



# LGBT health and vaccinations: Findings from a community health survey of Lexington-Fayette County, Kentucky, USA



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## ABSTRACT

Data on adult immunization coverage at the state level and for LGBT Americans in particular are sparse. This study reports the results of a 2012 Lexington-Fayette County, Kentucky, community health assessment's results asking about eight adult vaccinations among 218 lesbian, gay, bisexual, and transgendered (LGBT) respondents. Researchers collected data using an online survey distributed through LGBT social media, posters, and LGBT print media. The LGBT sample largely matches the demographics of the county as a whole except this group reports higher level of education and fewer uninsured individuals. Among LGBT respondents, immunization prevalence reaches 68.0% (annual Influenza), 65.7% (Hepatitis B), 58.8% (Chickenpox/Varicella), 55.9% (Hepatitis A), 41.2% (Smallpox), and 25.8% (Pneumonia). Among respondents who are currently within the recommended 19–26 years age range for the Human Papillomavirus (HPV) vaccine, the LGBT females are less likely to report receiving the vaccine (15.4%) compared to the national coverage percentage of 34.5%. Males, however, are more likely to have received the vaccine (10.3%) than the national percentage of 2.3%. The small number of LGBT seniors in the study report a much higher prevalence of the Shingles (Herpes Zoster) vaccines than for U.S. seniors 60 and older (71.4% compared to 20.1% nationally). LGBT respondents report higher percentages of adult vaccination.

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## 1. Introduction

Data on adult immunization coverage in the United States are limited largely to Influenza and Pneumonia vaccinations with national coverage data lacking for several other adult vaccines. Most individual states currently do not have state-level prevalence information for adult vaccinations except for self-reported Behavioral Risk Factor Surveillance Survey (BRFSS) data for Influenza and Pneumonia [1]. It is therefore not surprising that we have limited information specifically on adult immunizations among lesbian, gay male, bisexual, and transgendered (LGBT) Americans. There are, however, recent efforts to increase LGBT health data. The U.S.

government's Healthy People 2020 initiative for example includes a specific objective to expand population-based monitoring systems which can stratify by LGBT individuals [2] as well as objectives to expand Hepatitis B vaccinations among men who have sex with men (MSM) [3]. In an effort to expand health statistics of this underrepresented population, we conducted a community health assessment (CHA) in Fayette County, Kentucky, home to Lexington (population 310,000) and the core of a metropolitan area of almost half a million people bordering rural Appalachia [4]. The intent of this paper is to address the deficiency in the immunization literature by offering one of the first studies of a broad range of adult vaccinations among LGBT Americans. As such, it offers a benchmark for comparable future studies looking at LGBT vaccination in other national and regional contexts.

Historically, relatively little public health research has focused LGBT Americans, especially those from underrepresented regions of the country. LGBT health studies are typically focused on samples drawn from large metropolitan cities with minimal data from

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Southern and Appalachian LGBT populations. Over a 20 year period from 1980 to 1999 for example, only 0.1% of English language articles on human health in the MEDLINE index addressed LGBT populations [5]. A subsequent study covering a 22 year period from 1989 to 2011 also found that only 0.1% of National Institutes of Health (NIH) funded research included LGBT populations [6]. Among these, comprehensive CHAs of local communities such as the Fayette County study are apparently non-existent [5]. For example, while a number of recent studies using existing secondary data examine the health of Americans by different sexual orientations, we have been unable to identify a single LGBT-focused CHA specific to a particular city or county [7,8]. Indeed, very little information exists about the preventative health practices, including vaccinations, of LGBT populations outside of major urban regions.

### 1.1. Existing adult immunization data for the general population

Coverage data for adult immunizations are limited for all adults. While the U.S. Centers for Disease Control and Prevention (CDC) reports national coverage data for Influenza, Hepatitis A, Hepatitis B, Pneumonia, Shingles, and the Human Papillomavirus (HPV), the CDC does not report national coverage for Chickenpox (Varicella) or Smallpox [9] (see Table 4). The CDC also currently does not report state-level data because not all states have operational Immunization Information Systems (IIS) and/or adult immunization registries [9]. The Kentucky Immunization Registry for example, was scheduled to launch in November 2015 and was not operational when this study was conducted [10].

The existing Kentucky adult immunization coverage data comes from the 2012 Kentucky BRFSS and provides data only on self-reported Influenza and Pneumonia vaccinations. For 2012 the BRFSS data show the prevalence of Kentuckians aged 65 years and older who have been immunized for Influenza (KY 61.8% vs. US 60.1%, annually) and Pneumonia (KY 65.6% vs. US 68.8%, lifetime) closely mirrors national immunization rates among seniors. Within the state's senior population, there are no statistically significant differences in Influenza immunization in terms of sex, race, education, or annual income, although Kentucky's Black seniors are significantly less likely to be immunized against Pneumonia (49.9% of Black seniors compared to 66.9% of White seniors) [11].

The Kentucky BRFSS does not report county-level data but does provide data at the multi-county Area Development District (ADD) level. Lexington-Fayette County is part of the Bluegrass ADD. In 2012 the BRFSS reports a prevalence estimate of 62.8% among Bluegrass ADD seniors for the Influenza inoculation in the past twelve months and 63.2% for lifetime Pneumonia vaccine coverage [11]. In 2010 the University of Kentucky and Kentucky Department for Public Health analyzed county-level data and calculated 42% of Fayette County adults (19 and older) had received the Influenza vaccine in the past year compared to 39% among all Kentuckians [12]. Prevalence estimates for the general Kentucky or Fayette County population for other adult immunizations do not currently exist. Therefore, this study's county-level data on adult LGBT vaccinations are unique.

### 1.2. Existing adult immunization data for the lgbt population

Adult vaccination data and LGBT health data in general are rare, and the existing published LGBT vaccine studies largely focus on immunizations against sexually transmitted diseases such as HPV and Hepatitis A and B [7,13–17]. While one study does examine a broader range of adult vaccinations for MSM in prison, there are problems in generalizing this study to the majority of gay and bisexual men [18].

Population-based survey data have historically not asked for respondents' sexual orientation [19]. More recently, however, the

CDC has added sexual orientation questions to the 2013 National Health Interview Survey (NHIS) [8]. Among the 1.6% of respondents identifying as gay or lesbian in these face-to-face health interviews, 45.8% aged 18 and older report having received the Influenza vaccine in the past year. Among the 0.7% identifying as bisexual, 34.7% aged 18 and older report having received the Influenza vaccine in the past year [8].

Prior to 2011, 25 states and the District of Columbia included at least one item asking about sexual orientation identity or same-sex sexual behaviors on their states' version of the BRFSS [20]. Kentucky, however, first added a sexual orientation question to its BRFSS questionnaire in 2014. At the time of this article, these data are not publicly available [21].

Therefore, while the individual states seek to establish state immunization registries, state-level vaccine coverage data for adults currently are limited. For individual counties within states such data are rare. While the BRFSS data do compare Influenza and Pneumonia vaccination coverage by sex and race, most states have yet to collect or publish immunization data by sexual orientation. With its focus on a broad number of adult immunizations, this study's county-level data on understudied LGBT residents contributes to filling a large gap in immunization research.

## 2. Methods

This study was approved by the Fayette County Health Department's Internal Review Board (IRB) and funded by the Kentucky Office of Health Equity and the Kentucky HIV/AIDS Program. Study design included (a) a series of eight focus groups and (b) a cross-sectional survey of a convenience sample of local LGBT individuals conducted in 2012–2013. Researchers gathered data via eight confidential exploratory focus groups targeting different local LGBT communities living in the Lexington area. These focus groups were then used to design an anonymous web-based survey with an offline paper survey also available to respondents.

### 2.1. Focus groups

This study began with eight exploratory focus groups seeking input from various LGBT communities in Fayette County such as youth (ages 18–26), African-Americans, Hispanics, lesbian women, and gay men. Participants were recruited through social media advertisements such as Facebook. Focus group participants completed a short paper survey collecting their demographics and information on insurance coverage. An average of eight people participated in each focus group.

#### 2.1.1. Online survey recruitment

The feedback provided by the focus groups helped in the development of the online CHA survey. Researchers distributed the URL for the online survey through general and LGBT-specific social media such as Facebook and LambdaNet (a local LGBT listserv). Posters were distributed in Lexington gay bars, and 15 paper surveys were collected from individuals who wished to participate offline. Participants received no compensation for their voluntary participation. Participants were not pre-screened for selection criteria.

#### 2.1.2. Measures

The resulting analytic sample of 218 individuals responding to the immunization questions was analyzed using univariate statistics and chi-square tests. Data were analyzed using IBM SPSS 22.

**3. Results**

This survey reports on the health needs of LGBT residents of Lexington-Fayette County, Kentucky. Sexual identity, however, is challenging to define. For this study we selected respondents as belonging to our LGBT sample if they self-reported:

- Being transgendered (The transgendered category consists of the options to mark either female to male (F2M) or male to female (M2F).)
- Defined themselves as homosexual/gay/lesbian or bisexual.
- Defined themselves as a *heterosexual* and self-reported sexual behaviors with a member of the same sex.

After filtering out 46 exclusively heterosexual female respondents, the resulting LGBT sample consisted of 306 respondents (224 online survey participants, 15 paper survey participants, and 67 focus group participants.) Of the 239 individuals who completed the survey online or via a paper copy, 218 answered the eight immunization questions.

Four out of five respondents self-identify as *homosexual, gay, or lesbian* with another 14.5% identifying as bisexual. In terms of self-reported sexual partners, the female respondents are more likely to list both female and male sexual partners (see [Tables 2 and 3](#)).

While the LGBT sample consists of a convenience sample and therefore cannot be said to be statistically representative of every LGBT person living in Fayette County, the demographics of the sample closely mirror the county's total 2012 demographics with a few key differences. Primarily, the sample respondents report considerably higher education than the general population. The sample is also slightly more racially diverse, and the sample's mean age is 4 years older than for Fayette County residents as a whole. The U.S. Census Bureau does not collect gender data inclusive of transgendered categories, so we cannot compare the handful of transgendered respondents' demographics to the total Fayette County population of transgendered. Overall, analysis of the study sample's demographic composition points to close similarities to the total county population (see [Table 4](#)).

The analytic sample consists of 218 individuals who responded to eight questions asking about adult immunizations. Ranging from 5.0% of respondents on the Influenza vaccine question to 22.0% on the Hepatitis A vaccine question, a sizeable number of respondents report not knowing whether they have received a vaccine.

Respondents are most likely to report having received an Influenza vaccine. Almost two-thirds (68.0%) of respondents

**Table 1**  
Sexual orientation.

Sexual orientation	Percentage n = 281
Homosexual, gay, or lesbian	80.8 (227)
Bisexual	14.6 (41)
Heterosexual or straight	2.1 (6)
Refuse to identify	2.5 (7)

**Table 2**  
Sexual partners.

Sexual partners	Males	Females	Male-to-female transgendered	Female-to-male transgendered
All men	68.4% (93)	0.8% (1)	44.0% (4)	25.0% (1)
Mostly men	21.3% (29)	8.5% (11)	11.0% (1)	0.0% (0)
Both men & women	8.1% (11)	33.1% (43)	33.0% (3)	25.0% (1)
Mostly women	2.2% (3)	38.5% (50)	0.0% (0)	25.0% (1)
All women	0.0% (0)	19.2% (25)	11.0% (1)	25.0% (1)

**Table 3**  
Demographics.

Demographics	Fayette County (2012 data unless otherwise noted)	LGBT respondents (2012)
<b>Sex n = 281</b>		
Females	51.0%	49.3% (132)
Males	48.0%	50.7% (136)
Male-to-female transgendered	–	3.2% (9)
Female-to-male transgendered	–	1.4% (4)
<b>Race n = 281</b>		
White	79.0%	77.4% (216)
Black	15.0%	13.6% (38)
Multi-racial	2.0%	4.3% (12)
Native American	0.4%	1.8% (5)
Other	0%	1.4% (4)
Asian American	3.0%	0.7% (2)
<b>Ethnicity n = 281</b>		
Latino	7.0%	4.7% (13)
<b>Education n = 281</b>		
Percentage 25 years and older with a high school diploma	89.0%	97.2% (270)
Percentage 25 years and older with a Bachelor's degree or higher	31.0%	60.1% (167)
<b>Uninsured (Ages 18–64) n = 281</b>		
	23%	11.1% (31)
<b>Median household income</b>	<b>Dollars (2010), Median</b>	<b>Dollars (2012), Median n = 281</b>
	\$48,306	\$40,001–\$50,000
<b>Mean age</b>	<b>Years</b>	<b>Years n = 281</b>
	34 years	39 years (272)
<b>Relationship status</b>	<b>% of Households</b>	<b>% of Respondents n = 281</b>
Single	–	37.4% (105)
Dating someone	–	14.6% (41)
Living with partner	–	32.7% (92)
Same-sex domestic partners	<1.0%	8.5% (24)
Same-sex married	–	2.5% (7)
Opposite-sex married	44.2%	4.3% (12)
Opposite-sex domestic Partners	<1.0%	–

Note: Due to rounding not all percentages for sex and race may add up to 100%.

[n = 206] say they have received at least one annual inoculation against Influenza. Most respondents aged 19 and older have also been vaccinated for Hepatitis B (65.7%) [n = 178], Chickenpox (Varicella) (58.8%) [n = 187], and Hepatitis A (55.9%) [n = 170]. Vaccination for Smallpox is slightly less common (41.2%) [n = 177] as is the Pneumonia vaccine (25.8%) [n = 198]. Among respondents of all ages [n = 184], 10.9% have received the Shingles (Herpes Zoster) vaccine. While the number of respondents in the 60 and older age group recommended for the Shingles vaccine is small [n = 13], 71.4% report having received the vaccine. Among respondents in the 19–26 age range recommended for the HPV vaccine, 15.4% of females and 10.3% of males report having received the vaccine (see [Table 1](#)).

**3.1. Differences among sub-populations**

The prevalence of adult immunizations also shows some statistically significant differences between respondent sub-groups. Men are more likely to have received the Hepatitis A vaccine

**Table 4**  
Vaccinations.

Vaccinated for: (reporting for age group in brackets)	Fayette County LGBT respondents 2012, % (n)	Bluegrass ADD 2012 <sup>a</sup>	Kentucky 2012 <sup>a</sup>	National coverage 2012 <sup>b</sup>	Lifetime CDC adult recommen- dations
Influenza (19 and older)	68.0% (206)	c	c	41.5% <sup>d</sup>	One dose annually, 19 years and above
Influenza (65 and older)	60.0% (6)	62.8%	61.8%	66.2% <sup>d</sup>	One dose annually, 19 years and above
Hepatitis B (19 and older)	65.7% (178)	c	c	35.3%	Three doses, 19 years and above for anyone not in a long-term monogamous relationship and also specifically for men who have sex with men
Chickenpox (Varicella) (19 and older)	58.8% (187)	c	c	c	Two doses, 19 years and above
Hepatitis A (19 and older)	55.9% (170)	c	c	12.2%	Two doses, 19 years and above for men who have sex with men
Smallpox (19 and older)	41.2% (177)	c	c	c	No longer recommended, considered eradicated
Pneumonia (19 and older)	25.8% <sup>e</sup> (198)			20.0% <sup>e</sup>	One or two doses, 65 years or older
Pneumonia (65 and older)	60.0% (6)	63.2%	65.6%	59.9%	One or two doses, 65 years or older
HPV (Human Papillomavirus) (19–26 years of age)	15.4% <sup>f</sup> (91) 10.3% <sup>g</sup> (78)	c	c	34.5% <sup>f</sup> 2.3% <sup>g</sup>	Three-dose series, all females 19–26 years, males 19–26 years (recommended for men who have sex with men)
Shingles (Herpes Zoster) (60 and older)	71.4% <sup>h</sup> (13)	c	c	20.1% <sup>h</sup>	One dose, 60 years or older

Note: The CDC recommendations detail various situations such as being HIV-positive or adopting a child from another country which contravene or recommend vaccinations not covered by this table. Refer to CDC Immunization Schedules for more detailed information.

<sup>a</sup> Kentucky Behavioral Risk Factor Survey 2012 Annual Report, (<http://chfs.ky.gov/NR/rdonlyres/B83944D8-A64F-4C6E-B9AC-303C89313FE5/0/>).

<sup>b</sup> Source: William et al. [9], Noninfluenza Vaccination Coverage Among Adults—United States, 2012, Morbidity and Mortality Weekly Report (MMWR), February 7, 2014/63(05);95–102.

<sup>c</sup> Adult coverage data not available.

<sup>d</sup> Source: Santibanez et al., Flu Vaccination Coverage, United States, 2012–13 Influenza Season, U.S. Centers for Disease Control and Prevention, (<http://www.cdc.gov/flu/fluview/coverage-1213estimates.htm>).

<sup>e</sup> Among all adults 18 and older (LGBT respondents) and among high risk adults 19 and older (CDC).

<sup>f</sup> Females, 19–26 years of age, 1 dose or more.

<sup>g</sup> Males, 19–26 years of age, 1 dose or more.

<sup>h</sup> Among adults 60 years and older.

than women  $X^2(1, n=164)=6.462, p=.011$ . In terms of differences between White and Black respondents, White respondents are more likely than Black respondents to report receiving an annual Influenza vaccine  $X^2(1, n=191)=11.506, p=.001$ . Uninsured respondents are also less likely than insured ones to have had an Influenza shot  $X^2(1, n=205)=9.853, p=.002$  but not for the other seven vaccines. Similarly, respondents with a Bachelor's degree or higher are more likely to report having had the Influenza vaccine  $X^2(1, n=204)=13.439, p=.000$ , and the Pneumonia vaccine  $X^2(1, n=196)=5.435, p=.020$ . Respondents who report they are HIV+ are likewise more likely to have had the Hepatitis A vaccine  $X^2(1, n=135)=7.740, p=.005$  and the Pneumonia vaccine  $X^2(1, n=156)=25.536, p=.000$ . While chi-square tests for the Hepatitis B ( $p=.096$ ) and the Influenza vaccine ( $p=.058$ ) approach significance with HIV+ individuals more likely to report receiving these other two vaccines, the difference for both vaccines do not reach statistical significance.

We also performed independent-samples *t*-tests to examine whether there are statistically significant differences by age for the eight vaccines. Indeed, the mean ages of respondents is significantly older among those reporting they have had the Influenza, Pneumonia, Shingles, and Smallpox vaccines. On the other hand, the mean ages of respondents reporting they have been vaccinated for HPV, Hepatitis A, and Hepatitis B is younger.

There were no statistically significant differences for adult immunizations by: (a) self-identified sexual orientations, (b)

self-disclosure of one's sexual orientation to one's medical provider, or (c) military veteran status.

#### 4. Discussion

Public health research addressing LGBT individuals is especially rare for populations in the South and/or outside major metropolitan cities. Even among the U.S. population as a whole, data on adult vaccination coverage are sparse. These data from central Kentucky therefore provide a unique look at adult immunizations among LGBT Americans and point to several key findings:

##### 4.1. Comparisons to national, state, and local coverage data

Of the eight vaccines studied, national coverage data exists for six of them. Of these six, the Fayette County LGBT respondents of all sexes report considerably higher immunization levels for five vaccines (Hepatitis A, Hepatitis B, Influenza (19 and older), Pneumonia (19 and older) and Shingles/Zoster) compared to national U.S. coverage data. Males in our study also are more likely to be inoculated against HPV compared to their national peers in the same 19–26 age range. The LGBT women in the 19–26 age range, however, have lower HPV immunization rates than their national peers. The small number of LGBT seniors in this study makes generalizations problematic, but immunizations appear to be on par with national, state, and county-level data for annual Influenza and

lifetime Pneumonia inoculations. Shingles vaccinations, however, are far higher (71.4% vs. 20.1%) for the LGBT seniors (see Table 1). The Fayette County LGBT residents closely resemble the overall demographics of the county but stand out as having considerably higher education attainment. LGBT residents, however, do not earn more than their lesser-educated peers but are less likely to be uninsured. In terms of sexual attraction, the women in the Fayette County LGBT sample are more likely to list both female and male partners. This pattern corresponds to similar national findings from the 2011 to 2013 National Survey of Family Growth where females are more likely to have both male and female partners [22].

History, age, and CDC recommendations likely play a role in some of these prevalence findings. Routine smallpox inoculations ceased in the US in 1972 with immunizations stopping in the mid-1960s in some states [23]. At least 53% of respondents were born after 1972 and therefore were born after smallpox vaccinations ended in the U.S. Similarly, 45% of the female respondents and 59% of the male respondents were too old for the recommended vaccination ages when the first HPV vaccine, Gardasil®, was approved by the Food and Drug Administration (FDA) in 2006 (females) and 2009 (males) [24]. Conversely, only 7% of respondents have reached the recommended ages for the Shingles and Pneumonia vaccines. CDC recommendations for adult immunizations such as Hepatitis A and B for MSM may also help explain the considerably higher percentage of LGBT respondents who have had the Hepatitis A and B vaccines compared to the national prevalence (see Table 1).

This group of LGBT Americans reports a higher prevalence of immunization for five (six for males) adult vaccines compared to 2012 national data. Currently, county-level data for most adult vaccinations is not available for comparison. Future availability of Kentucky BRFSS data for senior immunizations (Influenza and Pneumonia) by sexual orientation may provide quality, population-based survey data for these two vaccines. Until national and/or state adult immunization registries become fully functional, however, this study serves as the only current data on (a) a broad range of LGBT Americans' adult immunizations and (b) prevalence data for adult immunizations for a specific local population in a Southern U.S. state. This small study aims at expanding adult immunization data for LGBT Americans but draws on a specific urban area in the Upper South. Expanding population-level surveillance that includes sexual orientation such as Kentucky's BRFSS will advance our immunization knowledge, but including vaccines beyond Influenza and Pneumonia is needed. Comparative research examining immunization coverage of LGBT populations in other parts of the United States is also needed to contextualize whether this study's findings of higher vaccination prevalence among LGBT populations are consistent nationally or a reflection of this particular Kentucky sample.

#### 4.2. Limitations

This study relies upon a non-random sampling technique (a convenience sample) which may not be representative of the entire adult LGBT population in Fayette County, and did not include individuals less than 18 years of age. Participants were also not pre-screened to see if they met inclusion criteria. Employing self-reported sexual identity and gender of sex partners may have excluded possible LGBT individuals. The sample also includes very few transgendered respondents and therefore has a limited ability to stratify for transgendered respondents. The number of Latino participants was too small to analyze for differences between Latinos and non-Latinos. Similarly, race groups other than White

and Black were too small to analyze for differences. The survey instrument also asked questions regarding vaccinations which are currently promoted for people of certain ages (HPV) or are no longer routinely given (Smallpox) which limits these questions applicability to all respondents. The question on Influenza vaccination is also worded differently than on the BRFSS which makes comparison of vaccination levels problematic. The survey also did not ask about other adult immunizations for Meningitis, Tetanus, Mumps, and Measles. These limitations may have affected participants' responses.

#### Conflict of interest

All authors report no conflicts of interest.

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