

PrEP and Porn

Trends in Popularity of Condom-less Pornographic
Videos featuring Men having Sex with Men

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INTRODUCTION

Background

Condoms had been the standard for gay sexually explicit media (SEM) since the AIDS crisis. Unprotected anal intercourse (UAI) was regarded as kink and the domain of niche production studios.

- **Positive association between watching UAI and participating in the activity**
 - 2011 study: MSM whose porn consumption was > 75% UAI: OR 8.1
- Advent of pre-exposure prophylaxis (PrEP) has stirred fears of **"risk compensation"** among MSM
 - 2016 meta-analysis: IRR of 44.6 for MSM on PrEP acquiring syphilis vs. MSM not on PrEP
- Role SEM has in **sexuality education**
 - 2010 qualitative study of n = 57 young MSM: SEM was "one of the most common informal sources of sexual information"

No studies to date have examined the impact these PrEP-associated cultural and sexual shifts among MSM have had on SEM consumption.

Question

Is there a relationship between condom utilization employed in SEM featuring MSM and:

- their consumers' viewing habits on the popular pornographic website PornHub (PH) in the United States in the last 10 years, and
- new guidelines recommended by the Center for Disease Control (CDC) for Truvada to be used as PrEP on May 14, 2014?

Definitions



"Barebacking" is gay slang for UAI, and how such sex is described in the pornography industry. Most large gay pornographic studios began producing bareback porn in the years following the CDC's endorsement of Truvada as PrEP.



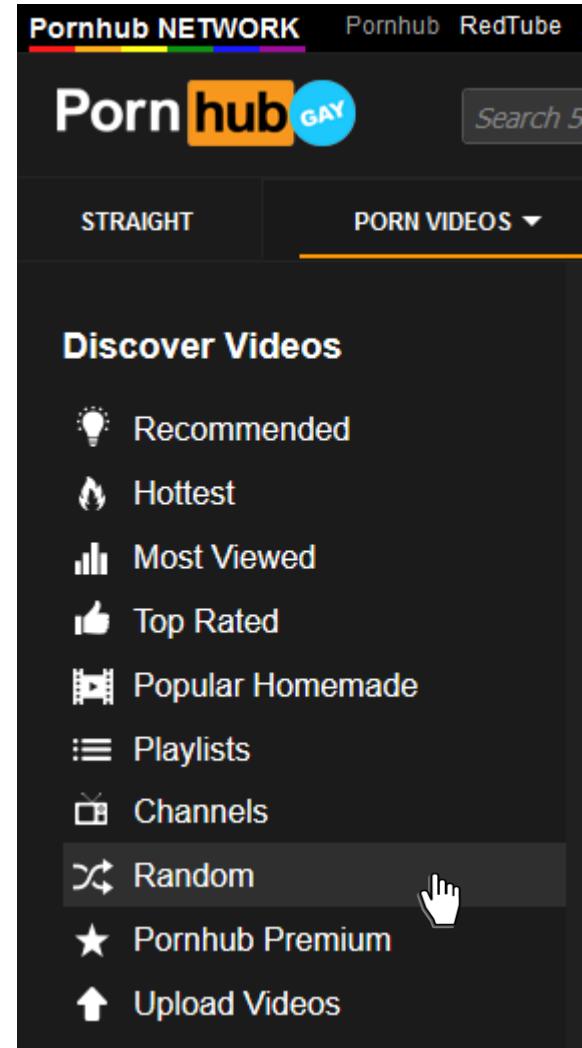
PrEP is shorthand for the **antiretroviral drug Truvada**. Truvada has had the **most adoption success among MSM** in the United States after recommendation by the CDC on May 14, 2014 (the "cutoff").

Porn **hub**

PornHub is the **most popular pornography site** on the internet worldwide, and the 18th most popular website in the US.

Methods

- **Data source:** PornHub's "random video" URL
 - Web scraped: 02.14.2018 – 02.25.2018
 - Video upload dates: 04.16.2009 – 02.13.2018
- **Analyses:**
 - Time trends
 - Model I: linear regression to the mean
 - Model II: linear regression to the quantile



Measures

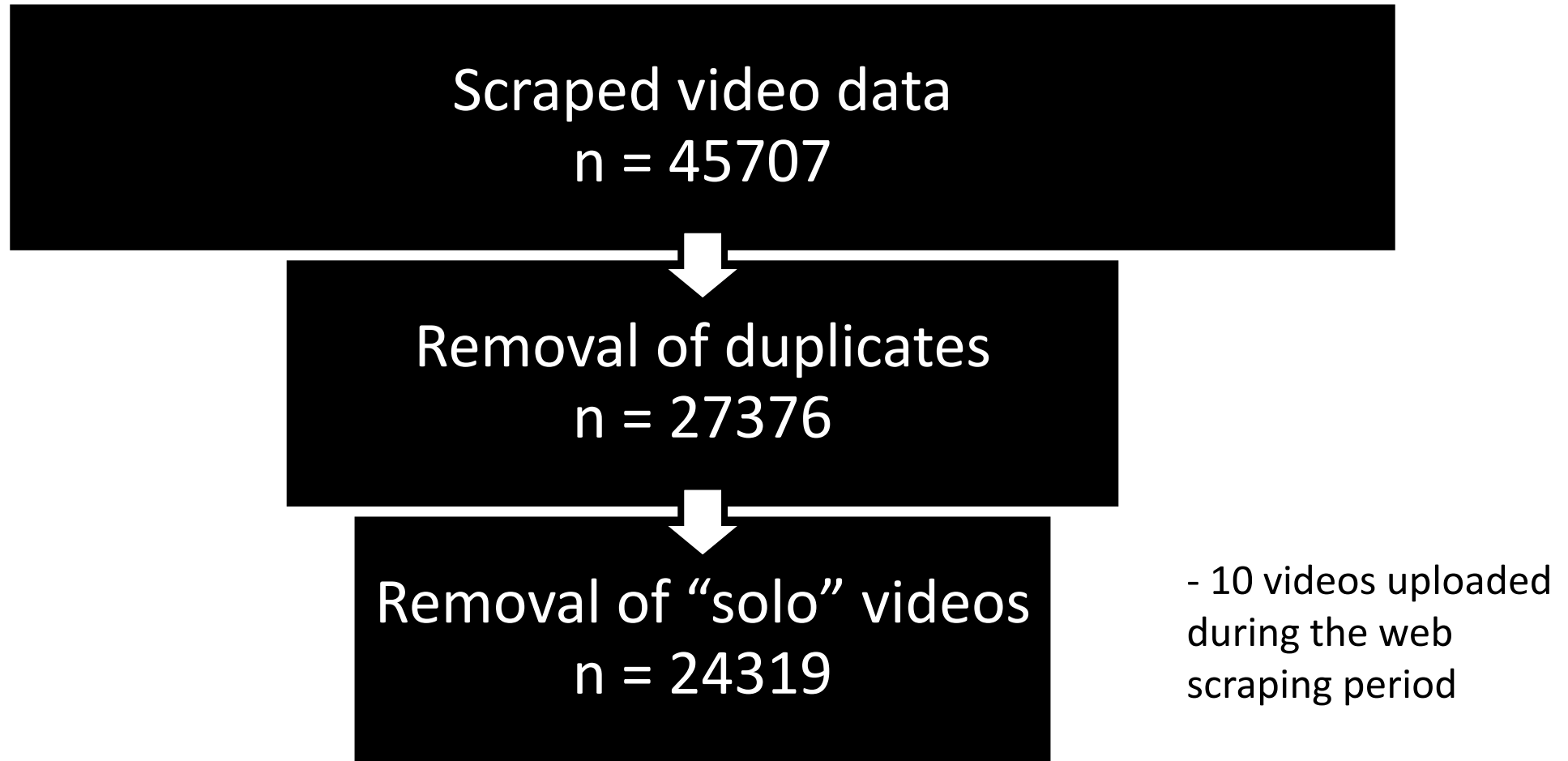
Dependent variable:

total views accumulated at time of web scraping
divided by total time uploaded (views / year), log-
transformed

Independent variables:

- Dummy variable indicating upload before or after cutoff (May 14, 2014)
- Upload date (decimal year format, centered and splined at cutoff)
- Bareback categorization (binary)
- Video rating (standardized)

Sample



Bareback videos: $n = 4951$

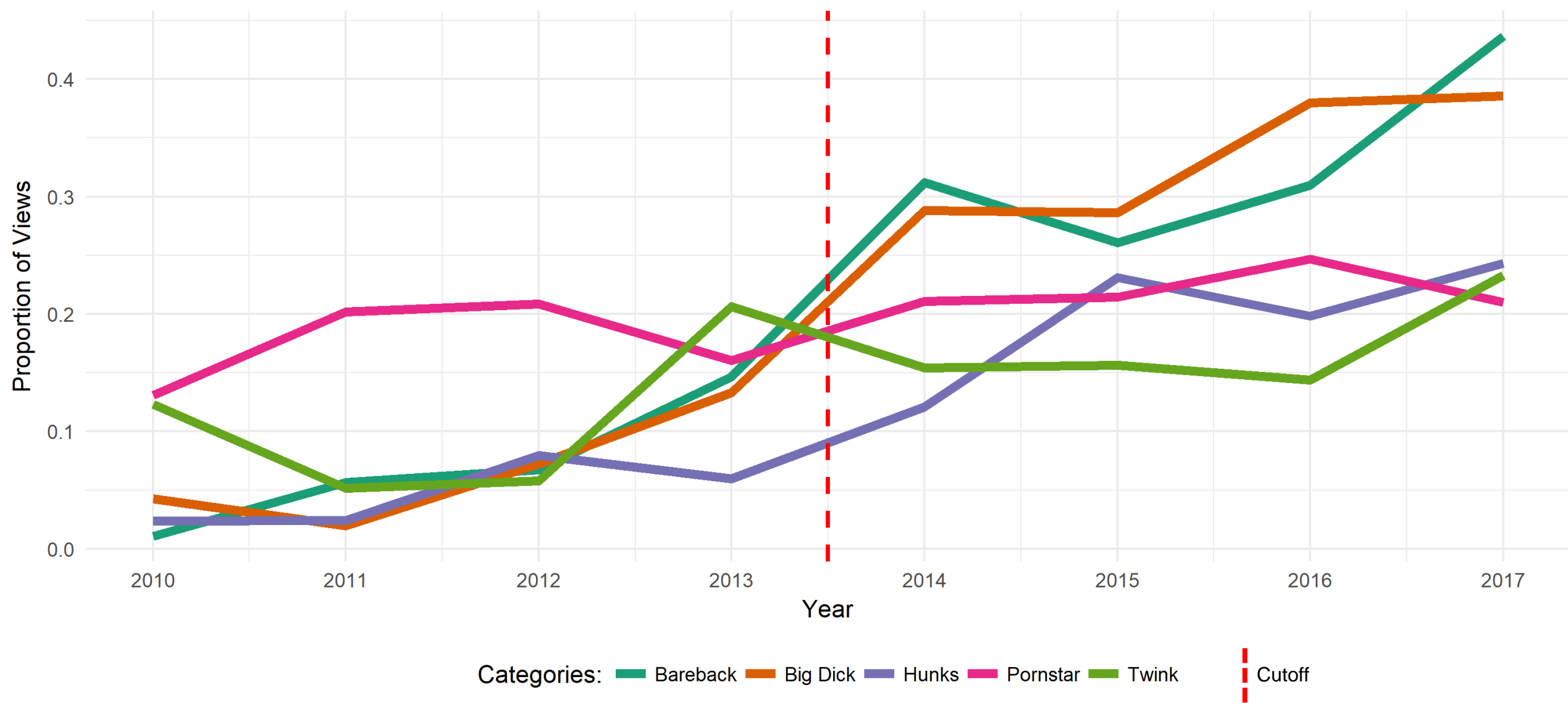
Non-bareback videos: $n = 19368$

ANALYSIS

Time trends

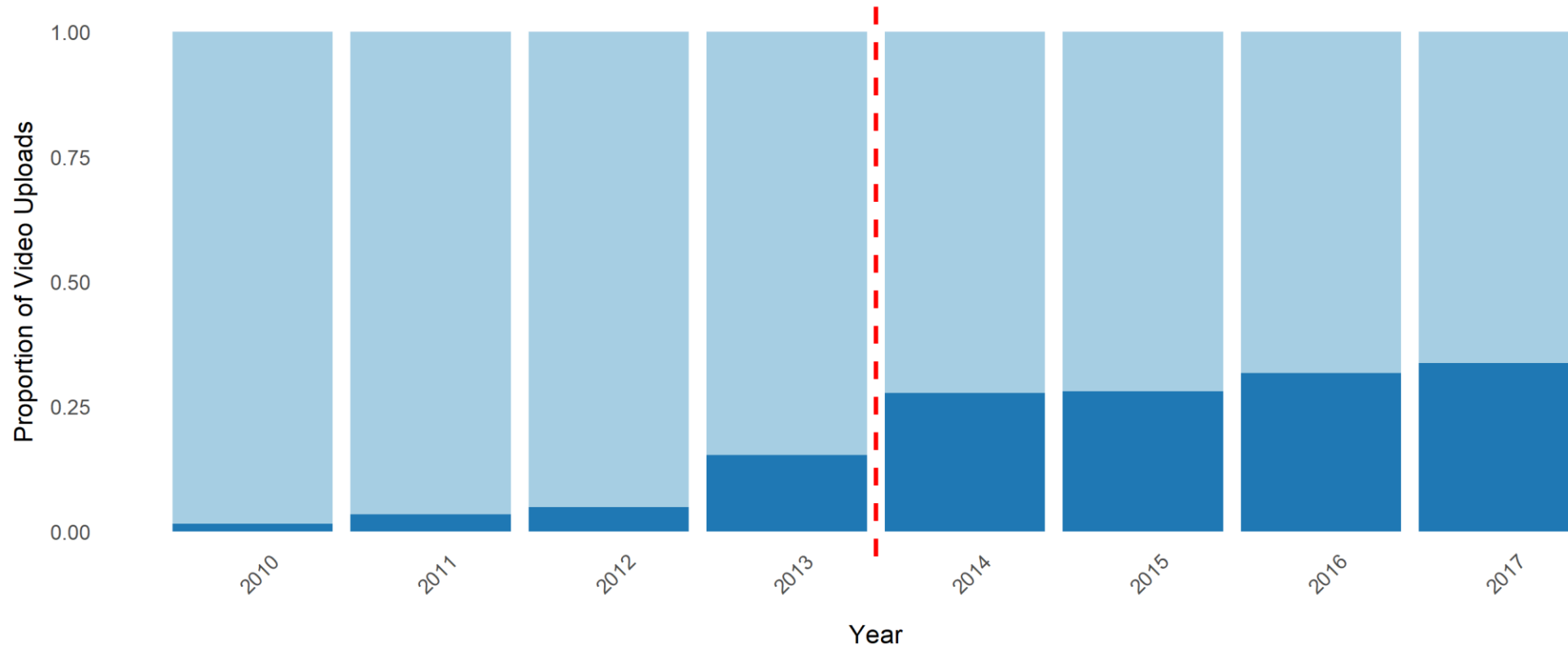
Proportion of Video Views per Upload Year by Category

Top 5 Categories by Overall Popularity



Proportion of Yearly Video Uploads

Comparison of Bareback Categorized Videos to Non-Bareback



Bareback No Yes Cutoff

Prior to Cutoff n = 12,354 (50.8%)		After Cutoff n = 11,965 (49.2%)		Statistical Test
Not Bareback	Bareback	Not Bareback	Bareback	Pearson's Chi 2:

n = 11,074 (89.6%)

n = 1,280 (10.4%)

n = 8,294 (69.3%)

n = 3,671 (30.7%)

p < 0.001

ANALYSIS Model i.

Linear Regression to
the Mean

Linear Regression to the Mean

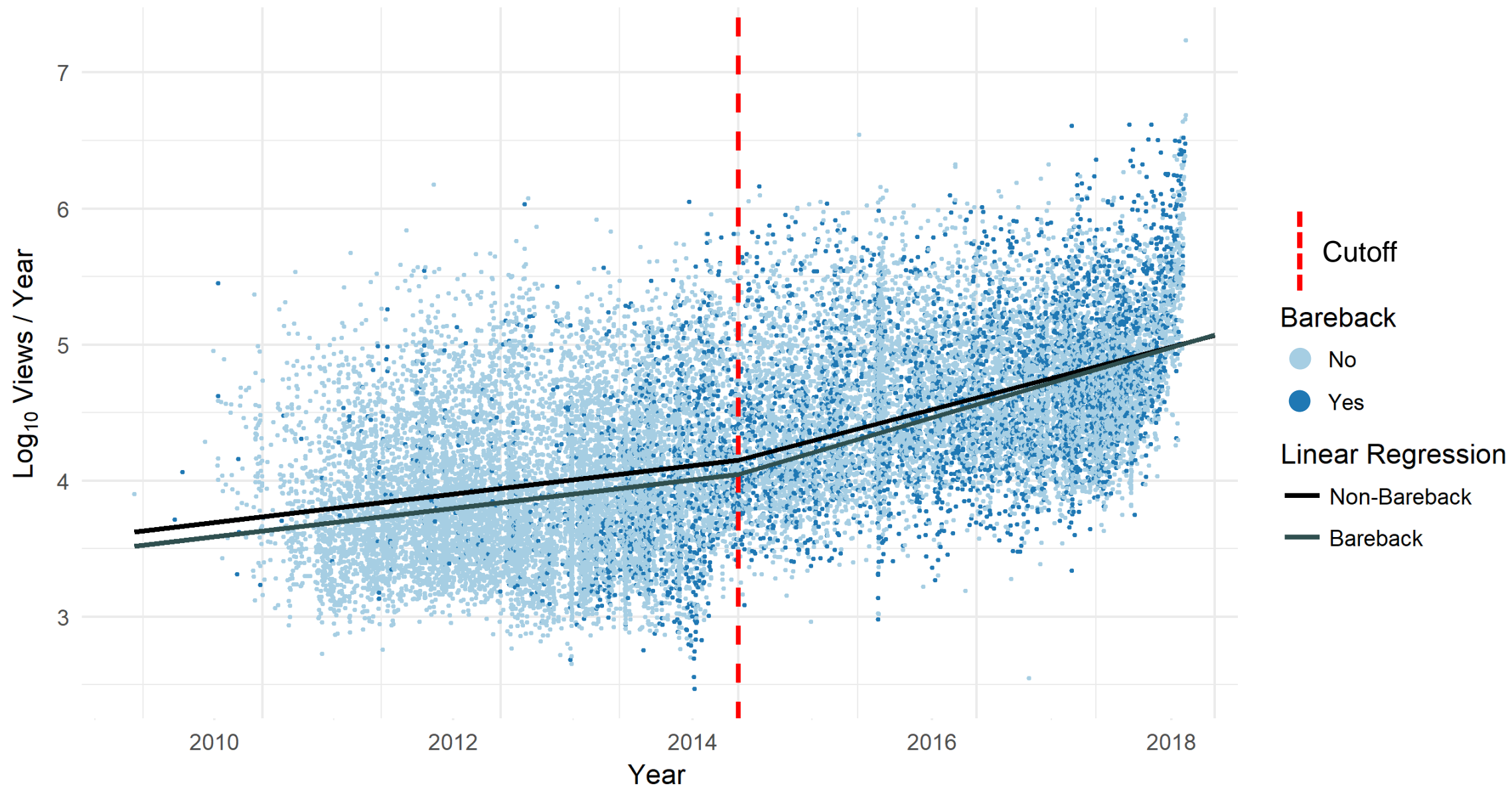
Results

$$e^{\log_{10}(y|x)} = \begin{cases} \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \varepsilon, & x_1 \in (-\infty, c) \\ \beta_0 + \beta_{1'} x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 z * x_3 + \varepsilon, & x_1 \in [c, \infty) \end{cases}$$

	Variable	Estimate	Confidence Interval	p-value
β_0	Intercept log (views / year) at cutoff	4.151	(4 .14, 4.16)	p < 0.001
β_1	Upload date: pre-cutoff decimal years (centered at cutoff)	0.104	(0.10, 0.11)	p < 0.001
$\beta_{1'}$	Upload Date: post-cutoff decimal years (centered at cutoff)	0.229	(0.22, 0.24)	p < 0.001
β_2	Rating normalized	0.221	(0.22, 0.23)	p < 0.001
β_3	Bareback	- 0.106	(-0.13, -0.08)	p < 0.001
β_4	Bareback * Cutoff	0.109	(0.08, 0.14)	p < 0.001

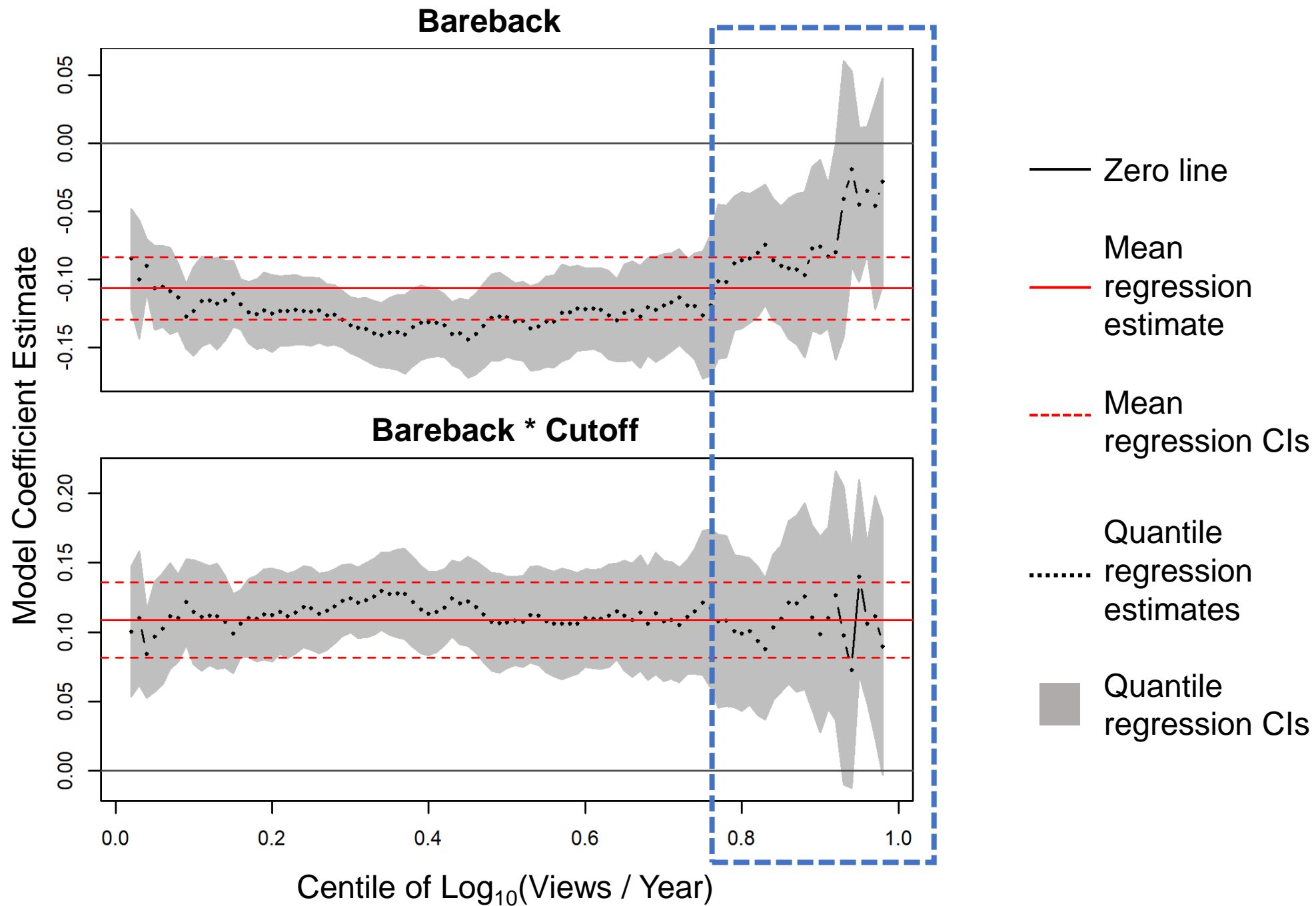
Linear Regression to the Mean

Log₁₀ Yearly View Rate of Videos by Bareback Categorization



ANALYSIS Model ii.

Linear Regression to
the Quantile



Linear regression to the quantile

Results

PRE-CUTOFF: (01.01.2014)

Model 1:

10.1k for bareback

13.0k for non-bareback

Model 2 Q0.95:

142.1k for bareback

115.5k for non-bareback

POST-CUTOFF: (01.01.2017)

Model 1:

57.1k for bareback

57.0k for non-bareback

Model 2 Q0.95:

444.8k for bareback

361.5k for non-bareback

Bareback	-0.11 (-0.13, -0.08) ***	-0.09 (-0.15, -0.03) **	-0.09 (-0.14, -0.04) ***	-0.08 (-0.15, 0.00) ns	-0.05 (-0.11, 0.02) ns
Bareback * Cutoff	0.11 (0.08, 0.14) ***	0.10 (0.04, 0.16) **	0.11 (0.05, 0.17) ***	0.10 (0.01, 0.18) *	0.14 (0.05, 0.23) **

DISCUSSION

Implications

- Demonstrated rise in popularity of bareback videos has implications for public health practitioners who work with MSM or in sexually transmitted infection control
- Considering the potential instructive role SEM has for young MSM, import of bareback SEM could be magnified among younger viewers
- Health equity concerns pertaining to those who can and do use PrEP and those impacted by viewership of UAI in gay SEM
- Averages can obfuscate the “extremes” in statistical research on media consumption
- More **high-quality** research is needed

Limitations

- No time series data on views accumulation for videos
- Assumption of the sexuality and gender of viewers
- Reliance on PornHub's categorization system for "bareback"
- Unable to control for web traffic by country of origin
- PornHub's "random video" URL is not so random

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