

Real-time adherence monitoring with follow-up improves adherence compared to electronic monitoring alone: quasi-experimental analysis

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Declarations

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 - NIH
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 - Natera (stock)

Electronic adherence monitoring

- Standard (e.g., MEMS) and real-time (e.g., Wisepill) devices

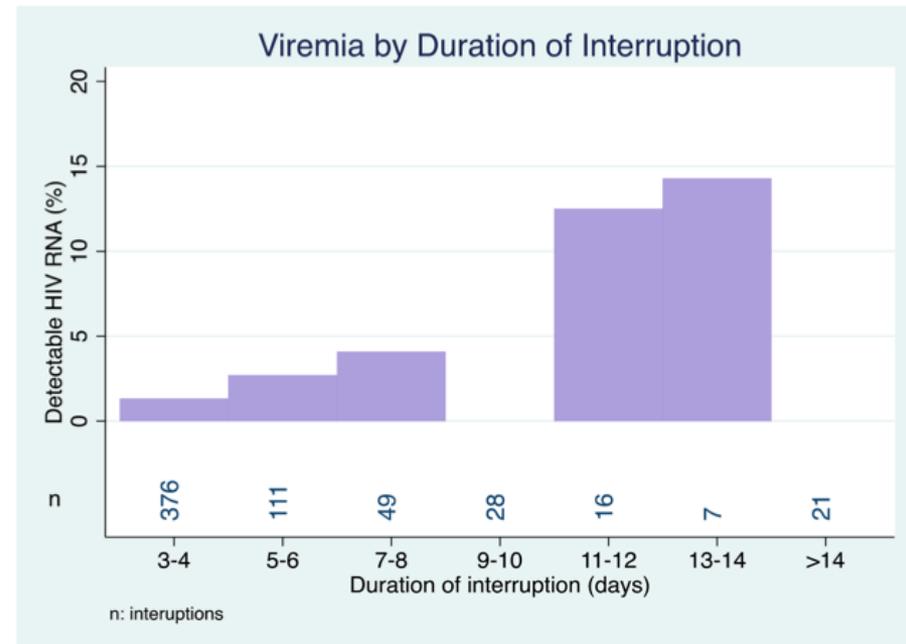


- Provide an objective day-to-day assessment of adherence (i.e., levels and patterns)
- Allow for differentiated interventions

Sustained adherence interruptions are associated with viral rebound

- Viremia can be detected in real-time
- Impact of real-time follow-up on adherence is unclear

(Sabin, JAIDS, 2015; Orrell, JAIDS, 2015; Haberer, AIDS, 2016)



(Haberer et al, AIDS, 2015)

UARTO

- Longitudinal observational cohort study (Uganda AIDS Rural Treatment Outcomes) among HIV-infected adults at ART initiation
- Enrollment 2005-2012
- Quarterly follow-up
 - Socio-demographic data
 - ART regimen
 - HIV RNA



Adherence monitoring in UARTO

MEMS

- 2005-2012
- Observational measure

Wisepill + follow-up

- 2011-2015
- Observational measure
- Sustained (48+ hr) adherence interruptions triggered home visits
 - Brief interviews
 - Phlebotomy for viral load assessment

Analysis

- Comparison of adherence for participants who had 6 months each of monitoring with MEMS and Wisepill + follow-up with ≤ 1 day in between
- Regression modeling with fixed effects and robust standard errors
 - Comparison of participant characteristics
 - Comparison of weekly averages and 48+ hour interruptions in adherence

Analysis

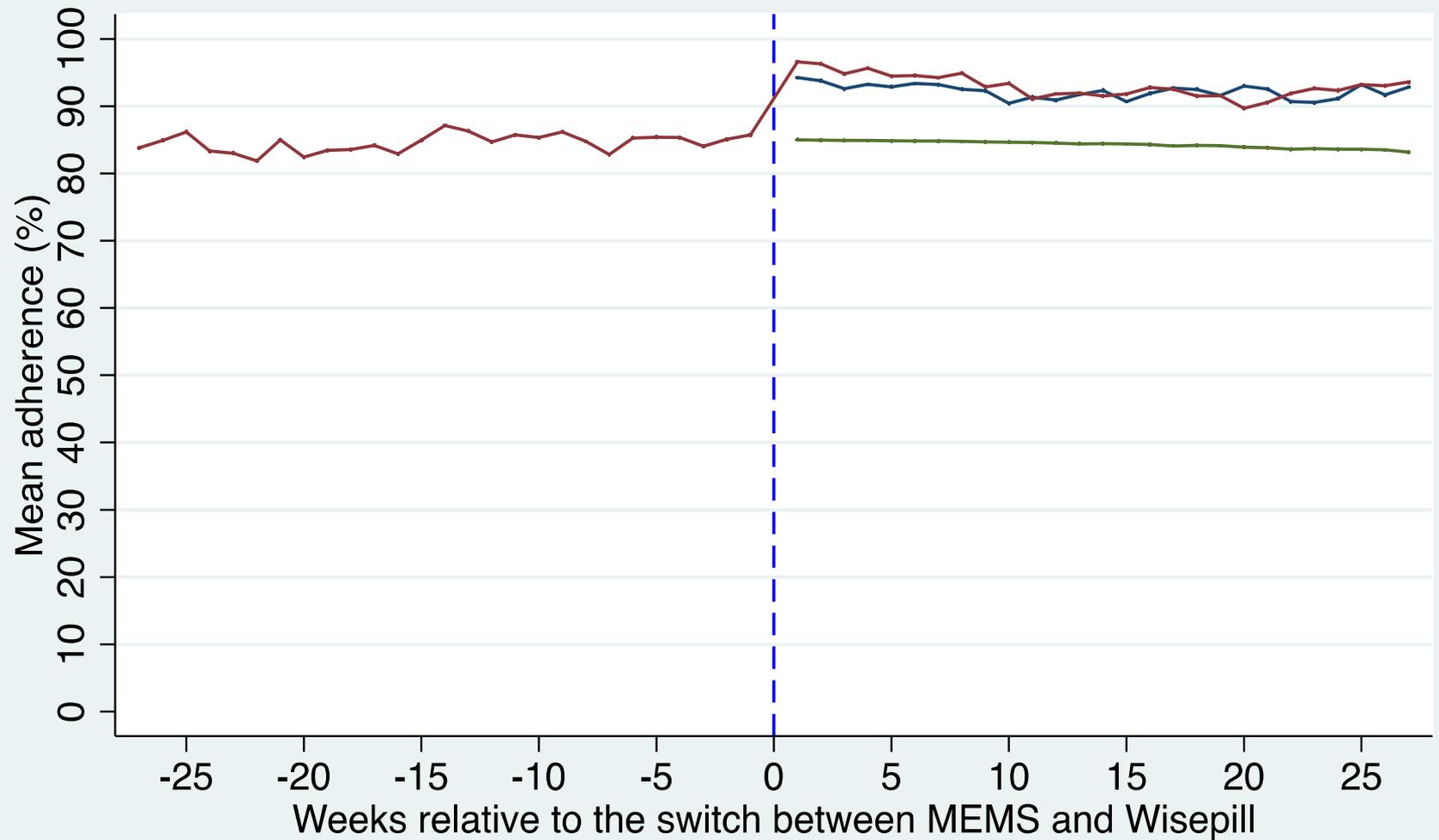
- Ordinary least squares regression modeling
 - To project estimated MEMS adherence if the participant had not switched to Wisepill + follow-up, and to compare that with the observed Wisepill adherence
 - To compare adherence for participants during Wisepill + follow-up with and without prior MEMS monitoring

Participant characteristics

- 112 participants had 6 months each of monitoring with MEMS and Wisepill + follow-up
 - Median age: 36 years
 - Female: 68%
 - Pre-ART CD4 count: 141 cells/ml
- All characteristics were similar in the two monitoring periods
 - ART regimen
 - Education
 - Wealth
 - Distance to clinic
 - Social support
 - Food insecurity
 - Viral suppression
 - Depression
 - Alcohol use

Comparison of adherence

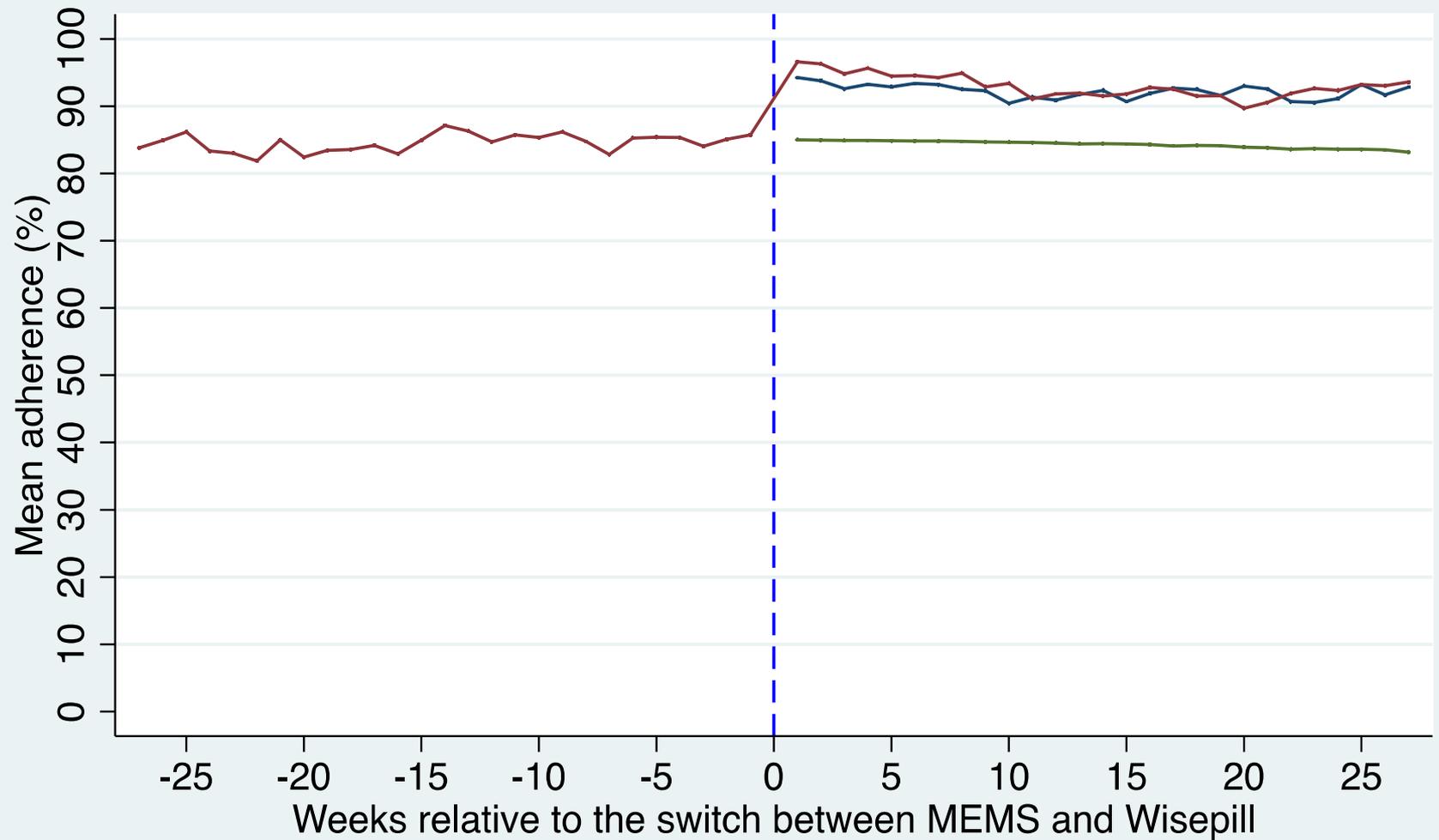
- Immediately after participants switched from MEMS to Wisepill + follow-up
 - Mean adherence increased:
84% to 93% ($p < 0.001$)
 - Mean 48+ hour interruptions decreased:
1.1 to 0.3 ($p < 0.001$)
- The difference in adherence was sustained over 6 months



- Participants with Wisepill monitoring only
- Participants with adherence monitoring by MEMS and Wisepill
- Projected MEMS adherence

Wisepill adherence not influenced by prior MEMS monitoring

- 112 participants have monitoring with both MEMS and Wisepill + follow-up
- 255 participants had Wisepill + follow-up only
- No difference was seen mean adherence between the two groups ($p=0.35$)
 - Both MEMS and Wisepill + follow-up: 93%
 - Wisepill + follow-up only: 92%



- Participants with Wisepill monitoring only
- Participants with adherence monitoring by MEMS and Wisepill
- Projected MEMS adherence

Additional findings

- Difference maintained in an analysis stratified by time on ART
- No difference in viral suppression
 - MEMS: 6%
 - Wisepill: 7%

Limitations

- Quasi-experimental design: Outcome measurement differs in the two periods compared
- Not a comparison of MEMS versus Wisepill monitoring
- Cannot distinguish between Hawthorne effect and effect of follow-up

Conclusions

- In this quasi-experimental analysis, real-time adherence monitoring linked to home visits for sustained interruptions was associated with increased adherence
- Randomized trials of participants initiating ART with long-term follow-up are needed to assess the impact of real-time adherence monitoring interventions on virologic outcomes
- Costing studies are also needed

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Thank you!

Questions?

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