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## Objectives

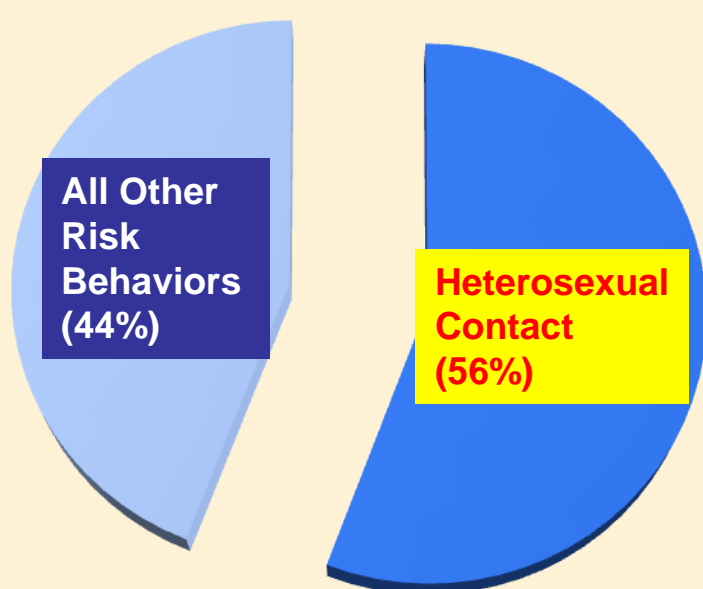
To examine the likelihood of persons diagnosed and living with HIV/AIDS (PDLWH/A) in Pennsylvania (PA) who can potentially transmit HIV through heterosexual contact [including those probably infected through injection drug use, i.e. IDU] vs. all other HIV risk behaviors and how this varies according to several demographic and geospatial characteristics.

## Methods

The PA HIV case surveillance dynamic cohort studied included 34,772 adults/adolescents (>13-years old at the time of HIV-diagnosis, excluding those probably infected through mother-to-child-transmission) with a definitive HIV diagnosis from January 1, 1980 who were longitudinally followed-up and presumed alive after death registry linkage as of December 31, 2010. Simple chi-square, geospatial, and adjusted/multiple logistic regression analyses were performed to estimate likelihoods of PDLWH/A who can potentially transmit HIV through Heterosexual Contact (vs. all other probable modes of transmission) and how this varies by current age(in 2010), race/ethnicity, sex/gender, and coalition region/HIV service area(HSA) of residence at the time of diagnosis.

## Results: Simple Analyses

Figure 1. Proportion of Heterosexual Contact vs. All Other Risk Behaviors, 2010

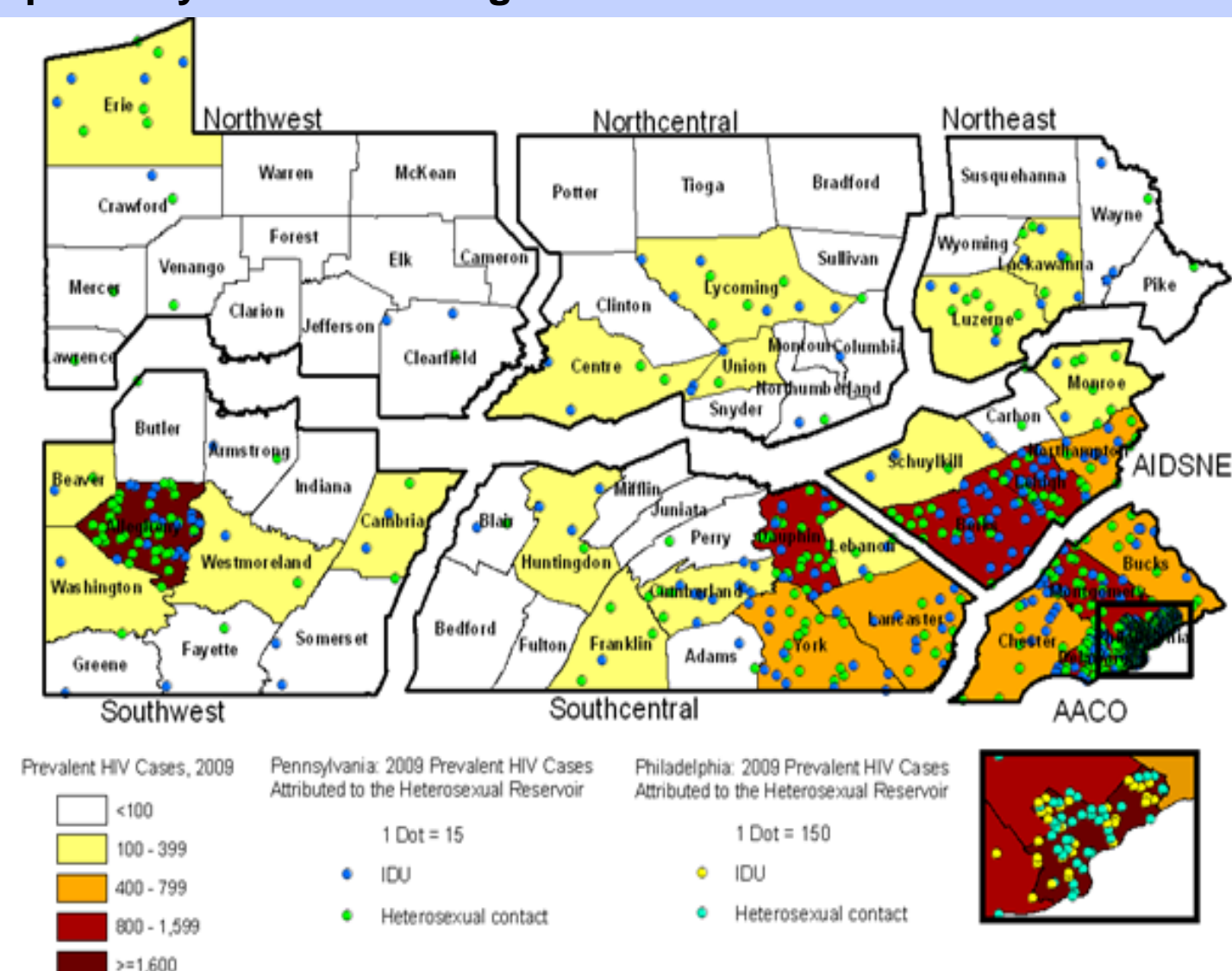


## Results: Simple Analyses

Table 1. Characteristics of PDLWH/A in PA who can Potentially Transmit HIV through Heterosexual Contact vs. All Other Risk Behaviors, 2010

| Characteristics   | Heterosexual Contact (incl. IDU) |         | All Other Risk Behaviors |         | P-Value |
|---|----------------------------------|---------|--------------------------|---------|---------|
|   | Number                           | Percent | Number                   | Percent |         |
| <b>Total</b>  | 19409                            | 100     | 15363                    | 100     |         |
| <b>Current Age (Years) as of December 31, 2010</b>      |                                  |         |                          |         |         |
| 13-19   | 54                               | 0       | 89                       | 1       |         |
| 20-29   | 1192                             | 6       | 1790                     | 12      |         |
| 30-39   | 3276                             | 17      | 2498                     | 16      |         |
| 40-49   | 7044                             | 36      | 5601                     | 36      |         |
| 50-59   | 5877                             | 30      | 3951                     | 26      |         |
| >=60  | 1966                             | 10      | 1434                     | 9       | <.0001  |
| <b>Race/Ethnicity</b>                                   |                                  |         |                          |         |         |
| White, Non-Hispanic                                     | 4005                             | 21      | 7391                     | 48      |         |
| Black, Non-Hispanic                                     | 11645                            | 60      | 6185                     | 40      |         |
| Hispanic  | 3599                             | 19      | 1545                     | 10      |         |
| Asian   | 115                              | 1       | 144                      | 1       |         |
| Native American   | 30                               | 0       | 30                       | 0       |         |
| Other race/ethnicity                                    | 15                               | 0       | 68                       | 0       | <.0001  |
| <b>Sex/Gender</b>                                       |                                  |         |                          |         |         |
| Male  | 10419                            | 54      | 14434                    | 94      |         |
| Female  | 8990                             | 46      | 929                      | 6       | <.0001  |
| <b>Coalition Region (Fig 2) (HIV Service Area, HSA)</b> |                                  |         |                          |         |         |
| AACO  | 13795                            | 71      | 8982                     | 58      |         |
| AIDSNET   | 1609                             | 8       | 1162                     | 8       |         |
| North-central   | 400                              | 2       | 413                      | 3       |         |
| Northeast   | 396                              | 2       | 399                      | 3       |         |
| Northwest   | 321                              | 2       | 410                      | 3       |         |
| South-central   | 1755                             | 9       | 1770                     | 12      |         |
| Southwest   | 1133                             | 6       | 2227                     | 14      | <.0001  |

Figure 2. Map of the Distribution of PDLWH/A in PA from 1980-2009 by Coalition Region/HIV Service Area (HSA) Stratified by County with an Overlay of Dot-Density of PDLWH/A who were probably infected through Heterosexual Contact or IDU.



Footnotes:  
-AACO, AIDS Activities Coordinating Office is the HIV service coalition region including Philadelphia and 4 surrounding counties in PA;

## Results: Adjusted Analyses

Table 2. Likelihood of PDLWH/A in PA who can Potentially Transmit HIV through Heterosexual Contact vs. All Other Risk Behaviors, 2010

| Variable   | Heterosexual Contact (incl. IDU) |         | All Other Risk Behaviors |        | Unadjusted Odds Ratio |             | Adjusted Odds Ratio |             |
|--|----------------------------------|---------|--------------------------|--------|-----------------------|-------------|---------------------|-------------|
|  | N=19409                          | N=15363 | OR                       | 95% CI | OR                    | 95% CI      |                     |             |
| <b>Current Age (Years) as of December 31, 2010</b> |                                  |         |                          |        |                       |             |                     |             |
| 13-29  | 1246                             | 6%      | 1879                     | 12%    | 1.00                  |             | 1.00                |             |
| 30-39  | 3276                             | 17%     | 2498                     | 16%    | 1.98                  | 1.81 2.16   | 2.12                | 1.91 2.36   |
| 40-49  | 7044                             | 36%     | 5601                     | 36%    | 1.90                  | 1.75 2.05   | 2.65                | 2.41 2.92   |
| 50-59  | 5877                             | 30%     | 3951                     | 26%    | 2.24                  | 2.07 2.44   | 3.91                | 3.54 4.32   |
| >=60   | 1966                             | 10%     | 1434                     | 9%     | 2.07                  | 1.87 2.28   | 3.87                | 3.44 4.35   |
| <b>Race/Ethnicity</b>                              |                                  |         |                          |        |                       |             |                     |             |
| White, Non-Hispanic                                | 4005                             | 21%     | 7391                     | 48%    | 1.00                  |             | 1.00                |             |
| Black, Non-Hispanic                                | 11645                            | 60%     | 6185                     | 40%    | 3.47                  | 3.31 3.65   | 3.13                | 2.96 3.32   |
| Hispanic   | 3599                             | 19%     | 1545                     | 10%    | 4.30                  | 4.00 4.61   | 4.55                | 4.19 4.93   |
| Other race/ethnicity                               | 160                              | 1%      | 242                      | 2%     | 1.22                  | 1.00 1.50   | 1.09                | 0.86 1.38   |
| <b>Sex/Gender</b>                                  |                                  |         |                          |        |                       |             |                     |             |
| Male   | 10419                            | 54%     | 14434                    | 94%    | 1.00                  |             | 1.00                |             |
| Female   | 8990                             | 46%     | 929                      | 6%     | 13.41                 | 12.47 14.41 | 15.11               | 14.00 16.32 |
| <b>Coalition Region</b>                            |                                  |         |                          |        |                       |             |                     |             |
| AACO   | 13795                            | 71%     | 8982                     | 58%    | 1.00                  |             | 1.00                |             |
| AIDSNET  | 1609                             | 8%      | 1162                     | 8%     | 0.90                  | 0.83 0.98   | 0.72                | 0.66 0.80   |
| North-central                                      | 400                              | 2%      | 413                      | 3%     | 0.63                  | 0.55 0.73   | 0.76                | 0.64 0.89   |
| Northeast  | 396                              | 2%      | 399                      | 3%     | 0.65                  | 0.56 0.74   | 0.82                | 0.70 0.97   |
| Northwest  | 321                              | 2%      | 410                      | 3%     | 0.51                  | 0.44 0.59   | 0.66                | 0.55 0.78   |
| South-central                                      | 1755                             | 9%      | 1770                     | 12%    | 0.65                  | 0.60 0.69   | 0.65                | 0.60 0.71   |
| Southwest  | 1133                             | 6%      | 2227                     | 14%    | 0.33                  | 0.31 0.36   | 0.41                | 0.38 0.45   |

Table 3. Sex-stratified Likelihood of PDLWH/A in PA who can Potentially Transmit HIV through Heterosexual Contact vs. All Other Risk Behaviors, 2010

| Variable   | Male                              |                          |                     | Female                            |                          |                     |
|--|-----------------------------------|--------------------------|---------------------|-----------------------------------|--------------------------|---------------------|
|  | Hetero-sexual Contact (incl. IDU) | All Other Risk Behaviors | Adjusted Odds Ratio | Hetero-sexual Contact (incl. IDU) | All Other Risk Behaviors | Adjusted Odds Ratio |
| <b>Current Age (Years) as of December 31, 2010</b> |                                   |                          |                     |                                   |                          |                     |
| 13-29  | 511                               | 5%                       | 1767                | 12%                               | 1.00                     |                     |
| 30-39  | 1339                              | 13%                      | 2290                | 16%                               | 2.34                     | 2.07 2.65           |
| 40-49  | 3549                              | 34%                      | 5256                | 36%                               | 3.08                     | 2.75 3.44           |
| 50-59  | 3678                              | 35%                      | 3759                | 26%                               | 4.66                     | 4.16 5.22           |
| >=60   | 1342                              | 13%                      | 1362                | 9%                                | 4.74                     | 4.16 5.40           |
| <b>Coalition Region</b>                            |                                   |                          |                     |                                   |                          |                     |
| AACO   | 7458                              | 72%                      | 8674                | 60%                               | 1.00                     |                     |
| AIDSNET  | 856                               | 8%                       | 939                 | 7%                                | 1.02                     | 0.92 1.14           |
| North-central                                      | 234                               | 2%                       | 374                 | 3%                                | 0.88                     | 0.74 1.05           |
| Northeast  | 242                               | 2%                       | 346                 | 2%                                | 1.08                     | 0.90 1.29           |
| Northwest  | 170                               | 2%                       | 382                 | 3%                                | 0.72                     | 0.59 0.87           |
| South-central                                      | 878                               | 8%                       | 1597                | 11%                               | 0.74                     | 0.67 0.81           |
| Southwest  | 581                               | 6%                       | 2122                | 15%                               | 0.43                     | 0.39 0.47           |
| <b>Race/Ethnicity</b>                              |                                   |                          |                     |                                   |                          |                     |
| White, Non-Hispanic                                | 2140                              | 21%                      | 7087                | 49%                               | 1.00                     |                     |
| Black, Non-Hispanic                                | 5997                              | 58%                      | 5765                | 40%                               | 3.59                     | 3.37 3.83           |
| Hispanic   | 2194                              | 21%                      | 1371                | 9%                                | 5.48                     | 5.02 5.97           |
| Other race/ethnicity                               | 88                                | 1%                       | 211                 | 1%                                | 1.53                     | 1.18 1.98           |

## Summary: Adjusted Analyses

The proportion of PDLWH/A who can transmit HIV through heterosexual-contact was ~56% (females~46%; racial/ethnic minorities~79%). PDLWH/A who can potentially transmit HIV through heterosexual contact were more likely to be: a) those currently in the age-group 30-39 years(OR=2.12;95%CI:1.91-2.36) and successive older age-groups, compared to the 13-29 years age-group, b) racial/ethnic minorities [black(OR=3.13;95%CI:2.96-3.32), Hispanic (OR=4.55;95%CI:4.19-4.93)] compared to whites; c) females (OR=15.11; 95%CI:14.00-16.32), except white and 'other race/ethnicity' females; and were less likely to be: a) residents of the other six HIV Service Areas, HSA compared to AACO HSA (Philadelphia and surrounding four PA counties).

## Conclusions

Given the high proportion presumed to know their HIV-status(~4/5), the substantial proportion of PDLWH/A constituting the potential reservoir of those who can transmit HIV through heterosexual contact (almost 1/2) suggests a major opportunity for tracking referrals, linkage and retention in care to ensure sustained prevention/care for the subgroups identified as more likely to be in this reservoir. Program planning and resource allocation should consider these findings to assure timely access and linkage to HIV treatment and HIV prevention services for the subgroups identified.

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