

AN UPDATE ON HIV MEDICAL CO-MORBIDITIES IN THE OAKLAND TRANSITIONAL GRANT AREA (TGA)

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Introduction to the Report

The Oakland Transitional Grant Area (TGA) - encompassing Alameda and Contra Costa County, California - continues to be devastated by the crisis of HIV and by the complex care, treatment, and support issues it engenders. In 2010, the Oakland TGA Collaborative Community Planning Council commissioned a full-scale needs assessment which incorporated both questionnaires and focus groups and eventually involved over 250 persons living with HIV and AIDS. Conducted at a cost of \$60,000, the needs assessment sought to identify key gaps and barriers across the entire Ryan White service system, especially in relation to selected priority populations.

One of the issues identified in the needs assessment involved the high prevalence of medical co-morbidities faced by persons with HIV, including conditions such as hepatitis C, heart disease, and renal disease. To gather more information on these co-morbidities, the Collaborative Community Planning Council in late 2011 commissioned a much smaller, \$5,000 report designed to gather additional information on the frequency of medical co-morbidities among persons living with HIV and how these co-morbidities may affect the cost, complexity, and quality of care for persons living with HIV in the Oakland TGA. Robert Whirry, an independent program development consultant who had been appointed to prepare the 2012 Oakland TGA Comprehensive HIV Services Plan, was contracted to prepare the need assessment as part of the larger Comprehensive Plan development process.

Because of its connection to the comprehensive planning process, the medical co-morbidities process was overseen by the **2012 Oakland TGA Comprehensive Plan Work Group**. The Work Group had been formed in December 2011 as a short-term subcommittee under the supervision of the Council's Quality Data and Services Planning Committee. The Chair of the Work Group was **Loren Jones**.

In early 2012, the Work Group discussed the overall substance, structure, and parameters of the needs assessment and collected and reviewed preliminary research and data collection to identify key medical co-morbidities related to HIV. The group also developed an information gathering structure and developed a preliminary outline for the assessment as a whole. Based on its research, the group identified **five** broad categories of medical co-morbidities that occur frequently in persons with HIV, grouped based on the close association between specific sub-conditions;

- **Hepatitis C / renal disease**
- **Obesity / diabetes**
- **Heart disease / high cholesterol / cardiovascular disease**
- **Smoking / lung disease**
- **Oral health**

Later in the planning process, the Work Group also identified **intimate partner violence** as a sixth area for research, based upon emerging literature stressing the important role of violence and trauma as co-factors for HIV transmission.

The Work Group decided on a **two-part** strategy for gathering information related to medical co-morbidities and HIV. First, the group commissioned an **in-depth literature review** to identify available information on the frequency and impact of medical co-morbidities on persons living with HIV, with a particular focus on persons with HIV living in urban areas. While health information is available on the frequency of health conditions in the Oakland TGA such as heart disease, renal disease, and diabetes, these data are not linked to persons with HIV, and cannot be used to assess the rate of medical co-morbidities among persons with HIV in Alameda and Contra Costa Counties.

Second, using resources identified by the Alameda County Office of AIDS Administration, **three focus groups** were conducted among persons living with HIV. The groups were specifically designed to gather information on the impacts of medical co-morbidities in participants' lives and to identify ways in which co-morbidities limited or complicated access and utilization of care both within and outside of the Ryan White HIV system. One focus group involved English-speaking persons living with HIV and AIOS (PLWHA) in Oakland; another involved English-speaking PLWHA in Richmond; and a third involved Spanish-speaking PLWHA in Oakland. The groups were conducted by Hill & Company Communications, using a collaboratively developed questionnaire format.

The report below summarizes the findings of the literature review process followed by a summary of the findings of the three focus groups. The report concludes with a set of general recommendations related to a response to medical co-morbidities in the Oakland TGA.

Part I. Findings From the Literature

▪ Mortality among PLWHA

Numerous studies have documented an overall decline in AIDS-related morbidity and mortality since the initiation of the HAART era in the United States and Europe.^{1 2 3} However, as antiretroviral therapy has improved the quality of life and life expectancy among persons living with HIV and AIDS and PLWHA have begun to live longer lives, other chronic co-morbid conditions have become more clinically relevant and the focus of care has begun to shift towards these non-HIV co-morbidities. HIV co-morbid conditions may result from a variety factors including the toxicity of anti-retroviral therapy (ART), chronic inflammation caused by HIV, aging, and lifestyle factors such as smoking. These conditions pose health risks for any individual but may be even more deleterious for PLWHA.^{4 5} As a result of medical co-morbidities and their disproportionate impact on sub-populations, outcomes for HIV-positive individuals in the post-ART era are not determined solely by HIV status, but also by demographic factors and individual health behaviors.

Recent data document not only that mortality among PLWHA has declined but that the causes of death in HIV-positive populations have changed over time. Whereas AIDS-related opportunistic infections were once the leading causes of mortality, chronic diseases that are most prevalent in the general population have now become leading causes of death among persons who are HIV-positive. In the HIV Outpatient Study (HOPS), for example, deaths per 100 person-years dropped from **7.0** in 1996 to **1.3** in 2004. At the same time, the proportion of deaths for which there was an AIDS-related cause also declined dramatically over that time, from **54%** in 1996 to **25%** in 2004. The most common non-AIDS-related causes of death and their relative frequency in 2004 were non-AIDS malignancy (**17.5%**), cardiovascular disease and pulmonary disease (**15% each**), hepatic disease (**12.5%**) and renal disease (**10%**). The HOPS research team noted that toxicities associated with HIV treatments may have resulted in some non-AIDS-related deaths, although their data show that even those with a longer history of HAART treatment demonstrated longer survival with co-morbid conditions.⁶

▪ Incidence/Prevalence of Co-morbidities Among PLWHA Overall

The co-morbid conditions most commonly documented among PLWHA can vary somewhat with time and with other factors such as age, race/ethnicity and hepatitis C virus (HCV) status. Overall, the most common non-HIV-related co-morbidities, as demonstrated in the Veterans Aging Cohort Study (VACS) and other work, are infection with hepatitis C virus (HCV) (**35%** prevalence in VACS), hypertension (about **32%**), diabetes (about **13%**) and obstructive lung disease (about **12%**).⁷ Renal, vascular and pulmonary diseases were positively associated with more advanced HIV disease, indicating that these conditions may be caused or worsened by HIV infection. Analyses also indicated that HIV status interacted significantly with age: for conditions such as liver disease that in general tend to decrease with age, HIV-positive VACS participants exhibited a smaller decrease than seronegative participants. For conditions such as hypertension, diabetes, vascular disease, renal disease, and pulmonary disease that generally increase in prevalence with age, seropositive VACS participants exhibited a greater increase than those who were seronegative.⁸ It thus appears that HIV infection may accelerate the aging process and hasten the progression of some co-morbid conditions.

The literature also indicates that as PLWHA age, the prevalence of co-morbidities they develop can change. One study found that among 18 to 29-year-olds, the most common medically-related co-morbidities and behaviors were tobacco use (**30.4%**), obesity (**9.4%**), hypercholesterolemia (**8.0%**), hypertension (**7.2%**) and hepatitis C (**5.9%**). Tobacco use varied significantly with age, peaking at about **40%** in the 40-59 age groups and then decreasing to **28.8%** in the 60 and over group. While obesity remained relatively stable across age groups, the prevalence of all the other conditions increased significantly with advancing age. In the oldest age group (persons 60 years and over), the most commonly diagnosed conditions were hypertension (**67.1%**), hypercholesterolemia (**65.8%**), diabetes (**28.8%**), renal disease (**23.3%**), coronary artery disease (**20.5%**) and hepatitis C (**12.7%**).¹⁰

Across age groups, many PLWHA now experience multiple chronic co-morbidities. In the Community Health Advisory and Information Network (CHAIN) study cohort, for example, over **80%** reported at least two conditions and about **25%** reported five or more.⁹ Other work has documented that the number of co-morbid conditions increases significantly with advancing age. On average, subjects aged 19 to 29 years had **2.20** diagnosed co-morbidities, while those older than 60 had **4.52**.¹⁰ Individuals who report more co-morbidities also use more medical services,⁹ highlighting the need for medical care relating to conditions other than HIV among PLWHA.

▪ Hepatitis C and Renal Disease

Hepatitis C infection is the most common bloodborne infection in the United States, and the leading cause for liver transplantation. It is transmitted primarily by exposure to an infected person's blood through the skin (most commonly through injection drug use).¹¹ Unlike HIV, hepatitis C virus (HCV) is not efficiently transmitted through sexual or perinatal exposures. Thus, the HCV prevalence among HIV-positive individuals who have a history of injection drug use is much higher than among those infected with HIV through sexual exposures.¹²

Overall, roughly **one quarter to one third** of all those infected with HIV are co-infected with HCV.^{11 70 13} **Fifty to 80 percent** of HIV-positive injection drug users are estimated to have HCV.¹⁴ HCV prevalence can vary significantly by race/ethnicity and other factors. In one large, multi-ethnic cohort of HIV-positive individuals, the highest HCV prevalence was found among African American subjects (**14.8%**), followed by Whites (**9.6%**) and Hispanics (**7.6%**).¹⁵ Participants in the Women's Interagency HIV Study (WIHS), about 80% of whom were women of color, had a much higher HCV prevalence rate at **41%**.¹⁶ Another, smaller study found co-infection with HCV to be much more common among HIV-positive subjects who also have either diabetes or hypertension: **61.4%** of those with a diabetes diagnosis and **52.9%** of those with a hypertension diagnosis were infected with HCV.¹⁷ Among a large group of veterans, infection with HCV was extremely common, affecting **45.1%** of those who were HIV-positive as compared to **30.8%** of those who were HIV-negative.⁴³

Co-infection with HIV has been associated with higher HCV viral load¹⁸ and can accelerate HCV disease progression.^{19 20 21} Data indicate that those co-infected with both HIV and HCV suffer increased mortality, apparently through accelerated liver disease.²² Recent treatment recommendations from the HCV-HIV International Panel note that clinicians should assess the extent of hepatic fibrosis (liver scarring) present in persons with HCV before initiating HCV treatment, as this is the best predictor of disease progression.³² However, in those who are co-infected with HIV, serum biochemical markers of fibrosis have been demonstrated to be generally less reliable due to factors such as the inflammatory reaction resulting from HIV infection and the use of drugs to treat HIV that may interfere with some serum markers of fibrosis.^{23 24} Antiretroviral drugs can also lead to chemically-based liver damage (hepatotoxicity) through multiple pathways, including direct liver injury and through hypersensitivity reactions involving the liver. Nucleoside analogs, non-nucleoside reverse transcriptase inhibitors and most protease inhibitors have all demonstrated hepatotoxicities.^{25 26 27 28 29 30} In addition,

some antiretroviral medications can interact with drugs used to treat HCV and may increase the risk of side effects such as anemia or neutropenia through overlapping toxicities.³¹ Clinicians are advised to avoid specific combinations of anti-HIV and anti-HCV drugs precisely to avoid such interactions and toxicities.³²

- **Obesity and Diabetes**

Obesity is a significant risk factor for diabetes, and overweight and obesity are growing problems among PLWHA. While wasting was commonly seen in the earlier days of the HIV epidemic, with the advent of HAART patients are living longer and gaining weight. Data indicate that overweight and obesity are now more prevalent among PLWHA than wasting syndrome, with levels exceeding **60%** in some samples.³³ This means that the prevalence of obesity among PLWHA is now roughly **equivalent** to that seen in the general population.^{33 34} As with HIV-negative populations, elevated body mass index (BMI) among those infected with HIV is associated with hypertension and dyslipidemia, known risk factors for cardiovascular disease.³⁴

Reducing obesity can be an important part of prevention and treatment of diabetes. The US Centers for Disease Control and Prevention (CDC) estimates that diabetes affects **11.3%** of Americans age 20 and older.³⁵ Untreated or poorly managed diabetes can result in severe complications including blindness, limb amputation, and death. It also contributes to a number of other health problems, including cardiovascular disease, hypertension, kidney disease, and complications during pregnancy, and can increase non-HIV morbidity and mortality among those infected with HIV.³⁶

HIV-positive individuals are subject to the same risk factors for developing diabetes as those who are HIV-negative, as well as additional risks caused by ART.^{37 38 39} Diabetes prevalence among HIV-positive individuals has been reported in the range of **2% to 12%**,^{8 9 16 41 42} although a 2012 study of HIV-positive veterans found an even higher diabetes prevalence of **19.5%**.⁴³ In the CHAIN cohort of HIV-positive individuals in New York City, the large majority (**86%**) of individuals who reported currently having a problem with diabetes were being treated for the condition.⁹ Treated or untreated, recent studies demonstrate that about **one-third to one-half** of HIV-positive patients with diabetes fail to meet American Diabetes Association goals for diabetes control as measured by HbA1c levels.^{44 45 46} Poor control of diabetes has been directly associated with poor control of HIV-1 RNA; it may be that individuals who do not adhere to their ART regimen are also less likely to adhere to their diabetes therapy, resulting in poor control of both conditions.¹⁷

▪ Hypertension, High Cholesterol, and Cardiovascular Disease (CVD)

Hypertension is an important risk factor for cardiovascular disease (CVD), and is common among those infected with HIV; prevalence estimates range roughly from **20%** to **33%**.^{9 16 47} In a number of studies, hypertension prevalence estimates for HIV-infected individuals have been similar to those found among matched HIV-negative control subjects and the general population.^{16 17 48} As in the general population, hypertension prevalence among PLWHA is higher among African Americans than other ethnic groups⁹ and increases with age; rates as high as **56.4%** have been reported in HIV-positive African American men above the age of 50.⁴⁷ Fewer than **half** of HIV-positive hypertensive subjects in one recent study met goals for blood pressure control,⁴⁴ a finding that is similar to study results assessing the proportion of general hypertensive subjects who have their condition under control (**35%**).⁴⁹ Poor hypertension control has been significantly associated with poor control of HIV-1 RNA, possibly because those with poor adherence to HIV therapy are more likely to demonstrate poor adherence to hypertension therapy.¹⁷

Elevated cholesterol is an additional important risk factor for cardiovascular disease, and there is mounting evidence that high cholesterol and triglycerides are adverse side effects of HIV antiretroviral therapy.^{50 51} Armah and colleagues' study of veterans found that among those who were infected with HIV, **11.2%** had high high-density lipoprotein cholesterol (HDL cholesterol, the so-called "good" cholesterol); **10.4%** had high or very high low-density lipoprotein cholesterol (LDL cholesterol, or the so-called "bad" cholesterol); and **22.7%** had high or very high triglycerides, which significantly raise the risk of heart disease. All of these values were significantly higher than those found among HIV-negative subjects.⁴³ In the CHAIN cohort, **over a quarter** of respondents reported current problems with high cholesterol yet a third of these were not being treated for the condition,⁹ placing them at increased risk for CVD.

CVD is an increasingly common cause of morbidity and mortality among PLWHA. Studies have shown that, relative to those who are not HIV-infected, HIV-positive individuals face greater CVD risk due to their HIV, the use of certain antiretrovirals, and the prevalence of lower levels of high density lipoprotein cholesterol.^{52 53 54 55 56 57} The HOPS study looked at rates of hospitalizations for cardiovascular disease over time, and found that after controlling for age and demographic factors, cardiovascular disease incidence rates have remained stable.⁷⁰ The Veterans Aging Cohort Study found the prevalence of cardiovascular disease to be **12.8%** among HIV-positive veterans as compared to **6.3%** among those who were HIV-negative,⁴³ and that vascular disease was

associated with low CD4 count and detectable viral load. Additionally, VACS data indicate that age interacts with HIV status as it relates to vascular disease, suggesting that vascular disease may be exacerbated by infection with HIV.⁸

▪ **Smoking and Lung Disease**

Current smoking prevalence among U.S. adults is **19.3%**.⁵⁸ Prevalence among PLWHA, however, is much higher, in the range of **40% to 60%**.^{9 33 43 59 60} For all individuals regardless of HIV status, smoking contributes to a number of negative health outcomes, including pneumonia, vascular disease, lung cancer, and obstructive lung disease. HIV-positive smokers face additional risks beyond those affecting seronegative smokers, however. Daily use of tobacco can diminish PLWHA's immune and virologic response to antiretroviral therapy by as much as **40%**.⁶¹ PLWHA who smoke are also significantly more likely to experience respiratory symptoms than seronegative smokers.⁶² HIV-positive smokers have an elevated risk of developing a number of pulmonary diseases including bacterial pneumonia, emphysema, invasive pneumococcal disease, and chronic obstructive lung disease (COPD).^{63 64 65 66} PLWHA are also at increased risk for developing lung cancer independent of smoking status; in the ALIVE study, even after adjusting for smoking exposure, HIV infection was associated with a **3.5-fold increase** in risk for lung cancer.⁶⁷ Smoking also impacts the health-related quality of life of PLWHA, with current smokers reporting lower levels of quality of life compared to HIV-positive former and never smokers.⁶⁸ Evidence indicates that among PLWHA, current smokers also report greater higher rates of HIV-related symptoms as compared to nonsmokers.⁶⁵

Like their seronegative counterparts, HIV-positive individuals enjoy health benefits when they quit smoking. In a multi-national study of over 33,000 HIV-positive participants, those who quit smoking experienced a significant decrease in risk for myocardial infarction and coronary heart disease; all-cause mortality among former smokers was essentially the same as for people who never smoked.⁶⁹

Pulmonary disease is responsible for a significant proportion of hospitalizations among PLWHA. In one large study, the diagnoses documented at hospitalization that had the highest incidence were pulmonary disease (1.99 per 100 person-years) and cardiovascular disease (1.60 per 100 person-years). While overall incidence rates either declined or remained stable over time, chronic conditions such as these were much more common as a percentage of all diagnoses associated with hospitalizations because the incidence of AIDS-defining opportunistic infections decreased substantially.⁷⁰

- **Oral Health and HIV**

Oral health problems are common among people living with HIV/AIDS. PLWHA experience a high incidence of general oral health problems such as dental decay, cavities, gingivitis) as well as other oral health problems that are directly related to HIV infection. Studies estimate that between **32%** and **46%** percent of PLWHA will have at least one major HIV-related oral health problem during the course of their infection, including bacterial, viral, and fungal infections; cancer; and ulcers.⁷¹ Poor oral health can impede food intake and nutrition, leading to poor absorption of HIV medications and leaving PLWHA susceptible to progression of their disease.⁷² HIV medications themselves can also lead to negative side effects such as dry mouth, which can predispose PLWHA to dental decay, periodontal disease, and fungal infections.⁷³ Bacterial infections such as dental decay and periodontal disease that begin in the mouth can escalate to systemic infections that can harm the heart and other organs if not treated, particularly in PLWHA with severely compromised immune systems. In extreme situations, poor oral health can adversely affect quality of life and limit career opportunities and social contact as result of facial appearance and odor.

Several studies have documented high rates of unmet oral health care needs and low utilization of oral health services among PLWHA, in most cases because of a lack of HIV-specific dental care coupled with inadequate support for dental and oral health care services for low-income individuals.⁷¹ The HIV Cost and Services Utilization Study (HCSUS) found that **58%** of PLWHA did not receive regular dental care.⁷⁴ More recent studies covering specific U.S. regions have reported similar findings, such as a study in North Carolina which found that **64%** of PLWHA had unmet dental needs.⁷¹ Not only does the literature suggest that PLWHA have more unmet oral health care needs than the general population but it also suggests that PLWHA have more unmet oral health care needs than unmet medical needs.^{71 74} Certain sub-categories of PLWHA such as people of color (especially women and those without dental insurance) are also less likely to receive oral health care than others living with HIV.⁷¹ Key barriers faced by PLWHA in terms of accessing oral health care include a lack of insurance; limited incomes; a lack of providers; HIV-related stigma among mainstream dental providers; and limited awareness of HIV-specific oral health manifestations.⁷⁵

On July 1, 2009, adult dental services were eliminated from the California State Medicaid / Medi-Cal budget as a result of the state's ongoing fiscal crisis. The loss of dental services was critical to our region since this benefit contributes to the comprehensive care for HIV positive individuals. The Ryan White Part A-funded HIV Dental Care Program provides support for dental services for HIV positive individuals

living in Alameda County who do not have dental insurance, including persons who formerly received dental coverage Medicaid or Medi-Cal. In Alameda County, total of **six** public and private clinics provide services through the HIV Dental Program. However, these providers have been overwhelmed with the increased number of patients requesting dental care and treatment. A preliminary analysis conducted in 2011 suggested that fewer than **10%** of previously covered Medicaid / Medi-Cal patients with HIV may be able to access dental care services through the existing system.

In late 2011, the Alameda County Office of AIDS Administration received a technical assistance grant through the US Health Resources and Services Administration (HRSA) HIV/AIDS Bureau to more closely investigate this issue. Through this grant, a dental consultant - Dr. David Reznik -is currently conducting a series of site visits to the Oakland TGA to assess the level of need for oral health care and produce recommendations for addressing oral health care access gaps in the region. The consultant's initial visit was conducted in early 2012 and resulted in a brief summary of HIV-specific dental care services provided to low-income PLWHA. The second site visit was initially scheduled for the spring of 2012 but is now scheduled to be conducted from September 10 - 12, 2012. This secondary visit is expected to produce a more concrete series of recommendations for addressing the HIV oral health care crisis in the Oakland TGA.

▪ **Intimate Partner Violence**

The 2010 National Intimate Partner and Sexual Violence Survey (NIPSVS) estimated that more than **one-third** of American women and **one-quarter** of American men have experienced intimate partner violence (IPV) in their lifetime, including rape, physical violence and/or stalking by an intimate partner. Among these victims, **16%** of males and **63%** of females reported symptoms of post-traumatic stress disorder (PTSD). In California, the NIPSVS estimated that over **4.5 million** women and **3.7 million** men have experienced IPV in their lifetime.⁷⁶

There are multiple links between IPV and HIV. The World Health Organization notes that violence can expose women to HIV infection and progression through: a) trauma that provides a portal of entry for the virus; b) inhibition of the ability to negotiate safer sex; c) decreased access to HIV/AIDS information and testing; d) fear of HIV-positive status disclosure; and e) decreased access to treatment and support services.⁷⁷ These same factors can affect male victims of intimate partner violence as well. Compared to those in the overall population, HIV-positive women are more likely to have experienced sexual or IPV⁷⁸ and are disproportionately affected by PTSD.⁷⁹ One

small study found that relative to seronegative women who have not experienced IPV, HIV-positive women were **three to seven times more likely** to report negative health outcomes such as depression, anxiety and suicidal ideation and that they were **12.5 times as likely** to report ever attempting suicide.⁸⁰

Trauma and PTSD both also contribute to negative health outcomes for HIV-positive women (and in some cases for men as well), including medication non-adherence, antiretroviral failure, and higher mortality.^{81 82 83 84 85} An increasingly large body of literature documents that these factors also contribute to increases in HIV transmission risk behaviors among HIV-positive individuals, such as reporting sex with a partner whose status is negative or unknown and inconsistent condom use.^{85 86 87 88 89}

Part II. Focus Group Findings

From February 24 - 29, 2012, Hill and Company Communications conducted a series of **three 1½-hour focus groups** designed to gather information on the impacts of medical co-morbidities on persons living with HIV and AIDS in both Alameda and Contra Costa County. Because they included a relatively small number of total participants, the focus groups were **not** intended to provide a statistically reliable cross-sampling of persons living with HIV in the TGA. Instead, the groups were intended to complement the literature by providing greater insight into the personal experiences of low-income persons living with HIV in dealing with and seeking treatment for medical co-morbidities. The dates, locations, and participants in the focus group were as follows:

- **Focus Group # 1** took place in **Richmond** on **February 24, 2012**. A total of **10** individuals participated in the focus group, including **3** females and **7** males. **Eight** participants were African American, **one** was Latino, and **one** was Native American/White. Of the participants, **100%** were unemployed and **80%** were disabled. **70%** of participants were between the ages of 41 and 50 while the remaining **30%** of participants were age 40 and under. Participants in the group had been HIV-positive for an average of **16 years**.
- **Focus Group # 2** consisted of **monolingual Spanish-speaking persons** living with HIV. The group was held in **Oakland** on **February 28, 2012**. The group included **10** Spanish-speaking participants – **5** females and **5** males. Of the participants, **80%** were unemployed; **50%** were disabled; **50%** were 51 to 60 years of age; and **40%** were 41 to 50 years of age. Participants had been HIV-positive for an average of **14.2 years**. **6** participants were from Mexico, while the remaining **4** participants were from El Salvador, Guatemala, Colombia, and France.
- **Focus Group # 3** took place in **Oakland** on **February 29, 2012** and consisted of **10** total participants – **6** females, **3** males, and **1** transgender person. **7** participants were African Americans; **1** was White; **1** was multi-racial; and **1** was Asian. Of the participants, **90%** were unemployed and **60%** were disabled. Participants represented a broad range of ages, with **40%** of participants between the ages of 41 and 50 years; **20%** between the ages of 31 and 40; and **20%** were between the ages of 51 and 60. Additionally, **1** participant was in the 21 to 30 age group while **1** was in the 61 to 70 age group. Participants had been HIV+ for an average of 11 years.

Key findings from the three focus groups included the following:

- Virtually all focus group participants reported that they were living with one or more HIV medical co-morbidities. These included high frequencies of high blood pressure, high cholesterol, obesity, heart ailments, and diabetes and lower frequencies of hepatitis C, respiratory disease related to smoking, kidney disease, and sleeping disorders. Many participants noted that they were dealing with mental health issues such as depression, although these were outside the assessment's focus on physical co-morbidities.
- Participants generally agreed that their personal physicians addressed and treated their existing co-morbidities fairly well. Many participants stated that they see other doctors - usually specialists - to obtain care for one or more of their co-morbidity issues. Women frequently noted a preference for specialists to deal with co-morbidities because of increase sensitivity to women's health issues.
- The most frequent negative comment related to primary medical care involved the fact that participants felt that their physicians did not spend adequate time with them to discuss their co-morbid health care issues. Some participants noted that doctors did not always seem to listen to or trust the health care information they were providing in regard to their co-morbidities. In one group, African American and Latino participants were shocked to learn that a white male and an Asian male spent as long as 45 minutes with their physician during a typical visit, an experience that none of the other participants had had.
- Some participants noted that their doctors had not done a thorough job of sharing information about other health care services that might be available to address their co-morbid conditions. Participants were concerned that there could be additional services available to address their physical co-morbidities of which they were unaware.
- The primary barrier to accessing care for physical co-morbidities involved the difficulty in obtaining timely appointments from primary and specialty care physicians. Some participants also noted difficulties when trying to call and talk to their case managers. Participants believed that some of these difficulties may be attributable to funding cutbacks in both Medi-Cal and the Ryan White systems.
- Participants were highly satisfied with their physicians' knowledge of their HIV and co-morbidity medications and the potential negative interactions among those medications.

- Some participants expressed a desire for greater integration of HIV and co-morbidity specialist care. One participant mentioned that she was referred to a specialist by her primary care doctor and the specialist had no idea why she was in his office.
- Very few participants had spoken to a registered dietician regarding nutrition or dietary issues related to their medical co-morbidities. However, most participants whose treatment involved dietary modifications (such as diabetes and heart disease) had discussed these modifications with their primary care physician.
- The topic of dental care generated a great deal of conversation and strong feelings among participants. In general, participants had deeply negative feelings regarding the availability of dental care for low-income persons for HIV, with no significant gender differences in relation to these responses. Many participants discussed the health care inequities that persons of color face in regard to accessing and obtaining needed oral health services
- Across all three focus groups, a central complaint in regard to oral health care involved the fact that in almost all cases in which there is a problem with a tooth, dentists recommend extraction as the only solution. This includes recommending extractions when the only problem is a cavity that needs a filling. Conversely, preventive dentistry is almost never discussed and almost never available as an option for patients and participants overall felt a sense of hopelessness in regard to the possibility of ever receiving adequate preventive oral health care services.
- The key suggested improvement to expand care for medical co-morbidities would be for doctors to become better listeners and to spend more individual time with each patient. At the same time, participants were aware that diminished resources usually do not give providers this luxury.

Part III. General Recommendations

As noted above, this brief report is intended to summarize key medical co-morbidities related to HIV/AIDS and the potential impact of these conditions on HIV care and access issues and is not a comprehensive survey of client needs in the Oakland TGA. Nevertheless, some significant themes emerged from the project that may be of value in assessing and planning HIV services in the region.

- The lack of access to adequate dental and oral health services for persons with HIV remains a serious health problem for the Oakland TGA. This problem, however, is not limited to persons with HIV but extends to nearly all low-income people living in our region. Ensuring adequate oral health care services - including regular preventive dentistry - will require concerted action along many fronts, including the reinstatement of dental care benefits for persons who are eligible for Medicare and Medicaid. The Planning Council should also review and consider upcoming findings and recommendations that will grow out of the oral health care study currently being conducted in the Oakland TGA by Dr. David Reznik.
- Increased coordination between primary HIV care physicians and specialty care physicians could increase the quality of response to medical co-morbidities in persons with HIV. Impending changes in the health care delivery system may hasten this increased coordination.
- Increased access to dietary and nutritional support services could be a useful tool in helping address co-morbidities such as obesity, diabetes, and heart disease in persons with HIV.
- The provision of smoking cessation counseling and referrals should be an integral component of primary HIV medical sessions for PLWHA who smoke.
- Hepatitis C testing should continue to be offered in conjunction with rapid HIV testing wherever possible, and HIV clinical providers should continue to integrate expanded patient counseling and treatment options in regard to hepatitis C.
- HIV specialty clinics and providers should be aware of the full range of potential treatment and reimbursement options available to their patients in other public and private programs and facilities.

Current and future implementation of the Affordable Care Act (ACT) will have significant implications for access to and delivery of care for medical co-morbidities. The Oakland TGA Collaborative Community Planning Council should continue to assess the impact of health care reform on access to and coordination of care for HIV-related medical co-morbidities. This could include providing advocacy for increased funding in key areas.

Endnotes

- ¹ Palella FJ Jr., Delaney KM, Moorman AC, et al. (1998). Declining morbidity and mortality in an ambulatory HIV-infected population. *New England Journal of Medicine* **338**:853-860.
- ² Vittinghoff E, Scheer S, O'Malley PM, et al. (1999). Combination antiretroviral therapy and recent declines in AIDS incidence and mortality. *Journal of Infectious Disease* **179**:717-720.
- ³ Mocroft A, Ledergerber B, Katlama C, et al. (2003). Related articles, links decline in the AIDS and death rates in the EuroSIDA study: an observational study. *Lancet* **362(9377)**:22-29.
- ⁴ El-Sadr WM, Lundgren JD, Neaton JD, et al. (2006). CD4+ count-guided interruption of antiretroviral treatment. *New England Journal of Medicine* **355**:2283-2296.
- ⁵ Justice AC, McGinnis KA, Skanderson M, et al. (2010). Towards a combined prognostic index for survival in HIV infection: the role of "non-HIV" biomarkers. *HIV Medicine* **11**:143-151.
- ⁶ Palella FJ Jr., Baker RK, Moorman AC, Chmiel JS, Wood KC, Brooks JT, Holmberg SD, and HIV Outpatient Study Investigators (2006). Mortality in the highly active antiretroviral therapy era: Changing causes of death and disease in the HIV Outpatient Study. *JAIDS* **43(1)**:27-34.
- ⁷ Justice AC (2006/2007). Prioritizing primary care in HIV: Co-morbidity, toxicity and demography. *Primary Care in HIV* **14(5)**:159-163.
- ⁸ Goulet JL, Fultz SL, Rimland D, Butt A, Gibert C, Rodriguez-Barradas M, Bryant K and Justice AC (2007). Do patterns of co-morbidity vary by HIV status, age, and HIV severity? *Clinical Infectious Diseases* **45**:1593-1601.
- ⁹ Messeri P, Lee G and Berk S (2009). *CHAIN Report 2007-4: Prevalence of Chronic Diseases & Co-morbid Conditions in the CHAIN Cohort of PLWHA*. Downloaded May 6, 2012 from http://www.nyhiv.org/pdfs/chain/CHAIN%202007-4%20Report_Prevalence%20of%20Chronic%20Diseases%20Comorbid%20Conditions%20PLWHA.pdf.
- ¹⁰ Vance DE, Mugavero M, Willig J, Raper JL and Saag MS (2011). Aging with HIV: A cross-sectional study of co-morbidity prevalence and clinical characteristics across decades of life. *Journal of the Association of Nurses in AIDS Care*, **22(1)**:17-25.
- ¹¹ Centers for Disease Control and Prevention (2009). *Viral hepatitis information for gay and bisexual men*.
- ¹² Alter MJ (2006). Epidemiology of viral hepatitis and HIV co-infection. *Journal of Hepatology* **44**:S6-S9.
- ¹³ Rockstroh J, Mocroft A, Soriano V, Tural C, Losso M, Horban A, et al. (2005). Influence of hepatitis C on HIV disease progression and response to antiretroviral therapy. *Journal of Infectious Disease* **192**:992-1002.
- ¹⁴ California Department of Public Health, Office of AIDS. *Fact Sheet, June 2009: Hepatitis C Virus Co-Infection*. Available at: www.cdph.ca.gov/programs/aids/documents/FSHEPC.pdf.
- ¹⁵ Silverberg MJ, Leyden W, Quesenberry Jr, CP and Horberg MA (2009). Race/ethnicity and risk of AIDS and death among HIV-infected patients with access to care. *Journal of General Internal Medicine* **24(9)**:1065-1072.

-
- ¹⁶ Data from the Women's Interagency HIV Study web site, cited by Justice (2006/2007).
- ¹⁷ Monroe AK, Chander G and Moore RD (2011). Control of medical co-morbidities in individuals with HIV. *JAIDS* **58(5)**:458-462.
- ¹⁸ Sherman K, Shire N, Rouster S, Peters M, Koziel M, Chung R, et al. (2005). Viral kinetics in hepatitis C or hepatitis C/HIV-infected patients. *Gastroenterology* **128**:313-327.
- ¹⁹ Benhamou Y, Bochet M, di Martino V, Charlotte F, Azria F, Coutellier A, et al. (1999). Liver fibrosis progression in HIV and hepatitis C virus co-infected patients. *Hepatology* **30**:1054-1058.
- ²⁰ Martin-Carbonero L, Benhamou Y, Puoti M, Berenguer J, Mallolas J, Quereda C, et al. (2004). Incidence and predictors of severe liver fibrosis in HIV infected patients with chronic hepatitis C: a European collaborative study. *Clinical Infectious Disease* **38**:128-133.
- ²¹ Martínez-Sierra C, Arizcorreta A, Díaz F, Roldan R, Martin-Herrera L, Perez-Guzman L, et al. (2003). Progression of chronic hepatitis C to liver fibrosis and cirrhosis in patients co-infected with hepatitis C virus and HIV. *Clinical Infectious Disease* **36**:491-498.
- ²² Kim AY and Chung RT (2009). Co-infection with HIV-1 and HCV – a one-two punch. *Gastroenterology* **137(3)**:795-814.
- ²³ Macias J, Giron-Gonzalez JA, Gonzalez-Serrano M, Merino D, Cano P, Jira JA, et al. (2006). Prediction of liver fibrosis in HIV/hepatitis C virus coinfecting patients by simple non-invasive indexes. *Gut* **55**:409-414.
- ²⁴ Nunes D, Fleming C, Offner G, O'Brien M, Tumilty S, Fix O, et al. (2005). HIV infection does not affect the performance of non-invasive markers of fibrosis for the diagnosis of hepatitis C virus-related liver disease. *JAIDS* **40**:538-544.
- ²⁵ Sanne I, Mommeja-Marin H, Hinkle J, Bartlett J, Lederman M, Maartens G., et al. (2005). Severe hepatotoxicity associated with nevirapine use in HIV-infected subjects. *Journal of Infectious Disease* **191**:825-829.
- ²⁶ Sulkowski M, Thomas D, Chaisson R and Moore R (2000). Hepatotoxicity associated with antiretroviral therapy in adults infected with HIV and the role of hepatitis C or B virus infection. *JAMA* **283**:74-80.
- ²⁷ Rodriguez-Rosado R, Garcia-Samaniego J and Soriano V (1998). Hepatotoxicity after introduction of highly active antiretroviral therapy. *AIDS* **12**:1256.
- ²⁸ Aceti A, Pasquazzi C, Zechini B, De Bac C, for the LIVER-HAART group (2002). Hepatotoxicity development during antiretroviral therapy containing protease inhibitors in patients with HIV. The role of hepatitis B and C virus infection. *JAIDS* **29**:41-48.
- ²⁹ Den Brinker M, Wit F and Wertheim-van Dillen P (2000). Hepatitis B and C virus co-infection and the risk for hepatotoxicity of highly active antiretroviral therapy in HIV-1 infection. *AIDS* **14**:2895-2902.
- ³⁰ Nuñez M, Lana R, Mendoza J, Martín-Carbonero L and Soriano V (2001). Risk factors for severe hepatic injury following introduction of HAART. *JAIDS* **27**:426-431.

-
- ³¹ Brau N, Rodriguez-Torres M, Prokupek D, Bonacini M, Giffen C, Smith J, et al. (2004). Treatment of chronic hepatitis C in HIV-HCV-co-infection with interferon alpha-2b + ribavirin full-course vs. 16-week delayed ribavirin. *Hepatology* **39**:989-998.
- ³² Soriano V, Puoti M, Sulkowski M, Cargnel A, Benhamou Y, Peters M, Mauss S, Bräu N, Hatzakis A, Pol S and Rockstroh J (2007). Care of patients co-infected with HIV and hepatitis C virus: 2007 updated recommendations from the HCV-HIV International Panel. *AIDS* **21**:1073-1089.
- ³³ Amorosa V, Synnestvedt M, Gross R, Friedman H, MacGregor RR, Gudonis D, Frank I and Tebas P (2005). A tale of 2 epidemics: The intersection between obesity and HIV infection in Philadelphia. *JAIDS* **39(5)**:557-561.
- ³⁴ Crum-Cianflone N, Tejidor R, Medina S, Barahona I and Ganesan A (2008). Obesity among HIV patients: the latest epidemic. *AIDS Patient Care & STDs* **22(12)**:925-930.
- ³⁵ Centers for Disease Control and Prevention (2011). *Get the Facts on Diabetes*. Available at: <http://www.cdc.gov/Features/DiabetesFactSheet/>.
- ³⁶ Neuhaus J, Angus B, Kowalska J, et al. (2010). Risk of all-cause mortality associated with nonfatal AIDS and serious non-AIDS events among adults infected with HIV. *AIDS* **24**:697-706.
- ³⁷ Butt A, Fultz S, Kwoh C, et al. (2004). Risk of diabetes in HIV infected veterans pre- and post-HAART and the role of HCV co-infection. *Hepatology* **40**:115-119.
- ³⁸ Tien PC, Schneider MF, Cole SR, et al. (2007). Antiretroviral therapy exposure and incidence of diabetes mellitus in the Women's Interagency HIV Study. *AIDS* **21**:1739-1745.
- ³⁹ Brown TT, Li X, Cole SR, et al. (2005). Cumulative exposure to nucleoside analogue reverse transcriptase inhibitors is associated with insulin resistance markers in the Multicenter AIDS Cohort Study. *AIDS* **19**:1375-1383.
- ⁴⁰ De Wit S, Sabin CA, Weber R, et al. (2008). Incidence and risk factors for new-onset diabetes in HIV-infected patients. *Diabetes Care* **31**:1224-1229.
- ⁴¹ Brown TT, Cole SR, Li X, et al. (2005). Antiretroviral therapy and the prevalence and incidence of diabetes mellitus in the multicenter AIDS cohort study. *Archives of Internal Medicine* **165**:1179-1184.
- ⁴² Adeyami O (2007). Cardiovascular risk and risk management in HIV-infected patients. *Topics in HIV Medicine* **15**:159-162.
- ⁴³ Armah KA, McGinnis K, Baker J, Gibert C, Butt AA, Bryant KJ, Goetz M, et al. (2012). HIV status, burden of co-morbid disease and biomarkers of inflammation, altered coagulation and monocyte activation. *Clinical Infectious Diseases* [epub ahead of publication, downloaded 5/22/2012 from <http://cid.oxfordjournals.org>].
- ⁴⁴ Satlin MJ, Hoover DR and Glesby MJ (2011). Glycemic control in HIV-infected patients with diabetes mellitus and rates of meeting American Diabetes Association management guidelines. *AIDS Patient Care & STDs* **25**:5-12.
- ⁴⁵ Bury JE, Stroup JS, Stephens JR, et al. (2007). Achieving American Diabetes Association goals in HIV-seropositive patients with diabetes mellitus. *Proceedings (Baylor University Medical Center)* **20**:118-123.

-
- ⁴⁶ Adeyemi O, Vibhakar S and Max B (2009). Are we meeting the American Diabetes Association goals for HIV-infected patients with diabetes mellitus? *Clinical Infectious Diseases* **49**:799-802.
- ⁴⁷ Baekken M, Os I, Sandvik L, et al. (2008). Hypertension in an urban HIV-positive population compared with the general population: influence of combination antiretroviral therapy. *Journal of Hypertension* **26**:2126-2133.
- ⁴⁸ Bergersen BM, Sandvik L, Dunlop O, et al. (2003). Prevalence of hypertension in HIV-positive patients on highly active retroviral therapy (HAART) compared with HAART-naïve and HIV-negative controls: results from a Norwegian study of 721 patients. *European Journal of Clinical Microbiology & Infectious Diseases* **22**:731-736.
- ⁴⁹ Caro JJ, Salas M, Speckman JL, et al. (1999). Persistence with treatment for hypertension in actual practice. *Canadian Medical Association Journal* **160**:31-37.
- ⁵⁰ Bozkurt B (2004). Cardiovascular toxicity with highly active antiretroviral therapy: Review of clinical studies. *Cardiovascular Toxicology* **4**(3):243-260.
- ⁵¹ Mondy K & Tebas P (2007). Cardiovascular risks of antiretroviral therapies. *Annual Review of Medicine* **58**:141-155.
- ⁵² Wand H, Calmy A, Carey DL, et al. (2007). Metabolic syndrome, cardiovascular disease and type 2 diabetes mellitus after initiation of antiretroviral therapy in HIV infection. *AIDS* **21**(18):2445-2453.
- ⁵³ Lai S, Fishman E, Lai H, et al. (2008). Long-term cocaine use and antiretroviral therapy are associated with silent coronary artery disease in African Americans with HIV infection who have no cardiovascular symptoms. *Clinical Infectious Diseases* **46**:600-610.
- ⁵⁴ Eron J Jr., Yeni P, Gathe J Jr., et al. (2006). The KLEAN study of fosamprenavir-ritonavir versus lopinavir-ritonavir, each in combination with abacavir-lamivudine, for initial treatment of HIV infection over 48 weeks: a randomized non-inferiority trial. *Lancet* **368**(9534):476-482. [Erratum appears in *Lancet* 2006; **368**(9543):1238].
- ⁵⁵ Mary-Krause M, Cotte L, Simon A, Partisani M, Costagliola D, Clinical Epidemiology Group from the French Hospital Database (2003). Increased risk of myocardial infarction with duration of protease inhibitor therapy in HIV-infected men. *AIDS* **17**(14):2479-2486.
- ⁵⁶ Montes ML, Pulido F, Barros C, et al. (2005). Lipid disorders in antiretroviral-naïve patients treated with lopinavir/ritonavir-based HAART: frequency, characterization and risk factors. *Journal of Antimicrobial Chemotherapy* **55**(5):800-804.
- ⁵⁷ Grunfeld C, Kotler DP, Arnett DK, et al. (2008). Contribution of metabolic and anthropometric abnormalities to cardiovascular disease risk factors. *Circulation* **118**(2):e20-e28.
- ⁵⁸ Centers for Disease Control and Prevention. *FastStats: Smoking*. Data from the 2010 National Health Interview Survey. Downloaded 5/21/2012 from <http://www.cdc.gov/nchs/fastats/smoking.htm>.
- ⁵⁹ Tien PC, Choi AI, Zolopa AR, Benson C, Tracy R, Scherzer R, Bacchetti P, Shlipak M and Grunfeld C (2010). Inflammation and mortality in HIV-infected adults: Analysis of the FRAM study cohort. *JAIDS* **55**:316-322.

-
- ⁶⁰ Tesoriero JM, Gieryic SM, Carrascal A and Lavigne HE (2010). Smoking among HIV positive New Yorkers: prevalence, frequency, and opportunities for cessation. *AIDS and Behavior* **14**:824-835.
- ⁶¹ Miguez-Burbano MJ, Burbano X, Ashkin D, Pitchenik A, Rodriguez A, Pineda L, et al. (2003). Impact of tobacco use on the development of opportunistic respiratory infections in HIV seropositive patients on antiretroviral therapy. *Addiction Biology* **8(1)**:39-43.
- ⁶² Diaz PT, Wewers MD, Pacht E, Drake J, Nagaraja HN and Clanton TL (2003). Respiratory symptoms among HIV-seropositive individuals. *Chest* **123(6)**:1977-1982.
- ⁶³ Nuorti JP, Butler JC, Farley MM, Harrison LH, McGeer A, Kolczak MS, et al. (2000). Cigarette smoking and invasive pneumococcal disease. *New England Journal of Medicine* **342**:681-689.
- ⁶⁴ Nuorti JP, Butler JC, Gelling L, Kool JL, Reingold AL and Vugia DJ (2000). Epidemiologic relation between HIV and invasive pneumococcal disease in San Francisco County, California. *Annals of Internal Medicine* **132(3)**:182-190.
- ⁶⁵ Crothers K, Griffith TA, McGinnis KA, Rodriguez-Barradas MC, Leaf DA, Weissman S, et al. (2005). The impact of cigarette smoking on mortality, quality of life, and co-morbid illness among HIV-positive veterans. *Journal of General Internal Medicine* **20(12)**:1142-1145.
- ⁶⁶ Vittecoq D, Escaut L, Chironi G, Teicher E, Monsuez JJ and Andrejak M (2003). Coronary heart disease in HIV-infected patients in the highly active antiretroviral era. *AIDS* **17(suppl 1)**:S70-S76.
- ⁶⁷ Kirk GD, Merlo C, O'Driscoll P, Mehta SH, Galai N, Vlahov D, Samet J and Engels EA (2007). HIV infection is associated with an increased risk for lung cancer, independent of smoking. *Clinical Infectious Diseases* **45**:103-110.
- ⁶⁸ Turner J, Page-Shafer K, Chin DP, Osmond D, Mossar M, Markstein L, et al. (2001). Adverse impact of cigarette smoking on dimensions of health-related quality of life in persons with HIV infection. *AIDS Patient Care & STDs* **15(12)**:615-624.
- ⁶⁹ Petoumenos K, Worm S, Reiss P et al. (2010). Rates of cardiovascular disease following smoking cessation in patients with HIV infection: Results from the D:A:D Study. 17th Conference on Retroviruses & Opportunistic Infections (CROI 2010). San Francisco. February 16-19, 2010. Abstract 124.
- ⁷⁰ Buchacz K, Baker RK, Moorman AC, Richardson JT, Wood KC, Holmberg SD, Brooks JT and the HIV Outpatient Study (HOPS) Investigators (2008). Rates of hospitalizations and associated diagnoses in a large multisite cohort of HIV patients in the United States, 1994-2005. *AIDS* **22**:1345-1356.
- ⁷¹ US Health Resources and Services Administration, *Oral Health & HIV*, Rockville, MD, 2011
- ⁷² Abel, S.N. and others. Principles of Oral Health Management for the HIV/AIDS Patient. U.S. Health Resources and Services Administration (HRSA) Bureau of HIV/AIDS. 2000
- ⁷³ New York State Department of Health AIDS Institute. Oral Health Care for People with HIV Infection: Clinical Guidelines for the Primary Care Practitioner. December 2001

-
- ⁷⁴ Coulter ID, Marcus M, Freed JR, Der-Martirosian C, Cunningham WE, Andersen RM, Maas WR, Garcia I, Schneider DA, Genovese B, Shapiro MF, Bozzette SA. (2000), Use of Dental Care by HIV-Infected Medical Patients. *Journal of Dental Research*, Vol. 79, No. 6, pp. 1356-1361.
- ⁷⁵ O'Neill, J.F. and others. A Clinical Guide to Supportive and Palliative Care for HIV/AIDS. HRSA Bureau of HIV/AIDS. 2003.
- ⁷⁶ Black M.C., Basile, K.C., Bredling, M.M., Smith, S.G., Walters, M., Merrick, M.T., Chen, J., & Stevens, M.R. (2011). *The National Intimate Partner and Sexual Violence Survey (NISVS): 2010 Summary Report*. Atlanta, GA: National Center for Injury Prevention and Control, Centers for Disease Control and Prevention. Available at http://www.cdc.gov/ViolencePrevention/pdf/NISVS_Report2010-a.pdf.
- ⁷⁷ World Health Organization. *Violence against Women and HIV/AIDS: Information Sheet*. Available at: <http://www.who.int/hac/techguidance/pht/InfosheetVaWandHIV.pdf>.
- ⁷⁸ Fields CV (2012). *Presentation Before the President's Advisory Council on HIV/AIDS (PACHA), February 28, 2012*. Available at www.aids-alliance.org/policy/pacha/45th-pacha-meeting-presentation-c-virginia-fields.pdf.
- ⁷⁹ Machtinger EL, Wilson TC, Haberer JE and Weiss DS (2012). Psychological trauma and PTSD in HIV-positive women: a meta-analysis. *AIDS and Behavior* [epub ahead of print]. PMID: 22249954.
- ⁸⁰ Gielen AC, McDonnell KA, O'Campo PJ and Burke JG (2005). Suicide risk and mental health indicators: Do they differ by abuse and HIV status? *Women's Health Issues* **15**:89-95.
- ⁸¹ Ironson G, O'Cleirigh C, Fletcher MA, Laurenceau JP, Balbin E, Klimas N, et al. (2005). Psychosocial factors predict CD4 and viral load change in men and women with human immunodeficiency virus in the era of highly active antiretroviral treatment. *Psychosomatic Medicine* **67**(6):1013-1021.
- ⁸² Leserman J, Pence BW, Whetten K, Mugavero MJ, Thielman NM, Swartz MD, et al. (2007). Relation of lifetime trauma and depressive symptoms to mortality in HIV. *American Journal of Psychiatry* **164**(11):1707-1713.
- ⁸³ Mugavero MJ, Pence BW, Whetten K, Leserman J, Swartz M, Stangl D, et al. (2007). Predictors of AIDS-related morbidity and mortality in a southern U.S. cohort. *AIDS Patient Care and STDs* **21**(9):681-690.
- ⁸⁴ Mugavero MJ, Raper JL, Reif S, Whetten K, Leserman J, Thielman NM, et al. (2009). Overload: impact of incident stressful events on antiretroviral medication adherence and virologic failure in a longitudinal, multisite human immunodeficiency virus cohort study. *Psychosomatic Medicine* **21**(9):920-926.
- ⁸⁵ Machtinger EL, Haberer JE, Wilson TC and Weiss DS (2012). Recent trauma is associated with antiretroviral failure and HIV transmission risk behavior among HIV-positive women and female-identified transgenders. *AIDS and Behavior* [Epub ahead of print]. PMID: 22426597.
- ⁸⁶ Chung CH, Liebschutz JM, Horton NJ and Samet JH (2006). Association of violence victimization with inconsistent condom use in HIV-infected persons. *AIDS and Behavior* **10**(2):201-207.
- ⁸⁷ Cohen M, Deamant C, Barkan S, Richardson J, Young M, Holman S, et al. (2000). Domestic violence and childhood sexual abuse in HIV-infected women and women at risk for HIV. *American Journal of Public Health* **90**(4):560-565.

⁸⁸ Hogben M (2001). The effect of sexual and physical violence on risky sexual behavior and STDs among a cohort of HIV seropositive women. *AIDS and Behavior* **5**(4):353-361.

⁸⁹ Lang DL, Salazar LF, Wingood DM, DiClemente RJ and Mikhail I (2007). Associations between recent gender-based violence and pregnancy, sexually transmitted infections, condom use practices, and negotiation of sexual practices among HIV-positive women. *JAIDS* **46**(2):216-221.