Additional file 2. Characteristics of included studies

Author (Year)/Study Design	Aim of Research	Sample/Recruitment/Country	Stigma Measure	Outcomes	Confounders	Main Stigma-Related Findings
Earnshaw (2013) Cross-sectional	To evaluate the HIV stigma framework and to determine the contributions of each HIV stigma mechanism (internalized, enacted, and anticipated) on indicators of health and well-being.	95 people at a community clinic providing integrated HIV were recruited by members of the clinic staff in Bronx, New York, U.S.	Internalized stigma - Adapted Berger (32) and HIV-stigma scale (97)	ARV adherence (Swiss HIV Cohort Study (98)); physical health (chronic illness comorbidity)	Anticipated HIV stigma, Enacted HIV stigma	ARV adherence: Internalized HIV stigma was uniquely associated with indicators of poorer behavioral health and well-being, including more days of medical care gaps and greater likelihood of antiretroviral therapy (ART) non-adherence (effect marginal, p=0.06) (OR=1.73 [0.97, 3.08])
Herek (2013) Cross-sectional	To examine how awareness of societal stigma (felt stigma) and negative feelings toward oneself as a member of a stigmatized group (self-stigma) are related to psychological well-being.	196 English-speaking people who had been diagnosed with HIV for at least 3 months were recruited at two community clinics comprising the East Bay AIDS Research Institute in Oakland and Berkeley, California, U.S.	Felt stigma - Westbrook (99) and Berger (32)	Depression (CES-D, 7 item short form (100)); Anxiety (State anxiety (66)	None	Depression: Felt stigma was a significant predictor of depressive symptoms (r=0.374) Anxiety: Felt stigma scores predicted a significant amount of variance in anxiety scores (r=0.367)
Nyamathi (2013) Cross-sectional	To examine correlates of stigma among rural women living with AIDS.	68 women living with AIDS who participated in a randomized clinical trial intervention were recruited in South India.	Internalized stigma - 4 constructs of a stigma scale (101)	Depression (CES-D (63)); Physical health (HIV symptoms); ARVadherence (Self-reported information on ART adherence history); Access and utilization of health and social services (Recent healthcare visits); Quality of life	None	Depression: Depressive symptomatology was not related to any of the stigma measures. (r=0.03) Physical health: Since social support can be an important predictor of ART adherence, it is not surprising that women who had a high level of internalized stigma had lower CD4 levels. (r=0.21) Adherence with ART There is potential association between stigma and adherence with ART (r= - 0.19) Access and utilization of health and social services: There is possible association between stigma and access and utilization of health and

						social services (r=0.13) Quality of life: Quality of life was associated with higher levels of internalized stigma (r=0.44)
Slater (2013) Cross-sectional	To determine predictors of quality of life (QOL) in older gay men with HIV.	60 older gay men with HIV were recruited between September 2010 and April 2011 through clinician referral at infectious disease/HIV clinics, as well as through the placement of flyers and brochures in HIV clinics and AIDS service organizations in Alabama, Georgia, and North Carolina, U.S.	Internalized HIV Stigma Instrument (102)	Overall quality of life (Hat-QoL (103))	Medical comorbidities, emotional/informational support, emotion-focused coping	Overall quality of life: HIV stigma remained a significant negative predictor of QOL (= - 0.21 (SE=0.08))
Tomassilli (2013) Cross-sectional	To determine the effect of HIV stigma on sexual affect (i.e. sexual anxiety) and the role sexual affect plays in the relationship between HIV stigma and mental health.	60 HIV-positive, sexually active adults who participated in Positive Talk, a pilot study in New York City, U.S.	Berger (32)	Depression (CES-D (63))	None	Depression: HIV stigma was a significant predictor of mental health in Step 1 of analysis, but not Step 2 (=3.78 (SE=2.08))
Wohl (2013) Cross-sectional	To examine differences in HIV stigma versus MSM stigma and the role of these stigmas in depression for HIV-positive Latino and African American MSM.	100 Latino MSM were recruited from five HIV clinics in Los Angeles County, California, U.S.	13 item scale (104)	Depression (BSI (105))	None	Depression: Depression was positively correlated with HIV stigma (r=0.47, p<0.0001)
Chaudoir (2012) Cross-sectional	To examine whether two coping-related factors—spiritual peace and proactive coping—moderate the effect of HIV stigma on depressive symptoms.	525 mostly African-American, 65% male, 52% heterosexual, 68% rural. Alabama, U.S.	Sowell HIV Stigma Scale	Depression (CES-D)	Spiritual peace, proactive coping	Depression: HIV stigma is reliable predictors of significant depressive symptoms (Beta 1.27, SE 0.18, OR=3.56, 95%CI=2.51, 5.04 p<0.001).
Ivanova (2012) Cross-sectional	To investigate correlates of anxiety among 361 women living with HIV (WLWH) of reproductive age.	361 participants for the present study were recruited as part of the Women's HIV fertility survey study. Candidates were recruited with non-random sampling methods from 28 AIDS service organizations (ASOs), eight medical and HIV clinics, and two community health centers in Ontario, Canada	Perceived HIV-stigma - ("Concern with Public Attitudes about People with HIV" subscale of the Berger HIV stigma scale (32))	Anxiety (HADS-A (106))	Age, government assistance, caregiver for a children, romantic/sexual relationship status, born in Canada, undetectable viral load, CD4 count, on antiretroviral medication, reproductive health-related worries, experienced judgment from family and friends for trying to become pregnant	Anxiety: HIV-stigma was positively associated with high anxiety (OR=1.06 (1.04, 1.08))
Newman (2012)	To explore the relationship between social support, perceived stigma, and QOL in	217 HIV-positive adults were recruited when they were receiving free	Berger (32)	Social support (Perceived availability of support	None	Social support: There was a weak, negative association between social

Cross-sectional	HIV-positive adults participating in a family-centered pediatric HIV care and treatment program.	comprehensive HIV care and treatment including ART at Kalembe Lembe Pediatric Hospital in Kinshasa, Democratic Republic of Congo		subscale (107)); Overall quality of life (WHOQOL-HIVBREF (68))		support and perceived stigma (r= - 0.17(225), p<0.01) Overall quality of life: There was a negative association between the combined psychological status/QOL variable and perceived stigma (r= - 0.16 (217), p<0.05)
Pappin (2012) Cross-sectional	To explore correlates of anxiety and depression in patients enrolled in a public sector ART program.	716 participants were recruited in 2007/08 from twelve public ART clinics in five districts in the Free State Province of South Africa	8-item Stigma Scale Questionnaire (108)	Anxiety (HADS (106))	Disruptive side effects, avoidant coping, being a widow	Anxiety: Stigma was associated with an increase in symptoms of anxiety (OR=1.14 CI=(1.07, 1.21))
Paz-Bailey (2012) Cross-sectional	To describe demographics, HIV risk behaviors and sexually transmitted infection prevalence, and identify correlates of unsafe sex.	457 HIV positive men and women living or receiving care or treatment were recruited in two cities of Honduras.	Self-stigma (4 questions)	Risk behavior (unprotected sex)	None	Risk behavior: Self-stigma was associated with increased unprotected sex (OR=1.6 95%CI=(1.1, 2.4))
Rao (2012) Cross-sectional	To examine whether social support mediates the relation between enacted stigma and both depressive symptoms and QOL among HIV outpatients clients, in order to identify mechanisms to reduce HIV stigma and its negative consequences.	120 people living with HIV (PLWH) who received care at Ditan Hospital, a facility specializing in infectious disease in Beijing, China.	Berger (32)	Social support (MOS-SSS-C (109))	None	Social support: Social support was significantly associated with less stigma (r= - 0.26, p<0.01)
Rao (2012) Cross-sectional	To investigate whether depressive symptoms mediate the relationship between stigma and ART adherence.	720 patients who received ART between February and November 2009 and attended the University of Washington Harborview Medical Center HIV Clinic, U.S.	SSCI (110)	Depression (PRIME – MD (111) (112))	Age, sex and race	Depression: HIV-stigma had a strong association with depressive symptoms (□ = - 0.67 (SE=0.05))
Rueda (2012) Cross-sectional	To evaluate whether mastery and social support moderated the negative effect of stigma on depressive symptoms.	825 participants completed an assessment battery (OHTN Cohort Study) between October 2007 and July 2009 at three clinical sites located in the Greater Toronto Area, Canada.	Modified version of The HIV stigma scale (32) (108) (113)	Depression (CES-D (63)), social support (MOS-SSS (72))	Age, education, personal income, recent viral load, time since HIV diagnosis, mastery	Depression: Stigma had a positive association with depressive symptoms (□ = 0.13 CI=(0.07, 0.19))
Steward (2012) Cross-sectional	To examine whether the 4 stigma manifestations – enacted (discrimination), vicarious (hearing stories of discrimination), felt normative (perceptions of stigma's prevalence), and internalized (personal endorsement of	961 people were recruited from a variety of settings including, including nongovernment organizations, AIDS services organizations and hospitals in	Internalized stigma (114)	Depression (BDI version 1(115), validated in India (116)); ARV adherence (on antiretroviral therapy); Access and utilization of health and social services	None	Depression: Depression symptoms were correlated with internalized stigma (r=0.36) ARV adherence: There is possible association between stigma and

	stigma beliefs) – were linked with delays in seeking care among HIV-infected people.	Bengaluru and Mumbai in India.		(Delays in care seeking)		ARV adherence (r=0.08) Access and utilization of health and social services: Internalized form of stigma were correlated with delays in care seeking (r=0.09)
Sumari-de Boer (2012) Cross-sectional	To compare adherence to ART and virological response between HIV-positive indigenous and immigrant, and investigate if differences were related to a difference in psychological variables including: HIV-stigma, QOL, depression and beliefs about medications.	Between January 2008 and June 2009, 201 adults non-pregnant HIV-1 infected patients were asked to participate in the present study at the outpatient HIV clinic of the Academic Medical Centre in Amsterdam, the Netherlands.	Personalized stigma - Berger (32)	ARV adherence (Pharmacy refill non adherence); Physical health (Detectable plasma viral load)	None	ARV adherence: Personalized stigma (OR=1.03, 95% CI: 1.0-1.1, p=0.04) was significantly related to pharmacy-refill non-adherence Physical health: There is possible association between personalized stigma and detectable plasma viral load (OR=1.03, CI=(1.0, 1.08), p=0.27)
Tam (2012) Randomized Control Trial	To determine how QOL may be improved and HIV-stigma can be lessened over time, and to assess the effect of peer support on QOL and internal stigma during the first year after initiating ART among a cohort of HIV-positive people.	228 ARV-naïve patients were recruited to the QOL study within the DOTARV project from October 2008 to November 2009. The study sample was selected from four districts, which consisted of 71 communities in Quang Ninh province, Vietnam.	The Internal AIDS-related stigma questionnaire focused on self-blame and concealment of HIV status (61)	Overall quality of life (Vietnamese version of the WHOQOL-HIVBREF (68))	None	Overall quality of life: There was a significant, yet weak association between QOL change over time and changes in internal AIDS-related stigma ($p<0.001$), $r = -0.36$
Varni (2012) Cross-sectional	To examine if the consequences of stigma-related stressors on psychological well-being depend on how people cope with the stress of HIV stigma.	200 participants were recruited from medical care centers in Vermont, a major university-affiliated hospital in New Hampshire, and through AIDS service organizations in Vermont, New Hampshire, and Massachusetts, U.S.	Enacted stigma - Revised version of Berger (113)	Depression (Symptom Check List-90-R (117)); Anxiety (Symptom Check List-90-R (117))	None	Depression: There is potential association between enacted stigma and depression (r=0.34) Anxiety: There is potential association between enacted stigma and anxiety (r=0.32)
Vyavaharkar (2012) Cross-sectional	To examine physical, psychological and social factors associated with QOL among rural women with HIV.	399 women were recruited from community-based HIV/AIDS organizations that provided HIV care and supportive services to people living with HIV/AIDS (PLWHA) in rural areas of South Carolina, North Carolina, and Alabama, U.S.	Sowell (Internalized HIV stigma and perceived HIV stigma (60))	Depression (CES-D(63)); Overall quality of life (CIQOLL (118)); Social support (MOS-SSS (72))	Depression and social support; HIV symptom frequency, depression, problem-focused coping, perceived situational control, healthy lifestyles and race for quality of life	Depression: Possible associations exist between internalized HIV stigma and depression (r=0.28) Quality of life: Significant association exists between perceived HIV-stigma and quality of life ($\beta = -0.26$ (SE=0.06)) Social support: Possible association exists between internalized stigma

						and perceived social support (r= - 0.22)
Abaynew (2011) Case-control	To examine factors associated with late presentation to HIV/AIDS care in Sub-Saharan Africa.	320 HIV positive individuals who had visited HIV/AIDS care in the ART clinic were recruited from the Dessie referral hospital and Borumeda district hospital, Ethiopia.	Perceived stigma – 5 item questionnaire (119) (120)	Access and utilization of health and social services (Late presentation to HIV/AIDS care)	Living arrangements, ownership residence, pregnancy status, perceived ART side effects, symptoms at HIV testing, HIV status disclosure to partners, ever alcohol use, time spent with steady partner	Access and utilization of health and social services: People living with HIV/AIDS who perceived HIV stigma were more likely to present late to HIV/AIDS care than those who did not perceive HIV stigma (OR=3.1, 95% CI: 1.09-8.76)
Bogart (2011) Cross-sectional	To examine whether perceived discrimination, which has been associated with poor mental health in prior research, contributes to greater depression and post-traumatic stress disorder (PTSD) symptoms among HIV-positive Black men who have sex with men (MSM).	180 participants were recruited via flyers at three HIV social service agencies and an HIV medical clinic in Los Angeles, CA, U.S.	Perceived discrimination – MDS (121)	Depression (8-item depression screener from the Medical Outcome study(122))	Age, stable housing, heterosexual, racial discrimination, sexual orientation	Depression: Individuals who experience racial, sexual orientation, and HIV-related discrimination had worse depression symptoms than did individuals who experience only HIV discrimination □ = -0.00 (SE=0.05)
Hatzenbuehler (2011) Longitudinal	To examine the prospective relationships between experiencing HIV-stigma and symptoms of anxiety and depression, and sexual transmission risk behavior.	314 HIV-infected MSM participated in a secondary HIV-prevention study at their primary care site in Boston, MA, U.S.	Perceived stigma - Two items (123)	Depression (Patient health questionnaire depression severity scale (112)); Anxiety (14 item from Patient Health Questionnaire (112)) Risk behavior (he number of instances of unprotected insertive or receptive anal intercourse with HIV-uninfected or unknown status partners within the past 3 months).	Unclear	Depression: Perceived stigma predicted symptoms of depression (□ =0.16, SE=0.03, df=222, p<0.001) Anxiety: Perceived stigma predicted generalized anxiety (□ =0.05, SE=0.02, df=223, p=0.05). Unprotected receptive anal intercourse was significantly associated with perceived stigma (□ =0.06, SE=0.03, df=250, p=.047).
Nozaki (2011) Cross-sectional	To assess the factors that influence ART adherence in rural settings.	518 clients aged 18 and over that came to the hospital or one of the four rural health centers that offered ART services were recruited in Zambia.	Perceived fear of stigma resulting from taking antiretroviral therapy at home or work	ARV adherence (number of ARV doses missed in the past four days)	Age, cost of return trip, adherence support, way to remember when to take ARVs, felt pressured to share ARVs	Adherence: Perceived fear of stigma resulting from taking ARVs did not maintain significance in the multivariable analysis, probably because of the high association with feeling pressured to share ARVs with someone as confounding factor. (OR=1.06, CI=(0.409, 2.747), p=0.905)

Peltzer (2011) Cross-sectional	To determine the prevalence of depressed mood and associated factors in postnatal HIV-positive women in primary care facilities.	607 HIV-positive women in 48 primary health care clinics and community health centres were recruited through systematic sampling in Nkangala district, South Africa.	Internalized AIDS related stigma scale (61)	Depression (EPDS (124))	Health status, sexual behavior and partner characteristics, social support	Depression: Internalized stigma was associated with depressed mood (OR=1.12 (95% CI=(1.05, 1.19))
Steward (2011) Longitudinal	To examine whether the framework that divides stigma manifestations into enacted, vicarious, felt normative and internalized stigma could explain associations among stigma, efforts to avoid HIV serostatus disclosure, and depression symptoms.	229 HIV-infected individuals were recruited via the outpatient general medicine department of an urban, private hospital in Southern India.	Internalized Stigma (10 item that measures experienced HIV discriminatory acts (114))	Depression (BDI version I (115))	Recruited at hospital, data collection wave, enacted stigma, disclosure avoidance, internalized stigma by wave	Depression: Internalized stigma - remained significant predictor of depression symptoms (=10.985 (SE=1.933))
Tanney (2011) Cross-sectional	To explore the relationship between depression, stigma and risk behaviors in a multi-site study of high-risk youth living with HIV.	186 youth were recruited at the time of a regularly scheduled visit or at supportive activities at four Adolescent Trials Network sites located in Fort Lauderdale, Philadelphia, Baltimore, and Los Angeles and one non-ATN site located in Detroit, U.S.	Berger HIV Stigma Scale (32)	Depression (BSI (125))	None	Depression: Association existed between stigma and depression (r=0.44)
Traeger (2012) Longitudinal	To identify risk factors for missed HIV primary care visits; to inform efforts toward increasing care engagement; and to test HIV-relevant factors, health/treatment, psychiatric, and patient perception factors for appointment non-adherence controlling for socioeconomic indicators.	503 HIV primary care patients were recruited via several methods including specific in-house recruitment drives, medical provider referrals, distribution of study flyers throughout Fenway Health, and informational tables set up in clinic lobbies in New England, U.S.	"I feel ashamed that I have HIV"	Access/utilization of health services (at least one missed HIV medical appointment attendance)	Socioeconomic factors, demographic factors, racial/ethnic identification, health and treatment factors, psychiatric disorders	Access and utilization of health services: HIV stigma did not predict risk for non-adherence (OR=1.35, 95% CI=(0.83, 2.20))
Wohl (2011) Cross-sectional	To examine the role that social support, stress, stigma and HIV disclosure play in the retention of HIV care for African Americans and Latinos.	334 African American and Latino women and MSM were recruited from five HIV clinics in Los Angeles County, U.S.	Emlet HIV stigma (104)	Access and utilization of health and social services (Retention in HIV care – two or more primary care visits in the 6 months before the study interview)	General support, general stress, HIV-specific support, HIV-specific stress, satisfaction with support, gender/identity, race/ethnicity, age in years, CD4 cell count, years since HIV diagnosis, number of network members to whom HIV status was disclosed,	Access and utilization of health and social services: Data on the mean scores for HIV-stigma –were presented for those who were and were not retained in HIV care. There were no statistical differences found between the two groups.(OR=0.9, CI=(0.9, 1.0))

					chronic burden score, HIV-related symptoms, BSI score, MSM stigma	
Abboud (2010) Cross-sectional	To determine the impact of HIV/AIDS on the quality of life (QoL) in adult patients living with HIV/AIDS.	A convenience sample of 41 adults living with HIV/AIDS were recruited through physicians in the spring of 2007 from two major hospitals in Beirut, Lebanon.	Sowell (60)	Overall quality of life (MQoL-HIV (126))	Symptom, relationship status, education level	Overall quality of life: perception of being stigmatized predicted poorer QOL (□ = - 21.51 (SE=7.08))
Dietz (2010) Longitudinal	To identify factors associated with appointment-keeping among HIV-infected adolescents and young adults.	178 HIV-infected adolescent and young adult females were recruited in five cities in the U.S..	Berger (32)	Access and utilization of health and social services (Appointment keeping, defined by the number of clinic visits attended)	ART status and CD4 count, CES-D, marijuana use during past 90 days, alcohol use during past 90 days, mood disorder, social network support, health care satisfaction and illness cognition	Access and utilization of health and social services: HIV stigma subscales were not significantly associated with the outcome of interest (OR=1.00, CI=(0.99, 1.00))
Grov (2010) Cross-sectional	To evaluate the association between depression, loneliness, health, and HIV-related stigma among HIV-positive adults over the age of 50.	914 participants who were at least aged 50, HIV-positive, not institutionalized were recruited by ACRIA through NYC AIDS Services Organizations, clinics and the agency's client database using flyers, presentations by ACRIA staff, mail and email contacts in the U.S.	Berger (32)	Physical health (MOS-HIV (70))	None	Physical health: significant negative correlations existed between HIV-stigma and all five measures of perceived health (r = - 0.09)
Vyavaharkar (2010) Cross-sectional	To examine the relationships between HIV-stigma, social support, and depression in a sample HIV-infected African American women.	338 women recruited from community based HIV consortiums that provided services to HIV-infected women living in rural areas of South Carolina, North Carolina, and Alabama, U.S.	Internalized stigma scale	Depression (CES-D (63))	Social support	Depression: Stigma variables (internalized stigma) were significantly and positively correlated with depression (□ =0.22 (SE=0.05))
Clum (2009) Longitudinal	To test the hypothesis that HIV-stigma was associated with increased engagement in risk behaviour in young, HIV positive women and that depressive symptoms and social support mediate this relationship; to conduct a latent class analysis of risk behavior that included indices of both sexual and drug risk to assess risk behavior in young women with HIV.	147 U.S. HIV-infected female adolescents and young adults aged 13 to 24 who were receiving HIV-related care at Adolescent Medicine Trials Network (ATN) sites in New York City (Montifiore Medical Center. Adolescent AIDS Program), Miami (University of Miami/Jackson Memorial Medical Center), New Orleans (Tulan Medical Center), Chicago (Stroger Hospital of Children's Hospital, University of Southern California).	Berger	Depression (NIMH Diagnostic interview schedule for children (Shaffer, 2000)); Social support (Social Provisions Scale (Russell, 1984)); Risk behavior (unprotected serodiscordant sex, partner concurrency)	None	Depression: There is possible association between HIV stigma and depression (r=0.314) Social support: There is possible association between HIV stigma and social support (r= - 0.367) Risk behavior: There is a possible lacks of association between HIV stigma and risk behavior (r = 0.006)

DiIorio (2009) Cross-sectional	To test a psychosocial model of medication adherence among people taking antiretroviral medications.	236 participants were recruited at a clinic that serves people with HIV located in a large southeastern metropolitan area in U.S.	Personal stigma items from the Perceived Stigma of HIV/AIDS Scale (127)	Social support (Personal Resource Questionnaire (128)); ARV adherence (UCSF Adherence Questionnaire (73))	None	Social support: There is possible association between stigma and social support (r= - 0.134) ARV adherence: There is possible association between stigma and ARV adherence (r= - 0.22)
Dowshen (2009) Cross-sectional	To examine the experiences of HIV-stigma among young MSM by interpreting data from the total stigma scale and four subscales: personalized stigma, public attitudes, negative self-image, and disclosure concerns.	42 ethnically diverse young MSM were recruited consecutively from August 2004 to September 2005 through various avenues including flyers, e-mails, and snowball sampling in Chicago, U.S.	Berger HIV Stigma Scale (32)	Depression (BSI (64)); Social support (MSPSS (129))	None	Depression: Total stigma scale score were significantly, positively correlated with depression (r=0.356) Social support: Total stigma scale scores were significantly, positively correlated with social support (r= -0.316)
Kalichman (2009) Cross-sectional	To test the psychometric properties of the Internalized AIDS-Related Stigma Scale (IA-RSS) to measure internalized AIDS-related stigmas among people infected with HIV in three countries.	1068 HIV-positive people were recruited from ART/infectious disease clinics and support groups in South Africa; 1090 recruited from HIV-related medical centers in Swaziland; 219 were recruited from community support and HIV treatment services in the U.S.	Internalized AIDS-Related Stigma Scale (130)	Depression: (CES-D (63)); Physical health (HIV symptoms); Social support (Social Support Questionnaire (71))	None	Depression: Internalized stigma was positively correlated with depression scores in all three countries, higher internalized stigma scores were related to greater depression symptoms (Cape Town r=0.27, Swaziland r=0.31, Atlanta r=0.38) Physical health: Internalized stigma was correlated with HIV symptoms

						in Swaziland and not in Cape Town or Atlanta (Cape Town r=0.05, Swaziland r=0.18, Atlanta r=0.12) Social support: Internalized stigma was inversely associated with social support in all three countries with greater internalized stigma scores relating to lower social support, although weakly in Swaziland (Cape Town r= - 0.32, Swaziland r=-0.08, Atlanta r= - 0.26)
Li (2009) Cross-sectional	To examine complex relationships among demographics, HIV-stigma, and social support and their impact on depression among PLWHA.	408 individuals from four district hospitals were recruited by healthcare workers and research staff in the Northern and North-eastern regions of Thailand.	Perceived stigma in scales adapted from HIV-stigma (131), and validated by Thai investigators (132)	Depression (15-item depression screening test(133)); Emotional social support (two subscales in the MOS-SSS (72))	None	Depression: Levels of depression were significantly correlated with levels of perceived stigma (r=0.4) Emotional and social support: Significant negative correlations were observed among emotional social support and perceived stigma (r= - 0.19)
Sayles (2009) Cross-sectional	To estimate the association between HIV-stigma and self-reported access to care, regular source of HIV care, and antiretroviral therapy adherence; and to test whether mental health mediates these associations.	142 HIV-positive adults were recruited from five community organizations providing outreach and social services to PLHA, as well as two HIV clinical care sites in Los Angeles County, U.S.	Internalized HIV stigma - 28-item scale (102)	ARV adherence (self-reported "Sub-optimal ART adherence"); Access and utilization of health and social services (Poor access to care measure)	Age, gender, race/ethnicity, education, sexual orientation, history of intravenous drug use, income, insurance status, years since diagnosis, and CD4 count	ARV adherence: When the mental health composite score (MCS) was added to the model predicting suboptimal ART adherence, the association between high stigma and adherence was no longer statistically significant (OR=2.09, CI=(0.81, 5.39)) Access and utilization of health and social services: When the MCS was added to the model predicting poor self-reported access to care, high stigma remained significantly associated with poor access (OR=4.42, CI=(1.88, 10.37))

Carlucci (2008) Cross-sectional	To assess travel to point-of-care for ART as a potential barrier to adherence within the context of patient demographics, perceived stigma, and selected clinical indices.	409 patients who were receiving ART were recruited from the Macha Mission Hospital (MMH), Zambia	Patient perceived HIV stigma	ARV Adherence (doses taken/prescribed)	Home-to-MMH travel duration (dry season), WHO stage 3 or 4, BMI, cost of transport (dry season)	ARV adherence: perceived stigma did not demonstrate any significant (P< 0.05) predictors of adherence (OR=1.1, CI=[0.55, 2.1])
Keeney (2008) Cross-sectional	To examine the relationship between PTSD symptomatology, substance abuse, alcohol abuse, depression, HIV-stigma, HIV symptoms, QOL and treatment adherence in PLWHA.	154 HIV-infected adult men and women were recruited via flyers posted at various HIV medical clinics and social service agencies on Staten Island, U.S.	HIV Stigma Measure (134)	ARV adherence (2)	None	ARV adherence: HIV-stigma exhibited no relationship to treatment adherence (r=0.10, p=0.24)
Mogengege (2008) Cross-sectional	To explore the impact of situational HIV variables (stigma and disclosure) and resilience factors (family coping and help seeking behaviors) on self-ratings of maternal depression and parent-ratings of child emotional functioning.	62 HIV-positive African American were contacted by student investigators and recruited from ASOs in Metropolitan Washington, D.C. area, U.S.	HIV Stigma Scale (32)	Depression(CES-D (63))	None	Depression: Results showed significant correlations between maternal depression and stigma (r=0.5, p<0.01)
Sayles (2008) Cross-sectional	To develop and evaluate a multi-dimensional measure of internalized HIV stigma that captures stigma related to treatment and other aspects of the disease among socio-demographically diverse PLWHA.	202 HIV-positive adults were recruited from five community-based organizations providing outreach and social services to HIV-positive women and men, as well as from two HIV specialty clinics in a large U.S. city.	Developed by authors (135) (102)	Emotional and mental distress (12 item Medical Outcomes Study Short Form - mental (65)), social support (Fleishman social support scale (136)), physical health (12 item Medical Outcomes Study Short Form - physical (137))	None	Emotional and mental distress: The SF-12 MCS was significantly negatively correlated with the stigma scale (r's ranged – 0.26 to – 0.44), such that those who reported greater levels of internalized stigma also reported poorer mental health. (r = - 0.50) Social support: The overall internalized stigma scale was negatively correlated with social support (r= - 0.43), such that persons reporting greater levels of stigma experienced low levels of social support. Physical health: Though we hypothesized the SF-12 PCS would be weakly correlated with stigma scales, no significant correlation

						was found in our sample (r= - 0.14)
Brennan (2007) Cross-sectional	To examine the association between specific "characteristics of the population at risk", "individual determinants" and HIV medical care utilization, specifically, a HIV infected individual's attitudes and beliefs, referred to in Anderson's model as predisposing mutable characteristics, were examined.	135 HIV infected individuals accessing HIV medical care in Baton Rouge, Louisiana, U.S.	HIV stigma scale (32)	Access and utilization of health and social services (HIV medical care utilization)	Age, transmission risk by injection drug use, length of diagnosis and length of scheduled return	Access and utilization of health and social services: For every one point increase in a HIV infected individual's perceived stigma, a HIV infected individual is 2% less likely to return to utilize HIV medical care (OR=0.98 CI=[0.96, 1])
Emlet (2007) Cross-sectional	To examine the experiences of HIV-stigma in a sample of 25 older adults with HIV/AIDS.	25 participants recruited from the local AIDS service organization (ASO), county public health, infectious disease clinics, and medical centers in the Pacific Northwest of U.S.	Berger HIV Stigma Scale (32)	Depression (CES-D (63))	None	Depression: Higher scores on the CES-D were positively correlated with all stigma subscales and overall score (r=0.627, p=0.001)
Kinsler (2007) Longitudinal	To evaluate the relationship between perceived stigma from a health care provider and access to care among PLWHAs to see whether perceived stigma in clinical settings may discourage HIV-infected individuals from accessing needed health care services.	223 low income, HIV-infected individuals were enrolled in this study in Los Angeles County, U.S.; 171 completed the follow up questionnaire and was used for the analysis.	Four items perceived stigma (adopted from the HCSUS instrument (138))	Access and utilization of health and social services (Low level of access to care (138))	Gender, race/ethnicity, age, education, income, insurance, exposure/risk category (MSM), CD4, birthplace (United States)	Access and utilization of health and social services: Perceived stigma from a health care provider was significantly associated with low levels of access to care at 6-month follow up (adjusted OR=2.85, CI=(1.06, 7.65))
Mak (2007) Longitudinal	To test the attributional pathway from perceived control to responsibility to self-blame and finally to self-stigmatization; and to examine the social and psychological consequences of stigma.	150 PLWHAs were recruited when they came for regular medical appointments at the AIDS Clinic, the only AIDS service unit operated by the Hospital Authority in Hong Kong. 119 participants were re-interviewed at a mean lapse of seven months on their physical and mental health.	Developed by authors	Social support (MOS-SSS (72))	Internal controllability, perceived responsibility, perceived blame	Social support: Increased level of self-stigma was shown to significantly reduce social support (□ = - 0.42, p<0.05)
Murphy (2007) Cross-sectional	To explore the impact of maternal disclosure of HIV-positive serostatus on young children, utilizing in-depth qualitative interviews.	Agency staff identified potential participants and obtained mothers' verbal consent to be contacted by UCLA interviewers about the study. 236 participants for the study were recruited from 11 clinical primary care sites and three AIDS service organizations throughout the Los Angeles County, U.S.	Berger HIV Stigma Scale (32)	Depression (Hamilton Depression Inventory (139))	Alcohol use, social provision, health-related anxiety, self-reported fair/poor health, number of illness symptoms	Depression: This model confirmed a significantly positive association between stigma and depression (□ =0.361 (SE=0.078), p=0.001)

Naar-King (2007) Longitudinal	To evaluate the care utilization and health outcomes of newly diagnosed persons in the Outreach Initiative over 12 months of follow-up.	104 newly diagnosed people living with HIV/AIDS were recruited from Outreach Initiative sites in the U.S. Data were available for 86 people at 6 months and 79 people at 12 months.	Perception of HIV stigma (140) (108)	Access and utilization of health and social services (Decreased adequate retention in HIV care)	Unmet support service needs decreased, decrease in binge drug and alcohol use, improvement in insurance coverage, improvement in MCS, less than 30 years old	Access and utilization of health and social services: Stigma was not associated with retention (AOR= 1.03, CI=(0.78, 1.37), p=0.84)
Prachakul (2007) Cross-sectional	To examine relationships among functional social support, HIV related stigma, social problem solving, and depressive symptoms.	During June 2004, 30 people living with HIV were recruited from two HIV outpatient clinics in the southeastern United States.	Sowell HIV Stigma Scale (60)	Depression (CES-D (63)); Social support (Interpersonal Support Evaluation List (141))	None	Depression: HIV-stigma was associated positively with depressive symptoms (r=0.46, p=0.01). Social support: HIV-stigma was associated negatively with functional social support (r= - 0.49, p<0.01)
Wingood (2007) Cross-sectional	To investigate the association between self-reported HIV discrimination and health outcomes among African-American and white women living with HIV.	366 women were recruited by project staff from seven of the largest clinics and health departments providing medical care to women living with HIV/AIDS in Georgia and Alabama, U.S.	Perceived HIV discrimination by direct asking	Access and utilization of health and social services (Not sought medical care for HIV/AIDS in this past year)	Race and health insurance status	Access and utilization of health and social services: Women who reported HIV discrimination were more likely to have not sought HIV/AIDS medical care (OR=2.5, 95% CI=(1.2, 5.4), p=0.02)
Wright (2007) Cross-sectional	To shorten a HIV stigma scale to make it less burdensome for HIV-positive youth without compromising psychometric properties.	64 youths infected with HIV were recruited from an adolescent HIV clinic within a tertiary care children's hospital located in a major metropolitan area in the U.S.	Berger HIV Stigma Scale (32)	Depression (BSI(64)); anxiety (BSI(64)); Social support (shortened Social Provision Scale(142))	None	Depression: Depression positively correlated with the more personal effects of stigma (r=0.351) Anxiety: Anxiety positively correlated with the more personal effects of stigma (r=0.241) Social support: There is possible association between stigma and social support (r= - 0.198)
Peretti-Watel (2006) Cross-sectional	To investigate the patterns of HIV disclosure to significant others (parents, siblings, children, other relatives, friends and colleagues) and describe them in terms of socio-demographic background and other characteristics, including experiences of AIDS-related	2484 people living with HIV/AIDS were recruited in 102 French hospital departments delivering HIV care by the French National Agency of AIDS Research	Direct questioning	ARV adherence (3 ordered values (high, moderate and poor adherence) validated in previous cohort studies (143))	Age, being a migrant, adverse effect of HARRT, potential alcohol abuse, drug injection, living in a couple, disclosure patterns	ARV adherence: Those who have already experienced discrimination from sexual partners were less prone to be highly adherent to their treatment (OR=1.68, CI=(1, 2.82))

	discrimination.					
Rintamaki (2006) Cross-sectional	To evaluate whether social stigma may prevent people living with HIV from revealing their status to others and thus serve as a barrier to HIV treatment adherence as assessed by concerns on self-reported treatment adherence.	204 consecutive HIV-infected patients receiving medical care, who were prescribed one or more antiretroviral medications, and available for interviews prior to their physician visit at outpatient infectious disease clinics were recruited for this study at Northwestern Memorial Hospital and the Louisiana State University Health Sciences Center at Shreveport, U.S.	PMAQ (144, 145)	ARV adherence (PMAQ (144) (145))	Age, gender, race, education, number of HIV medications in regimen, site	ARV adherence: A high concern for stigma was the only statistically significant, independent predictor of missed medication doses in past 4 days (OR=3.3, CI=(1.4, 8.1))
Vance (2006) Cross-sectional	To examine self-reported emotional health in adults with and without HIV and to assess the effects of age and other factors on such ratings of emotional health.	50 HIV-positive participants were recruited from north central Alabama, U.S. for a study initially investigated cognitive aging.	Sowell (60)	Emotional and mental distress (Self-rated emotional health by directly asking)	None	Emotional and mental distress: The self-rated emotional health questions were significantly related to HIV stigma (r= - 0.32, p< 0.05)
Prachakul (2005) Cross-sectional	To examine where social support, HIV-stigma, and social problem-solving are mediators of the relationship between HIV-related sign and symptom severity, physical limitations and depressive symptomatology in PLWHAs; and toto explore the family structure of PLWHAs through their selection of family of choice.	150 people living with HIV, primarily males and African Americans, were recruited during their visits at two HIV outpatient clinics in a southeastern U.S.	Demi-HIV Stigma Scale (146)	Depression (CES-D (63))	HIV-related signs and symptom severity and four social demographic variables (i.e. age, gender, race and duration of the disease)	Depression: There was a significant relationship between HIV-stigma and depressive symptomatology (=0.442 (SE=0.094), p<0.01)
Relf (2005) Cross-sectional	To determine the level and impact of HIV-stigma in a culturally diverse sample of persons attending an urban HIV clinic.	87 people attending an urban clinic were recruited from a U.S. city.	Berger HIV Stigma Scale (32)	Depression (CES-D(63)); Overall quality of life (34-item instrument (147))	None	Depression: Stigma was found to be associated with depressive symptomatology; although the associations were not strong, they are theoretically and clinically important (r=0.28, p=0.0094) Overall quality of life: HIV-stigma may be associated with an overall lower quality of life (r= - 0.40, p=0.0001)

Nachega (2004) Cross-sectional	To investigate the level of adherence in a group of HIV-1-infected individuals in the poor, urban township of Soweto, South Africa, where only limited access to ART has been available.	66 HIV infected patients who received care at the HIV Outpatient Clinic of Chris Hani Baragwaneth Hospital were recruited in in Soweto, South Africa.	Fear of stigmatization (Rejection or violence or both)	ARV adherence (ratio of doses taken to doses prescribed over the previous month)	None	ARV adherence: The odds of obtaining > 95% adherence decreased considerably with an increased fear of stigmatization (rejection or violence or both) by the patient's sexual partner (OR=0.13, 95% CI=(0.02 – 0.70))
Heckman (2002) Cross-sectional	To study the rates and predictors of depressive symptomatology in HIV-positive older persons using the CIQOL model, which posits that emotional distress in HIV-positive persons is a function of AIDS-related stigma, barriers to health care and social services, physical well-being, social support, and engagement coping.	AIDS service organizations in New York and Milwaukee, WI contacted client who were 50+ years of age and notified them of an opportunity to participate in a study examining the life circumstances of HIV-infected older adults. 83 HIV-infected individuals who enroll in the project contacted research staff in their respective city	2-tem scale assessing perceptions of AIDS-related stigma. The two items were "Lack of knowledge about HIV/AIDS among community residents" and "Community residents' stigma against persons living with HIV/AIDS."	Physical health (Physical well-being subscale of the FAHI (148)); social support (PSRS (149)); Access and utilization of health and social services (BACS (150))	None	Physical health: There is potential association between AIDS-related stigma and barriers to care and services (r= 0.42) Social support: There is a possible association between AIDS-related stigma and physical well-being (r= - 0.22) Access and utilization of health and social services: There is a potential association between AIDS-related stigma and perceptions of social support (r = - 0.11)
Berger (2001) Cross-sectional	To test measure the stigma perceived by people with HIV that was developed based on the literature on stigma and psychosocial aspects of having HIV.	318 people infected with HIV answered questionnaires distributed by 60 organizations in eight U.S. states	Berger HIV Stigma Scale (32)	Depression(CES-D(63)); Social support (Social support indices (107))	None	Depression: Higher levels of depression were associated with higher levels of overall stigma (r=0.63) Social support: Social support availability and validation showed similar patterns: moderate negative correlations with the total stigma score (r=0.54)
Reece (2001) Cross-sectional	To examine factors (physical and psychological health status, health beliefs, and perceptions of HIV stigma) associated with an increased likelihood of HIV-positive clients dropping out of a community-based psychotherapy program.	132 HIV positive individuals accessing mental health care were recruited, at an inner city, HIV-related mental health clinic in Atlanta, Georgia, U.S.	HIV Stigma Measure (60)	Depression (BSI depression (64)); Anxiety (BSI anxiety (64)); Physical health (positive symptoms); Access and utilization of health and social services (Drop out from care)	None for depression, anxiety and physical health. For access and utilization of health and social services, confounders include demographics, health status indicators, psychological health (BSI) indicators, health belief model	Depression: Significant associations were detected between perceived stigma and – depression (r=0.52) Anxiety: Significant associations were detected between perceived stigma and anxiety (r=0.48) Physical health: Significant associations were detected between

					constructs	perceived stigma and physical symptom total (r=0.45) Access and utilization of services: Increased levels of perceived stigma were significantly associated with dropout from care (exp(□)=1.29 CI=[1.02, 1.64], p=0.0353)
Demi (1998) Cross-sectional	To investigate the association of suicidality sociodemographic characteristics, HIV related symptoms, perceived stigma, depressive mood, emotional distress, and family cohesion in HIV-positive women.	214 women with HIV infection were recruited from six AIDS-HIV public health treatment sites and two community-based treatment programs in a southeastern U.S. state.	Demi-HIV Stigma Scale (146)	Depressive mood (BSI(64)); Emotional and mental distress(BSI(64)); physical health (number of HIV symptoms)	None	Depression: Greater perceived stigma were associated with higher levels of depressive symptoms (r=0.52) Emotional and mental distress: There is association between perceived stigma and emotional and mental distress (r=0.53) Physical health: Greater HIV-related symptoms were associated with greater perceived stigma (r=0.29)
Bozarth (1998) Cross-sectional	To examine the relationship of the perception of stigma, social support, depression, coping, and spirituality to the health status of individuals with HIV/AIDS.	43 HIV-positive people accessing AIDS service organizations were recruited in both metropolitan and rural areas, in the Southern U.S.	12-item perception of stigma scale (created by study author)	Depression (CES-D(63)); Physical health (health status); social support (MSPSS (129))	None	Depression: The strongest correlations are between perception of stigma and depression (r=0.758, p<0.000) Physical health: All predictor (including stigma) are significantly correlated with health status (r= - 0.51) Social support: All predictors are significantly associated with one another (sigma and social support) (r= - 0.54)
Miles (1997) Longitudinal	To study the contribution of selected personal (ie. stigma, mastery) and family (ie. conflict, support) characteristics and health-related factors to depressive symptoms in HIV-positive mothers with infants; and to determine which of these	54 HIV-infected mothers with infants recruited in the pediatric HIV clinic of two southeastern University Medical Centers in U.S.	Demi-HIV Stigma Scale (146)	Depression (CES-D(63)); physical health (Short Health Survey(151))	None	Depression: Stigma was significantly related to depression (□ =6.45 (SE=2.07)) Physical health: level of perceived stigma was correlated with more

	factors predict depressive symptoms.					perceived physical symptoms (r=0.39)
Moneyham (1997) Cross-sectional	To examine the role of psychological factors as mediators on the impact of HIV-related stressors on emotional distress of a clinic-based sample HIV-positive women.	Between 1993 and 1994, 264 HIV-infected women were recruited by female research assistants from eight HIV/AIDS treatment sites serving both rural and urban settings in Georgia, U.S.	13-items for perceived stigma developed by authors	Emotional and mental distress (17-item scale representing a range of positive and negative emotional responses)	None	Emotional and mental distress: All of the stressor and mediator variables (including stigma) are positively and significantly related to the outcome measure, emotional distress. (r=0.46, p<0.05)

* The sample size in the Sample/Recruitment/Country column was the sample size for the analysis.
# Main findings were interpreted based on multivariate model results rather than bivariate model
CES-D: Center for Epidemiological Studies Depression Scale
BDI Version 1: Original Beck Depression Inventory
CIQOLL: Chronic Illness Quality of Life Ladder (CIQOLL)
MOS-SSS: Medical Outcomes Study Social Support Survey (MOS-SSS)
MOS-SSS-C: The Chinese version of the Medical Outcomes Study-Social Support Survey (MOS-SSS-C)
BSI: Brief Symptom Inventory (BSI)
SSCI: stigma scale for chronic illness (SSCI)
PRIME – MD: the primary care evaluation of mental disorder (PRIME – MD)