

**Unmet Need for HIV Primary Medical Care among PLWHA
Residing in the Boston Eligible Metropolitan Area in 2007**



JSI Research & Training Institute, Inc.

Laureen M. Kunches PhD

Wendy Chow MPH

Joseph Musolino

Lisa R. Hirschhorn MD, MPH

**For the Boston Public Health Commission
December 2009**

TABLE OF CONTENTS

I.	EXECUTIVE SUMMARY	3
II.	BACKGROUND	4
III.	METHODOLOGY	4
3.1	Population Inputs	6
3.1.1	Population Estimates - Number of PLWHA as of 12/31/07	6
3.1.2	Massachusetts Inpatient Hospital Discharge Data 2006 - To Estimate Public vs. Private Insurance Coverage Distribution	6
3.2	Care Inputs	7
3.2.1	Medicaid Outpatient Claims Data 2006 – Care Patterns of Publicly Insured PLWHA in Boston EMA	7
3.2.2	Chart Review Data for Private Insurance Adjustment – Care Patterns of Privately Insured PLWHA in Boston EMA	7
3.2.3	New Hampshire Unmet Need Estimate & Out of State Care Adjustment – Care Patterns of PLWHA in New Hampshire-Boston EMA	8
3.3	Comparability of Three Main Data Sources	9
IV.	RESULTS	11
4.1	Population Estimates	11
4.1.1	HIV/AIDS Surveillance Data – Boston EMA (MA & NH)	11
4.2	Public & Private Insurance Coverage Distribution	12
4.2.1	Inpatient discharge data and insurance adjustments	12
4.3	Care Pattern, Adjustments, & Unmet Need Estimates – MA & NH	13
4.3.1	Medicaid Data to Represent Care Pattern of all PLWHA covered by Public Insurance	13
4.3.2	Chart Review Data to Represent Care Pattern of all PLWHA covered by Private Insurance	14
4.3.3	New Hampshire Unmet Need – 3 EMA Counties	14
4.4	Characteristics of PLWHA with Met & Unmet Need – Medicaid	15
4.5	Unmet Need in the Boston EMA, Overall & Subpopulations Rates	16
V.	LIMITATIONS	17
VI.	CONCLUSIONS	18
VII.	APPENDICES	19
Appendix A.	Medicaid HIV-Positive Case Extraction Algorithm	
Appendix B.	Medicaid HIV-Positive Case Selection Flow Diagram	
Appendix C.	Unmet Need -All PLWHA Age 13+ in Boston EMA	
Appendix D.	Unmet Need -All PLW-AIDS Age 13+ in Boston EMA	
Appendix E.	Unmet Need -All PLW-HIV non-AIDS Age 13+ in Boston EMA	
Appendix F.	Unmet Need -All Male PLWHA Age 13+ in Boston EMA	
Appendix G.	Unmet Need -All Female PLWHA Age 13+in Boston EMA	
Appendix H.	Unmet Need -All White non-Hispanic PLWHA Age 13+ in Boston EMA	
Appendix I.	Unmet Need -All Black non-Hispanic PLWHA Age 13+ in Boston EMA	
Appendix J.	Unmet Need -All Hispanic PLWHA Age 13+ in Boston EMA	

Funding for this project was provided by the Boston Public Health Commission through Part A of the Ryan White HIV/AIDS Treatment Modernization Act of 2006.

I. EXECUTIVE SUMMARY

To address and reduce disparities in HIV medical care access and utilization, the Health Resources and Services Administration-HIV/AIDS Bureau (HRSA-HAB) supported the development of an unmet need framework to estimate the number of people who are aware they have HIV infection but are not receiving regular primary medical care. By identifying populations where unmet need exists and recognizing changes in HIV demographics, program planners may set priority areas and direct resources targeting disparities and gaps in care.

The Boston Public Health Commission (BPHC) has contracted with JSI Research & Training Institute Inc. (JSI) to estimate the number of people who were HIV/AIDS aware and living in the Boston Eligible Metropolitan Area (Boston EMA) who had an unmet need for HIV primary care. The unmet need estimate for the calendar year 2006 was presented in March 2009. The current report updates this estimate for the calendar year 2007 and incorporates information about people living with HIV/AIDS residing in the three New Hampshire counties that are also part of the Boston EMA. Potential differences in unmet need by patient subpopulations were also explored.

Operational definitions of met and unmet need set by HRSA enable comparisons across jurisdictions and geographic locations. An individual who is aware that he/she is HIV positive is considered to have an unmet need (lack of recommended medical care) if there is no receipt of a viral load test, CD4 count, or antiretroviral drug during a defined 12-month period.

Using surveillance data, inpatient discharge data, Medicaid claims, medical chart review data, and New Hampshire unmet need estimates, it was found that of 15,169 people living with HIV/AIDS who were age 13 and over in the Boston EMA at the end of 2007, 11.6% or 1,755 were not engaged in HIV primary care. Estimates by subpopulations of persons living with HIV/AIDS (PLWHA) by gender, race/ethnicity, and HIV stage revealed no obvious disparities. Of females, an estimated 12.0% had unmet need, compared to 11.3% of males. By race/ethnicity, White non-Hispanics had a slightly higher unmet need of 12.5%, compared to Black non-Hispanics (10.9%) and Hispanics (9.4%).

Overall, the vast majority of people living with HIV/AIDS in the Boston EMA fulfilled the HRSA definition of met need for HIV primary care in 2007, with no apparent differences across subpopulations. Nevertheless, there remained roughly 1 in 12 people living with HIV disease who had no lab tests or HIV medications, which are surrogate markers for engagement in HIV medical care. Decision makers and HIV care providers should continue efforts to ensure that all individuals who are aware of their HIV infection receive the standard clinical care and services necessary to optimize health, longevity and quality of life.

II. BACKGROUND

To address and reduce disparities in HIV medical care access and utilization, the Health Resources and Services Administration-HIV/AIDS Bureau (HRSA-HAB) supported the development of an unmet need framework (University of California, San Francisco) to estimate the number of people who are aware of their HIV infection (referred to as "HIV/AIDS aware") but are not receiving regular HIV primary care. By identifying populations where unmet need exists and recognizing changes in HIV demographics, program planners may set priority areas and direct resources targeting disparities and gaps in care.

To this end, the Boston Public Health Commission (BPHC) has contracted with JSI Research & Training Institute (JSI) to estimate the number of people who were HIV/AIDS aware and living in the seven Massachusetts counties and three New Hampshire counties of the Boston Eligible Metropolitan Area (Boston EMA) who had an unmet need for HIV primary care during the calendar year 2007. Potential differences in unmet need by patient subpopulations were also explored.

III. METHODOLOGY

The unmet need framework for HIV care developed by the University of California, San Francisco was used to evaluate HIV care patterns in the Boston EMA. The framework estimates unmet need by taking the difference between the total population of HIV-positive and aware individuals and the total number of HIV-positive and aware individuals who are receiving HIV primary care.

$$\begin{aligned} & \textit{Total Number of HIV-positive and Aware Individuals} \\ & - \textit{Total Number of HIV-positive and Aware Individuals who are in Care} \\ & = \textit{Total Number of HIV-positive and Aware with Unmet Need} \end{aligned}$$

HRSA has established operational definitions of met and unmet need to enable comparisons across jurisdictions and geographic locations. An HIV/AIDS aware individual is considered to have an **unmet need** (lack of recommended medical care) if there is no receipt of **any** of the following three components of HIV primary care during a defined 12-month period:

- (1) Viral load test, or
- (2) CD4 count, or
- (3) Antiretroviral therapy (ART).

An individual is considered to have **met need** for HIV primary care if there is documentation of receipt of any of these three components during the 12-month period.

Population estimates of the number of HIV/AIDS aware individuals as of 12/31/2007 were derived from both Massachusetts and New Hampshire surveillance data. For the Massachusetts unmet need calculation, the total number of HIV/AIDS aware individuals in care or who have met need was estimated from a number of healthcare utilization data sources including, Massachusetts Medicaid claims and medical record reviews at a large multi-clinic medical practice in the EMA. Since care patterns may differ based on medical insurance coverage, it was necessary to determine the number of PLWHA who were covered by private versus public insurance. Thus, an inpatient hospital discharge database with payer information was used to estimate the distribution

of privately and publicly covered PLWHA in the MA Boston EMA. The estimate for the three New Hampshire counties was obtained in a report from the New Hampshire Department of Health and Human Services.

The following table describes the data and data sources used in this analysis:

Table 1. Data Sources for Population Inputs and Care Patterns		
Data	Data Source	Purpose
Population Input		
Massachusetts surveillance estimates– living residents of 7 counties in MA as of 12/31/2007	HIV and AIDS cases reported to Massachusetts HIV/AIDS Surveillance Program	Best estimate of local population of PLWHA (representing the “HIV/AIDS aware” population)
New Hampshire surveillance estimates – living residents of 3 counties in NH as of 12/31/2007	HIV and AIDS cases reported to the New Hampshire HIV/AIDS Surveillance Program	Best estimate of local population of PLWHA (representing the “HIV/AIDS aware” population)
MA Hospital Inpatient Discharge Data 2006 ^a	Massachusetts Division of Health Care Finance and Policy	To derive an estimate of the proportion of PLWHA covered by public and private insurance.
Care Pattern		
Medicaid billing claims data for 2006 (residents of 7 EMA counties in MA) ^a	Masshealth/Medicaid	To derive a representative estimate of unmet need among all <i>publicly insured</i> PLWHA
Chart review data from large multi-clinic medical practice in 2001 ^b	MA HIV Clinical Care Quality Management Project-JSI	To derive a representative estimate of unmet need among all <i>privately insured</i> PLWHA
New Hampshire unmet need analysis - 48% for the entire state	New Hampshire Department of Health and Human Services report	To derive a representative estimate of unmet need among PLHWA residing in the <i>3 NH counties</i> of the Boston EMA

^a 2006 inpatient discharge and 2006 Medicaid billing data were used because 2007 data were unavailable at the time of this analysis; this assumes that there was no change in the distribution of publicly vs. privately insured and in the care utilization of Medicaid patients from 2006 to 2007.

^b 2001 chart review data from a private practice were used because no private insurance data in 2007 were available; this assumes that there was no difference in care utilization among the privately insured from 2001 to 2007.

An overall estimate of unmet need was generated for the Boston EMA for 2007. Estimates by gender, race/ethnicity, and disease stage (AIDS or HIV-non AIDS) were also examined to explore potential differences in care patterns by subpopulations.

For this analysis, children under the age of 13 as of the end of 2007 were excluded where possible. There were several reasons for this decision. First, there were only a small number of cases under age 13 (n=81) in the MA-Boston EMA surveillance data. Second, pediatric treatment is centered in a few tertiary care centers, and so not representative of the adult care network and including them might increase potential bias from this level of care. Finally, HRSA has not included any specific pediatric quality measures in their work thus far, and so pediatric HIV care quality issues may be separate from adult care. Since only age at diagnosis was available in the NH surveillance data, no exclusions by age were made. Age of diagnosis was

used as a close proxy for age for the NH population in 2007. Only ten PLWHA in the NH EMA counties were diagnosed under age 13.

3.1 POPULATION INPUTS

3.1.1 Population Estimates

Population estimates of people living with HIV/AIDS (PLWHA) as of December 31, 2007 were provided by the Massachusetts HIV/AIDS Surveillance Program and the New Hampshire HIV/AIDS Surveillance Program. Distributions by gender, race/ethnicity, age, and HIV stage were also provided.

The Boston EMA consists of seven counties in Massachusetts and three additional counties in southern New Hampshire. People living with HIV/AIDS in the three NH counties - Hillsborough, Strafford, and Rockingham - represented 5.1% (776) and PLWHA in the seven MA counties represented 94.9% (14,393) of all PLWHA in the Boston EMA as of the end of 2007.

3.1.2 Massachusetts Inpatient Hospital Discharge Data FY 2006 - To Estimate Public versus Private Insurance Coverage Distribution

Since care patterns may differ by insurance coverage, the number of PLWHA covered by public and private insurance and separate rates of unmet need for each group were estimated. Insurance payer information from the 2006 Massachusetts Inpatient Discharge Database was used (as 2007 data were unavailable at the time of this calculation). Of all hospital discharges in 2006, those with the presence of any primary or secondary diagnosis of HIV/AIDS were identified. Patients with zip codes indicating residence in the Boston EMA jurisdiction were selected. The final dataset was subsequently used to estimate the distribution of public and private insurance coverage among HIV/AIDS individuals.

There were some limitations in using hospital discharge data to determine the distribution of insurance coverage. One is that our data file did not contain identifiers so we cannot determine which discharges represent the same person; the analysis represents discharges and not individuals. Also, we believe that patients in the hospital discharge sample may not be representative of the general PLWHA population in the Boston EMA, in that they are more likely to have advanced HIV disease or other co-morbidities and may be different in other socio-demographic attributes. These factors are potentially associated with eligibility for health insurance. Another concern is that publicly insured patients may be more likely to have more or multiple admissions, thus leading to an overestimate of the number or proportion of PLWHA who receive medical benefits from public sources.

3.2 CARE INPUTS

3.2.1 *Medicaid Outpatient Claims Data 2006 – Care Patterns of Publicly Insured PLWHA in Massachusetts-Boston EMA*

Medicaid outpatient claims data in 2006 were used to determine and represent the HIV primary care utilization pattern of all publicly insured PLWHA (2007 data were unavailable at the time of this calculation). An algorithm was developed to capture all patient claims files in 2006 that contained any single HIV diagnosis, HIV laboratory test, or antiretroviral drug code (Appendix A). Of patients with any of these codes, Medicaid then extracted outpatient billing claims containing additional diagnoses, procedure, and pharmacy/anti-retroviral drug codes that were included in the data request. Patient demographics including gender, date of birth, and race/ethnicity were provided, as well as patient residential zip codes. Furthermore, information on the number of days enrolled in Medicaid during the year was also available.

Given the wide inclusion criteria for extracting patients from the Medicaid billing data as described above, it was necessary to use a case selection process to remove potential “false positives” from the data set --- patients with low likelihood of being truly HIV-positive (Appendix B). For example, patients who were extracted by Medicaid due to a single antiretroviral drug code were removed since these cases may not be HIV positive, but may have been on post-exposure prophylaxis. Patients with a CD4 or viral load test who lacked any HIV diagnosis code were also removed.

As with the inpatient discharge data, zip codes were used to select for patients who resided in the Boston EMA. Furthermore, patients enrolled in Medicaid for less than one full year (<365 days in 2006) were excluded, since they may have received care elsewhere that would not be captured in the Medicaid data. This minimized the potential bias of overestimating unmet need. The unmet need estimate derived from the Medicaid claims dataset was used to represent the percentage of the general PLWHA population covered by public insurance.

3.2.2 *Chart Review Data for Private Insurance Adjustment – Care Patterns of Privately Insured PLWHA in Massachusetts-Boston EMA*

According to HRSA-HAB guidelines, patients covered by private insurance can be assumed to have 100% met need for HIV primary care. However, as evident by other unmet need calculations that have involved the analysis of a private insurance claims dataset, even privately insured PLWHA do not have completely met need.

Due to logistical constraints of acquiring a separate healthcare utilization database from a commercial insurance source and no known estimates of unmet need for privately covered PLWHA in the state, we used medical chart abstraction data collected from a large multi-clinic private practice in metro Boston that participated in an HIV clinical care quality and management project in 2001 (the most recent year for which data are available).

3.2.3 New Hampshire Unmet Need Estimate and Out of State Care Adjustment – Care Patterns of PLWHA in New Hampshire-Boston EMA

The New Hampshire Department of Health and Human Services calculated an unmet need of 48% for the calendar year 2007, primarily on the basis of mandated laboratory reporting for HIV viral loads by providers and test centers. The only available estimate included the entire state of NH and was not specific to the three counties that are of focus in this Boston EMA unmet need calculation. The 48% was also likely an overestimate for the three EMA counties, as some residents in southern NH (part of the EMA) are known to be receiving HIV care in Massachusetts where providers and laboratories may not be adhering to the viral load reporting requirement. In order to address this bias in the NH data, an adjustment to the 48% estimate was needed.

3.3 COMPARABILITY OF THREE MAIN DATA SOURCES

In using information from various data sources to characterize the Boston EMA HIV population and describe care patterns, some assumptions were made regarding the comparability and generalizability of these data.

Surveillance data provided the closest representation of the number of HIV/AIDS aware residents in the Boston EMA jurisdiction. Given both MA and NH surveillance data were generated as of July 2009, the limitation of lag time in case reporting was reduced.

In using Medicaid claims and inpatient discharge data to describe care patterns and insurance type distribution, we assumed that these samples were representative of the general PLWHA population. Table 2 describes the HIV/AIDS population observed in each of the main data sources.

Table 2. Comparison of 3 Main Data Sources for HIV/AIDS Population Characteristics (Boston EMA 2007)				
	Surveillance Data Living Cases as of 12/31/07		Medicaid Data 2006 (HIV Diagnosis Code & Enrolled 365 days in Medicaid & Age ≥ 13)	Hospital Discharge Data 2006 (HIV Diagnosis Code & Age ≥ 13)
	MA N= 14,393	NH N= 776	N= 5,219	N= 4,710^d
Gender				
Female	28.2% (4066)	26.2% (203)	39.0% (2035)	36.1 % (1699)
Male	71.8% (10327)	73.8% (573)	61.0% (3184)	63.9% (3011)
Race/Ethnicity				
White non-Hispanic	45.4% (6563) ^a	69.8% (542)	52.6% (2743)	47.0% (2215)
Black non-Hispanic	30.5% (4411)	15.2% (118)	21.2% (1108)	28.7% (1351)
Hispanic	22.2% (3208)	13.3% (103)	6.9% (358)	17.1% (806)
Asian/Pacific Islander	1.4% (209)	0.6% (1)	0.5% (26)	0.5% (23)
American Indian/Alaskan Native	0.1% (18)	0.1% (5)	0.3% (14)	0.3% (13)
Other/Unknown	0.4% (57)	0.9% (7)	18.6% (970)	6.4% (302)
Age				
	Age end of 2007	Age at diagnosis	Age during 2006	Age during 2006
<13	-	1.3% (10)	-	-
13-24	2.6% (376)	9.2% (71)	4.2% (218)	1.9% (88)
25-29	3.6% (513)	15.1% (117)	3.5% (181)	3.4% (159)
30-34	6.6% (951)	19.7% (153)	5.6% (294)	5.7% (266)
35-39	13.2% (1901)	24.6% (191)	12.6% (656)	14.7% (690)
40-44	21.4% (3084)	14.7% (114)	21.5% (1120)	24.5% (1154)
45-49	21.9% (3157)	8.8% (68)	22.5% (1172)	20.7% (976)
50+	30.6% (4411)	6.7% (52)	30.2% (1578)	29.2% (1377)
HIV Stage				
HIV non-AIDS	43.8% (6311)	47.3% (367)	n/a	n/a
AIDS	56.2% (8082)	52.7% (409)	n/a	n/a

^a Race/ethnicity surveillance data may include individuals under age 13, as the distribution of race/ethnicity by age groups was not available.

^b Only age at diagnosis was available from the New Hampshire surveillance data, so no exclusions by age were made. A total of ten PLWHA were under age 13 at diagnosis.

^d Discharge level data, not patient level, therefore an individual patient may be represented more than once if multiple hospitalizations occurred during the year.

Although the proportion of males (~60%) and females (~40%) in the Medicaid and hospital discharge data were similar, surveillance data indicated that the general PLWHA population had a slightly higher proportion of males (~70%) than females (~30%). This is an expected difference as public insurance programs enroll more women than men and women with HIV have been shown to have more hospitalizations.

The race/ethnicity distribution in the hospital discharge sample was comparable to the surveillance data, with slight differences potentially attributable to the 6.4% of missing information in the discharge data sample. However, the difference between the Medicaid sample and the epidemiologic profile appeared greater, likely due to a function of data limitations within Medicaid claims. Among Medicaid patients, 53% were White non-Hispanic, 21% were Black non-Hispanic, and 7% were Hispanic, compared to 46%, 30%, and 22% respectively in the surveillance data. This observed difference is inconclusive, however, because 19% of Medicaid claims had missing or unknown race.

To further verify and ensure that differences were not due to the exclusion criteria, we compared the demographics of the full Medicaid sample (no exclusions) with that of the subset Medicaid sample (i.e. patients with any HIV diagnosis code, enrolled 365 days, and age \geq 13, N = 5,219) and similar distributions were observed (for gender, race/ethnicity, and age).

Also, since the Medicaid sample represented approximately 40% (5219/13830) of the total PLWHA surveillance population, one explanation for the discrepancies may be that the other 60% of PLWHA in the Boston EMA have different characteristics than PLWHA receiving Medicaid coverage.

Similar age distributions were noted in the Medicaid, hospital discharge, and the MA surveillance data. In all three sources, about 50% of PLWHA were age 45 and over. The mean ages in the Medicaid and hospital discharge data sets were nearly identical (44.9 and 44.6, respectively).

The New Hampshire unmet need estimate was determined from a prior analysis conducted by the state and JSI was not able to obtain care utilization data directly, so the focus was on MA data. However, in comparing the epidemiological profile of PLWHA in these two states, we note a greater proportion of White non-Hispanics in NH (70%) than in MA (45%). The differences in age distribution in the NH portion of the EMA surveillance data were most likely due to the bias introduced in using the age at diagnosis rather than current age. Percentage of PLWHA by gender and HIV stage were similar.

Given the differences in these data sources, readers are encouraged to consider these limitations in the interpretation of findings.

IV. RESULTS

4.1 POPULATION ESTIMATES

4.1.1 HIV/AIDS Surveillance Data – Boston EMA (MA & NH)

Population estimates of PLWHA at the end of the calendar year 2007 were obtained from the Massachusetts HIV/AIDS Surveillance Program and the New Hampshire HIV/AIDS Surveillance Program (Table 3). In the Boston EMA counties of Massachusetts, a total of 14,393 people ages 13 and over were living with HIV/AIDS as of the end of 2007 (81 PLWHA under age 13 as of end of 2007 were excluded):

- 43.8% were HIV non-AIDS and 56.2% had AIDS
- 71.8% were male and 28.2% were female
- 2.6% were age 13-24, 3.6% age 25-29, 19.8% age 30-39, 43.3% age 40-49, and 30.6% age 50 and over
- 45.4% were White non-Hispanic, 30.5% Black non-Hispanic, 22.2% Hispanic, and 1.9% other race/ethnicity (Asian/Pacific Islander, American Indian/Alaskan Native, other/unknown)

In the three NH counties in the EMA, a total of 776 people were living with HIV/AIDS as of the end of 2007:

- 47.3% were HIV non-AIDS and 52.7% had AIDS
- 73.8% were male and 26.2% female
- 69.8% were White non-Hispanic, 15.2% Black non-Hispanic, 13.3% Hispanic and 1.6% were other race/ethnicity.

In total, 15,169 people were living with HIV or AIDS within the Boston EMA as of 12/31/2007.

Table 3. Population Estimates of PLWH/PLWHA in the Boston EMA, by State and Total	MA-Boston EMA Counties	NH-Boston EMA Counties	Total Boston EMA
Total living with HIV/AIDS as of 12/31/07	14,393	776	15,169
HIV non-AIDS	6,311 43.8%	367 47.3%	6,678 44.0%
AIDS	8,082 56.2%	409 52.7%	8,491 56.0%

4.2 PUBLIC & PRIVATE INSURANCE COVERAGE DISTRIBUTION

4.2.1 Inpatient Discharge Data and Insurance Adjustments

A total of 4,710 inpatient discharges (among patients age 13 or older) from the Massachusetts Inpatient Hospital Discharge Database 2006 contained codes indicating HIV disease and residence in the Boston EMA. Each discharge contained information on the source of payment – documented as the primary and/or secondary payer. Since some discharges contained more than one payment source, insurance payer combinations were examined. The table below summarizes the primary payer distribution as well as the percentages of discharges with “any” or “only” type of the specified insurance.

Table 4. Insurance Type(s)	Primary Payer	Any	Only
Medicaid, Medicare, or Medicare /Medicaid Managed Care	78.7%	82.0%	-
Medicaid or Medicaid Managed Care	43.4%	73.3%	37.1%
Medicare or Medicare Managed Care	35.3%	36.0%	3.8%
Free Care or Self-Pay	3.9%	16.5%	3.6%
Commercial or Private	16.3%	19.7%	8.4%
Other Insurance	1.0%	1.2%	0.6%

Recognizing a likely difference between the hospital discharge sample and the general PLWHA population, some assumptions and adjustments were made in estimating the public and private insurance distribution. In the discharge data, we found that 78.7% of discharges listed Medicaid/Medicare or Medicare/Medicaid Managed Care as the primary payer, with another 3.9% with free care/self-pay. If these discharges were unduplicated patients and representative of the general PLWHA population in the EMA, this would suggest that approximately 82.6% of PLWHA were covered by public insurance.

In 2003, Suffolk University conducted a survey among PLWHA who received care in the Boston EMA (N=466) and reported that 82% of respondents had any Medicaid coverage and 16% had any Medicare coverage.¹ Nine percent of all respondents had both Medicare and Medicaid. These are fairly comparable to the unadjusted public-private insurance distribution found in the inpatient discharge data and thus validate our use of the discharge data.

With the assumption that publicly insured patients were more likely to be hospitalized and more likely to have multiple admissions, we expected an over-representation of publicly insured patients in the discharge data. Therefore, we adjusted the proportion of publicly insured patients from 82.6% downwards to 70.0%. Individuals who were not covered by public insurance were considered to be privately insured (100% - 70.0% = 30.0%). These estimates were best

¹ Beinecke, Robert H., Matava MA, Rivers N, Awunti N. *Voices of Experience 2003: HIV/AIDS Consumer Views on Their Needs for Services in Massachusetts and the Boston Eligible Metropolitan Area (EMA)*. Suffolk University, Center for Public Management. February 2004.

approximations given the data available. Furthermore, preliminary findings from a recent HIV care consumer survey in the Boston EMA also support this 70%-public and 30%-private distribution assumption.

Therefore, of the 15,169 PLWHA in the Boston EMA:

- 10,618 (70.0%) were covered by public insurance, and
- 4,551 (30.0%) were covered by private insurance.

For this analysis, the same 70.0% and 30.0% public-private insurance distribution were applied for each subpopulation of PLWHA.

4.3 CARE PATTERN & UNMET NEED ESTIMATES - MASSACHUSETTS & NEW HAMPSHIRE

4.3.1 *Medicaid Data to Represent Care Pattern of all PLWHA covered by Public Insurance in Massachusetts Boston EMA Counties*

A total of 5,219 patients from the Medicaid sample met the HIV-positive case selection criteria and were enrolled for a full year and thus were included in the calculation of unmet need. Of the 5,219 patients, 61.0% were males and 39.0% were females. About 18.5% (966) of patients had missing race/ethnicity. White non-Hispanics made up 52.6% (2,743) of the sample, while 21.2% (1,108) were Black non-Hispanics, 6.9% (358) were Hispanics, and less than 1% of each American Indian, Asian/Pacific Islander, or other race. Approximately, 4.2% (218) were ages 13-24 and 65.6% (3,423) were 25-49. Twenty-five percent (1,305) of the sample were ages 50-59 and 5.2% (273) of patients were 60 and over.

Using the Medicaid database to represent care utilization in the publicly insured sector, we determined that an overall 12.7% of HIV-positive patients covered by Medicaid for the entire year of 2006 to have an unmet need for HIV primary care. Eighty-seven percent had at least one viral load test, CD4 count, or antiretroviral drug that indicated met need for HIV primary care.

Rates of unmet need were explored by gender and race-ethnicity. A slightly higher proportion of females (13.5%) had an unmet need compared to males (12.2%), but this was not statistically significant. Given the small numbers of American Indians, Asian/Pacific Islanders, and patients with an "other" race category, only rates for White non-Hispanics (12.9%), Black non-Hispanics (12.8%), and Hispanics (10.3%) are reported. While nearly one-fifth of the sample had an unknown race, the rate of unmet need for this group was similar to the overall rate; thus, suggesting the race-ethnicity distribution in this unknown race group was equivalent to or closely resembled the actual distribution.

Since no diagnosis codes could be used to distinguish disease stage (HIV non-AIDS or AIDS), the overall rate of 12.7% was used to calculate unmet need estimates for the HIV and AIDS subgroups. Table 5 summarizes the unmet need results derived from the Medicaid sample. These rates were used to calculate the rates for all PLWHA covered by all public insurance.

Table 5.	Unmet Need Estimate for Publicly Insured PLWHA N=5,219
Overall	12.7%
Female	13.5%
Male	12.2%
White non-Hispanic	12.9%
Black non-Hispanic	12.8%
Hispanic	10.3%

4.3.2 Chart Review Data to Represent Care Pattern of all PLWHA covered by Private Insurance in Massachusetts Boston EMA Counties

From the chart review of a private multi-clinic practice, it was determined that 96% of privately insured patients have a met need for HIV primary care. Due to sample size limitations (n=83), separate subpopulation rates were not applied; instead, the unmet need rate of 4% was used to represent that of all privately insured PLWHA (Table 6).

Table 6.	Unmet Need Estimate for Privately Insured PLWHA N=83
Overall	4.0%

It should be noted that the 96% met need may still be an overestimate of the true rate, since the private clinic that participated in the chart review was a highly efficient practice that employed nurse case managers and extensive outreach strategies that facilitated patient retention and delivery of regular care. However, while this care utilization pattern may not be generalizable to all privately insured PLWHA, it was the best estimation available. Further, we assumed similar care patterns in 2007 as in 2001, the year of the chart review; this is a reasonable assumption since there have been no changes in national guidelines about frequency of visits in the interim.

4.3.3 Adjusted New Hampshire Unmet Need Estimate for PLWHA in the 3 New Hampshire Counties in the Boston EMA

A report by the New Hampshire Department of Health and Human Services stated an unmet need of 48% for the calendar year 2007. This estimate included all PLWHA living in the state, and not limited to the three counties in the Boston EMA. Since some PLWHA living in the southern NH Boston EMA counties receive care in Massachusetts, it is likely that this care and lab information does not get reported and captured in the NH numbers, which leads to an overestimate of unmet need in the NH portion of the Boston EMA.

To adjust for this, it was approximated that 20% of PLWHA in the NH counties of the Boston EMA receive some care outside of NH that is underreported. Factoring in this underreporting of out of state care, the overall unmet need for PLWHA in NH-Boston EMA counties decreased from 48% to 39.4% (See Appendix C-J for calculation).

4.4 CHARACTERISTICS OF PLWHA WITH MET & UNMET NEED – MEDICAID SAMPLE

Based on findings from the inpatient discharge data, we assumed that a substantial proportion (70%) of PLWHA received medical coverage through public sources. With the assumption that unmet need estimates derived from MA Medicaid claims data are applicable to the 70% of the PLWHA population covered by any public insurance, characteristics of Medicaid patients with met and unmet need can be considered a reasonable representation of the demographics in the entire EMA.

Among those with unmet need in the publicly insured sector, 58.7% were males, 41.3% females, 65.7% White non-Hispanics, 26.4% Black non-Hispanics, and 6.9% Hispanics. About 40% of patients with unmet need were ages 40-49, 30.5% were 50 and over, while 29.8% were under age 40.

Among those with met need in the publicly insured sector, 61.3% were males, 38.7% females, 64.3% White non-Hispanics, 26.0% Black non-Hispanics, and 8.6% Hispanics. Of patients with unmet need, 44.5% were 40-49, 30.2% were 50 and over, while 25.3% were under age 40.

Overall, there were no discernible differences in demographics of PLWHA who had met and unmet need.

Table 7. Characteristic of PLWHA with Met & Unmet Need, Medicaid Sample		
	Medicaid Patients with Met Need (N=4,556)	Medicaid Patients with Unmet Need (N=663)
Gender		
Male	61.3%	58.7%
Female	38.7%	41.3%
Race/Ethnicity		
White non-Hispanic	64.3%	65.7%
Black non-Hispanic	26.0%	26.4%
Hispanic	8.6%	6.9%
Age		
<=19	2.3%	2.6%
20-29	4.7%	9.4%
30-39	18.3%	17.8%
40-49	44.5%	39.8%
50-59	25.2%	23.7%
60-69	4.4%	4.8%
70+	0.6%	2.0%

4.5 UNMET NEED IN THE BOSTON EMA, OVERALL RATES & BY SUBPOPULATIONS

Using the methodology explained above, the overall number of PLWHA in the Boston EMA with unmet need for HIV primary care in 2007 was calculated, as were estimates for several subpopulations. Step-by-step calculation tables are presented in appendices C-J. Summary results are displayed in Table 8 below:

Table 8.		Percentage of HIV Population with Unmet Need in the Boston EMA	
		%	n
All PLWHA 13+			
	(N=15169)	11.6%	1,755
Gender			
	Male (N=10900)	11.3%	1,233
	Female (N=4269)	12.0%	512
Race/Ethnicity			
	White non-Hispanic (N=7105)	12.5%	885
	Black non-Hispanic (N=4529)	10.9%	495
	Hispanic (N=3311)	9.4%	311
HIV Stage			
	HIV non-AIDS (N=6678)	11.7%	780
	AIDS (N=8491)	11.5%	975

An estimated 1,755 or 11.6% of PLWHA in the Boston EMA had an unmet need for HIV primary care in 2007.

Females (12.0%) and males (11.3%) had similar rates of unmet need. Approximately 12.5% of White non-Hispanics had an unmet need in 2007, which was slightly higher compared to Black non-Hispanics (10.9%) and Hispanics (9.4%). Since HIV stage was indeterminable from Medicaid claims data, the overall rates of 10.1% (Medicaid claims for MA) and 39.4% (adjusted NH unmet need estimate) were used to estimate the number of PLWH and PLWA who had an unmet need for primary HIV medical care.

V. LIMITATIONS

There were some limitations that warrant attention. First, the assumption was made that there was no change in care pattern between 2006 and 2007. This permitted us to use the 2006 Medicaid claims data to calculate 2007 unmet need, since 2007 Medicaid data were unavailable at the time of this analysis. If the actual unmet need in 2007 were lower than in 2006, then the present estimate of 12.7% for all publicly insured PLWHA in the Massachusetts EMA counties would be an overestimate. However, we believe that there was minimal effect on the resulting estimate for several reasons: (1) unmet need rates for years 2004 to 2006 from available Medicaid data were similar; (2) quality management chart review data collected from publicly funded clinics across the Boston EMA showed consistent rates of clinical visits from 2005 to 2008, which suggest similar care patterns over time. Nevertheless, updated care utilization data for estimating care moving forward is needed, especially with potential changes due to universal health care coverage in Massachusetts.

Second, the results might have been biased because unmet need among Medicaid patients was assumed to be the same among all publicly insured PLWHA, with no adjustments for possible variations by other types of public insurance (e.g. Veteran Affairs and other non-Medicaid public programs). For example, our unmet need estimate would be an overestimate if VA patients have better care utilization and represented a substantial proportion of all publicly insured PLWHA. But, as found in the discharge data – Medicaid was the largest public insurance payer while the percentage of other public insurance was small. Nonetheless, additional studies to investigate care patterns by types of coverage would be useful for validating our assumptions. Further, if feasible, a commercial insurance medical claims dataset would be helpful to evaluate the 4% unmet need assumed for all privately insured PLWHA.

Third, the inability to distinguish HIV stage (HIV non-AIDS or AIDS) from the Medicaid data was a constraint in the calculation. Care patterns are likely different between PLWH and PLWA, but due to data limitations, the overall unmet need estimate was used for both groups and so any potential differences in care could not be evaluated.

Lastly, the unmet need estimate for NH was adjusted to account for underreporting of care received outside of NH. Even if our assumption of 20% out of state care were not exact, the effect on the overall unmet need for the EMA was expected to be insubstantial, due to the small proportion of PLWHA from NH in the entire Boston EMA.

VI. CONCLUSIONS

Of the 15,169 people living with HIV/AIDS who were age 13 and over and living in the Boston EMA as of the end of 2007, an estimated 11.6% or 1,755 were not engaged in HIV primary care, receiving no viral load, no CD4 count, and no antiretroviral drug in the year. Estimates by subpopulations of PLWHA revealed no obvious disparities, although a smaller proportion of Hispanics had unmet need than individuals of other racial or ethnic background.

Unmet need estimates calculated separately for the Massachusetts and New Hampshire counties of the Boston EMA were found to be different. In Massachusetts, 10.1% of PLWHA had unmet need while in New Hampshire an estimated 39.4% of PLWHA had unmet need after adjusting for possible care received out of state. Since PLWHA in the NH counties represented only 5% of all PLWHA in the Boston EMA, the combined estimate of 11.6% was only slightly higher than the Massachusetts unmet need.

It is encouraging that nearly 90% of people living with HIV/AIDS in the Boston EMA fulfilled the HRSA definition of met need for HIV primary care in 2007. Nevertheless, there remained roughly 1 in 12 people living with HIV disease who did not access a basic level of HIV primary care during the year. The unmet need in the New Hampshire counties was also higher compared to Massachusetts. Public health officials, policy makers and HIV care providers should continue efforts to ensure that all individuals who are HIV/AIDS aware receive the standard clinical care and services that are necessary to optimize their health and quality of life.

Acknowledgements: The authors thank Deborah Isenberg of the Massachusetts Department of Public Health and the data analysts of MassHealth for access to the claims data, without which this report would have been impossible.

Appendix A. Algorithm for Extracting Records from Medicaid Claims Data

<u>Denominator codes (CPT, DRG and NDC) to identify population of individuals with HIV infection</u>	
<i>Any of the following codes during the year:</i>	
1. Procedures (CPT codes)	
87534	HIV-1 Direct probe technique
87535	HIV-1 Amplified probe technique
87536	HIV-1 Quantification
87901	Genotypic resistance testing: "Infectious agent genotype analysis by nucleic acid (DNA or RNA); HIV-1, reverse transcriptase and protease"
87903	Phenotypic resistance testing: "Infectious agent phenotype analysis by nucleic acid (DNA or RNA) with drug resistance tissue culture analysis, HIV-1; first through 10 drugs tested"
87904	Phenotypic testing (additional drugs): "Each additional drug tested"
87900	Virtual PHENOTYPE DRUG TEST, HIV 1: "Infectious agent drug susceptibility phenotype prediction using regularly updated genotypic bioinformatics"
OR	
2. Diagnosis (ICD-9 codes)	
V08	ASYMPTOMATIC HIV INFECT STATUS
042.XX	HUMAN IMMUNODEFICIENCY VIRUS
079.53	HIV-2
OR	
3. National Drug Code (NDC code)	
Any of 78 NDC for antiretroviral drugs	

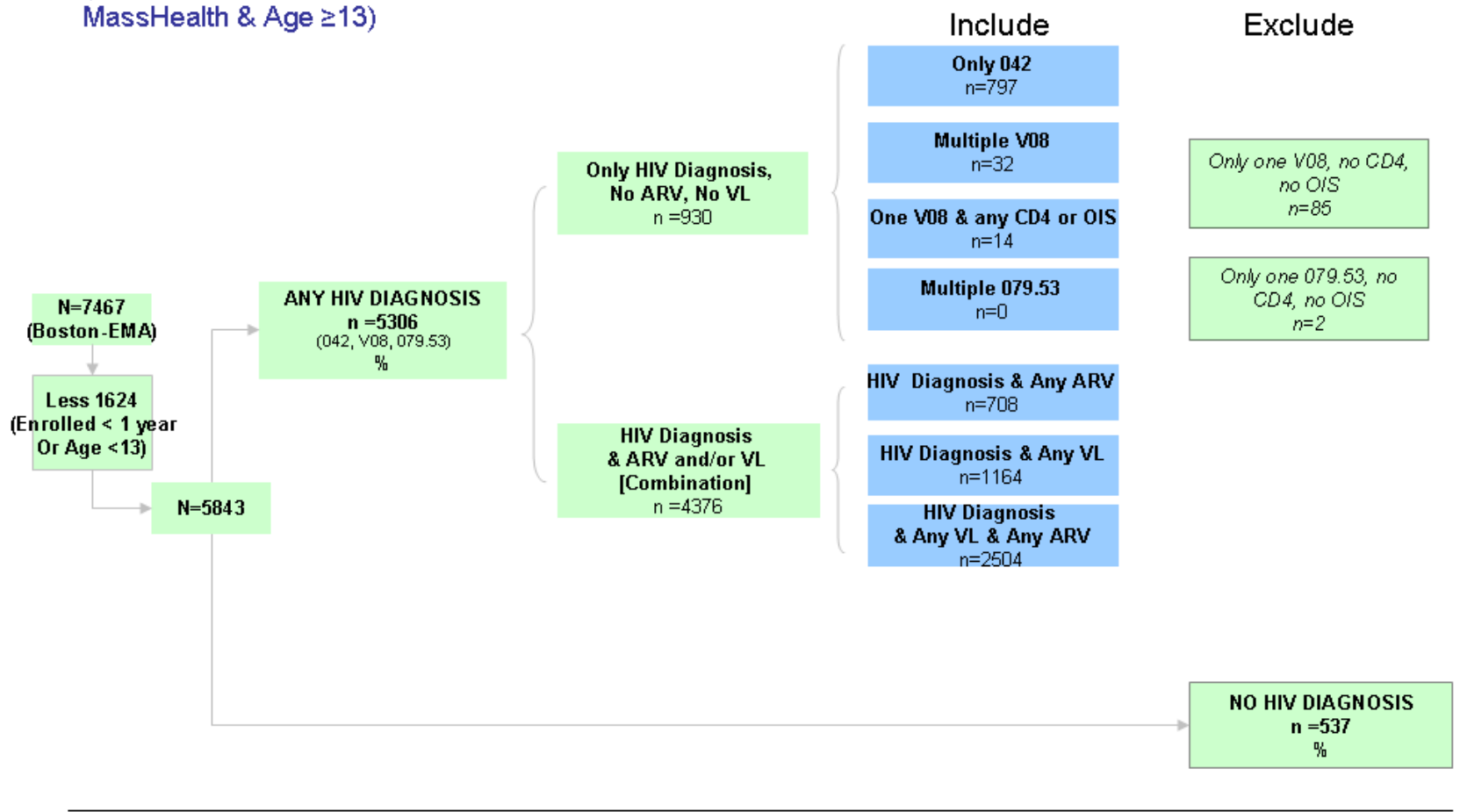
Appendix B. Flowchart Illustrating Medicaid Claims Data Case Selection Criteria

(Patients must live in the Boston EMA, must be enrolled in Medicaid Full Year, age ≥13, and have an HIV Diagnosis code to be included)

2006 Data –

Patient Inclusion Flow Diagram

(Boston EMA Patients - Enrolled Full Year in MassHealth & Age ≥13)



Include = 5219 (89.3%) Exclude = 624 (10.7%)

**Appendix C. Unmet Need for HIV Primary Care among PLWHA 2007 – Boston EMA
Patients Age 13 and older**

Population/Care Patterns		MA	NH	Data Source
A	Number of persons living with HIV/AIDS (PLWHA) and aware as of end of Calendar Year 2007	14393	776	MA HIV/AIDS Surveillance NH DHHS HIV/AIDS Surveillance Data (living cases in the Boston EMA)
B	<u>MA</u> : % of PLWHA covered by public insurance <u>NH</u> : % of PLWHA in NH receiving care outside NH	70%	20%	<u>MA</u> : Hospital Discharge Data Estimate <u>NH</u> : Estimate of NH PLWHA receiving care outside of NH
C	<u>MA</u> : # of PLWHA covered by public insurance <u>NH</u> : # of PLWHA in NH receiving care outside NH	10075	155	MA: A*B NH: A*B (52% met need, 48% unmet need)
D	<u>MA</u> : % of publicly insured PLWHA receiving HIV primary care <u>NH</u> : % of <i>all</i> PLWHA in NH who received HIV primary care (NH estimate)	87.3%	52.0%	<u>MA</u> : Met Need Estimate Medicaid Data <u>NH</u> : NH Met Need Estimate
E	# of PLWHA estimated to be receiving HIV primary care	8799	404	<u>MA</u> : C*D <u>NH</u> : A*D
MA: Private Insurance Adjustment NH: Out of State Care Adjustment		Calculation/Source		
F	<u>MA</u> : % of PLWHA covered by private insurance <u>NH</u> : % of PLWHA in NH with unmet need	30%	48%	<u>MA</u> : Hospital Discharge Data Estimate <u>NH</u> : Estimate
G	<u>MA</u> : # of PLWHA covered by private insurance <u>NH</u> : # of PLWHA in NH receiving care outside NH presumed to have unmet need (using NH estimate - higher due to underreporting of out of state labs)	4318	74	<u>MA</u> : A * F <u>NH</u> : C * F
H	<u>MA</u> : % of privately insured PLWHA receiving HIV primary care <u>NH</u> : % of PLWHA in NH receiving care outside of NH who received HIV primary care	96%	90%	<u>MA</u> : Privately Insured Met Need Estimate from Chart Review <u>NH</u> : 100% - Overall MA Unmet Need (Ji)
I	<u>MA</u> : # of privately insured PLWHA receiving HIV primary care <u>NH</u> : # of PLWHA receiving care outside of NH who received HIV primary care	4145	67	G * H
Calculated Results		Calculations		
J	# of PLWHA with unmet need for HIV primary care in Boston EMA (MA & NH)	1449	305	A-E-I
i	% of PLWHA with unmet need in Boston EMA (MA & NH)	10.1%	39.4%	
ii	Total Unmet Need in Boston EMA	11.6%		(J-MA +J-NH)/(A-MA+A-NH)
		1755		

**Appendix D. Unmet Need for HIV Primary Care among PLWHA 2007 – Boston EMA
Patients Age 13 and older, AIDS Diagnosis**

Population/Care Patterns		MA	NH	Data Source
A	Number of persons living with HIV/AIDS (PLWHA) and aware as of end of Calendar Year 2007	8082	409	MA HIV/AIDS Surveillance NH DHHS HIV/AIDS Surveillance Data (living cases in the Boston EMA)
B	<u>MA</u> : % of PLWHA covered by public insurance <u>NH</u> : % of PLWHA in NH receiving care outside NH	70%	20%	<u>MA</u> : Hospital Discharge Data Estimate <u>NH</u> : Estimate of NH PLWHA receiving care outside of NH
C	<u>MA</u> : # of PLWHA covered by public insurance <u>NH</u> : # of PLWHA in NH receiving care outside NH	5657	82	MA: A*B NH: A*B (52% met need, 48% unmet need)
D	<u>MA</u> : % of publicly insured PLWHA receiving HIV primary care <u>NH</u> : % of <i>all</i> PLWHA in NH who received HIV primary care (NH estimate)	87.3%	52.0%	<u>MA</u> : Met Need Estimate Medicaid Data <u>NH</u> : NH Met Need Estimate
E	# of PLWHA estimated to be receiving HIV primary care	4941	213	<u>MA</u> : C*D <u>NH</u> : A*D
MA: Private Insurance Adjustment NH: Out of State Care Adjustment				Calculation/Source
F	<u>MA</u> : % of PLWHA covered by private insurance <u>NH</u> : % of PLWHA in NH with unmet need	30%	48%	<u>MA</u> : Hospital Discharge Data Estimate <u>NH</u> : Estimate
G	<u>MA</u> : # of PLWHA covered by private insurance <u>NH</u> : # of PLWHA in NH receiving care outside NH presumed to have unmet need (using NH estimate - higher due to underreporting of out of state labs)	2425	39	<u>MA</u> : A * F <u>NH</u> : C * F
H	<u>MA</u> : % of privately insured PLWHA receiving HIV primary care <u>NH</u> : % of PLWHA in NH receiving care outside of NH who received HIV primary care	96%	90%	<u>MA</u> : Privately Insured Met Need Estimate from Chart Review <u>NH</u> : 100% - Overall MA Unmet Need (Ji)
I	<u>MA</u> : # of privately insured PLWHA receiving HIV primary care <u>NH</u> : # of PLWHA receiving care outside of NH who received HIV primary care	2328	35	G * H
Calculated Results				Calculations
J	# of PLWHA with unmet need for HIV primary care in Boston EMA (MA & NH)	814	161	A-E-I
i	% of PLWHA with unmet need in Boston EMA (MA & NH)	10.1%	39.4%	
ii	Total Unmet Need in Boston EMA	11.5%		(J-MA +J-NH)/(A-MA+A-NH)
		975		

**Appendix E. Unmet Need for HIV Primary Care among PLWHA 2007 – Boston EMA
Patients Age 13 and older, HIV non-AIDS**

Population/Care Patterns		MA	NH	Data Source
A	Number of persons living with HIV non-AIDS (PLWH) and aware as of end of Calendar Year 2007	6311	367	MA HIV/AIDS Surveillance NH DHHS HIV/AIDS Surveillance Data (living cases in the Boston EMA)
B	<u>MA</u> : % of PLWH covered by public insurance <u>NH</u> : % of PLWH in NH receiving care outside NH	70%	20%	<u>MA</u> : Hospital Discharge Data Estimate <u>NH</u> : Estimate of NH PLWHA receiving care outside of NH
C	<u>MA</u> : # of PLWH covered by public insurance <u>NH</u> : # of PLWH in NH receiving care outside NH	4418	73	MA: A*B NH: A*B (52% met need, 48% unmet need)
D	<u>MA</u> : % of publicly insured PLWH receiving HIV primary care <u>NH</u> : % of <i>all</i> PLWH in NH who received HIV primary care (NH estimate)	87.3%	52.0%	<u>MA</u> : Met Need Estimate Medicaid Data <u>NH</u> : NH Met Need Estimate
E	# of PLWH estimated to be receiving HIV primary care	3858	191	<u>MA</u> : C*D <u>NH</u> : A*D
MA: Private Insurance Adjustment NH: Out of State Care Adjustment				Calculation/Source
F	<u>MA</u> : % of PLWH covered by private insurance <u>NH</u> : % of PLWH in NH with unmet need	30%	48%	<u>MA</u> : Hospital Discharge Data Estimate <u>NH</u> : Estimate
G	<u>MA</u> : # of PLWH covered by private insurance <u>NH</u> : # of PLWH in NH receiving care outside NH presumed to have unmet need (using NH estimate - higher due to underreporting of out of state labs)	1893	35	<u>MA</u> : A * F <u>NH</u> : C * F
H	<u>MA</u> : % of privately insured PLWH receiving HIV primary care <u>NH</u> : % of PLWH in NH receiving care outside of NH who received HIV primary care	96%	90%	<u>MA</u> : Privately Insured Met Need Estimate from Chart Review <u>NH</u> : 100% - Overall MA Unmet Need (Ji)
I	<u>MA</u> : # of privately insured PLWH receiving HIV primary care <u>NH</u> : # of PLWH receiving care outside of NH who received HIV primary care	1818	32	G * H
Calculated Results				Calculations
J	# of PLWH with unmet need for HIV primary care in Boston EMA (MA & NH)	635	144	A-E-I
i	% of PLWH with unmet need in Boston EMA (MA & NH)	10.1%	39.4%	
ii	Total Unmet Need in Boston EMA	11.7%		(J-MA +J-NH)/(A-MA+A-NH)
		780		

**Appendix F. Unmet Need for HIV Primary Care among PLWHA 2007 – Boston EMA
Patients Age 13 and older, Gender - Male**

Population/Care Patterns		MA	NH	Data Source
A	Number of persons living with HIV/AIDS (PLWHA) and aware as of end of Calendar Year 2007	10327	573	MA HIV/AIDS Surveillance NH DHHS HIV/AIDS Surveillance Data (living cases in the Boston EMA)
B	<u>MA</u> : % of PLWHA covered by public insurance <u>NH</u> : % of PLWHA in NH receiving care outside NH	70%	20%	<u>MA</u> : Hospital Discharge Data Estimate <u>NH</u> : Estimate of NH PLWHA receiving care outside of NH
C	<u>MA</u> : # of PLWHA covered by public insurance <u>NH</u> : # of PLWHA in NH receiving care outside NH	7229	115	MA: A*B NH: A*B (52% met need, 48% unmet need)
D	<u>MA</u> : % of publicly insured PLWHA receiving HIV primary care <u>NH</u> : % of <i>all</i> PLWHA in NH who received HIV primary care (NH estimate)	87.8%	52.0%	<u>MA</u> : Met Need Estimate Medicaid Data <u>NH</u> : NH Met Need Estimate
E	# of PLWHA estimated to be receiving HIV primary care	6346	298	<u>MA</u> : C*D <u>NH</u> : A*D
MA: Private Insurance Adjustment NH: Out of State Care Adjustment				Calculation/Source
F	<u>MA</u> : % of PLWHA covered by private insurance <u>NH</u> : % of PLWHA in NH with unmet need	30%	48%	<u>MA</u> : Hospital Discharge Data Estimate <u>NH</u> : Estimate
G	<u>MA</u> : # of PLWHA covered by private insurance <u>NH</u> : # of PLWHA in NH receiving care outside NH presumed to have unmet need (using NH estimate - higher due to underreporting of out of state labs)	3098	55	<u>MA</u> : A * F <u>NH</u> : C * F
H	<u>MA</u> : % of privately insured PLWHA receiving HIV primary care <u>NH</u> : % of PLWHA in NH receiving care outside of NH who received HIV primary care	96%	90%	<u>MA</u> : Privately Insured Met Need Estimate from Chart Review <u>NH</u> : 100% - Overall MA Unmet Need (Ji)
I	<u>MA</u> : # of privately insured PLWHA receiving HIV primary care <u>NH</u> : # of PLWHA receiving care outside of NH who received HIV primary care	2974	50	G * H
Calculated Results				Calculations
J	# of PLWHA with unmet need for HIV primary care in Boston EMA (MA & NH)	1007	226	A-E-I
i	% of PLWHA with unmet need in Boston EMA (MA & NH)	9.8%	39.4%	
ii	Total Unmet Need in Boston EMA	11.3%		(J-MA +J-NH)/(A-MA+A-NH)
		1233		

**Appendix G. Unmet Need for HIV Primary Care among PLWHA 2007 – Boston EMA
Patients Age 13 and older, Gender - Female**

Population/Care Patterns		MA	NH	Data Source
A	Number of persons living with HIV/AIDS (PLWHA) and aware as of end of Calendar Year 2007	4066	203	MA HIV/AIDS Surveillance NH DHHS HIV/AIDS Surveillance Data (living cases in the Boston EMA)
B	<u>MA</u> : % of PLWHA covered by public insurance <u>NH</u> : % of PLWHA in NH receiving care outside NH	70%	20%	<u>MA</u> : Hospital Discharge Data Estimate <u>NH</u> : Estimate of NH PLWHA receiving care outside of NH
C	<u>MA</u> : # of PLWHA covered by public insurance <u>NH</u> : # of PLWHA in NH receiving care outside NH	2846	41	MA: A*B NH: A*B (52% met need, 48% unmet need)
D	<u>MA</u> : % of publicly insured PLWHA receiving HIV primary care <u>NH</u> : % of <i>all</i> PLWHA in NH who received HIV primary care (NH estimate)	86.5%	52.0%	<u>MA</u> : Met Need Estimate Medicaid Data <u>NH</u> : NH Met Need Estimate
E	# of PLWHA estimated to be receiving HIV primary care	2463	106	<u>MA</u> : C*D <u>NH</u> : A*D
MA: Private Insurance Adjustment NH: Out of State Care Adjustment				Calculation/Source
F	<u>MA</u> : % of PLWHA covered by private insurance <u>NH</u> : % of PLWHA in NH with unmet need	30%	48%	<u>MA</u> : Hospital Discharge Data Estimate <u>NH</u> : Estimate
G	<u>MA</u> : # of PLWHA covered by private insurance <u>NH</u> : # of PLWHA in NH receiving care outside NH presumed to have unmet need (using NH estimate - higher due to underreporting of out of state labs)	1220	19	<u>MA</u> : A * F <u>NH</u> : C * F
H	<u>MA</u> : % of privately insured PLWHA receiving HIV primary care <u>NH</u> : % of PLWHA in NH receiving care outside of NH who received HIV primary care	96%	90%	<u>MA</u> : Privately Insured Met Need Estimate from Chart Review <u>NH</u> : 100% - Overall MA Unmet Need (Ji)
I	<u>MA</u> : # of privately insured PLWHA receiving HIV primary care <u>NH</u> : # of PLWHA receiving care outside of NH who received HIV primary care	1171	18	G * H
Calculated Results				Calculations
J	# of PLWHA with unmet need for HIV primary care in Boston EMA (MA & NH)	432	80	A-E-I
i	% of PLWHA with unmet need in Boston EMA (MA & NH)	10.6%	39.4%	
ii	Total Unmet Need in Boston EMA	12.0%		(J-MA +J-NH)/(A-MA+A-NH)
		512		

**Appendix H. Unmet Need for HIV Primary Care among PLWHA 2007 – Boston EMA
Patients Age 13 and older, Race – White non-Hispanic**

Population/Care Patterns		MA	NH	Data Source
A	Number of persons living with HIV/AIDS (PLWHA) and aware as of end of Calendar Year 2007	6563	542	MA HIV/AIDS Surveillance NH DHHS HIV/AIDS Surveillance Data (living cases in the Boston EMA)
B	<u>MA</u> : % of PLWHA covered by public insurance <u>NH</u> : % of PLWHA in NH receiving care outside NH	70%	20%	<u>MA</u> : Hospital Discharge Data Estimate <u>NH</u> : Estimate of NH PLWHA receiving care outside of NH
C	<u>MA</u> : # of PLWHA covered by public insurance <u>NH</u> : # of PLWHA in NH receiving care outside NH	4594	108	MA: A*B NH: A*B (52% met need, 48% unmet need)
D	<u>MA</u> : % of publicly insured PLWHA receiving HIV primary care <u>NH</u> : % of <i>all</i> PLWHA in NH who received HIV primary care (NH estimate)	87.1%	52.0%	<u>MA</u> : Met Need Estimate Medicaid Data <u>NH</u> : NH Met Need Estimate
E	# of PLWHA estimated to be receiving HIV primary care	4001	282	<u>MA</u> : C*D <u>NH</u> : A*D
MA: Private Insurance Adjustment NH: Out of State Care Adjustment				Calculation/Source
F	<u>MA</u> : % of PLWHA covered by private insurance <u>NH</u> : % of PLWHA in NH with unmet need	30%	48%	<u>MA</u> : Hospital Discharge Data Estimate <u>NH</u> : Estimate
G	<u>MA</u> : # of PLWHA covered by private insurance <u>NH</u> : # of PLWHA in NH receiving care outside NH presumed to have unmet need (using NH estimate - higher due to underreporting of out of state labs)	1969	52	<u>MA</u> : A * F <u>NH</u> : C * F
H	<u>MA</u> : % of privately insured PLWHA receiving HIV primary care <u>NH</u> : % of PLWHA in NH receiving care outside of NH who received HIV primary care	96%	90%	<u>MA</u> : Privately Insured Met Need Estimate from Chart Review <u>NH</u> : 100% - Overall MA Unmet Need (Ji)
I	<u>MA</u> : # of privately insured PLWHA receiving HIV primary care <u>NH</u> : # of PLWHA receiving care outside of NH who received HIV primary care	1890	47	G * H
Calculated Results				Calculations
J	# of PLWHA with unmet need for HIV primary care in Boston EMA (MA & NH)	672	213	A-E-I
i	% of PLWHA with unmet need in Boston EMA (MA & NH)	10.2%	39.4%	
ii	Total Unmet Need in Boston EMA	12.5%		(J-MA +J-NH)/(A-MA+A-NH)
		885		

**Appendix I. Unmet Need for HIV Primary Care among PLWHA 2007 – Boston EMA
Patients Age 13 and older, Race – Black non-Hispanic**

Population/Care Patterns		MA	NH	Data Source
A	Number of persons living with HIV/AIDS (PLWHA) and aware as of end of Calendar Year 2007	4411	118	MA HIV/AIDS Surveillance NH DHHS HIV/AIDS Surveillance Data (living cases in the Boston EMA)
B	<u>MA</u> : % of PLWHA covered by public insurance <u>NH</u> : % of PLWHA in NH receiving care outside NH	70%	20%	<u>MA</u> : Hospital Discharge Data Estimate <u>NH</u> : Estimate of NH PLWHA receiving care outside of NH
C	<u>MA</u> : # of PLWHA covered by public insurance <u>NH</u> : # of PLWHA in NH receiving care outside NH	3088	24	MA: A*B NH: A*B (52% met need, 48% unmet need)
D	<u>MA</u> : % of publicly insured PLWHA receiving HIV primary care <u>NH</u> : % of <i>all</i> PLWHA in NH who received HIV primary care (NH estimate)	87.2%	52.0%	<u>MA</u> : Met Need Estimate Medicaid Data <u>NH</u> : NH Met Need Estimate
E	# of PLWHA estimated to be receiving HIV primary care	2692	61	<u>MA</u> : C*D <u>NH</u> : A*D
MA: Private Insurance Adjustment NH: Out of State Care Adjustment				Calculation/Source
F	<u>MA</u> : % of PLWHA covered by private insurance <u>NH</u> : % of PLWHA in NH with unmet need	30%	48%	<u>MA</u> : Hospital Discharge Data Estimate <u>NH</u> : Estimate
G	<u>MA</u> : # of PLWHA covered by private insurance <u>NH</u> : # of PLWHA in NH receiving care outside NH presumed to have unmet need (using NH estimate - higher due to underreporting of out of state labs)	1323	11	<u>MA</u> : A * F <u>NH</u> : C * F
H	<u>MA</u> : % of privately insured PLWHA receiving HIV primary care <u>NH</u> : % of PLWHA in NH receiving care outside of NH who received HIV primary care	96%	90%	<u>MA</u> : Privately Insured Met Need Estimate from Chart Review <u>NH</u> : 100% - Overall MA Unmet Need (Ji)
I	<u>MA</u> : # of privately insured PLWHA receiving HIV primary care <u>NH</u> : # of PLWHA receiving care outside of NH who received HIV primary care	1270	10	G * H
Calculated Results				Calculations
J	# of PLWHA with unmet need for HIV primary care in Boston EMA (MA & NH)	449	46	A-E-I
i	% of PLWHA with unmet need in Boston EMA (MA & NH)	10.2%	39.4%	
ii	Total Unmet Need in Boston EMA	10.9%		(J-MA +J-NH)/(A-MA+A-NH)
		495		

**Appendix J. Unmet Need for HIV Primary Care among PLWHA 2007 – Boston EMA
Patients Age 13 and older, Race – Hispanic**

Population/Care Patterns		MA	NH	Data Source
A	Number of persons living with HIV/AIDS (PLWHA) and aware as of end of Calendar Year 2007	3208	103	MA HIV/AIDS Surveillance NH DHHS HIV/AIDS Surveillance Data (living cases in the Boston EMA)
B	<u>MA</u> : % of PLWHA covered by public insurance <u>NH</u> : % of PLWHA in NH receiving care outside NH	70%	20%	<u>MA</u> : Hospital Discharge Data Estimate <u>NH</u> : Estimate of NH PLWHA receiving care outside of NH
C	<u>MA</u> : # of PLWHA covered by public insurance <u>NH</u> : # of PLWHA in NH receiving care outside NH	2246	21	MA: A*B NH: A*B (52% met need, 48% unmet need)
D	<u>MA</u> : % of publicly insured PLWHA receiving HIV primary care <u>NH</u> : % of <i>all</i> PLWHA in NH who received HIV primary care (NH estimate)	89.7%	52.0%	<u>MA</u> : Met Need Estimate Medicaid Data <u>NH</u> : NH Met Need Estimate
E	# of PLWHA estimated to be receiving HIV primary care	2013	54	<u>MA</u> : C*D <u>NH</u> : A*D
MA: Private Insurance Adjustment NH: Out of State Care Adjustment				Calculation/Source
F	<u>MA</u> : % of PLWHA covered by private insurance <u>NH</u> : % of PLWHA in NH with unmet need	30%	48%	<u>MA</u> : Hospital Discharge Data Estimate <u>NH</u> : Estimate
G	<u>MA</u> : # of PLWHA covered by private insurance <u>NH</u> : # of PLWHA in NH receiving care outside NH presumed to have unmet need (using NH estimate - higher due to underreporting of out of state labs)	962	10	<u>MA</u> : A * F <u>NH</u> : C * F
H	<u>MA</u> : % of privately insured PLWHA receiving HIV primary care <u>NH</u> : % of PLWHA in NH receiving care outside of NH who received HIV primary care	96%	90%	<u>MA</u> : Privately Insured Met Need Estimate from Chart Review <u>NH</u> : 100% - Overall MA Unmet Need (Ji)
I	<u>MA</u> : # of privately insured PLWHA receiving HIV primary care <u>NH</u> : # of PLWHA receiving care outside of NH who received HIV primary care	924	9	G * H
Calculated Results				Calculations
J	# of PLWHA with unmet need for HIV primary care in Boston EMA (MA & NH)	271	41	A-E-I
i	% of PLWHA with unmet need in Boston EMA (MA & NH)	8.4%	39.4%	
ii	Total Unmet Need in Boston EMA	9.4%		(J-MA +J-NH)/(A-MA+A-NH)
		311		