Commentary

Impact of Psychiatric Disorders on the HIV Epidemic

Mental illness continues to fuel the HIV epidemic. There is a high prevalence of mental disorders in the HIV-infected population and a high prevalence of HIV infection in the mentally ill. Without effective treatment of mental disorders, HIV treatment outcome is poor, and transmission of disease continues. High frequencies of mental illness are found in corrections facilities, among the homeless, among injection drug users, and in patients attending sexually transmitted disease clinics. Such populations must be targeted for effective mental health treatment if overall outcomes of HIV treatment are to be improved and transmission of HIV is to be reduced. This article summarizes a presentation on mental illness and the HIV epidemic made by Andrew F. Angelino, MD, at the 10th Annual Ryan White HIV/AIDS Program Clinical Update in June 2007. The original presentation is available as a Webcast at www.iasusa.org.

Considerable overlap exists among the population of individuals with mental disorders and the HIV-infected, homeless, and corrections populations, with the high frequency of mental disorders in these latter populations associated both with risk behaviors for acquiring and transmitting infection and with poorer outcome as the result of failure to seek or adhere to appropriate treatment. Mental disorders thus play a major role in fueling the ongoing HIV epidemic, and treatment of these disorders would go a long way toward improving overall HIV care and reducing transmission. We know where many at-risk individuals are—whether in corrections facilities or neighborhoods marked by high rates of injection drug use (IDU)—and we need to convince our legislators and other public servants that extending effective treatments to these populations benefits society as a whole.

Mental Disorders in HIV-infected Persons

There is a clear interrelationship of HIV infection and mental illness. In the Johns Hopkins Moore (HIV) Clinic, the prevalence of non–substance abuse axis I disorders in new medical intakes (ie, patients coming for their first visit after receiving a diagnosis of HIV infection) was measured at 54%, including major depression in 20% and adjustment disorder in 18%. Substance use disorders were found in 74% of patients, cognitive impairment in 18%, and personality disorder in 26%. The emotional response to the recent diagnosis is probably largely reflected in the rate of adjustment disorder, but the remainder of the disorders predate the diagnosis. Prevalence rates of HIV infection in mentally ill inpatient and outpatient populations have been reported at 5.2% to 22.9% (Carey, *Prof Psychol Res Pract*, 1995; Cournos, *Clin Psychol Res,* 1997; McKinnon, *Psychiatr Serv*, 1998), compared with a rate of 0.3% to 0.4% in the US general population over a comparable time period (McQuillan, *J Acquir Immune Defic Syndr Hum Retrovirol*, 1997).

Although some people acquire HIV infection via an isolated sharing of a contaminated needle or an unprotected sexual encounter, these are unusual episodes. Far more frequently, infection is acquired when risk behaviors are chronically repeated, and mental illness is a significant contributor to the repetition of risk behaviors, as well as to the likelihood of winding up in environments in which risk behaviors are both more common and more likely to result in acquiring infection.

The effect of having significant mental illness on one's life outcomes—relationships, education, employment, socioeconomic status, etc—has been shown to be a "downward drift." This means that more mentally ill people are living, often with few social and emotional supports, in impoverished areas where illicit drug use is rampant. In such areas, because the rates of IDU are high, exposure to drugs of abuse is also high, and therefore initial use becomes more likely. Early users are at high risk of sharing needles and the other "works" of drug use; the median time to getting one's own "outfit" in 1 study was 1.67 years (Waldorf D, *Criminal Justice Policy Rev*, 1989). In areas where IDU is prevalent, HIV infection is also prevalent, so needle-sharing in these areas tends to increase the risk of transmission. Determining who is in need of mental health care is not difficult, and we need to concentrate on such individuals and such areas if we are to make a serious inroad to stopping continued transmission and poor outcomes of HIV treatment.

Various studies have shown that outcomes of HIV treatment are worse in individuals with untreated mental illness. HIV-infected women with chronic depressive disorder have a 2-fold greater relative risk of death than do those without depression, with the relative risk greater than 4-fold in women with CD4+ counts below 200 cells/μL (Ickovics, *JAMA*, 2001). Patients with psychiatric disorders have a slower rate of virologic suppression and a faster rate of virologic failure than do counterparts without such disorders (Pence, *J Acquir Immune Defic Syndr Hum Retrovirol*, 2007), and lack of psychological resources has been associated with increased mortality in HIV-infected women (Ickovics, *AIDS*, 2006).

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At-risk Populations: Corrections and the Homeless

Data from 2005 in the United States indicated that 56% of the approximately 1,255,500 state prison inmates, 45% of the 156,600 federal inmates, and 64% of the 747,500 local jail inmates had histories or symptoms of mental health problems (US Department of Justice Bureau of Justice Statistics, 2006). Although the United States incarcerates more people than any other nation, the association of mental illness with incarceration is not limited to this country. For example, among 189 prisoners examined in Melbourne, Australia, 23% had current mood disorders and 3% had psychotic disorders; overall, 82% had at least 1 lifetime mental disorder, 26% had at least 2 lifetime disorders, and 69% had at least 1 lifetime substance use disorder (Herrman, *Am J Psychiatry*, 1991).

Statistics such as these suggest that we lock up our mentally ill more than hospitalize them. What happens when they are incarcerated? In open forums, US corrections administrators and legislators usually report that there is no problem with sex or drugs in prisons. In the 1840s, however, Fyodor Dostoevsky was in a Siberian prison, and later wrote about how wealthier inmates would have money sent to them, which was used to pay poorer inmates to shine their boots or repair their clothing; the poorer inmates used the money to buy vodka. If vodka could be had in the middle of nowhere in 1840, it is a good bet that there is heroin available in, say, the Baltimore City Jail or another facility in 2008.

And there is. A recent study on injection drug use in US corrections facilities estimated that 81% of men and women users had been incarcerated at least once, with 31% using drugs while in prison and 15% (49% of those using drugs) using injection drugs in prison (Clarke, *Subst Abuse*, 2001). Male sex and a higher number of incarcerations were associated with IDU in prison. Again, the problem is not just in the United States. A study in Greece found that 56% of men incarcerated for drug offenses used drugs while in prison, with 35% using injection drugs and 18% injecting drugs daily (Malliori, *Addiction*, 1998); 39% of inmates who knew they were HCV seropositive shared needles anyway (compared with 33% who had unknown HCV serostatus or knew that they were HCV seronegative).

The same tendencies toward risk behaviors that lead to prison, including but not limited to drug use, also lead to higher rates of HIV infection. Data from 1999 show that the AIDS rates per 100,000 population were 31.4 for the US general population versus 198.5 for the population in US corrections facilities. People in prison often eventually get out—notwithstanding that approximately 70% eventually return. Reentering society carrying the burden and experience of having been a noncitizen and carrying the additional label of "ex-felon" limits choices in future life, a state that itself can be considered a mental illness, and a treatable one.

We do not treat it, however. A recent US study showed that the top 2 activities engaged in within 24 hours of release were having sexual relations and using drugs (Seal, *AIDS and Behavior*, 2003). Explanations for the need for sexual activity included "proving I'm a man" and "making up for lost time," and the offering of sex partners to ex-felons from gangs as a reward for their silence is also common. Explanations for drug use included "could not get as much inside," drugs being offered as a reward for silence, and drugs being used as part of sexual encounters (eg, "crack" cocaine use). Released prisoners reported low rates of condom use immediately after incarceration, with rates higher for individuals with steady partners.

As sad as it seems, continued incarceration is associated with better HIV outcome than release and reincarceration. In a recent study matching released and reincarcerated HIV-infected prisoners 1:2 with unreleased HIV-infected prisoners, there were statistically significantly fewer individuals with undetectable viral load in the reincarcerated group, with a mean change in plasma HIV RNA level of $+1.29$ $\log_{10}$ copies/mL in the reincarcerated group versus -0.03 $\log_{10}$ copies/mL in the incarcerated group (Stephenson, *Public Health Rep*, 2005). When prisoners are released, they are more likely to not take their medicines, and not keep follow-up appointments, and thus their disease worsens.

Another repository for those with mental disorders is the street. The risk of being homeless is high for the mentally ill in the United States. Part of the problem in this regard was the development and use of medicines beginning in the 1960s that markedly reduce the symptoms of such chronic illnesses as schizophrenia; these treatments did not make patients more socially competent or functional enough to have and hold a job, for example, although they were deemed "well" enough or "controllable" enough to live safely in the community for the most part. As a result, the public psychiatry system and state hospital systems began closing down; currently, in Maryland, for example, we have approximately 10% of the psychiatric beds that we had 20 years ago. Where are the people who used to be hospitalized chronically in those beds? Most are not living in stable housing; many are homeless or functionally homeless. Homelessness, of course, increases demoralization and worsens mental illness. Major depression has been diagnosed in 35% of homeless individuals and substance use disorder in 53% (Schanzer, *Am J Public Health*, 2007). A 1998 study reported 12% HIV seroprevalence among homeless, substance-using, mentally ill individuals (Rahav, *Subt Use Misuse*, 1998).

What Can Be Done?

So, what do we do about this mess? Needle-exchange programs work. It is true that all the addicts themselves do not always show up with the needles in community-based programs; frequently, they opt to pay others with drugs to bring in 200 or 300 needles. This economy works in its way, for it gets clean needles into the system and allows us to make contact with the person who brings in the needles and keep offering treatment.

Prison needle-exchange programs have been tried in other countries that publicly admit the possibility of a drug-

use problem in that setting. Table 1 shows findings in 6 1- or 2-year studies in Switzerland, Germany, and Spain; no cases of blood-borne virus infections were observed in any of the inmates in the study. In the system used, a prisoner is given a dummy syringe upon admission to the facility; the dummy syringe can be inserted into a vending-type machine to receive a clean needle in return, and then used needles can be exchanged for clean ones. The cells have small medicine cabinets containing a cup in which the needle is to be kept, both to prevent guards from getting needlestick injuries when they search the cells and to let program personnel know that they should leave pamphlets offering treatment. Any drugs found are removed, because drug use is illegal and discouraged, and if the needle is found anywhere but in the cup, punitive measures are taken. So long as the needle is left in the cup, however, it is not removed. Inmates in some of these studies reported that they used less drugs simply because having their own needle gave them a choice about when to use drugs, rather than their feeling compelled to use drugs immediately whenever a needle was available for sharing.

We, as a society, have to decide to admit that drug use occurs in prisons in the United States (and elsewhere), that it is a public health problem, and that we have to treat that public health problem if we want to stop inmates from getting infected with HIV and bringing HIV back into the community. Or, we can continue to ignore the problem, because we do not want drugs to be in prisons, because drugs are not supposed to be there, and because we want people to feel deprived in prison, where they are supposed to be receiving punishment.

We can also provide case management when inmates leave prison. Project Bridge was a labor-intensive program in Rhode Island that observed 97 released inmates over 3 years (Rich, *J Urban Health*, 2001). Only 3% of subjects were lost to follow-up, and there was 73% adherence to appointments overall, including 100% adherence to HIV-related appointments, 100% to appointments for the AIDS Drug Assistance Program or otherwise related to AIDS medication, 76% to housing-related appointments, and 37% to employment-related appointments. Ninety-five percent of clients were referred to mental health services, but adherence to those appointments was only 48%, meaning that we need to do better with getting and keeping these people in mental health treatment. In this regard, it is significant that the biggest issue the subjects reported in the study was trust; the predominant sentiment was their lack of trust of "the system" and fear of actions by health workers that might lead to their reincarceration.

Treatment works. Figure 1 shows data from a small study in the Johns Hopkins Moore Clinic comparing time to receipt of antiretroviral therapy and length of survival in patients receiving treatment for mental disorders versus matched patients with no documentation of mental illness or psychiatric intervention (essentially, a group of individuals with an estimate of >50% undiagnosed mental illness). A patient in the HIV clinic at Johns Hopkins who is receiving treatment from a psychiatrist is substantially more likely to be receiving antiretroviral treatment—because mental illness treatments improve adherence, both to mental illness treatments and HIV treatments. Although the difference was not statistically significant, there was a trend that patients receiving mental health treatment were also more likely to be alive at the end of the follow-up period. The benefits seen in this small study are not the result of a complex intervention that can never be replicated at some other site; the benefits are really just the result of improved adherence to antiretroviral drug regimens in mentally ill patients who are taking medi-

Table **1.** HIV Outcome in Prison-based Needle-exchange Programs

	Switzerland		Germany		Spain	
Prison	Hindelbank	Realta/Cazis	Lingen	Vechta	Basauri, Bilbao	Pamplona
Sex	Women	Men	Men	Women	Men	NA
No. of inmates	110	100	230	170	250	150
Injection drug use, %	39	42	50	50	50	64
Sample size, no.	137	234	83	169	607	115
No. of years studied	2	1	2	2	1	1
No. of syringes distributed	5985	1389	4517	16,390	12,500	NA
Syringes returned, %	100	NA	98.3	98.9	82	NA
Cases of blood-borne virus infection	0	0	0	0	0	0

NA indicates not available. Adapted from Dolan et al, *Addiction,* 2003.

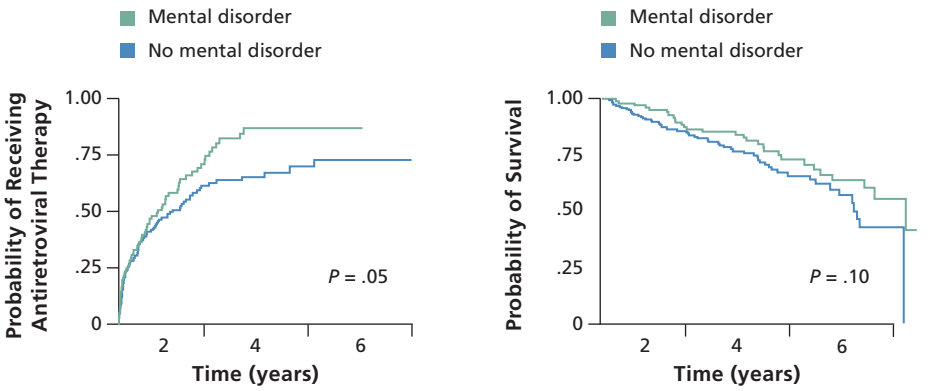

Figure **1.** Left: Time to receipt of antiretroviral treatment in patients with versus without documented mental disorders at the Johns Hopkins Moore Clinic. Right: Length of survival among HIV-infected individuals receiving treatment for mental disorders at the Johns Hopkins Moore Clinic versus those with no documented mental disorder or psychiatric intervention.

cations for their mental illness and receiving counseling.

Mental illnesses have always fueled the HIV epidemic (Figure 2). Their effects in this regard have become increasingly apparent as the benefits of prevention and effective treatment have increased in those segments of society that can and do take better care of themselves. The availability of effective treatments for HIV infection and for mental illness means little if affected individuals are not getting them or are not adherent to them. Who are the high-risk individuals? Who are the individuals who engage in risk behaviors? Many of them are in psychiatric clinics, in corrections facilities, in sexually transmitted disease clinics, or are homeless. These are the people we need to target with effective treatments. We all know what happens with mentally ill individuals who come to our clinics and are not receiving effective treatment for their mental illness: We ask them where they have been and try to prod them to be responsible and keep their appointments, while they point out how hard that is. Few clinics have psychiatrists who work closely with HIV providers, and almost none have psychiatrists on site. Thus, HIV providers can refer patients, but have just as much impact on adherence to mental health treatments as they do to HIV treatments for this ill population.

So, part of the hard work to be done is to bring this message and these data to our legislators, clinic managers, funding and granting entities, and communities and emphasize the urgency of identifying and treating mental illness in these populations. The science and the capitalist system behind the development of effective drug treatments are wonderful; we invent important new drugs and treatments, and those responsible for doing this should be rewarded for it. Advances in health care do not always accompany development of a new drug, however. If we acknowledge that we are a multilayered society, real advances in health care can come when we raise the health-care standards for the low, the disenfranchised, and the no-voice, nonvoting patients who are mentally ill, have been in and out of the corrections system, and have few people invested or interested in their well-being. We can find them if we want to.

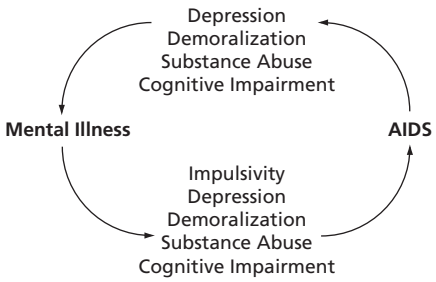

Figure **2.** Interrelationship of mental illness and AIDS.

Presented by Dr Angelino in June 2007. First draft prepared from transcripts by Matthew Stenger. Reviewed and edited by Dr Angelino in May 2008.

Dr Angelino has received honoraria from Abbott Laboratories, AstraZeneca, Boehringer Ingelheim Pharmaceuticals, Inc, Bristol-Myers Squibb, Eli Lilly and Co, Gilead Sciences, Inc, GlaxoSmithKline, Janssen, Merck & Co, Inc, Ortho Biotech Products, LP, Pfizer, Inc, Roche, Schering-Plough Corp, Monogram Biosciences, Inc, and Wyeth.

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