



Penn

Infectious Diseases

Impact of Managed Problem Solving Antiretroviral Adherence Intervention on HIV Copy-Years

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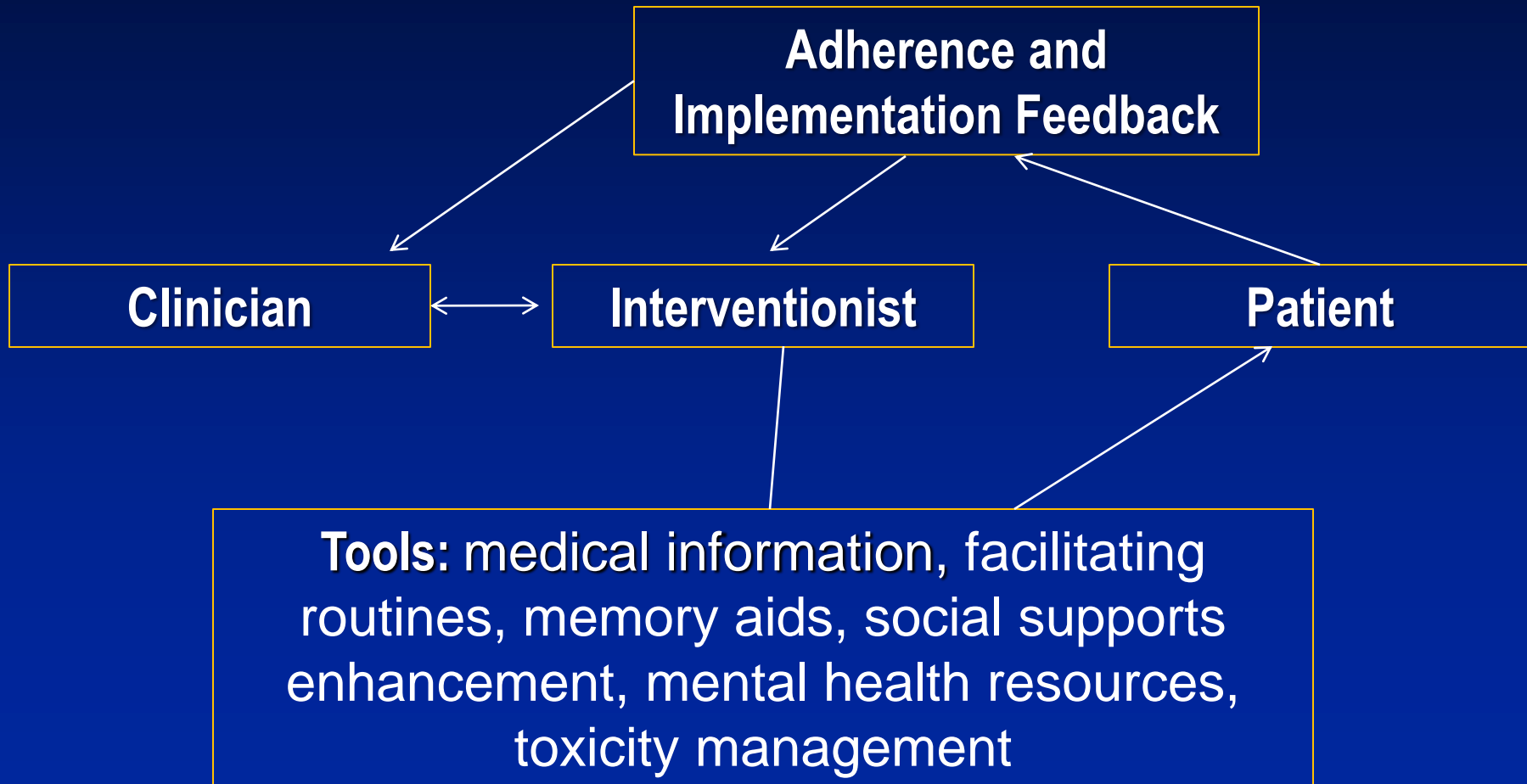
Problem Solving for Adherence

- **Depression is major adherence barrier**
- **Multifactorial nature of both depression and non-adherence**
- **Problem solving already adapted**
 - **Cancer and HIV respite care**
 - **Obesity**

Problem Solving Therapy vs. Treatment

- **Therapy requires training**
 - Many sessions
 - Patients need motivation
 - Added burden of homework
- **Treatment**
 - Goal is just solving problems
 - Problem solver is part of team

Conceptual Framework



Defining the Problem



Brainstorm



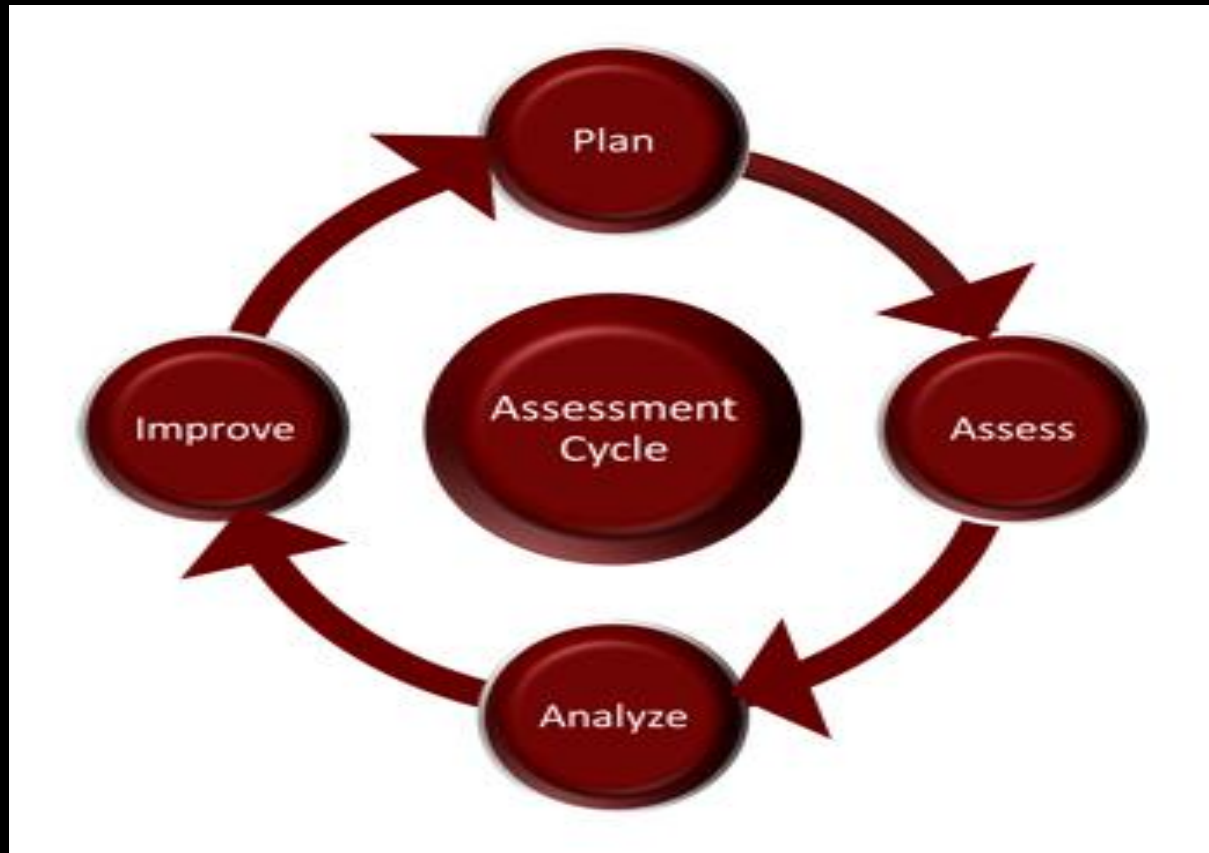
Decision re: Plan



Implement Plan



Assessment and Modification



MAPS Study Design

- **Train interventionists to deliver MAPS**
 - College graduate
 - Familiar/comfortable with HIV topics
 - Health background not necessary
- **Randomize 1:1 to MAPS vs. Usual Care (UC)**

Eligibility Criteria

- HIV-1 infection
- Age ≥ 18 years
- HIV VL $> 10^3$ copies/ml
- Any CD4 count
- Not living in care facility
- Able to consent
- Initiating an active regimen

Baseline Screening

- **Assessment of adherence barriers**
 - Knowledge of regimen
 - Knowledge of desirable adherence
 - Plans if doses missed
 - Depression
 - Substance Use

Delivery of Intervention

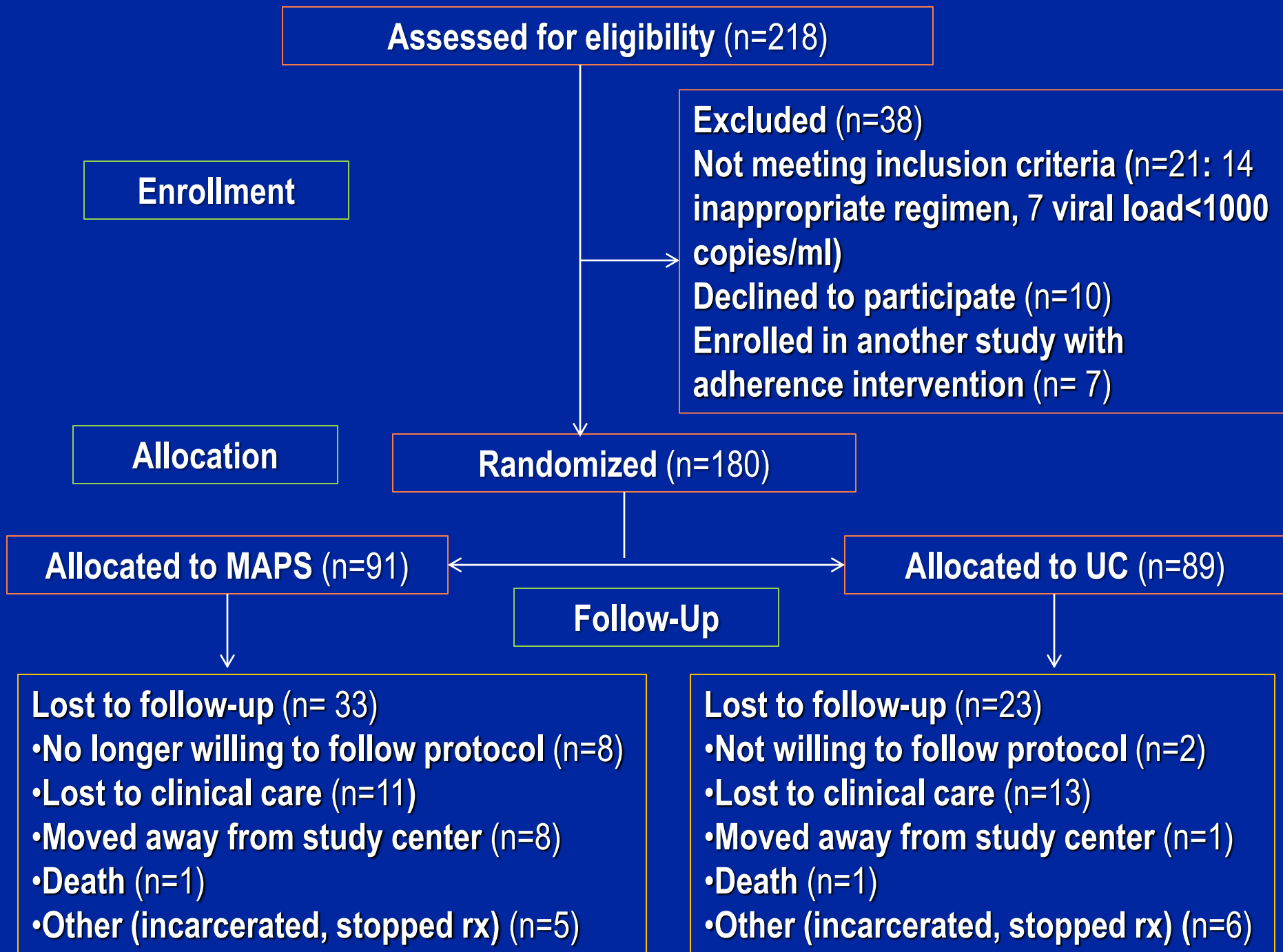
- **Initial visit**
 - Duration 60-90 min
- **3 monthly follow-up visits with adherence feedback via MEMS**
 - Duration 45-60 min
- **Weekly phone calls for 3 mo**
 - Duration 5-20 min
- **Monthly refill calls for 1 yr**
 - Duration 1-5 min

Outcomes

- Primary: adherence
 - Measured continuously using MEMS
 - Summarized quarterly: % doses taken
- Secondary: HIV VL
 - Measured quarterly
 - VL < 75 copies/ml
 - HIV copy-years = average viral load over each quarter x 3 months, and summed over the year

ITT vs. AT

- **Intent to Treat**
 - Primary analysis approach
 - Strategy trial-all subjects evaluated
- **As Treated**
 - Secondary analysis approach
 - Provides useful data on patients remaining in care



Baseline Characteristics	MAPS (n=91)	UC (n=89)
Median age (range), yrs	43 (20-65)	42 (19-60)
Male sex	52 (57%)	56 (63%)
Race Black	80 (88%)	73 (82%)
White	9 (10%)	15 (17%)
Other	2 (2%)	1 (1%)
Treatment naïve	40 (44%)	32 (36%)
Baseline VL (log ₁₀ copies/ml)-Q25,75	3.24 (2.46, 4.32)	3.47 (2.35, 4.40)
Baseline CD4 count cells/mm ₃ - Q25,75	287 (146, 370)	244 (116, 379)

Adherence Results

- MAPS associated with higher adherence
 - ITT: Odds of being in a higher category of adherence 1.78 (1.07-2.96) for MAPS vs. UC
 - AT: Odds of being in a higher category of adherence 2.33 (1.35-4.05) for MAPS vs. UC

VL Results

- **MAPS -higher odds of UDVL**
 - ITT: Odds of UDVL=1.48 (0.94-2.31) favoring MAPS
 - AT: Odds of UDVL=1.98 (1.15-3.41) favoring MAPS
- **MAPS-lower HIV copy-years**
 - ITT:MAPS: 1.54 vs. UC: 2.02 log copy-years, p=0.046
 - AT: MAPS: 1.36 vs. UC: 1.87 log copy-years, p=0.027

Limitations

- **Generalizability**
 - Specialty clinic population
 - Use of MEMS for feedback
- **Evidence for effect**
 - Mixed conclusion on virologic effect
- **Bias**
 - Unclear how dropouts affected true impact of intervention

Conclusions and Next Steps

- **MAPS effective at improving adherence and virological outcome**
 - Refine and disseminate
- **Adapt to VA System**
 - MAPS-EXTRA
 - Use pharmacy refill system
- **Modify approach to use for retention**
 - PREPARE

Acknowledgements

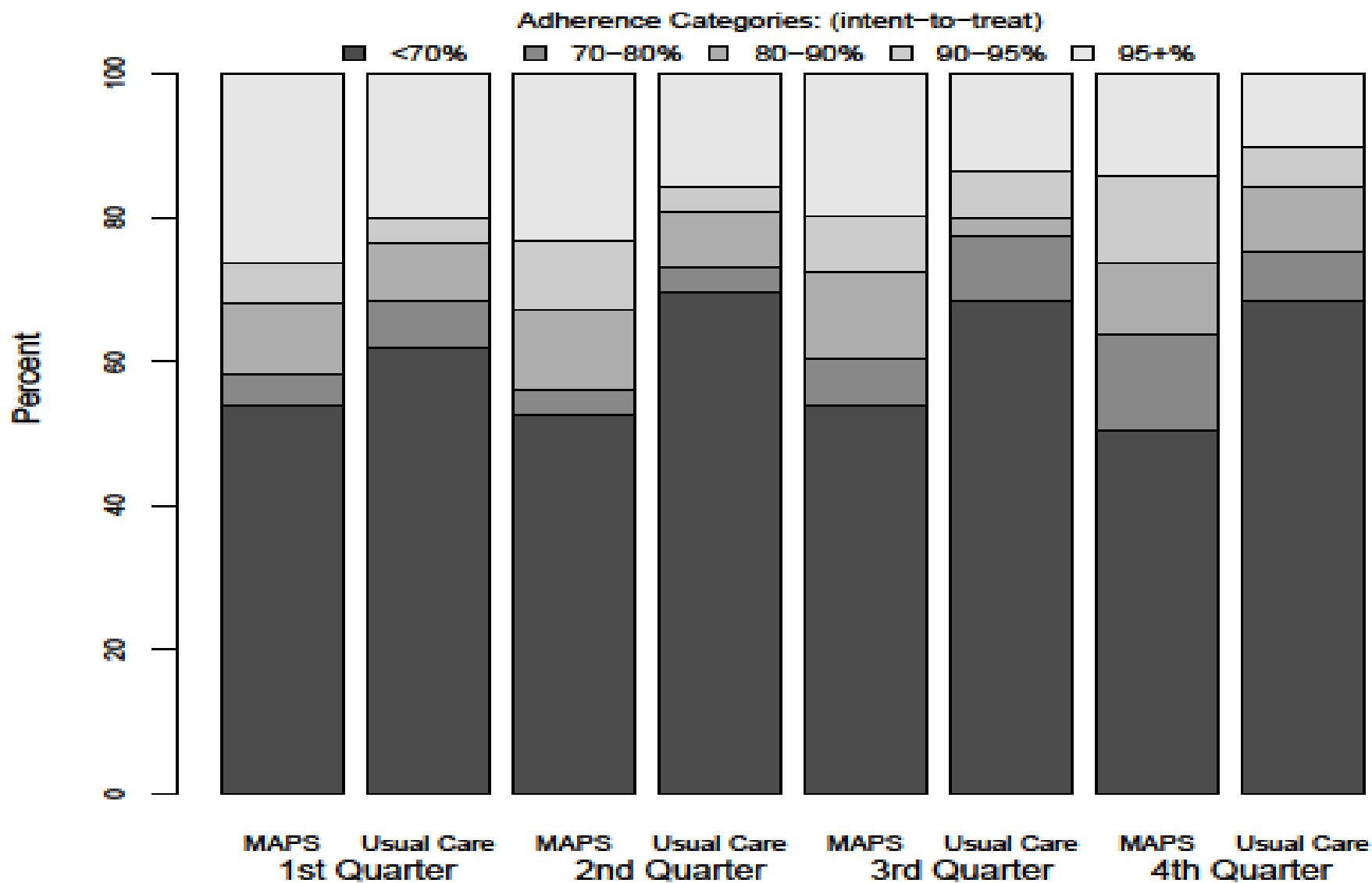
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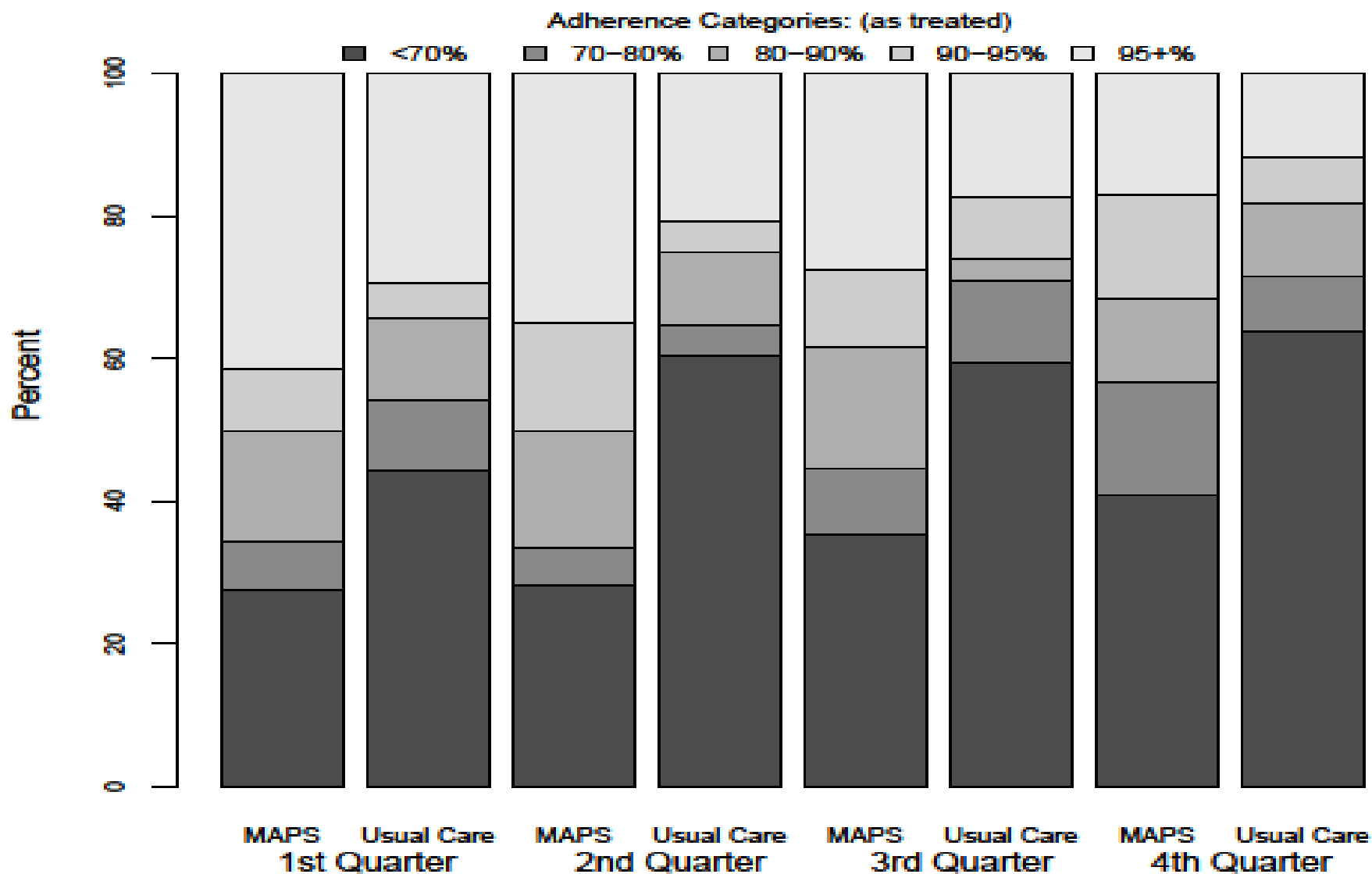
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Longitudinal Distribution of Adherence Categories



Longitudinal Distribution of Adherence Categories



Adherence Results by Quarter

Median adherence (Q25,75) (missing=0%)	MAPS	UC	P value
Q1	0.61 (0,0.95)	0.52 (0, 0,85)	>0.5
Q2	0.64 (0, 0.94)	0.42 (0.02, 0.81)	0.45
Q3	0.60 (0, 0.93)	0.39 (0.01, 0.78)	0.2
Q4	0.69 (0.21, 0.91)	0.39 (0.04, 0.79)	0.02
Median adherence (Q25,75) (missing=missing)	MAPS	UC	
Q1	n=58, 0.90 (0.63,1.0)	n=61, 0.78 (0.51,0.97)	0.046
Q2	n=60, 0.90 (0.66,0.98)	n=68, 0.60 (0.27,0.89)	<0.002
Q3	n=65, 0.86 (0.56,0.97)	n=69, 0.58 (0.26, 0.91)	<0.01
Q4	n=76, 0.77 (0.47,0.92)	n=77,0.50 (0.13, 0.83)	<0.002

VL Results by Quarter

Proportion with UDVL (missing=failure)	MAPS	UC	P value
Q1	53/91 (58%)	42/89 (47%)	0.14
Q2	53/91 (58%)	47/89 (53%)	0.46
Q3	52/91 (57%)	39/89 (44%)	0.07
Q4	54/91 (59%)	45/89 (51%)	0.24
Proportion with UDVL (missing=missing)			
Q1	53/68 (78%)	42/67 (63%)	0.052
Q2	53/62 (86%)	47/70 (67%)	<0.02
Q3	52/69 (75%)	39/59 (66%)	0.25
Q4	54/72 (75%)	45/76 (59%)	0.04