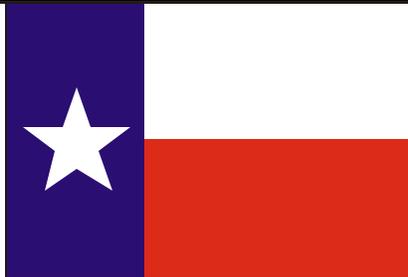


# TEXAS

**NorthSTAR Pregnancy/Substance Abuse  
Final Technical Report**



October 11, 2001

**NorthSTAR**



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## Summary

This study examines health care services received by a 460-member sample of female Medicaid recipients who were pregnant or of childbearing age, resided in the Dallas Service Delivery Area and received treatment for behavioral health disorders or chemical dependency from NorthSTAR between September 1, 1999 and August 31, 2000.

### Key findings

- ◆ 58% of the 460 NorthSTAR sample also utilized STAR services
  - 26% (N=119) of NorthSTAR members were pregnant during the study period and used STAR services. Of these members:
    - All were pregnant and recipient of at least one STAR service prior to their first NorthSTAR service
    - 91% utilized STAR prenatal visits
    - Younger members (25 or under) had a higher prenatal visit rate (6.8) than older members (4.4)
    - 95% who delivered had STAR postpartum visits
    - 44% had STAR emergency room services
    - Pregnant members had an increase in their STAR prenatal visit rate after their first NorthSTAR service
    - The rate of NorthSTAR outpatient visits was the same for pregnant members who only received outpatient care (10.8) as for those who also received residential treatment (10.7)
    - More pregnant members had NorthSTAR outpatient visits (58%) than did nonpregnant members (53%) or those using no STAR services (37%)
  - 74% (N=339) of NorthSTAR members of childbearing age were not pregnant during the study period. Of these members:
    - 44% (N=150) utilized STAR physical health services and of these nonpregnant members:
      - + 79% utilized STAR physical health outpatient visits
        - ◇ 67% had 1-5 visits
        - ◇ 20% had 6-10 visits
        - ◇ 13% had 11-28 visits
      - + 49% utilized STAR emergency room services
      - + Younger members (age <35) had more STAR emergency room visits than older members

- 
- ✦ Dual diagnosis members (substance abuse disorders plus one or more other behavioral health diagnoses) had more STAR emergency room visits than members treated only for substance abuse.
  - ◆ 42% (N = 191) of the 460 NorthSTAR members received only NorthSTAR services. Of these members:
    - 83% had residential treatment
    - 36% had behavioral health outpatient visits (average 16.8)
    - 10% had emergency room visits.
    - 6% had inpatient admissions

Differences in STAR and NorthSTAR utilization were also observed for ethnicity.

- More minority recipients (55%) utilized both STAR and NorthSTAR services than non-minority recipients (45%).
- Pregnant Hispanic recipients had a higher STAR prenatal visit rate (6.2) and a higher NorthSTAR outpatient visit rate (12.7) than other pregnant recipients.
- Hispanic recipients who only utilized NorthSTAR services had a higher outpatient visit rate (17.7) than others with no STAR services (11.5).

More than half (58%) of NorthSTAR members received physical health services from STAR, in addition to their NorthSTAR treatments. Members who were pregnant consumed very large portions of the STAR services; receiving both prenatal visits and services associated with delivery and postpartum care. The extent to which specific behavioral health needs of females Medicaid recipients with chemical dependency influenced their physical health needs warrants further study

## Introduction

The potential effects of substance abuse on the health of women, children, and families has prompted support at the state and federal levels for comprehensive drug and alcohol treatment models. Since 1995, services available to childbearing women with substance abuse disorders have expanded with a dramatic shift toward Medicaid Managed Care (MMC) (Andrulis & Hopkins, 1999).

In Texas, SCR55 (74<sup>th</sup> Legislature) directed the Health and Human Services Commission (HHSC) to guide the integration of mental health and substance abuse services into MMC (Texas HHSC, 1998).

NorthSTAR is a managed care pilot in the Dallas Service Delivery Area (SDA) that blends public funding from Texas Department of Mental Health and Mental Retardation (TDMHMR), Texas Commission on Alcohol and Drug Abuse (TCADA), and Medicaid to provide comprehensive behavioral health services under a capitated risk-based system to Medicaid recipients and non-Medicaid clients.

Its goal is to improve behavioral health outcomes in a cost efficient system. Medicaid recipients utilizing behavioral health services from NorthSTAR are provided physical health services from the STAR program.

How do NorthSTAR and STAR<sup>1</sup> programs address the health needs of women of childbearing age receiving behavioral health services, including those who are pregnant?

This report examines the totality of services utilized by female Medicaid recipients enrolled in NorthSTAR.

The specific research questions addressed were:

1. What STAR and NorthSTAR program services do pregnant and nonpregnant NorthSTAR members receive?
2. Are there differences in service utilization by age, ethnicity or behavioral health diagnosis of female NorthSTAR members?

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<sup>1</sup> The Medicaid STAR program provides services under fee-for-service (FFS) and managed care (HMO/PCCM) systems. In this report, unless otherwise indicated, reference to STAR data and findings indicates services provided by both fee-for-service and managed care.

# Methods

## Eligibility

All female Medicaid recipients enrolled in the NorthSTAR program between September 1, 1999 and August 31, 2000 and who received a female specialty service (as defined by specific billing codes) were potentially eligible for the study. From this pool, a sample consisting of 460 individuals was generated for detailed study.

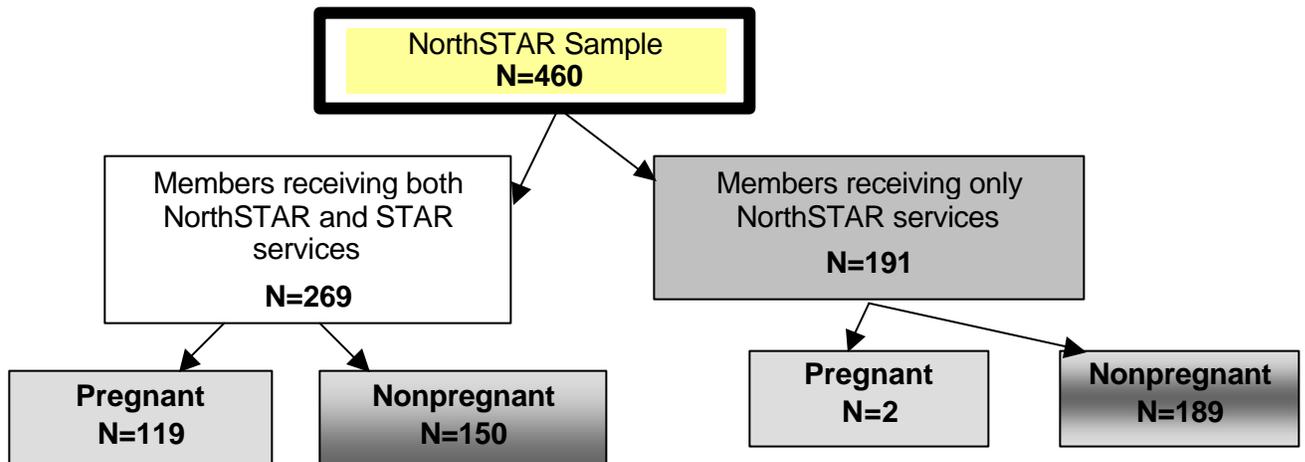
## Sample Configuration

To facilitate investigation of the research questions, the NorthSTAR sample population was subset based on two major criteria: members with and without STAR services and members' pregnancy status.

The procedures used to identify the subsets of members illustrated in Figure 1 are described in Appendix A. Application of these criteria produced three subset sample populations for analysis:

1. Pregnant NorthSTAR members using STAR services
2. Nonpregnant NorthSTAR members using STAR services
3. NorthSTAR members, both pregnant and not pregnant, not using STAR services

Figure 1. NorthSTAR Sample and Sub-Sample Populations



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## Sample Demographic Characteristics

The most salient demographic characteristics of the sample are described below. Appendices B and C provide additional details.

- Caucasians constituted 49.3%, African-Americans 40.4%, and Hispanics 9.5% of the sample.
- Almost 50 percent of the members were age 26-35. Age ranged from 14 to 54 years (Mean 30.9, SD 7.26, Median 29).
- Pregnant members were younger (Mean Age 27.26) than nonpregnant members (Mean Age 32.31) and those who only utilized NorthSTAR services (Mean Age 32.06).
- Recipients of Temporary Assistance to Needy Families (TANF) constituted 93% of the sample, 6% were Supplemental Social Security Income (SSI) eligibles.

## Data Sources

Data were derived from three sources:

- Members' demographic data for the study period of September 1, 1999 through August 31, 2000.
- Members' NorthSTAR enrollment and encounter data for the study period of September 1, 1999 through August 31, 2000.
- Members' STAR fee-for-service (FFS) enrollment and claims data and STAR managed care (PCCM and HMO) enrollment and encounter data for the study period of September 1, 1999 through August 31, 2000, and from March 1, 1999 through August 31, 1999.

STAR claims and encounters for six months prior to the study period were included to facilitate accurate analysis of STAR program services such as identification of pregnancy and prenatal visits used by NorthSTAR members.

## Variable Definitions

Appendix D provides detailed information on variables and measures used in the analysis.

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## **Statistical Analysis**

Analyses were conducted on the total sample and three sub-samples, as follows.

- Frequency distributions were computed for all categories of STAR and NorthSTAR program services: inpatient admissions, outpatient visits, emergency visits, prenatal visits, and residential treatment
- STAR and NorthSTAR program services were cross-tabulated with ethnicity and age.
- Chi-square tests were performed where appropriate.

## **Study Limitations**

This study was limited to an assessment of STAR and NorthSTAR services for women of childbearing age enrolled in NorthSTAR.

Administrative encounter data alone do not insure precise assessment of the number of prenatal visits, entry into care, trimester of care, deliveries, mental health care, and treatment patterns throughout inpatient and outpatient services.

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## RESULTS

Results are presented in two sections, based on the two research questions that guided the analysis.

Section one investigates the type and rate of total services received by pregnant and nonpregnant NorthSTAR members. Section one results are presented separately for:

- Pregnant NorthSTAR members using STAR services
- Nonpregnant NorthSTAR members using STAR services
- NorthSTAR members using NorthSTAR services only

Section two investigates the influence of age, ethnicity, and of multiple behavioral health diagnoses on NorthSTAR members' utilization of both STAR and NorthSTAR services.

## SECTION I

### **What STAR and NorthSTAR program services do pregnant and nonpregnant NorthSTAR members receive?**

#### **Pregnant NorthSTAR members using STAR services**

Of the 460 NorthSTAR members eligible for this study, 119 (26%) were pregnant.

#### ***STAR Prenatal Visits***

Over 90% of pregnant members had STAR prenatal visits recorded in STAR claims/encounter data. Table 1 shows the distribution of prenatal visits by days before delivery that correspond to trimesters. Appendix E presents details of the members who had no prenatal visits recorded.

- 34% of prenatal visits occurred 1 - 87 days before delivery (3<sup>rd</sup> trimester of pregnancy)

The date when prenatal care is initiated is also of interest in examining delivery of care. Table 2 describes the number of pregnant women who initiated care in the first, second, and third trimesters before delivery.

- Although only 21% initiated care in the first trimester, all but 11 of the 119 pregnant women had an average of 5.3 prenatal visits before delivery.

Piper, Ray and Griffin (1990) reasoned that Medicaid members who receive care before pregnancy are most likely to begin prenatal care in the first trimester. This study confirms that study finding.

- Of the 25 members who had first trimester prenatal visits; three-quarters were utilizing STAR outpatient services greater than 280 days before delivery.

### **STAR Behavioral Health Outpatient Visits**

Nine percent of pregnant members also had STAR behavioral health outpatient visits, the majority (71.7%) following delivery.

### **STAR Postpartum Visits**

Among the 58 pregnant members who delivered during the study period, most (95.1%) had postpartum visits within 60 days of delivery.

- 78% had only one visit
- 22% had 2-4 visits.

**Table 1.  
Number of STAR Visits by Days Pre- and Post-Delivery for Pregnant Members**

Type of STAR Service	Probable Prenatal/Post Partum Period based on estimated date of delivery			Delivery to 60 days after	Total
	176 to 280 days before delivery 1 <sup>ST</sup> TRIMESTER	88 to 175 days before delivery 2 <sup>ND</sup> TRIMESTER	1 to 87 days before delivery 3 <sup>RD</sup> TRIMESTER		
Prenatal Visits	97	279	195		<b>571</b>
Percentage of Prenatal Visits	16.9%	48.8%	34.3%		<b>100%</b>
Behavioral Health Outpatient Visits	0	3	14	43	<b>60</b>
Percentage of Behavioral Health Outpatient Visits	0%	4.9%	23.4%	71.7%	<b>100%</b>
Postpartum Visits				79	<b>79</b>

**Table 2.  
STAR Prenatal Visits by Days Before Delivery for Pregnant Members**

	Total	First STAR Prenatal Visit by Days Before Delivery		
		176 to 280 days before delivery 1 <sup>ST</sup> TRIMESTER	88 to 175 days before delivery 2 <sup>ND</sup> TRIMESTER	1 to 87 days before delivery 3 <sup>RD</sup> TRIMESTER
Number of Members	<b>108</b>	25	36	47
Percentage of Members	<b>100%</b>	21.00%	33.61%	36.13%

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### ***STAR Prenatal Visits Before and After First NorthSTAR Service***

The prenatal visit rate of pregnant members utilizing STAR prenatal visits before and after receiving their first NorthSTAR service is presented in Table 3.

- All pregnant members were utilizing STAR prenatal services before receiving NorthSTAR behavioral health services.

Using the trimester of first prenatal visit, the total number of prenatal visits utilized by pregnant members after their first NorthSTAR service was calculated (Table 4).

- The prenatal visit rate for members who were in their first trimester increased from 1.7 to 4.1 after receiving their first NorthSTAR service.
  - However, of the 25 members who initiated care in their 1<sup>st</sup> trimester, after receiving their first NorthSTAR service,
    - 13 were still in their 1<sup>st</sup> trimester
    - 2 were in their 2<sup>nd</sup> trimester
    - 4 were in their 3<sup>rd</sup> trimester
    - 1 was in postpartum period
    - 5 were not receiving any STAR service.
- The prenatal visit rate for members who initiated care in their second trimester decreased after receiving their first NorthSTAR service from 4.5 to 3.6 but their combined total of prenatal visits was 8.1, exceeding the average of 5.3 for prenatal visits generally.
  - Notably, of the 36 members initiating care in their 2<sup>nd</sup> trimester, after receiving their first NorthSTAR service,
    - 21 were not receiving any STAR service because they were either receiving NorthSTAR inpatient or NorthSTAR residential treatment. Specifically,
      - 57% were in residential treatment
      - 14% were in inpatient
      - 24% were receiving outpatient visits
    - 5 were in their 2<sup>nd</sup> trimester
    - 7 were in their 3<sup>rd</sup> trimester
    - 3 were in postpartum period.

- The prenatal visit rate for members who began prenatal care in the third trimester increased from 1.8 to 3.2 after their first NorthSTAR service.
- However, of the 47 members initiating STAR care in their 3<sup>rd</sup> trimester, after receiving their first NorthSTAR service,
  - 19 were not receiving any STAR service
  - 25 were in third trimester
  - 3 were in postpartum period.

Of the 108 members receiving prenatal visits before NorthSTAR, after their first NorthSTAR service, 41.2% did not have further evidence of STAR services.

**Table 3.**  
**Prenatal Visit Rate Before Receiving First NorthSTAR Service by Trimester Received First Prenatal Visit**

	# of Prenatal Visits <b>Before</b> Receiving 1 <sup>st</sup> NorthSTAR service	# of Members by Trimester	Prenatal Visit Rate Before 1 <sup>st</sup> NorthSTAR Service
1 <sup>st</sup> Trimester	43	25	1.7
2 <sup>nd</sup> Trimester	162	36	4.5
3 <sup>rd</sup> Trimester	84	47	1.8

**Table 4.**  
**Prenatal Visit Rate After Receiving First NorthSTAR Service by Trimester**

	# of Prenatal Visits <b>After</b> Receiving 1 <sup>st</sup> NorthSTAR service	# of Members by Trimester	Prenatal Visit Rate After 1 <sup>st</sup> NorthSTAR Service
1 <sup>st</sup> Trimester	54	13	4.1
2 <sup>nd</sup> Trimester	25	7	3.6
3 <sup>rd</sup> Trimester	109	36	3.2

### STAR Inpatient Admissions

Nearly three-quarters (84 of 119) of pregnant members had STAR inpatient admissions, the majority (46.0%) associated with delivery (Table 5).

- Twenty percent had multiple (2-6) admissions, described in detail in Appendix F.

**Table 5.**  
**STAR Inpatient Admissions of Pregnant Members**

Type of Service	Probable Prenatal/Post Partum Period based on estimated date of delivery							TOTAL
	>280 days before delivery	176 to 280 days before delivery 1 <sup>ST</sup> TRIMESTER	88 to 175 days before delivery 2 <sup>ND</sup> TRIMESTER	1 to 87 days before delivery 3 <sup>RD</sup> TRIMESTER	Delivery	1 to 60 days after delivery	>60 days after delivery	
STAR Inpatient Admissions	0	4	6	47	58	5	6	<b>126</b> (N=84)
Percentage of Admissions	0%	3.1%	4.8%	37.3%	46.0%	4.0%	4.8%	<b>100%</b>

### STAR Length of Stay

Length of stay averaged 6.1 days (Table 6). However, six TANF members had seventeen admissions accounting for 61.4% of total days. Excluding these, members' average length of stay, almost all associated with delivery, was 2.8 days.

- Length of stay for the majority (78.6%) of pregnant members' was one to five days.

**Table 6.**  
**STAR Inpatient Lengths of Stay for Pregnant Members**

		Number of STAR Inpatient Admissions	Number of Members
Length of Stay	1-5 days	95	66
	6-10 days	14	7
	11-20 days	11	5
	21-30 days	4	4
	>30 days	2	2
<b>Total</b>	<b>767 days</b>	<b>126</b>	<b>*84</b>

17 Members had multiple admissions

**STAR Emergency Room Visits**

Nearly 44% of pregnant women had STAR emergency visits (Table 7), with 51.7% occurring just before or just after delivery.

**Table 7.**  
**STAR Emergency Room Visits of Pregnant Members**

Type of STAR Service	Probable Prenatal/Postpartum Period based on estimated date of delivery						Total
	>280 days before delivery	176 to 280 days before delivery 1 <sup>ST</sup> TRIMESTER	88 to 175 days before delivery 2 <sup>ND</sup> TRIMESTER	1 to 87 days before delivery 3 <sup>RD</sup> TRIMESTER	Delivery to 60 days after	>60 days after delivery	
STAR Emergency Room Visits	7	14	20	26	35	16	<b>118</b> (N=52)
Percentage	5.9%	11.9%	16.9%	22.0%	29.7%	13.6%	<b>100%</b>

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### **NorthSTAR Behavioral Health Outpatient Visits**

Comfort and Kaltenbach (1999) report higher attrition in substance abuse outpatient programs than in residential treatment programs.

This study, however, shows that pregnant members who only received NorthSTAR behavioral health outpatient visits had comparable utilization (average of 10.8 OP visits) to pregnant members who also received NorthSTAR residential treatment (average of 10.7 OP visits).

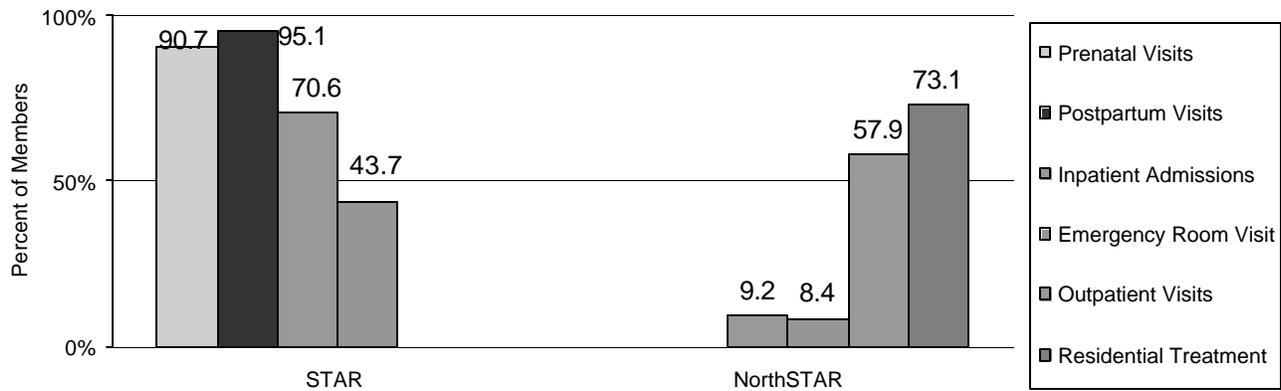
More than half of pregnant members (57.9%) had NorthSTAR behavioral health outpatient visits (Table 8).

- 57.9% had 1-10 visits
- 31.9% had NorthSTAR outpatient visits only
- 68.1% also had residential treatment.

**Table 8.**  
**NorthSTAR Outpatient Visits or Residential Treatment by Pregnant Members**

Range of Outpatient Visits	Pregnant Members Receiving NorthSTAR Behavioral Health Outpatient Visits		Pregnant Members Receiving NorthSTAR Outpatient Visits only		Pregnant Members Receiving NorthSTAR Behavioral Health Outpatient Visits and Residential Treatment	
	N	Percentage	N	Percentage	N	Percentage
1 to 10 visits	40	57.9%	13	59.1%	27	57.4%
11 to 20 visits	18	26.1%	5	22.7%	13	27.7%
21 to 30 visits	4	5.8%	3	13.7%	1	2.1%
>30 visits	7	10.2%	1	4.5%	6	12.8%
<b>Total Members</b>	<b>69</b>		<b>22</b>		<b>47</b>	

**Figure 2.**  
**STAR and NorthSTAR Services Received by Pregnant Members (N=119)**



***NorthSTAR Emergency Room Visits***

- 8.4% had NorthSTAR ER visits.

***NorthSTAR Inpatient Admissions***

- 9.2% had NorthSTAR inpatient admissions.

***NorthSTAR Residential Treatment***

- 73.1% received residential treatment.

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## Nonpregnant NorthSTAR members using STAR services

The following sections provide details of STAR and NorthSTAR services received by nonpregnant members. Of the 339 in the study who were not pregnant, 150 (44.2%) received STAR physical health services. Their use of services is summarized in Figure 3.

### ***STAR Outpatient Visits***

Among the 150 nonpregnant members, 79.3% had STAR physical health outpatient visits and 18.5% had STAR behavioral health outpatient visits. Of these members,

- 67% had 1-5 STAR outpatient visits
- 20% had 6-10 STAR outpatient visits
- 13% had 11-28 STAR outpatient visits

### ***STAR Emergency Room Visits***

Half (49.3%) of the 150 nonpregnant members who used STAR services had STAR emergency room visits.

- 51% of visits were received by SSI eligibles.
- 81.1% had 1-3 visits

### ***STAR Inpatient Admissions***

Thirty-three nonpregnant members had STAR inpatient admissions (Table 9). Appendix F gives details of nonpregnant members with multiple STAR admissions or long length of stay.

- 63.6% had 1-5 day length of stay.

**Table 9.**  
**STAR Inpatient Admissions and Lengths of Stay of Nonpregnant Members**

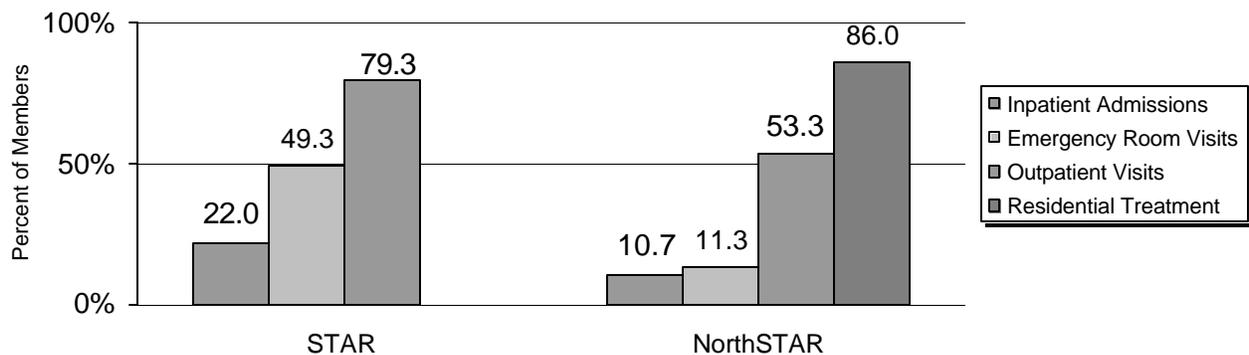
		Number of STAR Inpatient Admissions	Number of Nonpregnant Members
Length of Stay	1-5 days	39	21
	6-10 days	14	10
	> 10 days	2	2
<b>Total</b>		<b>55</b>	<b>33</b>

### NorthSTAR Services Received by Nonpregnant Members

NorthSTAR services received by the 150 nonpregnant members who used STAR included the following:

- 10.7% had NorthSTAR inpatient admissions
- 86% received residential treatment.
- 53.3% had outpatient visits.
  - Average number of visits was 8.7
  - 67.5% had 1-10 visits
  - 27.5% had 11-20 visits
- 11.3% had emergency room visits

**Figure 3.**  
**STAR and NorthSTAR Services Received by Nonpregnant Members (N=150)**



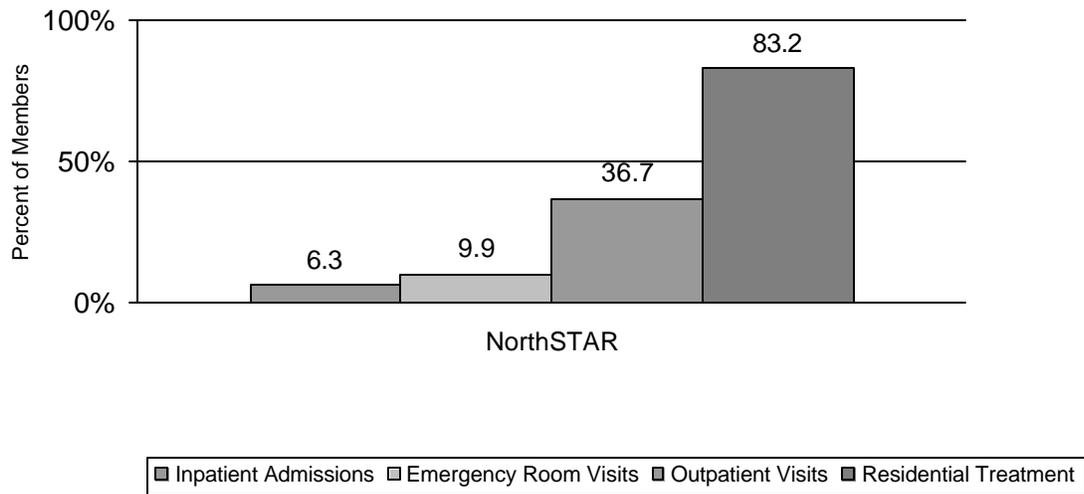
### NorthSTAR members receiving no STAR services

Forty-two percent (N=191) of the 460 members in the NorthSTAR study did not receive STAR physical health services. Two members had NorthSTAR encounters that met criteria suggesting a pregnancy, but these members did not have evidence of STAR services in STAR encounter data within the study period.

The NorthSTAR services received by these members is as follow (Figure 4):

- 83.2% had residential treatment
- 36.7% (N = 70) had behavioral health outpatient visits. For these,
  - Average number of visits was 16.8.
    - 77.1% had 1-10 visits
    - 4.3% had 11-20
    - 18.6% had > 20 visits
  - 31.5% also had residential treatment.
- 9.9% had emergency room visits.
- 6.3% had inpatient admissions

**Figure 4.**  
**NorthSTAR Services Received by Members using no STAR Services (N=191)**



## SECTION II:

### Are there differences in service utilization by age, ethnicity or behavioral health diagnosis of NorthSTAR members?

#### *STAR Prenatal Visits by Ethnicity and Age of Pregnant Members*

Demographic differences in prenatal visit utilization in this study ran somewhat counter and were more positive than reported research (CDC, 2000; Argeriou & Daley, 1997). In general non-minority and older pregnant women have higher prenatal utilization rates than minority and younger women.

Caucasian members accounted for more prenatal visits (48.8%) than both African American members (30.5%) and Hispanic members (20.7%), owing to the ethnic distribution in the sample (Table 10).

- However, Hispanic members had the highest visit rate per member (6.2 visits) than either Caucasian members (5.3 visits) or African-American members (4.7 visits).
- Younger members (<25 years) averaged 6.8 visits, compared to just 4.2 for older members (Table 11).

**Table 10.**

**Number of STAR Prenatal Visits by Ethnicity of Pregnant Members**

	Total	Ethnic Group		
		Caucasian	African American	Hispanic
Number of Pregnant Members	108*	53	36	19
Percentage of Members	100%	49.1%	33.3%	17.6%
Number of Prenatal Visits	571	279	174	118
Percentage of Prenatal Visits	100%	48.8%	30.5%	20.7%

\*Eleven pregnant members did not have prenatal visits

**Table 11.**

**Number of STAR Prenatal Visits by Age Group of Pregnant Members**

	Total	Age Group					
		Age 16 to 20	Age 21 to 25	Age 26 to 30	Age 31 to 35	Age 36 to 40	Age 41 to 45
Number of Pregnant Members	108*	14	30	35	21	6	2
Percentage of Pregnant Members	100%	13.0%	27.9%	32.4%	19.4%	5.5%	1.8%
Number of Prenatal Visits	571	108	191	136	105	22	9
Percentage of Prenatal	100%	18.9%	33.5%	23.8%	18.4%	3.8%	1.6%

\*Eleven pregnant members did not have prenatal visits

---

**NorthSTAR Outpatient Visits by Ethnicity of Pregnant Members**

In general, ethnic minorities, in particular Hispanics, tend to utilize behavioral health services less than non-minorities (Takeuchi et. al, 1999).

However, in this study, the rate of NorthSTAR outpatient visits was highest for Hispanic members, averaging 12.7 visits, than either Caucasian (average 10.3 visits) or African-American (average 10.5 visits) members.

**Table 12.**

**Number of NorthSTAR Outpatient Visits by Ethnicity of Pregnant Members**

	Ethnic Group				Total N=69
	Caucasian	African American	Hispanic	Asian Pacific Islander	
Type of NorthSTAR Behavioral Health Service					
Outpatient Visits	349	241	143	4	<b>737</b>
Percentage of Outpatient Visits	47.3%	32.7%	19.4%	0.6%	<b>100%</b>

**STAR Emergency Room Visits by Ethnicity and Age of Nonpregnant Members**

Substance abuse disorders, females' age and ethnicity (Caucasian) have been shown to be a positive and significant determinant of the probability of using an emergency room for medical treatment (McGreary, 2000).

- African Americans (56.7%) accessed the majority of STAR emergency room visits (Table 13).
- Members between the ages of 26 and 35 utilized more emergency room services (38.1%) than other age groups (Table 13).

**Table 13.**

**Number of STAR Emergency Room Visits by Ethnicity of Non Pregnant Members**

	Ethnic Group				
	Caucasian	African American	Hispanic	Asian Pacific Islander	
Type of STAR Physical Health Service					
Emergency Room Visits	91	132	9	1	<b>233</b>
Percentage of Emergency Room Visits	39.2%	56.7	3.7%	0.4%	<b>100%</b>

**Table 14.**

**Number of STAR Emergency Room Visits by Age Group of Non Pregnant Members**

	Age Group				
	Total	Age 16 to 25	Age 26 to 35	Age 36 to 45	Age 45 or older
Number of Emergency Room Visits	<b>233</b>	39	90	49	55
Percentage of Emergency Room Visits	<b>100%</b>	16.9%	38.1%	21.1%	23.9%

## STAR Emergency Room Visits by Behavioral Health Diagnosis of Nonpregnant Members

The high number of emergency room visits (233) among nonpregnant members, prompted investigation of the relationship between diagnoses and emergency room visits.

It is well known that behavioral health conditions such as depression or anxiety are associated with physical symptoms that cause individuals to seek treatment at emergency facilities (National Center on Addiction and Substance Abuse, 1996).

- Over half (58.1%) of nonpregnant members utilizing emergency room visits had dual diagnoses of a substance abuse disorder and a behavioral health disorder (Table 15).
- Additionally, four percent of nonpregnant members using emergency room visits had substance abuse disorders plus two other behavioral health disorders.
- These dual diagnoses members utilized 74.3% of the total number of emergency room visits.

**Table 15.**

### Number of Emergency Room Visits by Behavioral Health Disorder of Nonpregnant Members

	Substance Abuse Disorder	Substance Abuse Disorder Plus One Behavioral Health Disorder	Substance Abuse Disorder Plus Two or more Behavioral Health Disorders
Number of Members	28	43	3
Percentage of Members	37.8%	58.1%	4.1%
STAR Emergency Room Visits	60	125	48
Percentage of Visits	25.7%	53.6%	20.7%

**NorthSTAR Outpatient Visits of Members Using No STAR Services by Ethnicity**

It is well known that ethnic minorities utilize behavioral health services less than non-minorities (Takeuchi et. al, 1999).

- On average, Hispanic members had a higher visit rate (17.7) than Caucasian members (12.3) and African American members (10.3).

**Table 16.**  
**Members Using No STAR Services**  
**Number of NorthSTAR Outpatient Visits by Ethnicity**

	Ethnic Group			
	Caucasian	African American	Hispanic	
Type of NorthSTAR Behavioral Health Service				
Outpatient Visits	467	175	266	<b>908</b>
Percentage of Outpatient Visits	51.4%	19.3%	29.3%	<b>100%</b>

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## Discussion

More than half (58.5%) of NorthSTAR members also utilized STAR program services. Of this group, 44% were pregnant and accounted for the majority of STAR services. Overall, more minority members (55.4%) utilized STAR services than Caucasian members.

While most pregnant members received less than the recommended number of prenatal visits, a large percentage (90.7%) had prenatal visits – on average 5.3 -- and most who delivered during the study period also had postpartum visits (95.1%). These frequency rates are higher than both the national rates (80.2% prenatal and 45% postpartum) reported by the Center for Prevention and Disease Control (CDC, 2000) and the rate of prenatal care (58.7%) reported for Medicaid eligible pregnant women with substance abuse disorders (Argeriou & Daley, 1997).

Demographic differences in prenatal visit utilization in this study ran somewhat counter and were more positive than reported research (CDC, 2000; Argeriou & Daley, 1997). In general, non-minority and older pregnant women have higher prenatal utilization rates than minority and younger women. However, in this study based on a 460-member sample in Dallas SDA, young members and Hispanic members had higher prenatal visit rates than other members. Some of these observations were:

- Members who were less than 25 years of age had a higher STAR prenatal visit rate (6.8) than members over the age of 25 (4.2).
- Hispanic members had a higher STAR prenatal visit rate (average 6.2) than Caucasian and African American members, 5.3, and 4.7 respectively.

The care of pregnant women with chemical dependency is complex (Kelly, Zatzick & Anders, 2001). The normal and common complaints associated with pregnancy may overlap with manifestation of either substance abuse or mental disorders (Grella, 1996). Models of comprehensive programs that have been developed specifically for childbearing women include outreach, family support services, medical care, coordination of services, case management and after care services (Finkelstein 1994). For the pregnant members of this study, the findings suggest that while the recommended broad spectrum of supportive and specialized treatment services is available, there is also room for improvement (Samet, Friedmann, & Saitz, 2001; Shwartz, Baker, Mulvey & Plough, 1997). Specifically,

- Fourteen percent of pregnant members had multiple STAR inpatient admissions.
- Average number of prenatal visits (5.3) for pregnant members was lower than recommended for optimal prenatal care.
- Only 21% received first trimester prenatal care.
- More than half of pregnant members had STAR emergency room visits (51.7%) just before or just after delivery.
- After receiving their first NorthSTAR service, 41% of pregnant members did not have further evidence of STAR services.

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On the positive side, the study found comparable utilization of NorthSTAR outpatient visits for pregnant members who utilized only NorthSTAR outpatient visits compared to those who also had residential treatment. Additionally, pregnant members had an increase in their prenatal visit rate after their first NorthSTAR service.

In general, ethnic minorities utilize behavioral health services less than non-minorities (Takeuchi et. al, 1999). The results of this study are therefore encouraging, in that,

- Pregnant Hispanic members had a higher NorthSTAR behavioral health outpatient visit rate (12.7) than other pregnant members.
- In addition, Hispanic members with no STAR services utilized more NorthSTAR behavioral health outpatient visits (17.7) than other members with no STAR services (11.5).

The high rate of utilization of emergency room services observed in this study by nonpregnant members appears to be associated mainly with members who have dual disorders of substance abuse and other behavioral health diagnoses. Substance abuse, coupled with diagnoses such as depression, panic disorder and anxiety disorder, often produces physical symptoms that could prompt an individual to seek medical treatment more frequently than someone with substance abuse alone (Grella, 1997; National Center on Addiction and Substance Abuse, 1996). McGeary (2000) noted that females with dual diagnoses increased their probability of receiving emergent care by six percent.

Some demographic differences were also observed in utilization of STAR emergency room visits by nonpregnant members. Research shows that Caucasian women and older women have higher emergency room utilization rates than minority women and younger women (McGreary, 2000; National Center on Addiction and Substance Abuse, 1996). Contrary to this research, based on a 460-NorthSTAR-member sample in the Dallas SDA, the majority of nonpregnant members that utilized STAR emergency room visits were:

- African American (56.7%) and
- Younger women (55%).

NorthSTAR members who utilized STAR program services also had a higher NorthSTAR outpatient visit rate than members who received only NorthSTAR services. Without a more sophisticated measure of morbidity, however, it is not possible to ascertain whether the increase in treatment intensity reflects greater clinical need.

## Conclusions

More than half (58%) of NorthSTAR members received physical health services from STAR, in addition to their NorthSTAR treatments. Members who were pregnant consumed very large portions of the STAR services; receiving both prenatal visits and services associated with delivery and postpartum care. The extent to which specific behavioral health needs of female Medicaid recipients with chemical dependency influenced their physical health needs warrants further study.

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## APPENDIX A

### Identification of Sub Samples

#### ***Members Receiving both STAR and NorthSTAR Program Services***

The claims and/or encounter file for all Medicaid Eligibles for the specified study period was used to locate all STAR FFS claims and STAR HMO/PCCM encounters for the study sample. Claims and/or encounters identified were primarily STAR fee-for-service.

Of the 460 members enrolled in the NorthSTAR Program and utilizing NorthSTAR services, 59% had claims and/or encounters for STAR program services (Refer to Figure 1). Forty-one percent of members utilized only NorthSTAR program services.

#### ***Pregnant and Nonpregnant Members Receiving STAR services***

After identifying members' STAR claims and encounters, pregnancy ICD-9 diagnosis codes were used to distinguish members with STAR claims and/or encounters relating to pregnancy or delivery and members without STAR claims relating to pregnancy or delivery. (Refer to Figure 1).

Of the 269 members utilizing STAR program services, 119 members had STAR claims and/or encounters that met the criteria defining a pregnancy related claim or encounter (see Appendix D).

Of the 191 members receiving NorthSTAR services only, one percent had NorthSTAR encounters that met the criteria defining a pregnancy. These two members with NorthSTAR pregnancy related encounters did not receive any STAR program physical health services.

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## APPENDIX B

### Demographic Characteristics

#### ***Characteristics of Members Utilizing both STAR and NorthSTAR Program Services***

Demographic characteristics of the sub samples of 119 pregnant members and 150 nonpregnant members utilizing both STAR and NorthSTAR program services are listed below:

- Almost half of the pregnant members were Caucasian, 31.9% were African American, and 18.5% were Hispanic.
- The majority of pregnant members (62.2%) were between the ages of 21 and 30 (Mean 27.26, SD 5.72, and age range 16 to 43).
- Of the total sample of 44 Hispanic members, 50% were pregnant
- The sub sample of nonpregnant members was predominantly (53.3%) African American, 42% were Caucasian and 4.7% were Hispanic.
- Most nonpregnant members were over the age of 30 (Mean 32.31, SD 7.24, range 14 to 54).
- By program type, 81.3% of nonpregnant members were enrolled in TANF compared to 18% enrolled in SSI.
- Of the total sample of 186 African Americans, 43% were not pregnant.

#### ***Characteristics of Members Utilizing only NorthSTAR Program Services***

Demographic characteristics of the 191 members who utilized only NorthSTAR program services included:

- The sub sample of members who utilized only NorthSTAR program services were predominantly (56.1%) Caucasian, 35.6% were African American and 7.8% were Hispanic.
- Almost 47% of members who utilized only NorthSTAR program services were between the ages of 26 and 35, 19.4% were between the ages of 14 and 25, and 33% were over the age of 35 (Mean 32.06, SD 7.41, range 14 to 51).
- By program type, 97.8% of members who utilized only NorthSTAR services were enrolled in TANF.
- Of the total sample of Caucasian members, 47.1% only utilized NorthSTAR program services.

**Table 15.**

**Demographic Characteristics of NorthSTAR Members by Total Sample and Sub Samples**

	Total Sample of NorthSTAR Members <b>N=460</b>		Pregnant Members receiving STAR and NorthSTAR program services <b>N=119</b>		Non Pregnant Members receiving STAR and NorthSTAR services <b>N=150</b>		Pregnant and Nonpregnant Members receiving <u>Only</u> NorthSTAR services <b>N=191</b>	
<b>Characteristic</b>	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>
<b>Age</b>								
17 or younger	16	3.5%	5	4.2%	6	4.0%	5	2.6%
18 to 20	14	3.0%	9	7.6%	1	0.7%	4	2.1%
21 to 25	74	16.1%	32	26.9%	14	9.3%	28	14.7%
26 to 30	134	29.1%	42	35.3%	43	28.7%	49	25.7%
31 to 35	95	20.7%	21	17.6%	34	22.7%	40	20.9%
36 to 40	80	17.4%	8	6.7%	36	24.0%	36	18.8%
41 to 45	33	7.2%	2	1.7%	9	6.0%	22	11.5%
46 or older	14	3.0%			7	4.7%	7	3.7%
<b>Ethnicity/Race</b>								
Caucasian	227	49.3%	57	47.9%	63	42.0%	107	56.1%
African American	186	40.4%	38	31.9%	80	53.3%	68	35.6%
Hispanic	44	9.5%	22	18.5%	7	4.7%	15	7.8%
American Indian or Alaskan	1	0.2%	1	0.8%				
Asian Pacific Islander	2	0.4%	1	0.8%			1	0.5%
<b>Type of Program</b>								
TANF	427	92.8%	118	99.2%	122	81.3%	187	97.8%
SSI	30	6.5%	1	0.8%	27	18.0%	2	1.1%
Unknown	3	0.7%	0		1	0.7%	2	1.1%

## APPENDIX C Demographic Characteristics by Medicaid Program Type

Table 16.

### Demographic Characteristics of NorthSTAR members enrolled in Supplemental Social Security Income (SSI) Medicaid Program N=30

	Pregnant Members Utilizing STAR and NorthSTAR services N=3	Nonpregnant Members Utilizing STAR and NorthSTAR services N=25	Members receiving Only NorthSTAR services N=2
	N	N	N
Characteristic			
Age			
18 to 25	1	1	
26 to 35	2	10	
36 to 45		9	1
46 or older		5	1
Ethnicity			
African American	2	17	
Caucasian	1	8	2

Table 17.

### Demographic Characteristics of NorthSTAR members enrolled in Unknown Medicaid Program Type N=3

	Pregnant Members Utilizing STAR FFS/MCO and NorthSTAR services N=1	Nonpregnant Members Utilizing STAR FFS/MCO and NorthSTAR services N=2
	N	N
Characteristic		
Age		
18 to 25	1	
26 to 35		1
36 to 45		1
Ethnicity		
African American	1	1
Caucasian	1	1

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## Appendix D

### Variable Definitions

#### Medicaid Membership Number

Numeric assigned number during study period.

#### Ethnicity

Members' ethnicity was identified from Maximus enrollment files in administrative records and categorized into six groups: African American, Caucasian (non-Hispanic Caucasian), Hispanic, Native American, Asian American, and other/not specified.

#### Age

Member's age at time of study period (September 1, 1999 to August 31, 2000) was determined from enrollment files in administrative records.

#### Medicaid Risk Group

Members' risk group was determined from Maximus enrollment files in administrative records and categorized into two groups: SSI recipient (aged, blind, disabled, refugee) and TANF recipient (AFDC, M-C/PW, MNP). If a member was enrolled in more than one program, the longest enrollment was selected.

#### STAR Services

Unduplicated PCCM, MCO, and FFS claims/encounters were used to identify physical health services received by NorthSTAR members. Physical health services were categorized into five categories: outpatient visit, inpatient consultation, emergency room visit, prenatal visit, and postpartum visit.

CPT and Medicaid local codes identified PCCM, MCO and FFS physical health services NorthSTAR members received. These procedure codes were 99201 to 99205, 99211 to 99215 and Z9813 for outpatient visit, w0004 and 99281 to 99285 for emergency room visit, 59425, 59426, 9020X, 9030X, X4822, 4100X, and in conjunction with pregnancy diagnosis codes 99201 to 99205, 99241 to 99245 for prenatal visit, and 59430 for postpartum visit.

#### Inpatient Admission and Length of Stay

NorthSTAR members' number of non-NorthSTAR inpatient admissions and length of stay was determined from claims/encounters administrative files.

#### Pregnancy

Pregnancy was identified by ICD-9 diagnosis related to pregnancy, delivery, or maternal causes of perinatal morbidity and mortality from PCCM, FFS or MCO claims or encounters. The following ICD codes in one of the eight diagnosis code fields were used: 640xx to 676xx, 760xx to 779xx, V22xx to V24xx.

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### **Date of Delivery**

Delivery was identified by one of the following ICD-9-CM codes in one of the eight diagnosis code fields from PCCM, FFS or MCO claims or encounters: 650 – 65000, V270 – V2700, V272 – V2720, V273-V2730, V275 – V2750, V276 – V2760, 6400x – 6489x where x = 1 or 2, 6510x – 6563x where x = 1 or 2, and 6565x – 6769x where x = 1 or 2.

### **Prenatal Visits by Trimester**

After determining pregnancy, date of delivery and identifying prenatal visits, the visits were separated into trimesters based on the following methodology. First, using the date of conception and date of delivery as temporal points, the beginning and ending dates of each trimester were determined. Specifically, date of conception = (delivery date – 280 days); end of first trimester = (delivery date – 176 days); beginning of second trimester = (delivery date – 175 days); end of second trimester = (delivery date – 88 days); and beginning of third trimester = (delivery date – 87 days). Prenatal visits that fell between conception and the end the first trimester were coded as first trimester visits. Prenatal visits that fell between the beginning and end of the second trimester were coded as second trimester visits. Prenatal visits that fell between the beginning of the third trimester and the delivery date were coded as third trimester visits.

### **NorthSTAR Behavioral Health Services**

Unduplicated NorthSTAR encounters were used to identify behavioral health services received by NorthSTAR members. Services were categorized into three categories: outpatient visit, residential and emergency room visit.

CPT and Medicaid local procedure codes that identified NorthSTAR services were 201BH, 203BH, 205BH to 207BH, 209BH to 211BH, 3003X, 213BH, and 215BH for outpatient visit, w0004 and 99281 to 99285 for emergency room visit, and 202BH, 204BH, and 212BH for residential.

### **STAR Behavioral Health Services**

STAR behavioral health services received were determined through PCCM, MCO, and FFS claims and/or encounters grouped into behavioral health outpatient visit.

CPT and Medicaid local codes identified STAR behavioral health services. These procedure codes were 90801, 90804 to 90805, 1001x, 1002x, z9101, 7008x, 1050x, 1051x, 1052x, 8011x, 8012x, 8010x, and 8019x for outpatient visit and for inpatient behavioral health consultation.

### **Behavioral Health Diagnosis**

Medicaid claims/encounters were used to identify behavioral health ICD-9 Diagnosis codes by using all eight diagnosis fields. Codes were grouped into five categories: 1) Substance Abuse Disorder for codes 291xx to 292xx, 303xx to 305xx, and v113, v791, 2) Organic Disorder for codes 290xx, 293xx and 294xx, 3) Thought Disorder for codes 295xx, 297xx to 299xx, and v11xx, 4) Mood Disorder for codes 296xx, 311, v790, and v11 and 5) Personality Disorder for codes 301.xx.

## Appendix E Pregnant Members with no STAR Prenatal Visits Recorded

Table 17.

### Pregnant Members who Utilized STAR Services at Delivery and Postpartum Only

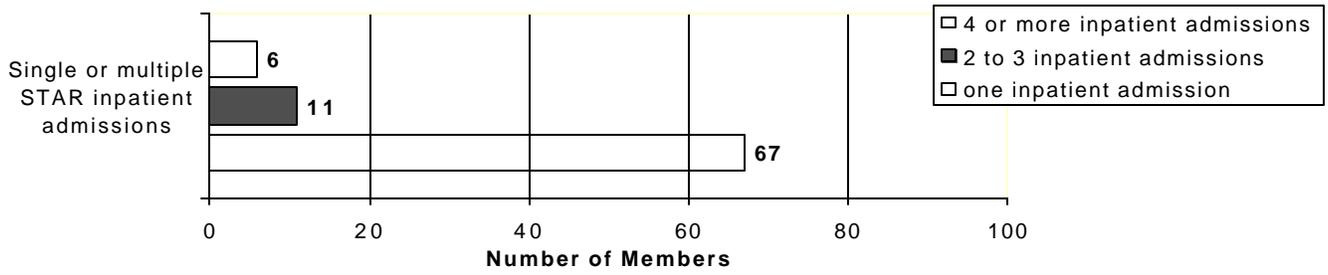
Age	Ethnicity	Diagnoses	FFS/MCO Inpatient Admission	FFS/MCO Length of Stay	FFS/MCO Prenatal Visits	FFS/MCO Postpartum Visits	FFS/MCO ER	NS Outpatient Visits	NS Inpatient Admission	NS Residential Care
26	Asian pacific Islander	Substance Abuse	1	1	0	1	0	4	No	No
27	African American	Substance Abuse Alcohol Mood	1	3	0	0	0	0	No	Yes
38	African American	Substance Abuse	1	2	0	0	0	12	No	Yes
40	African American	Substance Abuse Alcohol Mood	1	2	0	0	0	41	No	No
23	Hispanic	Substance Abuse Alcohol	0	0	0	1	0	1	No	Yes
26	Hispanic	Substance Abuse	1	4	0	1		20	No	Yes
28	Hispanic	Substance Abuse Mood	0	0	0	0	0	38	No	Yes
21	Caucasian	Substance Abuse Mood	1	2	0	1	0	13	No	Yes
28	Caucasian	Substance Abuse	0	0	0	0	1	0	No	Yes
28	Caucasian	Substance Abuse Mood	1	1	0	0	0	3	No	Yes
30	Caucasian	Substance Abuse	1	2	0	1	0	0	No	Yes

## Appendix F Utilization of STAR Inpatient Admissions

**Table 18.  
Pregnant Members with High Number of STAR Admissions or Length of Stay**

Age	Ethnicity	Diagnoses	STAR Inpatient Admission	STAR Length of Stay	STAR Prenatal Visits	STAR Postpartum Visits	NorthSTAR Outpatient Visits	NorthSTAR Inpatient Admission	NorthSTAR Residential Treatment
21	African American	Substance Abuse	1	14	5	1	12	No	No
22	African American	Substance Abuse	4	54	5	2	0	No	Yes
25	African American	Substance Abuse	3	101	0	1	4	No	Yes
25	African American	Substance Abuse	3	6	6	1	0	No	Yes
29	African American	Substance Abuse	5	9	4	1	1	No	Yes
36	American Indian	Substance Abuse Mood	3	27	4	0	0	No	Yes
17	Hispanic	Substance Abuse	3	57	1	1	0	Yes	Yes
22	Hispanic	Substance Abuse	1	23	3	0	12	Yes	Yes
22	Hispanic	Substance Abuse	1	28	0	1	36	No	Yes
24	Hispanic	Substance Abuse	4	17	7	1	3	No	No
22	Caucasian	Substance Abuse	3	46	4	3	12	No	Yes
29	Caucasian	Substance Abuse	1	78	5	1	3	No	Yes
29	Caucasian	Substance Abuse Mood	4	10	6	2	0	Yes	Yes
29	Caucasian	Substance Abuse	3	13	0	0	12	Yes	Yes
31	Caucasian	Substance Abuse	2	16	7	2	0	No	Yes
33	Caucasian	Substance Abuse Mood	6	23	11	0	3	No	Yes
37	Caucasian	Substance Abuse Mood Thought	5	20	3	2	0	NO	Yes
43	Caucasian	Substance Abuse	3	19	6	1			

**Figure 6.**  
**Number of Single and Multiple STAR Inpatient Admissions for Pregnant Members (N=84)**



**Table 19.  
Nonpregnant Members with High Number of STAR Admissions or  
Length of Stay**

Age	Ethnicity	Diagnoses	FFS/MCO Inpatient Admission	FFS/MCO Length of Stay	FFS/MCO Outpatient Visits	FFS/MCO Emergency Room Visits	NS Outpatient Visits	NS Inpatient Admission	NS Residential Care
35	African American	Substance Abuse Mood	2	10	2	0	2	No	Yes
17	African American	Substance Abuse Mood	1	13	2	3	0	No	No
46	African American	Substance Abuse Mood	3	28	21	27	0	No	Yes
25	Caucasian	Substance Abuse Mood	4	14	14	1	0	No	Yes
29	Caucasian	Substance Abuse Mood Thought	4	19	1	7	0	Yes	Yes
29	Caucasian	Substance Abuse Mood	1	12	14	23	18	Yes	Yes
23	African American	Substance Abuse Mood Thought	2	19	0	0	0	No	Yes
15	Caucasian	Substance Abuse Mood	2	16	17	3	0	No	Yes
28	Caucasian	Substance Abuse Mood Thought	1	77	0	0	0	No	Yes
32	Caucasian	Substance Abuse Mood Thought	4	19	0	8	0	No	Yes
27	Caucasian	Substance Abuse Mood Thought	6	17	28	12	1	Yes	Yes

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## Appendix G

### Literature Review

In recent years, the prevalence of substance abuse among childbearing women has become widespread (National Institute on Drug Abuse (NIDA), 2001). Co-occurrence of behavioral health disorders with a substance abuse disorder is not uncommon (Schulberg, Magruder, & deGruy, 1996). Childbearing women with substance abuse typically have multiple, complex, and interacting needs (Kelley, Zatzick & Anders, 2001). The specialized nature of needs relating to pregnancy or to parenting have been integrated into comprehensive treatment and recovery services (Grella, 1996). Positive findings have been demonstrated from programs designed to meet the needs of childbearing women with substance abuse issues (Daley, Argeriou & McCarty, 1998; Ingersoll, Lu & Haller, 1995).

#### Substance Abuse and Childbearing Women

The prevalence of substance abuse among women of childbearing age has become widespread, crossing all ethnic, racial and socioeconomic lines (Vega, Kolody, Hwang, & Noble, 1993). Of women who use illicit drugs, about half are in the childbearing age group of 15 to 44 (National Institute on Drug Abuse (NIDA), 2001). Similarly, of women who abuse alcohol, the incidence is highest among childbearing women between the ages of 20 and 40 years of age (Schmidt & Weisner, 1995).

Reports also indicate that among childbearing women, the hallucinogen marijuana is often used in combination with alcohol and tobacco (NIDA, 2001; Olds, London, & Ladewig, 1992). Day and Richardson (1991) reported that approximately 15% of pregnant women use marijuana. In addition, the incidence of cocaine use by women of childbearing age has been reported to be about 15% (Rosenak, Diamant, Yaffe, & Hornstein 1990) with higher rates (30%) reported in urban areas (Lynch & McKeon, 1990).

A substantial number of childbearing women treated in obstetrics have unrecognized and untreated substance use. For example, in a sample of 500 women who were hospitalized for childbirth, Lake and associates (1992) collected anonymous urine samples. From this sample, 5% tested positive for cocaine, marijuana or both. In a similar study, Schultzman and his associates (1991) urine tested 500 pregnant women residing in a large urban city. Of the 500 women, 73% tested positive for cocaine.

#### Psychiatric Disorders and Substance Abuse

Substance use has a significant co-occurrence with other psychiatric disorders and behavioral problems (Schulberg, Magruder, & deGruy, 1996). Although there are no large-scale epidemiological studies on

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psychiatric co-morbidity among childbearing women, population-based studies suggest high rates of co-morbidity with substance abuse particularly for chemical dependency (Kelly et al, 1999; Kessler, McGonagle, & Zhao, 1994). For example, Kessler and his associates (1996) discovered a high prevalence of concurring addictive and mental disorders in non-institutionalized women between the ages of 15 to 54. The 15- through 24-year-old cohort of women had the highest 12-month prevalence of any disorder, including substance use, and of three or more disorders.

Although pregnant women are expected to experience mental problems at a rate similar to the general female population, relatively little is known about the detection and treatment of psychiatric disorders in pregnant women under obstetric care (Miranda, Azocar, Komaromy & Golding, 1998).

Using medical record review in conjunction with psychiatric screening instruments, Kelly, Zatzick, and Anders (2001) examined the detection and treatment of mental disturbances among pregnant women cared for in the obstetrical sector. Of the 186 study participants, 38% screened positive for psychiatric and/or substance abuse disorders. Women who screened positive were more likely to have Medicaid insurance coverage and inadequate prenatal care than women with negative screening results. Only one in four of study participants who screened positive had charted record of a mental health or substance abuse treatment and just one in three had been evaluated for psychiatric problems or drug use.

### **Behavioral Health in Primary Care**

Over the past two decades, a series of investigations have assessed the detection, treatment, and outcomes of childbearing women with psychiatric and substance abuse disorders in primary care (Schulberg, Magruder, & deGruy, 1996). Studies of diagnostic patterns, both in clinical samples (Rounsaville et. al 1991) and in general population samples (Regier, et. al, 1990), show that the co-occurrence of addictive and mental disorders is highly prevalent and more common in treatment samples than in untreated community samples.

Reports also suggest that rates of psychiatric disorders among pregnant women are similar to rates for women in the general population and for women cared for in primary care (Williams, et al, 1999). Similarly, there are examples in the literature that document the complex needs of childbearing women with substance abuse disorders (Kelley, Zatzick & Anders, 2001; Melnick, 1992; Saitz, Mulvey, & Samet, 1999). For example, Kelly and her associates (1999) found in a population-based investigation of hospital delivery records that women with chart-documented mental disorders at delivery had a two-fold higher risk of inadequate prenatal care.

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Numerous reports have been written on the characteristics, treatment, perinatal outcomes, and research methodology in relation to chemically dependent women and their infants. However, most studies pertaining to maternal substance use have focused on the neonatal outcomes of substance-exposed infants and treatment research methodology with modest attention to treatment outcomes.

### **Programs for Childbearing Women with Substance Abuse**

According to the Substance Abuse and Mental Health Services Administration (1995), between 1981 and 1993, the annual admission rates to publicly funded drug treatment facilities in the United States increased dramatically from 6.3% to 44% for cocaine-abusing clients. Women represented 28% of the 1993 admissions to drug and or alcohol treatment facilities. In 1990, the Health Care Financing Administration broadened its service reimbursement policy to include a variety of substance abuse treatment interventions for Medicaid eligible pregnant women (Breitbart, Chavkin & Wise, 1994). These initiatives resulted in expansion in the amount and type of substance abuse treatment enabling detoxification, outpatient and residential drug treatment programs to accommodate the needs of women in their childbearing years.

Specialized treatment programs for childbearing women have recently been developed with the recognition that women who abuse alcohol and other drugs enter treatment with gender-specific issues (Grella, 1996). Models of comprehensive programs that have been developed specifically for childbearing women include outreach, family support services, medical care, coordination of services, case management and after care services (Finkelstein 1994). Women completing these programs have demonstrated reductions in psychological distress and improvements in independent living, parenting, interpersonal and occupational skills (Saunders, 1993).

#### ***Residential Programs***

Several residential programs for childbearing women have been developed that enable them to maintain custody of their children while in treatment (Hughes et. al, 1995). Stevens and Arbiter (1995) report that women, either pregnant or parenting, admitted to a residential treatment program are either court referred or involved with Child Protective Services upon entry. However, findings regarding the effectiveness of a court order before treatment are mixed. For example, researchers Laken and Ager (1996) found a history of protective services involvement to be related to increased retention while Brown (1992) and Finkelstein (1994) found that fear of protective services involvement kept women from attending substance abuse treatment.

Other studies investigating outcomes of women in residential programs have reported that women either pregnant or parenting are entering treatment to avoid legal penalties or to retain custody of

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their children (Hughes et. al, 1995; Stevens & Arbiter, 1995). For example, studies of residential programs for pregnant and parenting women have found that retention in treatment improved significantly when the women's children lived on site (Coletti et al., 1992). Hughes and his associates (1995) demonstrated that women who were able to have their children live with them while in a substance abuse residential program stayed in treatment significantly longer than women who did not have their children in residence.

Daley, Argeriou, and McCarty (1998) explored the effects of pregnancy on treatment utilization and outcomes by examining treatment service records of 227 pregnant drug and alcohol dependent women enrolled in the Massachusetts MOTHERS project (Medicaid Opportunities to Help Enter Recovery Services) and a matched comparison group of 277 non-pregnant drug and alcohol dependent women. Substance abuse treatment utilization during a 6-month period of observation was greater for pregnant than for non-pregnant women. Pregnant women were more likely to enter long-term residential and methadone services and more likely to be readmitted to detoxification. Non-pregnant women received more short-term intensive treatment and more transitional care. Researchers conclude that the higher frequency of service utilization by pregnant women likely reflects a desire to terminate alcohol and drug use for the welfare of the infant.

### ***Outpatient Programs***

Nardi (1997) described the patterns of program attendance and substance use abstinence that characterized a group of 40 low-income women who were enrolled in Project Hope, an intensive multidisciplinary outpatient program of addiction treatment for women who were pregnant or mothers of newborns and children under 3 years of age. The program had a successful treatment completion rate of 46%. The mean birth weight for the infants born to the mothers in the program (n=36) was 2948 grams with a low birth weight incidence of 15%. Substance use abstinence was positively associated with length of time in the program, and attendance correlated with length of stay as well as substance use abstinence.

Ingersoll, Lu, and Haller (1995) investigated relapse during treatment among 64 pregnant women with a first time admission to a perinatal treatment intensive outpatient program. Pregnant women with more severe consequences of drug use, such as job loss or legal involvement, and women with antisocial personality disorder or anxiety disorders tended not to relapse during treatment. However, pregnant women with more social exposure to substance abuse through familial addiction or current drug use in their home had greater risk for relapsing during treatment.

Comfort and Kaltenbach (1999) evaluated outcomes of two treatment programs, the Maternal Addiction Treatment Evaluation

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and Research (MATER), a comprehensive outpatient treatment program for pregnant and parenting drug dependent women and their children and My Sister's Place, a long term residential treatment program for pregnant and parenting women and their children under the age of six years. Comparisons of program retention and infant birth outcomes found no significant differences between treatment programs whereas abstinence and patterns of attrition showed meaningful differences favoring residential treatment. Pregnant women in the residential program were able to maintain substance use abstinence. Two critical periods for specialized intervention were identified. The first three months post admission comprised a critical period during which one third of the women departed from both the residential and outpatient programs. A second critical period was identified between delivery and two months postpartum. During this period, twice as many outpatient clients as residential clients left treatment.

### **Case Management and Substance Abuse Programs**

Ease of access to services and an ability to move in and out of treatment are necessary for engaging or re-engaging women who are pregnant or parenting into substance abuse programs (Schliebner, 1994). Case management that incorporates a care coordination aspect of care facilitates substance abuse recovery by assisting women to navigate multiple agencies (Laken & Hutchins, 1995; Laken et al, 1997).

Laken and Ager (1996) found case management contributed to increased retention in outpatient drug treatment. In a follow up study, Laken, McComish & Ager (1997) re-evaluated case management associated with an outpatient substance abuse treatment program for low-income pregnant and postpartum women (N=168) and their children. The outcome variables evaluated were changes in urine toxicology (55.4% better/all clean) and birth weight (Mean=2798 grams). The authors conclude that case management and threat of child protective services encouraged retention in treatment services during pregnancy. Retention was associated with a reduction in illicit substance use and a reduction in illicit substance use was associated with an increase in birth weight.