HIV INCIDENCE ESTIMATES
NEW YORK STATE, 2014

INTRODUCTION

HIV incidence data[1] estimate the number of persons newly infected in a given year. The overall benchmark for New York State's *Ending the Epidemic* initiative is a reduction in such cases to 750 by the end of 2020. This document reports 2016 update on NYS incidence estimates and population rates for 2006-2014.

HIGHLIGHTS FROM UPDATED HIV INCIDENCE ESTIMATION, 2006-2014

- NYS had an **estimated 2,481 new HIV infections** in 2014 or 14.8 infections per 100,000 population.
- Almost **67% of estimated new infections** occurred in Non-Hispanic blacks and Hispanics, although their combined population proportion was just 32% in 2014. The estimated HIV incidence rate for non-Hispanic blacks (32.4 per 100,000) was five times that of non-Hispanic whites (6.5 per 100,000), and the rate for Hispanics was 4.5 times higher (29.8 per 100,000).
- Persons ages 25-34 had the **greatest estimated number of new infections of any age group** (872) and the highest rate (30.6 per 100,000). In 2014, **one in every three** estimated new infections was in persons aged 25-34 years, although only 17% of NYS residents were ages 25-34 in 2014.
- Estimated new infections among men (2,113) were almost **six times higher than among women** (368).
- Men who have sex with men (MSM) comprised **over two-thirds of estimated new infections** (77%).

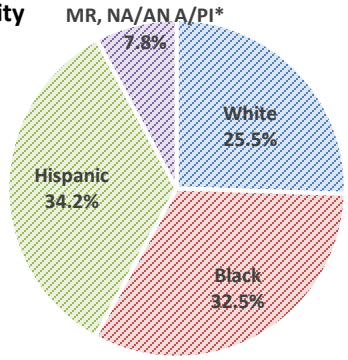
2016 METHODOLOGY UPDATES

- Incidence estimates cited in this document were calculated using the CDC developed methods that were substantially updated in May 2016.
- NYS used this revised methodology to generate HIV incidence estimates for 2006-2014. These estimates replace previous NYS HIV incidence estimates.
- Among major methodology changes that impact the estimated HIV incidence numbers:
    - The mean duration of recent infection (MDRI) was revised for BED (BED HIV-1 EIA Capture Assay) tested specimens:
        - MDRI=198.4 days (from 162 days, used in previous calculation)
        - Incidence estimates for 2006-2013 were recalculated using the revised MDRI
    - The BioRad Avidity assay was used as the recency test for specimens with HIV diagnosis date 2014 onward, using an MDRI of 240 days

- The progress demonstrated in these HIV incidence estimates are a result of revisions to the CDC developed methodology and as a result of programmatic changes implemented by the New York State Department of Health as part of the *Ending the Epidemic* initiative.

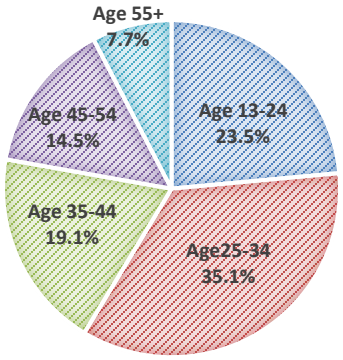
NYS INCIDENCE ESTIMATES BY POPULATION GROUP, 2014

By Race/Ethnicity

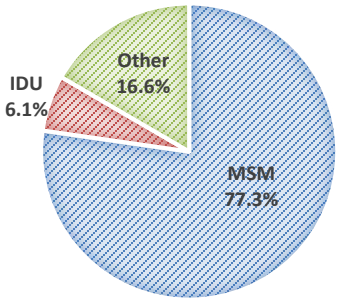


** Multirace, Native American/Alaska Native, Asian/Pacific Islander*

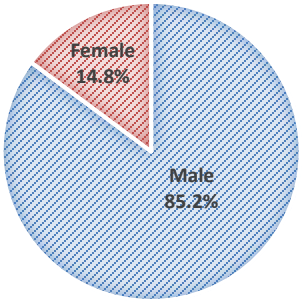
By Age Group



By HIV Transmission Risk



By Sex at Birth



STATEWIDE HIV INCIDENCE TRENDS, 2006-2014

The new infection estimates for each year are shown in **Figure 1a** along with the 95% confidence

Figure 1a. NYS Incidence Estimates

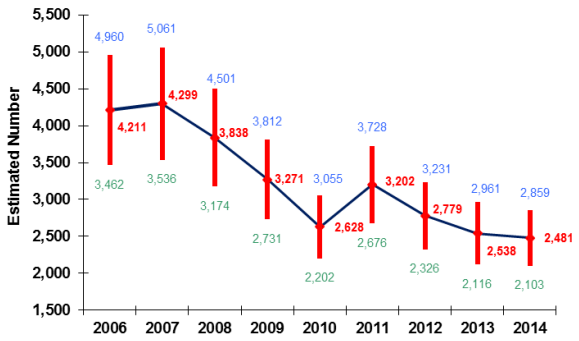
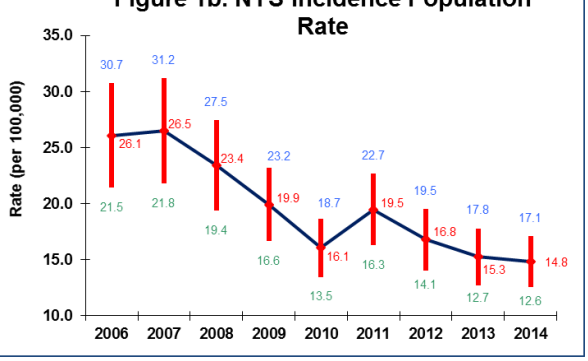


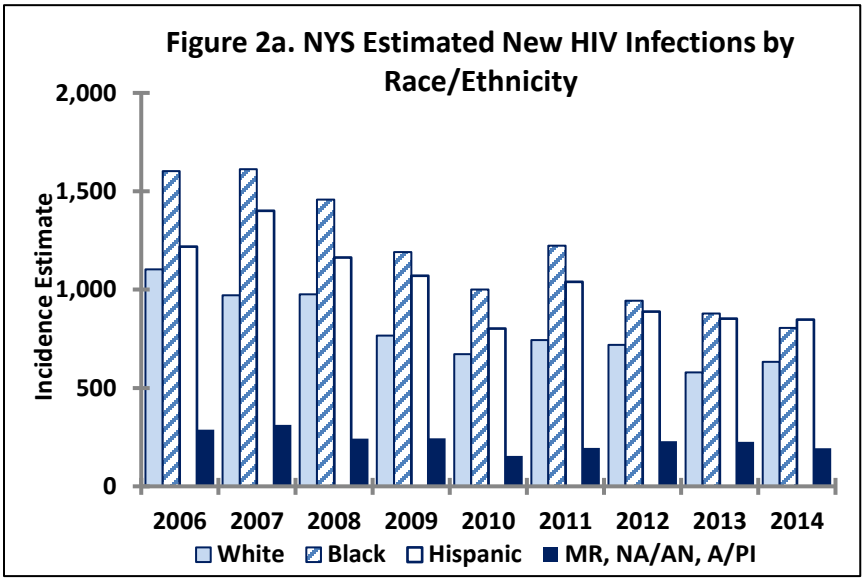
Figure 1b. NYS Incidence Population Rate

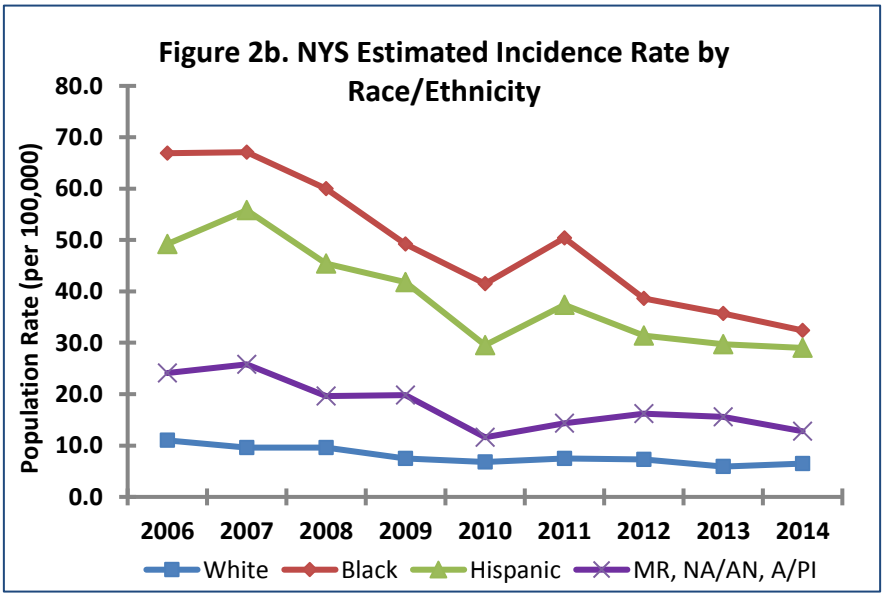


interval. Between 2006 and 2014, estimated new HIV infections decreased 41%. The estimated incidence rates (i.e., the number of new infections per 100,000 population) and 95% confidence intervals are shown in **Figure 1b**. Between 2006 and 2014, the estimated incidence rate decreased by 43%. Both decreases are statistically significant.

HIV INCIDENCE TRENDS BY RACE/ETHNICITY, 2006-2014

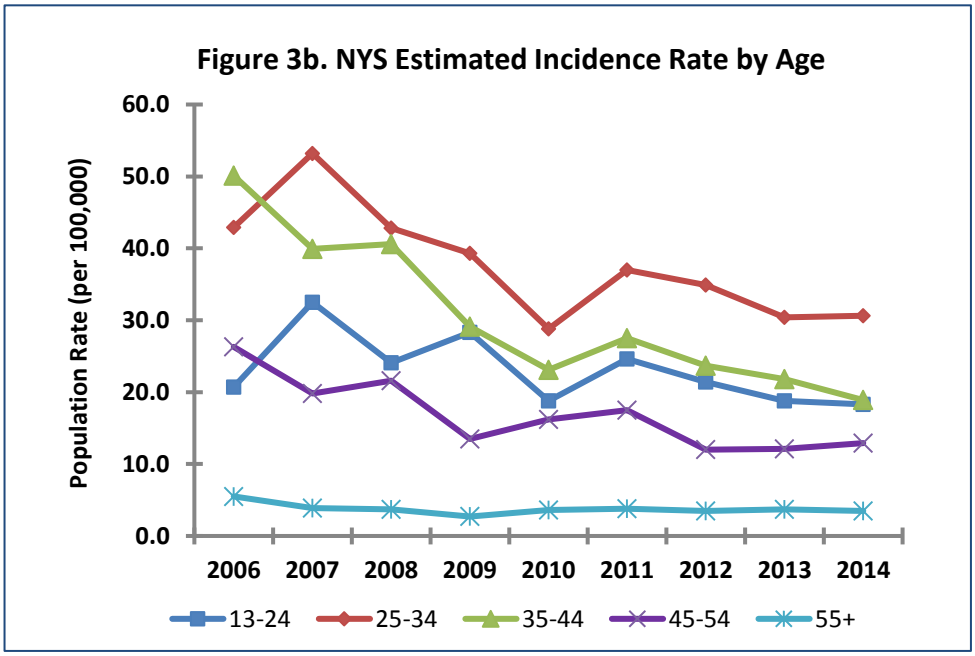
Incidence by race/ethnicity is shown in **Figures 2a** and **2b**. Between 2006 and 2014, estimated new HIV infections decreased as follows: non-Hispanic white 43% decrease; non-Hispanic black 50% decrease; Hispanic 30% decrease; and for the combined non-Hispanic multi-race (MR), Native American/Alaska Native (NA/AN), and Asian/Pacific Islander (A/PI) category 33% decrease. The NYSDOH is unable to assess incidence individually for numerically smaller race/ethnicity groups using CDC's incidence methodology.





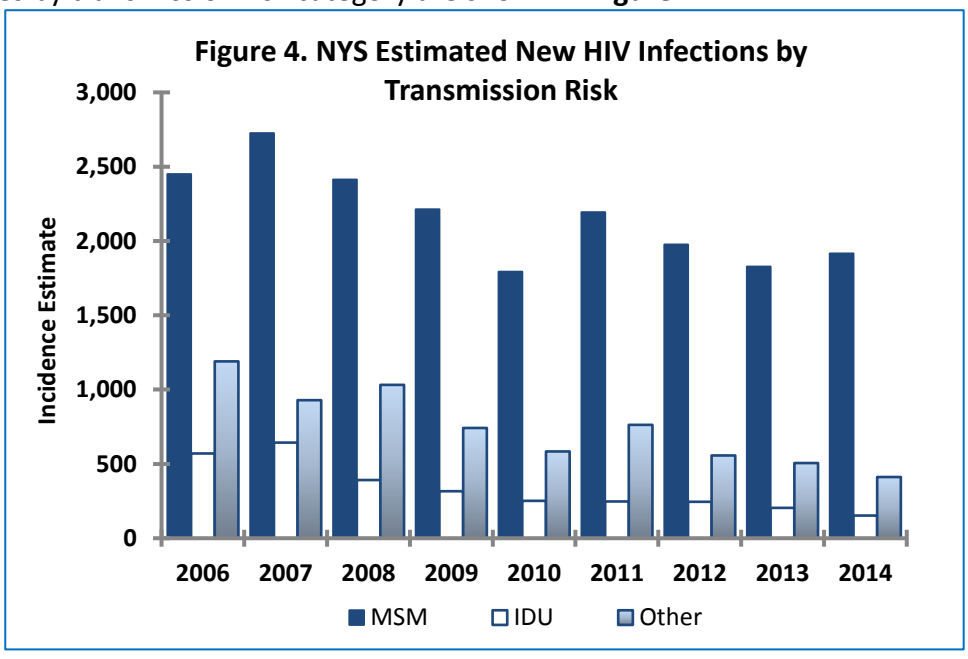
HIV INCIDENCE TRENDS BY AGE, 2006-2014

Persons aged 25-34 had the greatest estimated incidence of any age group for nearly every year. Although a modest decrease is seen in the 25-34 age group, in 2014 one out of every three new HIV infections was estimated to occur among these young adults. A decrease of 67% in estimated new HIV infections is seen for the age group 35-44 between 2006 and 2014.



HIV INCIDENCE TRENDS BY TRANSMISSION RISK, 2006-2014

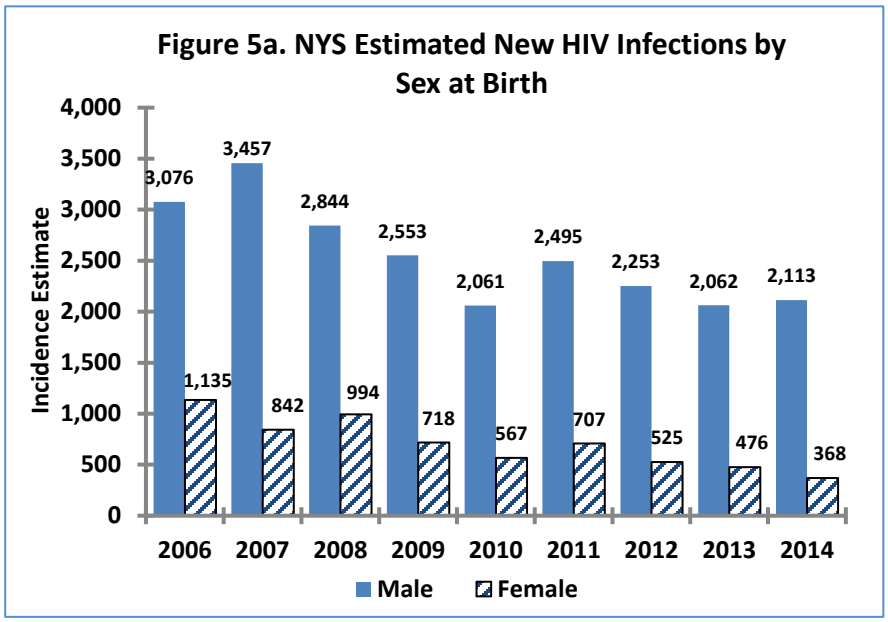
Estimates by transmission risk category are shown in **Figure 4**.

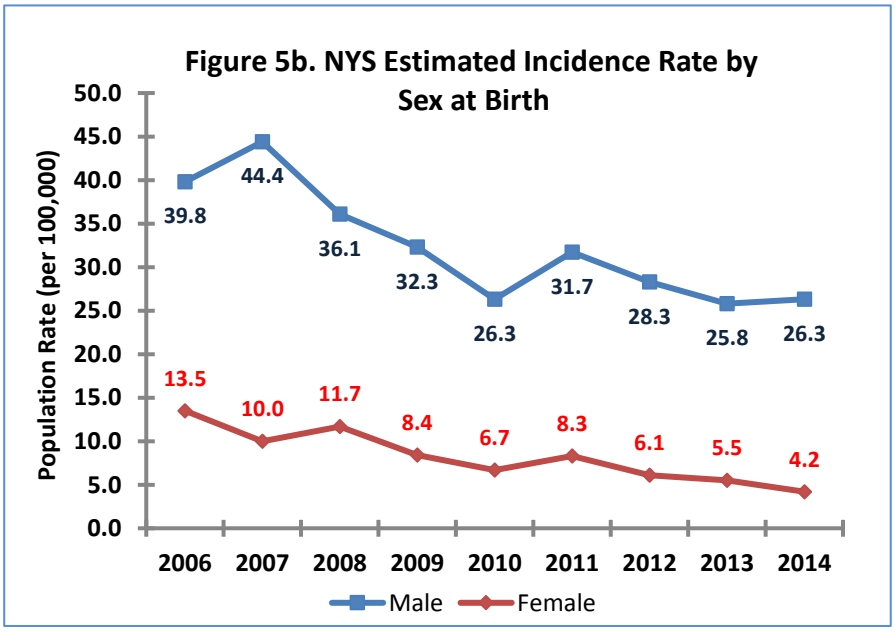


The vast majority of estimated new infections continue to occur among MSM. From 2006-2014, there was a 22% decrease in new HIV infections among MSM, compared to a 73% decrease among IDU and a 65% decrease among "other risk." In this estimation procedure, estimated infections among persons with both MSM and IDU risk are grouped with IDU risk.

HIV INCIDENCE TRENDS BY SEX AT BIRTH, 2006-2014

Estimates by sex at birth are shown in **Figures 5a** and **5b.** A 31% decrease among males and a 68% decrease among females was seen from 2006-2014. Of the total estimated infections occurring in 2014, 85% occurred in males. The NYSDOH is unable to assess incidence for transgender persons using CDC's incidence methodology based on small numbers.





SPECIAL FOCUS: DEMOGRAPHIC SUBGROUP TRENDS AMONG MSM, 2006-2014

To further examine MSM subpopulations, incidence estimates were created for 12 subgroups[2] characterized by age (13-29, 30+ years), transmission risk (MSM, non-MSM/persons with all other risks), and race/ethnicity (non-Hispanic black, Hispanic, and Other). The 'other' race/ethnicity category is comprised mostly of non-Hispanic whites, but also includes Native American/Alaska Native, Asian/Pacific Islander and multi-racial.

Figure 6a shows decreases over time in incidence estimates for both MSM and non-MSM. However, non-MSM have experienced a percentage decline three times (68%) that of MSM (23%). In 2014, an estimated 77% of new infections were in MSM with 23% in non-MSM.

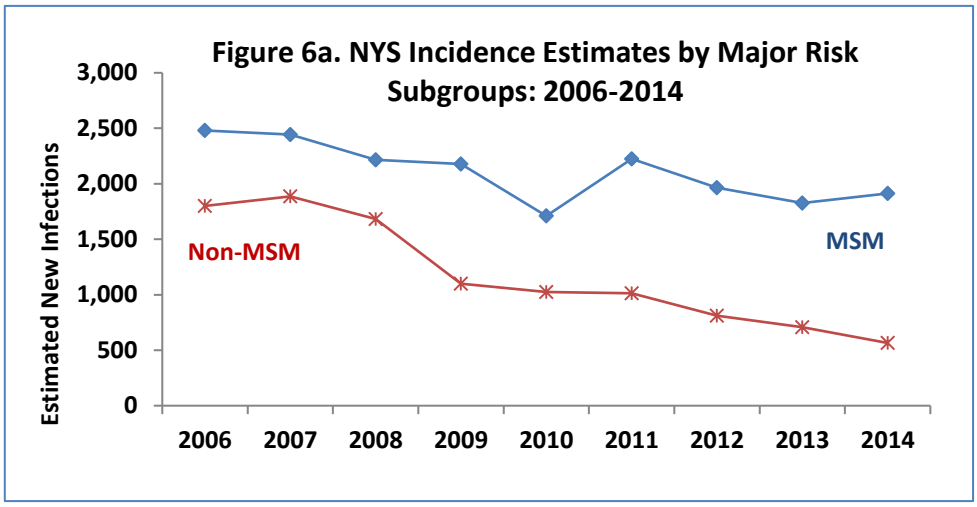
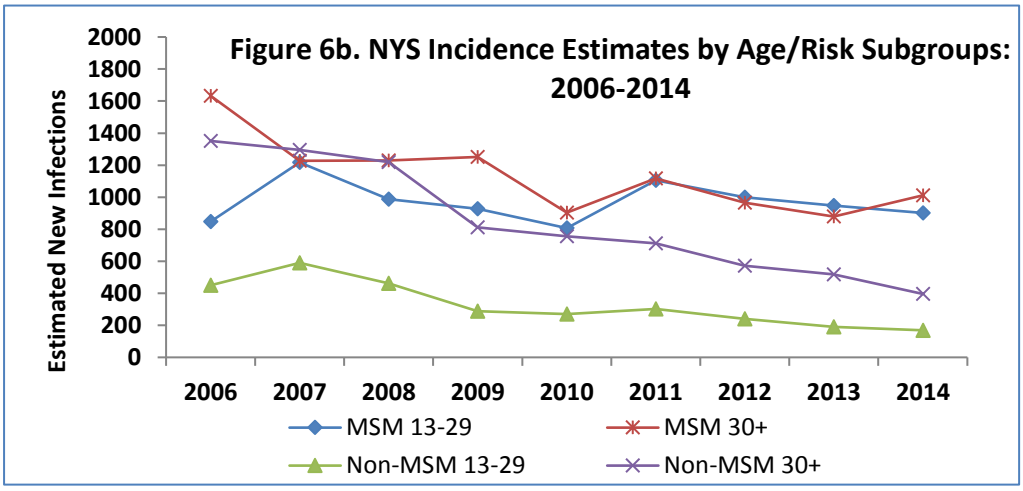
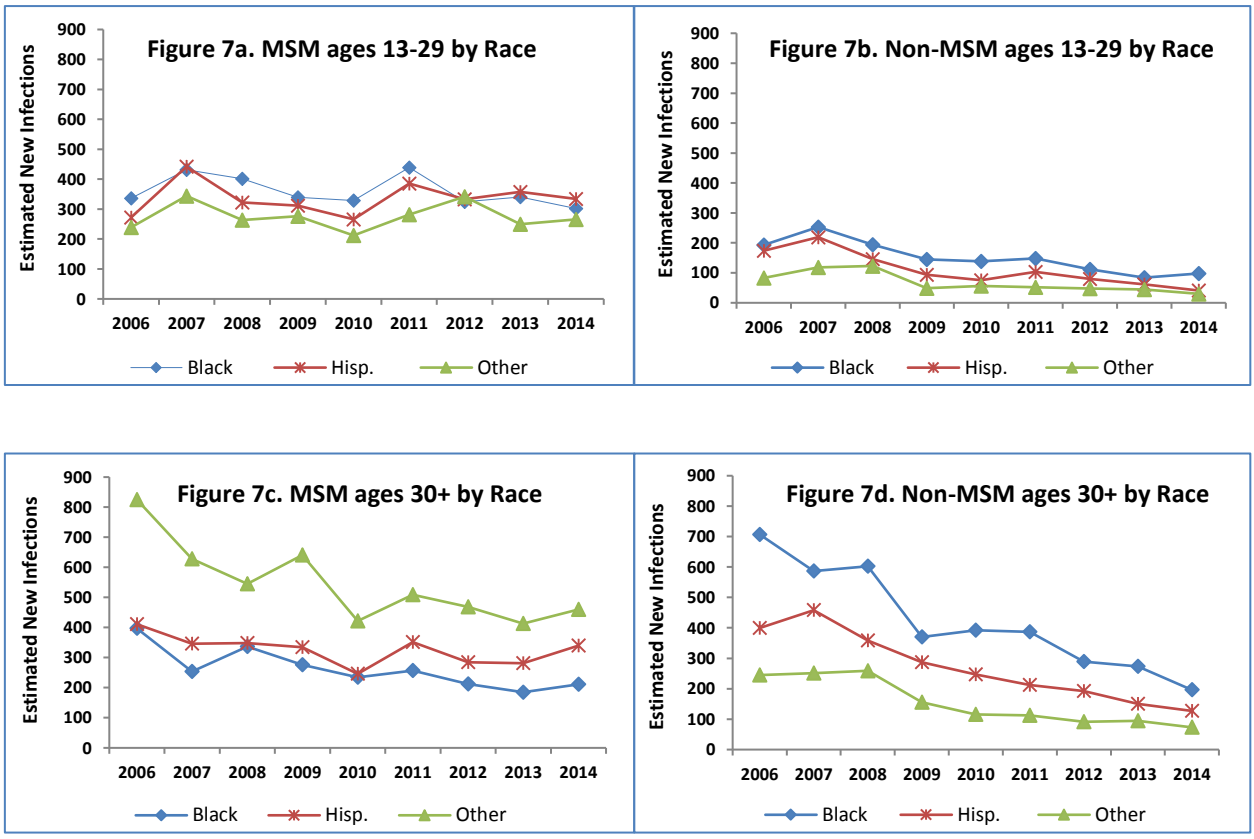


Figure 6b shows incidence trends among MSM and non-MSM ages 13-29 and 30+. Between 2006 and 2014, large decreases (38%-70% decreases) in new infections were seen for all groups except the MSM 13-29 group, which experienced a very slight increase of 7% in the same period.



Figures 7a-d examine trends among the subgroups more closely. Between 2006 and 2014 all transmission risk, age and race subgroups experienced declining HIV incidence, though older MSM show a small increase in 2014 compared to 2013. Note, due to requirements of the CDC incidence methodology, age, risk and race/ethnicity were collapsed into two (or three for race/ethnicity) groups: young (13-29) and older (30 and over); MSM and non-MSM; non-Hispanic black, Hispanic, and all other race/ethnic groups (comprised mostly non-Hispanic whites). This was necessary to meet the minimum calculation modeling requirements.

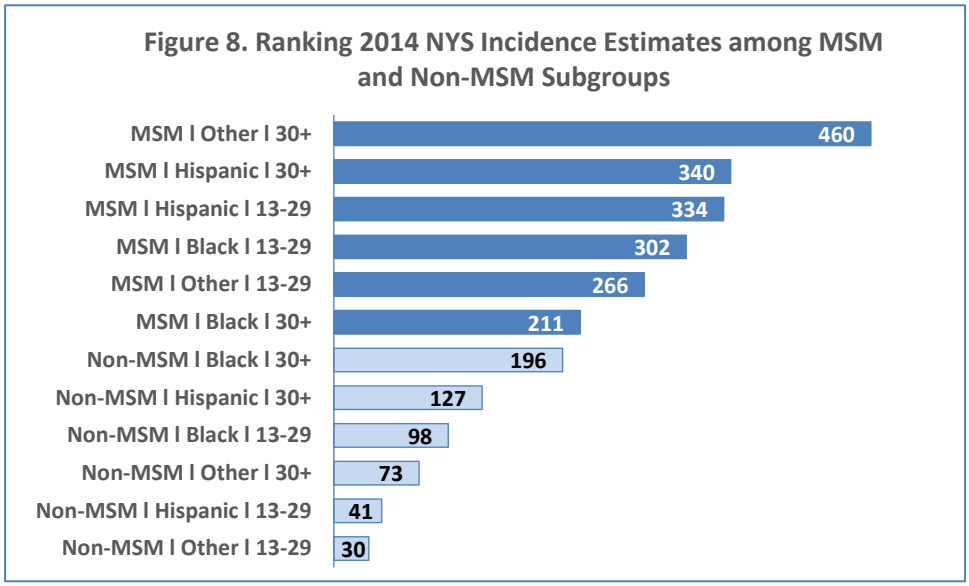


These figures document progress towards reducing HIV incidence in NYS. All subgroups but two yielded significantly decreasing incidence from 2006-2014.

- Two young MSM subgroups (Figure 7a) experienced an increase in estimated new infections: the young MSM Hispanic subgroup (an increase of 22.8%) and the young MSM Other (mostly white) subgroup (an increase of 11.3%).
- Among all subgroups, the young non-MSM Hispanic subgroup (Figure 7b, red) had the largest decrease in estimated new infections, with a decrease of 76.4% over the estimation period.
- The six older subgroups (Figure 7c and 7d) yielded decreased estimated new infections over time, however there was large variation in the magnitude of decrease by group:
    - All three older non-MSM subgroups (Figure 7d) experienced significant and marked reductions in estimated HIV incidence (ranging from 68% to 72%).
    - Among the three older MSM subgroups (Figure 7c) the decreases were relatively moderate with the Hispanic subgroup yielding the smallest reduction (17.3%).

- In terms of the burden of new infections among all 12 subgroups, the older MSM of Other race/ethnicity (mostly non-Hispanic whites) subgroup (in Figure 7c) had the highest number of estimated new infections each year between 2006 and 2014.

Figure 8 shows the estimated number of new infections occurring in each population subgroup in 2014. These data underscore the need to ensure all populations benefit from the enhanced *Ending the Epidemic* efforts to reduce new HIV infections to 750 by the end of 2020. The dark-shaded bars represent MSM groups; the light-shaded bars represent non-MSM groups.



CONCLUSION

New York State has made solid progress in driving down new infections from 2006 levels. In order to reach the goal of 750 new infections by the end of 2020 it will be important to continue this progress, ensuring that *Ending the Epidemic* activities effectively serve those groups where new infections continue to occur.

Questions about this report should be directed to the Bureau of HIV/AIDS Epidemiology: 518-474-4284 or bhae@health.ny.gov

ENDNOTES

[1] Incidence data, derived by using a CDC-developed method called the stratified extrapolation approach (SEA) (http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2919237/), combine a range of data sources and analytical methods to produce an estimate of the number of new HIV infections in a given year. Whereas counts of newly diagnosed cases may include HIV infections that occurred many years ago, incidence estimates are limited to only those infections that happened within a specified time frame. In 2016, the CDC updated the SEA which a revised BED window period and the addition of a new STARHS test for specimens that were diagnosed in 2014 and later.

[2] The subgroups were chosen to facilitate evaluation of HIV incidence among race/ethnicity and age subgroups of MSM. To meet the minimum size requirements of the SEA procedures, disparate groups of individuals were combined in the "non-MSM" category (males and females with IDU, and heterosexual) and in the "other" race/ethnicity category (whites, Asian/Pacific Islanders, Native Americans/Alaska Natives, multiracial). The aggregate estimate for these combined categories provides some information about the relative magnitude of incidence in these groups, but the trajectory of the epidemic in any one group may not be accurately represented by the aggregate number.