

# **Project Access Case Management Program**

**August 2003- February 2004**

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**By**

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## **Executive Summary**

Since the Community Case Management program was initiated in December 2001, 5,598 individuals have met enrollment criteria (three emergency department visits in six months). To date, 4,611 people did not respond to the invitation to participate in the voluntary, free of charge program, of which 56.8% were children, and 43.2% were adults. However, a total of 987 patients have enrolled in the program since its initiation in December 2001.

The number of enrolled clients has increased with each six-month evaluation period: 111, 117, 215, 257, and 227, respectively. The overall enrollment rate is 21.1% (children = 12.6% and adults (33.4%). The client population is predominantly single, white, low-income, female adults, with a high school education or less. More than 50% report they are unemployed.

The Case Management program appears to be effective in reducing ED visits for non-urgent health problems, and in achieving cost savings for the medical centers. The short-term goal of reducing ED visits was achieved, and current analyses of medical referrals suggests that the majority of participating clients were connected to their medical referral at the third follow-up. More than 60% of medical referrals were fully verified. Only 18% of patients had no verified medical referrals. Regardless of perceived social support, clients receive approximately the same number of medical referrals (low 1.9, moderate 1.8, high 1.7).

Results also suggest that CCM clients' perceived physical health and mental health status improves significantly. CCM clients perceive less control over their health than healthy adults. Small, positive changes were identified in CCM clients' health locus of control. However, the changes were nonsignificant. There was an inverse relationship between perceived social support and emergency department use. Emergency department use remains highest in those with the lowest perceived support and lowest in those with higher perceived social support. Although there was reduced ED use by all three groups, the greatest reduction occurred among those with lowest perceived social support, followed by those with the highest perceived social support. The case management teams appear to be most effective in helping extremely high users of the ED, who may have complex social and/or health problems.

The following document describes Community Case Management (CCM) client demographics for the fifth reporting period, August 2003 through February 2004, and overall demographic and utilization patterns and comparisons for all clients enrolled since December 2001.

### **Enrollment Criteria and Procedure**

There were four case management teams, located at Via Christi St. Joseph campus, St. Francis campus, and Riverside campus, and Wesley Medical Center. The selection criteria were slightly different at the facilities. At Via Christi St. Joseph and St. Francis campuses, patients with three or more visits to the emergency department (ED) in six months qualify, whereas patients with three or more visits in 12 months qualify at Wesley and Via Christi Riverside. Patients who qualify for the voluntary, no-charge program receive a brochure through the mail inviting them to participate in the program. If patients choose to, they may contact the Community Case Management Team for an introductory assessment. If patients participate in the program, the care management teams help them apply for benefits, provide health education, and facilitate connections to clinics, with follow-up until eligibility was determined. ED visits six months prior to enrollment were assessed and entered into the CCM database. Likewise, client ED visits six months after enrollment were tracked and recorded.

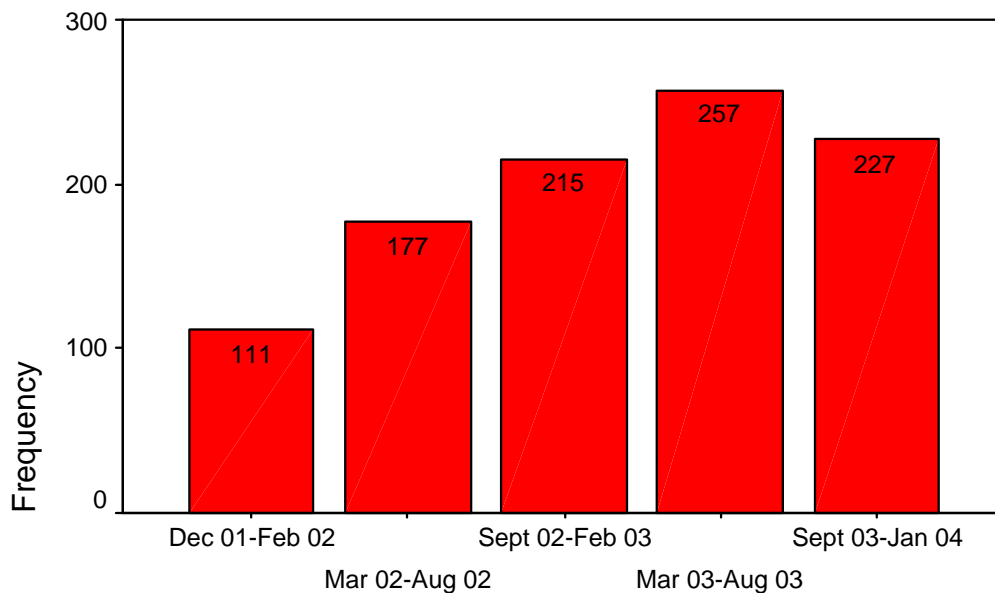
### **Characteristics of Enrolled Clients**

Since the program was initiated in December 2001, 5,598 individuals met Case Management program enrollment criteria (three visits in 6 months for adults and one visit for children), of which 987 have enrolled in the CCM program. To date, 4,611 clients did not respond to the invitation to participate in the case management program, of which 56.8% were children (aged 0-18) years and 43.2% were adults (aged 19-64 years). Among children, the mean age was 7.2 years (median age = 5 years). Approximately 50% were aged 5 years or younger, and 70% were 10 years of age or younger. Among adults, the mean age was 33 years (SD 24.6), and the median age was 30 years. The majority (75%) was aged 39 years or younger. More than half of this group was female (60%).

Of all qualifying individuals, 987 cases have been opened, of which 33% were children and 67% were adults. Of children meeting criteria (N = 2,591), 326 were enrolled, a 12.6% enrollment rate. Among adults meeting enrollment criteria (1,974), 660 voluntarily entered the program, a 33.4% enrollment rate. The overall enrollment is 21.6% since the program was initiated with a progressive increase in enrolled clients during each six-month reporting period (Graph 1). In order to meet report submission deadlines, data was downloaded in early February, which will reflect lower numbers in the most recent six-month period.

**Graph 1**

### Community Case Management Client Enrollment by Reporting Period



N = 987

#### **Demographic Characteristics: September 2003 to January 2004**

There were 215, 257, and 227 clients enrolled during the last three reporting periods (September 2002 through February 2003, March through August 2003, September 2003-January 2004).

Age—evenly divided, children represent 46.3% of the sample while 53.7% were adults

Gender— predominantly female (60.0%)

Race/Ethnicity— all clients: African American 21.8%, Caucasian 55.6%, Hispanic 17.8%, American Indian 3.6%, and Asian less than 1.3%. Ethnic representation was largely unchanged from previous reporting periods with Native American enrollment increasing by 2%. Analysis of adult clients reveals that only 29.5% are minority (African American = 18.9%, Hispanic = 10.7%, Native American 2.5%, and Asian < 1%), the remaining adults are Caucasian (70.5%). Among children, 62.1% are represented by minorities (African American 29.1%, Hispanic 26.2%, American Indian 4.9%, Asian 1.9%).

Marital status (adults only)—predominantly single (73.8%)

Annual Income—30.3% reported income of less than \$10,000, 14.8% reported income between \$10,000 and \$25,000 annually, and 1.6% reported income greater than \$25,000. The remainder reported they were unemployed. Income designation was refused on 19.7% of observations

Work Status (Adults only)—employed 34.0%, unemployed 66.0%

Education Level (Adults only)—41.5% reported less than high school education, 42.3% reported high school diploma or GED, and the remainder reported some college or vocational technical training. However, approximately 9.0% did not report education status.

Missed Work due to Illness (Adults only)—80.0% reported they missed no work days due to illness, approximately 8% missed one week due to illness, and the remaining 10% reported missing between 10 and 105 days. The mean days missed was 3.31days (SD 12.1)

Insurance status—When asked, “have you ever been insured,” 10.7% reported never being insured, while 82.0% reported having been insured previously, and 7.4% refused to answer or

had missing data. When asked, “how long have you been without insurance,” 28.7% reported being insured less than 1 year, 37.7% for one to five years, 13.1% for more than five years, 9.0% reported never being insured, and 11.5% did not respond.

### Social Support Assessment

Scores for the subscales were computed by summing individual items scores on the 5-point Likert scale ranging from 1 (no one would do this) to 5 (most family members or friends would certainly do this). The range of possible scores for all subscales ranges from 45 to 225. A lower score indicates poorer perceived social support. From September 2003 through January 2004, there were 134 valid measures using the SSB. For each subscale (emotional, socializing, practical assistance, financial assistance, and advice/guidance) and the summary score, the mean and median scores were comparable with previous timeframes with each construct slightly skewed to the right. There was a 15 – 20 point difference between the 25<sup>th</sup> and 75<sup>th</sup> percentiles for each subscale, indicating a wide variability in perceived social support among clients enrolled in the case management program (Table 2).

**Table 2: Assessment of Perceived Social Support, September 2003 through January 2004**

	<b>Emotional (10-50)</b>	<b>Socializing (7-35)</b>	<b>Practical Assistance (8-40)-</b>	<b>Financial Assistance (8-40)</b>	<b>Advice and/or Guidance (12-60)</b>	<b>Summary Score (45-225)</b>
N						
Valid	133	133	134	134	133	134
Missing	2	2	1	2	2	1
Mean	38.37	26.75	29.45	26.77	45.56	166.7
Median	40.0	29.0	32.0	28.0	48.0	176.0
Std. Deviation	11.1	7.7	9.4	10.1	13.4	49.3
Percentiles						
25	30	21	21	17	36	125.3
50	40	29	32	28	48	176.0
75	49	34	39	37	58	212.8

Measured using Social Support Behaviors Scale



## **Self-Reported Health Issues**

Participants are interviewed about the types of health problems they are experiencing.

- Dental: 33.0% reported having dental problems. Of those with dental problems, oral pain (14.7%), and missing/damaged teeth (77.7%) are most frequently listed.
- Tobacco: 37.0% of adults reported using tobacco products.
- Drugs: 8.4% reported having had a previous drug problem and have sought treatment.
- Alcohol: 6.6% reported an alcohol problem and have sought treatment previously.
- Pregnancy: 2.6% reported being pregnant.
- A majority of clients enrolling during this six-month period reported emotional health problems (70.9%), and difficulty coping with emotional problems (57.3%).
- The reasons for frequenting the ED rather than visiting a doctor's office or clinic included: could not afford upfront costs associated with an office visit or owed money to the doctor (74.0%), time of day (6.2%), transportation (1.8%), no barriers (4.4%), Language (<1.0%), and other (6.6%).

Data was missing for 6.6% of the responses.

## **Demographic Characteristics of All Clients: December 2001 through January 2004**

Since its initiation in December 2001, 987 clients have enrolled in the case management program. Participants were predominantly single, white, low-income, female adults. More than half of the participants reported a high school education or less. Approximately 33% reported they were employed, while more than 50% indicate no employment. Approximately 10% reported never having health insurance. When asked, "How long have you been without insurance?" 19.4% reported being uninsured less than 1 year, 26.1% for one to five years, 10.3% for more than five years, 7.9% reported never being insured. There was a wide variability in perceived social support among participants. The most frequently reported reason for seeking

care in the ED rather than visiting a doctor's office or clinic was money owed to the doctor (74.2%).

Age—majority were adults (67.0%) vs. children (33.0%)

Gender—predominantly female (68.5%)

Race/Ethnicity— African American 23.3%, Caucasian 59.2%, Hispanic 14.7%, Native American 2.1% and Asian < 1.0%. Hispanic population proportion has increased slightly. Total minority representation was approximately 41.0%. Twenty-five clients did not respond to the question.

Marital status—predominantly single (65.4%), potential poor social support.

Education Level (Adults only)—26.2% reported less than high school education, 33.9% reported high school diploma or GED, approximately 20.0% reported some college or vocational technical training, and 1.0% reported a college education. Nearly 42.0% did not report their education level.

Annual Income (Adults only)— 30.2% reported income of < \$10,000, 19.4% reported income between \$10,000 and \$25,000 annually, and 1.8% reported income greater than \$25,000. Approximately 21.0% did not report their income level. The remainder reported they were not employed.

Work Status (Adults only)—employed 33.2%, unemployed 52.4%.

Missed Work due to Illness (Adults only)—84.8% reported missing 0 days due to illness, however the remaining 14.7%, the mean number of days missed was 2.8 (SD 12.4) with a range between 1 and 150 days.

Insurance status—when asked, “have you ever been insured,” 10.5% reported never having health insurance, while 54.5% reported having been insured previously, and 35.0% have missing data. When asked, “how long have you been without insurance,” 19.4% reported being uninsured less than 1 year, 26.1% for one to five years, 10.3% for more than five years, 7.9% reported never being insured.

### Social Support Assessment

The Social Support Behaviors Scale (SSB) is a 45-item instrument designed to assess five modes of social support including: emotional, socializing, practical assistance, financial assistance, and advice/guidance. The instrument was designed to assess available supportive behavior and to do so separately for family and friends. However, to improve the completion rate of the instrument in this population, perceived support from family and friends was assessed simultaneously, rather than separately. The five subscales have been confirmed through factor analysis, and the instrument is an important measure for the study of social support networks, and also for use in clinical practice as a way of understanding real and potential supports available for clients. The SSB has very good internal consistency, with alphas exceeding .85 for several college samples. Moreover, the instrument has good concurrent validity, with significant correlations with social support network associations and support appraisals.

The instrument was administered when the client enrolled into the CCM program, and will be used in two ways for the evaluation project. The CCM teams may use the subscale and summary scores to identify clients who may have less social supports in place, and may need greater attention and/or more resources. Secondly, the instrument will be used in multivariate analyses at the end of the evaluation to assist in understanding variability in outcomes related to social support.

Scores for the subscales were computed by summing individual items scores on the 5-point Likert scale ranging from 1 (no one would do this) to 5 (most family members or friends would certainly do this). The range of possible scores for all subscales ranges from 45 to 225. A lower score indicates poorer perceived social support. From December 2001 through January 2004, there were 536 valid measures using the SSB. For each subscale (emotional, socializing, practical assistance, financial assistance, and advice/guidance) and the summary score, the mean and median scores were comparable, suggesting the group scores were evenly distributed. There was a 10 – 18 point difference between the 25<sup>th</sup> and 75<sup>th</sup> percentiles for each subscale, indicating a wide variability in perceived social support among clients enrolled in the case management program (Table 2). The summary score can vary from a low of 45 to a high of 225, and shows the greatest variability with a 79-point difference between the 25<sup>th</sup> (132.3) and 75<sup>th</sup> percentile (211.0). See Table 2a.

**Table 2a: Assessment of Perceived Social Support for All CCM Clients, December 2001 through January 2004**

		<b>Emotional (10-50)</b>	<b>Socializing (7-35)</b>	<b>Practical Assistance (8-40)-</b>	<b>Financial Assistance (8-40)</b>	<b>Advice and/or Guidance (12-60)</b>	<b>Summary Score (45-225)</b>
N	Valid	536	536	537	535	535	536
	Missing	5	5	4	6	6	5
Mean		38.9	27.2	29.8	27.6	45.8	169.4
Median		42.0	29.0	32.0	29.0	48.0	178.0
Std. Deviation		10.7	7.3	9.0	9.7	12.6	46.8
Percentiles							
	25	31	22	23	20	36	132.3
	50	42.0	29.0	32.0	29.0	48.0	178.0
	75	49	34	38	36	58	211.0

Measured using Social Support Behaviors scale

## **Self-Reported Health Issues**

Participants are interviewed about the types of health problems they are experiencing.

- Dental: 25.8% (N=244) reported having dental problems. Major problems among these 244 individuals include missing/damaged teeth (192), oral pain (119), and chewing problems (54).
- Tobacco: 25.0% reported using tobacco products.
- Drugs: 5.2% reported having had a previous drug problem and have sought treatment
- Alcohol: 4.5% reported an alcohol problem and have sought treatment previously.
- Pregnancy: 1.8% reported being pregnant
- A large percentage of clients reported emotional health problems (45.5%), and difficulty coping with emotional problems (35.0%).
- The reasons for frequenting the ED rather than visiting a doctor's office or clinic included 1) either could not afford the upfront cost of a doctor office visit or owed money to the doctor's office (74.2%), 2) time of day (11.1%), 3) transportation (2.4%), 4) work (< 1.0%), 5) language (<1.0%), 6) no barriers (2.7%), and 7) other (8.6%).

## **Chief Health Complaint for Seeking Emergency Department Services**

Case management personnel recorded the chief complaint for each emergency department visit. These complaints were analyzed simultaneously to assess which types of health problems prompted the need to seek medical care. Of 5,784 recorded responses, orthopedic pain represents the most frequent complaint (14.7%), followed by %, headache/migraine (9.0%), abdominal pain (8.4%), back pain (7.8 %), respiratory distress (6.9%), dental pain (5.8%), and cold/flu symptoms (4.3%). The remaining categories of complaints, including allergic reaction, chest pain, diarrhea, drug or alcohol related problems, earache, fever, nausea/vomiting, trauma, urinary tract infection, and vaginal bleeding, range from

3.0% to less than 1.0% of health problems. The “other” complaint category represents 24.7% of presenting complaints, and will require input from the case management teams to describe what this category represents (Graph 2). Revisions to the case management database are underway to capture visit complaint more fully.

### **Community Case Management Activities**

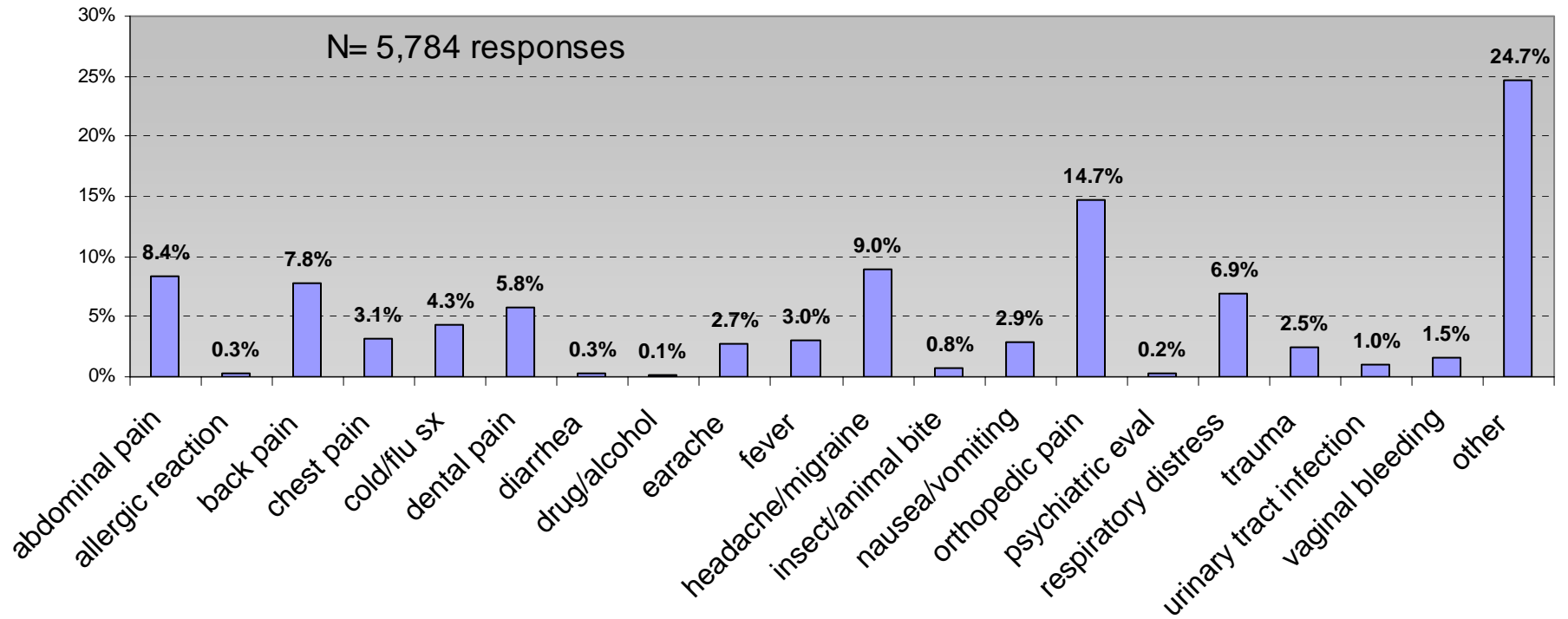
For the time period between December 2001 through January 2004, 10,805 interactions took place between case management teams and enrolled clients. The majority of activity involves interactions between the client and case management team members (pre-enrollment 6.0%, post-enrollment 94.0%). The case management teams use several methods to make initial contact with clients including letters, phone calls, leaving flyers at client homes, cold calls (contacting by cell phone while out in community--unscheduled) and making an initial home visit that has been prescheduled. Clients respond to a follow-up call after contact by letter most frequently (49.9%), followed by letter alone (27.5%), phone call alone (16.0%), short notice home visit (4.9%), and a flyer left at the client’s home (1.6%). See Graph 3.

Once a client was enrolled, there were several activities in which the case managers may interact with a client, including: a phone call to the client, collateral calls or visits to community referrals, a home visit, accompanying a client to an appointment, or fielding a phone call from the client. The most frequent activity was collateral calls/visits (31.1%), followed by phone calls to clients (29.3%), home visits (24.6%), fielding calls from clients (7.6%), making an unscheduled visit to the home while in the field (4.2%), and accompanying clients to appointments (3.2%). See Graph 4.

The case management process involves initial contact with the client, assessment of client needs and goal setting, coordination of services and resources, referrals to health and community services/providers, education about disease management, and use of community resources, and/or health system, counseling, and evaluation of service impact on client health status. Of the nearly 11,000 client interactions from December 2001 – January 2004, more than 40% of case management activity involves coordination of services for enrolled clients. Nearly 20% was consumed by making the initial contact with the client. Approximately 30% involves assessment and evaluation processes. See Graph 5.

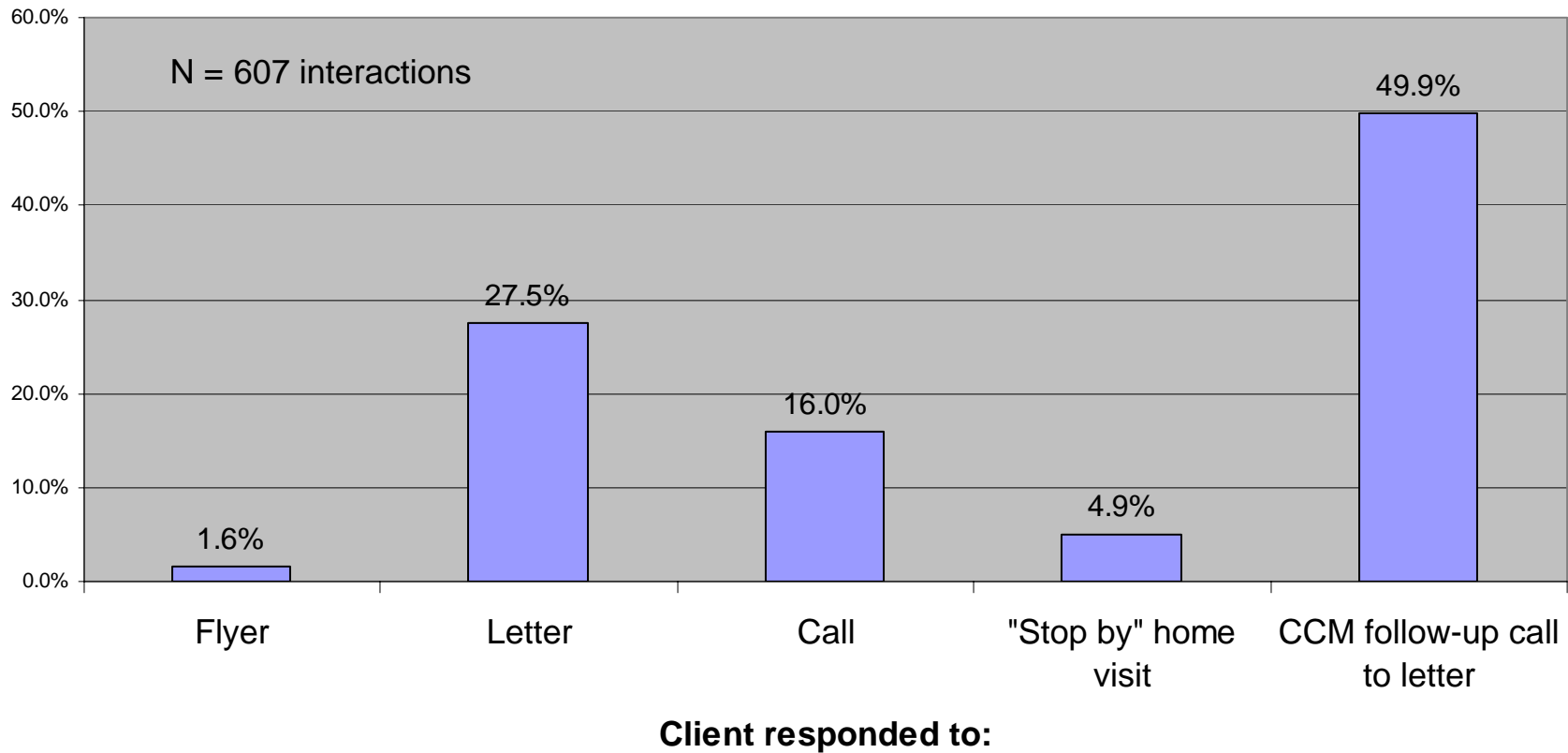
Graph 2

### Emergency Visit Patient Complaint by Type December 2001 - January 2004



Graph 3

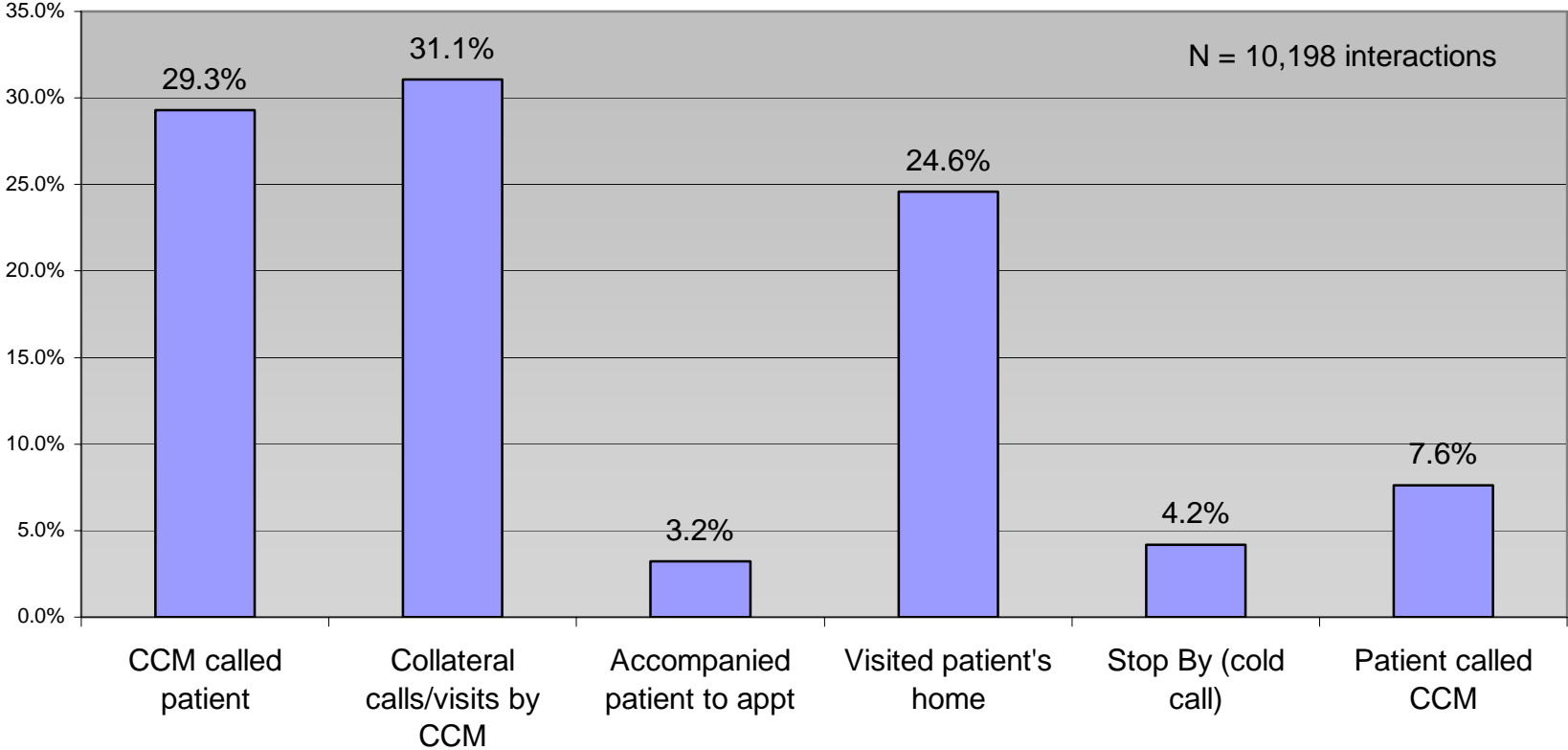
### Community Case Management Pre Enrollment Activity December 2001 - January 2004





Graph 4

### Community Case Management Post Enrollment Activity December 2001 - January 2004



Graph 5

### Consultation Activity by Type December 2001 - January 2004

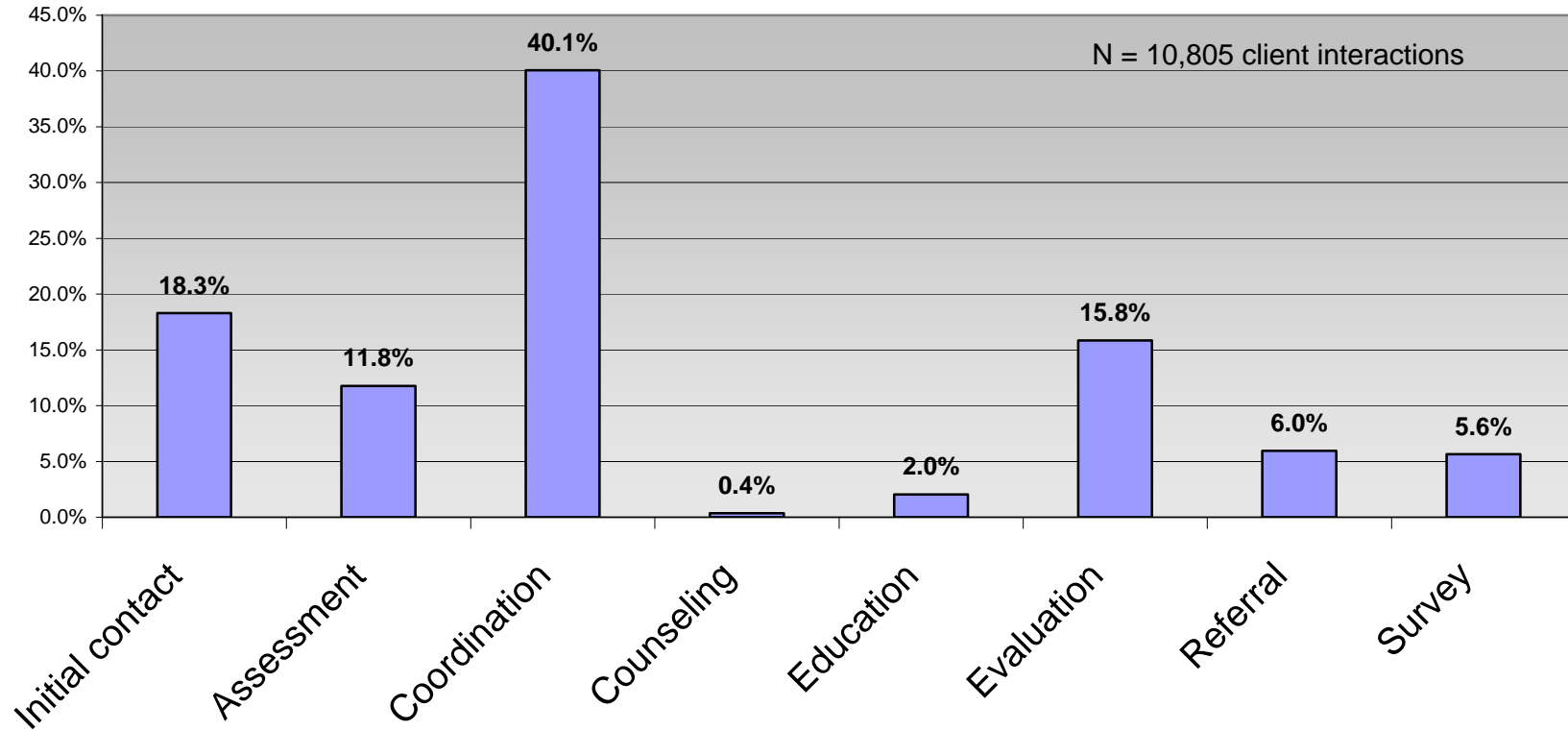


Table 3 describes key service output indicators. The mean number of client contacts was 13.0, while the mean number of days a case was open was 182 days. The average number of referrals per client was 2.9, whereas the number of verified referrals was 2.5. The average number of follow-ups was 3.0 per client, whereas the average number of completed follow-ups was 2.4 per client. From December 2001 to January 2004, more than 2,683 referrals were made for enrolled clients, of which, 48.7% were medical, 46.6% were social, and 4.7% were dental (Graph 6).

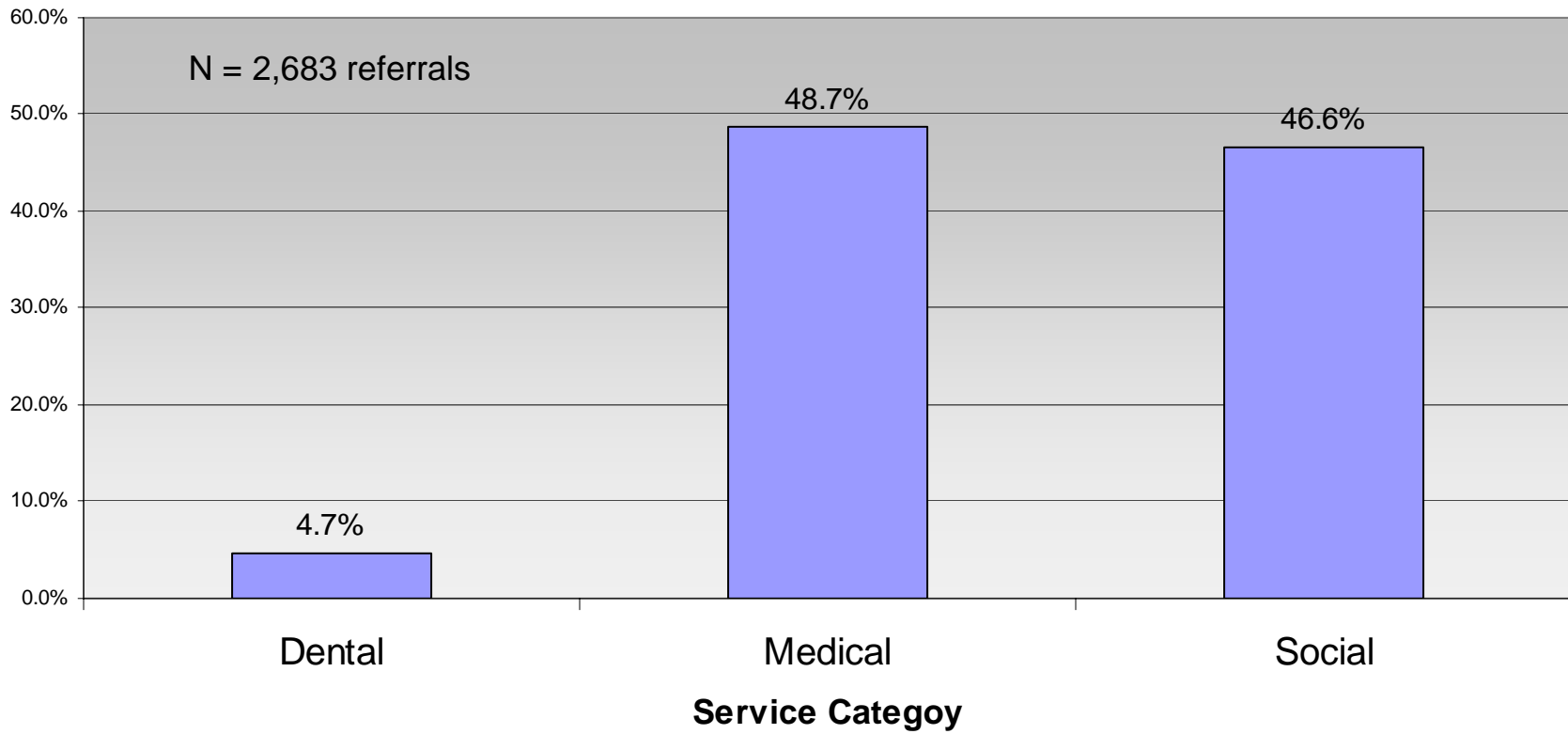
**Table 3 : Key Service Output Indicators per Client, December 2001 – August 2003**

<b>Indicator</b>	<b>Mean (SD)</b>	<b>Median</b>
Number of Contacts (N=986)	13.0 (12.1)	10
Number Days Open (N=465)	182.3 (134.7)	175
Number of Follow-Ups (N=863)	3.0 (1.1)	3.0
Number of Follow-Ups Completed (N=676)	2.4 (1.0)	2.0
Number of Referrals (N=957)	2.9 (2.4)	2
Number of Verified Referrals (N=807)	2.5 (1.9)	2

A total of 2,642 referrals were made, of which 63.5% were medical and dental referrals, and 36.5% were for social services. Of the 965 social service referrals made, the greatest number of social service referrals were to Social and Rehabilitation Services (SRS) (34.9%), followed by providing and reviewing printed education/referral material (14.6%), financial counseling (13.5%), and “other” services (35.7%). See Graph 7. For medical and dental referrals (N=1,677), written medical information represents 13.4% of all medical referrals, followed by Project Access (10.6%), medical prescriptions and supplies (10.1%), and Hunter Health Clinics (9.3%). Hospital-based clinics, other low-income clinics, dental clinics, and ComCare absorbed less than 5% of medical referrals. The “other” category represents a substantial percentage (32%), and further definition of this category will be necessary to fully understand additional referrals were made (Graph 8).

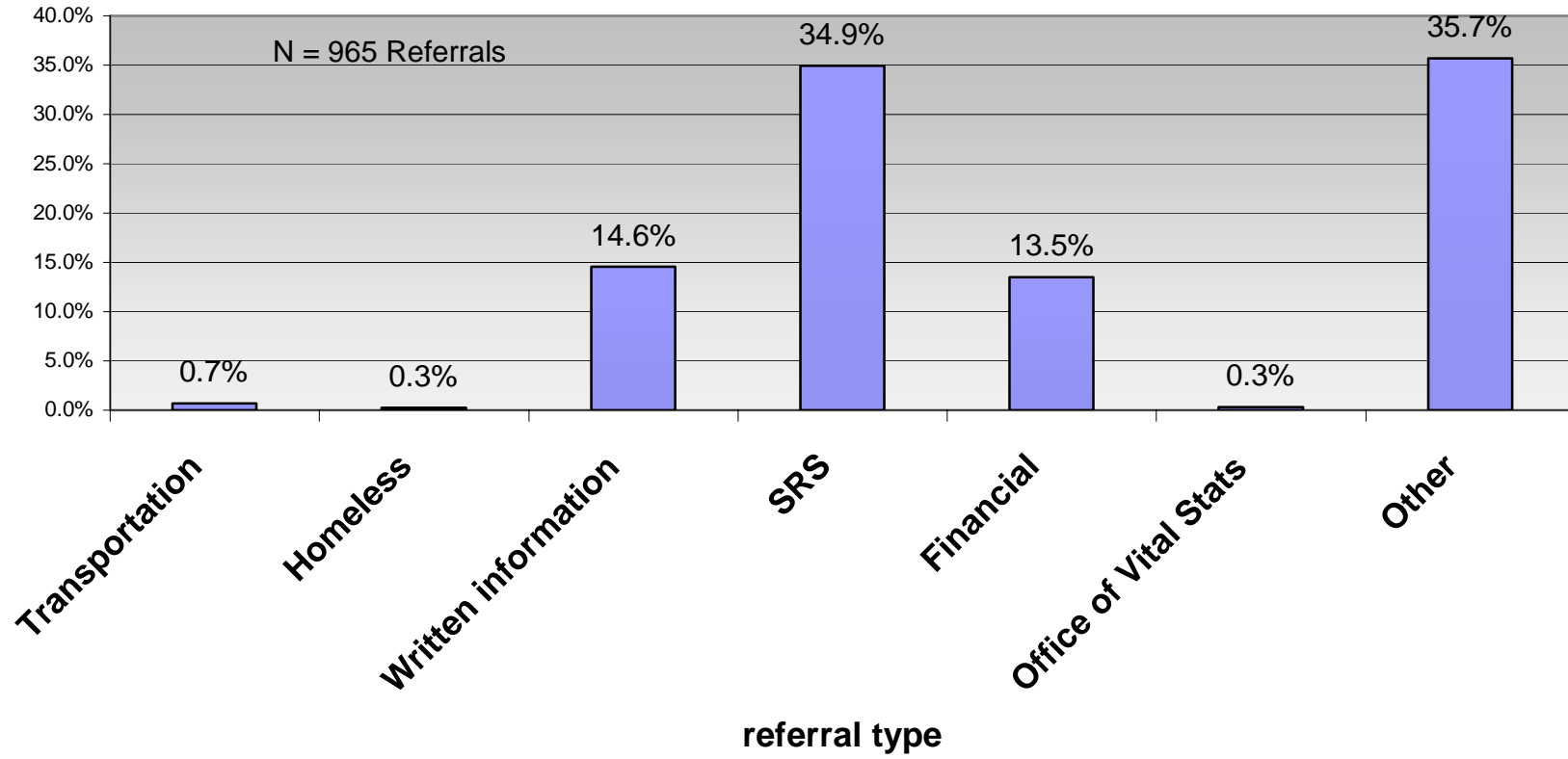
**Graph 6**

### **CCM Referrals by Service Category December 2001 - January 2004**



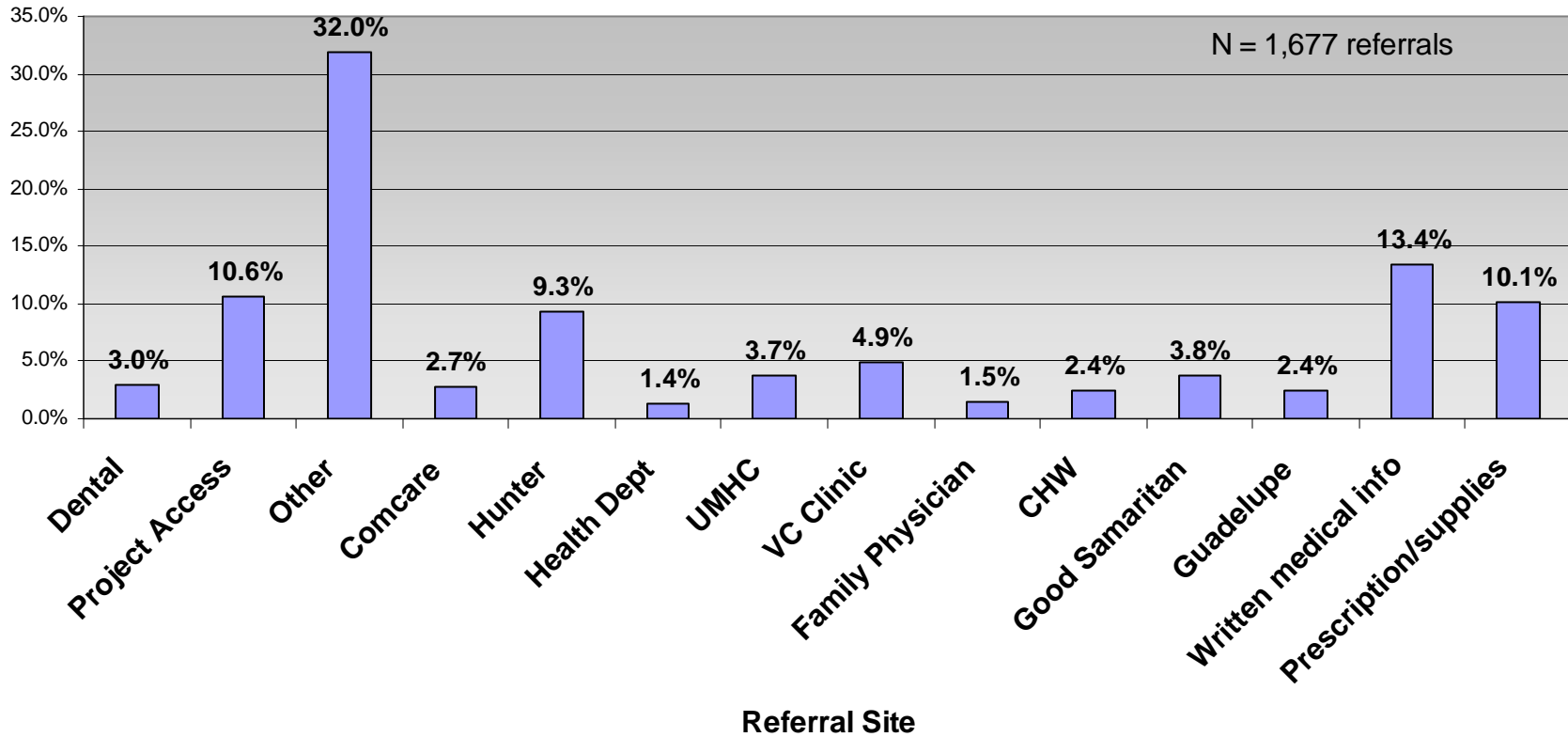
Graph 7

### Social Service Referrals by Type December 2001 - January 2004



Graph 8

## Medical Service Referrals December 2001 - January 2004

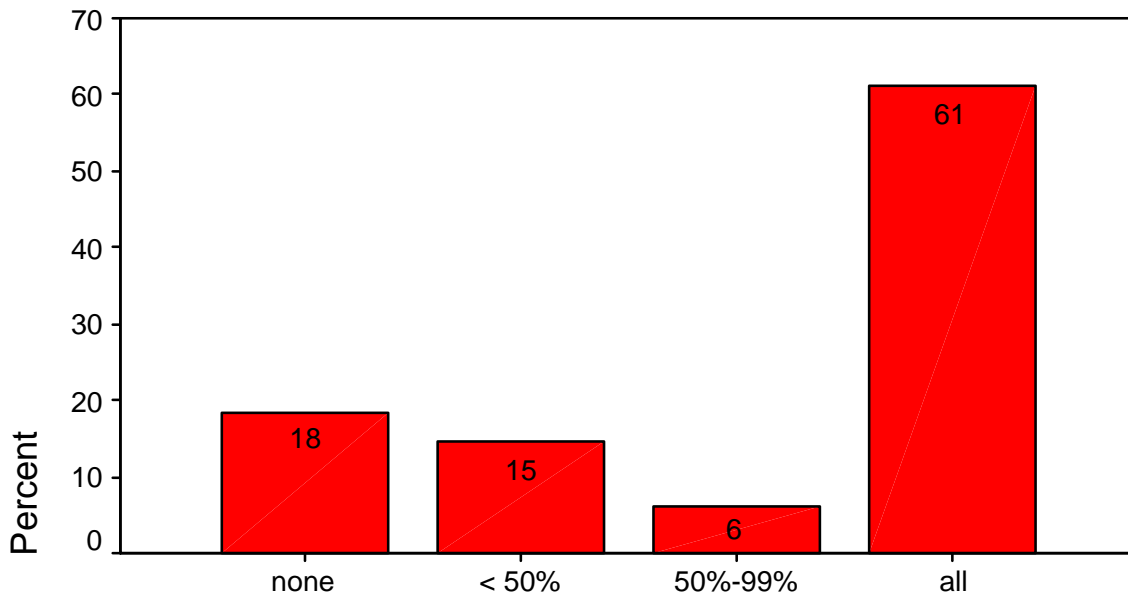


A primary objective of the case management program was to link low-income uninsured to a primary care home. Among the 729 clients with complete data, approximately 61% show all medical referrals were verified, while 6% show 50% to 99% verified, 15% have less than 50% verified, and 18% had no referrals verified (Graph 9). Analyses indicate the mean number of medical referrals for case management clients was 1.6, while the mean number of verified medical referrals was 1.4. Total medical referrals per client ranged from a low of zero to a maximum of 5. When levels of perceived social support were applied to the number of verified medical referrals, an interesting relationship was revealed. Clients with the lowest perceived social support receive approximately one additional medical referral (4.1) than do those clients with moderate (3.5) or high (3.4) social support (Graph 10-1 and Graph 10-2). The number of verified medical and social referrals appears comparable across all groups.

**Graph 9**

## Percent Verified Medical Referrals

December 2001-January 2004

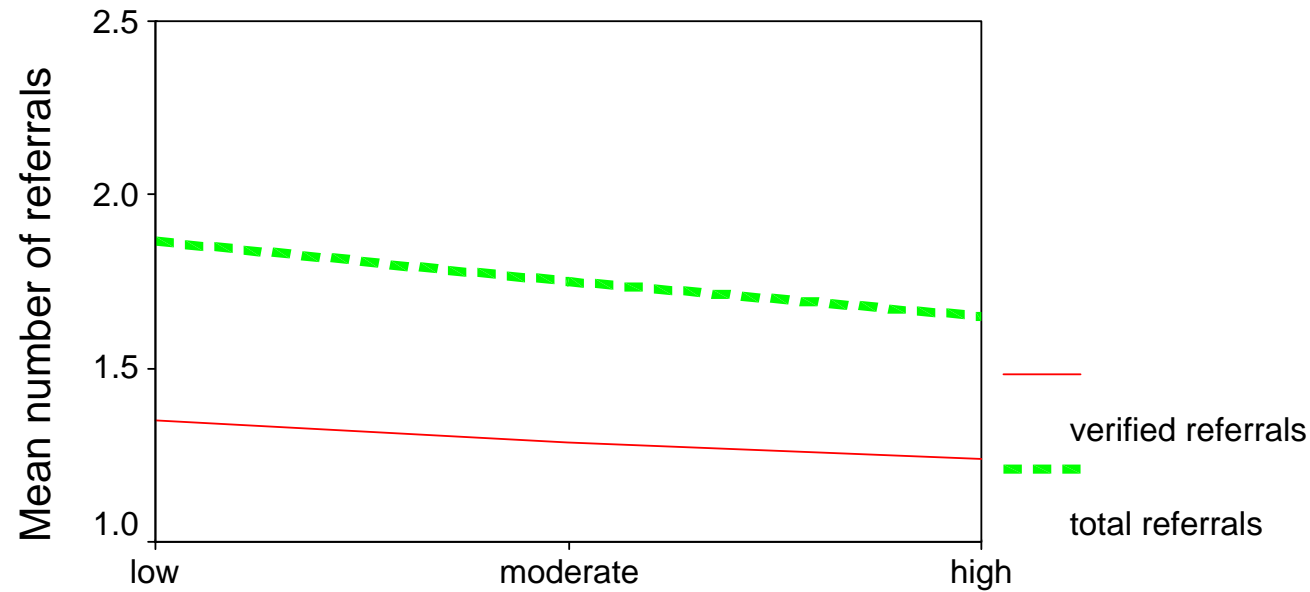


percent verified medical referrals recode

N = 729 clients

Graph 10-1

## Number of Verified Medical Referrals by Perceived Social Support



Perceived Social Support

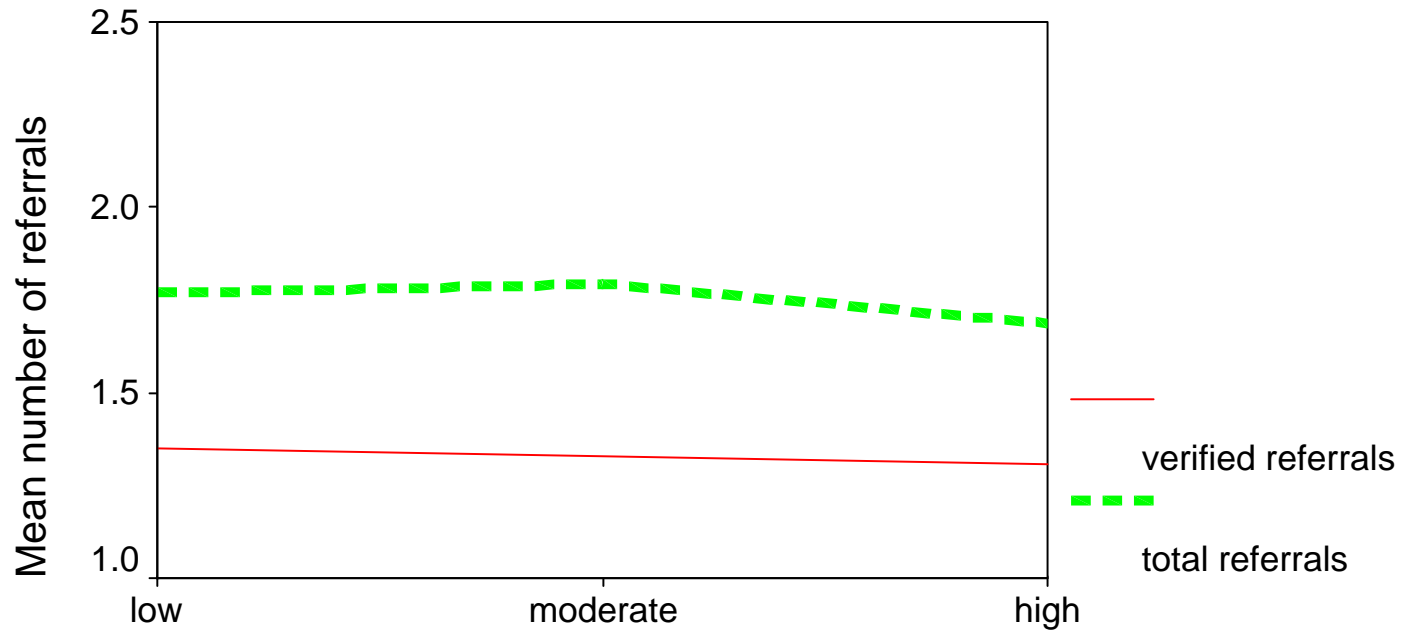
N = 400

December 2001 - January 2004



Graph 10-2

## Number of Verified Social Referrals by Perceived Social Support



Perceived Social Support

N = 627 clients

December 2001 - January 2004

## **Community Case Management Outcomes, December 2001-August 2003**

### Health Status Assessment

Eight health concepts were measured in the SF-8, and include: physical functioning, bodily pain, role limitations due to physical health problems, role limitations due to personal or emotional problems, emotional well-being, social functioning, energy/fatigue, general health perceptions, and perceived change in health. These eight health concepts comprise the physical and mental health composite scores. Physical health scores of this population using the initial SF-8 measure indicates the median physical health functioning score of the Project Access patients was approximately 15 points lower than the general US population (poorer perceived physical health than general population). The other noteworthy piece of information was that the mean/median mental health functioning scores (poorer perceived mental health scores than general population) were approximately 10 points lower than the national norm (See Table 4).

### Comparison of Pre/Post Physical and Mental Health Scores

There were 141 clients with a pre and post SF-8 measure. The physical health mean score was 36.0, a 13-point difference to US population norms (49.2). The mental health mean score was 41.8, seven points lower than US population norms (49.2). Perceived physical health scores improved by approximately five points (pre 36.0, post 40.5), a highly statistically significant improvement ( $t=-5.441$ ,  $df$  140,  $p<.001$ ). Moreover, perceived mental health showed a nearly two point improvement (pre 42.1, post 44.1), which was clinically important, but not statistically significant ( $t=-1.936$ ,  $df$  139,  $p=.06$ ). See Table 5. There were differences in perception of mental and physical health status among those with high, moderate and low social support, but they were not statistically significant. Those clients with a lower social support status reported a lower mental and physical health SF-8 score than US population norms both before and after case management (Graph 11 and Graph12).

**Table 4: Comparison of SF-8 Physical and Mental Health Scores at Enrollment to General US Population Norms, December 2001 through August 2003**

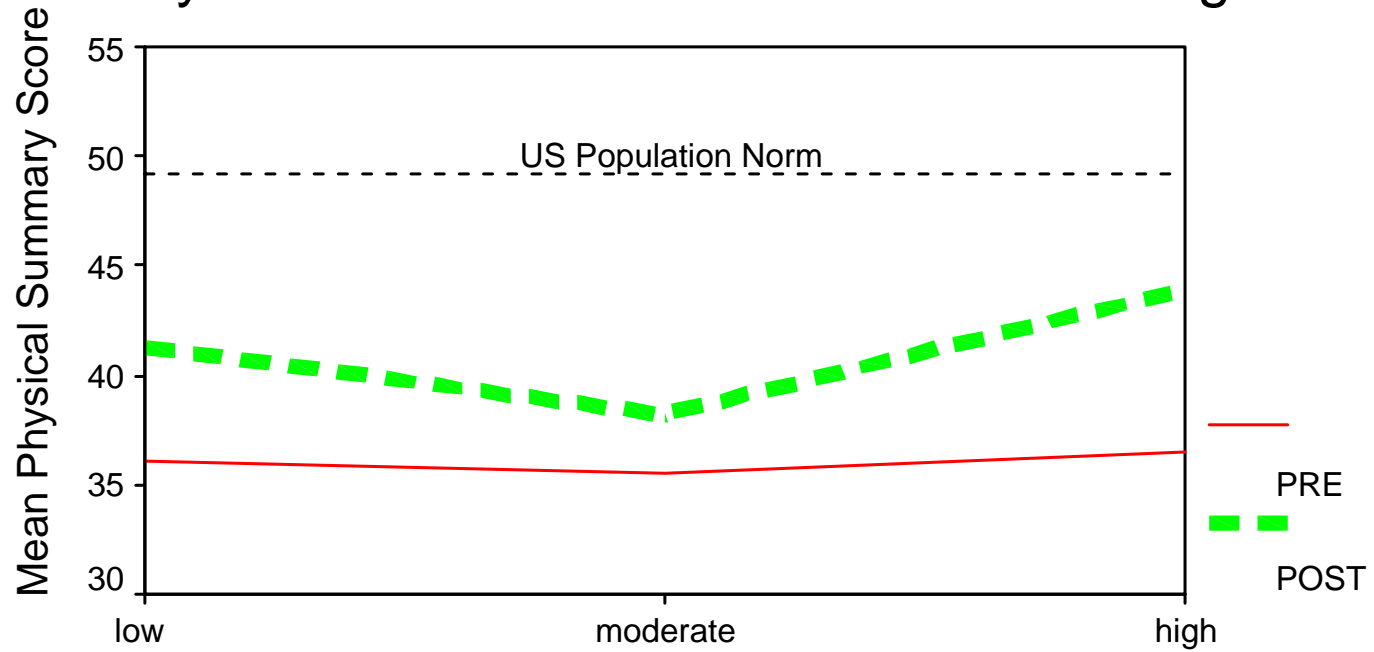
		<b>CCM Clients</b>	<b>SF-8 Norms for General US Population</b>	<b>CCM Clients</b>	<b>SF-8 Norms for General US Population</b>
		physical health composite score	physical health composite score	mental health composite score	mental health composite score
		N = 378	N= 7,472	N = 378	N= 7,472
Mean		35.03	49.20	41.18	49.19
Median		35.25	51.89	41.79	51.14
Percentiles	25	27.83	43.95	32.67	44.18
	50	35.25	51.89	41.79	54.14
	75	41.91	55.93	50.41	57.46
SD		10.79	9.07	12.55	9.46

**Table 5: SF-8 Physical and Mental Health Scores Before and After Intervention, December 2001 through August 2003**

	Initial SF-8 Mean (SD) N=141	Post SF-8 Mean (SD) N=141	Paired t-test	SF-8 Norms for General US Population N= 7,472
Physical health composite score	36.0 (9.8)	40.5 (9.5)	t=-5.441, df=140, p<.001	49.20 (9.07)
Mental health composite score	42.1 (10.8)	44.1 (10.1)	t=-1.9363, df=139, p=.06	49.19 (9.46)

Graph 11

## SF-8 Physical Functioning by Perceived Level of Social Functioning



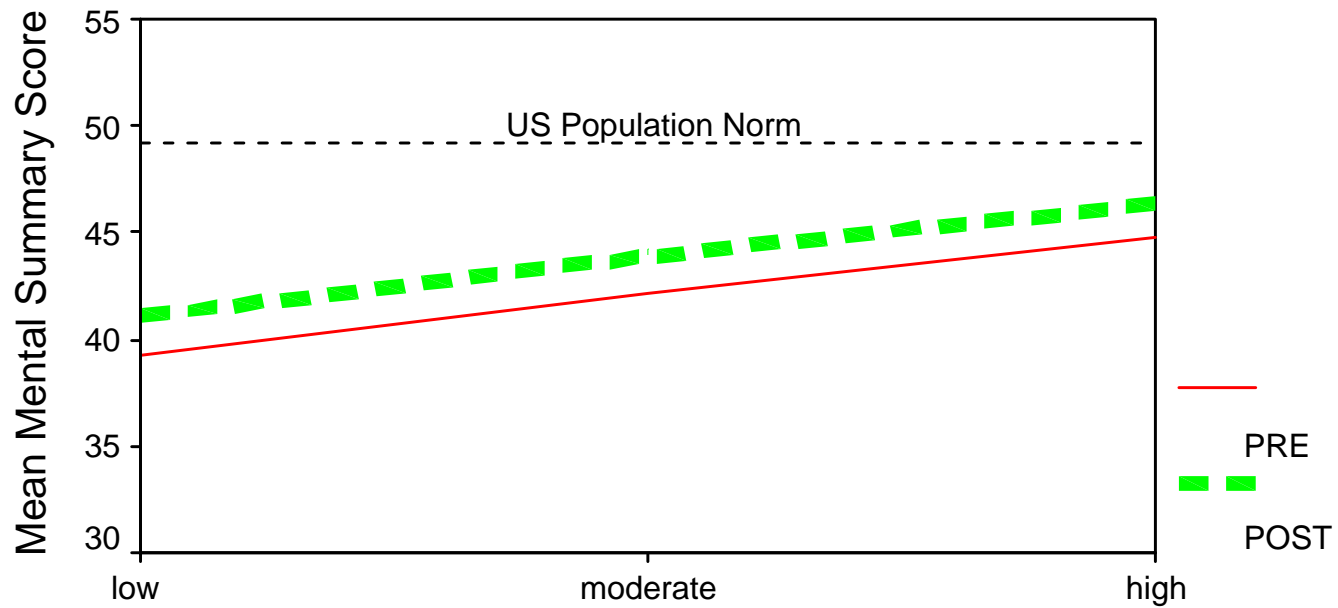
Perceived Social Support

N = 140

December 2001 - January 2004

Graph 12

## SF-8 Mental Functioning by Perceived Level of Social Functioning



Perceived Social Support

N = 140

December 2001 - January 2004

### Assessment of Perceived Control Over Health

The Multidimensional Health Locus of Control Scales (MHLC) was designed to measure three dimensions of locus of control of reinforcement in relationship to health. The tool assesses people's belief that their health is or is not determined by their own behavior. These issues of internal and external control have been extensively studied in regard to numerous clinical problems. The MHLC looks at beliefs about three source of control over health, with each of three subscales, which include internality, powerful others, and chance locus of control. All items were arranged on a 6-point Likert scales, ranging from "strongly agree" to "strongly disagree." Higher scores reflect externality or less perceived control. The MHLC was normed on healthy adults (N=1,287), and the following mean scores were derived on each subscale: Internal 25.55, Change 16.21, and Powerful others 19.16.

The MHLC was measured pre and post intervention, at the time of enrollment, and upon disenrollment. There were 135 valid pre and post measures at the time of this analysis. When mean scores for each of the subscales were compared to normed values for the instrument, each of the subscales was higher for the CCM clients. Internal LOC was 26.2 for CCM clients vs. 25.6 for healthy adults. Likewise, the Powerful Others LOC subscale for the sample was 21.7 vs. 19.2 for healthy adults. The Chance LOC subscale was 19.5 for CCM clients vs. 16.2 for healthy adults. These findings suggest CCM participants feel as though they have less control over their health than do other healthy adults. See Table 6.

### Comparison of Pre/Post Health Locus of Control Scores

Analysis of pre and post scores for each of the subscales shows the internal locus of control was unchanged. However, the powerful others scale increased by less than one point, and chance locus of control scale decreased by less than one point, suggesting a small improvement in perceived control over their health. The powerful others subscale increase may indicate that health professionals and/or family members assumed a slight perceived increase in influence over the group's health. The reduction in chance locus of control suggests clients feel they have more control or influence over their health. However, these changes were nonsignificant. Thus far, the sample was very small, and caution should be used interpretation, and in sharing results widely. As sample size increases, confidence in results will also increase.

Also, the timeframe for pre/post re-measurement may be too soon to detect changes in this construct. See Table 6.

Comparison of each of the scales to healthy adult norms reveals differences between low-income uninsured adults and the general healthy adult population. While the internal locus of control scale was comparable (26.2 CCM clients and 25.6 for healthy adults), the powerful others and chance scales vary. The powerful others scale shows a three point difference between the two groups (22.5 CCM clients and 19.2 for healthy adults), while the chance scale demonstrates a three point difference (19.3 CCM clients and 16.2 for healthy adults). Differences were greater between norms for chronically ill adults and the CCM clients. These differences may suggest that low-income groups may have an overall sense of less control over their lives.

#### Emergency Department Use

The Via Christi Health System has three case management teams, one each at St. Joseph St. Francis, and Riverside locations, while Wesley has one team at their facility. The selection criteria were slightly different at the two facilities; at Via Christi, patients with three or more visits in six months qualify, whereas patients with three or more visits in 12 months qualify at Wesley. Patients who qualify for the voluntary, no-charge program receive a brochure through the mail inviting them to participate in the program. If the patient chooses to, they may contact the Community Case Management Team for an introductory assessment. If the patient participates in the program, the care management teams help them apply for benefits, provide health education, and facilitate connection to a clinic, with follow-up until eligibility was determined. Emergency visits 6 months prior to enrollment were assessed and entered into the CCM database. Likewise, client emergency department visits 6 months post enrollment were tracked and recorded.

**Table 6: Pre and Post Intervention Multidimensional Health Locus of Control Scales, September 2001 through August 2003**

	Pre Mean (SD)	Post Mean (SD)	Paired t-test	Norms for Healthy Adults N= 1,287
Internal Locus of Control	26.2 (6.2)	26.1 (5.3)	t=-.172, df=134, p=.864	25.55
Powerful Others Locus of Control	21.7 (6.4)	22.5 (6.4)	t=-1.411, df=134, p=.161	19.16
Chance Locus of Control	19.5 (6.8)	19.31 (6.2)	t=.766, df=134, p=.445	16.21

**Table 7: Pre and Post Intervention Emergency Department Visits, December 2001 through August 2003**

	Pre Intervention Mean (SD)	Post Intervention Mean (SD)	Paired t-test
Emergency Department Visits	6.18 (5.8)	4.0 (4.6)	t=7.473, df=420, p=<.001



### Long-term ED Use Changes

To gain insight into long-term results, analyses were extended from December 2001 to August 2003. During this time interval, the CCM client cohort had 3,582 visits prior to enrollment and 1,692 ED visits post enrollment, a 52.8% reduction (Graph 13-1). A breakdown of the percent reduction in ED visits by Healthy Communities Access Program (HCAP) grant reporting time periods is listed in Graph 13-2. The program continues to sustain gains in reducing repeat ED visits. The mean number of ED visits pre intervention was 6.2 and 4.0 post intervention, a mean reduction of 2.2 visits per client. Analysis using the paired t-test indicates this was a statistically significant reduction in ED visits ( $t=7.473$ ,  $df=420$ ,  $p < .001$ ) (see Table 7 and Graph 14).

The Social Support Behaviors scale (SSB) was divided into three groups, low, moderate and high social support. Graph 15 displays emergency department use by these three categories. There was an inverse relationship between perceived social support and emergency department use. Emergency department use was highest in those with the lowest perceived support and lowest in those with higher perceived social support. Although there was reduced ED use by clients in each group, the greatest reduction occurred among those with low perceived social support, followed by those with the highest perceived social support. The case management teams appear to be most effective in helping extremely high users of the ED, who may have complex social and/or health problems. Analysis of the mean change in ED use among low, moderate and high perceived social support revealed non significant differences between and within groups. (See Table 8).

To translate this reduction in visits to financial terms, a cost-benefit estimation was derived. The cost-benefit analysis is based upon hospital and ED physician charges avoided by reduced return visits to the ED. Both organizations estimated the average lost charges for both the hospital and the ED physicians. The average ED charge for a self-pay patient is \$500, while ED physicians reported the average charge for an ED patient is approximately \$210. One would assume that without intervention, repeat ED visits would continue in a manner comparable to pre-intervention activity. The difference between total numbers of visits pre versus post intervention was determined (1,892), and then multiplied by the estimated charge per patient for ED services (\$710). The charge avoidance achieved from December 2001 through August 2003 was \$1,437,920 (see Table 9).

**Table 8:  
 Comparison of Mean Change in Emergency Department Visits  
 Before and After Pre vs. Post Intervention by Perceived Social Support  
 December 2001 through August 2003**

Source	df	SS	MS	F
Between Groups	2	182.32	91.159	2.164
Within Groups	194	8172.0	42.124	
Total	196	8354.3		

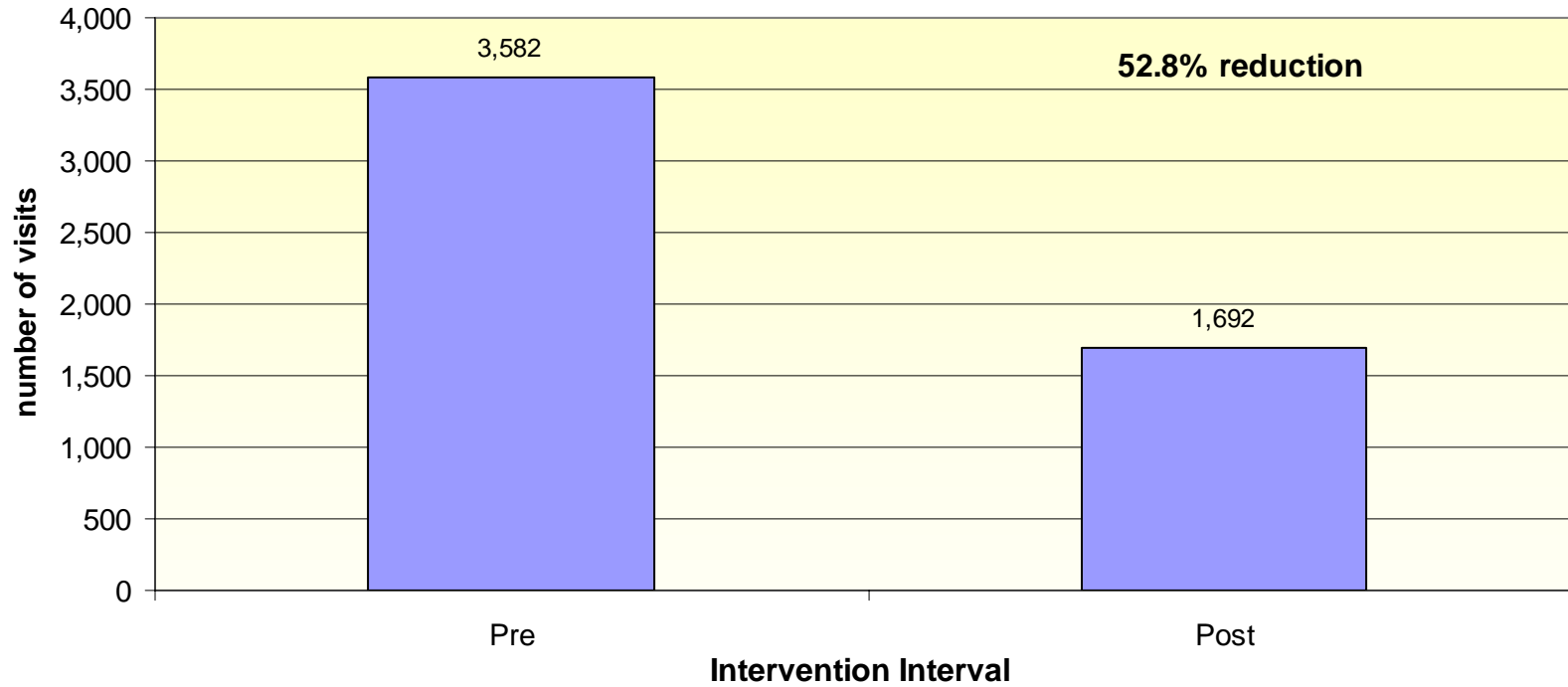
NS (.118)

**Table 9: Estimated Emergency Department Charge Avoidance Pre vs. Post Intervention,  
 December 2001 through August 2003**

	Dec 01 Feb02	Mar 02 Aug 02	Sept 02 Feb 03	Mar 03 Aug 03	All Cases
Total visits pre intervention	612	973	1290	707	3,582
Total visits post intervention	459	519	495	217	1,690
Difference in visits	153	454	795	490	1,892
Estimated charges pre-intervention	\$ 465,120	\$739,480	\$980,400	\$537,320	\$2,722,320
Estimated charges post-intervention	\$348,840	\$394,440	\$376,200	\$164,920	\$1,284,400
Estimated charge avoidance	\$116,280	\$345,040	\$604,200	\$372,400	<b>\$1,437,920</b>

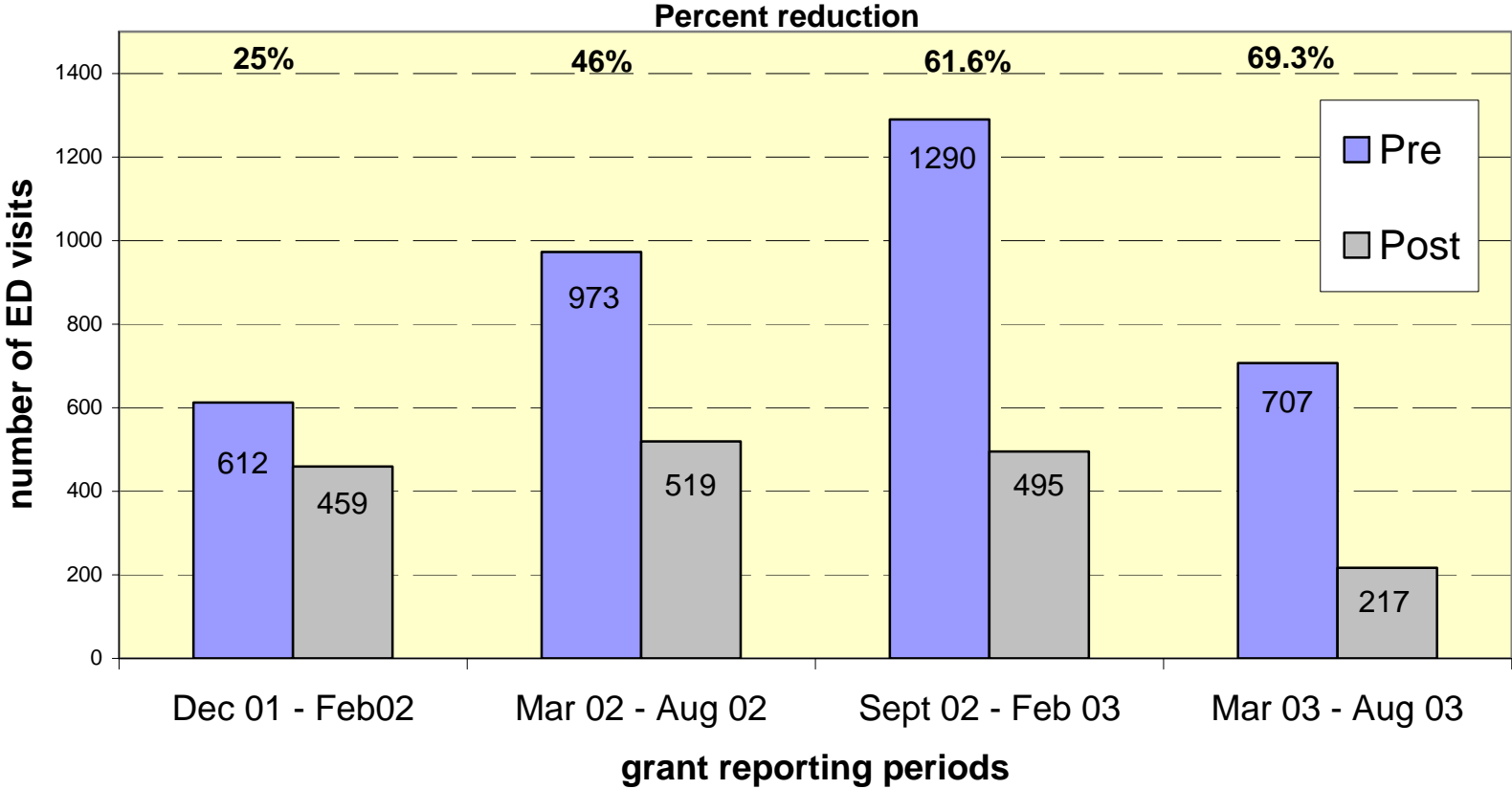
Graph 13-1

### Reduction in Total Emergency Department Visits December 2001 - January 2004



Graph 13-2

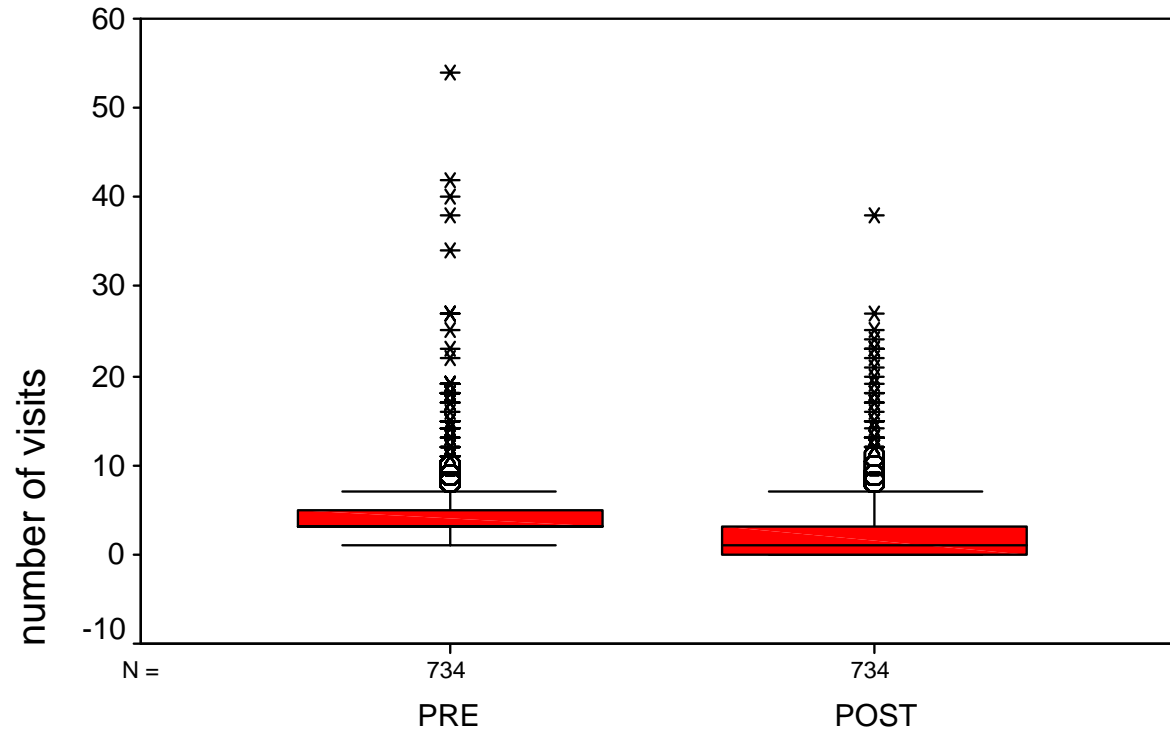
### Change in Emergency Department Visits Pre vs. Post Intervention by HCAP Grant Reporting Periods



Graph 14

### Community Case Management Dec 2001 - Jan 2004

### Emergency Department Visits Pre vs. Post Intervention

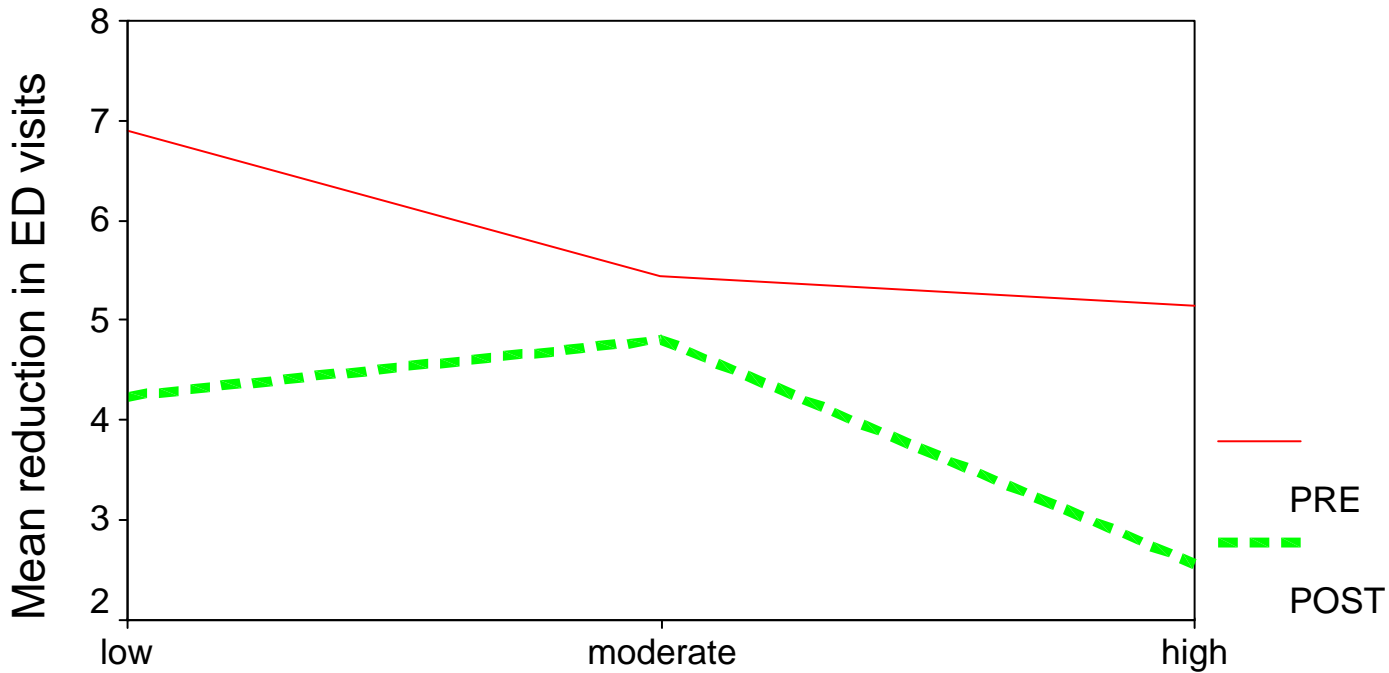


Reflects All Clients

A boxplot provides a graphical representation of overall variability of a sample. The median (midpoint of the distribution is the heavy black line in the center of the box). The upper and lower edges of the box represent the approximate 25th and 75th percentiles, or 1/4 and 3/4 along the way in the ordered sample. The upper and lower hinges (the T's at the further most points of the distribution) indicate the spread of all remaining values in the sample. The circles and asterisks were extreme and outlier observations.

Graph 15

## Emergency Department Visits Pre vs. Post Intervention by Perceived Social Support



Perceived Social Support

December 2001 - August 2003

N = 387 (reflects only those clients with social support measured)

## Conclusions:

1. Since the program was initiated in December 2001, 5,598 individuals met Case Management program enrollment criteria. To date, 4,611 people did not respond to the invitation to participate in the case management program, of which 56.8% were children, and 43.2% were adults.
2. A total of 987 patients have enrolled in the program since its initiation in December 2001. The number of enrolled clients has increased with each six-month evaluation period: 111, 117, 215, 257, and 227, respectively. The overall enrollment rate is 21.1% (children = 12.6% and adults (33.4%). The client population is predominantly single, white, low-income, female adults. More than half of the participants reported a high school education or less and more than 50% report they are unemployed.
3. Less than 50% of CCM clients were racial minorities, however within the past year the percentage of minority children has increased to more than 60% of those children enrolled. Adult minority representation remains constant at approximately 30%. Each organization should compare the ethnic representation of self-pay clients who visit the ED to assess whether the ethnic representation of the CM clients is comparable.
4. Of the participating CCM clients, 19.4% reported being uninsured less than 1 year, 26.1% for one to five years, 10.3% for more than five years, and an alarming 7.9% reported never having been insured. Changing the health care seeking behaviors of long-term uninsured will likely require greater time and resources than those more recently uninsured.
5. The Case Management program appears to be effective in reducing ED visits for non-urgent health problems, and in achieving cost savings for the medical centers.
6. There was an inverse relationship between perceived social support and emergency department use. Emergency department use remains highest in those with the lowest perceived support and lowest in those with higher perceived social support. Although there

was reduced ED use by all three groups, the greatest reduction occurred among those with lowest perceived social support, followed by those with the highest perceived social support. The case management teams appear to be most effective in helping extremely high users of the ED, who may have complex social and/or health problems.

7. The short-term goal of reducing ED visits was achieved, and current analyses of medical referrals suggests that the majority of participating clients were connected to their medical referral. More than 60% of medical referrals were fully verified. Only 18% of patients had no verified medical referrals. Regardless of perceived social support, clients receive approximately the same number of medical referrals (low 1.9, moderate 1.8, high 1.7).
8. Results suggest that CCM clients' perceived physical health and mental health status improves significantly.
9. CCM clients perceive less control over their health than healthy adults. Small, positive changes were identified in CCM clients' health locus of control. However, the changes were nonsignificant, and should be reassessed as sample size increases and be measured after greater time has elapsed after program disenrollment.
10. CCM clients appear to have poorer social support networks to rely upon, which may result in increased consumption of community and case management resources