

Text-messaging Promotes Adherence to Antiretroviral Therapy:

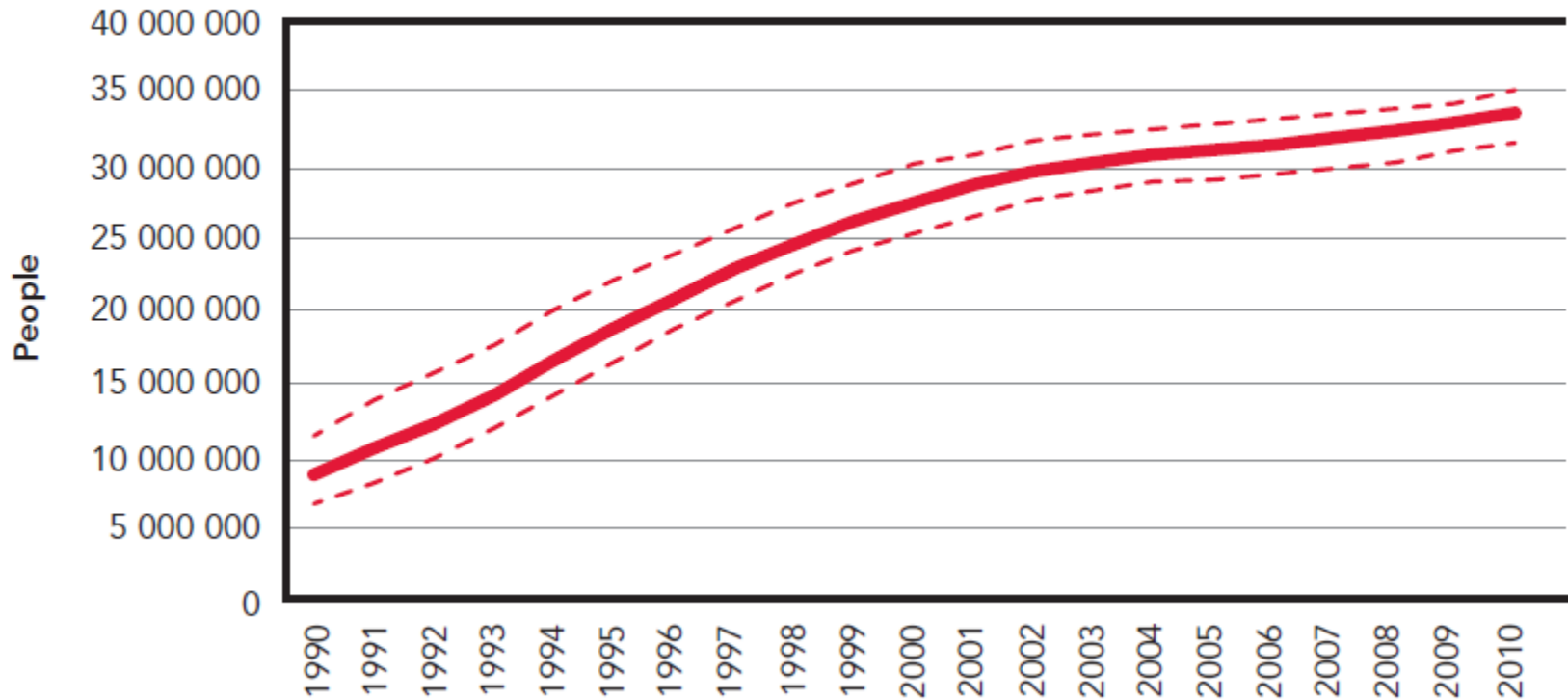
A Meta-Analysis of Intervention Trials

David J. Finitzis MA, Carter A. Lennon MA,
& Blair T. Johnson PhD

University of Connecticut, U.S.A.

HIV=Global Pandemic

PEOPLE LIVING WITH HIV



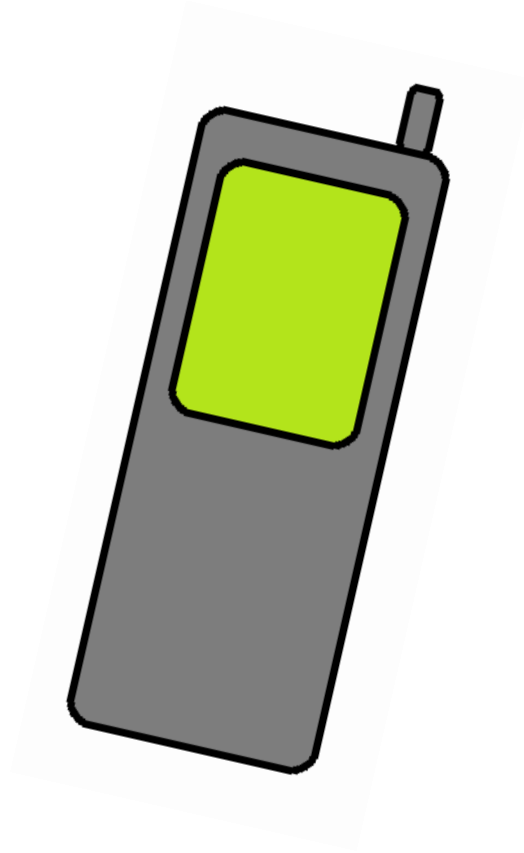
Source: UNAIDS, 2011

Promoting Adherence

- Standard of Care
- Research Interventions
 - Amico et al., 2006
 - $d=0.35$
 - 0.19 if ART naïve, 0.62 if pre-selected for MNA



Electronic Devices



1. Research Question:

How much do electronic messaging interventions improve adherence to anti-retroviral therapy (ART) in HIV+ individuals?

2. Data Collection

- **Inclusion Criteria:**
 - intervention studies that examine the use of electronic, text-based messaging to promote ART adherence in HIV+ samples
 - sufficient results to calculate effect size
- **Databases Searched:** PsycINFO, PubMed/ Medline, Academic Search Premier, CINAHL, & ProQuest Dissertations and Theses
- **Reverse search:** references of all relevant studies

Search Terms

**"CELL PHONE" OR "CELLULAR PHONE" OR "MOBILE PHONE"
OR "TEXT MESSAGE" OR SMS OR "SIMPLE MESSAGE SERVICE"
OR PAGER OR "TWO-WAY ELECTRONIC MESSAGING SYSTEM"**

AND

**HIV OR HIV+ OR HIV-POSITIVE OR "PEOPLE LIVING WITH
HIV/AIDS" OR "HUMAN IMMUNO-DEFICIENCY VIRUS
POSITIVE" OR PLWHA**

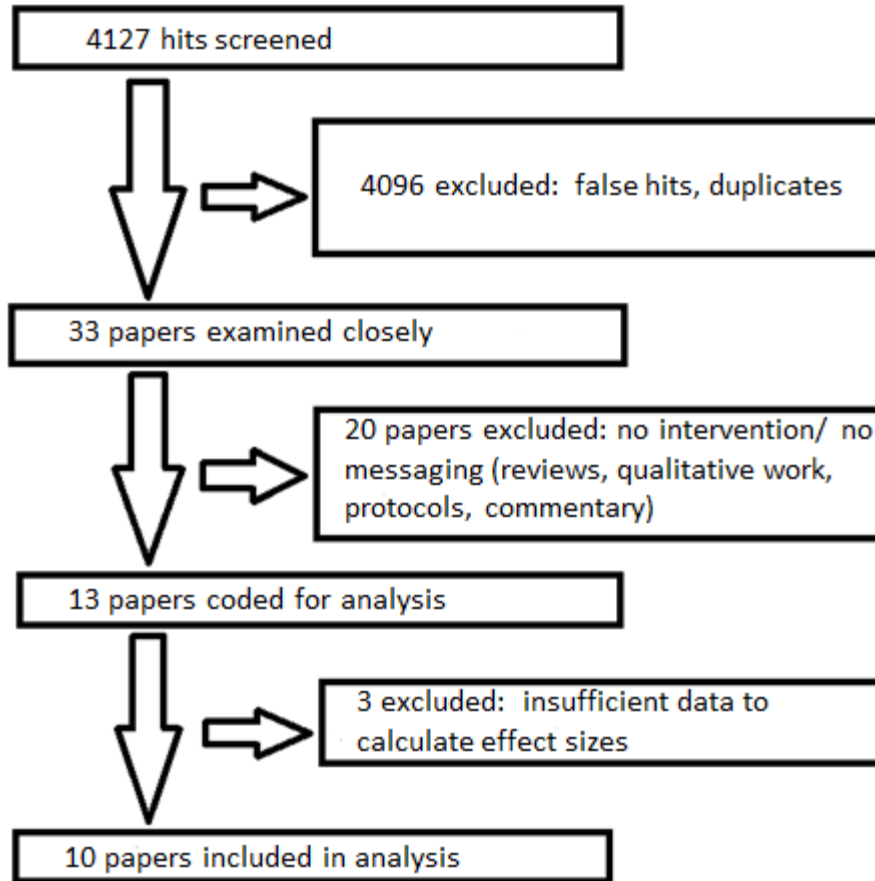
AND

**ART OR HAART OR "HIGHLY ACTIVE ANTIRETROVIRAL
THERAPY" OR "ANTIRETROVIRAL THERAPY"**

AND

**ADHERENCE OR "MEDICATION ADHERENCE" OR MNA OR
"MEDICATION NON-ADHERENCE"**

Search Outcomes



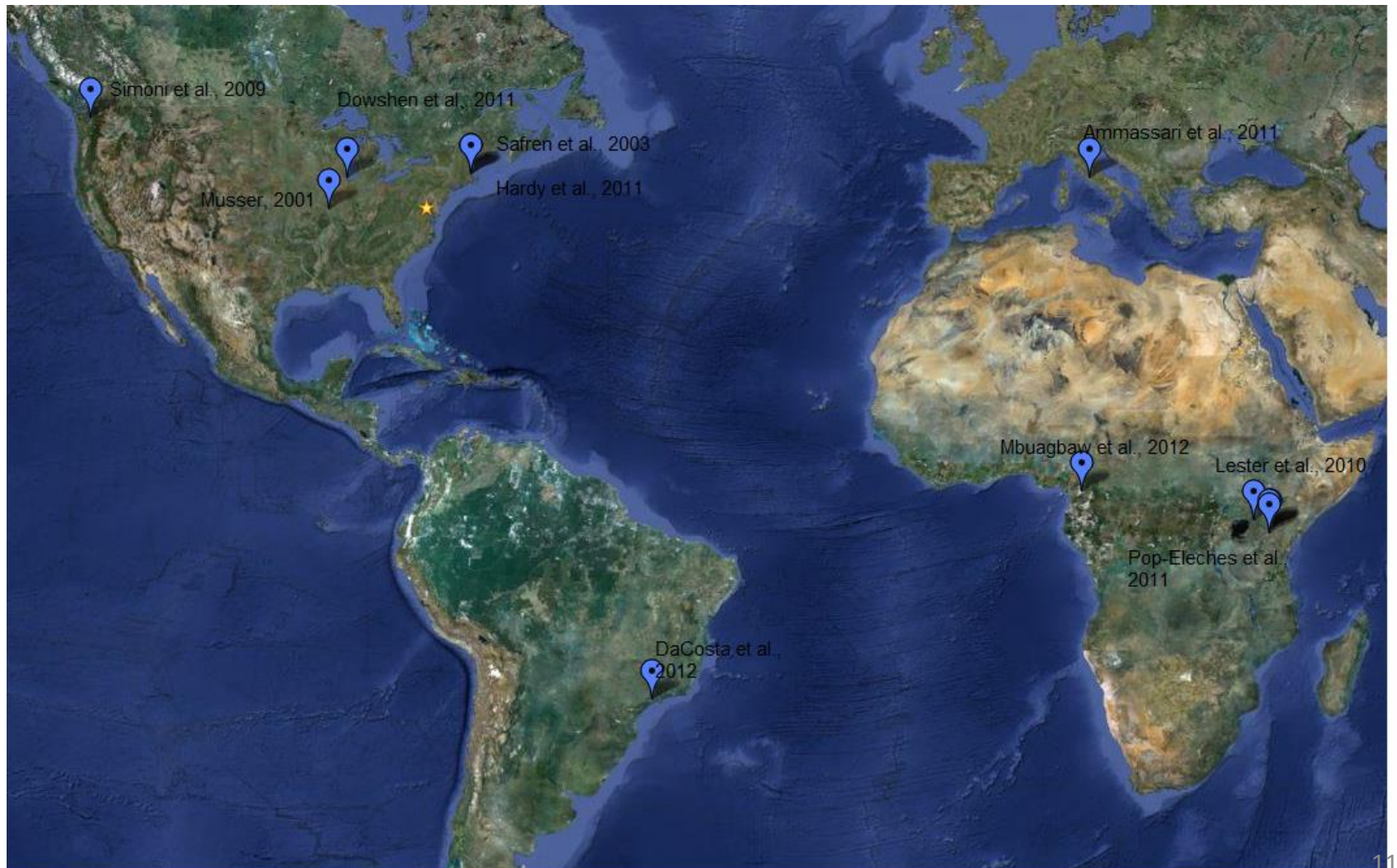
4. Results: Participant Characteristics

- n=2010 consented
 - 1638 (81%) retained to follow up
- 46% female
- 63% African
- Mean age: 37.76 years
- 82% ART naïve

4. Results: Study Characteristics

- Design
 - Two groups, pre/post (k=5)
 - Two groups, post only (k=3)
 - One group, pre/post (k=2)
- Peer reviewed (k=9)
 - 1 unpublished dissertation
- Most (70%) data from 2007-2010

4. Results: Study Characteristics



4. Results: Intervention Characteristics

- 11 Interventions total
- Average length of intervention: 169.9 days
- Daily messaging in 7 (64%) interventions
- Matched to dose in 6 (54%) interventions
- Message tailored in 5 (45%) interventions
- Bidirectional in 6 (54%) interventions

4. Results: Study Characteristics

- DV: mean outcomes reported=2.6 (range 1-4)

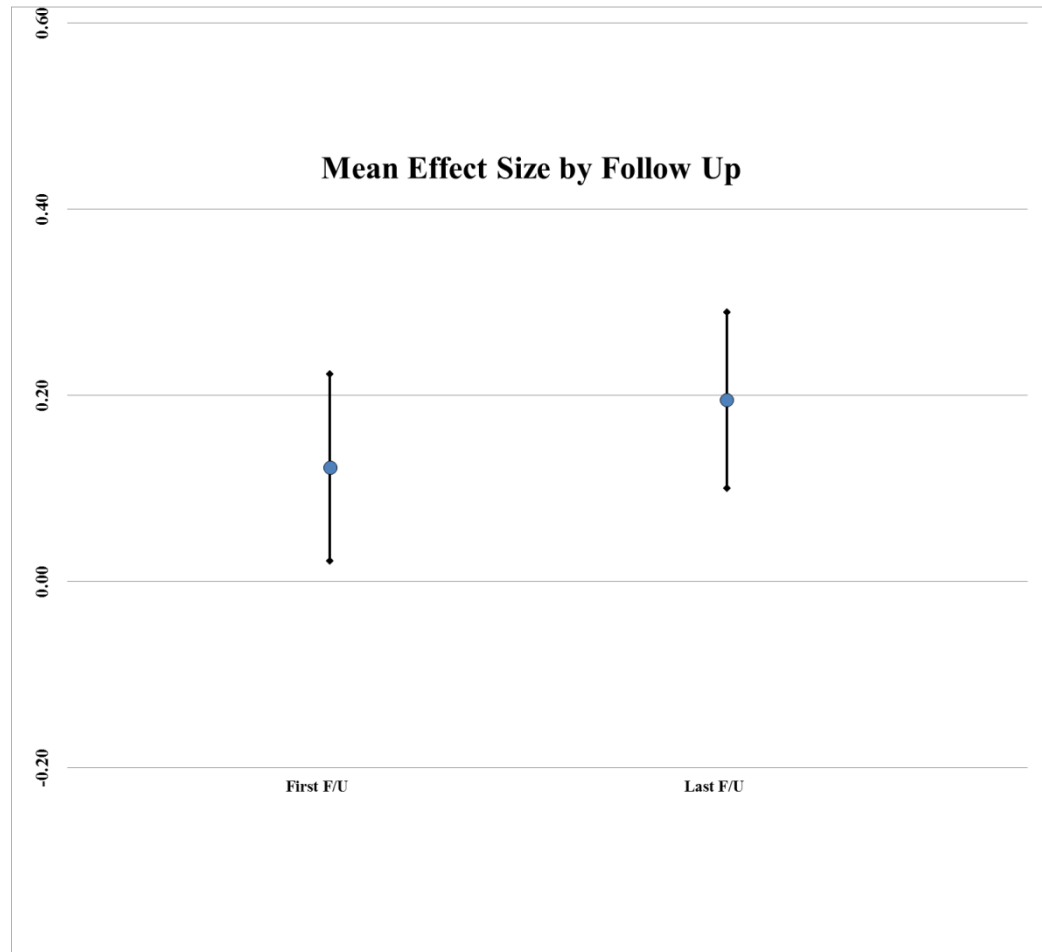
REPORTED OUTCOME	NUMBER OF STUDIES (k)
Self-report	7
Electronic Data Monitoring	5
Viral Load	3
CD4+ Count	2
Pill Count	2
Pharmacy Refill Data	1

5. Synthesis

- Comparison by follow up

Group	Mean ES	SE	-95% CI	+95% CI	Z	p
First follow up	.1226	.0513	.0221	.2232	2.3906	.0168
Last follow up	.1953	.0482	.1008	.2897	4.0523	.0001

5. Synthesis

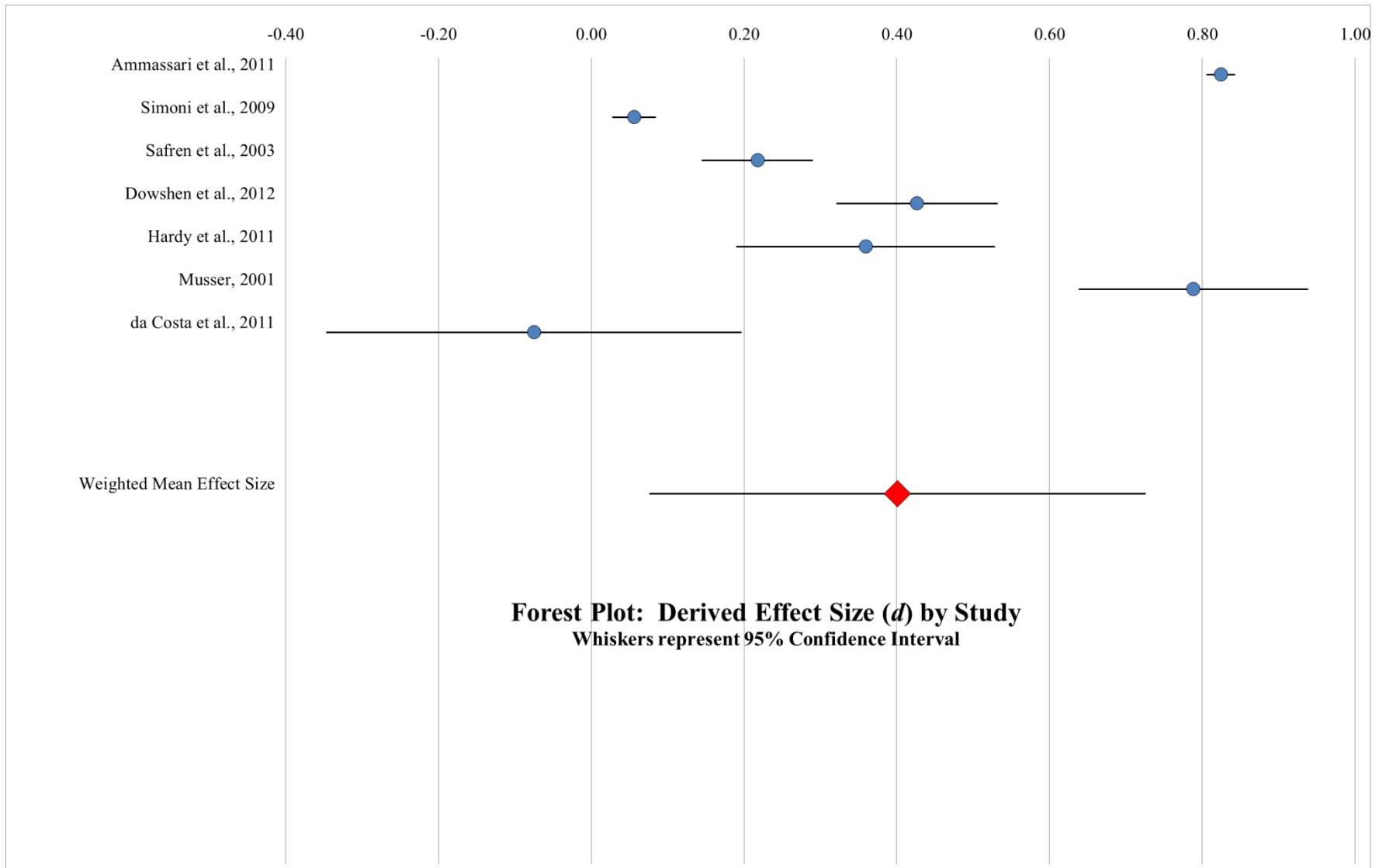


5. Synthesis

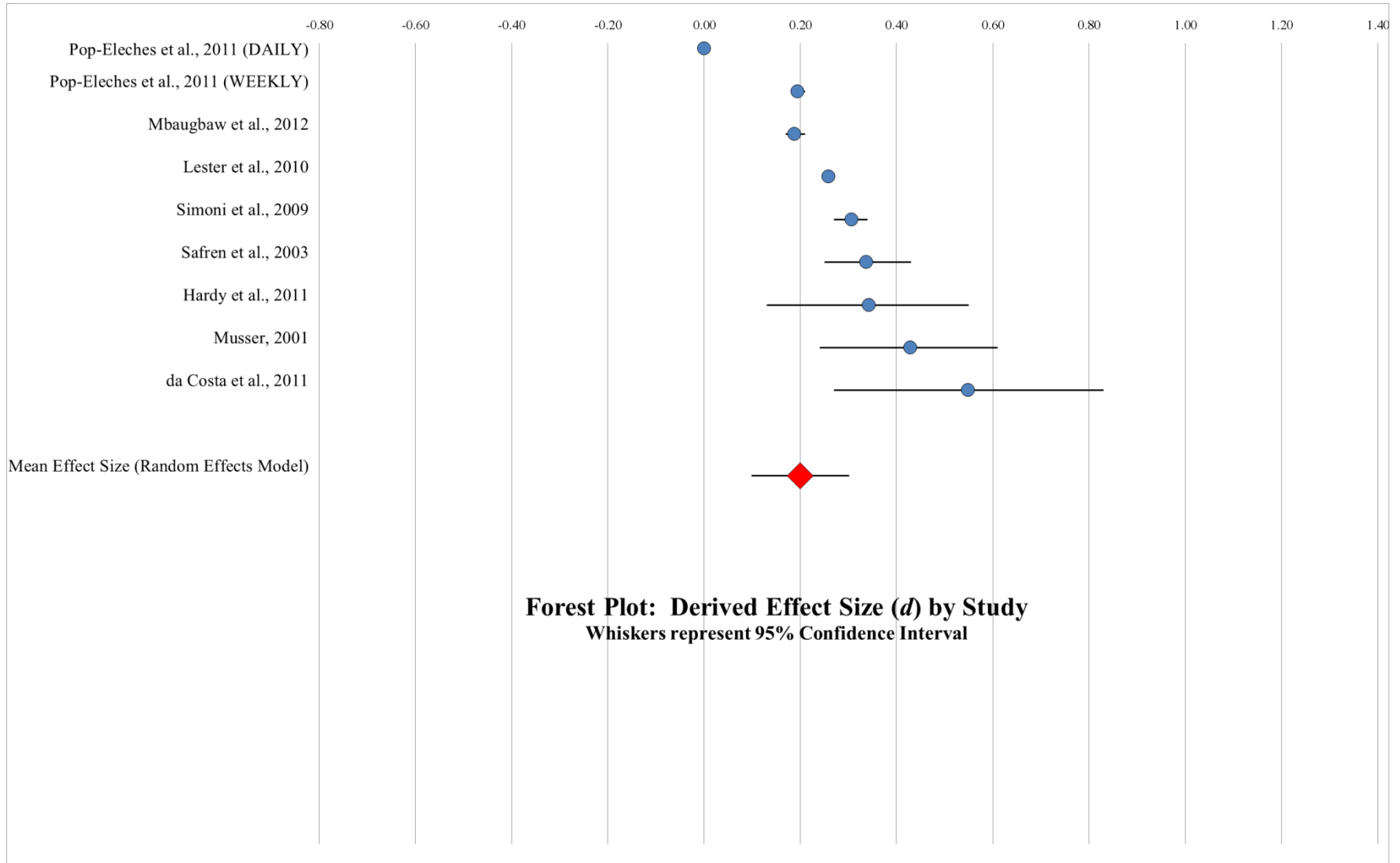
Condition	k	ES ₊	-95% CI	+95% CI
Control pre/post	5	-0.16	-0.37	0.05
Intervention pre/post	7	0.40	0.08	0.72
Intervention vs. Control	8*	.20	.10	.30

*one study used a 2-arm design yielding 9 intervention groups total for this category

5. Synthesis: intervention group pre/post



5. Synthesis: intervention vs. control



5. Synthesis: Biological Outcomes

Condition	K	ES ₊	-95% CI	+95% CI
Intervention pre/post	3	.74	.58	.90
Intervention vs. Control	2	.28	.13	.44

5. Synthesis: Assessing for Heterogeneity

$$Q = \chi^2_{(k-1)df} = \sum_{i=1}^k w_i (d_i - d_+)^2$$

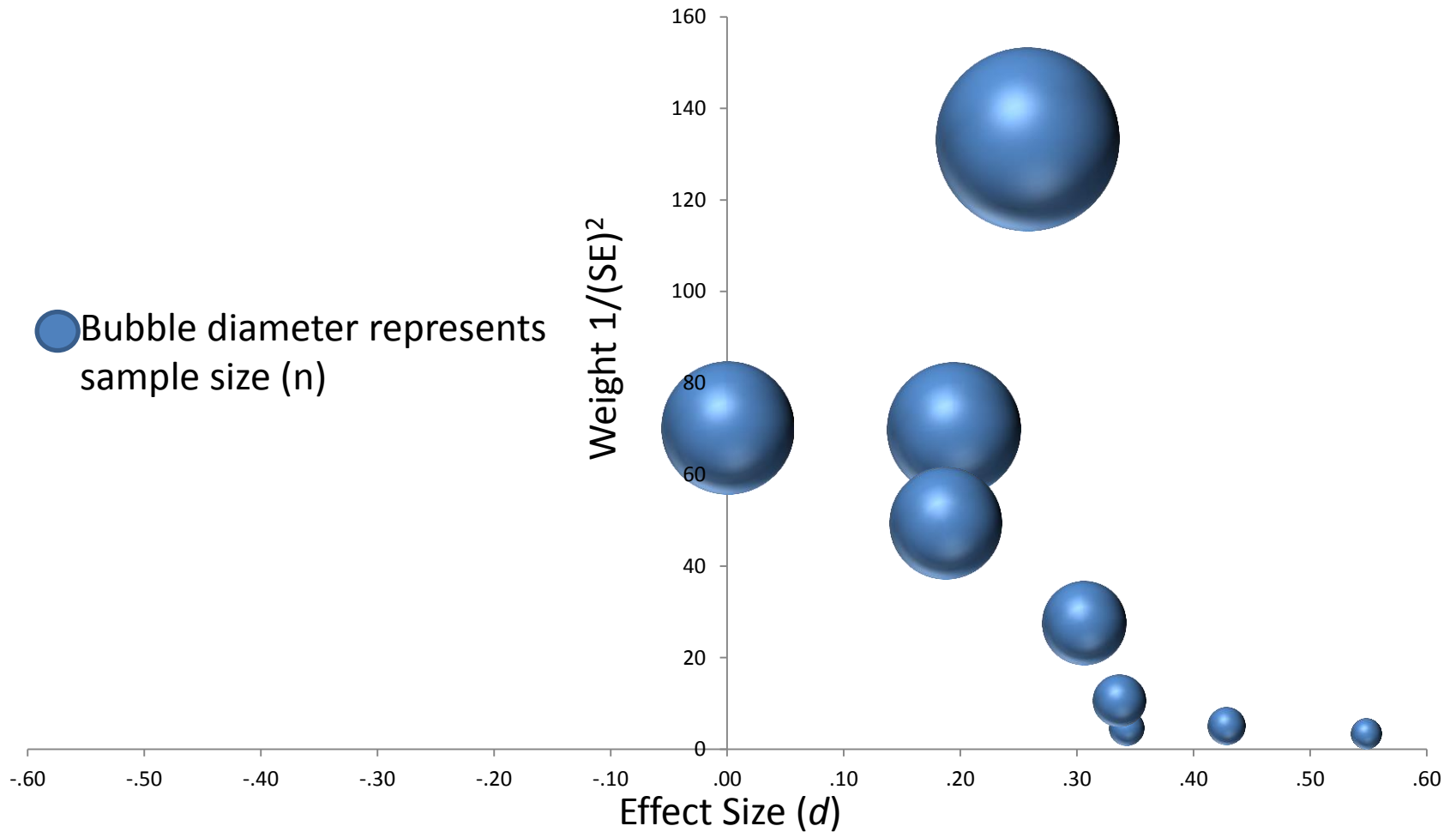
Cochrane's $Q=4.55$ ($p=0.80$)

Higgins $I^2= Q$ as a percentage (0% in this case)

5. Synthesis: Publication Bias



5. Synthesis: Publication Bias



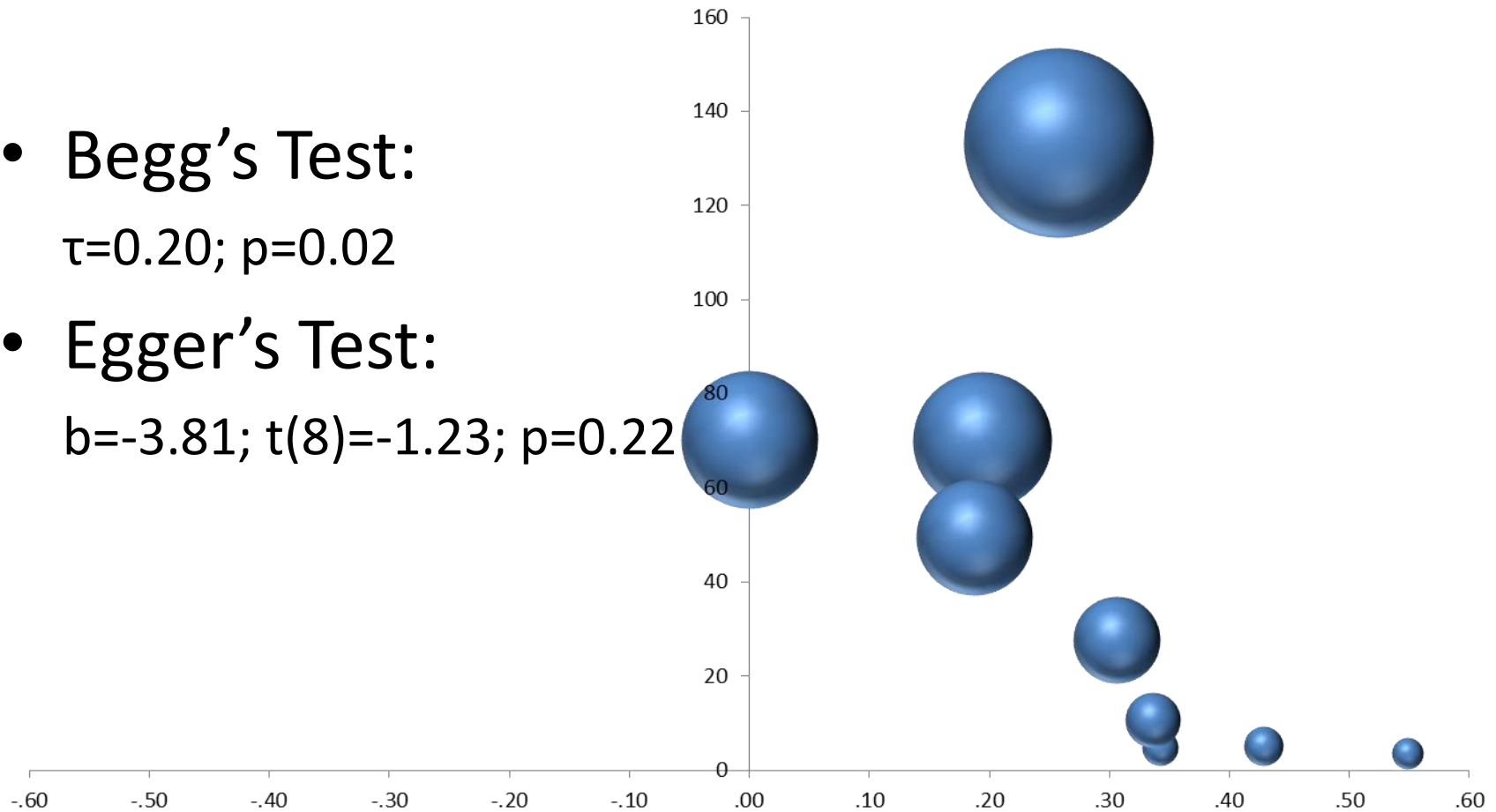
5. Synthesis: Publication Bias

- Begg's Test:

$\tau=0.20$; $p=0.02$

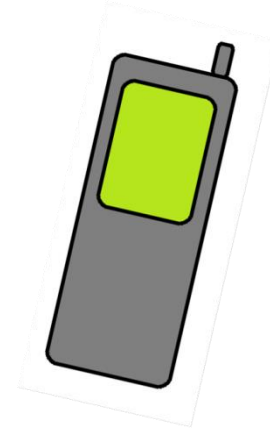
- Egger's Test:

$b=-3.81$; $t(8)=-1.23$; $p=0.22$



6. Conclusions

- A modest, significant effect
- Consistent
- Naïve vs. MNA
- Active ingredients



Acknowledgements

- National Institute of Mental Health:
 - Pre-doctoral fellowship T32MH074387-06
 - Seth C. Kalichman, PhD
- University of Connecticut
 - Major advisor: Dean G. Cruess PhD
 - Blair T. Johnson PhD
 - Carter A. Lennon MA
- Center for Health, Intervention, & Prevention

Thank you

