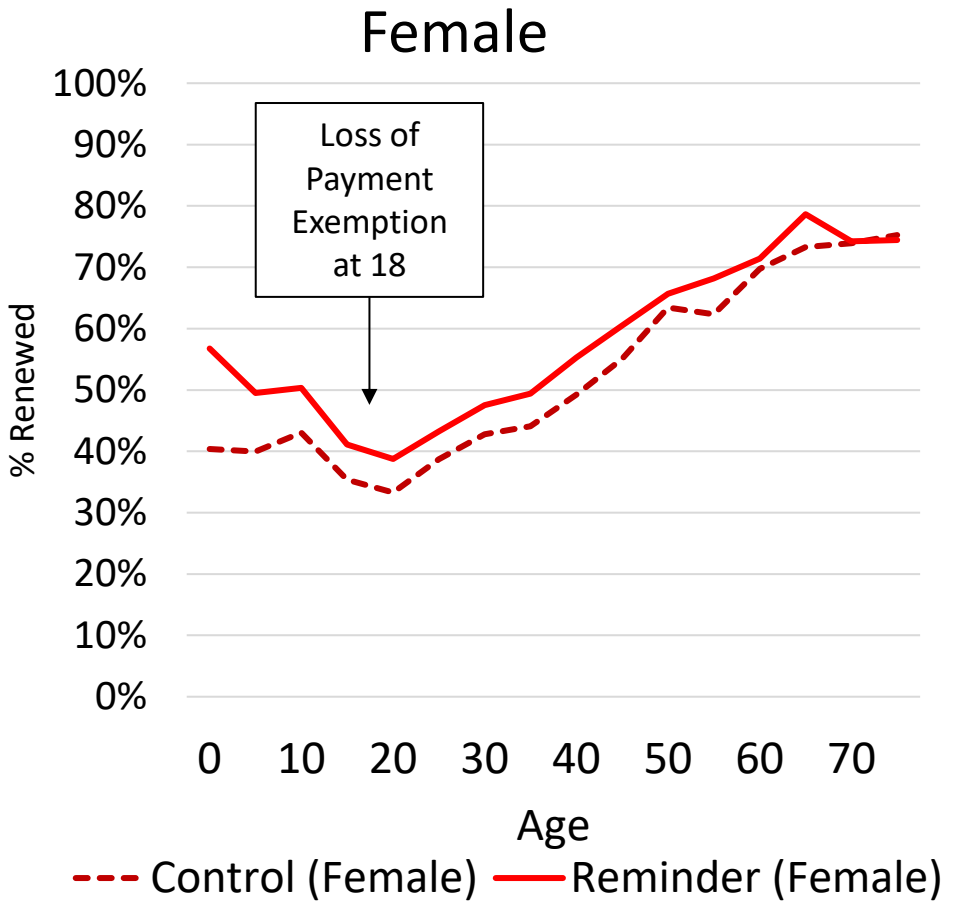
BUT

- Men responded more strongly to the Reminder SMS than women (OR: 1.103***)

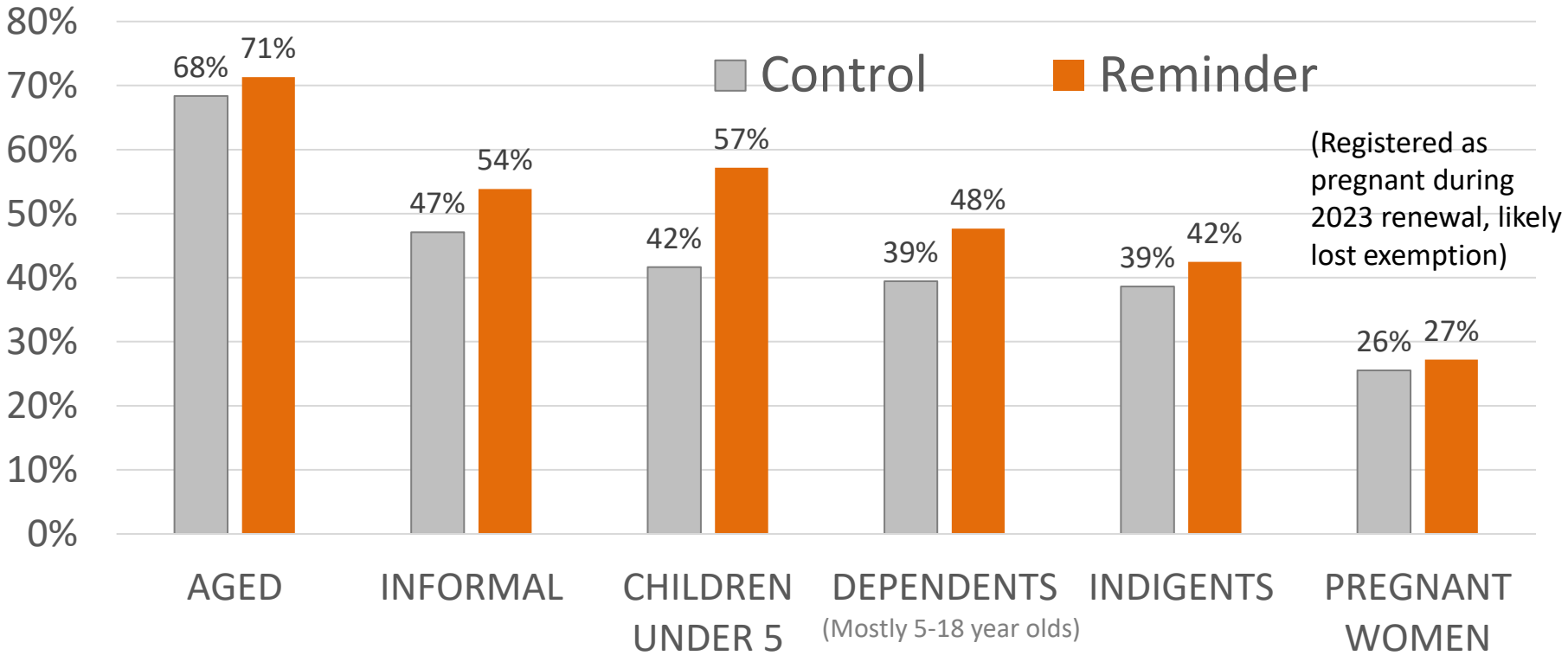
N=80,000

Renewal Rates by Age and Gender (Active Members)





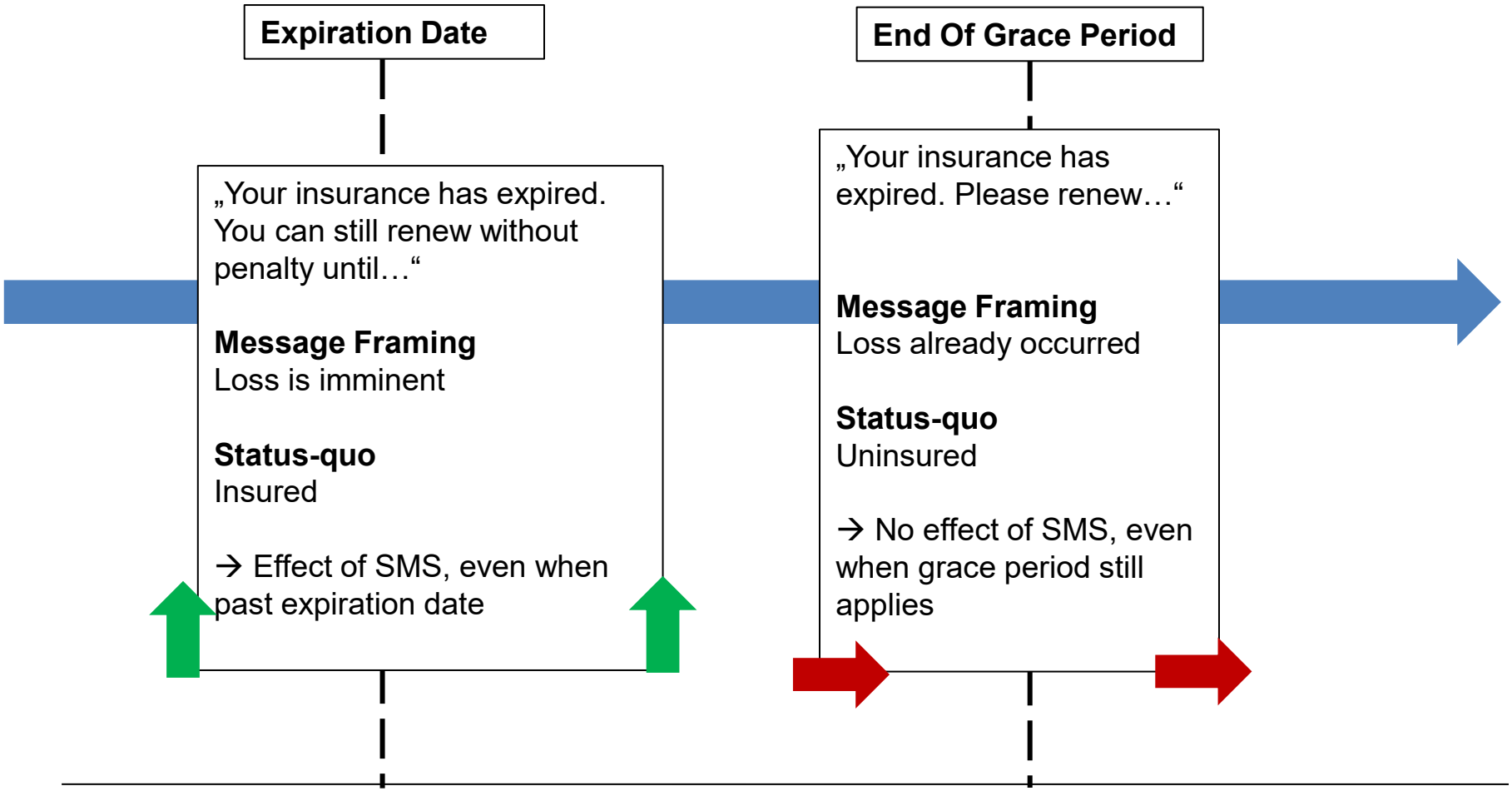
Renewal Rates by Membership Category (Active Members)



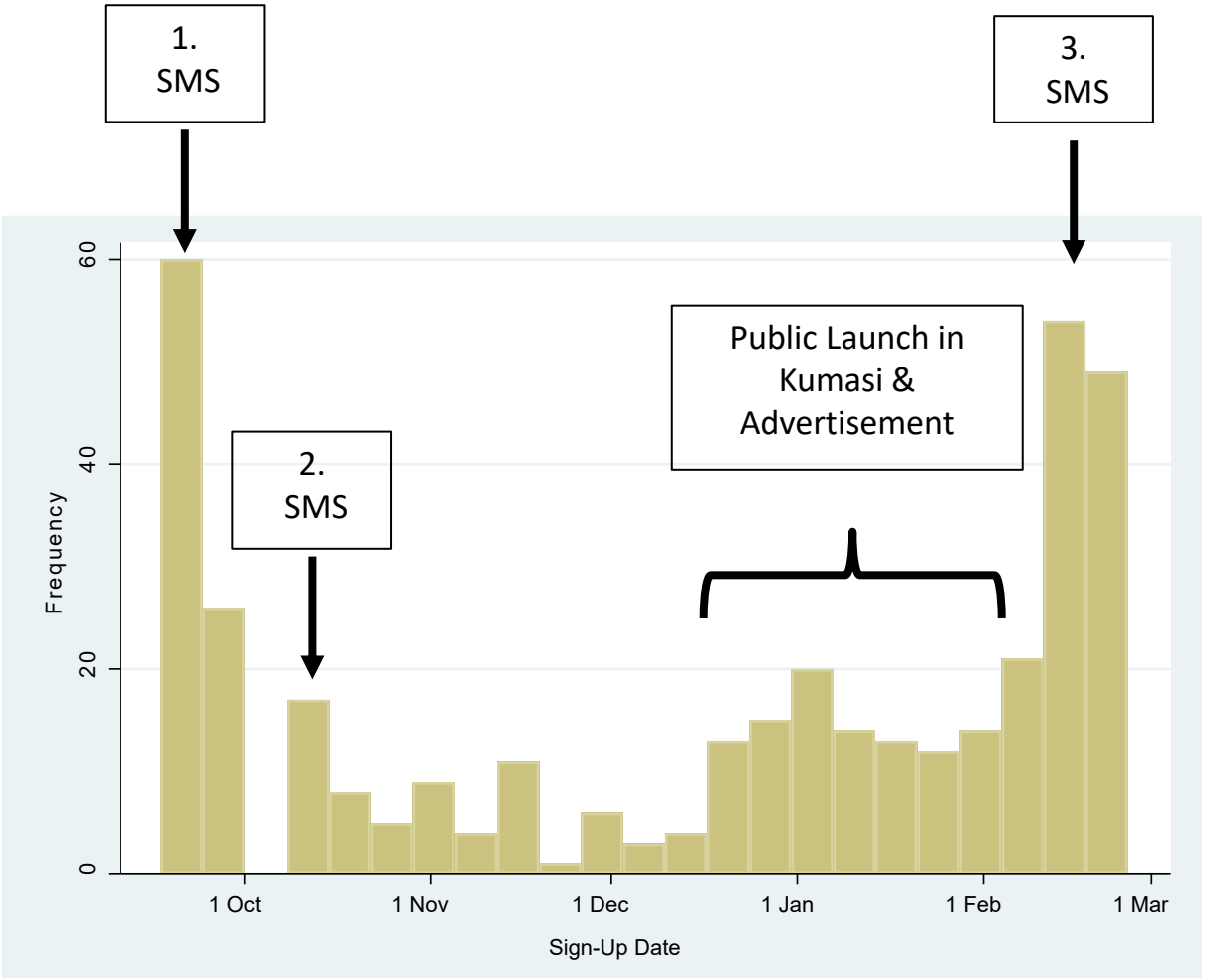
- Under 18 year-olds show strongest responsiveness to SMS reminders (OR: 1.178***)
- Informal workers show moderate responsiveness to SMS reminders (OR: 1)
- Aged and Fully Exempts (indigents, previously pregnant women) were the least responsive to SMS (ORs: 0.867*** and 0.883***)

Discussion of Reminders

- Framing mattered more than timing!
- Members who received SMS only in Grace Period responded only when exposed to the „Active Member“ SMS.



Automatic Renewal SMS to Trial Participants

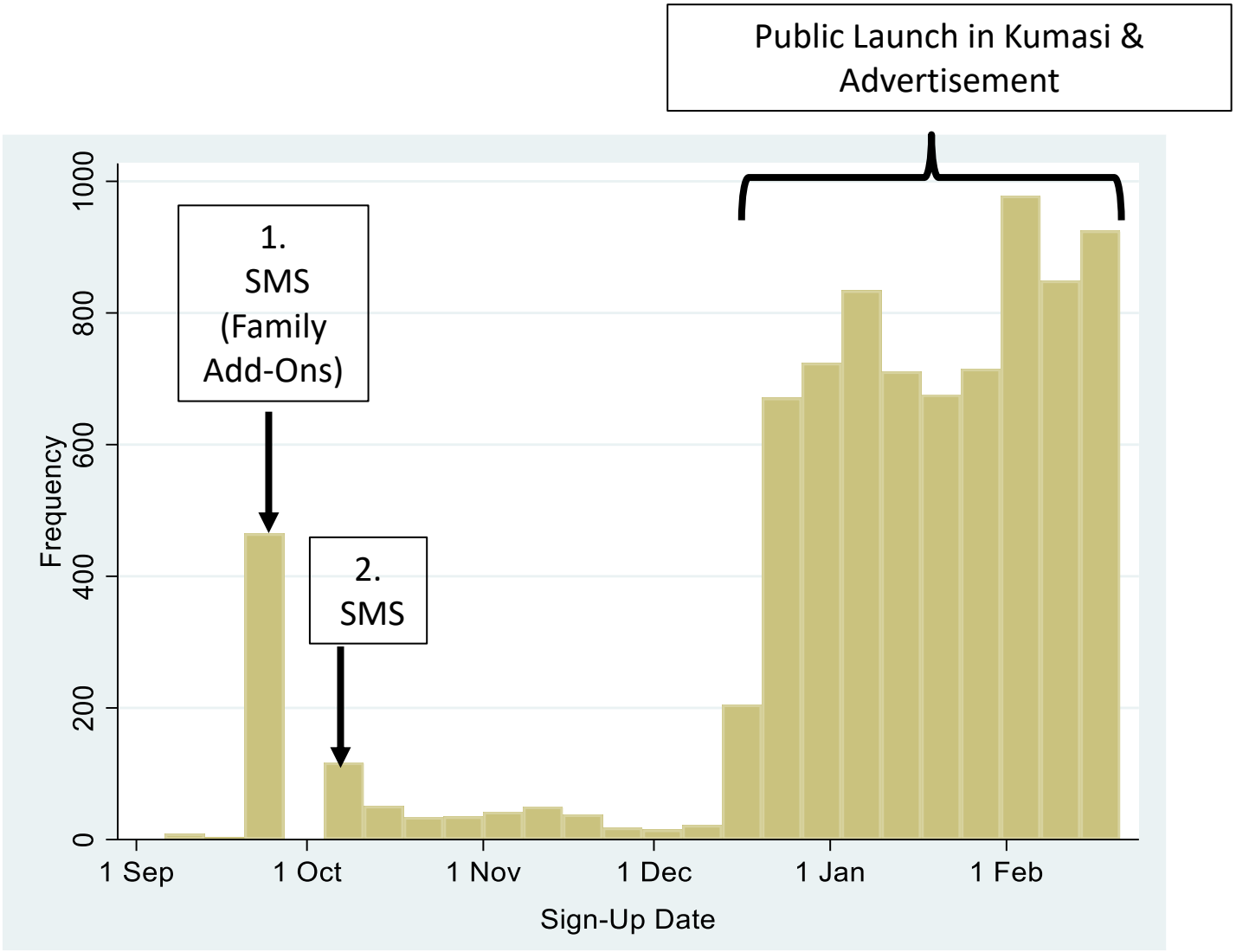


Sign-Up Rates in response to SMS
< 0.02%

Discussion
- Confirms requirement for extensive sensitization and community outreach

N=120,000 contacted

Automatic Renewal (All Ghana)

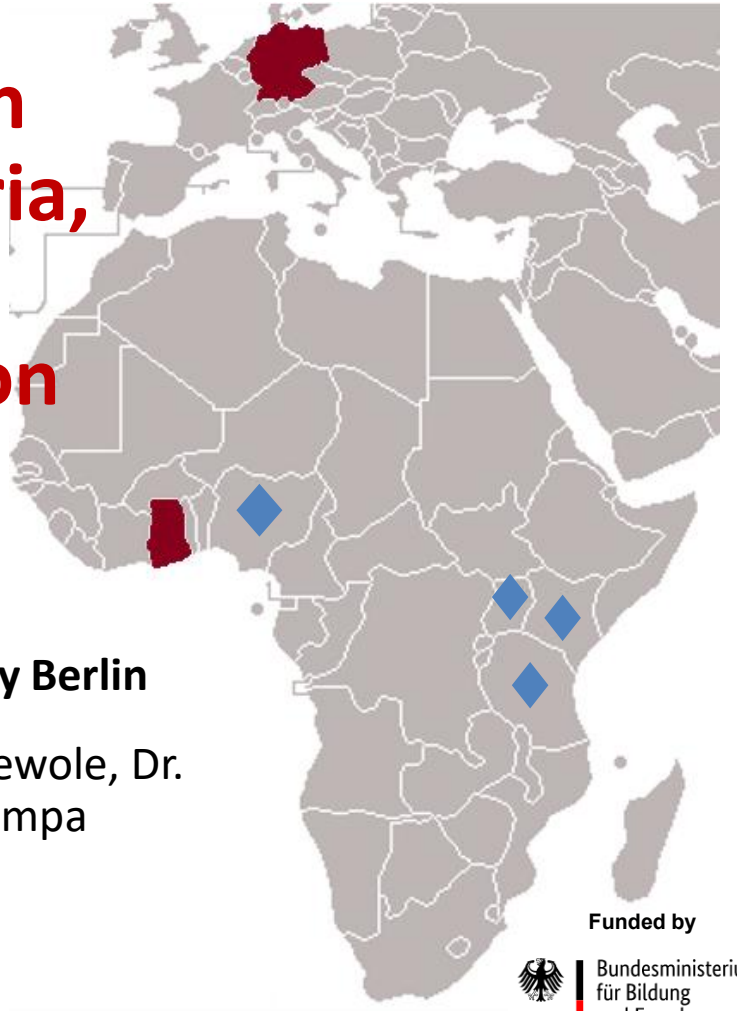


- End of November: ~4000 sign-ups
- End of February: ~11,000 sign-ups

Transferability research:

Assessing the applicability of the intervention to other contexts

Digital technologies for health care financing in Kenya, Nigeria, Tanzania and Uganda – assessment of the introduction of a renewal and reminder function



Dr. Verena Struckmann, Technical University Berlin

Collaborators: Dr. Pamela Godia, Dr. David Adewole, Dr. Respicius Shumbusho, Dr. Henry Zakumumpa

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Agenda

- What are digital technologies for health care financing?
- Overview of the health insurance coverage in Kenya, Nigeria, Tanzania and Uganda
- Provide an overview of the availability of DTHF and their role in supporting financing function across countries
- Assessing transferability criteria for the introduction of a reminder and renewal option
- Reflect on a way forward

Definition of digital technology for health care financing

- Any digital technology that is used to strengthen health financing systems across their three key functions:
  1) raising revenues,
  2) pooling resources,
  3) purchasing health services.
- Our focus is on mobile technologies (e.g. mobile payment services) and data technologies (e.g. data management and analytics including big data and artificial intelligence) as key drivers of change.

Health insurance coverage by country

Country	National Health Insurance
Kenya	24 % in 2022 (NHIF)
Nigeria	Less than 5% in 2021 (NHIS)
Tanzania	8% in 2021 (NHIF)
Uganda	0,2% in 2021 (CHI) + 5% in 2021 (PHI)

NHIF= National Health Insurance Fund
NHIS= National Health Insurance Scheme
CHI = Community Health Insurance
PHI = Private Health Insurance

Availability of DTHF and their financing function

A. Raising revenues:

n=40

B. Pooling:

n=17

Kenya n=17
Nigeria n=7
Uganda n=4
Tansania n=14

C. Purchasing:

n=19

The role of DTHF in supporting different financing functions

Kenya:

- Increase efficient revenue raising, effective pooling and transparent purchasing mechanisms

Tanzania:

- Simplifying payment processes through mobile platforms
- Breaking annual premiums into affordable instalments

Uganda:

- The majority of DTHF are targeting the population under 40 years with high digital literacy to enhance the mobilization of funds for health services

Nigeria:

- DTHF help expand health insurance coverage particularly among poor and vulnerable populations and minimise inequity of access to healthcare

"...some people need 50 reminders. Those in business know them. You sell them vegetables for fifty. You tell them in the morning when they pass by, and they tell you that they are aware. In the evening you tell them again that they owe you fifty. Up to ten times before they pay up." .” . – FGD participant *from Kenya*

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tic

			FGDs (n)
Kenya	10	NHIF, Ministry of Health, members of parliament, informal sector workers	35 (5FGDs)
		lth pany, workers	31 (5FGDs)
Tanzania	19	Regulatory institutions, mobile money operators (MMOs), digital innovators, informal sector workers	52 (4FGDs)
Uganda	16	Healthcare providers, private telecoms, insurance companies, regulatory authorities, local DTHF experts,informal sector workers	32 (4FGDs)

“Reminding you to pay is a good thing. But, when it is done too much it becomes boring. All of these messages are about money, money, money.“ – FGD *participant from Tanzania*

Assessment of relevant transferability criteria

Population
- Favourable age distribution -> digital literacy + trust
- High mobile phone penetration
- Consider local languages

Regulation/ legislation
- Importance of compliance of intervention with existing regulation
- Need for further regulatory frameworks

Intervention content
- Cultural sensitivity
- Tailor frequency of reminders
- User centred design of reminders

Adoption and implementation
- Misconcpetion of health insurance
- Build trust through clear communication
- High mobile phone ownership
- Authentification process needed -> concern about scams
- Involve key stakeholders in design and implementation process

Reflections on a way forward

- DTHF positively affect health financing functions and tasks → improved access
- Kenya, Nigeria and Tanzania: effects of the introduction of DTHF limited due to lack of human ressources + infrastructural limitations Health insurance awareness raising
- Across countries: misconception of health insurance → social norms
- Fragmented, multiple pools and payers
- Limited role of the government to the development and ownership of DTHF –> limits ownership & scale-up commitment

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Thanks for listening!
Questions,
feedback, ideas?

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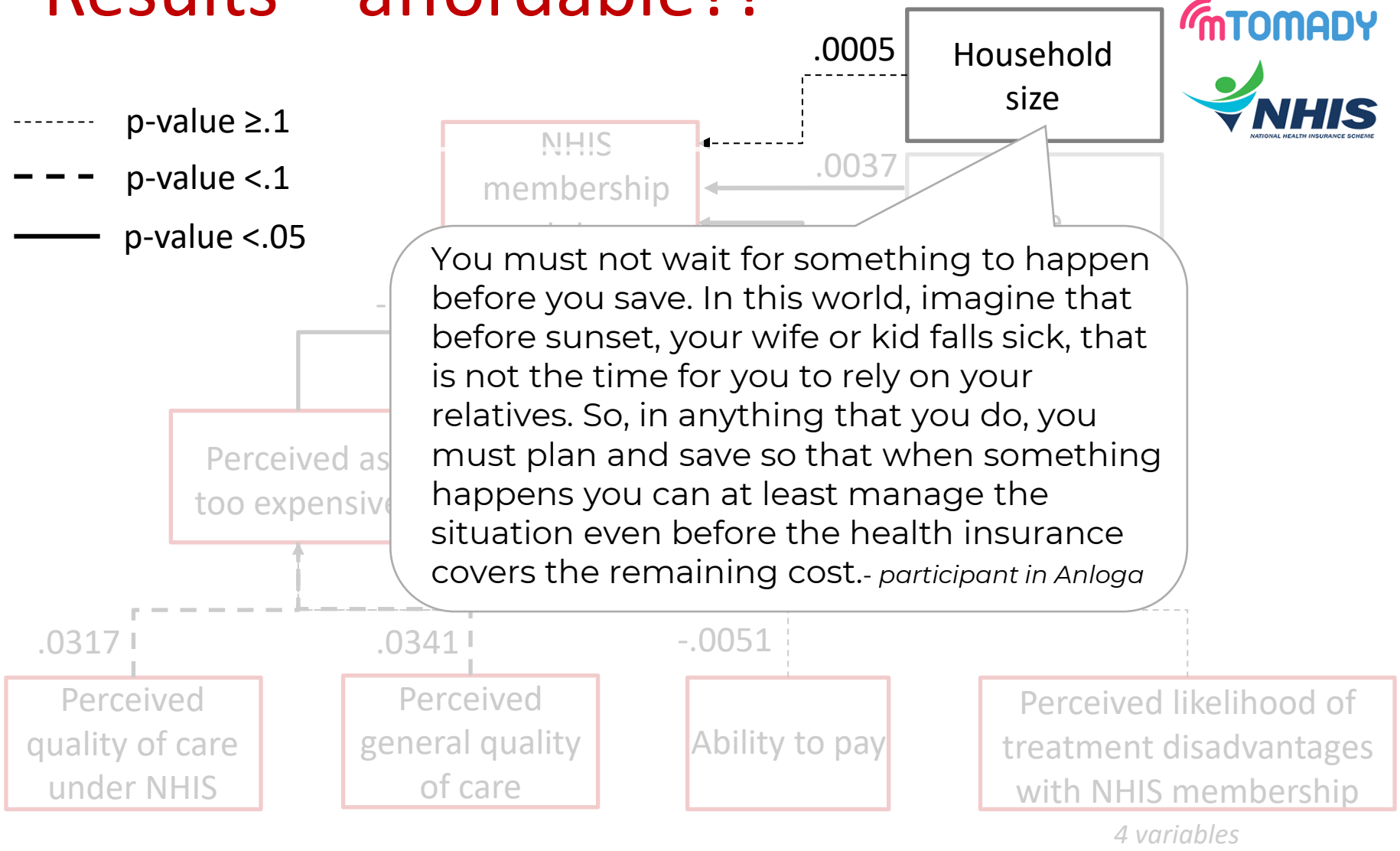
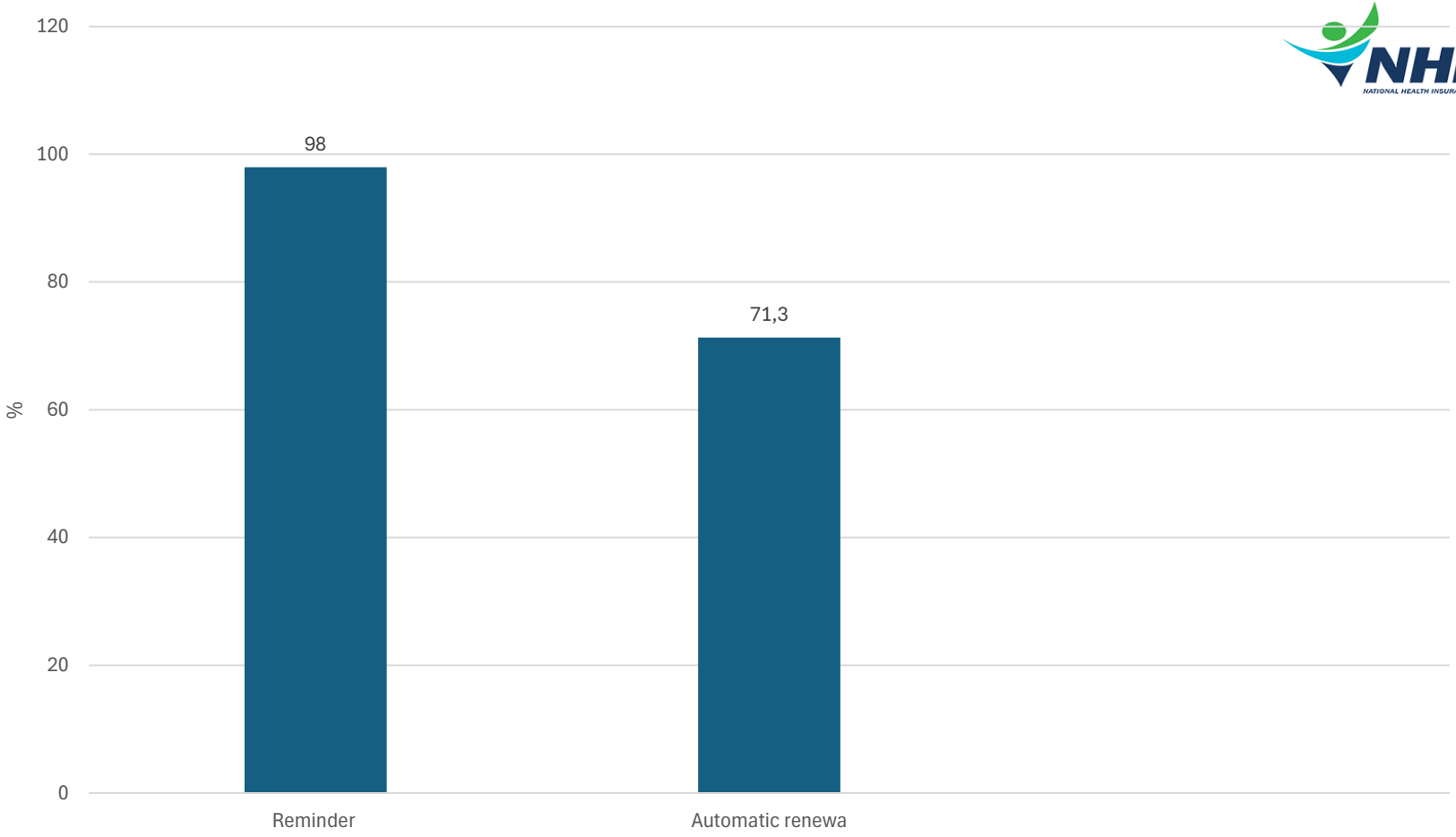
Appendix

Results – affordable?!



You must not wait for something to happen before you save. In this world, imagine that before sunset, your wife or kid falls sick, that is not the time for you to rely on your relatives. So, in anything that you do, you must plan and save so that when something happens you can at least manage the situation even before the health insurance covers the remaining cost.- *participant in Anloga*

Acceptance of solutions



Building an evidence-based intervention: context & design

- NHIS uptake decisions should not be viewed as merely individual decisions → to be considered in technology design and outreach
- Understanding decision components helps to define the potential and limitations of add-on interventions from the outset
- Affordability entails more than financial aspects and was a factor for only those in the poorest quintile and socioeconomic status.
- Psychosocial and health system issues were significant reasons for non-renewal.

Building an evidence-based intervention: design & solution

Different mobile phone add-on(s) can potentially contribute to increasing NHIS coverage in Ghana

- Automated renewal systems or SMS reminders have the potential to increase NHIS coverage rates in a cost-effective and scalable manner.
- Reforms of the NHIS premium structure could enhance both the equity and sustainability of the scheme.
- Implementation should address insurance literacy and build trust in using mobile technology.
- Targeted awareness campaign and education, segmented and contextual information should be applied

Reminder SMS

Reminders for Active Members						
SMS #	1	2	3	4	5	6
t_x (Expiration date= t_0)	t_{-28}	t_{-7}	t_0	t_{+30}	t_{+60}	t_{+89}
Condition	Membership has not been renewed by t_x					
Message	Dear *Name*, Your NHIS card will expire in *X* days. You can renew using the MyNHIS app, *929# or go to the nearest NHIA district office.			Dear *Name*, Your NHIS card is expired. You can renew within *X* days to avoid a 1-month wait. Use MyNHIS app, *929# or go to the NHIA district office.		

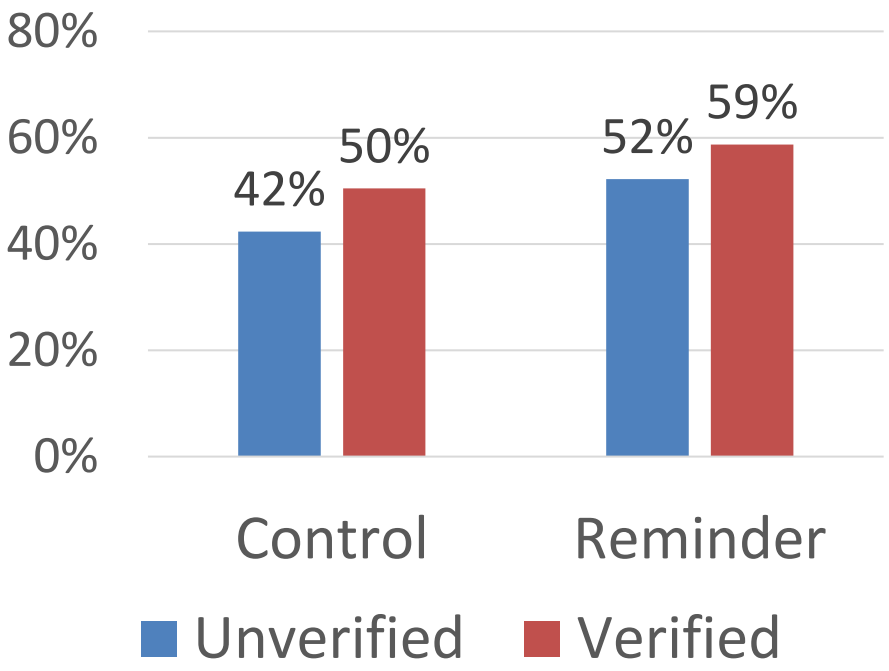
Reminders for Expired Members	
t	Day 1 and Day 14 of Trial
Condition	Membership has expired and has not been renewed by t
Message	Dear *Name,* Your NHIS card expired *dd/mm/yyyy*. You can use the MyNHIS app, *929# or go to the NHIA district office to renew your coverage.

Automatic Renewal SMS

Autorenewal Invitation	
Day of Trial	Day 1 and Day 14
Condition	Member has not opted into autorenewal
Message	Dear *Name*, NHIA offers a new option to renew your membership automatically. You can opt-in by dialling *929*20#. For more information, call NHIA call center at 6447.

Reminders after Sign-Up			
t_x	t_{-90}, t_{-60}	t_{-30}, t-29, t-28,	t_{-27}
Condition	• Active membership has not been renewed. • Member is required to pay premium or processing fee.	• Autorenewal payment has failed	• Autorenewal payment has failed 4 times
Message	Dear *Name*, your NHIS insurance automatically renews on *dd/mm/yyyy*. Please make sure you have *xx* cedis in your MoMo account. (Dial *929*20# to change your settings)	Dear *Name*, unfortunately, your membership could not be renewed. We will try again tomorrow. Please make sure you have *xx* cedis in your MoMo account. (Dial *929*20# to change your settings)	Dear *Name*, your membership could not be renewed automatically. Please use MyNHIS app, *929# or go to the nearest NHIA district office.

Phone Number Verification Effect (Active Members)



Survey showed that only 51% of Phone Numbers in Database matched current main number.

Verifieds had higher baseline likelihood of renewal (OR=1.39***)

BUT:

No statistically significant difference in the treatment effect of reminders on the verified and unverified sample

(OR=.987)

→Intervention effective even without verification excercise

(Multiple phone numbers per person/household, but still reach intented user)

TITLE

XX