



# Age Differences in Viral Suppression, Antiretroviral Therapy Use, and Adherence Among HIV-positive Men Who Have Sex With Men Receiving Medical Care in the United States — Medical Monitoring Project, 2009-2013

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# CONFLICT OF INTEREST

- Nicholas DeGrootte has no real or apparent conflicts of interest to report

# BACKGROUND

- Diagnoses of HIV infection increased among men who have sex with men (MSM) from 2010 to 2014 with a 10% increase among the youngest group of MSM, those 13-24 years of age
- Viral suppression through adherence to antiretroviral therapy (ART) is essential to decrease HIV transmission and improve health outcomes
- National estimates of viral suppression and adherence among young MSM are lacking and the differences between young and older HIV-positive MSM have not been fully explored

# OBJECTIVES

- To describe differences between HIV-positive MSM ages 18-24 and ages 25 or older in care in the United States in terms of:
  - Sociodemographic characteristics
  - Prevalence of sustained viral suppression, ART use, and adherence
  - Depression, substance use, and ART beliefs
- To compare factors associated with adherence among young versus older MSM

# METHODS

- Medical Monitoring Project (MMP)
  - Surveillance system that produces annual cross-sectional nationally representative estimates describing the clinical and behavioral characteristics of HIV-positive adults receiving medical care in the United States
- Data collection
  - Interviews and medical record abstractions
  - Combined data from 2009-2013 cycles of MMP
  - Response rates:
    - Facilities: 76-85%
    - Patients: 49-55%

# METHODS

- Calculated weighted percentages and 95% confidence intervals among young and older MSM to estimate:
  - Sociodemographic and behavioral characteristics
  - Sustained viral suppression, ART use, and adherence
- Conducted stratified bivariate analyses to assess whether factors associated with adherence differed among young versus older MSM
  - Depression
  - Substance use
  - ART medication-related beliefs
- All analyses accounted for unequal selection probabilities and non-response

# DEFINITIONS

- Sustained viral suppression
  - All HIV viral load tests in past 12 months undetectable or <200 copies/mL as documented in the medical record
- Current ART Use
  - Self-reported ART use
- Adherent
  - Reported taking 100% of ART doses, past 3 days
- Depression
  - Symptoms of major or other depression over the past 2 weeks according to criteria from the Diagnostic and Statistical Manual of Mental Disorders, 4th ed. (DSM-IV-TR)

# DEFINITIONS

- Poverty
  - At or below poverty threshold as defined by the Department of Health and Human Services<sup>1</sup>
- Binge drinking
  - $\geq 5$  alcoholic beverages at one sitting for men during the 30 days preceding the interview
- Stimulant use
  - Stimulant use was defined as injection or non-injection use of methamphetamines, other amphetamines, ecstasy, cocaine, or crack

<sup>1</sup><https://aspe.hhs.gov/prior-hhs-poverty-guidelines-and-federal-register-references>



# Demographics Among Young and Older MSM, MMP 2009-2013

| Demographic                       | Weighted % (95% CI) |                  | P-value |
|-----------------------------------|---------------------|------------------|---------|
|                                   | 18-24 (n = 361)     | 25+ (n = 10,487) |         |
| <b>Race/Ethnicity</b>             |                     |                  | <0.0001 |
| White, non-Hispanic               | 15 (10-21)          | 53 (48-57)       |         |
| Black, non-Hispanic               | 61 (53-69)          | 23 (19-27)       |         |
| Hispanic or Latino                | 18 (13-23)          | 19 (16-21)       |         |
| Other                             | 5 (3-7)             | 5 (5-6)          |         |
| <b>Education</b>                  |                     |                  | <0.0001 |
| <High School                      | 14 (10-18)          | 8 (7-9)          |         |
| High School diploma or equivalent | 30 (24-35)          | 21 (19-22)       |         |
| >High School                      | 58 (51-63)          | 71 (70-73)       |         |
| <b>Poverty</b>                    |                     |                  | <0.0001 |
| At or below poverty level         | 49 (41-56)          | 26 (24-27)       |         |

# Depression and Substance Use Among Young and Older MSM, MMP 2009-2013

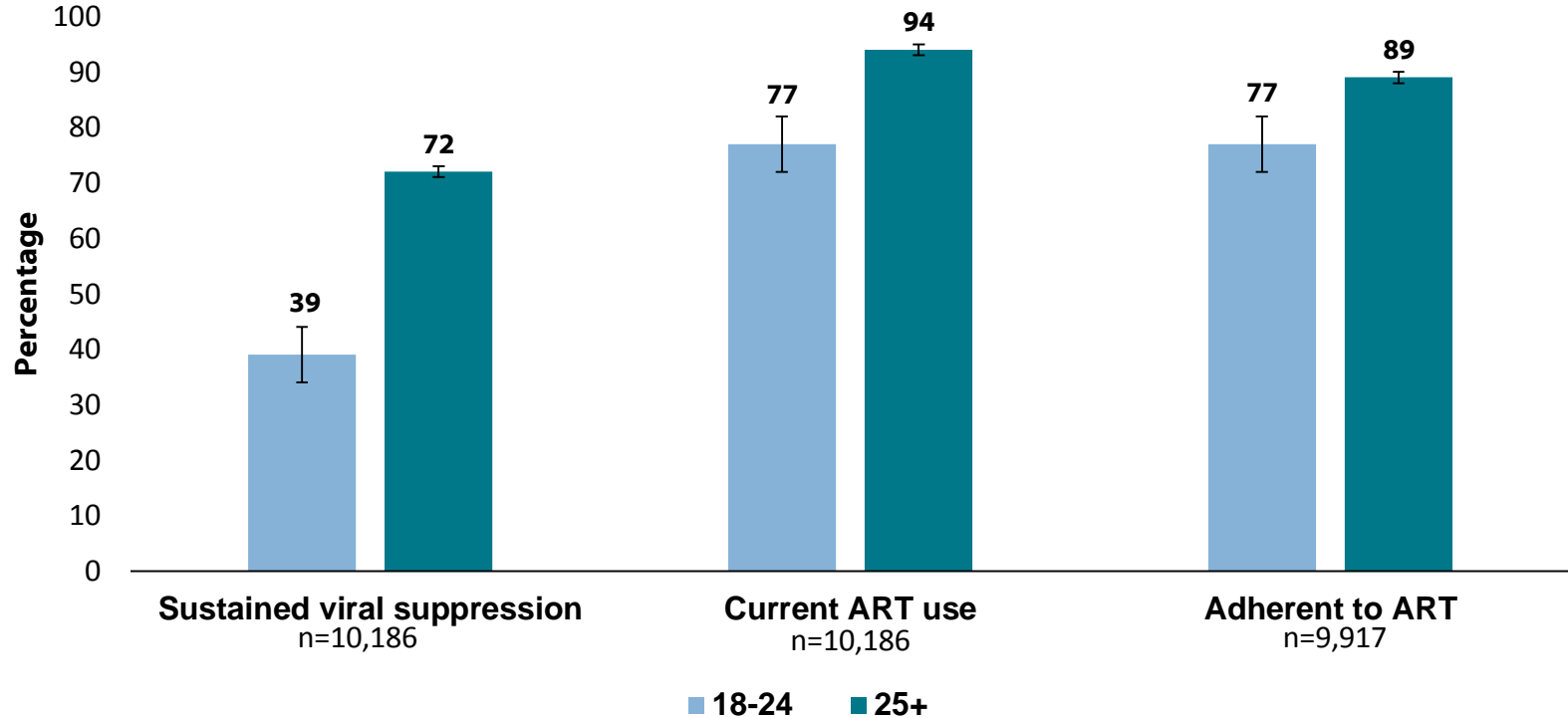
| Depression and Substance Use | Weighted % (95% CI) |                  | P-value |
|------------------------------|---------------------|------------------|---------|
|                              | 18-24 (n = 361)     | 25+ (n = 10,487) |         |
| <b>Depression</b>            |                     |                  | 0.16    |
| Major depression             | 14 (10-18)          | 11 (9-11)        |         |
| Other depression             | 10 (6-14)           | 11 (10-11)       |         |
| No depression                | 76 (71-81)          | 79 (78-80)       |         |
| <b>Binge drinking</b>        | 32 (27-38)          | 18 (17-19)       | <0.0001 |
| <b>Stimulant use</b>         | 12 (8-16)           | 12 (11-13)       | 0.91    |

# ART Medication Beliefs Among Young and Older MSM, MMP 2009-2013

| ART Medication Beliefs                    | Weighted % (95% CI) |                  | P-value |
|---|---------------------|------------------|---------|
|   | 18-24 (n = 361)     | 25+ (n = 10,487) |         |
| <b>Bothered by ART side effects*</b>      |                     |                  |         |
| About half/most/all of the time           | 20 (15-25)          | 16 (14-17)       | 0.04    |
| <b>Sure can take ART as directed</b>      |                     |                  |         |
| Not at all/somewhat                       | 8 (5-11)            | 5 (4-5)          | 0.01    |
| <b>Sure ART has a positive effect</b>     |                     |                  |         |
| Not at all/somewhat                       | 13 (9-18)           | 10 (9-11)        | 0.08    |
| <b>Sure of resistance if non-adherent</b> |                     |                  |         |
| Not at all/somewhat                       | 17 (12-21)          | 21 (19-22)       | 0.13    |

\*Past 30 days

# Sustained Viral Suppression, Current ART Use, and Adherence Among Young and Older MSM, MMP 2009-2013\*



\*All associations:  $p < 0.0001$

# Factors Associated With ART Adherence Among Young MSM, MMP 2009-2013<sup>†</sup>

| Depression and Substance Use | Weighted Row % (95% CI) |         |
|------------------------------|-------------------------|---------|
|                              | Adherent                | P-value |
| <b>Depression</b>            |                         |         |
| No depression                | 82 (77-88)              | <0.01   |
| Other depression             | 69 (55-83)              |         |
| Major depression             | 56 (38-74)              |         |
| <b>Binge drinking</b>        |                         |         |
| Yes                          | 75 (66-85)              | 0.65    |
| No                           | 78 (71-84)              |         |
| <b>Stimulant use</b>         |                         |         |
| Yes                          | 79 (63-94)              | 0.42    |
| No                           | 76 (71-82)              |         |

<sup>†</sup>Limited to those currently on ART

# ART Medication Beliefs Associated With ART Adherence Among Young MSM, MMP 2009-2013<sup>‡</sup>

| ART Medication Beliefs                        | Weighted Row % (95% CI) |         |
|---|-------------------------|---------|
|   | Adherent                | P-value |
| <b>Bothered by side effects, past 30 days</b> |                         |         |
| About half/most/all of the time               | 63 (47-78)              | 0.01    |
| Never/rarely                                  | 80 (75-85)              |         |
| <b>Sure can take ART as directed</b>          |                         |         |
| Not at all/somewhat                           | 54 (29-79)              | 0.01    |
| Very sure/extremely sure                      | 78 (73-84)              |         |
| <b>Sure ART has a positive effect</b>         |                         |         |
| Not at all/somewhat                           | 58 (38-78)              | 0.01    |
| Very sure/extremely sure                      | 79 (74-85)              |         |
| <b>Sure of resistance if non-adherent</b>     |                         |         |
| Not at all/somewhat                           | 77 (60-94)              | 0.93    |
| Very sure/extremely sure                      | 76 (70-83)              |         |

<sup>‡</sup>Limited to those currently on ART

# Factors Associated With ART Adherence Among Older MSM, MMP 2009-2013<sup>‡</sup>

| Depression and Substance Use | Weighted Row % (95% CI) |         |
|------------------------------|-------------------------|---------|
|                              | Adherent                | P-value |
| <b>Depression</b>            |                         |         |
| No depression                | 90 (89-91)              | <.0001  |
| Other depression             | 84 (82-87)              |         |
| Major depression             | 80 (78-83)              |         |
| <b>Binge drinking</b>        |                         |         |
| Yes                          | 84 (82-86)              | <.0001  |
| No                           | 90 (89-90)              |         |
| <b>Stimulant use</b>         |                         |         |
| Yes                          | 76 (72-79)              | <.0001  |
| No                           | 90 (89-91)              |         |

<sup>‡</sup>Limited to those currently on ART

# ART Medication Beliefs Associated With ART Adherence Among Older MSM, MMP 2009-2013<sup>‡</sup>

| ART Medication Beliefs                        | Weighted Row % (95% CI) |         |
|---|-------------------------|---------|
|   | Adherent                | P-value |
| <b>Bothered by side effects, past 30 days</b> |                         |         |
| About half/most/all of the time               | 84 (81-86)              |         |
| Never/rarely                                  | 89 (88-90)              | <.0001  |
| <b>Sure can take ART as directed</b>          |                         |         |
| Not at all/somewhat                           | 56 (50-61)              | <.0001  |
| Very sure/extremely sure                      | 90 (89-91)              |         |
| <b>Sure ART has a positive effect</b>         |                         |         |
| Not at all/somewhat                           | 81 (78-84)              | <.0001  |
| Very sure/extremely sure                      | 89 (88-90)              |         |
| <b>Sure of resistance if non-adherent</b>     |                         |         |
| Not at all/somewhat                           | 77 (60-94)              | <.0001  |
| Very sure/extremely sure                      | 76 (70-83)              |         |

<sup>‡</sup>Limited to those currently on ART



# Summary of Factors Associated With Non-adherence Among Young and Older MSM, MMP 2009-2013

| Factors                              | Associated With Non-adherence |     |
|--------------------------------------|-------------------------------|-----|
|                                      | 18-24                         | 25+ |
| Depression                           | X                             | X   |
| Binge drinking                       |                               | X   |
| Stimulant use                        |                               | X   |
| Bothered by ART side effects         | X                             | X   |
| Unsure can take ART as directed      | X                             | X   |
| Unsure ART has a positive effect     | X                             | X   |
| Unsure of resistance if non-adherent |                               | X   |

X indicates significant association

# DISCUSSION

- Compared to older MSM, young HIV-positive MSM had significantly lower prevalence of:
  - Viral suppression (39% vs. 72%)
  - ART use (77% vs 94%)
  - Adherence (77% vs. 89%)
- Associations with adherence
  - Depression, experiencing side-effects of ART, not taking ART as directed, and being unsure of ART's positive effects were associated with non-adherence among all MSM
  - No significant associations between binge drinking, stimulant use, being unsure of resistance from non-adherence to ART, and adherence among young MSM

# DISCUSSION

- Young HIV-positive MSM are more socioeconomically challenged compared to older MSM, which can create barriers to optimal healthcare
- Many interventions exist to improve adherence in adults, yet few rigorously evaluated tailored interventions have been developed to improve adherence among young persons
- Young MSM with depression reported poor adherence and thus addressing mental health may be important
- Providers may need to ask about and address ART side effects that their patients may experience to improve adherence among young MSM

# LIMITATIONS

- Results are not generalizable to HIV-positive MSM that are not receiving medical care or are undiagnosed
- Cross-sectional analysis, causality cannot be assessed
- Small sample for young MSM, may have lacked power to detect other differences
- Not every possible factor was assessed for an association with adherence

# CONCLUSION

- The significantly lower prevalence of sustained viral suppression, ART use, and adherence among HIV-positive young MSM supports the continued need to improve the last steps in the HIV care continuum among this group
- This analysis found several behavioral and attitudinal differences between young and older MSM, as well as differences in factors associated with adherence among the groups, which suggests that tailored adherence interventions may be beneficial for HIV-positive young MSM

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For more information, contact CDC  
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