

Healthcare Appointments as Commitment Devices

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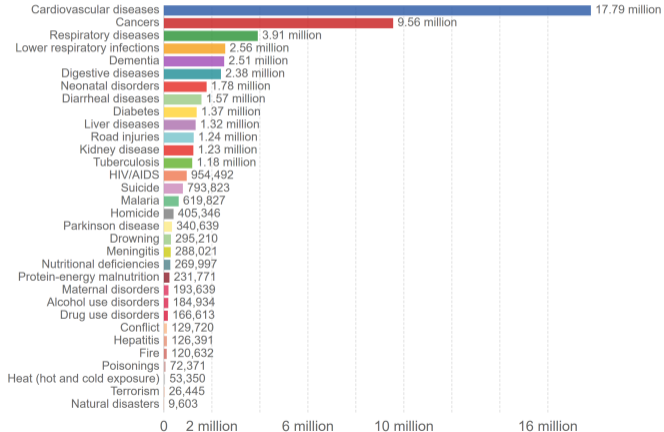
Health behaviors are plagued by commitment problems

- Short term costs, long term gains
- Prone to self-control problems (O'Donoghue and Rabin 1999)
- Modeled as **procrastination** or **present bias**
- Disagreement between present and future self

Many major global health problems already have biomedical solutions

Number of deaths by cause, World, 2017

Our World
in Data



Source: IHME, Global Burden of Disease

OurWorldInData.org/causes-of-death • CC BY

How do we get people to use these solutions?

News - Health

Millions of UK adults putting off going to doctor, poll claims

'It's common sense that pretending they aren't happening isn't going to fix anything'

Emma Elsworthy | Wednesday 13 November 2019 18:01 |



Lynne Cameron/PA Wire

- Preventive care can stave off many diseases
- **Behavior change** is key to improving public health
 - Improving diets & exercise (diabetes, cardiovascular problems)
 - Treating water & hygiene (diarrhea)
 - Using bednets (malaria)

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- Preventive care can stave off many diseases
- **Behavior change** is key to improving public health
 - Improving diets & exercise (diabetes, cardiovascular problems)
 - Treating water & hygiene (diarrhea)
 - Using bednets (malaria)
- Key problem: people put this stuff off and/or simply forget about it

Commitment devices are often proposed as a solution

- People voluntarily put up collateral (money)
- Get money back only if they follow through with healthcare
- Can help people overcome self control problems (Laibson 1997, Gul and Pesendorfer 2001, Halpern, Asch, and Volpp 2012, Laibson 2015)
- Commitment devices encourage healthy behavior in many health contexts (Gine, Karlan and Zinman 2010, Royter, Stehr, and Sydnor 2015, Shilbach 2019)

Another option is appointments—ubiquitous in rich-country healthcare systems

massvax.maryland.gov



**Your vaccination is
successfully booked.
Please bring the
confirmation text or
email to the
appointment. Please**

massvax.maryland.gov

Booking Details

Location

Six Flags

Location address

13710 Central Ave, Bowie, MD 20721

Appointment 1: Date and time

Tuesday March 2 8:30AM, 2021

Appointment 2: Date and time

Tuesday March 23 8:00AM, 2021

Why pre-schedule healthcare?

Appointments address a wide range of logistical challenges:

- Provider time constraints
- Availability of space (exam rooms, operating theaters)
- Reducing crowding, controlling flow of patients
- Ensuring treatments happen at correct time (e.g. second covid vaccine dose)

⇒ Use of appointments is motivated by **supply-side** issues in healthcare provision

This paper: appointments are also commitment devices for healthcare

We attempt to answer how appointments affect preventive care & why

- Do appointments increase HIV testing?
- Which works better—traditional financial commitments or appointments?
- How do appointments work?

Previous research: appointments may be effective

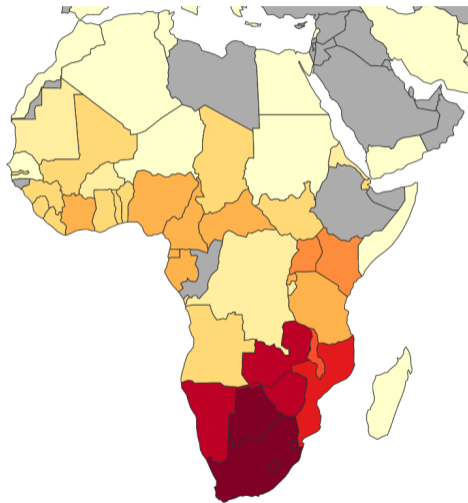
- Appointments for HIV tests bring in more men than ones for pregnancy information (Mohlala et al. 2011)
 - But no pure control group
- Financial commitments can help improve health behaviors (e.g. Volpp et al. 2009, stickK.com)
 - Seem to backfire often (John 2019, Bai et al. 2017)
- Appointments increase flu shots (Chapman et al. 2016) and HIV testing in a low-prevalence setting (Salvadori et al. 2020)
 - Much lower-stakes—will this work for actions that are more costly?
 - Unclear *why* they were effective

Preview of findings: appointments are very effective

- Offering appointments increases HIV testing by over 150%
 - Nearly 2X as effective as financial commitment devices
- Appointments appear to substitute for commitment devices, but with fewer drawbacks
- Evidence points to two key mechanisms:
 - Appointments are **social commitment devices**
 - They come with reminders that address **limited attention/memory**

Malawi is at the front lines of the final offensive against AIDS

- 10% of population has HIV
 - 9th-highest rate in world
- Developed the Option B+ strategy
 - Lifetime ART for infected pregnant women through ANC visits
(Coutsoudis et al. 2013)
- Moving toward universal test-and-treat
- Men still mainly left out of HIV care pipeline & key to epidemic spread
(Watkins 2011, Dovel et al. 2020)



Our study targets high-risk men

- Drew a sample of $\approx 1,200$ men
- Had to own a mobile phone
 - Possible marker of wealth and thus HIV risk
 - Cell phones were used in our intervention
- Sampled men at bars & nightclubs in the city of Zomba in southern Malawi
 - Bars in southern Malawi are markets for transactional sex work
 - Men who frequent bars engage in high risk activities: drinking, unprotected sex, multiple partners

Experiment had four study arms

After baseline survey, men were randomly assigned to

1. Control group
2. Financial commitment device
3. Appointment
4. Commitment device + Appointment

Every respondent received an HIV testing voucher

- Worth approx. \$1 (MK500)—about half a day's wages
- Voucher code sent by text message
- Redeem within 2 months
 - Deadline not emphasized in script
- Any HIV testing site in town (11 options)
 - Did not have to follow through with test to get voucher \implies we use actual testing, not voucher redemption, as our outcome
- Hired qualified HIV diagnostic assistants and integrated them into clinics
 - Done to minimize wait times for study participants
 - Also to avoid disrupting normal clinic operations

All respondents received a gift of airtime worth \$2 for taking the baseline survey

Commitment device was explained using familiar references

Have you ever taken a loan where you had to give collateral (“chikole”) which you would get back when you repay?

Sometimes you really want to do something, but you don't have the willpower or self-control.

For example, a person might want to go for HIV testing, but he keeps postponing because he is afraid, or he is busy, or maybe he is just lazy.

It can help to make a commitment, for example, by using a collateral (“chikole”) to ensure that you go for testing.

I want to offer you a way to give some collateral (“chikole”) for HIV testing.

We elicited commitment device preferences for **every** respondent

Want to give up \$2 (MK 1,000) out of your MK 2,000 gift right now for an additional \$2 increase in your HIV testing voucher?

(Staking about a day's wages on the fact that they will show up for a test)

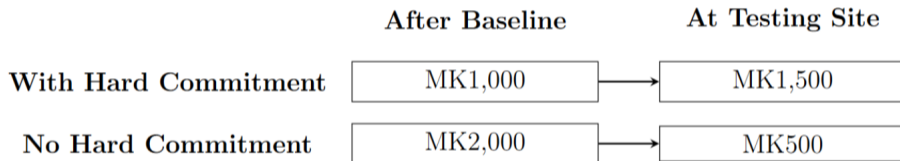
If you say yes, we will have a lottery, and 50/50 chance MK 1,000 of your gift goes to the "chikole".

If you say no, you will just get all MK 2,000 of your gift now.

Are you sure about your answer?

51 percent of men want the commitment device

Timing of compensation with and without commitment device



Appointment intervention design

Elicit preference for treated **only**

- *Are you interested in an appointment for HIV testing?*
- Respondent chooses date, time, location
- Can still redeem voucher anytime

65 percent sign up for an appointment

HIV testing staff call to remind them about the appointment 2 days beforehand

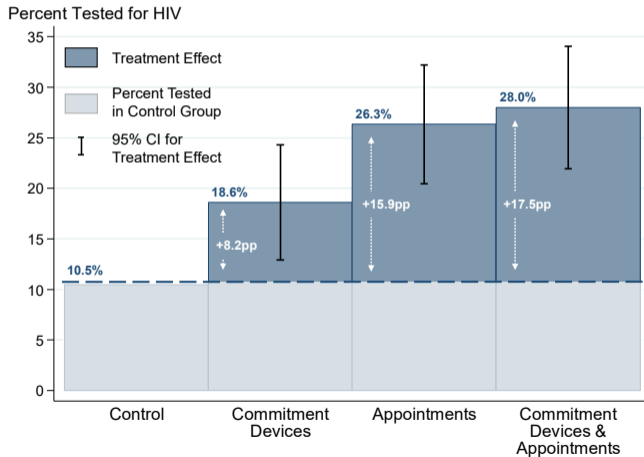
Empirical strategy: regress testing on treatments + controls

$$T_i = \alpha + \beta_1 CD_i + \beta_2 A_i + \beta_3 A_i \times CD_i + \gamma' X_i + \varepsilon_i$$

- T_i : Indicator for getting tested
- CD_i : Commitment device treatment
- A_i : Appointment treatment
- X_i : Controls (pre-specified or chosen via Chernozhukov et al. 2017 Double ML)

Analysis plan posted at <https://www.socialscisceregistry.org/trials/4295>
before we got the data

Both interventions increase HIV testing, but **appointments are much more effective**



Commitment demand is high, but CDs *backfire* for most men

Of those who received *only* the commitment device:

- 36% redeemed the voucher
- 27% got tested

Most men are made worse off—social benefit?

- Parallels findings by John (2019) and Bai et al. (2020)

Appointments don't have this problem

- No financial losses
- Social losses/shame?

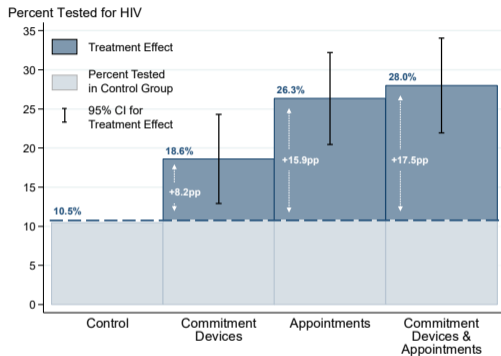
An appointment is a **bundle** of many interventions

Bundled appointment intervention is likely more valuable than sum of its parts

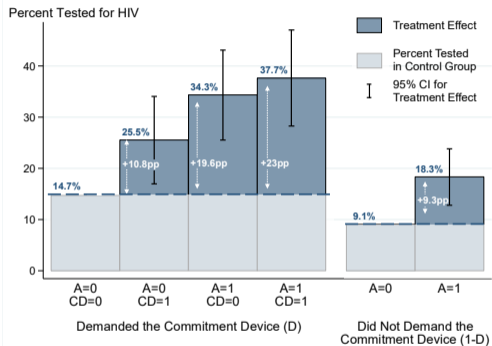
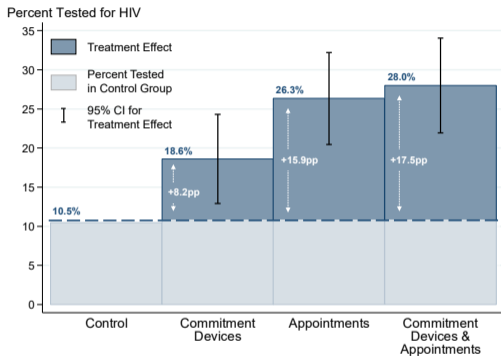
We find clear evidence for two primary mechanisms (likely not the only ones):

1. **Social commitment device** addresses **self-control** problems
2. **Reminders** address problems of **limited memory**

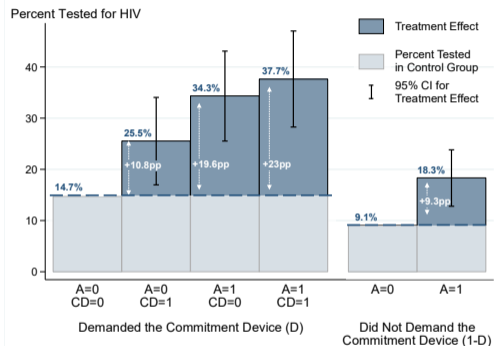
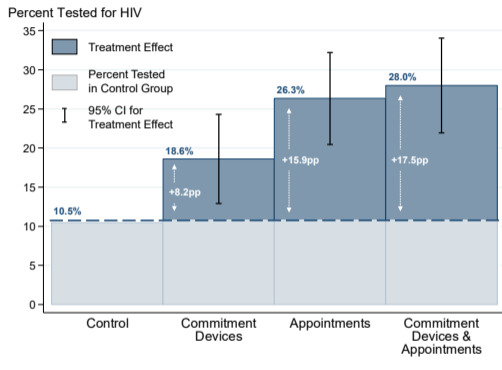
Appointments substitute for commitment devices



Appointments substitute for commitment devices



Appointments substitute for commitment devices



- Appointments alone are nearly as good as appointments + CDs
- Effects are predominantly among men who demand commitment

An appointment is a commitment

Appointments create a **social commitment** with the HDA

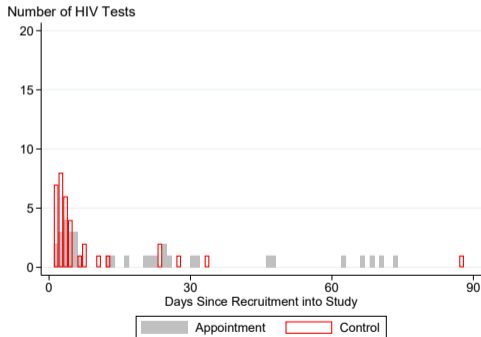
- Creates social pressure to follow through with healthcare (Karing 2018)
- Many examples from finance, e.g. savings deposit collectors (Ashraf et al. 2013)

Also act as an **invitation** to seek healthcare

- Clinics typically target women (Dovel et al. 2020)

Limited memory

Reminders \Rightarrow testing later, even outside appointment date

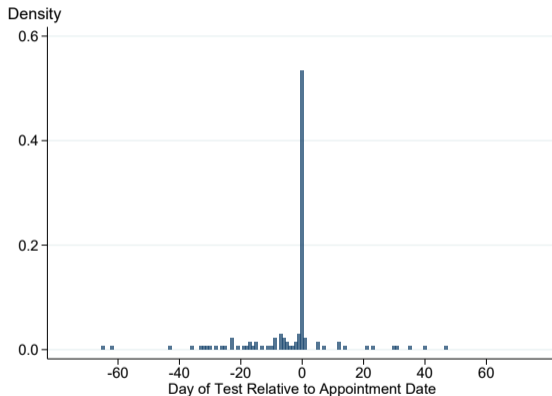


15 days later on average
($p = 0.005$)

Time pattern of tests also rules out displacement

- One concern: additional HIV tests caused by appointments just substitute for other/future tests
 - i.e. testing shifts into study clinics & from future into study period
- Shifting clinics is unlikely
 - Study included all local clinics
 - Appointment & control arms had same financial incentive to visit study clinics
- What about shifts in timing? Implausible given total lack of testing late in study in non-appointment arms

Spike in testing on appointment date



It's not only about the reminders

Other Mechanisms

Spike on date is consistent with **social commitment**

Interviews with clinic staff indicate little to **no wait time** under the status quo

Making **a plan**/date salience

- Not very effective for increasing HIV testing (Macis et al. 2021)

Conclusion

Appointments are a very effective tool for increasing healthcare utilization

- Address several behavioral barriers at once

More than double demand for HIV test

- Even for emotional/high-stakes decision
- Has potential to increase other preventive care

Better than commitment devices, and:

- More feasible to implement (no need to give out money)
- No risk of financial losses for patients

Major potential for other preventive care as well

Under-utilization of many preventive care services

- Prostate exams
- Skin cancer checks
- Well-child visits

Appointments work even for emotionally difficult/high-stakes problems

Problem addressed by appointments also generalizes

- More than not wanting to go to doctor, people just forget about stuff
- Auto-schedule next appointment for doctor, like dentist?
- Other automatic reminders? Need to target these well, so they don't just fade into the broader noise of digital life

Key open questions

- What other mechanisms could be behind the effectiveness of appointments?
 - Do they work on you, personally?
 - If so—why?
- What do we know about the general use of appointments in developing countries?
 - Is there data on this?
- Are there other domains where appointments might work well?

Thanks!

If you have any other questions/comments/suggestions, please send them to me at jkerwin@umn.edu

Appendix Table

	(1) HIV Test	(2) HIV Test	(3) HIV Test
Appointment (A)	0.151*** (0.030)	0.159*** (0.030)	0.160*** (0.030)
Commitment (CD)	0.080*** (0.029)	0.082*** (0.029)	0.084*** (0.029)
A × CD	-0.081* (0.046)	-0.065 (0.044)	-0.090** (0.045)
Controls	None	Pre-specified	Double ML
N	1,232	1,232	1,232
R-squared	0.023	0.167	0.088
Control-group mean	0.113	0.113	0.113

Heteroskedasticity-robust standard errors in parentheses: * $p < 0.10$,

** $p < 0.05$, *** $p < 0.01$

Self control problems appear to be a barrier to HIV testing

Half of men demand commitment

Reasons for avoiding test:

- Not needed (34%)
- Too busy, too lazy, too forgetful (33%)
- 8% mention laziness specifically