HIV Incidence Estimates, Alabama 2010-2014

Background:

HIV Incidence Surveillance is a supplemental National HIV Surveillance System (NHSS) activity funded by the Centers for Disease Control and Prevention (CDC), and conducted in 25 areas across the United States, including Alabama. HIV incidence estimates provide the most representative picture of HIV trends available, identifying at-risk target groups for focused prevention efforts. HIV Incidence Surveillance provides national and local estimates of the number of recent HIV infections in a given period, and is different from the number of newly diagnosed HIV infections reported through case surveillance. Whereas a person newly diagnosed with HIV may have been infected for years before diagnosis, HIV incidence refers to persons recently infected with HIV within the last 5 months. As an HIV Incidence Surveillance site, Alabama is able to provide local incidence estimates to depict the burden of HIV in the state and assess the effectiveness of prevention efforts over time.

The CDC's HIV Incidence Surveillance methodology is based on an approach known as the Serologic Testing Algorithm for Recent HIV Seroconversion (STARHS). STARHS uses a special laboratory test (i.e., BED or AVIDITY assay) to classify newly diagnosed infections as either long-standing (i.e., infected ≥6 months prior to testing) or recent (i.e., infected within the last five months). The STARHS method is conducted on HIV-1 antibody positive blood samples collected within 90 days of diagnosis from newly diagnosed HIV cases age ≥13 years without a Stage 3 (AIDS) infection within 6 months of initial diagnosis. STARHS results indicating recent infection, in combination with case-based surveillance data HIV testing and treatment history (TTH) information, are used to estimate HIV incidence. The CDC extrapolates data collected by the 25 HIV Incidence Surveillance sites to estimate HIV incidence at the national level via a Stratified Extrapolation Approach.

Overview:

The CDC estimates national HIV incidence has remained stable at about 50,000 infections per year since the mid-1990s. Blacks, Latinos, and gay and bisexual men who have sex with men (MSM) continue to be disproportionately affected by HIV in the United States. Similar disparities are seen in Alabama, where Blacks comprise 26% of the state's population (according to United States Census Bureau 2014 population estimates), but account for an estimated 71% of recent HIV infections in 2014 (Table 1). Of all recent estimated HIV infections during 2014, 76% were among gay and bisexual MSM, 19% were attributed to heterosexual contact, and 4% were attributed to injection drug use (IDU). Blacks experienced similar risk factors, with 77% of estimated recent infections occurring among MSM, 21% attributed to heterosexual contact, and 2% attributed to IDU.

Table 1. Annualized HIV Incidence Estimation among Adults and Adolescents ≥ 13 Years, by Year of Infection and Selected Characteristics, Alabama 2010-2014

	2010				2011			
	No.	**%**	**SD**	**(95% CI)†**	**No.**	**%**	**SD**	**(95% CI)†**
Sex								
Male	566	75.3%	119	(330-802)	680	82.6%	131	(423-937)
Female	186	24.7%	53	(82-289)	144	17.5%	42	(61-226)
Age at infection								
13-24	383	50.9%	86	(214-551)	343	41.7%	85	(176-510)
25-34	194	25.8%	57	(83-305)	250	30.4%	69	(114-385)
35-44	101	13.4%	40	(21-180)	118	14.3%	48	(24-211)
45-54	60	8.0%	30	(2-118)	91	11.1%	40	(12-169)
≥55	15	2.0%	17	(0-49)	22	2.7%	19	(0-65)
Race/Ethnicity								
Male								
Black	424	74.9%	101	(224-623)	465	68.4%	103	(263-667)
White	109	19.3%	47	(16-201)	166	24.4%	62	(44-288)
Hispanic	4	0.7%	9	(0-21)	30	4.4%	24	(0-78)
Female								
Black	140	75.3%	46	(48-231)	110	76.4%	37	(36-183)
White	41	22.0%	22	(0-84)	27	18.8%	17	(0-61)
Hispanic	0	0.0%	0	-	0	0.0%	0	-
All								
Black	563	74.9%	109	(348-778)	575	69.9%	110	(359-790)
White	150	19.9%	51	(51-250)	193	23.5%	65	(66-320)
Hispanic	4	0.5%	9	(0-21)	30	3.6%	24	(0-78)
Risk Factor								
Black								
MSM	371	65.9%	94	(185-556)	422	73.4%	98	(229-614)
IDU	20	3.6%	19	(0-56)	17	3.0%	18	(0-53)
MSM/ IDU	16	2.8%	17	(0-49)	11	1.9%	16	(0-42)
Heterosexual	157	27.9%	52	(56-259)	124	21.6%	43	(40-209)
White								
MSM	100	66.7%	45	(12-189)	157	81.3%	61	(37-276)
IDU	9	6.0%	11	(0-31)	12	6.2%	12	(0-37)
MSM/IDU	6	4.0%	10	(0-26)	7	3.6%	12	(0-32)
Heterosexual	35	23.3%	20	(0-74)	17	8.8%	14	(0-45)
Hispanic								
MSM	4	100%	8	(0-20)	21	70.0%	21	(0-62)
IDU	0	0.0%	0	-	3	10.0%	7	(0-17)
MSM/IDU	0	0.0%	0	-	4	13.3%	9	(0-22)
Heterosexual	0	0.0%	0	-	4	13.3%	9	(0-22)
All								
MSM	504	67.0%	113	(280-728)	616	74.8%	126	(368-864)
IDU	29	3.9%	22	(0-73)	34	4.1%	23	(0-80)
MSM/IDU	22	2.9%	20	(0-60)	23	2.8%	23	(0-68)
Heterosexual	197	26.2%	58	(83-312)	151	18.3%	46	(61-241)
Total‡	**752**	**100**	**127**	**(502-1,003)**	**823**	**100**	**138**	**(553-1,094)**

Table 1. Annualized HIV Incidence Estimation among Adults and Adolescents ≥ 13 Years, by Year of Infection and Selected Characteristics, Alabama 2010-2014 *(continued)*

	2012				2013			
	No.	**%**	**SD**	**(95% CI)†**	**No.**	**%**	**SD**	**(95% CI)†**
Sex								
Male	558	81.8%	88	(384-731)	591	78.3%	111	(372-810)
Female	124	18.2%	49	(28-220)	164	21.7%	55	(56-272)
Age at infection								
13-24	309	45.3%	63	(186-433)	345	45.7%	81	(187-503)
25-34	226	33.1%	55	(119-333)	241	31.9%	67	(111-372)
35-44	87	12.8%	32	(24-150)	79	10.5%	39	(4-155)
45-54	52	7.6%	26	(0-103)	56	7.4%	33	(0-122)
≥55	8	1.2%	11	(0-30)	33	4.4%	25	(0-83)
Race/Ethnicity								
Male								
Black	396	71.0%	73	(253-539)	444	75.1%	96	(256-631)
White	121	21.7%	38	(46-196)	122	20.6%	49	(26-218)
Hispanic	5	0.9%	8	(0-20)	3	0.5%	9	(0-21)
Female								
Black	100	80.6%	43	(14-185)	129	78.7%	52	(28-231)
White	21	16.9%	18	(0-56)	30	18.3%	25	(0-78)
Hispanic	4	3.2%	8	(0-19)	3	1.8%	7	(0-16)
All								
Black	470	68.9%	85	(330-662)	573	75.9%	111	(356-790)
White	144	21.1%	43	(58-226)	152	20.1%	55	(44-259)
Hispanic	9	1.3%	11	(0-31)	6	0.8%	11	(0-28)
Risk Factor								
Black								
MSM	378	80.4%	71	(240-517)	398	69.5%	90	(222-574)
IDU	10	2.1%	14	(0-38)	11	1.9%	16	(0-41)
MSM/ IDU	6	1.3%	9	(0-23)	11	1.9%	14	(0-39)
Heterosexual	101	21.5%	42	(19-183)	153	26.7%	57	(40-266)
White								
MSM	108	75.0%	36	(37-180)	101	66.4%	44	(15-186)
IDU	11	7.6%	13	(0-35)	14	9.2%	16	(0-45)
MSM/IDU	6	4.2%	8	(0-23)	9	5.9%	13	(0-34)
Heterosexual	16	11.1%	17	(0-49)	28	18.4%	23	(0-74)
Hispanic								
MSM	3	33.3%	7	(0-16)	2	33.3%	7	(0-16)
IDU	0	0.0%	0	-	0	0.0%	0	-
MSM/IDU	0	0.0%	0	-	2	33.3%	6	(0-14)
Heterosexual	6	66.7%	9	(0-24)	3	50.0%	8	(0-19)
All								
MSM	524	76.8%	85	(358-690)	522	69.1%	103	(321-724)
IDU	21	3.1%	20	(0-60)	25	3.3%	22	(0-69)
MSM/IDU	13	1.9%	12	(0-37)	20	2.6%	20	(0-59)
Heterosexual	124	18.2%	47	(31-217)	188	24.9%	61	(67-308)
Total‡	**682**	**100**	**101**	**(484-880)**	**755**	**100**	**127**	**(505-1,005)**

Table 1. Annualized HIV Incidence Estimation among Adults and Adolescents ≥ 13 Years, by Year of Infection and Selected Characteristics, Alabama 2010-2014 *(continued)*

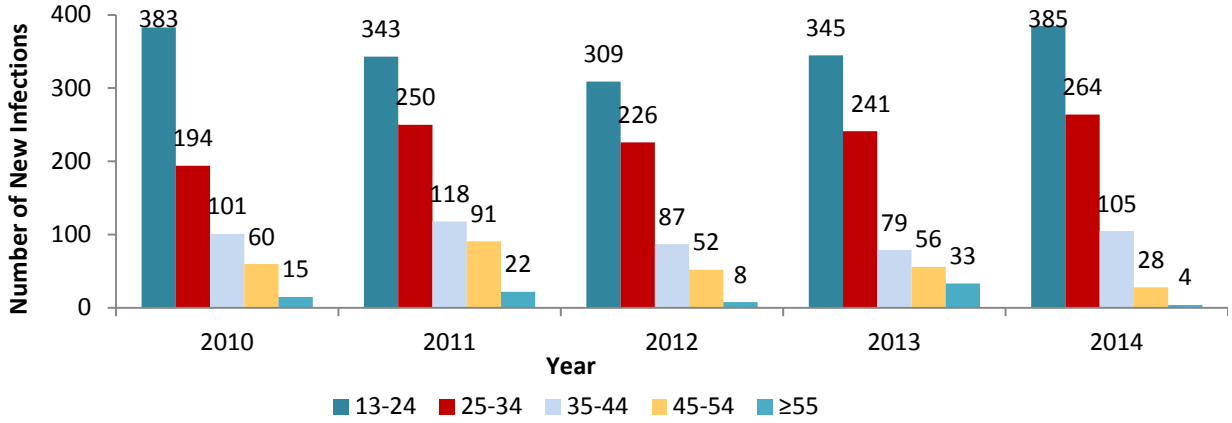
	2014			
	No.	**%**	**SD**	**(95% CI)†**
Sex				
Male	642	81.8%	91	(464-820)
Female	144	18.3%	42	(61-227)
Age at infection				
13-24	385	49.0%	67	(253-517)
25-34	264	33.6%	57	(153-375)
35-44	105	13.4%	35	(37-173)
45-54	28	3.6%	18	(0-62)
≥55	4	0.5%	8	(0-21)
Race/Ethnicity				
Male				
Black	454	70.7%	75	(308-601)
White	176	27.4%	46	(87-266)
Hispanic	1	0.2%	4	(0-8)
Female				
Black	99	68.8%	35	(31-168)
White	33	22.9%	18	(0-69)
Hispanic	1	0.7%	3	(0-7)
All				
Black	554	70.6%	84	(388-719)
White	209	26.6%	50	(111-306)
Hispanic	2	0.3%	5	(0-11)
Risk Factor				
Black				
MSM	425	76.7%	72	(283-566)
IDU	13	2.3%	13	(0-39)
MSM/ IDU	2	0.4%	5	(0-12)
Heterosexual	114	20.6%	38	(39-190)
White				
MSM	158	75.6%	44	(73-243)
IDU	14	6.7%	13	(0-38)
MSM/IDU	12	5.7%	11	(0-34)
Heterosexual	26	12.4%	17	(0-59)
Hispanic				
MSM	1	50.0%	4	(0-8)
IDU	0	0.0%	2	(0-5)
MSM/IDU	0	0.0%	0	-
Heterosexual	1	50.0%	3	(0-6)
All				
MSM	593	75.5%	87	(422-763)
IDU	31	3.9%	19	(0-68)
MSM/IDU	14	1.8%	13	(0-39)
Heterosexual	148	18.9%	43	(64-232)
Total‡	**785**	**100**	**102**	**(585-986)**

Source: Alabama Department of Public Health, STD Prevention and Control, HIV Surveillance Branch.
Note: Data by transmission category have been statistically adjusted to account for missing risk-factor information via the multiple imputation method prior to HIV incidence estimation. CI- Confidence Interval. IDU – Injection Drug User. MSM – Men who have Sex with Men. SD – Standard Deviation. †Confidence intervals reflect random variability affecting model uncertainty but may not reflect model-assumption uncertainty; thus, they should be interpreted with caution. ‡Because column totals for estimated numbers were calculated independently of subpopulation values, they may not sum to the column total and percentages may not sum 100%.

HIV Infections by Age:

In 2014, the estimated number of recent HIV infections was highest among individuals aged 13-24 years (49%, 385 [95% CI: 253-517]), followed by individuals aged 25-34 years (34%, 264 [95% CI: 153-375]), and decreased with age (Table 1). Similar trends were seen in previous years (Figure 1). This downward shift in the age distribution of Alabama's recently infected HIV population indicates a need for increased prevention efforts targeting adolescents and young adults.

Figure 1. Estimated Recent HIV infections by Age Group, Alabama 2010-2014

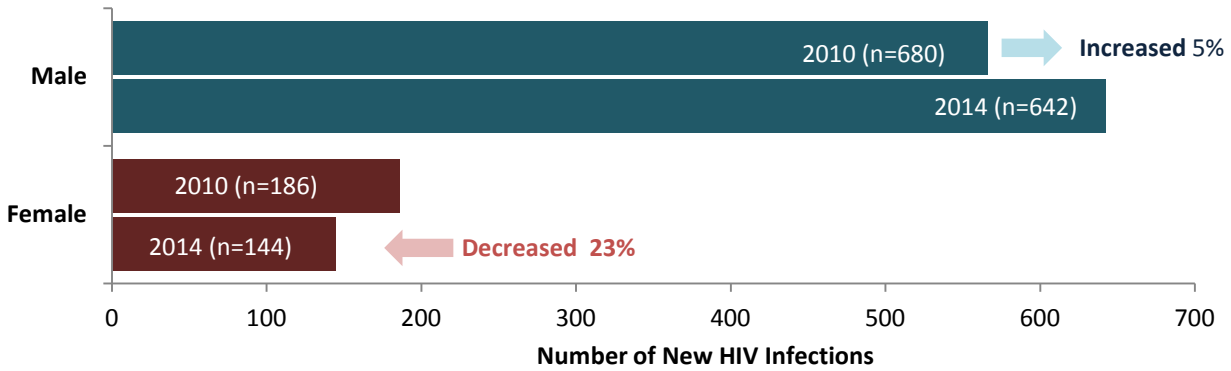


Source: Alabama Department of Public Health, STD Prevention and Control, HIV Surveillance Branch.

HIV Infections by Sex:

Comparing 2010 to 2014, the overall estimated number of recent HIV infections remained stable (Table 1). However, gender comparison shows the estimated number of recent HIV infections increased slightly among men between 2010 and 2014, while the number decreased in women (Figure 2). In 2014, the estimated rate of recent HIV infections among males (27.3 per 100,000 Alabama males) was 4.5 times that of females (5.8 per 100,000 Alabama females).

Figure 2. Estimated Number of Recent HIV Infections by Gender, Alabama 2010 and 2014

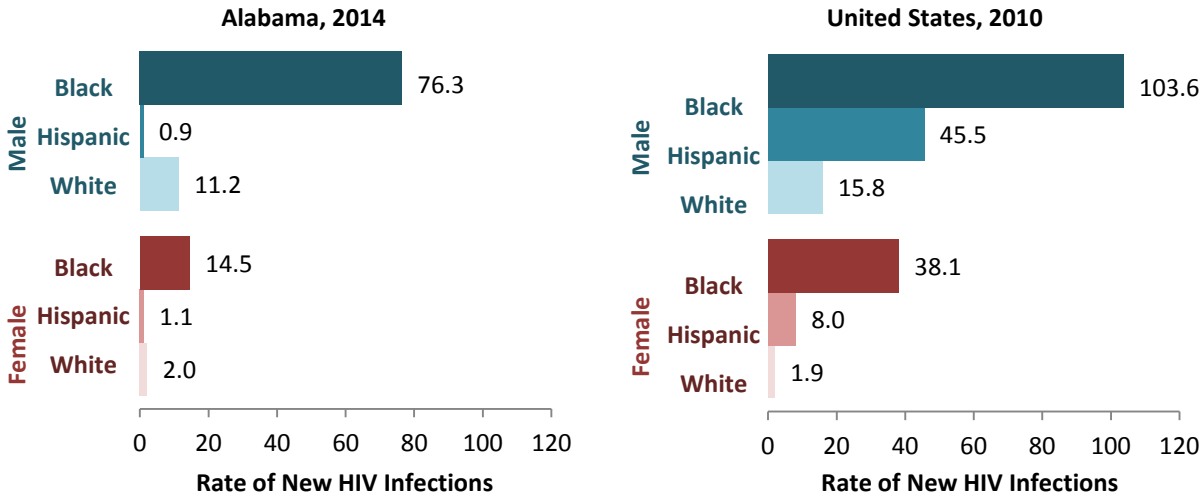


Source: Alabama Department of Public Health, STD Prevention and Control, HIV Surveillance Branch.

HIV Infections by Race and Ethnicity:

Blacks remain disproportionately affected by HIV in Alabama. The estimated rate of recent HIV infections among Blacks (43.2 per 100,000 Blacks) was nearly 7 times (6.6) as high as the rate in Whites (6.5 per 100,000 Whites) in 2014. Racial disparities remained when incidence estimates were stratified by sex, with Alabama rates mirroring national trends (Figure 3). In Alabama, the estimated rate of recent HIV infections in Black males (76.3 per 100,000 Black males) was 6.8 times as high as the rate in White males (11.2 per 100,000 White males) during 2014, compared to estimated rates 6.5 higher throughout the United States during 2010. Racial disparities among females were even more pronounced, with Black females having 7.3 times the estimated risk of HIV infection than White females in Alabama during 2014, compared to 20 times the risk throughout the United States in 2010. Continued HIV testing, treatment, and prevention programs are needed in the Black community.

Figure 3. Estimated Rate of Recent HIV Infections, Alabama 2014 and United States 2010

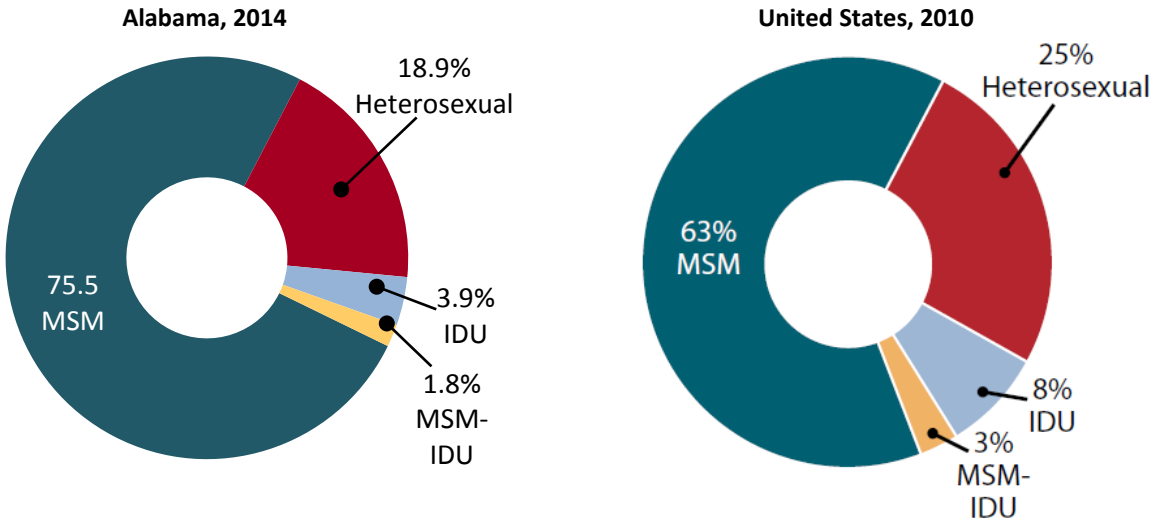


Sources: Alabama Department of Public Health, STD Prevention and Control, HIV Surveillance Branch. Centers for Disease Control and Prevention. Fact Sheet: Estimates of New HIV Infections in the United States, 2007-2010. http://www.cdc.gov/nchhstp/newsroom/docs/2012/HIV-Infections-2007-2010.pdf. Accessed 3/23/2016. Note: Alabama rates per 100,000 population calculated with U.S. Census Bureau 2014 population estimates for sex, race, and ethnicity.

HIV Infections by Route of Transmission:

Gay and bisexual MSM remain the population most heavily affected by HIV infection in Alabama and throughout the United States. In Alabama, MSM accounted for 76% of estimated recent infections during 2014, compared to 63% of estimated recent infections in the United States during 2010 (Figure 4). Comparing 2010 to 2014, the estimated number of recent HIV infections among MSM increased 9% while the number of recent infections among heterosexuals decreased 7% in Alabama (Table 1).

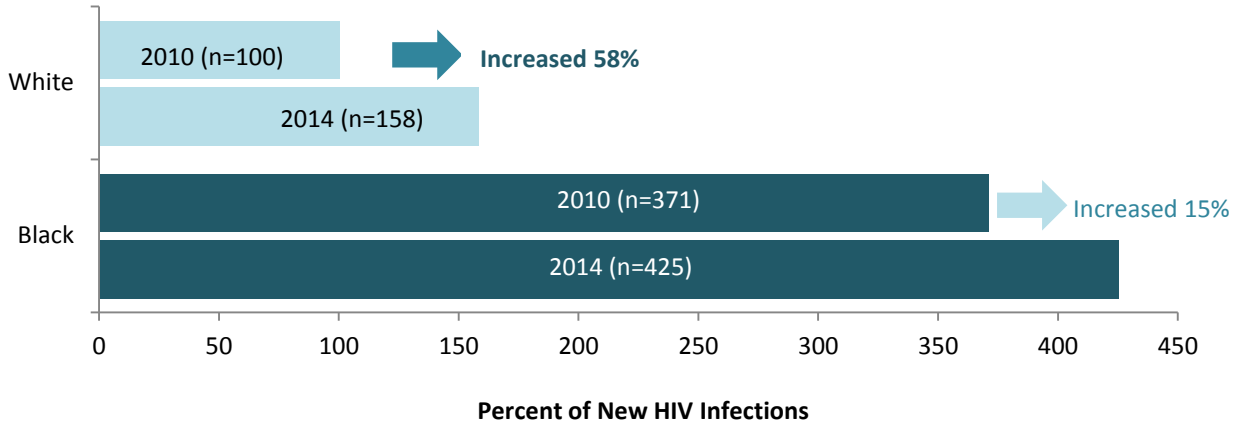
Figure 4. Estimated Recent HIV Infections by Transmission Category, Alabama 2014 and United States 2010



Sources: Alabama Department of Public Health, STD Prevention and Control, HIV Surveillance Branch. Centers for Disease Control and Prevention. Fact Sheet: Estimates of New HIV Infections in the United States, 2007-2010. http://www.cdc.gov/nchhstp/newsroom/docs/2012/HIV-Infections-2007-2010.pdf. Accessed 3/23/2016. Note: Data by transmission category have been statistically adjusted to account for missing risk-factor information via the multiple imputation method prior to HIV incidence estimation.

Stratification by race indicates an increase in the estimated number of recent HIV infections among Black (15%) and a substantial increase (58%) among White gay and bisexual MSM between 2010 and 2014 (Figure 5). HIV testing, treatment, and prevention efforts must reach gay and bisexual men, especially young Black men, to successfully prevent future infections. Since many MSM do not identify as being gay or bisexual, targeting young Black males, regardless of sexual orientation, is advised.

Figure 5. Estimated Number of Recent HIV Infections Among Men who have Sex with Men by Race, Alabama 2010 and 2014



Source: Alabama Department of Public Health, STD Prevention and Control, HIV Surveillance Branch.

Summary:

Alabama's HIV incidence data estimates 785 cases of recent HIV infections (rate 16.2 per 100,000) occurred among adults and adolescents ≥ 13 years during 2014 (Table 2). Between 2010, and 2014, the estimated number and rate of recent HIV infections remained stable, aside from a slight increase in 2011 to 823 (rate of 17.1 per 100,000) and a significant decrease during 2012 to 682 estimated recent infections (rate of 14.2 per 100,000). Further analysis indicates no significant difference exists between 2010, 2011, 2012, 2013, and 2014 annualized HIV incidence estimates and the increase in 2011 as well as the decrease in 2012 was likely due to chance (Table 3).

Table 2. Estimated Incidence of HIV Infection among Adults and Adolescents ≥ 13 Years, Alabama 2010-2014

Year	Estimated No.	(95% CI)†	Population Estimate	Estimated Rate	(95% CI)†
2010	752	(502-1,003)	4,785,570	15.7	(10.5-21.0)
2011	823	(553-1,094)	4,801,627	17.1	(11.5-22.8)
2012	682	(484-880)	4,817,528	14.2	(10.0-18.3)
2013	755	(505-1,005)	4,833,722	15.6	(10.4-20.8)
2014	785	(585-986)	4,849,377	16.2	(12.1-20.3)

Source: Alabama Department of Public Health, STD Prevention and Control, HIV Surveillance Branch. †CI- Confidence Interval. Confidence intervals reflect random variability affecting model uncertainty but may not reflect model-assumption uncertainty; thus, they should be interpreted with caution. Rates per 100,000 population calculated with U.S. Census Bureau 2010, 2011, 2012, 2013 and 2014 population estimates.

Table 3. Comparison of HIV Incidence Estimates among Adults and Adolescents ≥ 13 Years, Alabama 2010-2014

Comparison	Year 1		Year 2		Z-Test Results	
(Year 1 vs Year 2)	Incidence Estimate	SD†	Incidence Estimate	SD†	Z Statistic	P Value
2010 vs. 2011	752	127.2	823	137.6	0.400	0.69
2010 vs. 2012	752	127.2	682	100.8	0.457	0.65
2010 vs. 2013	752	127.2	755	127.3	0.015	0.99
2010 vs. 2014	752	127.2	785	102.3	0.217	0.83
2011 vs. 2012	823	137.6	682	100.8	0.877	0.38
2011 vs. 2013	823	137.6	755	127.3	0.385	0.70
2011 vs. 2014	823	137.6	785	102.3	0.236	0.81
2012 vs. 2013	682	100.8	755	127.3	0.474	0.64
2012 vs. 2014	682	100.8	785	102.3	0.777	0.44
2013 vs. 2014	755	127.3	785	102.3	0.200	0.84

Source: Alabama Department of Public Health, STD Prevention and Control, HIV Surveillance Branch. †SD-Standard Deviation.

An estimated 1 in 6 (16.0%) people living with HIV in Alabama are unaware of their infection and 1 in 5 (20.3%) HIV-positive MSM are unaware of their status. Although counseling and testing data indicates repeat testers (i.e., individuals with one or more previously negative HIV test) report more HIV risk factors than first time testers, the estimated number of recent HIV infections in Alabama has been greater among first time testers in three of the previous four years (Table 4). This finding indicates HIV counseling and testing campaigns should eliminate testing barriers so that more individuals will undergo regular HIV testing and become aware of their HIV status. Only by increasing awareness will the true burden of HIV be known.

Table 4. HIV Incidence Testing History among Adults and Adolescents ≥ 13 Years, Alabama 2010-2014

	2010		2011		2012		2013		2014	
New Testers	375	49.9	425	54.1	260	39.8	465	60.1	263	33.5
Repeat Testers	377	50.1	360	45.9	394	60.2	308	39.9	523	66.6
Total†	**752**	**100**	**785**	**100**	**654**	**100**	**774**	**100**	**785**	**100**

Source: Alabama Department of Public Health, STD Prevention and Control, HIV Surveillance Branch. †Because column totals for estimated numbers were calculated independently of the values for the subpopulations, the values in each column may not sum to the column total.

Alabama's HIV Prevention Campaign: Know. Manage. Live.

While no single strategy exists to effectively control the HIV epidemic, new therapies are available to increase the longevity of HIV positive persons while simultaneously decreasing the likelihood of infecting others. Treatment as Prevention, which refers to using antiretroviral treatment (ART) to decrease the risk of HIV transmission, has emerged as a highly effective HIV prevention method.

Alabama's Know. Manage. Live campaign is an HIV awareness and prevention strategy focused on HIV testing, treatment, and prevention that identifies individuals infected with HIV, links these individuals into care, and ensures retention in care by increasing access to HIV care providers and ART to effectively suppress viral load. Being virally suppressed—which means that HIV is under control at a level that keeps people healthy and reduces the risk of transmitting the virus to others—not only improves a person with HIV's health and enhances their lifespan; it also significantly reduces their risk of transmitting HIV to partners. People living with HIV who adhere to ART and have suppressed viral loads can reduce the risk of sexual transmission of HIV by 96%.

An estimated 1 in 6 (16.0%) people living with HIV in Alabama are unaware of their infection and, thus, are not receiving regular medical care to manage the disease. Estimated prevalence is highest among MSM, with 1 in 5 (20.3%) of HIV-positive MSM unaware of their status. Ongoing and expanded involvement from community leaders representing Blacks, young adults and adolescents, gay and bisexual men, and other at-risk target groups is needed to decrease the spread of HIV and encourage all individuals to learn the facts about HIV, get tested, and take action to protect themselves and their partners. Additional information about Alabama's Know. Manage. Live. Campaign is available at https://adph.org/aids.

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