Chapter 4
Addressing Behavioral Cancer Risks from a LGBT Health Equity Perspective

Karen I. Fredriksen-Goldsen, Charles P. Hoy-Ellis and Maria Brown

Abstract Accounting for individual, community, and societal factors, as well as historical context and life-course events, we utilize a Health Equity model to consider behavioral risks and identify social determinants that may influence cancer risks in LGBT populations. Based on data from available research, we provide estimates of the prevalence of behavioral risks in LGBT communities, including excessive drinking and substance abuse, obesity, poor nutrition and diet, and physical inactivity. Both upstream and downstream factors that may elevate such behavioral risks for cancer among LGBT populations, including those unique to particular subgroups, are discussed. Examples of innovative programs and interventions designed for LGBT communities to target cancer-related behavioral risks are briefly described. We conclude with research, practice, and policy recommendations that are needed to promote health equity and reduce the disparate cancer burden in LGBT communities.

Introduction

In *Healthy People 2020* lesbian, gay, bisexual, and transgender (LGBT) people are for the first time identified as U.S. national health priorities [1]. The Centers for Disease Control and Prevention [2] conclude that sexual orientation is a primary gap in health disparities research, which result from social, economic, and environmental disadvantage. Current research indicates that LGBT people experience higher rates of disability [3], physical limitations [3–6], poor general health [3–5], and psychological distress [3–5].

The American Cancer Society [7] recognizes cancer as a significant health issue in the LGBT community. It is estimated that there are more than a million LGBT people living with cancer in the United States [8]. Cancer risks occur at many lev-

K. I. Fredriksen-Goldsen (✉) · C. P. Hoy-Ellis
School of Social Work, University of Washington, Seattle, Washington, USA
e-mail: fredrikk@u.washington.edu

M. Brown
Syracuse University, NY, USA

U. Boehmer, R. Elk (eds.), *Cancer and the LGBT Community,*
DOI 10.1007/978-3-319-15057-4_4

els, from cells to society—from biological and genetic, to behavioral to environmental risks. As a result of a distinct cluster of risk factors (such as higher rates of smoking, excessive alcohol use, and obesity), emerging evidence suggests there is an elevated cancer burden in the LGBT community [8–15].

Although research suggests elevated levels of cancer risks in this population, to date there is a lack of concrete data regarding the incidence and prevalence of cancer in LGBT communities [14]. Because sexual orientation and gender identity data are not included in national cancer registries, our understanding of cancer in these communities remains limited. In recent years only a few state-level population-based health surveys have included sexual orientation questions, providing preliminary data to estimate the cancer risk in lesbian, gay, and bisexual populations, although not in transgender populations. Yet, cancer prevalence and risks vary considerably between states and regions [16], requiring broader, more comprehensive data collection to better understand the cancer risks faced by LGBT populations across the country.

Social contextual factors, such as social networks, cultural norms, discrimination, and victimization are shaped by socio-demographic characteristics, such as race/ethnicity and sexual orientation [17] and strongly influence behavior [18]. *Behavioral risk factors* are personal behaviors that impact health outcomes, such as diet, physical activity, and tobacco and alcohol use, to name just a few [19]. Such behavioral risk factors, including over-eating, excessive drinking, substance use, poor diet and nutrition, and physical inactivity, are critical to identify and fully consider, since they are potentially modifiable and may be amenable to change. Furthermore, behavioral risk factors can increase the risk of multiple types of cancer [20], and can operate synergistically with other risk factors, dramatically increasing the overall risk of cancer [7, 8].

This chapter will examine available evidence on the prevalence and potential causes of cancer-related behavioral risk factors in LGBT populations, including excessive drinking and substance use, physical inactivity and obesity, and diet and poor nutrition. When available, we will also examine prevalence rates for subgroups in these populations and the influence of demographic characteristics. Based on a Health Equity model, we will discuss potential factors associated with these behavioral risks, and highlight innovative programs and interventions that have been developed to reduce these risks. Lastly, we will identify the unique challenges that exist in addressing behavioral cancer risks in LGBT communities and implications for future practice, policy and research.

Social, Contextual, and Behavioral Risks

It is important to recognize that there are numerous types and subtypes of cancer, and that some risk factors are common to multiple types of cancers while others are more specific to a particular type. Equally important is that some risk factors are synergistic. For example, obesity or being overweight, inadequate nutrition, and lack of physical activity are related and together account for approximately a third of U.S. cancer

mortality [21]. Such behavioral risks for cancer, along with excessive drinking and substance use, have been found to be elevated among various subgroups in LGBT populations [14]. Smoking as a primary behavioral risk for cancer will be discussed in-depth in a subsequent chapter so is not addressed here. The health-wealth gradient (i.e., lower income, education, and social status being associated with worse health) is also found in cancer risk [17], and the larger social context has both direct and indirect effects. For example, experiences of discrimination have been implicated in poor general health among older LGBT adults [22, 23], while the stress associated with concealment of minority identity may affect psychoneuroimmunological functioning [24]. For example, the functionality of immune-system cells may foster metastasis of breast cancer to other organs and body-systems [25]. At the same time, individuals may use alcohol as a way to cope with stress [26].

It is also important to recognize that some health risks may have their origins much earlier in life. For example, sexual minority women and men report significantly higher rates of physical [27, 28], sexual [27, 28], and psychological abuse [27] in childhood. Sexual minorities also report higher rates of victimization in adulthood than heterosexuals [27, 28], and these higher rates of victimization are associated with excessive alcohol use [28] and other drug abuse [29]. In the general population, childhood victimization is also associated with adult obesity, physical inactivity, victimization, and multiple serious illnesses, among several other poor health outcomes [30–32]. Transgender adults also report significant rates of childhood victimization [33]. Recent research suggests that adverse childhood events such as these may also have a link to cancer in adulthood through alterations of biological systems [34]. Two such examples are the dysregulation of the hypothalamic-pituitary-adrenal (HPA) axis and subsequent allostatic load, and epigenetics, the process whereby environmental factors, including stress, induce methylation to literally switch genes on or off to result in disease [34–36]. Such an epigenetic "switch" has recently been identified in relation to breast cancer and the ATF3 gene [25].

Health Equity Model

Most LGBT health research has focused on health disparities [37–39], with limited attention to the full continuum of health outcomes in these communities. In this chapter we utilize the *Health Equity model*, which addresses the full health potential of LGBT people [40]. Health disparities are differences in population-level disease incidence and prevalence resulting from marginalization and economic, environmental, or social disadvantage [38]. A health equity approach aims to not only reduce disparities, but to fully maximize efforts embedded within social contexts so that all people can attain their health potential [40, 41]. The behavioral risks and resources that influence LGBT health must be examined in order to develop services and interventions that promote health equity and improve health and well-being in these communities.

From this perspective, LGBT health can best be understood in the context of a multidimensional framework, highlighting how (a) social positions and (b) struc-

tural and environmental context intersect with (c) adverse and health-promoting pathways to influence the full range of health outcomes in LGBT communities [40]. The pathways influencing health as identified in this perspective include behavioral, social, psychological, and biological mechanisms [40]. This model expands upon earlier conceptualizations by taking into account the historical and cultural contexts over the life course, including generational and cohort effects, as well as the intersectionality of broader social positions and health-promoting and adverse mechanisms, including health behaviors. Utilizing the Health Equity model is important in order to understand the complexity and range of the risks and resources and health indicators that influence LGBT health across the life course.

Excessive Drinking

Excessive use of alcohol increases the risk for several types of cancer, including oral, esophageal, breast, liver, and colorectal [42]. Alcohol is broken down through metabolic processes into other compounds which are toxic (e.g., acetaldehyde), and oxygen reactive, both of which can damage DNA; it can also increase the risk for cancer through interfering with the body's ability to absorb many important vitamins and nutrients, as well as increasing serum estrogen, which has been linked to breast cancer [42].

Several studies provide evidence that LGBT populations drink alcohol excessively and/or have higher rates of drug use than do heterosexuals [5, 6, 29, 43]. Data from the 2000 National Alcohol Survey (NAS) indicates that 12% of lesbians and 17% of bisexual women met *DSM-IV* criteria for alcohol dependence (past-year), compared to 2% of heterosexual women and 4% of women who identified as heterosexual but also reported same-sex behavior in the previous 5 years [44]. This same study found that 10% of gay men and 6% of bisexual men met the criteria, compared to 6% of heterosexual men and 11% of men who identified as heterosexual but also reported same-sex behavior in the previous five years; the differences among women were significant, while those among men were not [44].

Data from the Washington State Behavioral Risk Factor Surveillance System (BRFSS) indicates that older lesbian and bisexual women (8%) are significantly more likely to drink excessively than heterosexual women (5%), as are older gay and bisexual men (17%), compared to 11% of older heterosexual men [4]. Conversely, California Health Interview Survey (CHIS) data indicates that on average among adults of all ages, heterosexual men drink more than gay and bisexual men [45]. It may be that these conflicting findings reflect differences in the ages of the respective samples, or other regional sociodemographic differences (e.g., race/ethnicity). Population-based data from New Mexico indicates that bisexual and heterosexual men binge-drink at similar rates (20%), although the rate among bisexual women (24%) is significantly higher than heterosexual women (8%) [46]. Nearly half (46%) of lesbian, gay, and bisexual high school youth in Massachusetts report binge-drinking in the past month, compared to 33% of their heterosexual peers

[47]. Significantly higher rates of excessive drinking and other substance use by lesbian, gay, and bisexual youth has been found across several population-based studies [47].

In addition to important differences by sexual orientation and gender, it also appears there may be important differences by sexual orientation and age. For example, evidence suggests that bisexual women may be at greater risk than either lesbian or heterosexual women [48]. Similarly, in contrast to comparably aged heterosexual women, lesbian and bisexual women younger than aged 50 may be more likely to drink excessively [9, 49], while lesbians aged 50 and older appear more likely to drink excessively than bisexual women of the same age [4]. Because research on older sexual minorities as a distinct population is still rare, these findings are preliminary. There are several studies that include young, middle-aged, and older adults, but very few make comparisons between cohorts. On the other hand, there has been significantly more research on younger sexual minorities, which suggests that results for this age group may be more robust. The evidence indicates that alcohol and drug use are more prevalent among lesbian, gay, and bisexual youth than among their heterosexual peers. Lesbian, gay, and bisexual youth are more likely than their heterosexual peers to use alcohol and cocaine before the age of 13 [47]. Substance use before age 18 is strongly associated with increased risk of abuse and dependency in adulthood [50].

Discrimination, internalized stigma, and expectations of rejection have been associated with increased alcohol use among sexual minority and transgender individuals [51, 52]. There is some evidence that internalized heterosexism may also be associated with alcohol use and alcohol-related problems among lesbians [53], and more experiences of rejection subsequent to disclosure of sexual orientation among sexual minority youth [54]. One in four transgender participants in a large community-based survey report abusing alcohol, after experiencing discrimination in the workplace [55]. Childhood maltreatment is among the stressors associated with earlier onset and greater prevalence of alcohol use among adults [51], which is one of the significant risk factors for multiple types of cancer. Risk of excessive drinking may also result from the significance of bars as both an important historical and contemporary social venue in LGBT communities [56]. This is further exacerbated by targeted marketing practices; "…alcohol and tobacco advertising works on LGBT audiences because gay-targeted ads make them feel desired, understood, safer, and more comfortable doing business with brands that recognized them for who they were" (Double Platinum, n.d., as cited in [57]).

Other Drugs

Unlike excessive drinking, substance abuse includes a wide variety of other drugs that are composed of numerous chemical compounds. Studying the relationships between drug use and cancer risk is further confounded by the fact that many drugs (e.g., cocaine, methamphetamine, heroin) are often "cut" or diluted with a variety

of other substances, from mannitol, which is a diuretic, to strychnine, a commonly used rodent poison; such toxic substances may be used in the manufacturing and processing of some drugs [58]. Thus, the relationship between drug use and cancer risk is complex and difficult to study. A review of epidemiological studies found conflicting results in the relationship between marijuana use and the risk of different types of cancer [59]. Some carcinogens found in tobacco smoke are also present in marijuana smoke [59], although compounds in marijuana have also shown to have anti-inflammatory and anti-carcinogenic properties [59, 60].

The lack of attention to sexual orientation and gender identity in most national surveys creates significant challenge in understanding the prevalence of drug abuse among LGBT people. It has been suggested that the rate of drug abuse among LGBT people ranges from 20 to 30%, which is substantially higher than the 9% estimated in the overall population [61]. A Washington State study of heterosexual and LGBT individuals seeking publicly-funded drug abuse treatment found that the four most common drugs for which treatment was sought were the same, although differences in prevalence of other abused drugs were noted [62]. The most commonly reported drugs used among LGBT versus heterosexual clients respectively were alcohol (50 vs. 37%), methamphetamine (21% vs. 14%), marijuana (13% each), and heroin (14% vs. 11%). This same study found that heterosexual women and men were more likely to seek treatment for alcohol; lesbian, bisexual, and transgender women were more likely to seek treatment for heroin; and gay, bisexual, and transgender men were more likely to do so for methamphetamine [62].

Data from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) indicates that lesbian (26%) and bisexual women (24%) have significantly higher rates of past-year drug abuse disorders than heterosexual women (6%), as do gay (31%) and bisexual men (28%) compared to heterosexual men (16%) [43]. Data from the Massachusetts BRFSS indicates that among adults aged 40 and older, 24% of gay men, 10% of lesbians, 20% of bisexual men, and 39% of bisexual women used illicit drugs in the past 30 days, compared to 10% of heterosexual men and 5% of heterosexual women [6]. High rates of substance use, as well as hormone therapy among transgender individuals have been noted in large-scale surveys, thus they may be at elevated risk for some cancers than non-transgender people [63].

Discrimination, internalized stigma, and expectations of rejection have been associated with increased use of drugs among bereaved gay men [64]. The experience of LGBT-based victimization (verbal and physical assaults) has been associated with greater risk of lifetime drug abuse problems [65]. Lesbian, gay, and bisexual young adults who are rejected by their families are more than three times as likely to abuse illicit drugs as those who are not [66]. More than half (57%) of transgender participants have been rejected by their families [55]. As a result of employment discrimination, transgender individuals may end up working in the "street economy," which places them at increased risk for drug abuse and interpersonal victimization [55].

Obesity

Obesity and being overweight are connected to as many as 20% of cancer mortalities in the U.S. [21], and have been positively linked with breast cancer (among post-menopausal women), colorectal, endometrial (uterine lining), esophageal, and kidney cancers, and may increase the risk for cancers of the gallbladder, liver, ovaries, cervix, aggressive prostate, as well as non-Hodgkin lymphoma and multiple myeloma. Having a large waistline, whether or not one is overweight or obese, is associated with greater risk of colorectal cancers and likely with pancreatic, endometrial, and breast (among postmenopausal women) cancers [21]. The underlying mechanisms of risk seem to vary by cancer type, but may include inflammation, immune system functioning, hormone levels, and how the body regulates hormones, as well as substances involved in cellular division, such as insulin-like growth factor-1 (IGF-1). Sedentary lifestyles (i.e., physical inactivity) and poor nutrition are significant predictors of adult obesity [67].

Lesbian and bisexual women have higher rates of being overweight or obese than their heterosexual peers [4, 5, 68]; and, lesbians may have higher rates of obesity than bisexual women [69]. Washington State data indicates that 36% of lesbians and bisexual women 50 years of age and older are obese, compared to 26% of older heterosexual women; 23% of older gay and bisexual men are obese, compared to 27% of older heterosexual men [4]. The lower rates of obesity among gay and bisexual men mirror findings from the CHIS [45]. Interestingly, New Mexico data indicates non-significant differences in the rates of obesity among gay men (35%) as compared to heterosexual men (24%) [46].

In a study comparing lesbian and heterosexual sisters, lesbians had greater waist circumferences, waist-to-hip ratios, higher body-mass indices, and more extensive weight-cycling [70]. Demographic factors associated with being overweight or obese among lesbian and bisexual women include older age, less education, living with a partner, and poor general health [71]; African American lesbians, and lesbians that reside in urban or rural areas (as opposed to suburban) are also at higher risk for obesity [48]. In attempting to obscure anatomical differences in the chest and hips, transgender men may elect to intentionally gain extra weight [72].

Obesity is generally considered to result from individual characteristics (e.g., genetics) and behaviors (e.g., overeating, poor nutrition, and lack of exercise). While these factors are important, recent research strongly suggests that obesity also spreads through social network ties, particularly friendships that are of the same-sex [73]. Being in a cohabiting relationship is a risk factor for obesity and overweight among lesbian and bisexual women [71]. Modifiable risk factors in controlling excess weight and obesity include more physical activity, consumption of more fresh fruits and vegetables and less sugary foods and drinks, and eating smaller portions [67]. Increasing physical activity in structured environments, such as fitness centers or exercise classes, may be more difficult for sexual minority women, as many fitness facilities do not offer family memberships to same-sex headed families, and physical activity groups tend not to be lesbian-specific [48].

Many lesbians who do wish to lose weight frame weight loss in the context of becoming healthier, rather than in the context of improving their appearance [74], and they may therefore be amenable to modifying nutrition and exercise to improve overall health and decrease cancer risk. There is some evidence of a weight loss benefit to participating in a mostly lesbian group, which was found in an internationally-franchised weight loss program, even when the program itself is not focused on sexual minority issues [74].

Diet and Nutrition

Diet and poor nutrition are related to being overweight and obese, and are also independent risk factors for cancer [75]. The actual role that diet and nutrition plays in cancer has been investigated but remains somewhat unclear [76], in part, because foods contain many compounds and the ways in which foods are prepared may also be important. Diets high in vegetables and fruits likely decrease the risk of oral, esophageal, stomach, pancreatic, prostate, and lung cancers, possibly through the antioxidant properties of phytochemicals that occur naturally in plants; whole grain fiber has been associated with decreased risk of colorectal cancers [76]. Large intake of red meats, especially fatty cuts, and processed meats (e.g., bologna, hotdogs) have been linked with increased risk of colorectal cancer; dairy products, such as milk, may decrease the risk of colorectal and bladder cancers but may increase the risk of prostate cancer [76]. Fatty foods in general, and foods prepared in fat and through frying have also been linked to increased risk of cancer [76]. Skipping meals and eating fast food are also associated with poor nutrition [77]. Again, although clear associations between nutrition and numerous cancers have been established, the underlying mechanisms of risk continue to be studied [76].

"Food insecurity is generally defined as having limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways" [78]. Compilation of data from the Gallup Daily Tracking Survey (GDTS), the National Survey of Family Growth (NSFG), and the American Community Survey (ACS) indicates that regardless of gender, race/ethnicity, age, and educational achievement, LGBT adults (29%) are significantly more likely than their heterosexual peers (18%) to have experienced food insecurity in the past year [78]. New Mexico data indicates that only 16% of lesbians and gay men meet nutritional guidelines for fruits and vegetables, compared to 21% of heterosexuals, and 29% of bisexuals, although these differences are not significant [46]. Although percentages were not provided, CHIS data indicates that gay and bisexual men's nutritional habits are similar to heterosexual men's [45].

While sexual minority women may be aware that diet is important, they may not know what constitutes a healthy diet [79]. Lesbian and bisexual women are more likely to skip breakfast than heterosexual women [80], and are less likely to include fresh fruits and vegetables in their diets [68]. Lesbians, but not bisexual women

aged 50 and older are less likely than heterosexual women of the same age to consume five or more servings of fresh fruits and vegetables daily; no differences have been noted between gay, bisexual, and heterosexual men [9]. There is no difference in reported fruit and vegetable consumption between sexual minority and heterosexual women according to CHIS data [81]. Compared to non-LGBT heterosexual adults aged 18 and older, across LGBT demographic groups, women, Native, Hispanic, African, and Hawaiian Americans, those who identify as multiracial, those with less than a 4-year degree, and those who are younger are at particular risk for food insecurity [78].

Transgender individuals may have unique dietary issues, as some foods are involved in the production of hormones; thus, some may adjust their diets in feminizing and masculinizing efforts [72]. Transgender men on testosterone therapy may experience deficiencies in protein, micronutrients, certain vitamins, and insufficient calories in their diets; some transgender women may diet excessively to appear more feminine [72]. Modifiable factors related to better diet and nutrition are similar to those related to obesity, such as eating more fresh fruits and vegetables, avoiding foods high in fat and sugar [67], reducing red meat and eliminating processed meats, utilizing cooking methods other than frying in food preparation [76], avoiding fast food, and not missing meals, whenever possible.

Physical Activity

Lack of physical activity is an important factor in being overweight or obese, as well as an independent risk factor for cancer [21, 75]**.** Regular physical activity improves immune system functioning, levels and regulation of certain hormones (e.g., estrogen, insulin), and reduces inflammation [82]. Regular physical activity has been linked to decreased risk of breast, colon, uterine, and lung cancers [82]. People with disabilities and physical limitations have a significantly increased risk for being physically inactive [83]. A diet poor in fruits and vegetables, low/intermediate levels of routine physical activity, and being a current or recent smoker each independently increase the risk of disability [84].

Lifetime experiences of discrimination and internalized heterosexism have been associated with increased risk of disability among older lesbian, gay, bisexual [22], and transgender adults [23]. Data on adults aged 50 and older indicates that 44% of lesbian and bisexual women have a disability, compared to 37% of heterosexual women, and 38% of gay and bisexual men, compared to 34% of heterosexual men; not only are these differences significant after accounting for age, income, and education, but it appears that lesbian, gay, and bisexual adults experience the onset of disability at younger ages than do their heterosexual peers [4].

A study comparing lesbians to heterosexual women noted that about a third of each group had been physically inactive during the past month, but among those who were physically active, 37% of lesbians had engaged in regular vigorous physical activity, compared to only 14% of heterosexual women [85]. Data from another

study indicates that bisexual women and men are more likely to meet standards for physical activity (71%) than are their heterosexual counterparts (54%), as are lesbians and gay men (60%), although the latter is non-significant [48]. Percentages were not provided, but CHIS data indicates that gay and bisexual men's exercise habits are similar to heterosexual men's [45]. A convenience sample of transgender men found that more than half (55%) were physically inactive [86], although a large-scale survey found that 74% of transgender and 82% of lesbian, gay, and bisexual older adults engage in moderate physical activity on a weekly basis [87].

Several studies have shown that at least some subgroups of sexual minorities may be more likely to engage in physical activity, which may reduce risk for cancer. For example, Boehmer and colleagues [9] report that lesbians younger than 50 are more likely to engage in moderate physical activities and bisexual women are more likely to engage in muscle-strengthening activities than heterosexual women of similar age. Brown and Grossman's [88] analysis of data from the National Social Life, Health, and Aging Project (NSHAP) suggests that respondents who report a history of same-sex sexual relationships are more likely to be physically active than their sexual majority peers.

Boehmer and Bowen's [81] examination of California Women's Health Survey (CWHS) data indicates that women who only have sex with women are the most physically active, while women who have sex with both men and women are the least physically active, although the difference is not statistically significant. Compared to heterosexuals of similar age, gay men less than 50-years old seem to have a higher probability of engaging in exercise that builds muscle, and bisexual men 50-years old and older seem to have a higher probability of engaging in vigorous activities [9]. Fredriksen-Goldsen, Kim and colleagues [4] find that lesbian, gay, and bisexual adults aged 50 and older do not differ from older heterosexual adults in their levels of moderate physical activity. Sexual minority youth, especially boys, may be at increased risk for physical inactivity [89]. Emerging evidence suggests that transgender women and men may be hesitant to exercise for a variety of reasons related to bodily appearance, comfort, and perceived gender norms [72].

Cross Cutting Risks and Strengths

Although risks for cancer and many other serious diseases are often attributed in part to individual genetic and behavioral factors, a health equity perspective identifies how larger structural factors are also important [90, 91]. Alcohol is a good example, since LGBT people are specifically targeted for marketing; in a featured article in the *New York Times*, Absolut® vodka "celebrated 30 years of marketing" to the LGBT community [92]. LGBT individuals may abuse alcohol and other drugs in part as a response to such exposure, as well as in response to their experiences with discrimination [93]; even today it is still legal to discriminate against lesbians, gay men, and bisexual women and men in 29 states, and against transgender women and men in 32 [94]. An alarming finding is that sexual minorities living in communities

with high levels of anti-gay prejudice have an estimated 12-year shorter life expectancy, as well as higher rates of cardiovascular disease (CVD) [95], which is significantly associated with stress. Lesbian, gay, and bisexual populations living in states that have passed anti-LGBT legislation experience significant increases in psychological distress as a result of stress [96].

Another structural risk factor is that LGBT people experience discrimination in healthcare settings, which can lead them to delay treatment and/or conceal their sexual and gender identities [97], which in turn can directly and negatively impact the timeliness, type and quality of care provided [98]. Healthcare providers' prejudicial attitudes are also a barrier to health promotion through healthcare access, such as preventive screenings that are critical to early detection, intervention and treatment [14]. In addition to missed opportunities for education about risky health behaviors, irregular access to healthcare may actually increase the odds of health risk behaviors [99, 100].

A recent study that pooled data from the 2005–2007 Youth Risk Behavior Surveys (YRBS) found that lesbian, gay, and bisexual youth in 9th to 12th grades in high school scored significantly higher than their heterosexual peers on 11 of 12 behavioral risks for cancer [89]. LGBT individuals who experienced physical, psychological, or sexual abuse or other adverse events in childhood may be at heightened risk for cancer [34]. This risk may be even greater in that childhood victimization has been associated with increased numbers of sexual partners and other high risk sexual behaviors as an adult [32], which increases the risk of cancers associated with human papilloma viruses (HPV), including oral, cervical, and anal [101].

Based on the Health Equity model it is imperative that we recognize the strengths and resources of LGBT people and the protective behaviors that promote good health. LGBT individuals and communities are resilient, despite the challenges and adversity that they may face. The human agency of LGBT people and the LGBT community are important resources, as was seen during the height of the AIDS pandemic. LGBT health activism can be traced back to the 1970s, "…when the American Psychiatric Association (APA)—under siege from activists disrupting the association's meetings—voted to change the classification [of homosexuality as a sociopathic personality disorder]" [102]. When HIV and the modes of transmission were identified, LGBT people and communities rallied from within to promote health and reduce risk behaviors [103]. Such health activism has continued, from lesbian and bisexual women's active engagement in raising awareness about breast cancer, to transgender women and men's work to recognize "the need for serious research on biological processes related to [their] … life circumstances" [102], and most recently the advocacy efforts that have led to LGBT health being prioritized in the national health objectives in *Healthy People 2020* [1].

Consider the role of similar advocacy efforts in the marriage equality movement. While the federal Defense of Marriage Act (DOMA) was passed by majorities of both Houses of Congress and was signed into law by President Clinton in 1996, Massachusetts became the first state to recognize same-sex marriage only seven years later in 2003; in 2013 the Supreme Court struck down a major provision of DOMA, requiring the federal government to recognize same-sex marriages [104].

Currently, 19 states and the District of Columbia recognize same-sex marriages, with litigation pending in the remaining states and in Puerto Rico [105].

Marriage has been shown to be a protective factor in terms of both mental and physical health, a protective mechanism that extends to same-sex marriage [106]. Marriage equality is still relatively recent and while some studies have examined its positive relationship to health outcomes [107], research is needed to assess its influence on health behaviors. A recent research synthesis on the "effect of [traditional] marriage and health behaviors" commissioned by the U.S. Department of Health and Human Services [108] found that, among other things: the frequency of excessive drinking in the year prior to and the year after first marriage declined by around 50% for men and 25% for women; both women and men experience modest gains in weight, as well as somewhat smaller gains in physical activity; and increased health care access and utilization.

Community-level factors are also important in the Health Equity model. Lesbian, gay, and bisexual youth who live in communities with supportive environments have fewer problems with alcohol abuse than their peers who reside in non-supportive communities [109]. Similarly, being active in HIV/AIDS organizations, as well as LGBT-specific community organizations, appears to moderate the relationship between stigma, engaging in sex under the influence, and consequent risky sex among gay, bisexual, and transgender Latino men [110].

LGBT individuals and their social relations and networks are important strengths; supportive social relationships can facilitate positive changes in health risk behaviors [18]. The LIVESTRONG Foundation™ (http://www.livestrong.org/) seeks to support and advocate for those affected by cancer. In a recent survey of cancer survivors, the foundation notes those who identify as LGBT are significantly less likely than heterosexuals to list biological family members as sources of support, instead listing members of their families of choice [111]. LGBT young adults who are accepted by their families of origin are at decreased risk for substance abuse [112].

Some studies suggest that lesbians and bisexual women are more likely to seek help for an alcohol problem than are heterosexual women [44], and they may also be more likely than their heterosexual sisters to exercise on a weekly basis [70]. Although gay men's concerns with body image is often seen as a negative and may increase their risk for eating disorders, it may also lead them to pay closer attention to their diet [113]. Lesbian and bisexual women and gay and bisexual men are significantly more likely than their heterosexual peers to engage in both professional mental health treatment and self-help groups [114]. Results of a large community-based survey indicate that 75% of transgender participants have received counseling, and another 14% intend to do so [55]. Such positive help-seeking behaviors across LGBT subgroups suggest that they may be amenable to engagement in programs or services designed to promote the behavioral change necessary to promote good health.

Innovative Programs and Interventions Designed to Reduce Risks

While there is a significant body of literature discussing the need for culturally sensitive, tailored interventions to reduce behavioral risks among LGBT people [115–117], there is limited evaluation of tailored interventions in modifying cancer-related risk behaviors. Although LGBT populations are increasingly being recognized as having disproportionate risks for some cancers, there appears to be a dearth of programs designed to address their specific behavioral risks, and very limited research on the programs that do exist. For example, only 6% of the nearly 14,000 substance abuse treatment centers in the U.S. provide programs specifically targeting lesbian and gay clients, and because many treatment groups are gender-specific, transgender adults likely encounter significant challenges accessing appropriate treatment [48]. Below we describe some innovative programs that have been designed to reduce behavioral risks and promote good health in LGBT communities. Each of these programs described below is free of charge in order to increase accessibility.

Obesity, Nutrition, Physical Activity The *SHE* (Strong. Healthy. Energized.) program offered by SAGE (Services & Advocacy for Gay, Lesbian, Bisexual & Transgender Elders) and other agencies that serve the LGBT community consists of 12 weekly in-person sessions designed to help older lesbian and bisexual women who are overweight or obese to work toward fitness goals (http://sageusa.org/newsevents/events.cfm?ID=627). Each session combines information about nutrition and cooking with exercise and topical discussions. In a "comfortable, fun atmosphere" participants learn about the relationships between weight, nutrition, and physical activity to lead happier, healthier lives.

Reduction of Excessive Use of Alcohol Canadian high schools that have longstanding (i.e., 3 or more years) Gay-Straight Alliances (GSAs) and LGB-specific anti-bullying policies have been shown to have a positive impact on lesbian and bisexual female adolescent problem alcohol use and its consequences, as well as that of heterosexual female and male adolescents [118].

The *Over the Influence Book Club* utilizes a harm reduction model [119], incorporating the principle "that people do engage in high-risk behaviors and to commit to helping those people reduce the harm associated with their behavior" [120]. In the *Over the Influence Book Club* in San Francisco (http://new.sfaf.org/stonewall/assets/doc/secular-alternatives-or.pdf), instead of reading a different book each month, the participants "read and chat" about the book *Over the Influence: The Harm Reduction Guide for Managing Drugs and Alcohol* [121]. The group's "come as you are" philosophy provides a safe supportive space where facilitated discussions help participants learn about various harm reduction tools and strategies, as well as themselves.

Drug Abuse Seattle's *Project NEON* (Needle Exchange and Sex Education Outreach Network) is also a harm reduction program that targets gay, bisexual, and transgender men who are engaged in methamphetamine use (http://www.projectneon.org/home.html). In addition to raising awareness about the relationships between

methamphetamine use and an array of health concerns, this program seeks to change community norms. An effective aspect of this program is the use of Peer Educators who go out into the community to provide needle exchange and bleach kits, and educate active users about both the importance of safer drug use (e.g., clean needles) as well as safer sex practices. Peer Educators undergo training and are supervised by professional staff, and because they are current and/or former users themselves, they are trusted in the community.

Research

The National Cancer Institute's Surveillance Epidemiology and End Results (SEER) database does not collect information on either sexual or gender identity, which presents a significant barrier to understanding cancer in LGBT communities [14]. The recent inclusion of a sexual identity question in the National Health Interview Survey (NHIS) will be instrumental in assessing cancer risk factors for lesbian, gay, and bisexual people at the national level, but no national health survey asks gender identity questions, so the prevalence of risk factors for cancer for the transgender population will remain unknown. In fact, even most existing state-level health surveys (e.g., the Washington BRFSS and the CHIS) that assess sexual orientation do not include gender identity questions, with the exception of Massachusetts's BRFSS [122]. Including these questions in both state and national health surveys will be instrumental in identifying the incidence, prevalence, and geographic variations in cancer and behavioral cancer risks among LGBT populations.

Research is needed that further delineates pathways by which health outcomes can be influenced by risk factors resulting from sexual and gender minority status. Based on the Minority Stress Model [24] both discriminatory acts and internal minority stressors (i.e., expectations of rejection, concealment of minority identity, internalized stigma) can create stress resulting from one's sexual and/or gender identity minority status [23, 24, 123–125]. Based on the Health Equity model, the interplay of structural factors such as social exclusion and discrimination, in combination with the presence or absence of personal and social resources may also result in adverse health behaviors [37, 40], some of which have been linked to the etiology of cancer. Continued research is needed to test the efficacy of such models in identifying multi-level pathways of risk.

Research must also be responsive to the identification of new risk factors as they emerge, such as the recent recognition that lack of sleep may create cancer risk [126]. A study using a convenience sample has examined the relationship between sexual orientation and sleep; results suggest that lesbians and gay men have shorter sleep durations than their heterosexual peers [127]. One of the main diagnostic criteria for depressive and anxiety disorders is sleep disturbances [128], and population studies have documented higher rates of these disorders among lesbians, gay men, and bisexual women and men [129].

More research is clearly needed to investigate linkages between stress and cancer. Through epigenetics and the gene-environment interaction, researchers have recently identified that the ATF3 gene is activated by stress, which affects the functionality of immune-system cells and may foster metastasis of breast cancer to other organs and body-systems, and independently predicts consequent morbidity [25]. Another line of research has identified a possible link between adverse childhood experiences, such as abuse, and cancer, which is not accounted for by other factors, such as smoking [34]. To date most of the extant research on LGBT cancer is cross-sectional in nature. While these studies provide helpful insights, findings are limited in terms of understanding health trajectories and addressing risk reduction. Longitudinal studies and those which include biological markers may significantly contribute to our understanding of underlying pathways of cancer risk.

Practice

Programs and interventions must address the heterogeneity of LGBT populations. In fact, programs have rarely been developed to attend to the unique needs of bisexual and transgender people, yet research demonstrates that they are vulnerable and may have distinct unmet needs [23, 55, 87, 130]. It is also imperative that intersecting social positions and identities of LGBT people be considered in order to develop culturally responsive interventions. In developing behavioral interventions, trust and credibility of providers are important considerations [131]. It is also important to consider the inclusion of members of the targeted population in the early development of tailored interventions for LGBT communities. It has also been suggested that social and recreational activities may be important to supplement the specific focus on behavior change [132].

Because of a long history of discrimination and marginalization, many LGBT people are fearful of accessing healthcare, both in the larger community and *within* LGBT communities [87]. Many who have accessed care have either been denied care or received inferior care because of their perceived sexual orientation or gender identity [87]. As a result, significant numbers of LGBT people have not disclosed their sexual orientation or gender identity to their medical providers [87], which can have serious negative consequences for health [98]. When LGBT people do disclose, they are at heightened risk for discrimination; medical providers themselves acknowledge discrimination exists within medical settings [133, 134]. Delay in accessing healthcare can have serious consequences for cancer-related mortality, as early detection can make a significant difference in cancer treatment and outcomes [20].

Experiences of heterosexism and homophobia in health care settings, and barriers to health insurance and access, may contribute to the under-utilization of cancer screenings by lesbian and bisexual women [135–141]. The experience of discrimination in medical settings based on sexual orientation may be further complicated by racial discrimination. Gay and bisexual men are more likely to be tested for

colorectal cancer than are heterosexual men, but with the exception of gay and bisexual men living alone, there is no difference in prostate-specific antigen (PSA) testing based on sexual orientation [142]. However, gay and bisexual African American men are less likely to be screened than either heterosexual African American men or gay and bisexual Non-Hispanic White men [142]. Furthermore, lack of recognition of the unique needs of transgender people in healthcare settings can result in compromised quality of care and under-utilization [143].

The experiences of LGBT patients in health care settings can be improved by training medical students and providers. This may result in more LGBT-friendly healthcare settings and opportunities for LGBT patients to safely disclose their sexual orientation and gender identity and confide in providers about health-related issues they would not discuss if they perceived a hostile or insensitive setting. Exposure to LGBT patients during clinical training has been shown to positively affect medical students' attitudes about LGBT patients, knowledge about LGBT healthcare concerns, and clinical interactions with LGBT patients [144].

Surveyed LGBT cancer patients suggest that healthcare workers providing cancer care be educated about the following issues pertaining to being LGBT and being diagnosed with cancer: the role that stigma plays in LGBT healthcare; the influence that the local healthcare environment has on the LGBT patient experience, and how highly variable environments can be; the degree to which disclosure about sexual orientation or gender identity is influenced by a patient's sense of perceived safety; the fact that respecting LGBT patients must also include respecting their support teams; the way that LGBT cancer patients are alienated by pervasive expectations of gender conformity; and the need of LGBT cancer survivors for culturally appropriate information and support [145].

There are unique challenges in addressing risk within LGBT communities, and risk reduction and prevention more generally. For example, some risk behaviors (e.g., alcohol and drug use) have been a normative aspect of LGBT culture and community in the past, which should be considered in treatment. LGBT individuals as "a group" may not be comfortable in drug abuse treatment programs in the general community, due to anti-LGBT attitudes and behaviors of providers, other group members, and agencies themselves. The "one size fits all" assumption implicit in grouping LGBT people under the same umbrella may also create significant challenges. Furthermore, lesbian and bisexual women and gay and bisexual men may be uncomfortable in drug abuse treatment groups that are not segregated by sex. Another challenge is heterosexism in mainstream behavioral risk reduction programs. For example, many physical fitness programs designed for adults are held in organizations which may be overtly or covertly hostile to LGBT people. Similarly, sports and other organized physical fitness activities may be anti-LGBT, even at younger ages [146].

Patients and providers need to be aware of cancer related resources available within the LGBT community. For example, the National LGBT Cancer Network (http://www.cancer-network.org/) provides access to online LGBT cancer support groups, cultural competence training modules, and a database for "LGBT-friendly

cancer treatment facilities." The Lesbian Cancer Initiative (http://www.gaycenter.org/health/lci) of the Lesbian, Gay, Bisexual, and Transgender Community Center in New York provides in-person services (e.g., mammography, support groups).

Policy

Because sexual orientation and gender identity information is not included in the National Cancer Institute's SEER registry [14], policymakers do not have vital information necessary to make informed decisions regarding the allocation of resources to address cancer and behavioral cancer risks in LGBT communities. Similarly, the Institute of Medicine [14] strongly recommends including sexual orientation and gender identity in electronic health records as an important avenue for collecting patient-level data and information on LGBT populations.

Multi-level interventions are needed to confront structural and environmental factors that may be linked to cancer risk in LGBT communities. Although most interventions target individual behavior change, it is equally important to develop an upstream approach and target larger systems and environmental and structural change to promote better health outcomes. To this end, policy studies are needed to assess health changes resulting from shifting structural and environmental contexts. Changing community norms and behaviors, as potential intervention points, may be used to enhance social capital to promote behavior change. For example, identifying additional sponsors and funding sources that promote healthy products at community events can influence community norms by creating healthy options as well as reducing reliance on alcohol and tobacco-related companies as they market to LGBT people.

Unlike the general population, wherein biological and legal family members provide the majority of informal caregiving, including caring for loved ones with cancer, LGBT people tend to provide such care to and for each other [87]. Yet, because these relationships are generally not recognized as such, important instrumental support may be denied [147]. Less than 40 % of LGBT adults have executed legal documents such as durable power of attorney for healthcare or living wills that allow someone else to make healthcare decisions on their behalf [148]. This will have profound implications for end of life care, in terms of both palliative and hospice care. Older lesbians and gay men living in states that do not recognize same-sex relationships are significantly more likely to be afraid of both dying alone and dying in pain than their counterparts residing in states that do recognize such relationships [149]. Policy change at local, state, and national levels are needed to recognize same-sex relationships and the role of friends and others in providing both instrumental and respite support for members of the LGBT community living with, or caring for someone with cancer.

Policies also impact LGBT cancer risks in other important ways. For example, alcohol and drug abuse programs and media tend to target younger LGBT people, despite evidence that LGBT older adults also drink excessively and use illicit drugs

at disproportionately high rates. For example, while the Healthy People 2010 chapter on alcohol and drug abuse among LGBT populations opens with the statement, "substance abuse is pervasive and affects all populations, youth to elderly, in the United States" [150], the chapter is overwhelmingly targeting LGBT youth, including the recommendations. Programs that do promote risk reduction among older adults, such as physical activity, tend to target heterosexuals.

Even within LGBT communities, policies by and large fail to recognize cancer risk as a serious health issue. Agencies and programs that serve LGBT people are ideally situated to communicate cancer risks that LGBT people face. In addition to communicating this information, it is necessary to provide free or low-cost cancer screenings specific to uninsured or underinsured subpopulations at risk (e.g., breast and cervical cancer for lesbians and bisexual women and transgender men, prostate cancer for gay and bisexual men and transgender women). Policies supporting prevention and early detection are also needed, as both policymakers and individuals in high-risk groups may be unaware of their risk. The returns of such a public health approach are evident in the impact that free screenings for HIV have had in the United States. Overcoming barriers increases the likelihood of early detection and treatment of cancer. By making free or low-cost screenings more readily available, cultural and social norms to access such services may be positively influenced with long-term public health benefits. Mainstream agencies and programs should also engage in targeted outreach efforts, using communications (e.g., language and imagery) that are culturally sensitive to LGBT people and their families.

Conclusion

This chapter illustrates cancer-related behavioral risks in LGBT populations. Based on the Health Equity model, the risks identified result from behavioral factors as well as larger sociocultural forces. Excessive use of alcohol and other drugs, weight management, diet, and physical activity are all related to cancer risks and are critical determinants of morbidity and mortality in the general population. It is imperative to better understand the complex ways in which individual behaviors, community norms, and larger social contexts interact to create and maintain cancer risks in LGBT communities. It is imperative that tailored community-based prevention efforts and interventions be designed and tested to improve health and promote health equity in these communities.

References

1. U. S. Department of Health and Human Services. Healthy people 2020 objectives: lesbian, gay, bisexual, and transgender health. 2011. http://www.healthypeople.gov/2020/topicsobjectives2020/overview.aspx?topicid=25. Accessed 26. Oct. 2011.
2. Centers for Disease Control and Prevention. CDC health disparities and inequalities report United States, 2011. MMWR *2011*. 2011;60(Suppl):1–116.

3. Wallace SP, Cochran SD, Durazo EM, Ford CL. The health of aging lesbian, gay and bisexual adults in California. Los Angeles: UCLA Center for Health Policy Research; 2011 Contract No.: PB2011-2.
4. Fredriksen-Goldsen KI, Kim H-J, Barkan SE, Muraco A, Hoy-Ellis CP. Health disparities among lesbian, gay male and bisexual older adults: results from a population-based study. Am J Pub Health. 2013;103(10):1802–9.
5. Dilley JA, Simmons KW, Boysun MJ, Pizacani BA, Stark MJ. Demonstrating the importance and feasibility of including sexual orientation in public health surveys: health disparities in the Pacific Northwest. Am. J Pub Health. 2010;100(3):460–7.
6. Conron KJ, Mimiaga MJ, Landers SJ. A population-based study of sexual orientation identity and gender differences in adult health. Am J Pub Health. 2010;100(10):1953–60.
7. American Cancer Society. Cancer facts for gay and bisexual men. Atlanta: American Cancer Society; 2013. http://www.cancer.org/healthy/findcancerearly/menshealth/cancer-facts-for-gay-and-bisexual-men. Accessed 17. Dec. 2013.
8. National LGBT Cancer Network. The LGBT Community's Disproportionate Cancer Burden. New York: National LGBT Cancer Network; 2013. http://www.cancer-network.org/cancer_information/cancer_and_the_lgbt_community/the_lgbt_communitys_disproportionate_cancer_burden.php. Accessed 17. Dec. 2013.
9. Boehmer U, Miao X, Linkletter C, Clark MA. Adult health behaviors over the life course by sexual orientation. Am J Pub Health. 2012;102(2):292–300.
10. Brandenburg DL, Matthews AK, Johnson TP, Hughes TL. Breast cancer risk and screening: a comparison of lesbian and heterosexual women. Women Health. 2007;45(4):109–30.
11. Case P, Austin SB, Hunter DJ, Manson JE, Malspeis S, Willett WC, et al. Sexual orientation, health risk factors, and physical functioning in the Nurses' Health Study II. J Women's Health (Larchmt). 2004;13(9):1033–147.
12. Cochran SD, Mays VM. Risk of breast cancer mortality among women cohabiting with same sex partners: findings from the National Health Interview Survey, 1997–2003. J Women's Health. 2012;21(5):528–33.
13. Dibble SL, Roberts SA, Nussey B. Comparing breast cancer risk between lesbians and their heterosexual sisters. Women's Health Issues. 2004;14(2):60–8.
14. Institute of Medicine. The health of lesbian, gay, bisexual, and transgender people: building a foundation for better understanding. Washington, DC: The National Academies Press; 2011. p. 347.
15. Zaritsky E, Dibble SL. Risk factors for reproductive and breast cancers among older lesbians. J Women's Health (Larchmt). 2010;19(1):125–31.
16. U.S. Cancer Statistics Working Group. United States Cancer Statistics: 1999–2010 Incidence and Mortality Web-Based Report. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Cancer Institute; 2013. http://www.cdc.gov/uscs. Accessed 17. March 2014.
17. Sorensen G, Emmons K, Hunt MK, Barbeau E, Goldman R, Peterson K, et al. Model for incorporating social context in health behavior interventions: applications for cancer prevention for working-class, multiethnic populations. Preventive Med. 2003;37(3):188–97.
18. Wilkinson RG, Marmot MG. Social determinants of health: the solid facts. Copenhagen: World Health Organization, 2003.
19. Centers for Disease Control and Prevention. Behavioral risk factor surveillance system. 2012. http://www.cdc.gov/brfss/. Accessed 24. Feb. 2012.
20. Centers for Disease Control and Prevention. Other ways to reduce cancer risk. Atlanta: Centers for Disease Control and Prevention; 2013. http://www.cdc.gov/cancer/dcpc/prevention/other.htm. Accessed 17. Dec. 2013.
21. American Cancer Society. Body weight and cancer risk. Washington, DC: American Cancer Society; 2013. http://www.cancer.org/cancer/cancercauses/dietandphysicalactivity/bodyweightandcancerrisk/body-weight-and-cancer-risk-effects. Accessed 18. March 2014.
22. Fredriksen-Goldsen KI, Emlet CA, Kim H-J, Muraco A, Erosheva EA, Goldsen J, et al. The physical and mental health of lesbian, gay male, and bisexual (LGB) older adults: the role of key health indicators and risk and protective factors. Gerontologist. 2013;53(4):664–75.

23. Fredriksen-Goldsen KI, Cook-Daniels L, Kim H-J, Erosheva EA, Emlet CA, Hoy-Ellis CP, et al. Physical and mental health of transgender older adults: an at-risk and underserved population. Gerontologist. 2013;53(4):664–75.
24. Meyer IH. Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: conceptual issues and research evidence. Psychol Bull. 2003;129(5):674–97.
25. Wolford CC, McConoughey SJ, Jalgaonkar SP, Leon M, Merchant AS, Dominick JL, et al. Transcription factor ATF3 links host adaptive response to breast cancer metastasis. J Clin Invest. 2013;123(7):2893–906.
26. Dawson DA, Grant BF, Stinson FS, Chou PS, Huang B, Ruan WJ. Recovery from DSM-IV alcohol dependence: United States, 2001–2002. Addiction. 2005;100(3):281–92.
27. Balsam KF, Rothblum ED, Beauchaine TP. Victimization over the life span: a comparison of lesbian, gay, bisexual, and heterosexual siblings. J Consulting Clin Psychol. 2005;73(3):477–87.
28. Drabble L, Trocki KF, Hughes TL, Korcha RA, Lown AE. Sexual orientation differences in the relationship between victimization and hazardous drinking among women in the National Alcohol Survey. Psychol Addict Behav. 2013;27(3):639–48.
29. Hughes T, McCabe SE, Wilsnack SC, West BT, Boyd CJ. Victimization and substance use disorders in a national sample of heterosexual and sexual minority women and men. Addiction. 2010;105(12):2130–40.
30. Alvy LM, Hughes TL, Kristjanson AF, Wilsnack SC. Sexual identity group differences in child abuse and neglect. J Interpers Violence. 2013;28(10):2088–111.
31. Springer KW, Sheridan J, Kuo D, Carnes M. Long-term physical and mental health consequences of childhood physical abuse: results from a large population-based sample of men and women. Child Abuse Negl. 2007;31(5):517–30.
32. Springer KW, Sheridan J, Kuo D, Carnes M. The long-term health outcomes of childhood abuse: an overview and a call to action. J Gen Internal Med. 2003;18(10):864–70.
33. Bandini E, Fisher AD, Ricca V, Ristori J, Meriggiola MC, Jannini EA, et al. Childhood maltreatment in subjects with male-to-female gender identity disorder. Intern J Impot Res. 2011;23(6):276–85.
34. Kelly-Irving M, Mabile L, Grosclaude P, Lang T, Delpierre C. The embodiment of adverse childhood experiences and cancer development: potential biological mechanisms and pathways across the life course. Intern J Pub Health. 2013;58(1):3–11.
35. Murgatroyd C, Spengler D. Epigenetics of early child development. Front Psychiatry. 2011;2:16.
36. Juster R-P, McEwen BS, Lupien SJ. Allostatic load biomarkers of chronic stress and impact on health and cognition. Neurosci Biobehav Rev. 2010;35(1):2–16.
37. Fredriksen-Goldsen KI. Health, aging, and sexuality in marginalized communities: LGBT older adults emerging from the margins. Invitational keynote address presented at the 7th Annual Chicago Workshop on Biomarkers in Population-Based Health and Aging Research (CCBAR); Chicago, IL; 2013, October.
38. Centers for Disease Control and Prevention. Social determinants of health. Atlanta: Centers for Disease Control and Prevention; 2011. http://www.cdc.gov/socialdeterminants/Definitions.html. Accessed 17. Oct. 2012.
39. U. S. Department of Health and Human Services. Foundation health measures: disparities, healthy people 2020. Washington, DC: U.S. Department of Health and Human Services; 2010. http://www.healthypeople.gov/2020/about/disparitiesAbout.aspx. Accessed 26. Oct. 2011.
40. Fredriksen-Goldsen KI, Simoni JM, Walters KL, Kim H-J, Lehavot K, Yang J, et al. Reconceptualization of health disparities by sexual orientation and gender identity: *LGBTQ Health Equity Model*. Am J Orthopsychiatr. 2014;84(6):653–63.
41. Braveman P. What is health equity: and how does a life-course approach take us further toward it? Matern Child Health J. 2014;18(2):366–72.

42. National Cancer Institute. Alcohol and Cancer Risk. Washington, DC: National Cancer Institute; 2013. http://www.cancer.gov/cancertopics/factsheet/Risk/alcohol. Accessed 17. March 2014.
43. McCabe SE, Hughes TL, Bostwick WB, West BT, Boyd CJ. Sexual orientation, substance use behaviors and substance dependence in the United States. Addiction. 2009;104(8):1333–45.
44. Drabble L, Midanik LT, Trocki K. Reports of alcohol consumption and alcohol-related problems among homosexual, bisexual and heterosexual respondents: results from the 2000 National Alcohol Survey. J Stud Alcohol. 2005;66(1):111–20.
45. Deputy NP, Boehmer U. Determinants of body weight among men of different sexual orientation. Prev Med. 2010;51(2):129–31.
46. VanKim NA, Padilla JL. New Mexico's progress in collecting lesbian, gay, bisexual, and transgender health data and its implications for addressing health disparities. Albuquerque: New Mexico Department of Health; 2010.
47. Garofalo R, Wolf RC, Kessel S, Palfrey SJ, DuRant RH. The association between health risk behaviors and sexual orientation among a school-based sample of adolescents. Pediatrics. 1998;101(5):895–902.
48. Substance Abuse and Mental Health Services Administration. Top health issues for LGBT populations information and resource kit. Rockville: Substance Abuse and Mental Health Services Administration, 2012. Contract No.: HHS Publication No. (SMA) 12-4684.
49. Gruskin EP, Hart S, Gordon N, Ackerson L. Patterns of cigarette smoking and alcohol use among lesbians and bisexual women enrolled in a large health maintenance organization. Am J Pub Health. 2001;91(6):976–9.
50. Hawkins JD, Catalano RF, Miller JY. Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: implications for substance abuse prevention. Psychol Bull. 1992;112(1):64–105.
51. Keyes KM, Hatzenbuehler ML, Hasin DS. Stressful life experiences, alcohol consumption, and alcohol use disorders: the epidemiologic evidence for four main types of stressors. Psychopharmacology. 2011;218(1):1–17.
52. Bradford J, Reisner SL, Honnold JA, Xavier J. Experiences of transgender-related discrimination and implications for health: results from the Virginia Transgender Health Initiative Study. Am J Pub Health. 2012;103(10):1820–29.
53. Amadio DM. Internalized heterosexism, alcohol use, and alcohol-related problems among lesbians and gay men. Addict Behav. 2006;31(7):1153–62.
54. Rosario M, Schrimshaw EW, Hunter J. Disclosure of sexual orientation and subsequent substance use and abuse among lesbian, gay, and bisexual youths: critical role of disclosure reactions. Psychol Addict Behav. 2009;23(1):175–84.
55. Grant JM, Mottet LA, Tanis J, Harrison J, Herman JL, Keisling M. Injustice at every turn: a report of the National Transgender Discrimination Survey. Washington, DC: National Center for Transgender Equality and National Gay and Lesbian Task Force; 2011.
56. Cochran SD, Keenan C, Schober C, Mays VM. Estimates of alcohol use and clinical treatment needs among homosexually active men and women in the US population. J Consulting Clin Psychol. 2000;68(6):1062–71.
57. Eliason MJ. Environmental strategies to address LGBT alcohol, tobacco, and drug use. San Francisco: LGBT-TRISTAR; 2010.
58. Cole C, Jones L, McVeigh J, Kicman A, Syed Q, Bellis MA. Cut: a guide to adulterants, bulking agents and other contaminants found in illicit drugs. Liverpool: Centre for Public Health; 2010.
59. Hashibe M, Straif K, Tashkin DP, Morgenstern H, Greenland S, Zhang ZF. Epidemiologic review of marijuana use and cancer risk. Alcohol. 2005;35(3):265–75.
60. National Cancer Institute. Laboratory/animal/preclinical studies. Bethesda: National Cancer Institute; 2013. http://www.cancer.gov/cancertopics/pdq/cam/cannabis/healthprofessional/page4. Accessed 26. March 2014.

61. Hunt J. Why the gay and transgender population experiences higher rates of substance use: many use to cope with discrimination and prejudice. Washington, DC: Center for American Progress; 2012.
62. Cochran BN, Cauce AM. Characteristics of lesbian, gay, bisexual, and transgender individuals entering substance abuse treatment. J Subst Abuse Treat. 2006;30(2):135–46.
63. Ashbee O, Goldberg JM. Trans people and cancer. Vancouver: Transgender Health Program; 2006.
64. Hatzenbuehler ML, Nolen-Hoeksema S, Erickson SJ. Minority stress predictors of HIV risk behavior, substance use, and depressive symptoms: results from a prospective study of bereaved gay men. Health Psychol. 2008;27(4):455–62.
65. Mereish EH, O'Cleirigh C, Bradford JB. Interrelationships between LGBT-based victimization, suicide, and substance use problems in a diverse sample of sexual and gender minorities. Psychol Health Med. 2014;19(1):1–13.
66. Ryan C, Huebner D, Diaz RM, Sanchez J. Family rejection as a predictor of negative health outcomes in white and Latino lesbian, gay, and bisexual young adults. Pediatrics. 2009;123(1):346–52.
67. Centers for Disease Control and Prevention. Obesity: halting the epidemic by making health easier, at a glance 2011. Atlanta: Centers for Disease Control and Prevention; 2011. http://www.cdc.gov/chronicdisease/resources/publications/aag/obesity.htm. Accessed 7. Dec. 2011.
68. Valanis BG, Bowen DJ, Bassford T, Whitlock E, Charney P, Carter RA. Sexual orientation and health: comparisons in the women's health initiative sample. Arch Fam Med. 2000;9(9):843–53.
69. Boehmer U, Bowen DJ, Bauer GR. Overweight and obesity in sexual-minority women: evidence from population-based data. Am J Pub Health. 2007;97(6):1134–40.
70. Roberts SA, Dibble SL, Nussey B, Casey K. Cardiovascular disease risk in lesbian women. Womens Health Issues. 2003;13(4):167–74.
71. Yancey AK, Cochran SD, Corliss HL, Mays VM. Correlates of overweight and obesity among lesbian and bisexual women. Prev Med. 2003;36(6):676–83.
72. Center of Excellence for Transgender Health. General Prevention and Screening San Francisco, CA: University of California Center of Excellence for Transgender Health; 2014. http://transhealth.ucsf.edu/trans?page=protocol-screening#S4X. Accessed 3. April 2014.
73. Christakis NA, Fowler JH. The spread of obesity in a large social network over 32 years. N Engl J Med. 2007;357(4):370–9.
74. Fogel S, Young L, Dietrich M, Blakemore D. Weight loss and related behavior changes among lesbians. J Homosex. 2012;59(5):689–702.
75. National Cancer Institute. Risk factors. Washington, DC: National Institutes of Health; 2006. http://www.cancer.gov/cancertopics/wyntk/cancer/page3. Accessed 17. Dec. 2013.
76. American Society of Clinical Oncology. The role of major nutrients in cancer prevention. Alexandria: American Society of Clinical Oncology; 2012. http://www.cancer.net/navigating-cancer-care/prevention-and-healthy-living/diet-and-nutrition/role-major-nutrients-cancer-prevention. Accessed 25. March 2014.
77. Veugelers PJ, Fitzgerald AL, Johnston E. Dietary intake and risk factors for poor diet quality among children in Nova Scotia. Can J Pub Health. 2005;96(3):212–6.
78. Gates GJ. Food insecurity and SNAP participation (Food Stamps) in LGBT communities. Los Angeles: Williams Institute, UCLA School of Law; 2014.
79. Bowen DJ, Balsam KF, Diergaarde B, Russo M, Escamilla GM. Healthy eating, exercise, and weight: impressions of sexual minority women. Women Health. 2006;44(1):79–93.
80. Brown SG, Morrison LA, Calibuso MJ, Christiansen TM. The menstrual cycle and sexual behavior: relationship to eating, exercise, sleep, and health patterns. Women Health. 2008;48(4):429–44.
81. Boehmer U, Bowen DJ. Examining factors linked to overweight and obesity in women of different sexual orientations. Prev Med. 2009;48(4):357–61.

82. American Society of Clinical Oncology. Physical activity and cancer risk. Alexandria: American Society of Clinical Oncology; 2013. http://www.cancer.net/navigating-cancer-care/prevention-and-healthy-living/physical-activity/physical-activity-and-cancer-risk. Accessed 18. March 2014.
83. Centers for Disease Control and Prevention. Physical inactivity and people with disabilities: a tip sheet for public health professionals. Atlanta: Centers for Disease Control and Prevention; 2010. http://www.cdc.gov/ncbddd/documents/physical-inactivity-tip-sheet-_phpa_1.pdf. Accessed 26. March 2014.
84. Artaud F, Dugravot A, Sabia S, Singh-Manoux A, Tzourio C, Elbaz A. Unhealthy behaviours and disability in older adults: three-City Dijon cohort study. Br Med J. 2013;347:f4240.
85. Aaron DJ, Markovic N, Danielson ME, Honnold JA, Janosky JE, Schmidt NJ. Behavioral risk factors for disease and preventive health practices among lesbians. Am J Pub Health. 2001;91(6):972–5.
86. Reisner SL, Gamarel KE, Dunham E, Hopwood R, Hwahng S. Female-to-male transmasculine adult health: a mixed-methods community-based needs assessment. J Am Psychiatr Nurses Assoc. 2013;19(5):293–303.
87. Fredriksen-Goldsen KI, Kim H-J, Emlet CA, Muraco A, Erosheva EA, Hoy-Ellis CP, et al. The aging and health report: disparities and resilience among lesbian, gay, bisexual, and transgender older adults. Seattle: Institute for Multigenerational Health; 2011.
88. Brown MT, Grossman BR. Same-sex sexual relationships in the national social life, health and aging project: making a case for data collection. J Gerontol Soc Work. 2014; 57(2–4):108–29.
89. Rosario M, Corliss HL, Everett BG, Reisner SL, Austin SB, Buchting FO, et al. Sexual orientation disparities in cancer-related risk behaviors of tobacco, alcohol, sexual behaviors, and diet and physical activity: pooled youth risk behavior surveys. Am J Public Health. 2014;104(2):245–54.
90. Hatzenbuehler ML, Phelan JC, Link BG. Stigma as a fundamental cause of population health inequalities. Am J Public Health. 2013;103(5):813–21.
91. Williams DR, Costa MV, Odunlami AO, Mohammed SA. Moving upstream: how interventions that address the social determinants of health can improve health and reduce disparities. J Public Health Manage. 2008;14(Suppl):S8–17.
92. Elliott S. Absolut celebrates its 30 years of marketing to gay consumers. New York Times [Internet]; (Business Day Media & Advertising). 2011. http://www.nytimes.com/2011/10/27/business/media/absolut-heralds-its-marketing-to-gay-consumers.html?_r=0.
93. McCabe SE, Bostwick WB, Hughes TL, West BT, Boyd CJ. The relationship between discrimination and substance use disorders among lesbian, gay, and bisexual adults in the United States. Am J Public Health. 2010;100(10):1946–52.
94. Human Rights Campaign. Employment Non-Discrimination Act. Human Rights Campaign, Washington DC. 2014. http://www.hrc.org/laws-and-legislation/federal-legislation/employment-non-discrimination-act. Accessed 19. May 2014.
95. Hatzenbuehler ML, Bellatorre A, Lee Y, Finch BK, Muennig P, Fiscella K. Structural stigma and all-cause mortality in sexual minority populations. Soc Sci Med. 2014;103:33–41.
96. Rostosky SS, Riggle EDB, Horne SG, Miller AD. Marriage amendments and psychological distress in lesbian, gay, and bisexual (LGB) adults. J Couns Psychol. 2009;56(1):56–66.
97. Eliason MJ, Dibble S, Dejoseph J. Nursing's silence on lesbian, gay, bisexual, and transgender issues: the need for emancipatory efforts. ANS Adv Nurs Sci. 2010;33(3):206–18.
98. American Medical Association. AMA policies on GLBT issues: H-65.973 health care disparities in same-sex partner households. American Medical Association, Washington, DC. 2013. http://www.ama-assn.org//ama/pub/about-ama/our-people/member-groups-sections/glbt-advisory-committee/ama-policy-regarding-sexual-orientation.page. Accessed 1. Nov. 2013.
99. Fisher JD, Cornman DH, Osborn CY, Amico KR, Fisher WA, Friedland GA. Clinician-initiated HIV risk reduction intervention for HIV-positive persons: formative research, acceptability, and fidelity of the options project. J Acquir Immune Defic Syndr. 2004;37(Suppl 2):S78–87.

100. Fisher JD, Fisher WA, Cornman DH, Amico RK, Bryan A, Friedland GH. Clinician-delivered intervention during routine clinical care reduces unprotected sexual behavior among HIV-infected patients. J Acquir Immune Defic Syndr. 2006;41(1):44–52.
101. National Cancer Institute. HPV and cancer. National Institutes of Health, Rockville. 2012. http://www.cancer.gov/cancertopics/factsheet/Risk/HPV. Accessed 11. July 2014.
102. Epstein S. Sexualizing governance and medicalizing identities: the emergence of 'state-centered' LGBT health politics in the United States. Sexualities. 2003;6(2):131–71.
103. Rofes E. Dry bones breathe: gay men creating post-AIDS identities and cultures. Harrington Park Press: New York; 1998.
104. Knauer NJ. Navigating a post-Windsor world: the promise and limits of marriage equality. Georget J Gend Law. 2014.
105. Freedom to Marry. Marriage Litigation. Freedom to Marry, New York. 2014. http://www.freedomtomarry.org/litigation. Accessed 14. July 2014.
106. Herek GM. Legal recognition of same-sex relationships in the United States: a social science perspective. Am Psychol. 2006;61(6):607–21.
107. Wight RG, LeBlanc AJ, de Vries B, Detels R. Stress and mental health among midlife and older gay-identified men. Am J Public Health. 2012;102(3):503–10.
108. Wood RG, Goesling B, Avellar S, Mathematica Research. The effects of marriage on health: a synthesis of recent research evidence. U.S. Department of Health and Human Services & Office of the Assistant Secretary for Planning and Evaluation, Washington, DC; 2007.
109. Hatzenbuehler ML, Pachankis JE, Wolff J. Religious climate and health risk behaviors in sexual minority youths: a population-based study. Am J Public Health. 2012;102(4):657–63.
110. Ramirez-Valles J, Kuhns LM, Campbell RT, Diaz RM. Social integration and health: community involvement, stigmatized identities, and sexual risk in Latino sexual minorities. J Health Soc Behav. 2010;51(1):30–47.
111. LIVESTRONG Foundation. Families of choice: sources of support for LGBT cancer survivors. LIVESTRONG Foundation, Austin. 2013. http://blog.livestrong.org/2013/03/25/families-of-choice-sources-of-support-for-lgbt-cancer-survivors/. Accessed 2. April 2014.
112. Ryan C, Russell ST, Huebner D, Diaz R, Sanchez J. Family acceptance in adolescence and the health of LGBT young adults. J Child Adolesc Psychiatr Nurs. 2010;23(4):205–13.
113. Kaminski PL, Chapman BP, Haynes SD, Own L. Body image, eating behaviors, and attitudes toward exercise among gay and straight men. Eat Behav. 2005;6(3):179–87.
114. Cochran SD, Sullivan JG, Mays VM. Prevalence of mental disorders, psychological distress, and mental health services use among lesbian, gay, and bisexual adults in the United States. J Clin Consult Psychol. 2003;71(1):53–61.
115. Cochran BN, Peavy KM, Robohm JS. Do specialized services exist for LGBT individuals seeking treatment for substance misuse? A study of available treatment programs. Subst Use Misuse. 2007;42(1):161–76.
116. Nemoto T, Operario D, Keatley J, Nguyen H, Sugano E. Promoting health for transgender women: Transgender Resources and Neighborhood Space (TRANS) program in San Francisco. Am J Public Health. 2005;95(3):382–4.
117. Nuttbrock L, Bockting W, Rosenblum A, Hwahng S, Mason M, Macri M, et al. Gender abuse, depressive symptoms, and HIV and other sexually transmitted infections among male-to-female transgender persons: a three-year prospective study. Am J Public Health. 2013;103(2):300–7.
118. Konishi C, Saewyc E, Homma Y, Poon C. Population-level evaluation of school-based interventions to prevent problem substance use among gay, lesbian and bisexual adolescents in Canada. Prev Med. 2013;57(6):929–33.
119. van Wormer K, McKinney R. What schools can do to help gay/lesbian/bisexual youth: a harm reduction approach. Adolescence. 2003;38(151):409–20.
120. Denning P. Practicing harm reduction psychotherapy: an alternative approach to addictions. vol xxv. Guilford Press: New York; 2000. p 262.

121. Denning P, Little J, Glickman A. Over the influence: the harm reduction guide for managing drugs and alcohol. vol xix. Guilford Press: New York; 2004. p 328.
122. Massachusetts Department of Public Health. The health of lesbian, gay, bisexual, and transgender (LGBT) persons with their heterosexual and non-transgender counterparts. Massachusetts: Massachusetts Department of Public Health; 2009.
123. Hendricks ML, Testa RJ. A conceptual framework for clinical work with transgender and gender noncomforming clients: an adaptation of the minority stress model. Prof Psychol: Res Pract. 2012;43(5):460–7.
124. Bockting WO, Miner MH, Swinburne Romine RE, Hamilton A, Coleman E. Stigma, mental health, and resilience in an online sample of the U.S. transgender population. Am J Public Health. 2013;103(5):943–51.
125. Szymanski DM, Sung MR. Minority stress and psychological distress among Asian American sexual minority persons. Couns Psychol. 2010;38(6):848–72.
126. Davis S, Mirick DK. Circadian disruption, shift work and the risk of cancer: a summary of the evidence and studies in Seattle. Cancer Causes Control. 2006;17(4):539–45.
127. Rahman Q, Silber K. Sexual orientation and the sleep-wake cycle: a preliminary investigation. Arch Sex Behav. 2000;29(2):127–34.
128. American Psychiatric Association, DSM-5 Task Force. Diagnostic and statistical manual of mental disorders: DSM-5. 5th ed. Arlington: American Psychiatric Association; 2013.
129. King M, Semlyen J, Tai SS, Killaspy H, Osborn D, Popelyuk D, et al. A systematic review of mental disorder, suicide, and deliberate self harm in lesbian, gay and bisexual people. BMC Psychiatry. 2008;8:70.
130. Sephton S, Spiegel D. Circadian disruption in cancer: a neuroendocrine-immune pathway from stress to disease? Brain Behav Immun. 2003;17(5):321–8.
131. Schwappach DL. Smoking behavior, to quit, and preferences toward cessation programs among gay men in Zurich, Switzerland. Nicotine Tob Res. 2008;10(12):1783–7.
132. Remafedi G, Carol H. Preventing tobacco use among lesbian, gay, bisexual, and transgender youths. Nicotine Tob Res. 2005;7(2):249–56.
133. Eliason MJ, Dibble SL, Robertson PA. Lesbian, gay, bisexual, and transgender (LGBT) physicians' experiences in the workplace. J Homosex. 2011;58(10):1355–71.
134. Eliason MJ, Dejoseph J, Dibble S, Deevey S, Chinn P. Lesbian, gay, bisexual, transgender, and queer/questioning nurses' experiences in the workplace. J Prof Nurs. 2011;27(4):237–44.
135. Buchmueller T, Carpenter CS. Disparities in health insurance coverage, access, and outcomes for individuals in same-sex versus different-sex relationships, 2000–2007. Am J Public Health. 2010;100(3):489–95.
136. Cochran SD, Mays VM, Bowen D, Gage S, Bybee D, Roberts SJ, et al. Cancer-related risk indicators and preventive screening behaviors among lesbians and bisexual women. Am J Public Health. 2001;91(4):591–7.
137. Harcourt J. Current issues in lesbian, gay, bisexual, and transgender (LGBT) health. J Homosex. 2006;51(1):1–11.
138. Kerker BD, Mostashari F, Thorpe L. Health care access and utilization among women who have sex with women: sexual behavior and identity. J Urban Health. 2006;83(5):970–9.
139. Roberts SJ, Patsdaughter CA, Grindel CG, Tarmina MS. Health related behaviors and cancer screening of lesbians: results of the Boston Lesbian Health Project II. Women Health. 2004;39(4):41–55.
140. Tracy JK, Lydecker AD, Ireland L. Barriers to cervical cancer screening among lesbians. J Women's Health (Larchmt). 2010;19(2):229–37.
141. Charlton BM, Corliss HL, Missmer SA, Frazier AL, Rosario M, Kahn JA, et al. Reproductive health screening disparities and sexual orientation in a cohort study of U.S. adolescent and young adult females. J Adolesc Health. 2011;49(5):505–10.
142. Heslin KC, Gore JL, King WD, Fox SA. Sexual orientation and testing for prostate and colorectal cancers among men in California. Med Care. 2008;46(12):1240–8.

143. Bauer GR, Hammond R, Travers R, Kaay M, Hohenadel KM, Boyce M. “I don’t think this is theoretical; this is our lives”: how erasure impacts health care for transgender people. J Assoc Nurs AIDS Care. 2009;20(5):348–61.
144. Sanchez NF, Rabatin J, Sanchez JP, Hubbard S, Kalet A. Medical students’ ability to care for lesbian, gay, bisexual, and transgendered patients. Fam Med. 2006;38(1):21–7.
145. Margolies L, Scout N. LGBT patient-centered outcomes: cancer survivors teach us how to care for all. Washington, DC: National LGBT Cancer Network, Network for LGBT Health Equity; 2013.
146. Gill DL, Morrow RG, Collins KE, Lucey AB, Schultz AM. Perceived climate in physical activity settings. J Homosex. 2010;57(7):895–913.
147. Cahill S, South K, Spade J. Outing age: public policy issues affecting gay, lesbian, bisexual and transgender elders. Washington, DC: National Gay and Lesbian Task Force; 2000.
148. Metlife Mature Market Institute, American Society on Aging. Still out, still aging: the metlife study of lesbian, gay, bisexual, and transgender baby boomers. New York: Metlife Mature Market Institute and American Society on Aging; 2010.
149. de Vries B, Mason AM, Quam J, Aquaviva K. State recognition of same-sex relationships and preparations for end of life among lesbian and gay boomers. Sex Res Soc Policy. 2009;6(1):90–101.
150. U.S. Department of Health and Human Services. Healthy People 2010: lesbian, gay, bisexual, and transgender health: substance abuse. Washington, DC: U.S. Department of Health and Human Services; 2000.