



Rural Versus Urban HIV/AIDS Clinical Outcomes: A Multi-state Perspective

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BACKGROUND

Those with HIV/AIDS in rural United States may experience unique barriers to HIV care, which may contribute to poor health outcomes.

Clinical outcomes and healthcare utilization were evaluated in rural and urban patients seen in high volume urban HIV care sites within the United States.

METHODS

The HIV Research Network (HIVRN) is a consortium of 19 sites that provide primary care to HIV patients. To be included, sites had to have a minimum data set available in electronic format or through paper abstraction. The minimum data required were the patients' age, sex, race, HIV transmission risk factor, CD4 level, viral load, and use of HAART. Seven sites, 5 academic and 2 community based site located in the Northeastern (1), Western (2), Midwestern (2) and Southern (2) US, were included in the analysis. The median sample size per site was 665 patients (Range: 55 to 3456 patients). All adult patients (≥ 18 years old) with at least one outpatient visit at any of the 7 sites in 2005 were eligible for inclusion in the study.

Using home zip codes in 2005, 9,586 patients were categorized using the University of Washington rural health categorization schema into rural (<10K) and urban (>10K).

Use of HAART was defined as three or more nucleosides or any use of one or more protease inhibitors [PI], or a non-nucleoside reverse transcriptase inhibitor [RTI] in combination with a nucleoside RTI; or a PI, non-nucleoside RTI, nucleoside RTI combination. We measured CD4 count and HIV-1 RNA as the first values recorded in 2005. Clinical and demographic characteristics, inpatient and outpatient utilization, quality of care, and virologic suppression were compared using chi-squared tests for categorical variables and t-tests for means. Logistic regression was used to assess factors associated with PCP prophylaxis. Variables significant at .20 were included in the final multivariate analysis.

Table 1. Demographic Characteristics

	Rural N= 170	Urban N=8,416	p value
Median Age	42	42	ns
Male	71%	77%	0.07
White	65%	37%	<0.001
Black	22%	40%	<0.001
Hispanic	11%	20%	0.004
HIV Risk Factor			
MSM	51%	56%	ns
IDU	18%	17%	ns
HET	31%	27%	ns

Table 3. Clinical Characteristics

	Rural N=170	Urban N=8,416	p value
Median CD4 Count	360	368	ns
CD4 Count Distribution			
<50	12%	10%	ns
50-200	18%	16%	
201-500	42%	44%	
>500	28%	31%	
Median HIV-1 RNA	440	490	ns
HIV-1 RNA Distribution			
<10K	64%	65%	ns
10-100K	23%	23%	
>100K	14%	12%	
VL<400 if on HAART	58%	60%	ns
HCV Infection	23%	20%	ns

Table 2. Pharmacy Characteristics

If eligible:	Rural N=170	Urban N=8,416	p value
On HAART ¹	80%	77%	ns
PCP prophylaxis ¹	78%	80%	ns
MAC prophylaxis ²	75%	76%	ns

¹CD4<200, ²CD4<50

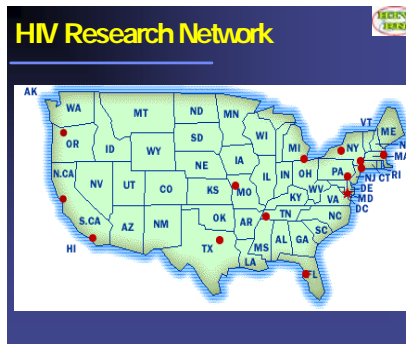
Table 4. Medical Utilization

	Rural N=170	Urban N=8,416	p value
IP Visits/100PY	17.1	26.8	0.06
IP visits/100PY if on HAART	16.5	26.1	0.09
OP visits/yr	3.95	5.24	<0.001
OP visits/yr if on HAART	4.02	5.82	<0.001

IP=inpatient, PY=person-years, OP=outpatient

Table 5. Bivariate and Multivariate Analysis: Factors associated with HAART Use

	Odds Ratio (95% CI)	Adjusted Odds Ratio (95% CI)
Age >40	1.20 (1.07 – 1.35)	1.25 (1.08 – 1.46)
Male	1.22 (1.07 – 1.38)	1.18 (0.99 – 1.40)
Black	0.55 (0.49 – 0.61)	0.41 (0.36 – 0.48)
IDU	0.75 (0.66 – 0.86)	0.57 (0.48 – 0.69)
Rural	1.29 (0.97 – 1.74)	1.25 (0.93 – 1.69)



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HIVRN Participating Sites
Alameda County Medical Center, Oakland, California (Silver Sianeros, D.O.)
Children's Hospital of Philadelphia, Philadelphia, Pennsylvania (Richard Rutstein, M.D.)
Community Health Network, Rochester, New York (Roberto Corales, D.O.)
Community Medical Alliance, Boston, Massachusetts (James Hellinger, M.D.)
Drexel University, Philadelphia, Pennsylvania (Peter Sklar, M.D.)
Henry Ford Hospital Detroit, Michigan (John Jovanovich, M.D., Norman Markowitz, M.D.)
Johns Hopkins University, Baltimore, Maryland (Kelly Gebo, M.D., Richard Moore, M.D.)
Montefiore Medical Group, Bronx, New York (Robert Bell, M.D., Lawrence Hanau, M.D.)
Nemechek Health Renewal, Kansas City, Missouri (Patrick Nemechek, M.D.)
Oregon Health and Science University, Portland, Oregon (P. Todd Korthuis, M.D.)
Parkland Health and Hospital System, Dallas, Texas (Philip Keiser, M.D.)
St. Jude's Children's Hospital (Arlene Gaur, M.D.)
St. Luke's Roosevelt Hospital Center, New York, New York (Victoria Sharp, M.D.)
Tampa General Health Care, Tampa, Florida (Jeffrey Nadler, M.D., Charant Somboonwit, M.D.)
University of California, San Diego, La Jolla, California (Stephen Spector, M.D.)
University of California, San Diego, California (W. Christopher Matthews, M.D.)
Wayne State University, Detroit, Michigan (Lawrence Crane MD., Jonathan Cohn, M.D.)

CONCLUSIONS

- Compared with urban patients:
 - Rural HIV patients are more likely to be white.
 - Rural HIV patients have less inpatient and outpatient utilization of healthcare.
- HAART usage, OI usage and HAART response indicators were similar between rural and urban patients.
- Overall, receipt of HAART was dependent on age, race, gender and IDU, but independent of geography.

IMPLICATIONS

Rural patients treated by experienced HIV providers can receive high quality HIV care with high rates of OI prophylaxis and HAART usage.

Rural patients may use inpatient and outpatient services less often due to barriers to care in more remote settings.

Efforts to understand these barriers and mitigate access to care issues need further exploration, especially among minorities and IDU.

Future comparison of care to rural patients delivered in rural settings versus urban sites are needed.