Regional Differences Among HIV Patients in Care: California Medical Monitoring Project Sites, 2007-2008

Susan Scheer[*,1], Alison J. Hughes[1], Judith Tejero[2], Mark A. Damesyn[3], Karen E. Mark[3], Tyler M. Arguello[3] and Amy R. Wohl[2]

[1]*San Francisco Department of Public Health, San Francisco, CA, USA*

[2]*Los Angeles County Department of Public Health, Los Angeles, CA, USA*

[3]*California Department of Public Health, Sacramento, CA, USA*

Abstract: *Introduction*: The Medical Monitoring Project (MMP) is a national, multi-site population-based supplemental HIV/AIDS surveillance project of persons receiving HIV/AIDS care. We compared California MMP data by region. Demographic characteristics, medical care experiences, HIV treatment, clinical care outcomes, and need for support services are described.

Methods: HIV-infected patients 18 years or older were randomly selected from medical care facilities. In person structured interviews from 2007 - 2008 were used to assess sociodemographic characteristics, self-reported clinical outcomes, and need for supportive services. Pearson chi-squared, Fisher's exact and Kruskal-Wallis p-values were calculated to compare regional differences.

Results: Between 2007 and 2008, 899 people were interviewed: 329 (37%) in San Francisco (SF), 333 (37%) in Los Angeles (LA) and 237 (26%) in other California counties. Significant regional sociodemographic differences were found. Care received and clinical outcomes for patients in MMP were positive and few regional differences were identified. HIV case management (36%), mental health counseling (35%), and dental services (29%) were the supportive services patients most frequently needed. Unmet needs for supportive services were low overall. Significant differences by region in needed and unmet need services were identified.

Discussion: The majority of MMP respondents reported standard of care CD4 and viral load monitoring, high treatment use, undetectable HIV viral loads and CD4 counts indicative of good immune function and treatment efficacy. Information from MMP can be used by planning councils, policymakers, and HIV care providers to improve access to care and prevention. Identifying regional differences can facilitate sharing of best practices among health jurisdictions.

Keywords: HIV care, medical monitoring project, HIV surveillance, California.

INTRODUCTION

California has the second highest number of persons living with HIV/AIDS in the United States (U.S.) after New York [1]. By the end of 2008, there were 100,366 adults and adolescents reported to be living with HIV or AIDS in California. San Francisco and Los Angeles counties account for more than half of persons living with HIV/AIDS in California with 14,440 (14%) in San Francisco and 36,705 (37%) in Los Angeles County. As the state where AIDS was first described [2] and with continued high rates of disease, changes in the HIV epidemic in California over the last three decades have often preceded changes in the rest of the country. Therefore, understanding the demographic, transmission, and clinical trends among persons living with HIV/AIDS in California is important to the U.S. epidemic as a whole. However, the HIV epidemic in California varies by region. HIV-infected persons in Los Angeles County are more likely to be Latino than in San Francisco or other California counties. In San Francisco, men account for 92% of persons living with HIV/AIDS compared to 88% in Los Angeles County and 87% in the rest of California. There are proportionally more people exposed to HIV through heterosexual contact and non-men who have sex with men (MSM) injection drug use in Los Angeles County and the other California counties compared to San Francisco, where approximately 86% of people living with HIV are either MSM or MSM injection drug users [3-5].

The Centers for Disease Control and Prevention implemented the Medical Monitoring Project (MMP) in 2004 in response to an Institute of Medicine recommendation that representative data on persons in HIV care in the U.S. was necessary to adequately track and compare clinical data, monitor and target prevention among HIV-infected individuals, evaluate service needs, and compare data across geographic regions [6,7]. MMP was designed to be a national, multi-site, comprehensive, population-based supplemental HIV/AIDS surveillance project.

*Address correspondence to this author at the San Francisco Department of Public Health, HIV Epidemiology Section, 25 Van Ness Avenue, Suite 500, San Francisco, CA 94102, USA; Tel: 415-554-9076; Fax: 415-431-0353; E-mail: susan.scheer@sfdph.org

1874-6136/12 2012 Bentham Open

We compared MMP data from California by region with respect to demographic characteristics of patients in care for HIV/AIDS and described their medical care experiences, HIV treatment use, clinical care and outcomes, and need for ancillary and support services. MMP's unmet need, clinical care and outcomes, and sociodemographic data can be used by community planning councils, policymakers, HIV care providers, and others to target care and prevention services and to inform the HIV prevention community planning process at the local, state and national levels.

METHODS

We analyzed MMP interview data from 2007-2008 collected in California. The San Francisco Department of Public Health and the Los Angeles County Department of Public Health conducted MMP in their respective counties and the California State Office of AIDS conducted MMP in the remaining counties. The MMP sampling methodology has been previously described [8]. Briefly, facilities were selected for inclusion from each of the three California project areas using stratified probability proportional to size sampling to ensure that both smaller and larger volume providers would be included. Only facilities that provided HIV medical care to patients over the age of 18 were included in the sampling frame. HIV care facilities that provided only inpatient care, facilities that had closed or were outside the study area, correctional and work-release facilities, tribal facilities and facilities on military installations were excluded from the sampling frame. HIV-infected patients 18 years of age or older from these facilities were then randomly selected for participation.

Facility Recruitment

Sampled facilities were contacted by MMP staff and asked to participate. In some cases, members of the MMP site's community advisory board or their provider advisory board contacted the sampled facility to gain their cooperation. A facility stipend was provided to most facilities to offset the costs of participating; San Francisco provided each participating facility $400, Los Angeles paid $25 per patient sampled to the facility regardless of whether or not the patient agreed to participate and the State Office of AIDS compensated sampled facilities in other California counties on average $300. The facility recruitment rate was calculated by dividing the number of sampled facilities that agreed to participate by the number of eligible facilities sampled.

Patient Recruitment

Each year 400 patients each from San Francisco and Los Angeles counties and 500 patients from the other California counties were selected to participate in MMP. In most cases the participating facilities made the initial contact with sampled patients, provided basic information about MMP and asked patients for verbal consent to be contacted by MMP staff. With permission of the provider, the MMP interviewer made the initial contact in a minority of cases. Standardized telephone scripts were used for contacting and recruiting patients and an interview was scheduled with eligible patients who agreed to participate. After completing an interview, patients were paid a $25 stipend in Los Angeles and the other California counties and $40 in San Francisco. Persons found to be HIV negative, deceased, incarcerated, younger than 18 years old, or those whom the medical provider believed were unable to give informed consent were ineligible. The interview response rate for each site was defined as the number of interviewed patients divided by the total of eligible patients.

Response Rate and Comparison to California HIV/AIDS Case Registries

The overall response rate equaled the interview response rate multiplied by the facility response rate. In addition, in order to evaluate representativeness of the MMP participants, we compared interviewed MMP patients with persons living with HIV/AIDS in 2007 and 2008 and reported to the HIV/AIDS case registries for each California region.

Data Collection

Data collection consisted of a face-to-face structured interview conducted by trained interviewers. Although MMP also conducts a medical record abstraction, these analyses are restricted to the interview data. The interview was approximately 45-60 minutes and included questions about demographics, sources of care, treatment regimens, treatment adherence, clinical outcomes, sexual and drug use behavior, need for supportive and ancillary services, and HIV prevention activities. All information was gathered through patient self-report. Questionnaire Development System (QDS) software was used to collect interviews on a handheld computer.

Data Analysis

Data analyses were conducted using SAS v.9.1.3. In this analysis, sociodemographic characteristics, self-reported clinical outcomes, and need for supportive and ancillary services were assessed. Unmet need for an ancillary or supportive service was defined as the number of patients reporting that they were unable to obtain a needed service divided by the number of patients reporting they needed the service in the past 12 months. Pearson chi-squared, Fisher's exact and Kruskal-Wallis p-values were calculated to compare differences across the three MMP jurisdictions in California. To protect the confidentiality of respondents and avoid their possible identification, we did not report the number and percentage of persons in categories where the cell sizes are small (<5). In these circumstances, not reported due to small cell size is indicated in the tables.

Human Subjects Protection

MMP was approved by the Institutional Review Boards covering local public and private hospitals, the University of California (UC) San Francisco, UC Los Angeles, and UC San Diego, the University of Southern California, Veteran Administration Hospitals in the selected project areas, the Los Angeles Department of Public Health, Stanford University, and the State of California Committee for the Protection of Human Subjects. All participants signed a written informed consent prior to the interview.

RESULTS

Between 2007 and 2008, 899 people receiving medical care for HIV/AIDS were interviewed: 329 (37%) in San

Francisco, 333 (37%) in Los Angeles and 237 (26%) in other California counties Patient interview response rate was 43% in San Francisco, 45% in Los Angeles, and 25% in other California counties. Patients sampled from 31, 22 and 42 outpatient medical facilities completed interviews in San Francisco, Los Angeles and in other California counties respectively. Overall, the project response rate was low (38% in San Francisco, 40% in Los Angeles, and 17% in other California counties).

Sociodemographic Characteristics

Table **1** includes the sociodemographic characteristics of patients participating in MMP from 2007 to 2008. Overall the majority of MMP patients were 40 years or older (77%), male (91%), and identified as gay or lesbian (68%). In addition, the majority were non-white races (52%) with 13% African-Americans, 30% Latinos, 3% Asian/Pacific Islanders and 6% reporting mixed or other race. Seventy percent had some college education or higher, 47% earned income from salary or wages, 75% reported being insured for the entire previous 12 months, and 52% had private/health maintenance organization (HMO) insurance. Only 7% had been homeless in the previous 12 months.

Significant regional differences were found for all the sociodemographic characteristics except for the proportion that were homeless in the previous 12 months (see Table **1**). Patients in Los Angeles were significantly more likely to be under 40 years old (31%), Latino (46%), uninsured for the entire previous 12 months (39%), recruited from a public facility (78%) and have a high school degree or less (43%) than patients in both San Francisco ($p<.0.01$) and in other California counties ($p<0.01$). Patients in San Francisco were more likely to be male (96%), identify as gay or lesbian (81%), have private/HMO insurance (63%), recruited from a private facility (69%) and have a college degree or higher (50%) than patients in both Los Angeles ($p<0.01$) and in other California counties ($p<0.01$). Patients in other California counties were significantly more likely to report public assistance or another source of income rather than salary (64%) and have Medicaid insurance (46%) than either San Francisco ($p<0.01$) or Los Angeles patients ($p<0.01$).

MMP Respondents Compared to HIV/AIDS Surveillance Data

Across all California regions, a greater proportion of MMP patients of mixed or other race were identified when compared to the HIV/AIDS case registry data (Table **2**). In San Francisco, African-Americans were underrepresented in MMP. In Los Angeles, African-Americans were underrepresented and Latinos were overrepresented. In the other California counties, older patients were overrepresented when compared to the case registry data. Compared to facility type at time of HIV diagnosis among living HIV/AIDS cases, MMP patients in San Francisco were more likely to be recruited from private facilities; in Los Angeles and all other California counties they were more likely to be recruited from public facilities (data not shown).

Care Received and Clinical Outcomes

The majority of MMP respondents reported standard of care CD4+ T-cell count (CD4) and plasma HIV-1 RNA (viral load) monitoring, high treatment use and undetectable HIV viral loads and CD4 counts indicative of good immune function and treatment efficacy (Table **3**). Nearly all patients reported having a usual source of care in the past 12 months (99.6%). Patients in all California regions each reported a median of 4 CD4 tests and a median of 4 viral load tests in the previous 12 months. Antiretroviral treatment (ART) use was also high with 93% reporting ever using ART and 90% reporting current ART use. Eleven percent of all MMP respondents reported they intentionally stopped taking their ART for at least two consecutive days in the previous 12 months. The majority of patients reported their most recent viral load was undetectable (79%) and their most recent CD4 test was equal to or greater than 500 cells/mm^3 (50%). Patients in San Francisco were, however, significantly more likely to report an undetectable viral load (82%) than patients in Los Angeles (75%, $p=0.03$).

Overall, 19% of patients reported that they were offered partner notification services after testing positive; patients in other California counties were significantly more likely to report being offered this service (29%) than patients in San Francisco (16%, $p<0.01$) or in Los Angeles (15%, $p<0.01$). In addition, 54% of patients overall reported that someone at their usual place of care discussed safe sex with them in the previous 12 months and this activity was more common in Los Angeles (73%) compared to other California counties (51%, $p<0.01$) and both Los Angeles and other California counties compared to San Francisco (37%, $p<0.01$).

Forty percent of respondents reported a previous HIV test before their first positive test. Forty percent of patients had progressed to AIDS, with patients in Los Angeles (33%) significantly less likely to have AIDS than patients in San Francisco (42%, $p=0.02$) and patients in other California counties (46%, $p<0.01$).

Need and Unmet Need for Supportive Services

The supportive services patients most frequently reported they needed in the past 12 months were HIV case management (36%), mental health counseling (35%), assistance finding dental services (29%) and social services (26%) (Table **4**). Unmet needs for supportive and ancillary services were low overall (Table **4**). The services with the highest reported unmet need were assistance finding shelter or housing (43%), assistance finding dental services (34%), social services (26%) and mental health counseling (22%).

There were significant differences by region in both needed services and unmet need for these services. Patients in other California counties reported greater need for HIV case management services (44%) and for home health services (15%) than both San Francisco (32%, $p<0.01$; 8%, $p=0.01$ respectively) and Los Angeles (34%; $p=0.03$; 7%, $p<0.01$ respectively). Los Angeles patients reported more need for assistance finding dental services (39%), education or information about HIV risk reduction (15%) and assistance finding a doctor (18%) than patients in both San Francisco (22%, $p<0.01$; 8%, $p<.01$; 9%, $p<0.01$ respectively) and other California counties (27%, $p<0.01$; 6%, $p<0.01$; 8%, $p<0.01$ respectively). Los Angeles patients also reported less need for social services (21%), than patients in both San Francisco (30%, $p=0.01$) and other California counties (29%, $p=0.03$).

Table 1. Sociodemographic Characteristics of MMP Respondents Receiving HIV/AIDS Care in California, 2007-2008

Characteristic	San Francisco		Los Angeles		Other California Counties[§]		Total		p-Value[‡]
	n	%	n	%	n	%	n	%	
Total	329	100.0	333	100.0	237	100.0	899	100.0	
Age in Years									<0.01 [a,c]
18-29	9	2.7	25	7.5	12	5.1	46	5.1	
30-39	49	14.9	79	23.7	30	12.7	158	17.6	
40-49	122	37.1	140	42.0	83	35.0	345	38.4	
≥50	149	45.3	89	26.7	112	47.3	350	38.9	
Birth Sex									<0.01 [a,b]
Male	315	95.7	287	86.4	214	90.3	816	90.9	
Female	14	4.3	45	13.6	23	9.7	82	9.1	
Sexual Orientation									<0.01 [a,b]
Homosexual, Gay or Lesbian	267	81.4	196	59.9	144	61.3	607	68.2	
Heterosexual or Straight	36	11.0	100	30.6	65	27.7	201	22.6	
Bisexual/Other	25	7.6	31	9.5	26	11.1	82	9.2	
Race/Ethnicity									<0.01 [a,b,c]
White	194	59.2	115	34.6	122	51.7	431	48.1	
African American	32	9.8	47	14.2	37	15.7	116	13.0	
Asian/Pacific Islander	9	2.7	7	2.1	7	3.0	23	2.6	
Latino	59	18.0	153	46.1	59	25.0	271	30.3	
Mixed/Other	34	10.4	10	3.0	11	4.7	55	6.1	
Education									<0.01 [a,b,c]
Less than high school	17	5.2	78	23.4	41	17.3	136	15.1	
High school graduate	39	11.9	65	19.5	33	13.9	137	15.2	
Some college	107	32.5	115	34.5	95	40.1	317	35.3	
College graduate	86	26.1	53	15.9	38	16.0	177	19.7	
Graduate degree	80	24.3	22	6.6	30	12.7	132	14.7	
Main income source, past 12 months									<0.01 [b,c]
Salary or wages	162	49.2	172	52.9	86	36.4	420	47.2	
Public Assistance	133	40.4	113	34.8	125	53.0	371	41.7	
Other[*]	34	10.3	40	12.3	25	10.6	99	11.1	
Health insurance, past 12 months									<0.01 [a,c]
Insured entire last 12 months	289	87.8	179	54.4	204	86.1	672	75.1	
Uninsured part of the last 12 months	21	6.4	23	7.0	16	6.8	60	6.7	
Uninsured entire last 12 months	19	5.8	127	38.6	17	7.2	163	18.2	
Type of Health Insurance among those insured at least part of last 12 months[†]									
Private/HMO	195	62.9	82	43.6	97	44.1	374	52.1	<0.01 [a,b]
Medicaid	87	28.1	54	28.7	101	45.9	242	33.7	<0.01 [b,c]
Medicare	98	31.6	86	45.7	95	43.2	279	38.9	<0.01 [a,b]
Recruitment Facility Type									<0.01 [a,b,c]
Public	101	30.7	261	78.4	121	51.1	483	53.7	
Private	228	69.3	72	21.6	116	48.9	416	46.3	
Homeless in past 12 months	25	7.6	25	7.5	14	5.9	64	7.1	0.70

[*]Other source of income includes savings, investments, retirement, and support from partner, family or others.
[†]health insurance type is not mutually exclusive.
[‡]p-values are Pearson chi-squared unless otherwise noted.
[§]Residents of the following other California counties were interviewed: Alameda, Butte, Fresno, Humboldt, Imperial, Kern, Lake, Marin, Nevada, Napa, Orange, Riverside, Sacramento, San Bernardino, Santa Clara, Santa Cruz, San Diego, San Mateo, San Joaquin, Santa Barbara, and Ventura.
[a]p<0.05 for SF versus LA.
[b]p<0.05 for SF versus CA.
[c]p<0.05 for LA versus CA.

Table 2. MMP Respondents Compared to Persons Living with HIV/AIDS Reported from HIV/AIDS Case Registries by Region, 2007-2008

Characteristic	San Francisco					Los Angeles					Other California Counties[‡]				
	MMP Data		HARS Data[†]		p-Value*	MMP Data		HARS Data[†]		p-Value*	MMP Data		HARS Data[†§]		p-Value*
	n	%	n	%		n	%	n	%		n	%	n	%	
Total	329	100	15307	100		333	100	40164	100		237	100	51936	100	
Age in Years					0.35					0.41					<0.01
18-29	9	2.7	598	3.9		25	7.5	3339	8.3		12	5.1	3666	7.1	
30-39	49	15	2448	16.0		79	23.7	8511	21.2		30	12.7	9561	18.4	
40-49	122	37	5999	39.2		140	42.0	16169	40.3		83	35.0	20687	39.8	
≥50	149	45	6262	40.9		89	26.7	12145	30.2		112	47.3	18022	34.7	
Birth Sex					0.22					0.25					0.06
Male	315	96	14410	94.1		287	86.4	35527	88.5		214	90.3	44662	86.0	
Female	14	4.3	897	5.9		45	13.6	4637	11.5		23	9.7	7274	14.0	
Race/Ethnicity					<0.01					<0.01					<0.01
White	194	59	9788	64.0		115	34.6	14420	35.9		122	51.7	26075	50.3	
African American	32	9.8	2123	13.9		47	14.2	8450	21.0		37	15.7	9485	18.3	
Asian/Pacific Islander	9	2.7	722	4.7		7	2.1	1206	3.0		7	3.0	1663	3.2	
Latino	59	18	2390	15.6		153	46.1	15527	38.7		59	25.0	14139	27.3	
Mixed/Other	34	10	265	1.7		10	3.0	561	1.4		11	4.7	524	1.0	

*p-values are Pearson chi-squared.
†HARS data includes living cases as of January 1, 2007 and at least 18 years old on January 1, 2008.
§California HARS data includes all California cases outside of San Francisco and Los Angeles counties.
‡Residents of the following other California counties were interviewed: Alameda, Butte, Fresno, Humboldt, Imperial, Kern, Lake, Marin, Nevada, Napa, Orange, Riverside, Sacramento, San Bernardino, Santa Clara, Santa Cruz, San Diego, San Mateo, San Joaquin, Santa Barbara, Ventura.

Patients in other California counties reported greater unmet need for social services (40%) than patients in both San Francisco (20%, p<0.01) and in Los Angeles (23%, p=0.03). San Francisco patients reported greater unmet need for treatment adherence support (35%) than patients in Los Angeles (percentage not reported due to small cell size, p=0.02). Patients in San Francisco reported more unmet need for transportation assistance (19%) compared to Los Angeles (6%, p=0.02). There was greater unmet need for assistance finding meals in other California counties (26%) versus San Francisco (17%, p=0.04). Reported unmet need for home health services and chore/homemaker was greater in San Francisco (37%; 33% respectively) than other California counties (14%, p=0.04; percentage not reported due to small cell size, p=0.04, respectively).

DISCUSSION

Using the MMP standardized sampling methodology and data collection instrument, we were able to characterize and assess care received, clinical outcomes and the need for supportive services among people receiving care for HIV/AIDS in California and make regional comparisons. Overall, the majority of participating patients reported receiving standard of care CD4 and viral load monitoring, high rates of treatment use, undetectable HIV viral loads and CD4 counts indicative of good immune function and treatment efficacy.

These results are encouraging and demonstrate improvements in HIV care since the HIV Cost and Utilization Study (HCSUS), the first examination of HIV care in a nationally representative sample in 1997-1998. Shapiro *et al.* concluded that access to care, especially among vulnerable populations such as Blacks, Latinos, women, the uninsured and Medicaid-insured patients, was suboptimal [9]. For example, 41% of patients in HCSUS with CD4 cell counts below 500 cells/mm^3 reported that they had not received antiretroviral therapy at the initial interview. At subsequent interviews, 15% of this population had not received ART. In contrast, 90% of all MMP patients, regardless of CD4 cell counts, reported current ART use which may indicate recent changes in access to and acceptance of ART among patients, revised recommendations regarding optimal time to initiate ART use or medical provider practices [10].

However, the need for supportive services among the California MMP sample was similar to HIV patients in care in other studies including HCSUS and the national MMP patients [7,11-13]. Sixty-seven percent of patients in HCSUS reported need for at least one supportive service and 40% of those who needed a service reported not receiving it (contingent unmet need) while 27% of the total sample reported an unmet need (prevalent unmet need). Similarly, among MMP patients, 70% reported need for any supportive service with 43% reporting contingent unmet need and 29%

Table 3. Clinical Outcomes of MMP Respondents Receiving HIV/AIDS Care in California, 2007-2008

Characteristic	San Francisco		Los Angeles		Other California Counties[§]		Total		p-Value[*]
	n	%	n	%	n	%	n	%	
Usual source of care, past 12 months	329	100.0	329	99.4	237	100.0	895	99.6	0.34[‡]
Ever tested for HIV before first positive test	141	43.1	117	36.5	99	42.0	357	40.4	0.19
Ever AIDS disease	136	42.0	107	33.0	109	46.2	352	39.8	<0.01 [a,c]
Ever ART Use	307	93.3	308	92.5	224	94.5	839	93.3	0.63
Current ART	295	89.7	296	88.9	215	90.7	806	89.7	0.78
Drug holiday in last 12 months	30	10.1	32	11.1	23	10.7	85	10.6	0.92
Ever had CD4 test	328	100.0	311	99.7	237	100.0	876	99.9	0.63[‡]
Most Recent CD4, cells/mm^3 (self-reported)									0.51
0-199	21	7.0	21	8.1	19	9.5	61	8.0	
200-349	55	18.3	48	18.5	30	15.0	133	17.5	
350-499	81	27.0	53	20.5	51	25.5	185	24.4	
≥500	143	47.7	137	52.9	100	50.0	380	50.1	
Number of CD4 tests in last 12 months, median, (min, max) ; mean ± SD	4 (1,16); 4.0 ± 1.8		4 (1, 12); 4.0 ± 1.7		4 (1, 15); 4.3 ± 2.4		4 (1, 16); 4.1 ± 1.9		0.87[†]
Ever had viral load test	329	100.0	308	99.4	236	100.0	873	99.8	0.20[‡]
Most Recent Viral Load, copies/ml (self-reported)									0.09 [a]
Undetectable	254	82.2	194	74.6	160	78.4	608	78.7	
Detectable	55	17.8	66	25.4	44	21.6	165	21.4	
Number of VL tests in last 12 months, median, (min, max) ; mean ± SD	4 (1,16); 3.9 ± 1.9		4 (1, 12); 3.9 ± 1.6		4 (0, 15); 4.3 ± 2.4		4 (0, 16); 4.0 ± 2.0		0.69[†]
Offered partner notification services after testing positive	47	15.5	47	14.8	64	29.1	158	18.8	<0.01 [b,c]
Someone at usual place of care discussed safe sex in past 12 months	120	36.5	235	72.8	121	51.1	476	53.5	<0.01 [a,b,c]

[*]p-values are Pearson chi-squared unless otherwise noted.
[†]Kruskal-Wallis p-value.
[‡]Fisher's Exact Test.
[§]Residents of the following other California counties were interviewed: Alameda, Butte, Fresno, Humboldt, Imperial, Kern, Lake, Marin, Nevada, Napa, Orange, Riverside, Sacramento, San Bernardino, Santa Clara, Santa Cruz, San Diego, San Mateo, San Joaquin, Santa Barbara, and Ventura.
[a]p<0.05 for SF versus LA.
[b]p<0.05 for SF versus CA.
[c]p<0.05 for LA versus CA.

reporting prevalent unmet need. MMP patients in California indicated need for the same top four supportive services as MMP patients nationally. As a state with a significant burden of HIV disease, need for supportive services in California will likely continue and may be expected to grow as survival with HIV improves and the population living with HIV ages. Therefore, it will be important to monitor the ability of HIV care agencies and providers in California to provide these services as the economic challenges in the state and at the Federal level continue. MMP data can assist Ryan White-funded HIV/AIDS agencies to target supportive services to the areas of greatest need in California.

We did identify some areas where the characteristics of interviewed MMP patients differed from the characteristics of persons in the HIV/AIDS case registries, indicating that some populations may have been under or overrepresented in MMP. However, some of these differences in population demographics may reflect characteristics of patients in HIV care as compared to all persons reported with HIV/AIDS. The case registry includes all reported HIV/AIDS cases regardless of whether they are engaged in care; therefore, it is possible that the differences seen in the MMP participants reflect true differences in access to care and/or care-seeking behaviors by population. For example, African-Americans are underrepresented in HIV care as indicated by more delayed testing for HIV and less ART use which results in poorer survival rates compared to people of other race/ethnicities in California [3,14]. In addition, the greater proportion of persons reporting a mixed or other race could reflect the opportunity during a face-to-face interview to describe race/ethnicity in more detail than is routinely collected on case report forms where race/ethnicity is

Table 4. Need for Supportive Services During the past 12 Months Among MMP Respondents Receiving HIV/AIDS Care in California, 2007-2008

Service	San Francisco				Los Angeles				Other California Counties[§]				Total				p-Value for Need for Service*	p-Value for Unmet Need for Service*
	Needed Service		Unmet Need for Service		Needed Service		Unmet Need for Service		Needed Service		Unmet Need for Service		Needed Service		Unmet Need for Service			
	n	%	n	%†	n	%	n	%†	n	%	n	%†	n	%	n	%†		
HIV case management	106	32.2	20	18.9	114	34.2	15	13.2	103	43.5	18	17.5	323	35.9	53	16.4	0.02[b,c]	0.49
Mental health counseling	127	38.6	33	26.2	100	30.0	19	19.0	85	35.9	15	17.7	312	34.7	67	21.5	0.06[a]	0.25
Social Services	97	29.5	19	19.6	70	21.0	16	22.9	68	28.7	27	39.7	235	26.1	62	26.4	0.03[a,c]	0.01[b,c]
Assistance finding dental services	71	21.6	28	39.4	129	38.7	39	30.2	64	27.0	22	34.4	264	29.4	89	33.7	<0.01[a,c]	0.42
Transportation assistance	64	19.5	12	18.8	78	23.4	5	6.4	60	25.3	10	16.7	202	22.5	27	13.4	0.23	0.07[a]
Assistance finding meals or food	46	14.0	NR		53	15.9	9	17.0	39	16.5	10	25.6	138	15.4	NR		0.68	0.11[b]
Education or information about HIV risk reduction	25	7.6	5	20.0	49	14.7	NR		13	5.5	NR		87	9.7	NR		<0.01[a,c]	0.18‡
Assistance finding shelter/ housing	31	9.4	14	45.2	43	12.9	18	41.9	25	10.6	11	44.0	99	11.0	43	43.4	0.35	0.96
Assistance finding a doctor	29	8.8	NR		60	18.0	5	8.3	20	8.4	NR		109	12.1	NR		<0.01[a,c]	1.00‡
Adherence support	20	6.1	7	35.0	29	8.7	NR		10	4.2	NR		59	6.6	NR		0.10[c]	0.04‡[,a‡]
Home health services	27	8.2	10	37.0	22	6.6	NR		35	14.8	5	14.3	84	9.3	NR		<0.01[b,c]	0.06[b]
Chore or homemaker	43	13.1	14	32.6	28	8.4	6	21.4	33	13.9	NR		104	11.6	NR		0.07[c]	0.11[b]

NR = not reported due to small cell size.
*p-values are Pearson chi-squared unless otherwise noted.
†percent is out of participants who reported needing that particular service.
‡Fisher's Exact test.
[§]Residents of the following other California counties were interviewed: Alameda, Butte, Fresno, Humboldt, Imperial, Kern, Lake, Marin, Nevada, Napa, Orange, Riverside, Sacramento, San Bernardino, Santa Clara, Santa Cruz, San Diego, San Mateo, San Joaquin, Santa Barbara, and Ventura.
[a]p<0.05 for SF versus LA.
[b]p<0.05 for SF versus CA.
[c]p<0.05 for LA versus CA.

recorded by the provider or abstracted from a medical record.

We were also able to identify some significant regional differences in the need and unmet need for supportive services. Identification of regional differences has implications for delivery of HIV care services as supportive services need to be culturally specific to the populations served. For example, in San Francisco, most services need to be tailored to the needs of men who have sex with men whereas Los Angeles care providers may have a greater need to ensure readily available Spanish language services. In addition, the higher proportion of younger clients in Los Angeles relative to San Francisco and the rest of the state could have implications for care service planning. However, notwithstanding the younger care clientele in Los Angeles, 70-80 percent of clients from all California regions were over 40 years of age, indicating that the specific needs of older persons living with HIV/AIDS will need to be addressed.

The original site of HIV diagnosis may also explain some of the regional differences found. The majority of HIV/AIDS cases are diagnosed at private facilities in all regions of California. Traditionally, HIV partner notification services are offered by public health departments and at counseling, testing and referral sites at the time of initial HIV diagnosis. Private medical providers are less likely to offer these services. Among MMP respondents, the total proportion reporting being offered partner services (19%) was low as has been reported in other studies [15,16] perhaps because of where these patients were originally diagnosed or because patients were diagnosed before HIV partner services were offered in their county. Additionally, partner notification services have been standard procedure for STD prevention and control and therefore may be more routinely offered in the smaller California counties where HIV, STD and other communicable disease activities are more fully integrated.

There are several limitations associated with this project. Most importantly, while MMP was designed to produce a representative sample of patients receiving HIV care nationally and within each jurisdiction, recruitment of both facilities and patients has proven difficult in California. As a result of low facility and patient response rates, our data may not be representative or generalizable to all patients in HIV care in California. Facilities were most likely to refuse participation due to time constraints involving sampling and recruiting patients. Additionally, patient response rates were higher in San Francisco and Los Angeles than the rest of the state. Thus estimates of indicators representing the combined California data may over-represent the experience of patients

in these jurisdictions relative to the underlying California-wide population of people receiving care. At the patient level, patients were often lost to follow up, did not see their medical provider during the recruitment period, failed to attend scheduled interviews or not well enough to participate. CDC is currently evaluating changes to the MMP sampling methodology that may improve response rates. For example, adjustments to facility sampling to prevent the same facilities from being sampled every year are being considered and, recently, the option for a telephone survey has been added to the MMP protocol to increase access to patients. Careful examination of barriers to participation will be needed to increase response rates to ensure representativeness.

In addition, we have not verified patients' self reported clinical information and it is likely that some patients are not able to accurately recall clinical results or might confuse medical terminology. Further analyses that compare the interview data with the medical record abstraction data will be able to assess the extent of this limitation. Another possible limitation is that, by nature of the sampling process, patients in regular medical care are most likely to be included and reached for participation. Therefore, the results may not be generalizable to patients who do not access care consistently.

Despite these limitations, the information available from MMP interview data contributes to the overall picture of HIV care among patients living with HIV/AIDS in California, information that is unavailable through routine surveillance activities. While the MMP respondents might not be representative of all persons receiving HIV care in California, these data provide evidence that HIV care in all regions of California is generally good and that those patients who are linked to and retained in care are receiving standard of care. Additionally, identifying differences by region can facilitate the sharing of best practices among local health jurisdictions to improve patient care and satisfaction. For example, MMP data show care providers in Los Angeles were more likely to have discussed safe sex during the last 12 months than other California regions. Additionally, data show greater levels of unmet need for social services among patients in other California counties than in San Francisco or Los Angeles. The next step will be to incorporate the information gathered from the comprehensive MMP medical chart abstractions. This additional information will describe in greater depth the HIV care experiences among patients in California and also allow us to validate the self-reported information gathered from the interview.

ACKNOWLEDGEMENTS

The Medical Monitoring Project was funded by the Centers for Disease Control and Prevention and funding for this project supported all the authors.

CONFLICT OF INTEREST

The authors confirm that this article content has no conflicts of interest.

REFERENCES

[1] Centers for Disease Control and Prevention. HIV Surveillance Report 2009; vol. 21, pp. 1-79. Available From: http://www.cdc.gov/hiv/topics/surveillance/resources/reports/inder.htm [Accessed: February 2011].

[2] Centers for Disease Control and Prevention. Pneumocystic Pneumonia- Los Angeles. MMWR Morb Mortal Wkly Rep 1981; 21:1-3.

[3] HIV Epidemiology Section, San Francisco Department of Public Health. HIV/AIDS Epidemiology. Annual Report 2009. San Francisco: San Francisco Department of Public Health July 2010; pp. 1-93.

[4] HIV Epidemiology Program, Los Angeles County Department of Public Health. HIV/AIDS Surveillance Summary Report. January 2010; pp. 1-33.

[5] Office of AIDS, California Department of Public Health. HIV/AIDS Surveillance. Quarterly Report. USA: Department of Public Health, September 2010; pp. 1-11.

[6] Institute of Medicine. Measuring what matters: Allocation, Planning, and Quality Assessment for the Ryan White CARE Act. Washington, D.C.:National Academies Press 2004; pp. 1-302.

[7] Centers for Disease Control and Prevention. Clinical and Behavioral Characteristics of Adults Receiving Medical Care for HIV Infection – Medical Monitoring Project, United States, 2007. MMWR Morb Mortal Wkly Rep 2011; 60: 1-17.

[8] McNaghten AD, Wolfe MI, Onorato I, *et al*. Improving the representativeness of behavioral and clinical surveillance for persons with HIV in the united states: the rationale for developing a population-based approach. PLoS ONE 2007; 2(6): e550.

[9] Shapiro MF, Morton SC, McCaffrey DF, *et al*. Variations in the Care of HIV-infected adults in the United States: Results from the HIV Cost and Services Utilization Study. JAMA 1999; 281: 2305-15.

[10] Panel on Antiretroviral Guidelines for Adults and Adolescents. Guidelines for the use of antiretroviral agents in HIV-1-infected adults and adolescents. USA: Department of Health and Human Services 2011; pp. 1-166.

[11] Katz MH, Cunningham WE, Mor V, *et al*. Prevalence and predictors of unmet need for supportive services among HIV-infected persons: impact of case management. Med Care 2000; 38: 58-69.

[12] Bonuck KA, Arno PS, Green J, *et al*. Self perceived unmet health care needs of persons enrolled in HIV care. J Community Health 1996; 21:183-98.

[13] Marx R, Katz MH, Park MS, Gurley RJ. Meeting the service needs of HIV-infected persons: Is the Ryan White CARE Act succeeding? J Acquir Immune Defic Syndr 1997; 14: 44-55.

[14] HIV Epidemiology Program, Los Angeles County Department of Public Health. An Epidemiologic Profile of HIV and AIDS in Los Angeles County. USA: Department of Health Services & Public Health 2009; pp. 1-151.

[15] Golden MR, Hogben M, Handsfield HH, St. Lawrence JS, Potterat JJ, Holmes KK. Partner Notification for HIV and STD in the United States: Low Coverage for gonorrhea, chlamydial infection, and HIV. Sex Transm Dis 2003; 30: 490-6.

[16] Golden MR, Hogben M, Potterat JJ, Handsfield HH. HIV partner notification in the United States: a national survey of program coverage and outcomes. Sex Transm Dis 2004; 31:709-12.

Received: April 16, 2011 Revised: October 28, 2011 Accepted: November 23, 2011