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Health Intervention with Targeted Services Evaluation

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Executive Summary

The Health Intervention with Targeted Services (HITS) program is an outreach program of the South Broward Hospital District d/b/a Memorial Healthcare System (MHS). The program was designed with three main goals: 1) to improve the health status of the community by linking the uninsured and underinsured to a 'medical home," 2) to maximize the use of community, state and federal resources, and 3) to reduce uncompensated care costs and avoidable admissions. To achieve these goals, emphasis was placed on enrolling eligible patients in health insurance programs such as Medicaid or KidCare, or in the Memorial Healthcare System (MHS) Primary Care Center (PCC) program. Another strategy to achieve the program's goals was to identify patients with chronic diseases such as diabetes or cardiac disease, and enroll them in a disease management (DM) program.

The HITS program began in November 2006, and over the course of the next three years through the evaluation end date of October 31, 2009, three separate phases were developed:

- Phase One utilized Geographic Information System (GIS) mapping to target neighborhoods in Broward County with the highest per capita uncompensated hospital care, based on MHS data. HITS staffers conducted health fairs, health education workshops, and provided mobile health care services in these neighborhoods, and, in some cases, went door-to-door to contact neighborhood residents.

- Phase Two targeted specific individuals with chronic diseases such as diabetes or cardiovascular disease. HITS staffers used a variety of means to contact these individuals and attempt to enroll them in health insurance, connect them with a medical home, and/or enroll them in one of the MHS DM programs.

- Phase Three targeted patients with chronic conditions as well but added the criteria of frequent uncompensated emergency department (ED) utilization, beginning with those who had $100,000 or more in uncompensated ED care in the year preceding the program. Again, HITS staffers used a variety of methods to reach potential enrollees, including telephone calls, personal letters, and in-home visits.

HITS records show that the program had 7,383 interactions with individuals with chronic health problems over its course (duplication and overlap was possible), with the majority coming from Phase I. Independent analysis by the University of Florida evaluators found that 1,399 individuals applied to one of the specified health insurance programs or PCC subsequent and their interaction with HITS staffers, and that 1,143 became enrolled in at least one of the programs.

Despite limitations in the dataset, a rough estimate of program savings can be calculated using publicly available figures on average Medicaid per member per month (PMPM) costs. Florida Medicaid estimates that the average PMPM costs for a Medicaid recipient for FY 2011-12 will be $565.91[1], which equates to $6,790.92 for the year. It is far from a perfect metric, however,

[1] Agency for Health Care Administration, Division of Medicaid, Program Analysis

this figure, multiplied by the 311 people enrolled in Medicaid subsequent to their HITS interaction yields more than $2.1M in uncompensated expenditures saved for the MHS. If the Medicaid figure is used for enrollees in all three programs targeted, the potential savings exceed $7.7M.

There were some demonstrated differences between enrollees overall prior to their HITS interaction and post-HITS interaction. Inpatients admissions, total inpatient days, average length of stay, and inpatient costs all decreased in the post-HITS period. Inpatient revenue and ED payment collected increased. However, ED visits and ED costs also increased significantly whereas ED revenue decreased significantly, though the magnitude of the change was small. More significant and reliable cost savings were found for the enrollees in the cardiac and diabetes disease management programs. The two programs, taken together, resulted in a reduction of 0.84 inpatient admissions per person per year on average, a decrease of 2.12 days in the average length of inpatient stay per admission per person per year on average, and a reduction of $11,459.10 in costs per person per year. The cardiac DM program was independently found to result in a decrease of 1.25 admissions per person per year, and a reduction of 6.85 inpatient days per person per year. The diabetes DM program resulted in a reduction of 2.60 days in the average length of inpatient stay per admission per person per year. These findings show that the program has made a significant impact both in the lives of the patients it serves and in the uncompensated utilization. However, increases were also found in measurements of the number of ED visits and ED costs among some portions of the populations.

In terms of health improvements, the data were insufficient to make a complete evaluation of program accomplishments, as many health improvements take time to manifest themselves. The most promising area in which to see improvements would seem to be among the DM enrollees, for HbA1c levels (among diabetes DM enrollees), lipids and ACE/ARB use (among cardiac DM enrollees), and SF-12 measures of functional status (for all DM enrollees). No significant changes in these measures have been found thus far, but data were available for little more than a handful of enrollees.

Evaluator's conclusions regarding whether the program has met its goals

Goal 1: To improve the health status of the community by linking the uninsured and underinsured to a "medical home."

- ***HITS substantially achieves this goal and is performing well.***

  The program has resulted in a large number of people applying for Medicaid, KidCare, or PCC, and the majority of them became enrolled in one or more programs. Mobile health screenings helped to identify significant health problems in some patients. Patients with chronic health conditions were enrolled in a DM program that assists them in managing their condition.

Goal 2: To maximize the use of community, state and federal resources.

- ***HITS is performing well, though it is not possible to determine whether the goal is fully met.***

  The enrollment of more than 1,100 people into Medicaid, KidCare or PCC demonstrates a use of available resources to provide health services for individuals in Broward County.

Goal 3: To reduce uncompensated care costs and avoidable admissions.

- ***It is too soon to tell, but initial findings are mostly positive.***

  Some (but not all) measures of cost and utilization show decreases following HITS, with the most sizable changes noted for enrollees of the DM programs.

The evaluators recommend a follow-up evaluation in approximately one year. This will allow for more people to become enrolled in HITS, thus increasing the power to find changes in cost, utilization, and health status that may occur subsequent to HITS, and will also allow for a longer runout period for claims data, so that changes in health status or behavior that are slow to manifest can be found.

The evaluators also made other recommendations, the most pervasive of which was to improve the data collection process and monitor data quality continually. Limitations in the dataset, both in terms of inadequate data due to runout time and small samples, and due to inaccurate or missing data, resulted in limitations in analysis and evaluation.

Finally, a recommendation was made to continue outreach in the HITS program to ensure that eligible individuals remain enrolled in health insurance programs/ PCC and in the DM programs.

Evaluation Purpose

South Broward Hospital District d/b/a Memorial Healthcare System (MHS) is a special tax district under the laws of the state of Florida that owns and operates hospitals and other healthcare facilities. MHS contracted with the University of Florida for the provision of a Process and Reporting Analysis of the Health Intervention with Targeted Services (HITS) program. The purpose of the Process and Reporting Analysis of HITS is to identify the HITS programs, develop a flowchart, review the data collected, document reports, evaluate opportunities, submit recommendations and prepare an impact analysis. MHS primary objectives for HITS Programs Process and Reporting Analysis are as follows:

- ***HITS Program Description***
  - Identify HITS program phases
  - Document the services provided by each program
  - Create process flowcharts for each HITS Phase

- ***Data Collection and Reporting Description and Recommendations***
  - Document the data acquisition process for HITS Phases to including intake of information, database entry and creating database and excel statistical reports
  - Review the process and analyze the data collected for each Phase. Each report in the HITS database such as the Lives Touched, HITS Statistics, Insurance Status (before and after, etc) and other reports created in Excel spreadsheets should be reconciled to ensure data accuracy
  - Document HITS Reports by identifying existing excel spreadsheets and database reports
  - Make recommendations to improve the process of collecting data and reporting

- ***HITS Program Evaluation Results***
  - Evaluate the HITS programs and the data collected to determine the value added to the community and to the Memorial Healthcare System
  - Prepare or Forecast an Impact Analysis of the HITS Programs
  - Make recommendations to improve the quality of HITS services

Description of HITS Phases and Services

➢ *HITS Program Description*

- Identify HITS program phases
- Document the services provided by each phase
- Create process flowcharts for each phase

The Health Intervention with Targeted Services (HITS) program increases enrollment into publically funded health insurance programs targeting uninsured persons presumably eligible for coverage, but not currently enrolled. HITS targets residents, living within South Broward Hospital District boundaries, who are most in need of medical care and most likely to represent future financial risk (i.e., generate high uncompensated emergency department and inpatient charges).

Memorial Healthcare System (MHS), a tax-assisted hospital district serving South Broward County residents, implemented HITS in November 2006 in response to escalating uncompensated care costs in an already burdened system. Memorial's analysis of these data indicated that a large portion of uncompensated costs could have been reimbursable through government-sponsored programs, if patients had enrolled prior to treatment. The HITS program has three main objectives (1) to improve the health status of the community by linking the uninsured and underinsured to a "Medical Home," (2) to maximize the use of community, state and federal resources, and (3) to reduce uncompensated care costs and avoidable admissions.

This innovative and continually evolving program utilizes results from each program phase to inform and refine program targets and processes. HITS staff utilizes a "data mining" approach to identify the uninsured. Program staff collaboratively assesses program results monthly to identify and address barriers and track program impact. Regardless of referral source, program criteria have remained constant.

The HITS Program consists of three phases identified by targeted population. HITS phases include (1) Neighborhood Projects, (2) Preventable. Avoidable Hospitalizations, and (3) Emergency Department Diversion: Chronic Conditions and Frequent Use *(see Table 1)*. Target subpopulations for each program phase were identified based on analysis of MHS uncompensated hospital care cost and utilization data.

Table 1. HITS Phases, Target and Program Dates

Phase #	Target	Program Dates
Phase I	Neighborhood GIS Mapping	11/01/06-12/31/09
Phase II	Preventable/Avoidable Hospitalizations: Chronic Conditions	05/01/08-04/30/10
Phase III	ED Diversion: Chronic Conditions and Frequent Use	05/01/08-04/30/10

Individuals with illnesses classified as chronic were targeted in all HITS efforts due to their medical complexity and ongoing need for management of their conditions. Each program phase was based on analysis of MHS uncompensated hospital care cost and utilization data. The

method utilized to identify and target participants is one variable that distinguishes HITS phases. Detailed referral and process and enrollment flowcharts depicting variations related to each phase are included in ***Appendices A-C*** of this report.

Phase I, initiated in November of 2006, targeted the seven neighborhoods with the highest per capita uncompensated hospital care. This phase included neighborhood health fairs, health education workshops and the provision of mobile health care services. In May 2008, Memorial initiated Phases II and III targeting residents with diabetes and cardiovascular disease (chronic heart failure and hypertension). These phases included disease management services for self-pay and charity patients with a recent MHS Inpatient or Emergency Department status. Because individual patients, rather than the community-at-large, were targeted in these two phases, neighborhood events and mobile health care access were not utilized.

Initial Phase II recruitment efforts target individuals with recent hospitalizations classified as diabetes or heart related Prevention Quality Indicators (PQIs). PQIs are a set of Agency for Healthcare Research and Quality (AHRQ) measures, which identify inpatient hospitalizations that may be "preventable" or "avoidable" when individuals utilize high quality primary and preventative care in an outpatient setting. The rationale for selecting individuals meeting these criteria was based on the assumption that this group would likely receive the greatest benefit from enrollment in a "medical home" and establishment of a routine source of healthcare.

Phase III efforts target patients with frequent uncompensated emergency department utilization with initial priority enrollment for those individuals with uncompensated care exceeding $100,000 in a 12-month period. The rationale was based on the assumption that access to primary and preventative care in an outpatient setting would lead to reductions in disease severity, utilization of ED for routine care and long-term treatment costs. Emergency department utilization for non-emergent issues are identified by Current Procedural Terminology (CPT) codes 99281 and 99282[2], are considered Level I and II visits for minor illnesses and routine tests. In FY 2007, $9.5 million in charity care charges at Memorial's facilities were generated from 13,356 Level I and II ED visits.

Phase I Neighborhood GIS Uncompensated Care Mapping

Phase I was initiated with the goal of *improving the health status of the community* by linking eligible residents to a medical home through a government-sponsored health insurance program or MHS Primary Care Center (PCC) Program. Phase I objectives included: (1) personalized individual contact with residents in targeted neighborhoods, (2) increased number of residents with a "medical home" (3) increased healthcare coverage (Medicaid, Florida KidCare, etc.), and (4) immediately impact health mobile health screenings.

Phase I consists of seven targeted neighborhood projects identified as having the highest rate and concentration of uncompensated hospital care. GIS maps (See ***Appendix D)*** were generated

[2] CPT Codes are used in the reporting of medical, surgical and diagnostic services and allow physicians, patients, insurance companies, and agencies to communicate effectively throughout the United States. CPT Codes 99281 and 99282 are considered Level I and Level II, which could be handled in a primary care setting.

based on hospital inpatient utilization data to identify geographic program targets. Each neighborhood project began with a one-month planning period followed by five months of aggressive outreach targeting health care barriers at the community level.

Table 2. Phase I Neighborhoods by Project Number and Dates

Project No.	Targeted Neighborhoods	Project Period
Project 1	Liberia, Hollywood	11/01/06 - 01/30/07
Project 2	Royal Poinciana, Hollywood	05/01/07 - 10/31/07
Project 3	North West Hallandale Beach	11/01/07 - 04/30/08
Project 4	Lake Forrest, West Park	01/01/08 - 05/31/08
Project 5	South West Hallandale Beach	06/01/08 - 12/31/08
Project 6	East Miramar	01/01/09 - 06/30/09
Project 7	Sherman Circle, Miramar	07/01/09 - 12/31/09

Memorial worked closely with trusted community partners such as faith-based and community-based organizations and cities to target neighborhoods with large numbers of uninsured residents. Memorial's staff built trust by collaborating with groups from the targeted communities, traveling into the community and providing free healthcare mobile health services utilizing a culturally diverse staff representative of the community. Working in conjunction with the Memorial adult and pediatric mobile health centers, the HITS program hosted health fairs (monthly), health education sessions (bi-weekly) and mobile health screenings (two times per week).

While this approach worked well in neighborhoods with public housing complexes or low-income housing, Memorial refined this "community-based approach" to a "door-to-door" approach to "hone in" even closer on the uninsured that frequently utilize their facilities. Program staff members travel with the mobile health van travel into the heart of underserved communities utilizing a door-to-door approach and enabling easy access to services. English, Spanish and Creole-speaking Neighborhood Liaisons and Eligibility Specialists educate residents regarding the importance of determining healthcare eligibility.

Staff members utilize laptop computers to assist residents with completing government sponsored health insurance applications. The mobile healthcare van facilitates immediate healthcare services and "medical home" referrals. Table 3 summarizes health screenings, testing and immunizations performed through the health unit in seven targeted neighborhoods.

Table 3. Phase I Mobile Health Testing/Screening By Neighborhood Project								
	Project 1	Project 2	Project 3	Project 4	Project 5	Project 6	Project 7	Total
Asthma								
Nebulizer Treatments	1	0	1	0	0	0	2	4
Breast Cancer Screening								
Mammograms	27	14	15	19	3	1	79	158
Cardiac Screening								
Blood Pressure Test	243	158	305	348	332	128	1,514	3028
Hypertension (B/P>140/90)	69	23	45	31	39	11	218	436
Borderline Hypertension	42	25	47	22	22	6	164	328
Cholesterol Screening	204	175	322	371	327	132	1,531	3062
High Cholesterol	40	19	14	24	27	16	140	280
Borderline Cholesterol	54	44	45	50	73	23	289	578
Electrocardiogram (EKG)	18	13	12	12	12	3	70	140
Diabetes Screen (Accucheck)	21	20	26	131	30	3	231	462
Abnormal In Known Diabetes	12	10	7	40	11	0	80	160
Abnormal w/o Diabetes History	2	4	2	1	1	0	10	20
HIV Test	34	51	199	182	161	71	698	1396
Positive Test Result	1	0	1	3	1	0	6	12
Immunization	35	28	76	100	0	22	261	522
Influenza Shot	23	14	49	62	0	18	166	332
Pneumonia Shot	12	14	27	38	0	4	95	190
Physical Exam	74	51	93	74	53	18	363	726

Phase II Preventable Diabetes and Cardiovascular Hospitalizations

Phase II targets the reduction of uncompensated care costs for *preventable hospital admissions*, for chronic heart disease related and diabetes conditions. Without a medical home, the uninsured often delay medical treatment until their condition worsens and becomes "urgent." They often arrive at the ED with severe chronic health issues, such as diabetes and heart-related conditions, frequently requiring lengthy and costly inpatient hospitalizations.

In FY 2007, the uninsured generated more than $22.9 million in charges billed to taxpayer-funded programs for avoidable hospital inpatient admissions at Memorial Healthcare System (MHS) hospitals. Many of these inpatient hospital stays may have been avoided based on Agency for Healthcare Research and Quality's (AHRQ) *Prevention Quality Indicators*. Diabetes and heart-related PQIs represented 50% of Memorial' uncompensated inpatient admissions. These costs may have been avoided if the uninsured had been linked to government-sponsored programs such as Medicaid and Medicare or Memorial Healthcare System's (MHS) Primary Care Program. A connection to a "medical home" facilitates provision of primary and preventive care in an outpatient setting, rather than in a costly emergency department or inpatient hospital setting.

Memorial analysts determined many of these persons would have been eligible for government-sponsored health insurance or the MHS Primary Care Center Program. However, because they lacked a "medical home" and had not completed eligibility determination paperwork prior to accessing care, their health care costs were charged to the uncompensated "charity" care program.

The "Inpatient Team," which consisted of a full-time Eligibility Counselor and Disease Manager/Registered Nurse, targeted persons with PQIs for heart-related (PQIs 7,8,13) or diabetes-related (PQIs 1,3,14,16) services with the goal of enrolling them in a medical home and disease management services. The Inpatient Team introduced the program via telephone, a personalized letter or a door hanger that explained Memorial's commitment to the community and the importance of establishing a medical home. After making contact, these culturally diverse, bilingual staff members arranged for an in-home visit to provide eligibility assistance. If this was not convenient, the team invited them to meet at a community location such as Hispanic Unity, the City of Hallandale Beach's Austin Hepburn Center or the City of Hollywood's Community Redevelopment Agency, who each provided "in-kind" space for the program. Regardless of the location, each team conducted approximately 20 eligibility assessments per week for government-sponsored programs and MHS's Primary Care Center Program using a portable laptop computer with wireless access.

Recruitment initially began for patients with a Prevention Quality Indicator as defined by the Agency for Health Care Quality. Once all patients with a PQI Classified inpatient hospitalization were targeted, the target expanded to include all uninsured inpatient hospitalizations for a chronic condition.

Phase III ED Diversion: Chronic Condtions and Frequent Visits

HITS Phase III targeted uninsured emergency department patients with a diagnosis associated with chronic conditions and other continuing medical problems. Eligibility teams to target uninsured persons who accessed emergency department services for non-emergent and/or primary care treatable. Staff analyzed uncompensated emergency department charge data to identify patients with frequent emergency department visits with uncompensated care costs greater than $100,000.

The "Emergency Services Team," consists of an Eligibility Counselor and a Community Liaison or Disease Manager (when appropriate). The Emergency Services Team introduced the program via telephone, a personalized letter or a door hanger that explained Memorial's commitment to the community and the importance of establishing a medical home.

After making contact, these culturally diverse, bilingual staff members arranged for an in-home visit to provide eligibility assistance. If this was not convenient, the HITS Team invited them to meet at a community location such as Hispanic Unity, the City of Hallandale Beach's Austin Hepburn Center or the City of Hollywood's Community Redevelopment Agency, who each provided "in-kind" space for the program.

Disease Management Services

Memorial's disease management services target uninsured individuals with chronic diseases, such as cardiovascular disease and diabetes. Disease management is an integrated system of interventions, measurements and refinements of health care delivery designed to optimize clinical and economic outcomes within a specific population. This program relies on aggressive prevention of complications, as well as the treatment of chronic conditions. Registered Nurse disease managers provide ongoing support and health education for clients who are struggling with their health issues. Disease managers help to ensure that clients keep their medical appointments and obtain laboratory tests when needed.

Once a potential client is identified, a disease management specialist and eligibility counselor schedule a home visit to determine eligibility and assist with enrollment into a behavior-changing program. Disease management specialists track these individuals week to week and conduct follow-up phone calls and home visits.

Diabetes Disease Management Activities

- Educate clients on diabetes self-management skills including but not limited to: diet, exercise, glucose monitoring and medication adherence.
- Assess compliance with diabetes self-management activities and physician's plan of care.
- Assess medication adherence at each contact.
- Referral for outpatient diabetes education as needed.
- Assist client with obtaining blood glucose monitoring equipment and medications.

Cardiac Disease Management Activities

- Educate clients on cardiac care self-management skills including but not limited to: diet, exercise, blood pressure monitoring, daily weight and medication adherence.
- Assess compliance with cardiac self-management activities and physician's plan of care.
- Assess medication adherence at each contact.
- Assist client with medications and any prescribed durable medical equipment (DME).

Memorial Healthcare System HITS Data Collection Efforts

➢ *Data Collection and Reporting Description and Recommendations*

- Document the data acquisition process for HITS Phases to including intake of information, database entry and creating database and excel statistical reports
- Review the process and analyze the data collected for each Phase. Each report in the HITS database such as the Lives Touched, HITS Statistics, Insurance Status (before and after, etc) and other reports created in Excel spreadsheets should be reconciled to ensure data accuracy
- Document HITS Reports by identifying existing excel spreadsheets and database reports
- Make recommendations to improve the process of collecting data and reporting

The purpose of the Health Intervention with Targeted Services (HITS) program is to link uninsured clients in the Memorial Healthcare System (MHS) service area (south Broward County) to a medical home in order to provide quality, ongoing preventive care in a primary care setting, rather than in an expensive emergency department or inpatient hospital setting. HITS links the uninsured to a medical home either through a government-sponsored health insurance provider or at any of four MHS Primary Care Centers (PCC). The current evaluation reviews three targeted approaches to outreach for HITS clients:

HITS I. Communities or neighborhoods with a significant number of potential clients are identified by reviewing socio-economic indicators and the addresses of clients of MHS that have received uncompensated care. HITS program staff reaches out to residents in those communities during a 6-month period, promoting community events, placing the mobile health centers in the neighborhood, knocking on doors, etc. Seven neighborhoods have been targeted since the program began in November 2006, each of which is identified as a Project in Phase 1. Six of the outreach efforts (Projects 1 to 6) had been completed by October 31, 2009, the cutoff date for the current evaluation, while the last (Project 7) was completed after the cutoff. A total of 6,318 clients were touched by HITS 1.

HITS II. Clients with uncompensated inpatient admissions that are associated with opportunities for disease management are identified and contacted directly by outreach staff. This Phase began May 1, 2008, and 534 clients were touched through October 31, 2009.

HITS III. Clients that have had multiple uncompensated emergency department admissions with opportunities for disease management are identified and contacted directly by outreach staff. This Phase began May 1, 2008, and 537 clients were touched though October 31, 2009.

HITS clients in all cases are screened to determine if they currently have some kind of insurance. If not, eligibility staff works with the clients and their families to enroll them in an insurance alternative that will give them access to a medical home. Program success is measured three ways. First, among those determined to have no insurance at the initial encounter, the number who are successfully enrolled in Medicaid, KidCare or a Primary Care Center. Second, the extent to which enrollment in one of the insurance alternatives results in improved care and

improved health outcomes for those enrolled. Third, the extent to which enrollment results in reductions in the overall cost of care, with special attention to the number and cost of emergency department and inpatient admissions.

Information on clients served by the HITS program is collected through two specific procedures that result in data that is kept in a program-specific (HITS) database. Supplementary data necessary for the overall evaluation is captured in other MHS information systems that are designed for all clients, such as billing and utilization. The Disease Management Program (DMP) collects additional information, such as clinical test results and quality of life surveys, for clients that are enrolled in HITS.

HITS program staff collects contact and demographic information for each client (and other members of the household), as well as the initial insurance status, at the moment of initial contact through outreach efforts. This initial data collection is transcribed into a pre-formatted Word document that is stored on a secure server. That data is then transferred to the HITS database (tbl_HITS, tbl_Contact, tbl_Demo) by a person specifically tasked with quality assuring the data. Each client (ParID) and each household (RelatedID) receives a unique identifier as a participant touched by the HITS program, and the initial Encounter Date (EncDate) is recorded. The client also is identified with the HITS Phase and Project, and for HITS 1, whether or not they live within the targeted area. Clients retain the unique identifiers (ParID and RelatedID) even if it is determined that they have already been touched previously by HITS – in other words, the same client may appear multiple times in the HITS database. Initial quality assurance includes consulting the MHS mainframe database to determine if the individual is already a client of MHS, which would give access to additional information and permit the inclusion of a Medical Record Number for the client in the HITS database. HITS staff submits a form to request updates to mainframe data that is inconsistent with the data they collect, as the mainframe data cannot be changed by HITS staff.

The HITS database, which did not exist at the beginning of the program, was designed over the course of implementation, and underwent a significant revision in January of 2009. This may explain the large number of records for which helpful demographic information is missing – gender (147), race (4,248), ethnicity (3,034), date of birth (385), marital status (671), and employment status (3,759).

HITS program staff also reports on the significant array of services provided to HITS 1 clients who visit the mobile health center during its presence in the neighborhoods. The total number of services provided is tabulated by the medical staff of the Mobile health center, but services are not identified for individual clients. There were a significant number of screenings for blood pressure (1,514), cholesterol (1,531) and HIV (698). These results are not part of the HITS Evaluation Database, but are included in the reports prepared by the HITS program staff. A summary of the services provided, by Project, is included in Appendix A.

A second data collection process is undertaken by the eligibility staff to track progress on enrollment in an insurance alternative for each touched individual. The initial insurance status determines the steps taken in following up. Clients who have no insurance at the time they are encountered are screened for eligibility and told what documents they need to present.

Eligibility staff works with each one to prepare and submit an insurance application. The steps in the application process, dates of completion and the outcome are tracked in a set of spreadsheets that are maintained by eligibility staff. The person in charge of quality assurance transfers this data to the HITS database (tbl_INS).

Tracking of insurance status was not systematic in the early Projects of HITS 1. There are no insurance status records for more than 15% of HITS clients, and 44% of the records have null values in all fields. In other words, only 41% of HITS clients had meaningful insurance status information. While this is not inconsistent for clients whose initial insurance status indicated that they were already enrolled in an insurance alternative, for 38% clients without insurance at the initial encounter, there was no insurance status data. Insurance enrollment outcomes and dates play two key roles in the evaluation: the number of successful insurance enrollments is an important measure of process, while the date of successful insurance enrollment is the best point of separation between pre-enrollment and post-enrollment in terms of both health outcomes and cost. Missing dates for insurance approvals, and some dates that were inconsistent, made it necessary to use the HITS Encounter Date (EncDate in tbl_HITS) as the effective date for separating pre-enrollment and post-enrollment outcomes. The insurance status data is a weak link in the HITS database and in the measurement of program outcomes. There was insufficient time to address all of the shortcomings in the recording of insurance status for the current evaluation effort. See the section on Process and Data Issues for additional observations on these problems.

An additional complexity resulted from the existence of multiple records for some HITS clients. Although the process outcomes justifiably counted each encounter and registered the insurance outcome, the measurement of health outcomes and costs should include each client only once, to avoid counting results multiple times. Duplicate client records were identified by two methods: (1) clients with the same Medical Record Number (MedRec in tbl_Contacts); and (2) clients without a MedRec whose name, date of birth and address made it clear that they were the same. For the measurement of health outcomes and costs, only the first method was necessary. Eliminating duplicate records for this purpose required the selection of one ParID, with the corresponding HITS Encounter Date, Phase and Project, initial insurance status and set of insurance outcomes. The record selected was the earliest one for which the initial insurance status was NONE and a successful enrollment was reported in Medicaid, KidCare or PCC. For the purpose of this evaluation, this procedure was carried out only on the HITS Evaluation Database, but it should be addressed in a more direct way in the HITS database itself.

Memorial Healthcare System HITS Reports

Reports currently produced by the HITS program staff include two types that are used to assess overall performance of the program: (1) reports focused on the number of individuals touched and the outcome of the effort to enroll them with a medical home, including successful application for either Medicaid or a Primary Care Card; and (2) reports focused on the utilization rates of services, especially emergency department and inpatient admissions, along with the associated costs. These reports are developed for each Phase and Project separately, and also are aggregated to provide an overview of the entire HITS program. Additional reporting is prepared

by the Disease Management Program staff for HITS clients enrolled in the DMP, but a discussion of those reports is not included here.

Reports on Individuals Touched and Insurance Outcomes

HITS program staff creates reports on the number of individuals and households touched through queries drawn from the HITS Database. Table 4. presents the total number of clients served through October 31, 2009, as reported in spreadsheets compiled by HITS program staff. These numbers present results that are slightly different from the totals compiled in the HITS Evaluation Database, which has data for 7,383 clients (6 fewer). The discrepancy arose due to final adjustments made in the HITS Evaluation Database after these results were compiled More than a third of those encountered through the HITS program (2,546, or 34.5%) already had some type of insurance at the time of initial contact.

Table 4. Summary of Clients Served and Insurance Status: HITS 1, HITS 2, and HITS 3

HITS Clients	HITS 1	HITS 2	HITS 3	Total
Period Begin Date	11/01/06	05/01/08	05/01/08	11/01/06
Period End Date	12/31/09	04/30/10	04/30/10	10/31/09
Touched Households	**3,143**	**442**	**330**	**3,915**
Touched Individuals	**6,318**	**534**	**537**	**7,389**
With Medical Record Numbers	4,215	506	468	5,189
Enrolled in Disease Management		138	4	142
Disenrolled in Disease Management		49	1	50
Current Enrollment in Disease Management		89	3	92
Initial Insurance Status	**6,318**	**534**	**537**	**7,389**
No Insurance	3,867	368	384	4,619
Already Has Kid Care	110	3	1	114
Already Has Medicaid	898	44	79	1,021
Already Has Medicare	69	10	10	89
Already Has Primary Care Card	226	74	28	328
Other Insured	938	30	26	994
Unknown	210	5	9	224
Current Status for "No Insurance"	**3,867**	**368**	**384**	**4,619**
Non-Filed Potential Medicaid	713	28	37	778
Medicaid Pending	3	3	7	13
Medicaid Approved	274	19	58	351
Medicaid Denied	74	29	37	140
Non-Filed PCC	1,207	70	64	1,341
Primary Care Card Pending	22	4	4	30
Primary Care Card Approved	643	152	166	961
Primary Care Card Denied	6	6	3	15
Other Status	925	57	8	990

Out of 4,619 individuals that were classified as having no insurance at the time of the initial encounter with the HITS Program (62.5%), a total of 351 clients were successfully enrolled in Medicaid and 961 were enrolled with a Primary Care Card that gave them access to MHS primary care centers. In other words, 1,312 clients (28.4% of those without insurance) were successfully enrolled in an insurance alternative.

Figure 1. HITS Clients by Initial Insurance Status, by Phase

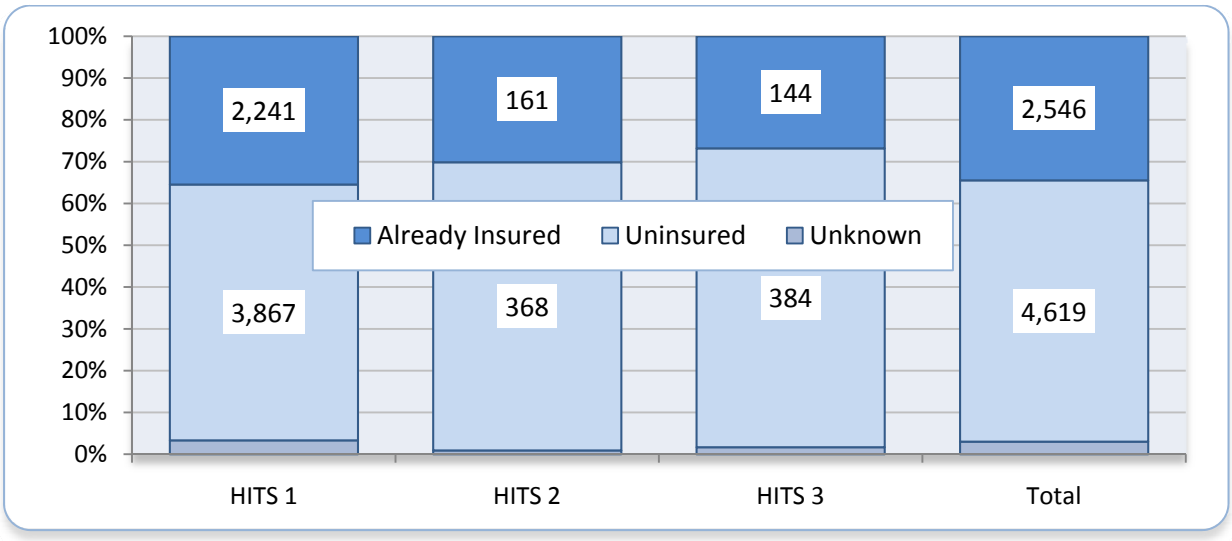
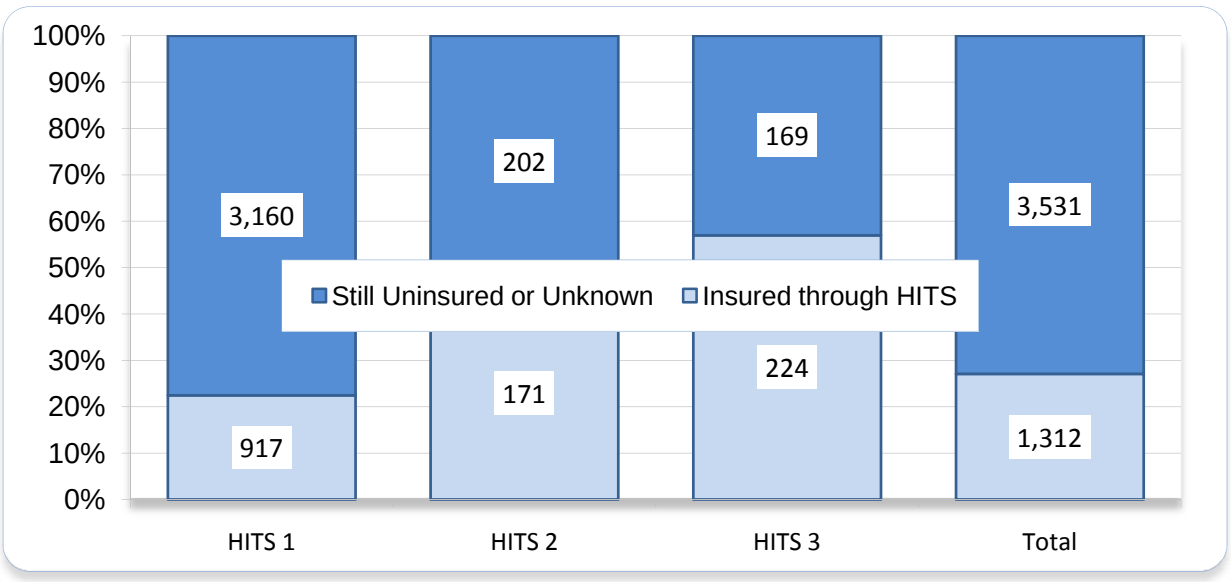


Figure 2. Initially Uninsured HITS Clients by Insurance Outcome, by Phase



Detailed summary tables for clients touched, services rendered and insurance enrollment outcomes, based on tabulations by the HITS program staff, can be seen in Table 4 (above).

Utilization and Net Cost Reports

HITS program staff has developed a comprehensive set of reports that tabulate utilization and net costs for the subset of HITS clients that have a Medical Record Number, which means they appear in the MHS billing system. The underlying assumption in these reports is that by comparing utilization and costs in the period prior to being touched by the HITS program with the period after being touched, they can show whether or not utilization, along with the corresponding costs, increased or decreased. The expectation is that client access to care will enable improvements in health status, reducing the use of emergency department and inpatient visits, and, over time, reducing the cost of care.

The reports establish a reference period for each Project in HITS 1 and annual reference periods for HITS 2 and HITS 3. In the case of HITS 1, each Project was conducted over approximately a 6-month period. The 12-month period starting with the Project begin date was defined to be the Active Year (baseline). The 12 months prior to the begin date for each Project were considered to be the Prior Year, and the 12 months starting one year after the begin date were considered to be the Post Year. Utilization data for all HITS 1 clients with a MedRec touched by each Project were aggregated for the Prior Year, the Active Year and the Post Year. For example, Table 5 shows the utilization of 5 categories of services for 404 clients in HITS 1, Project 1, during the Prior Year, the Active Year and the Post Year. Category totals are presented for emergency department visits, inpatient admissions, visits to primary care centers, visits for observation, and other services (including outpatient, urgent care and oncology).

Similar data have been tabulated for the total variable and fixed costs, total payments received and the net costs incurred by MHS, for each Project of HITS 1, and for each 12-month implementation period for HITS 2 and HITS 3.

Table 5. HITS 1 Project 1 Service Utilization Summary , Nov/05 to Oct/08

HITS 1 Project 1	Prior Year		Active Year		Post Year		3-Year Total
Active Period Nov/06 to Apr/07 Service Dates Nov/05 to Oct/08	01-Nov-05 to 30-Apr-06	01-May-06 to 31-Oct-06	01-Nov-06 to 30-Apr-07	01-May-07 to 31-Oct-07	01-Nov-07 to 30-Apr-08	01-May-08 to 31-Oct-08	
ER Visits	0	118	137	138	139	152	684
Admissions	5	22	34	36	30	38	165
PCC	7	168	375	272	240	227	1,289
Observation Patients	3	4	5	11	11	11	45
Outpatient / Home Health / UCC / Oncology / Other	0	107	160	219	203	193	882
Total	**15**	**419**	**711**	**676**	**623**	**621**	**3,065**

Source: MHS, HITS Program staff spreadsheets

At the time this evaluation was undertaken, these reports did not eliminate duplicate Medical Record Numbers (MedRec) for clients enrolled in more than one HITS program, which resulted in counting the outcomes multiple times for clients touched more than once.

It appears that all clients with a MedRec and utilization data were included in the tabulations, regardless of whether they had insurance at the time of the initial encounter or not, and regardless of whether or not they were approved for an insurance alternative. The preparation of the reports also required a tedious procedure to tabulate the raw data extracted from the MHS billing system and then map the results into the standard report format.

Another significant methodological issue for these reports is the use of a 12-month period as the baseline, starting with the begin date for each HITS 1 Project or each HITS 2 and HITS 3 implementation period, regardless of when the client actually gained access to insurance and services. For example, a client that was enrolled at the end of the specific HITS 1 Project period, and was approved for a Primary Care Card a month later, would have all care provided prior to the approval of the PCC, and for the first 5 months after getting enrolled, counted as part of the baseline period. A more rigorous criterion would be to use the date of approval of insurance as the dividing point between prior period and post period care and associated costs.

HITS Evaluation Database

The HITS Evaluation Database prepared for the current evaluation and delivered to the Florida Center for Medicaid and the Uninsured at the University of Florida for further analysis is composed of:

- four tables extracted from the HITS Database, which is maintained specifically for this program (tbl_HITS, tbl_Contacts, tbl_Demo, and tbl_INS);
- five tables for HITS clients enrolled in the Disease Management Program extracted from that program's database (tbl_DMDemographics, tbl_DMHbA1c, tbl_DMLipids, tbl_DMPrescriptions, and tbl_DMSF12); and
- two tables extracted from the mainframe billing system (tbl_HITSEncounters and tbl_HITSCharges).

A list of the individual tables included in the HITS Evaluation Database, together with a description of each data element (field), is included in Appendix F.

Process, Data and Reporting Issues

The lists below present detailed observations about the data collection process, the actual data delivered, and the reports developed with the data. These observations reiterate in greater detail some of the issues raised in the preceding sections, and form the basis of the recommendations that follow in the last section of this report.

Process Issues

- Eligibility staff makes contacts door-to-door in the target areas, or at fairs and expos, or clients come to the MediVan during its stops in the target area. Eligibility staff collects

initial data during these encounters, then transfers it to a Microsoft Word document (template). The Word documents for each HITS client are stored on a shared drive.

- HITS QA/QC staff prints the Word document for each client to facilitate review, which may unnecessarily expose confidential client information.

- HITS QA/QC staff transfers (re-enters) data to the HITS database, which creates opportunities for mistakes in the transfer of the data.

- Each new client receives a unique HITS Program identification (ParID). Clients that show up in more than one HITS Phase and/or Project receive a new ParID, which makes it easy to track the number of encounters in each Phase/Project, but leads to duplication in counts of unique individuals served. Currently, no effort is made to identify duplicates among those that have a Medical Record Number or among those that do not, although both exist.

- QA/QC staff uses the MHS mainframe database to research each new client, to verify demographic data and attach a Medical Record Number (MedRec) if one exists. It is not unusual to encounter contradictory data in the mainframe system (names spelled in different ways, different addresses, dates of birth, etc.), but the link is valuable because it often makes it possible to include missing data.

- Insurance status is tracked in a separate set of spreadsheets, where the current status of each client is kept on a separate monthly tab. This data is transferred to the HITS database (tbl_INS) periodically, but the functional status of the effort to complete an insurance approval during the process is available in the spreadsheets, not in the database. In other words, the insurance status in tbl_INS represents the final outcome, and the HITS database is not used to generate reports that could be used by management to monitor the status of clients that are still in the process of obtaining insurance.

- There have been only a small number of SF-12 Health Surveys completed, even among HITS clients in the Disease Management Program, and the small number of results that exist for other clients are not included in the HITS Evaluation Database. Health Surveys taken at the time HITS clients are first enrolled in an insurance program are necessary to establish a baseline. Surveys can then be repeated at subsequent intervals to determine the client's assessment of the benefits of being given a medical home.

Database Issues

- The initial delivery of the HITS Evaluation Database included four tables: tbl_HITS, tbl_Demo, tbl_Contacts and tbl_INS. Each of these tables was expected to have the same number of records. However, there were two discrepancies identified. First, tbl_Demo came with 7,391 records, one record less than tbl_HITS and tbl_Contacts. After review, the final version ended up with 7,383 clients in each of the three main tables.
- Second, tbl_INS (the insurance status table) has no record for 1,086 clients (671 from HITS 1/6, 268 from HITS 1/7, 74 from HITS 2 and 73 from HITS 3). Of these, 273 are classified

at the initial encounter as having no insurance (NONE). Another 3,248 of the 6,303 clients included in tbl_INS have records with no actual status information (all Yes/No fields were filled with No and all other fields are blank). Almost half of these (1,500) are classified as having no insurance at the first encounter. In other words, 1,773 (38%) of the clients with no insurance at the first encounter (4,614) also have no insurance status information.

- Within the insurance status table (tbl_INS) there are 110 records for clients that show that Medicaid was approved, but there is no approval date. There are 124 records for clients that show that a Primary Care Card was approved, but there is no approval date. The absence of an approval date means that there is not a precise beginning point for the time when the client became eligible for the benefits that the HITS program is designed to offer. Most of the missing insurance approval dates are for HITS1/1 and HITS1/2.

- The HITS Phase/Project identifiers in the initial delivery of the HITS Evaluation Database tables had some inconsistencies. The field HITS in tbl_HITS identifies the specific Phase of the intervention, and for Phase 1, the field Project identifies the specific Project. In the HITS Evaluation Database, the field Grant in tbl_Contacts identifies the HITS Phase. There were 11 client records in tbl_Contacts in the initial delivery that did not identify the Grant. However, tbl_HITS had the correct information identifying the Phase and Project for those same clients. At the same time, there were 5 records in tbl_HITS and tbl_Contacts that had inconsistent identifiers for the Phase and/or Project. Given that these fields are used in the selection of records for reports, it is important for the information to be consistent. HITS program staff corrected the missing data and inconsistencies in subsequent database deliveries, but these problems indicate that some problems were not being identified in the QA/QC process.

- There were 303 clients with Medical Record Numbers (MedRec) that appeared more than once in the initial delivery of the HITS Evaluation Database, with a total of 351 "excess" records for clients counted twice or more. Additional review, using first and last name, date of birth and address, revealed that there were another 101 additional duplicate records representing 50 clients that had no MedRec. Small variations in the spelling of names are common, and this increases the number of duplicates, as well as the difficulty in identifying them. Some differences in spelling are due to documentation with alternate spelling, making it difficult to resolve. In any case, clients who appear more than once in the tables lead to double counting of both clients served and households served since new household identifiers are assigned each time an individual is encountered.

- The conversion/consolidation of the HITS Database in January 2009 introduced some differences between the legacy records and the data for new clients that are reflected in heterogeneous content for many fields. It may be worthwhile to apply global rules to create consistent content for most fields across all records to facilitate queries, reports and future QA/QC. As examples:

    - Several of the demographic characteristics fields (Ethnicity, Race, Employ) may be blank or use the code 99 to indicate "unknown".
    - There are both text and numeric codes in the field for Ethnicity.

- There are unidentified codes in some fields ("6" for Race).
- There are missing data for some important fields (Gender, Date of Birth, Race, and Ethnicity).

- It will be easier to ensure the accuracy of the reports if an occasional effort is made to review the HITS Database for duplicates, and to QA/QC general consistency issues.

Reporting Issues

- The presence of multiple HITS entries for the same individuals leads to some problems in creating reports. Reports that tabulate data on the number of people served in each phase of the HITS program justifiably count repeat appearances by the same individuals in different phases/projects or even within the same phase/project, because this represents the outreach efforts of the program staff. However, utilization data for each phase of the HITS program, which is based on Medical Record Numbers, should not include these duplicate appearances, since it effectively "double-counts" the costs of those clients.

- Longitudinal reports compiled for each phase and project incorporate utilization data drawn from the MHS billing system. At the time of this evaluation, the raw data for each client was typically extracted and provided to the financial analyst on the HITS program staff by phase and project. It required complex tabulations in a spreadsheet environment to derive sub-totals of utilization, cost and payment data into the five categories, by sub-period of analysis (each 6-month period of each prior year, active year and post year). These tabulations were in the process of being incorporated into the routine that extracts the data from the billing system so that the tedious work carried out in spreadsheets would not be necessary. Considering the possible need to revise the way the periods of analysis are defined, it may be necessary to revise those extraction routines as well.

- Excel spreadsheets developed to compile the longitudinal data utilize external links that involve long file names, long tab names, and complex folder structures. In some cases, this generates lengthy paths that cause the size of the formula to exceed the space available in Excel. This makes it difficult to audit the formulas to ensure that they are correct. In addition, the wider use of array formulas could simplify the auditing and help to ensure their accuracy.

HITS Data Collection and Reporting Recommendations

The recommendations that follow highlight steps that could be taken to improve both the data collection process and the reliability and accuracy of the data used to report on the HITS program.

1) Develop an option for the initial data collected by field staff to be put into the HITS database directly, eliminating a significant intermediate step (first a Word document and then to an Access database). This would reduce possibilities for error while at the same time increasing data security.

2) In order to more effectively address the issue of duplicate entries for the same client, it would be helpful to introduce an additional field (EncSeqNo = Encounter Sequence Number) in tbl_HITS. This would make it possible to track the sequencing of encounters. In turn, a single ParID could be assigned to each individual by the HITS program, and used to track unique individuals, while allowing each encounter to be counted as part of the specific Phase and Project. The value of the ParID, in comparison to MedRec, is that for clients with no MedRec you could still eliminate duplicates. This step would require a global revamp in all of the client and household identifiers, as well as the reports, to eliminate duplication. It also would require a change to the data in the insurance status table (tbl_INS). In effect, the initial insurance status, along with insurance outcomes should be preserved for each HITS encounter (as is the case now), leading to a history of the efforts and outcomes associated with each client over time.

3) Carry out a one-time update of the insurance status table (tbl_INS) in the HITS database to ensure consistent data. In particular, an assessment should be made of the missing records and the records that have no substantive content. If there is no insurance status information for either those with no record and for those with records that are blank, they could be left out of the table. If insurance status information could be added, even for those seen in previous phases of the program, an alternative would be to include an additional field in the table to indicate that no insurance status information is available and include a record for every client in the HITS database.

4) Some insurance status records show applications filed and/or outcomes achieved for more than one type of insurance. This creates a conceptual problem for tabulating insurance outcomes in specific phases and projects of HITS. Since clients, over time, may apply for more than one type of insurance and/or apply for recertification, it may be more appropriate to track insurance status for each time that the client goes through the process, rather than trying to put the information for multiple events into a single record.

5) The spreadsheets currently used to collect insurance status data are cumbersome, and make it hard to keep the most current data available to support the creation of management reports. It would be best to migrate the posting of that data to the Access database.

6) It would be helpful to develop additional QA/AC routines to be used regularly by HITS program staff. Currently, all quality assurance is accomplished by reviewing the records for each client as a unit. It is helpful to periodically review the data in the database as a whole, to identify overall data weaknesses and inconsistencies.

   - Generate a list of clients who do not have a Medical Record Number (MedRec) by name, date of birth and address, to facilitate finding one on the MHS mainframe, if it exists.
   - Generate a list of duplicates – this will require two distinct approaches, one for those with a MedRec, and another for those without one, since the latter will require visual review of names, dates of birth and addresses.
   - A query should test the consistency of Grant (tbl_Contacts) and Phase/Project (tbl_HITS).

- Generate a list of clients with no information in important fields, such as gender, race, ethnicity and date of birth.
- Generate a list of insurance status information that will highlight unfinished business, such as applications pending or clients for whom missing documentation is required prior to submitting an application. This type of list could also bring attention to insurance approval dates that have been left out of the database.
- Create lists that can be used to periodically review spelling for names and addresses. Since scanned documents presented by clients with names will often include different spelling, it may be necessary to rank documents for the purpose of selecting the preferred spelling.

7) The spelling of municipal names currently presents a lot of variability. It would make sense to include a drop-down list for municipalities to reduce errors in the spelling of city names. If that is done, it would be good to review and correct the current municipal names in the database.

8) Until the change recommended above on the elimination of duplicate Medical Record Numbers is addressed, it is important to ensure that duplicate clients across HITS Phases/Projects are eliminated before utilization data is extracted from the billing system for any reports.

HITS Program Evaluation Results

- Evaluate the HITS programs and the data collected to determine the value added to the community and to the Memorial Healthcare System
- Prepare or Forecast an Impact Analysis of the HITS Programs
- Make recommendations to improve the quality of HITS services

Data for all HITS program interactions were obtained from MHS for the period from program inception through October 31, 2009. The resulting datasets included:

- Client information from HITS phases I, II, and III
- Health care billing data for HITS clients
- Selected health indicators for patients enrolled in a Disease Management program

As mentioned elsewhere in this report, the program data were not ideal for the purposes of conducting a program evaluation. Missing data was problematic, and, in the case of a missing MRN, it resulted in the loss of client data for most analyses. This is not unusual, however, since programs such as HITS are primarily concerned with reaching clients and conducting interventions with them, and data concerns are secondary to achieving those primary goals. Further, such programs often change in scope and methods throughout their course, and, thus, data problems are inherent to the evaluation of a living, breathing program.

Description of HITS Client Interactions

The master database contained information from 7,383 HITS interactions. It is important to understand that these 7,383 are not unique individuals, and it is known that some HITS clients were encountered more than once in the course of the three HITS phases. The reader must exercise caution in interpreting these data given the known duplication. However, since each interaction represents a separate outreach attempt, it is instructive to include summary information at this level to understand the total population encountered.

Gender

Among the 7,383 interactions, the gender breakdown shows that 55.6% of HITS interactions were with females and 44.4% were with males. This basic 55/45 split holds constant among all three HITS phases, regardless of the different targeting strategies used in the phases.

Table 6. Gender By HITS Phase

ETHNICITY	HITS 1		HITS 2		HITS 3		TOTAL	
	n	*%*	*n*	*%*	*n*	*%*	*n*	*%*
FEMALE	3462	56.1%	272	50.9%	292	54.8%	4026	55.6%
MALE	2707	43.9%	262	49.1%	241	45.2%	3210	44.4%
TOTAL	6169	100.0%	534	100%	533	100.0%	7236*	100.0%

* Missing values for 147 interactions

Age

In terms of age, the HITS program interactions included individuals from every age group, including children, adults, and seniors. Overall, more than one-third (33.5%) of HITS interactions (n=2,472) were with children aged 0-17 years, while 35.7% were with younger adults aged 18-44 years old (n=2,634) and just under one-quarter (22.4%, n=1,656) were with older adults aged 45-64. The remainder of interactions were with seniors aged 65 or older (4.3%, n=320), or with individuals whose age was not recorded in the database.

The HITS Phase I program included a larger percentage of children compared with the other HITS phases, with 36.0% of all interactions being with clients aged 0-17 years, compared with 12.1% children in Phase II and 24.6% in Phase III. Concomitantly, HITS Phase I included a smaller percentage of older adults, with 19.6% of interactions aged 45-64, compared with 46.9% in Phase II and 31.5% in HITS Phase III.

Table 7. Age Category by HITS Phase

AGE GROUP	HITS 1		HITS 2		HITS 3		TOTAL	
	n	*%*	*N*	*%*	*n*	*%*	*n*	*%*
0 – 17	2275	36.0%	65	12.1%	132	24.6%	2472	33.5%
18-44	2270	36.0%	174	32.5%	190	35.4%	2634	35.7%
45 – 64	1236	19.6%	251	46.9%	169	31.5%	1656	22.4%
65 OR OVER	249	3.9%	42	7.9%	29	5.4%	320	4.3%
UNKNOWN	281	4.5%	3	0.6%	17	3.1%	301	4.1%
TOTAL	6311	100.0%	535	100.0%	537	100.0%	7383	100.0%

Race

For more than half (57.5%) of HITS contacts, information was not collected on the client's race. When broken down by HITS phases, it is, perhaps, not surprising to see that most of these interactions (92.0%) were in HITS Phase I, when the program involved door-to-door outreach or health fairs in targeted low-income areas. HITS staffers did not know ahead of time whom they would be contacting, and all information had to be collected from the client during the interaction. In such a situation, it is understandable that data collection for internal use would be less important than ensuring that clients complete appropriate applications for Medicaid and other health programs. For HITS Phase II and Phase III, however, the HITS staff targeted specific individuals based on MHS data, and, thus, some information may have existed in the administrative databases already regarding the patient's race. The rate of unknown race drops to 32% in both HITS Phase II and III.

Among those interactions for which race were recorded, most clients were African-Americans. Nearly 31% of total interactions were coded as African-American, and this represents 72.5% of interactions when the missing data are excluded. Roughly 11% of total interactions were with clients whose race was reported as White, which represents just over one-quarter (26.7%) of interactions when missing data are excluded. The remaining few (less than 1%) were among Asians or people of other races.

Table 8. Race Designation by HITS Phase								
RACE DESIGNATION	HITS 1		HITS 2		HITS 3		TOTAL	
	n	*%*	*n*	*%*	*n*	*%*	*n*	*%*
WHITE	462	7.3%	188	35.1%	187	34.8%	837	11.3%
AFRICAN AMERICAN	1922	30.5%	174	32.5%	178	33.2%	2274	30.8%
OTHER	20	0.3%	4	0.8%	0	0.0%	24	0.3%
UNKNOWN	3907	61.9%	169	31.6%	172	32.0%	4248	57.6%
TOTAL	6311	100.0%	535	100.0%	537	100.0%	7383	100.0%

Ethnicity

Ethnicity information was not recorded for 41.2% of HITS interactions, and, again, the majority of the missing data (97.3%) is from HITS Phase I, in which neighborhoods or health fairs were targeted, rather than individuals as in HITS Phase II and III. Overall, one-third of interactions were with people who were of Hispanic ethnicity, which represents 56.7% among those whose ethnicity was recorded in the database.

Table 9. Ethnicity by HITS Phase								
ETHNICITY	HITS 1		HITS 2		HITS 3		TOTAL	
	N	*%*	*n*	*%*	*n*	*%*	*n*	*%*
HISPANIC	2038	32.3%	172	32.2%	251	46.7%	2461	33.3%
NON-HISPANIC	1312	20.8%	319	59.6%	248	46.2%	1879	25.5%
UNKNOWN	2961	46.9%	44	8.2%	38	7.1%	3043	41.2%
TOTAL	6311	100.0%	535	100.0%	537	100.0%	7383	100.0%

Initial Insurance Status

At the time of the HITS interaction, 62.5% of clients had no health insurance, while 13.8% had Medicaid, 1.5% had KidCare, 1.2% had Medicare, 4.4% had PCC, and 13.4% had some other form of insurance. For 3.0%, it was unknown whether the client had health insurance or not. As one might expect, the HITS phases II and III had interactions with a larger percentage of uninsured than HITS Phase I, since HITS II and III specifically targeted individuals thought to be uninsured.

Table 10. Initial Insurance Status by HITS Phase								
INSURANCE TYPE	HITS 1		HITS 2		HITS 3		TOTAL	
	N	*%*	*n*	*%*	*n*	*%*	*n*	*%*
KIDCARE	110	1.7%	3	0.6%	1	0.2%	114	1.5%
MEDICAID	898	14.2%	45	8.4%	79	14.7%	1022	13.8%
MEDICARE	68	1.1%	10	1.9%	10	1.9%	88	1.2%
NONE	3861	61.2%	368	68.8%	385	71.7%	4614	62.5%
OTHER	938	14.9%	29	5.4%	26	4.8%	993	13.5%
PCC	226	3.6%	75	14.0%	27	5.0%	328	4.5%
UNKNOWN	210	3.3%	5	0.9%	9	1.7%	224	3.0%
TOTAL	6311	100.0%	535	100.0%	537	100.0%	7383	100.0%

Program Achievements

The impact evaluation activities have focused on describing the degree to which the program has met three of its stated goals:

1. Enrolling eligible clients in public insurance programs (Medicaid, KidCare, PCC)
2. Lowering cost and/or utilization among the HITS clients
3. Improving the health of HITS clients as measured by specific health indicators

The following pages examine each of these issues in turn.

Enrollment in Public Insurance Programs

In order to measure the HITS program's progress toward its goal of enrolling clients in public insurance programs, data from the MHS were analyzed in order to determine the number of clients who became enrolled in Medicaid, KidCare, or PCC subsequent to a HITS interaction. It was necessary to limit the analysis to those who had a medical record number in the system, since the MRN is the only unique identifier in the database. Further, only those clients who indicated they did not have insurance at the time of the HITS interaction were included in the analysis. The number of clients meeting these criteria was 4,614. It is likely that there are some clients represented more than once in this number.

Table 11. Applications to Health Insurance Programs by HITS Phase

		HITS 1 (N=3861)	HITS 2 (N=368)	HITS 3 (N=385)	TOTAL (N=4614)
ALL	Applied to Any Program*	992	185	222	1399
	Enrolled in Any Program*	788	155	200	1143
MEDICAID	Approved	238	18	55	311
	Applied/Pending	286	47	94	427
	Denied	65	26	34	125
	Non-Filed Medicaid	73	0	1	74
	Total	**381**	**48**	**94**	**523**
KIDCARE	Approved	0	4	0	4
	Applied/Pending	4	4	0	8
	Denied	0	0	0	0
	Total	**4**	**8**	**0**	**12**
PCC	Approved	599	144	162	905
	Applied/Pending	621	157	171	949
	Denied	3	2	3	8
	Non-Filed PCC	113	11	5	129
	Total	**736**	**160**	**176**	**1072**

** Clients could apply for and become enrolled in more than one program. For those who applied for more than one program, they could be accepted to both, neither, or denied for one but accepted for another.*

Results show that, among the 4,614 clients, 1,399 applied to Medicaid, KidCare, and/or PCC. This is an overall application rate of 30.3%. HITS Phase I resulted in 992 clients applying for one or more of the three programs, an application rate of 25.7%. HITS Phase II resulted in 185 applications, for a rate of 50.3%, and HITS III resulted in 222 applications for a rate of 57.7%.

A total of 1143 client encounters became enrolled in one or more of the three public insurance options subsequent to their HITS interaction. Overall, 81.7% of those who applied for one or more of the programs became enrolled in at least one of the programs.

Reducing Cost and Utilization

In order to determine whether the HITS goal of reducing cost and utilization was met, several analyses were conducting comparing cost and utilization prior to the HITS interaction with cost and utilization after the HITS interaction. The analysis was conducted for HITS clients in general, as well as for a number of sub-populations.

- **HITS Enrollees Overall**
  1. All HITS clients meeting the inclusion criteria
  2. HITS clients enrolled in specific insurance programs

- **HITS Disease Management Enrollees**
  1. All Disease Management enrollees
  2. Cardiac Disease Management enrollees
  3. Diabetes Disease Management enrollees

The divider between the pre and post period was the HITS interaction that was associated with an indicator that the client became enrolled in an insurance program. This was not the ideal approach, as the use of an insurance approval date would have been more rigorous, but was not possible given the number of clients for whom this data was not recorded.
In the following tables in this section, we examine different subsets of the HITS population and provide means and differences for the pre and post-HITS periods for the following measures:

Emergency Department
- Number of visits per year
- Costs (annualized)
- Payments collected (annualized)
- Revenue (cost minus payments, annualized)

Inpatient
- Number of admissions per year
- Total days of stay (annualized)
- Average length of stay (annualized)
- Costs (annualized)
- Payments collected (annualized)
- Revenue (cost minus payments, annualized)

Total

- Costs (annualized)
- Payments collected (annualized)
- Revenue (cost minus payments, annualized)

HITS Overall

The first analysis was intended to examine cost savings for HITS clients, defined broadly. The following criteria were used to determine inclusion into this analysis:

1. Must have a medical record number. This is necessary in order to link HITS client information with MHS encounter and claims data.

2. Must have at least 3 months of encounter data prior to their HITS interaction and at least 3 months of encounter data post HITS interaction. This is necessary in order to establish a pattern of pre-HITS utilization/cost and post-HITS utilization/cost so that the two could be compared. The utilization/cost was converted to monthly average and subsequently annualized by multiplying 12. This ensures each individual had the same length of pre- and post- period for comparison.

3. Only the first HITS interaction was selected if the individual had more than one HITS interaction. The samples were selected regardless of their HITS phase, initial insurance status, and follow-up insurance status.

Table 12. Pre-HITS/post-HITS Comparisons, All Enrollees *(Annualized)*

		Pre-HITS		Post-HITS		Difference	*p-value*
		Total	Mean	Total	Mean		
Emergency Department	Visits per year	1,820.76	1.52	2,471.88	2.06	0.54	<.001
	Costs	$661,101.24	$551.38	$888,678.81	$741.18	$189.80	<.001
	Payments collected	$308,208.74	$257.05	$397,688.07	$331.68	$74.63	0.008
	Revenue*	$352,892.49	$294.32	$490,990.74	$409.50	$115.20	0.002
Inpatient	Admissions per year	874.98	0.73	676.18	0.56	-0.17	<0.001
	Total inpatient days	4,956.31	4.13	3,685.37	3.07	-1.06	0.002
	Average length of stay	2,471.23	2.06	1,694.08	1.41	-0.65	0.003
	Costs	$7,894,290.07	$6,584.06	$6,259,383.60	$5,220.50	-$1,363.56	0.032
	Payments collected	$2,603,978.10	$2,171.79	$2,732,241.99	$2,278.77	$106.98	0.836
	Revenue*	$5,290,311.97	$4,412.27	$3,527,141.61	$2,941.74	-$1,470.53	0.005
Total	Costs	$11,024,634.15	$9,194.86	$11,289,768.61	$9,415.99	$221.13	0.749
	Payments collected	$3,595,288.49	$2,998.57	$3,992,349.14	$3,329.73	$331.16	0.537
	Revenue*	$7,429,345.66	$6,196.28	$7,297,419.47	$6,086.25	-$110.03	0.849

**Revenue = post revenue – pre revenue = (post cost – pre cost) + (pre pay – post pay)*

Once all selection criteria were applied, there were 1,199 patients available for analysis. The pre-HITS period and post-HITS period were compared, as shown in the following table:

Significant differences were found in many measures of ED utilization/cost and inpatient utilization/cost, though no significant differences were found in total costs.

Emergency department visits actually increased by 0.54 visits per person per year in the post HITS period compared with the pre HITS period, and, concomitantly, ED costs also went up from a mean of $551.38 per person per year to $741.18 per person per year, an increase of $189.80. ED payments increased by $74.63 as well. However, ED Revenue decreased by $115.20 since the increase of cost outpaced the increase of payment in the post period compared with the pre period.

Inpatient admissions per person per year were slightly reduced in the post period, from a mean of 0.73 admissions per person per year in the pre period to 0.56 admissions per person per year in the post period. Total inpatient days was reduced by more than a day per person per year (1.06 days), and average length of stay was reduced by .65 days per admission per person per year. Given these findings, it is not surprising that costs were significantly reduced; the difference between the pre and post periods was $1363.56 per person per year. Payments collected did not change significantly, but since costs were reduced, revenue was also increased by $1,470.53 per person per year.

Total costs were not significantly different between the pre- and post-HITS periods.

A subsequent analysis examined a subset of the HITS clients from the above analysis, and focused only on those who had no insurance at their initial HITS encounter but were subsequently insured. The inclusion criteria included:

1. Had a medical record number. This is necessary in order to link HITS client information with MHS encounter and claims data.
2. Had at least 3 months of encounter data prior to their HITS interaction and at least 3 months of encounter data post HITS interaction. This is necessary in order to establish a pattern of pre-HITS utilization/cost and post-HITS utilization/cost so that the two could be compared. The utilization/cost was converted to monthly average and subsequently annualized by multiplying 12. This ensures each individual had the same length of pre- and post- period for comparison.
3. Had no insurance at their initial HITS interaction but subsequently were insured. For individuals with multiple HITS enrollment, only the first enrollment followed by a successful insurance approval would be selected as the sample for analysis. Any change in cost or utilization would be seen following the client's getting insurance.

Once all selection criteria were applied, there were 297 patients available for analysis. The pre-HITS period and post-HITS period were compared, as shown in the following table.

Table 13. Pre-HITS/post-HITS Comparisons for those Uninsured Pre-HITS and Insured Post-HITS *(Annualized)*					
		Pre-HITS Mean	**Post-HITS Mean**	**Difference**	***p-value***
Emergency Department	Visits per year	1.50	2.11	0.61	0.002
	Costs	$612.26	$815.24	$202.98	0.015
	Payments collected	$189.55	$186.84	-$2.71	0.953
	Revenue*	$422.72	$628.40	$205.68	0.013
Inpatient	Admissions per year	0.87	0.75	-0.12	0.226
	Total inpatient days	4.36	4.61	0.25	0.736
	Avg. length of stay	1.65	1.61	-0.04	0.881
	Costs	$7,437.19	$6,685.76	-$751.43	0.641
	Payments collected	$1,520.80	$1,823.45	$302.65	0.688
	Revenue*	$5,916.39	$4,862.31	-$1,054.08	0.486
Total	Costs	$10,126.54	$12,221.77	$2,095.23	0.217
	Payments collected	$2,195.57	$2,526.74	$331.17	0.702
	Revenue*	$7,930.97	$9,695.03	$1,764.06	0.264

**Revenue = post revenue – pre revenue = (post cost – pre cost) + (pre pay – post pay)*

Overall, when compared with the pre-HITS period, the post-HITS period did not differ significantly on most of the measures examined.

When examining Emergency Department visits and costs, only three measures showed statistically significant differences between the groups. First, there was a slight increase (0.61 visits per person) in the annual rate of ER visits in the post period relative to the pre period (p=.002). As would be expected given the increase in visits, there was also slight increase in annualized ER costs ($202.98) in the post period (p=.015) as well as corresponding decrease in revenue ($205.68) in the post period (p=.013). There was no statistically significant difference in annualized ER payments collected.

There were no differences in any of the inpatient measures examined. The pre-HITS and post-HITS periods did not differ in the rate of inpatient admissions, average length of stay, total inpatients days, inpatient cost, inpatient payment, or inpatient revenue.

There were no differences in any of the total cost measures examined. Total annualized cost for the post HITS period did not differ significantly compared with the pre HITS period, nor did the total payments or revenue.

HITS Clients Enrolled Into Memorial Primary Care Center Program

Further analyses were conducted to break out the HITS clients by the type of insurance they obtained. Of the 297 clients in the overall analysis, 235 were enrolled in the PCC program only (and not in any other program). The same measures used to evaluate all of the enrollees were included in this analysis.

Table 14. Pre-HITS/post-HITS Comparisons, PCC Enrollees *(Annualized)*					
		Pre-HITS Mean	**Post-HITS Mean**	**Difference**	***p-value***
Emergency Department	Visits per year	1.50	2.12	0.62	0.009
	Costs	$604.27	$839.36	$235.09	0.017
	Payments collected	$136.13	$107.61	-$28.53	0.465
	Revenue*	$468.13	$731.75	$263.62	0.007
Inpatient	Admissions per year	0.93	0.81	-0.13	0.247
	Total inpatient days	4.57	4.91	0.35	0.672
	Avg. length of stay	1.76	1.62	-0.13	0.622
	Costs	$7,837.60	$7,129.39	-$708.21	0.696
	Payments collected	$1,579.98	$1,385.75	-$194.23	0.815
	Revenue*	$6,257.63	$5,743.63	-$514.00	0.771
Total	Costs	$10,700.48	$12,966.54	$2,266.06	0.228
	Payments collected	$2,155.85	$1,919.52	-$236.33	0.801
	Revenue*	$8,544.63	$11,047.02	$2,502.39	0.176

**Revenue = post revenue – pre revenue = (post cost – pre cost) + (pre pay – post pay)*

Again, most analyses showed no difference between the pre- and the post-HITS groups. There was a slight increase (0.62 visits per person) in the annual rate of emergency department visits during the post period as compared with the pre period (p=.009). This mirrors the increase of 0.61 visits among the entire population of HITS clients. There was also a significant increase of $235.09 in the annualized ER costs per person (p=.017) and a significant decrease of $263.62 in the annualized ER revenue (p=.007) during the post period as compared with the pre period. However, there was no significant difference in the total annualized ER payments received.

There were no differences in any of the inpatient measures examined, including inpatient admissions, inpatient days, average length of stay, costs, payment, or revenue. Similarly, there were no differences found in any of the overall fiscal categories examined, which include total annualized cost, total payments collected, and total revenue.

HITS Clients Enrolled Into Medicaid

Those HITS clients who enrolled in Medicaid subsequent to their HITS enrollment (n=41) were examined separately. Again, most analyses showed no difference between the pre and the post group. There was a slight increase (0.85 visits per person) in the annual rate of Emergency Department visits during the post period as compared with the pre period (p=.011). There was also a significant increase of $245.81 in the annualized ER costs (p=.028) and a significant decrease in the annualized ER revenue (p=.031) during the post period as compared with the pre period. However, there was no significant difference in the total annualized ER payments received. There were no differences in any of the inpatient measures examined, including inpatient admissions, inpatient days, average length of stay, costs, payment, or revenue.

Similarly, there were no differences found in any of the overall fiscal categories examined, which include total annualized cost, total payments collected, and total revenue.

Table 15. Pre-HITS/post-HITS Comparisons, Medicaid Enrollees *(Annualized)*

		Pre-HITS Mean	Post-HITS Mean	Difference	*p-value*
Emergency Department	Visits per year	1.32	2.17	0.85	0.011
	Costs	$400.27	$646.08	$245.81	0.028
	Payments collected	$475.08	$488.77	$13.69	0.904
	Revenue*	-$74.81	$157.31	$232.12	0.031
Inpatient	Admissions per year	0.31	0.23	-0.08	0.503
	Total inpatient days	1.24	0.99	-0.25	0.606
	Avg. length of stay	0.83	0.81	-0.02	0.962
	Costs	$1,179.42	$1,141.81	-$37.61	0.948
	Payments collected	$845.36	$1,174.21	$328.85	0.579
	Revenue*	$334.06	-$32.41	-$366.47	0.224
Total	Costs	$2,620.66	$2,598.83	-$21.83	0.976
	Payments collected	$2,103.39	$2,060.65	-$42.74	0.952
	Revenue*	$517.27	$538.18	$20.91	0.947

**Revenue = post revenue – pre revenue = (post cost – pre cost) + (pre pay – post pay)*

HITS Clients in Both PCC and Medicaid

An analysis of clients who enrolled in both PCC and Medicaid (n=21) revealed no significant different in any of the 13 measures examined. It is important to remember, however, that the small number of clients in this group limits the ability to detect any difference that might exist.

Table 16. Pre-HITS/post-HITS Comparisons, Dual, PCC and Medicaid Enrollees *(Annualized)*

		Pre-HITS Mean	Post-HITS Mean	Difference	*p-value*
Emergency Department	Visits per year	1.9	1.9	0.0	0.999
	Costs	$1,115.62	$875.56	-$240.10	0.502
	Payments collected	$229.79	$484.02	$254.20	0.565
	Revenue*	-$1,704.41	-$9,356.26	-$7,651.90	0.216
Inpatient	Admissions per year	1.2	1.1	-0.1	0.894
	Total inpatient days	8.2	8.4	0.2	0.973
	Avg. length of stay	2.1	3.1	1.0	0.571
	Costs	$15,173.98	$12,545.22	-$2,628.80	0.804
	Payments collected	$2,177.32	$7,988.99	$5,811.70	0.264
	Revenue*	$12,353.96	$2,313.39	-$10,040.60	0.283
Total	Costs	$18,358.22	$22,675.03	$4,316.80	0.715
	Payments collected	$2,820.03	$10,231.83	$7,411.80	0.238
	Revenue*	$15,538.19	$12,443.20	-$3,095.00	0.723

**Revenue = post revenue – pre revenue = (post cost – pre cost) + (pre pay – post pay)*

Impact of HITS Phase I

As described earlier in this report, the HITS phases differed in the way that potential clients were targeted. Phase I targeted patients residing in specific neighborhoods found to have high per capita uncompensated hospital care. As such, cost savings for Phase I are examined separately from HITS overall because it is not known whether Phase I actually reached the appropriate individuals in the targeted neighborhoods.

Inclusion criteria for this analysis were as follows:

1. Had a medical record number. This is necessary in order to link HITS client information with MHS encounter and claims data.

2. Had at least 3 months of encounter data prior to their HITS Phase I interaction and at least 3 months of encounter data post HITS Phase I interaction. This is necessary in order to establish a pattern of pre-HITS utilization/cost and post-HITS utilization/cost so that the two could be compared. The utilization/cost was converted to monthly average and subsequently annualized by multiplying 12. This ensures each individual had the same length of pre- and post- period for comparison.

3. Were touched by HITS Phase I as their first HITS encounter, regardless of whether or not they were touched by HITS Phase II or III, or their initial and follow-up insurance status.

There were 879 enrollees who met the inclusion criteria for this analysis.

Results show that ED utilization and cost were significantly different post HITS compared with pre HITS. ED visits went up by 0.38 visits per person per year from a mean of 1.41 visits per person per year in the pre HITS period to a mean of 1.80 visits per person per year in the post HITS period. Consistent with this finding, ED costs also increased, from a mean of $490.56 annually to $613.72 annually. Neither payments collected nor revenue were significantly different pre and post HITS.

Inpatient admissions were down by 0.13 admissions per person per year in the post HITS period, and total inpatient days were also down by 0.57 days. Average length of stay was decreased by 0.35 days per admission per person per year. Costs did not differ significantly in the pre and post periods, and neither did payments collected. However, revenue increased by $407.25 per person annually.

There were no significant differences in total costs, payments collected, or revenue.

Table 17. Pre-HITS/post-HITS Comparisons, Phase I Only							
		Pre-HITS		Post-HITS		Difference	*p-value*
		Total	Mean	Total	Mean		
Emergency Department	Visits per year	1,243.68	1.41	1,577.95	1.80	0.38	<0.001
	Costs	$431,204.33	$490.56	$539,460.83	$613.72	$123.16	<0.001
	Payments collected	$243,857.92	$277.43	$296,477.69	$337.29	$59.86	0.078
	Revenue*	$187,346.42	$213.14	$242,983.15	$276.43	$63.30	0.094
Inpatient	Admissions per year	338.97	0.39	226.42	0.26	-0.13	<0.001
	Total inpatient days	1,538.00	1.75	1,040.06	1.18	-0.57	0.002
	Avg. length of stay	1,037.06	1.18	731.78	0.83	-0.35	0.003
	Costs	$1,993,907.73	$2,268.38	$1,667,833.14	$1,897.42	-$370.96	0.293
	Payments collected	$1,233,249.82	$1,403.01	$1,265,143.16	$1,439.30	$36.28	0.926
	Revenue*	$760,657.91	$865.37	$402,689.98	$458.12	-$407.25	0.054
Total	Costs	$3,533,200.93	$4,019.57	$3,860,178.76	$4,391.56	$372.00	0.333
	Payments collected	$1,897,239.74	$2,158.41	$2,039,212.76	$2,319.92	$161.51	0.692
	Revenue*	$1,635,961.19	$1,861.16	$1,820,966.01	$2,071.63	$210.47	0.425

**Revenue = post revenue – pre revenue = (post cost – pre cost) + (pre pay – post pay)*

HITS Phase I Clients by Insurance Status pre- and post-HITS Interaction

Further analyses were conducted to examine the impact of Phase I intervention according to the client's insurance status pre and post HITS. For the simplicity of comparison, only individuals with only one HITS interaction (Phase I) were included in the analysis. The 879 clients included in the overall Phase I analysis (above) were reduced to 811and broken into the following categories:

- Uninsured pre-HITS, Uninsured post-HITS: n=252
- Uninsured pre-HITS, Insured post-HITS: n=128
- Insured pre-HITS (not followed afterward): n=431

The same analyses of pre-HITS and post-HITS utilization and cost were conducted, including ER, inpatient, and total cost and utilization.

HITS Phase I Clients who were Uninsured Pre-HITS and Uninsured Post-HITS

The first sub-analysis looks at the pre-HITS and post-HITS cost and utilization for those phase I enrollees who were uninsured prior to their HITS interaction, and remained uninsured post-HITS. Inclusion criteria for this analysis were as follows:

1. Had a medical record number. This is necessary in order to link HITS client information with MHS encounter and claims data.

2. Had at least 3 months of encounter data prior to their HITS phase I interaction and at least 3 months of encounter data post HITS phase I interaction. This is necessary in order to establish a pattern of pre-HITS utilization/cost and post-HITS utilization/cost so that the two could be compared. The utilization/cost was converted to monthly average and subsequently annualized by multiplying 12. This ensures each individual had the same length of pre- and post- period for comparison.
3. Were touched by HITS phase I as their first and only HITS encounter.
4. Uninsured or insurance status unknown at the time of the HITS phase I interaction, and no insurance coverage reported post-HITS.

There were 252 clients who met these criteria.

Results indicate that ER visits increased by 0.52 visits from the pre-HITS period to the post-HITS period, though ER costs did not change significantly. ER payments received and revenue were also unchanged from the pre-HITS period to the post-HITS period.

Inpatient admissions were down by 0.14 admissions per person per year in the post HITS period. All other inpatient measures, including total inpatient days, average length of stay, costs, payments, and revenue were unchanged between the pre-HITS period and the post-HITS period.

Total costs, total payments collected, and total revenue were unchanged in the pre-HITS period to the post-HITS period.

Table 18. Pre-HITS/post-HITS Comparisons, Phase I: Uninsured pre-HITS, Uninsured post-HITS

		Pre-HITS Mean	Post-HITS Mean	Difference	*p-value*
Emergency Department	Visits per year	1.44	1.96	0.52	0.001
	Costs	$521.74	$643.33	$121.59	0.121
	Payments collected	$178.43	$220.51	$42.09	0.251
	Revenue*	$343.31	$422.81	$79.50	0.299
Inpatient	Admissions per year	0.38	0.24	-0.14	0.013
	Total inpatient days	1.69	1.11	-0.58	0.085
	Avg. length of stay	1.28	0.90	-0.38	0.141
	Costs	$1,588.77	$1,695.84	$107.07	0.818
	Payments collected	$805.53	$918.22	$112.69	0.824
	Revenue*	$783.24	$777.62	-$5.62	0.987
Total	Costs	$2,970.81	$3,759.55	$788.74	0.127
	Payments collected	$1,183.70	$1,461.72	$278.02	0.625
	Revenue*	$1,787.12	$2,297.83	$510.71	0.243

**Revenue = post revenue – pre revenue = (post cost – pre cost) + (pre pay – post pay)*

HITS Phase I Clients who were Uninsured Pre-HITS and Became Insured Post-HITS

The next sub-analysis looks at the pre-HITS and post-HITS cost and utilization for those Phase I enrollees who were uninsured prior to their HITS interaction, but became insured post-HITS. Inclusion criteria for this analysis were as follows:

1. Had a medical record number. This is necessary in order to link HITS client information with MHS encounter and claims data.
2. Had at least 3 months of encounter data prior to their HITS Phase I interaction and at least 3 months of encounter data post HITS Phase I interaction. This is necessary in order to establish a pattern of pre-HITS utilization/cost and post-HITS utilization/cost so that the two could be compared. The utilization/cost was converted to monthly average and subsequently annualized by multiplying 12. This ensures each individual had the same length of pre- and post- period for comparison.
3. Were touched by HITS Phase I as their first and only HITS encounter.
4. Uninsured or insurance status unknown at the time of the HITS Phase I interaction, and subsequently became insured post-HITS.

There were 128 clients who met these inclusion criteria.

Results show that the number of ER visits was unchanged in the post-HITS period compared with the pre-HITS period. Likewise, costs were unchanged from pre- to post-HITS, and payments collected were unchanged. However, ER revenue decreased by $188.77 annually.

None of the inpatients cost or utilization figures were changed in the pre-HITS to post-HITS periods. Admissions per person per year, total inpatient days, average length of stay, total costs, payments collected, and revenue were all unchanged.

Total costs were also unchanged, though payments collected decreased by an average of $902.14 per person annually. Thus, revenue decreased by an average of $1707.65 per person annually.

Table 19. Pre-HITS/post-HITS Comparisons, Phase I: Uninsured pre-HITS, Insured post-HITS					
		Pre-HITS Mean	Post-HITS Mean	Difference	*p-value*
Emergency Department	Visits per year	1.23	1.54	0.31	0.117
	Costs	$463.81	$556.45	$92.64	0.295
	Payments collected	$199.49	$103.36	-$96.13	0.071
	Revenue*	$264.33	$453.10	$188.77	0.040
Inpatient	Admissions per year	0.28	0.18	-0.11	0.090
	Total inpatient days	1.37	0.87	-0.51	0.217
	Avg. length of stay	0.82	0.71	-0.11	0.657
	Costs	$1,936.06	$1,201.96	-$734.10	0.172
	Payments collected	$822.79	$275.09	-$547.70	0.127
	Revenue*	$1,113.27	$926.87	-$186.40	0.611
Total	Costs	$3,629.10	$4,434.60	$805.50	0.254
	Payments collected	$1,434.57	$532.43	-$902.14	0.018
	Revenue*	$2,194.52	$3,902.17	$1,707.65	0.006

**Revenue = post revenue – pre revenue = (post cost – pre cost) + (pre pay – post pay)*

HITS Phase I Clients who were Insured prior to HITS

The final sub-analysis looks at the pre-HITS and post-HITS cost and utilization for those Phase I enrollees who were insured at the time of their HITS Phase I interaction. Inclusion criteria for this analysis were as follows:

1. Had a medical record number. This is necessary in order to link HITS client information with MHS encounter and claims data.
2. Had at least 3 months of encounter data prior to their HITS Phase I interaction and at least 3 months of encounter data post HITS Phase I interaction. This is necessary in order to establish a pattern of pre-HITS utilization/cost and post-HITS utilization/cost so that the two could be compared. The utilization/cost was converted to monthly average and subsequently annualized by multiplying 12. This ensures each individual had the same length of pre- and post- period for comparison.
3. Were touched by HITS Phase I as their first and only HITS encounter.
4. Were enrolled in health insurance at the time of the HITS Phase I interaction.

There were 431 clients who met these inclusion criteria.

Results show that ER visits increased by an average of 0.33 visits per person annually for this group in the post-period compared with the pre-period. ER costs also increased from a pre-HITS average of $484.68 per person annually to a post-HITS average of $629.58 per person annually. Payments collected increased significantly with an increase of $130.97 on average. However, ER revenue did not change significantly in the post-HITS period compared with the pre-HITS period.

Inpatient admissions were decreased by an average of 0.12 visits per person per year in the post-HITS period, and total inpatient days also fell, from an average of 1.85 days pre-HITS to 1.30 days post-HITS. Average length of stay was reduced by an average of 0.36 days per admission per person per year post-HITS. However, Inpatient costs and payments collected were unchanged. Inpatient revenue was marginally increased by an average of $657.09 post-HITS.

None of the total costs or utilization measures were changed from the pre-HITS to the post-HITS period.

Table 20. Pre-HITS/post-HITS Comparisons, Phase I: Insured pre-HITS

		Pre-HITS Mean	Post-HITS Mean	Difference	*p-value*
Emergency Department	Visits per year	1.51	1.83	0.33	0.003
	Costs	$484.68	$629.58	$144.90	0.001
	Payments collected	$379.53	$510.50	$130.97	0.038
	Revenue*	$105.16	$119.08	$13.92	0.799
Inpatient	Admissions per year	0.41	0.30	-0.12	0.015
	Total inpatient days	1.85	1.30	-0.55	0.035
	Avg. length of stay	1.17	0.82	-0.36	0.016
	Costs	$2,770.92	$2,205.39	-$565.53	0.376
	Payments collected	$2,059.98	$2,151.53	$91.55	0.900
	Revenue*	$710.94	$53.85	-$657.09	0.058
Total	Costs	$4,698.56	$4,671.56	-$27.00	0.968
	Payments collected	$3,102.87	$3,391.81	$288.94	0.699
	Revenue*	$1,595.70	$1,279.75	-$315.95	0.443

**Revenue = post revenue – pre revenue = (post cost – pre cost) + (pre pay – post pay)*

HITS Clients Enrolled Into Memorial Disease Management Program

The next analysis examined HITS clients who were enrolled in a disease management program to see if their cost or utilization changed post HITS interaction. Clients were selected based on the following criteria:

1. Had a MRN. This is necessary in order to link HITS client information with MHS encounter and claims data.
2. Were enrolled in a disease management program.
3. Had at least 3 months of encounter data prior to their DM enrollment date and at least 3 months of encounter data post DM enrollment. Similarly the utilization/cost was annualized in an identical fashion to the previous analysis. This is necessary in order to

establish a pattern of pre-HITS utilization/cost and post-HITS utilization/cost so that the two could be compared.

Once all selection criteria were applied, there were 78 patients available for analysis. The pre-HITS period and post-HITS period were compared, as shown in the following table.

Table 21. Pre-DM/Post-DM Comparisons, Overall *(Annualized)*

		Pre-DM Mean	Post-DM Mean	Difference	*p-value*
Emergency Department	Visits per year	1.24	1.87	0.63	0.045
	Costs	$474.04	$787.62	$313.58	0.033
	Payments collected	$73.46	$142.11	$68.65	0.400
	Revenue*	$400.58	$645.52	$244.94	0.061
Inpatient	Admissions per year	2.10	1.26	-0.84	0.001
	Total inpatient days	10.92	7.05	-3.88	0.063
	Avg. length of stay	4.64	2.51	-2.12	0.010
	Costs	$20,990.88	$9,531.78	-$11,459.10	0.013
	Payments collected	$2,201.82	$1,327.00	-$874.82	0.322
	Revenue*	$18,789.05	$8,204.78	-$10,584.27	0.017
Total	Costs	$25,588.73	$19,693.56	-$5,895.17	0.239
	Payments collected	$2,516.47	$1,992.01	-$524.46	0.577
	Revenue*	$23,072.26	$17,701.54	-$5,370.72	0.276

**Revenue = post revenue – pre revenue = (post cost – pre cost) + (pre pay – post pay)*

Significant changes were found on several measures when the post- and pre-periods were compared.

The number of Emergency Department visits increased by 0.63 visits per person (annualized) and the ER costs increased by $313.58 per person for the 12-month period. There was no difference in the ER payments collected or ER revenue.

The number of inpatient admissions fell by 0.84 visits over the annualized period. Total inpatient days decreased marginally and average length of stay fell by 2.12 days. Given these findings, it is not surprising that inpatient costs also fell; the annualized inpatient cost fell by $11,459.10 during the post period compared with the pre period. Inpatient payments collected did not change from pre to post, but revenue (cost minus payments) increased by $10,584.27 per person.Total costs did not differ between the pre- and post-periods. Payments collected and revenue also held steady.

Cardiac Disease Management Program

Further analyses were conducted to break out two DM programs. There were 35 patients who met the inclusion criteria and were enrolled specifically in the cardiac DM program.

Table 22. Pre-DM/Post-DM Comparisons, Cardiac DM Program *(Annualized)*					
		Pre-DM Mean	**Post-DM Mean**	**Difference**	***p-value***
Emergency Department	Visits per year	0.92	1.51	0.59	0.257
	Costs	$344.10	$704.22	$360.12	0.152
	Payments collected	$32.88	$220.78	$187.90	0.223
	Revenue*	$311.23	$483.43	$172.20	0.354
Inpatient	Admissions per year	2.72	1.47	-1.25	0.001
	Total inpatient days	14.31	7.46	-6.85	0.014
	Avg. length of stay	4.64	3.11	-1.53	0.229
	Costs	$33,511.69	$11,885.53	-$21,626.16	0.020
	Payments collected	$2,236.88	$1,419.25	-$817.63	0.515
	Revenue*	$31,274.81	$10,466.28	-$20,808.53	0.020
Total	Costs	$38,242.77	$20,914.39	-$17,328.38	0.059
	Payments collected	$2,564.59	$2,100.36	-$464.23	0.716
	Revenue*	$35,678.18	$18,814.03	-$16,864.15	0.063

**Revenue = post revenue – pre revenue = (post cost – pre cost) + (pre pay – post pay)*

Results show no difference in any of the ER measures between the pre and post DM enrollment period. The number of visits, annualized costs, payments collected and revenue did not change significantly following DM enrollment.

The number of hospital admissions was reduced for the cardiac DM group, however, with admissions dropping by 1.25 per person over the course of the annualized period. Total inpatient days also fell by 6.85 days person. The average length of stay for those admitted did not change significantly, however, but costs were reduced by $21,626.16 per person. Payments did not change between the pre and post periods, but revenue (cost minus payments) increased by $20,808.53 per person per year.

Results show that the total costs, payment collected, and revenue for the cardiac DM patients was not significantly different in the post DM enrollment period compared with the pre-DM enrollment period although the total cost was marginally decreased whereas the revenue marginally increased.

Diabetes Disease Management Program

The diabetes DM program included 43 enrollees who met the other criteria for inclusion in the analysis and were enrolled in the Diabetes program specifically. Results are shown below:

Table 23. Pre-DM/Post-DM Comparisons, Diabetes DM *(Annualized)*					
		Pre-DM Mean	**Post-DM Mean**	**Difference**	**p-value**
Emergency Department	Visits per year	1.51	2.17	0.66	0.088
	Costs	$579.79	$855.51	$275.72	0.116
	Payments collected	$106.49	$78.07	-$28.42	0.722
	Revenue*	$473.30	$777.44	$304.14	0.101
Inpatient	Admissions per year	1.59	1.09	-0.50	0.145
	Total inpatient days	8.17	6.71	-1.46	0.633
	Avg. length of stay	4.63	2.03	-2.60	0.017
	Costs	$10,799.52	$7,615.94	-$3,183.58	0.357
	Payments collected	$2,173.29	$1,251.92	-$921.37	0.462
	Revenue*	$8,626.23	$6,364.02	-$2,262.21	0.489
Total	Costs	$15,288.93	$18,699.86	$3,410.93	0.505
	Payments collected	$2,477.30	$1,903.82	-$573.48	0.676
	Revenue*	$12,811.63	$16,796.04	$3,984.41	0.423

**Revenue = post revenue – pre revenue = (post cost – pre cost) + (pre pay – post pay)*

There were no significant differences between the pre-DM period and the post-DM period for any of the ER measures examined. The number of ER visits, annualized costs, payment collected, and revenue were unchanged from pre- to post-intervention.

For the inpatient measures, there were no differences in the number of admissions or total inpatient days. However, the average length of stay was reduced by 2.60 days in the post period as compared with the pre period. Total inpatient costs, payments, and revenue were not different in the post period compared to the pre period.

None of the total cost measures was significantly different in the post period compared with the pre period. Total annualized costs, payments collected and revenue were all unchanged.

Improving Health Measures

In order to assess whether the HITS program has improved the health of program enrollees, four specific health measures were examined: ACE inhibitor or ARB blocker usage among heart disease patients, lipid levels, HbA1c levels, and SF12 scores. These data were only collected among DM enrollees, with lipids recorded for cardiac DM enrollees, HbA1c recorded for diabetes DM enrollees, and SF12 scores for all the DM enrollees. Inclusion criteria for these analyses are as follows:

1. Enrolled in the appropriate DM program (cardiac program for drug usage and cholesterol measurement and diabetes program for HbA1c measurement, and SF12 for all)
2. Had at least two measurements for the appropriate measure: one at DM enrollment and one at least 90 days post enrollment.

3. To ensure the appropriate baseline level, the first test date must be within 90 days before or after the DM enrollment date

Once these criteria were applied, there were overall 55 individuals in the group with SF scores, 34 people in the cardiac/cholesterol group, 58 with cardiac/prescription drug utilization, and 53 people in the diabetes/HbA1c group.

The baseline level was defined as the test date within 90 days before or after the DM enrollment date, and the post-period being at least 90 days after enrollment in the DM program.
Results for each analysis are shown below.

Table 24. Cardiac DM Health Indicator: ACE/ARB

	N	*%*
None	22	37.9
ACE	24	41.4
ARB	12	20.7

Overall 24 (41.4%) out of 58 cardiac DM enrollees took the ACE inhibitors and 12 (20.7%) out of 58 used ARB blockers, and 22 (37.9%) enrollees did not take any of these drugs.

Table 25. Cardiac DM Health Indicator: Lipids (n=34)

	Baseline		Post- DM enrollment	
	N	*%*	*N*	*%*
HDL ≥50 (desirable)	15	44%	12	35%
HDL < 50	19	56%	22	65%
LDL ≤100 (desirable)	12*	41%	17	50%
LDL > 100	20	59%	17	50%

*** Two (2) individuals had missing values.**

In order to define "maintenance" of a particular level, a 5% threshold was used: if the participant's change in measures was within 5% of the baseline value, that change was considered "maintenance" of that level.
Results of the cholesterol analysis are mixed. The percentage of patients with the desired HDL of 50 or more decreased from baseline to the post period (5 people maintained the same level (within 5% of the original level) one of them HDL value drop to under 50; 18 people HDL level increased, however only one of them resulting the change of HDL less than 50 to HDL 50 or more, whereas 11 people HDL level decreased and 3 of them resulting the change of HDL 50 or more to less than 50. Meanwhile the percentage of patients with the desired LDL of 100 or less increased from baseline to post (4 people maintained the same level with one of them drop the LDL level to less than 100; 13 people drop the LDL level, of which 7 changed from LDL 100 or more to 100 or less; 15 people LDL level actually increased with 3 changed from LDL 100 or less to LDL more than 100). However, it is important to consider than this analysis is based on only 34 patients, and caution should be exercised when interpreting the results.

Table 26. Diabetes DM Health Indicator: HbA1c (n=53)				
	Baseline		Post- DM enrollment	
	N	*%*	*N*	*%*
HbA1c ≤7 (desirable)	14	26%	19	36%
HbA1c > 7	39	74%	34	64%

Results of the HbA1c analysis show improvement. The percentage of patients with the desired level of 7 or less increased in the post period as compared to the pre period (15 people maintained the level, 29 people dropped the level with 6 changed the level of HbA1c more than 7 to 7 or less, and 9 people increased the level resulting one change the level of 7 or less to more than 7). Again, though, the reader should keep in mind that the analysis is based on a small number of patients (n=53) and thus, it is not possible to generalize to the larger HITS population.

Table 27. Disease Management SF-12 QOL Score			
Physical Component Summary (PCS)	**Mental Component Summary (MCS)**	*N*	*%*
Decreased	Decreased	4	7.27%
Decreased	Unchanged	4	7.27%
Decreased	Increased	3	5.45%
Unchanged	Decreased	2	3.64%
Unchanged	Unchanged	13	23.64%
Unchanged	Increased	3	5.45%
Increased1	Decreased	6	10.91%
Increased	Unchanged	14	25.45%
Increased	Increased	6	10.91%

SF-12 results show minimal changes with only 6 (10.9%) out of 55 people who had both baseline and post- DM scores had both increased PCS and MCS scores. Thirteen people (23.6%) did not change either PCS or MCS scores.

Impact Conclusions and Recommendations

Based on the data analyzed for this report, it is not possible to fully evaluate the HITS program. The two main limitations involve missing data in the database and insufficient run-out time to detect cost savings. However, some conclusions can be drawn and limited statements of evaluation are warranted.

In terms of the HITS goal to enroll patients in public health programs where possible, the data show clear success. More than 30% of HITS interactions resulted in an application for one or more of the desired public programs and 1,399 HITS clients applied for one or more programs. Further, 1,143 individuals became enrolled in one or more of the target public health insurance programs (Medicaid, KidCare, and PCC) subsequent to their HITS interaction, and 81.7% of those who applied for a program became enrolled in one or more programs.

It is not possible to fully evaluate whether the HITS program achieves its goal of reducing cost and utilization among program enrollees. Findings depend largely upon how the pre- and post-HITS populations are defined. However, when the population is defined broadly to include HITS clients regardless of insurance status pre- or post-HITS interaction, results show some significant differences in the post period compared with the pre period. ER payments collected, inpatients admissions, total inpatient days, average length of stay, and inpatient costs all decreased in the post-HITS period, and inpatient revenue increased. These are clearly positive findings. However, ER visits and ER costs actually increased significantly as well, though the magnitude of the change was small. More time is needed before reliable conclusions can be drawn regarding any cost reductions associated with the HITS program. A subsequent analysis will allow for more claims run-out time, and for greater numbers of patients to enroll, allowing for greater power to detect differences between the pre- and post-HITS periods.

One area in which the program clearly succeeds in reducing some costs and utilization is in the disease management programs. Data clearly show that the two DM programs, taken together, result in a reduction of .8 inpatient admissions per person per year on average, a decrease of 3.9 inpatient days per person per year on average, and a reduction of $11,459.10 in costs per person per year. The cardiac DM program was independently found to result in a decrease of 1.3 admissions per person per year, and a reduction of 6.9 inpatient days per person per year. The diabetes DM program resulted in a reduction of 2.6 days in the average length of inpatient stay per admission per person per year. These findings show that the program has made a significant impact both in the lives of the patients it serves and in the uncompensated utilization. However, it is important to consider that the data are not all positive. Increases were also found in measurements of the number of ER visits and ER costs among some portions of the populations. It is possible that these negative findings would be reversed, however, given more time for the program's interventions to be effective.

Memorial has made efforts to redirect persons inappropriately accessing the emergency department to primary care. HITS efforts to identify and enroll persons inappropriately utilizing the ED into a "medical home" are quite innovative and effective. However, the intensity and complexity of primary care needs of the uninsured chronic disease populations still exceeds capacity of the local primary care infrastructure. In order to reduce the emergency department

visits, it may be necessary to develop even further primary care capacity related to non-routine and urgent needs such as (1) implementing "Ask-A-Nurse" 24 hour telephonic nurse triage services; (2) developing a formal triage at Memorial Urgent Care Center(s); and/or (3) contracting with an external primary care provider or clinic. Additionally, it is likely that the clinical and fiscal program impacts may not be evident in the short term, due to pent up client demand due to many years or being unable to access primary and preventative care.

Despite the limitations in the dataset, a rough estimate of program savings can be calculated using publicly available figures on average Medicaid per member per month (PMPM) costs. Florida Medicaid estimates that the average PMPM costs for a Medicaid recipient for FY 2011-12 will be $565.91[3], which equates to $6,790.92 for the year. It is far from a perfect metric, however, this figure, multiplied by the 311 people enrolled in Medicaid subsequent to their HITS interaction yields more than $2.1M in uncompensated expenditures saved for the MHS. If the Medicaid figure is used for enrollees in all three programs targeted, the potential savings exceed $7.7M.

The program's impact on health status among enrollees is difficult to measure given the data and time-period limitations. No meaningful changes in the percentage of people with desirable cholesterol levels were found, and changes in the percentage of people with a desirable HbA1c were modest, at best. However, such changes take time, and subsequent evaluations may well find significant improvements.

Quality Recommendations and Discussion

Continue efforts to clean-up HITS databases and ensure integrity of the data. Valuable information for evaluation is lost when data are missing. A missing MRN results in a client being dropped from all cost and utilization measures. Missing values in DM fields result in clients being dropped from health improvement measures.

Add questions to HITS intake documents regarding prior hospital and primary care utilization and county residence during the previous 12 months. This information is especially important in Phase I instances where there is no MRN, and therefore (1) excluded from pre-post analysis and/or (2) where overall cost/utilization analysis would imply that a post-HITS cost/utilization is always an increased cost/utilization.

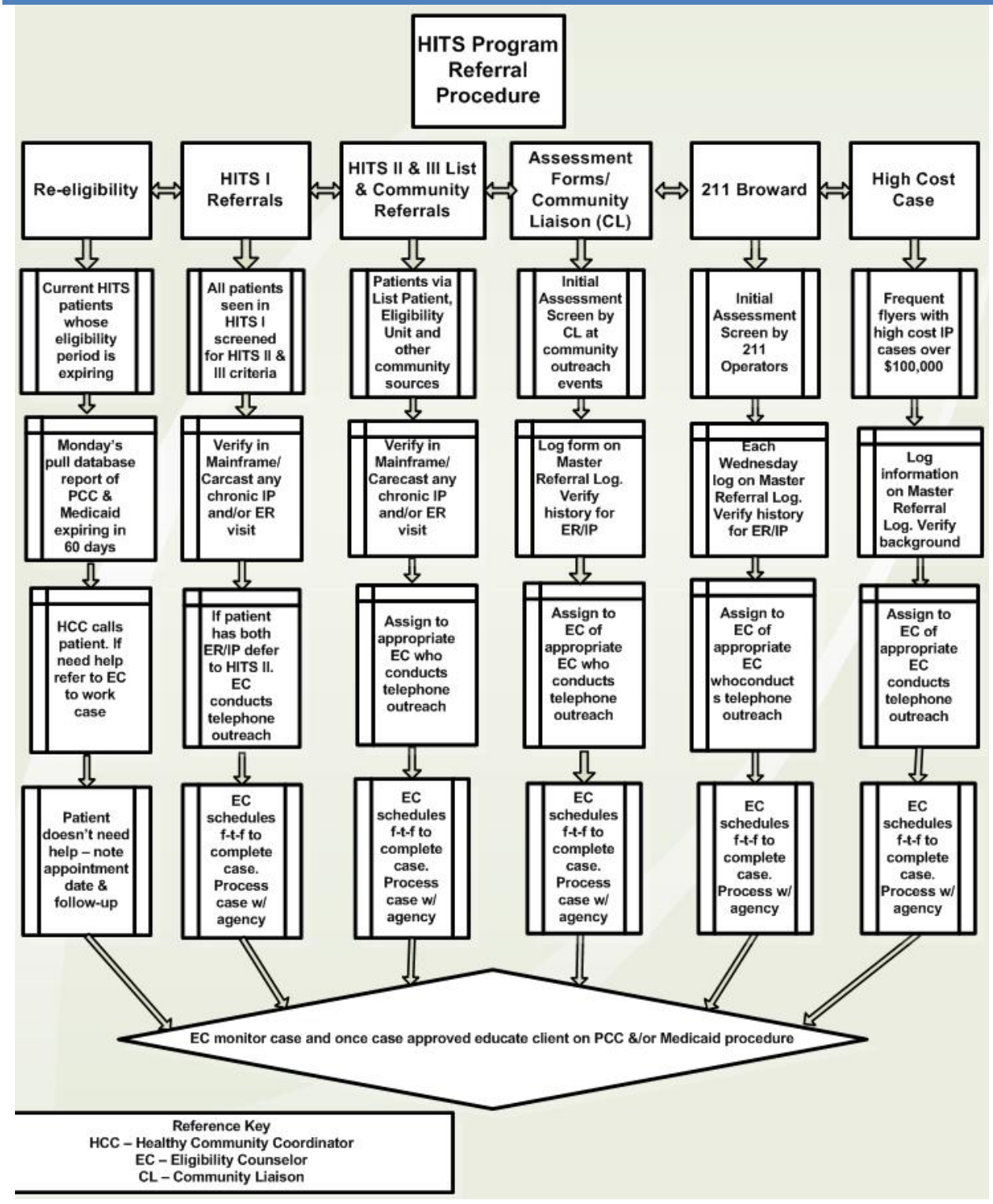
Adding relevant questions related to historical disease progression/severity may also be useful in developing stratified categories for analysis. For instance, advanced disease states may be less sensitive to the intervention and result in a smaller impact or longer period to realize benefits. Tracking information related to co-occurring conditions and/or morbidity may also be useful to identify targeted populations likely to experience the largest benefit from HITS.

Add essential fields to the DM prescription database in order to allow for more meaningful tracking and measurement of improvement. Some recommended additions include: NDC codes, therapeutic class code, days of supply, dose, etc.

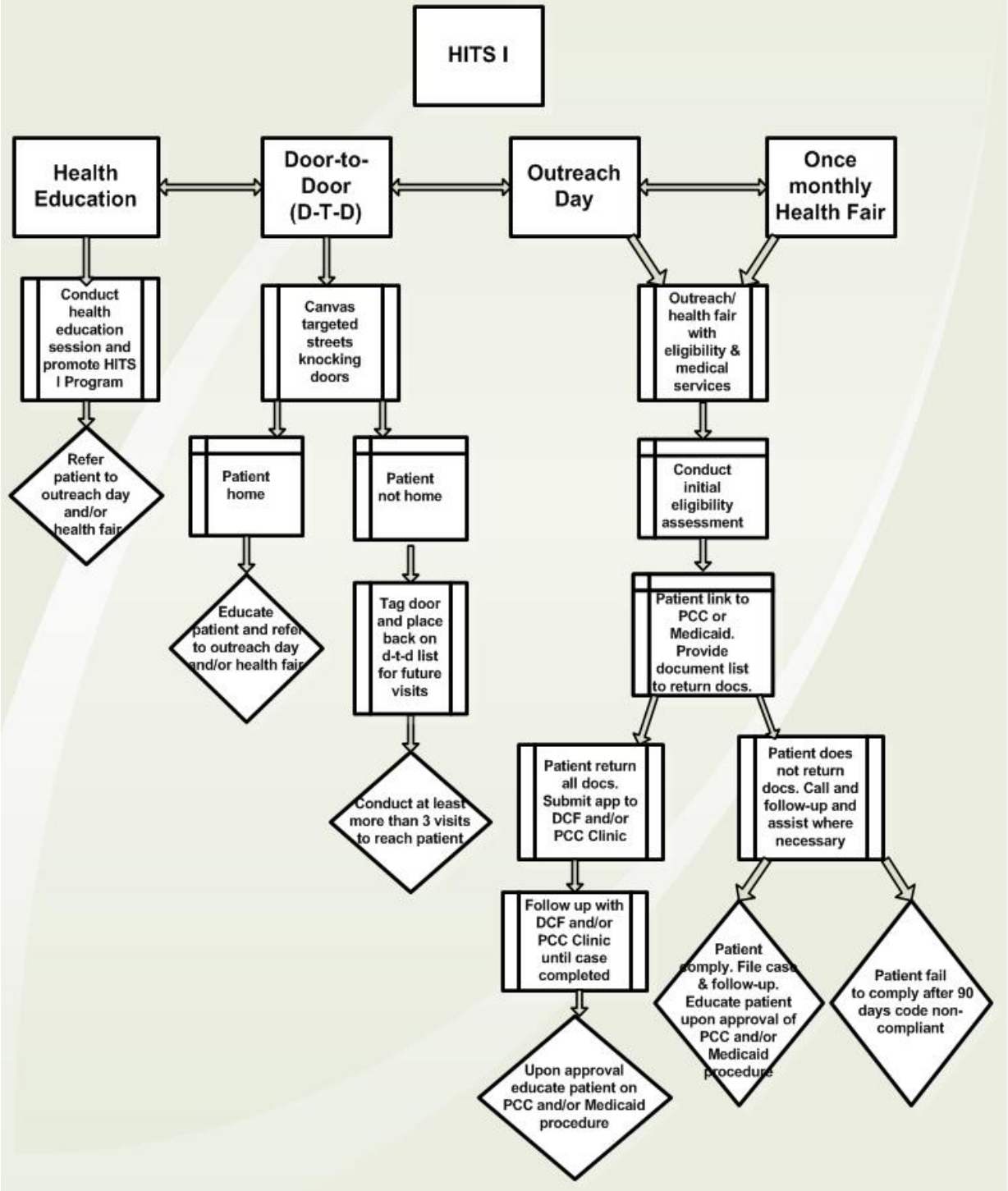
Conduct a follow up analysis in one year. A major limitation of this analysis is that insufficient time has passed since the HITS interaction, or since DM enrollment, to allow for runout. Health interventions take time to reap their rewards, and the longer the runout, the better the chance to find an effect.

Continue outreach efforts to ensure that those who are eligible remain enrolled in the various public insurance programs targeted by the program.

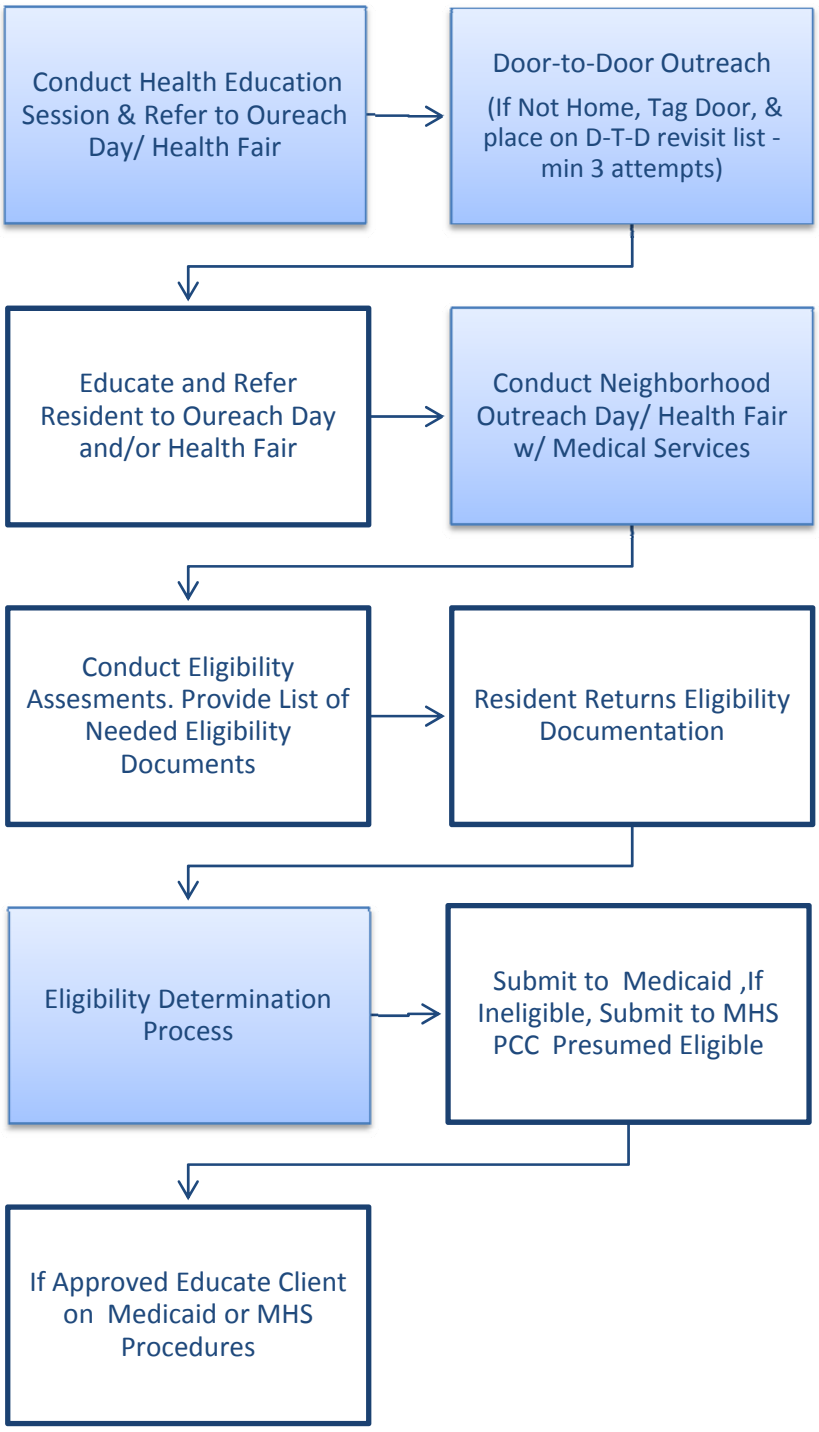
Appendix A: HITS Phases I-III Referral Procedure Flowchart



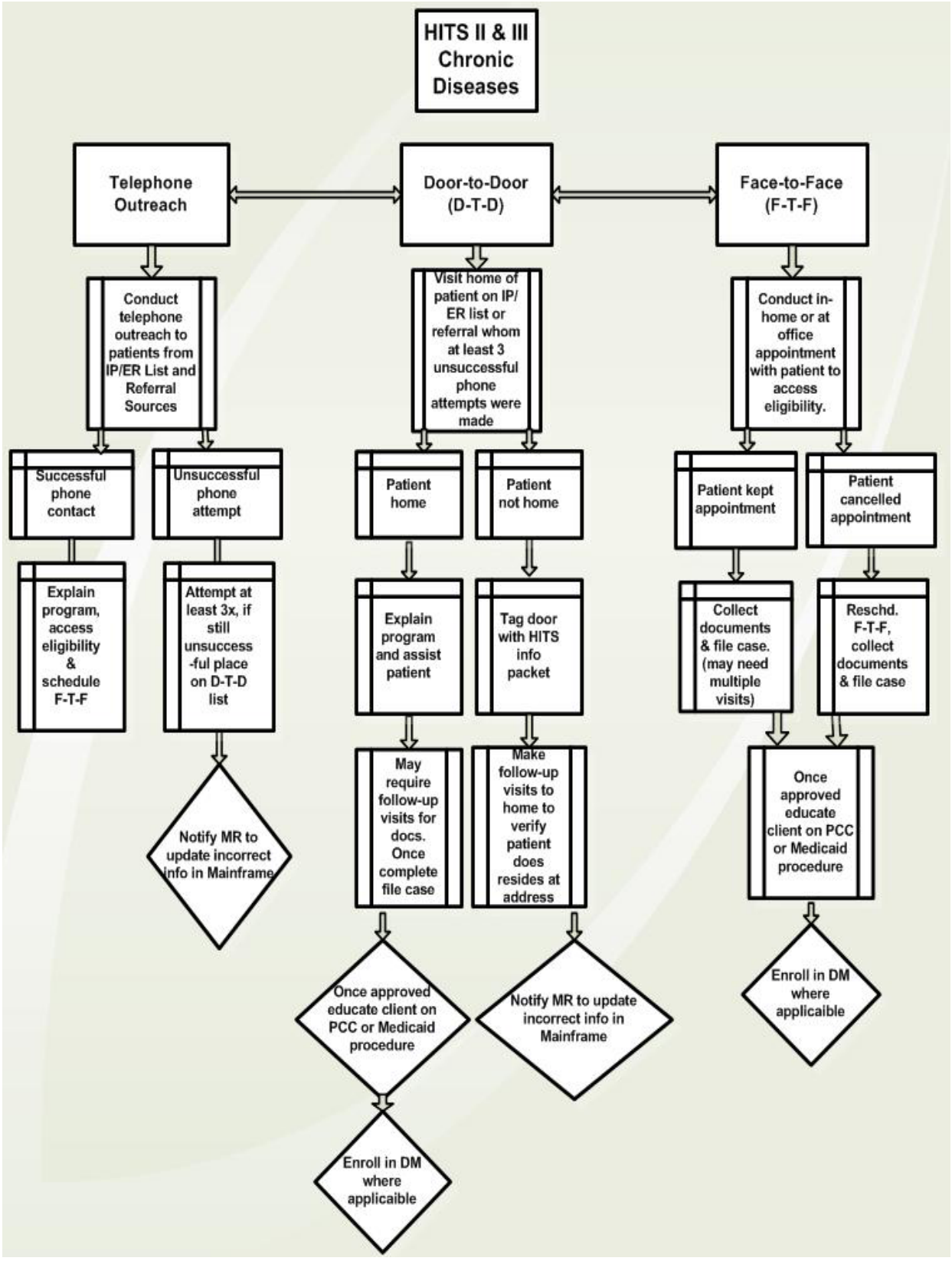
Appendix B: Phase I Process and Procedures Flowcharts



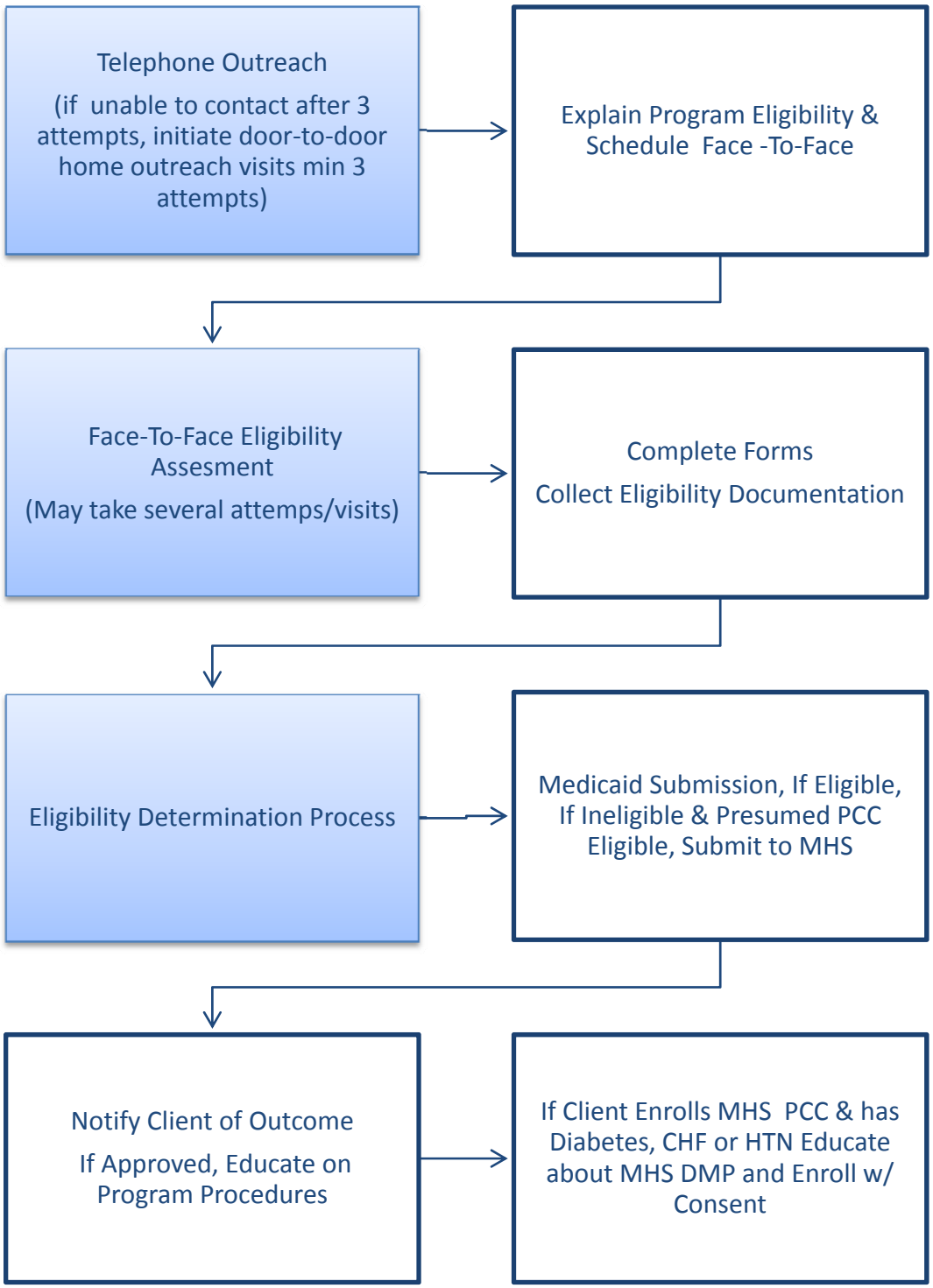
Phase I Process and Procedures Flowchart #2



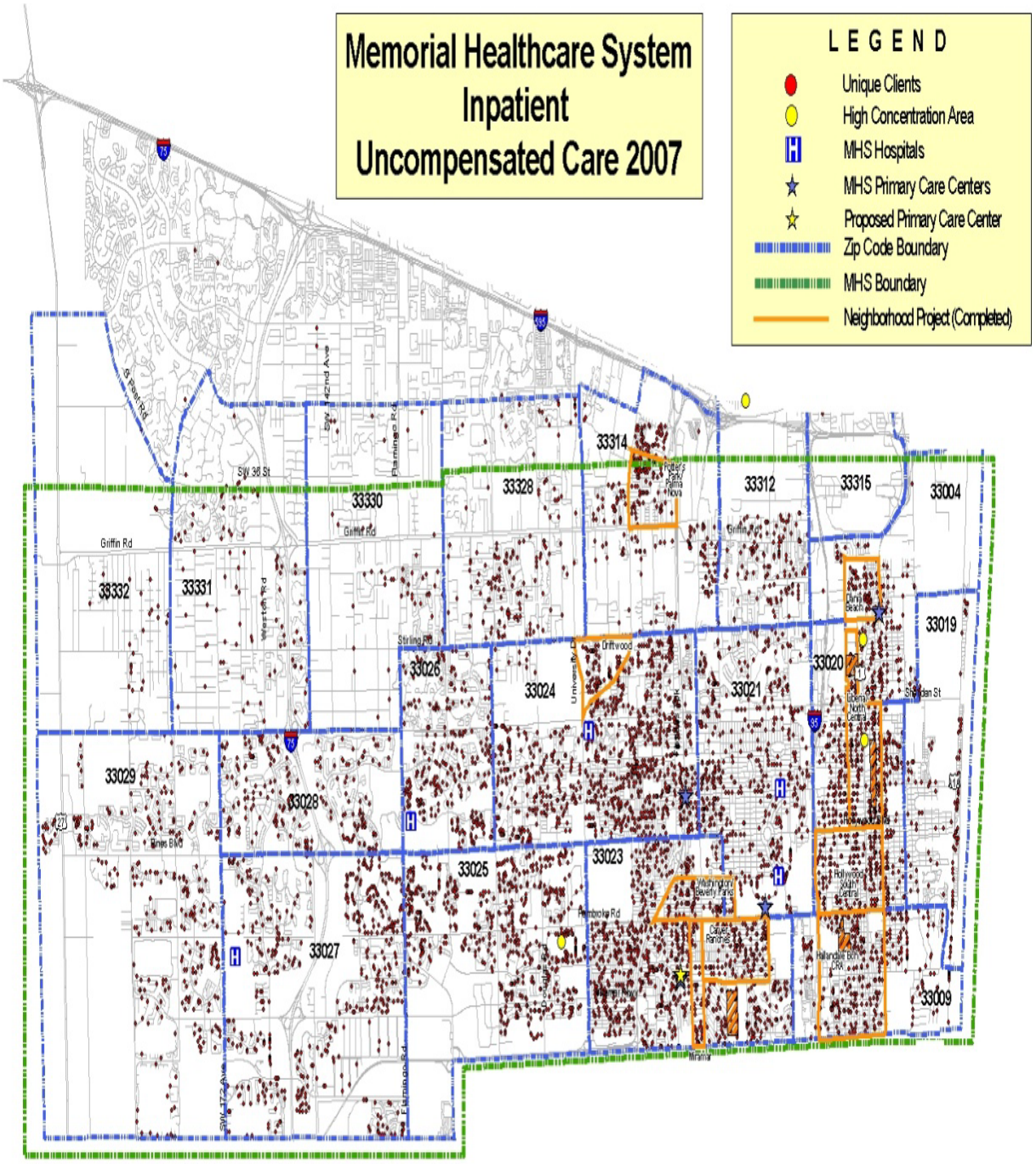
Appendix C: HITS Phases II & III Process and Procedures Flowcharts



HITS II & III Process and Procedures Flowchart #2



Appendix D: Memorial Inpatient Uncompensated Care Map 2007



Appendix E: Administrative Expenses & Contributions

HITS Administrative Expenses and Contributions (Excludes PCC, Inpatient & ED Charges)					
9/1/1/06 -10/31/ 31/09	HITS 1 Year 1 9/1/06-4/30/07	HITS 1 Year 2 5/1/07-4/30/08	HITS 1-3 Year 3 5/1/08-4/30/09	HITS 1-3 Year 4 5/ 1/09-10/31/09	Total Income & Expenses
4631 Partnership Contributions	-	*10,000*	*15,000*	-	*25,000*
4854 Contributions HFSF	-	-	*91,036*	*20,744*	*111,780*
Total Other Operating Revenues	-	*10,000*	*106,036*	*20,744*	*136,780*
6000 S&W Regular Productive)	*70,532*	*150,349*	*279,405*	*146,254*	*646,541*
6001 S&W Reg NonProductive	*202*	*685*	*(38)*	-	*850*
6004 S&W Weekend Differential	*46*	*260*	*206*	*120*	*633*
6005 S&W Differential	-	-	*46*	-	*46*
6006 S&W Overtime	*94*	*1,998*	*1,861*	*1,745*	*5,698*
6008 S&W Disability	-	-	*8,738*	*1,552*	*10,290*
6011 S&W Paid Leave	*3,566*	*7,422*	*22,426*	*13,702*	*47,116*
6012 S&W Paid Leave Cash Out	-	*4,035*	*3,883*	-	*7,918*
6112 FICA	*1,926*	*7,047*	*17,854*	*9,285*	*36,112*
6335 Oxygen And Gases	*139*	-	-	-	*139*
6336 General Supplies	*337*	*2,479*	*3,483*	*932*	*7,232*
6338 Small Equipment	*224*	*1,897*	*1,704*	*80*	*3,905*
6342 Food	-	*1,872*	-	*114*	*1,986*
6479 Purchased Outside Services	*636*	*9,929*	*2,811*	*11,077*	*24,453*
6717 Program Expenses	-	-	*6,305*	*2,552*	*8,857*
6768 Travel/Seminars/Meetings	*941*	*3,664*	*7,422*	*2,797*	*14,823*
6773 Ed. Supplies	-	*129*	*1,479*	-	*1,608*
6781 Advertising	*5,981*	*24,509*	*16,396*	-	*46,886*
6790 Freight	-	*202*	*71*	*6*	*278*
Total Operating Expenses	*84,625*	*216,477*	*374,052*	*190,216*	*865,370*
Net Profit / (Loss)	*(84,625)*	*(206,477)*	*(268,016)*	*(169,472)*	*(728,590)*
Average Cost		*(68,826)*	*(89,339)*	*(56,491)*	

NOTES:
1) Does not include any medical expenses incurred at the PCC clinics or Medi-Van.
2) Includes 20% of Director Sampier salary and 80% of Nicole's salaries- normally reported under Community Benefits Department.
3) Year 1 is reporting 8 months of activity 9/1/06 -4/30/07 Project 1 Liberia, Hollywood.
4) Year 2 HITS 1 completed three projects from 5/1/07-5/31/08. Average cost per project $77,487
   Project 2 (05/01/07 - 10/31/07) - Royal Poinciana neighborhood
   Project 3 (11/01/07 - 04/30/08) - N.W. Hallandale Beach neighborhood
   Project 4 (01/01/08 - 05/31/08) - Lake Forrest, West Park neighborhood
5) Year 3 HITS 1, 2 and 3 were running at the same time. Average cost per program $89,339
   HITS 1 Project 5 (06/01/08 - 12/31/08)
   HITS 1 Project 6 (01/01/09 - 06/30/09)
   HITS 2 Year 1 (05/01/08 - 04/30/09) - Inpatient with chronic diseases
   HITS 3 Year 1 (05/01/08 - 04/30/09) - ER patients with chronic diseases
6) Year 4 HITS 1-3 were running at the same time. Average cost per program for 6mos 5/1/09-10/31/09 $56,491
   HITS 1 - 4 months of Project 7 (07/01/09 - 10/31/09)
   HITS 2 Year 2 - 1st six months (05/01/09 - 10/31/09) - Inpatient w/ chronic diseases
   HITS 3 Year 2 - 1st six months (05/01/09 - 10/31/09) - ER patients w/ chronic diseases
7) HITS collected $25,000 in contributions from neighborhood partners & $111,780 HFSF thru10/31/09.

Appendix F: HITS Evaluation Database Data Dictionary

Memorial Healthcare System

Health Intervention with Targeted Services
Evaluation Database Documentation

tbl_HITS

Number of Records **7,383**

Field Name	Field Description
ParID	HITS Program Participant ID Number (unique - no duplicates); 349 Clients were enrolled more than once in the Phases and Projects of HITS - they received a distinct ParID for each enrollment.
EncDate	Date of initial encounter in the HITS Program
HITS	Phase of the HITS Program in which the Client is enrolled (1, 2, 3)
Project	For HITS1 clients only, Project in which the Client is enrolled (1-7); blank for HITS2 and HITS3.
Target	For HITS1 Clients only, whether Client lives within the target area for the specific Project (In, Out); blank for HITS2 and HITS3.
Result	Outcome of Encounter (Done = intake completed -> to be further accessed for program eligibility; Declined = intake completed -> declined; Ineligible = intake completed -> ineligible, Giftcard = a special outreach effort that did not result in enrollment)
Function	Event or venue in which Client was encountered
Ins	Insurance status at initial encounter with the HITS Program (Medicare, Medicaid, Kid Care, PCC, Other, NONE, Unknown)
InsDes	Identification of specific provider of insurance at enrollment in the HITS Program
Primary	Primary HITS client in a household (True, False)
HealthPb	Has a health issue (True, False)
HealthPbDes	Description of health issue
Comments	Additional information/notes

Memorial Healthcare System
Health Intervention with Targeted Services
Evaluation Database Documentation

tbl_Contacts

Number of Records	7,383
Field Name	**Field Description**
ParID	HITS Program Participant ID Number (unique - no duplicates); 349 Clients were enrolled more than once in the Phases and Projects of HITS - they received a distinct ParID for each enrollment.
RelatedID	HITS Program Household ID Number (when Clients are enrolled more than once and have distinct ParIDs, the RelatedIDs are also different, double-counting some households)
Grant	Specific HITS Program (HITS1, HITS2, HITS3) or other grant program (HRSA)
MedRec	Medical Record Number, used systemwide by MHS (7-digit ID, unique to each individual client); numbers beginning with 9999 were created outside of MHS system to account for 50 Clients with no MedRec identified as duplicates.
FName	Client First Name
LName	Client Last Name
Relation	Client role in household, relationship with head of household
Address	Residential Address
City	Residential City
Zip	Residential Zip Code
Building	Residential Building Identifier
Apartment	Residential Apartment Identifier
Phone	Primary phone number
ContactNum	Additional phone contact number
EmerName	Name of Emergency Contact Person
EmerPhone	Telephone for Emergency Contact Person
EmerRel	Relationship of Emergency Contact Person to Client
InputDate	Date intake data was input (earliest is 15/May/07)
Chkd	True, False (all values are 0 = False)

Memorial Healthcare System
Health Intervention with Targeted Services
Evaluation Database Documentation

tbl_Demo

Number of Records	7,383
Field Name	**Field Description**
ParID	HITS Program Participant ID Number (unique - no duplicates); 349 Clients were enrolled more than once in the Phases and Projects of HITS - they received a distinct ParID for each enrollment.
Gender	Gender (F = Female, M = Male, Blank = Unknown)
Marital	Marital Status (S = Single, M = Married, D = Divorced, W = Widow, Blank = Unknown)
Ethnicity	Ethnicity (0 = Non-Hispanic, 1 = Hispanic or Latino, 99 = Blank = Unknown)
Race	Race (1 = White, 2 = African American, 3 = Asian, 4 = Native Hawaiian / Pacific Islander, 5 = American Indian / Alaska Native, 6 = 99 = Blank = Unknown)
DOB	Date of Birth
Age	Age at time of enrollment
ContactNum	Telephone number for contact
Employ	Employment Status (0 = Unemployed, 1 = Part-time, 2 = Occasional, 3 = Retired, 4 = Self-employed, 5 = Disabled, 15 = Full-time, 99 = Blank = Unknown)
Student	Student Status (P = Part-time, F = Full-time, Check = Verify Status, Blank = Unknown)
Citizen	Citizen (True, False)
ResAlien	Resident Alien (True, False)
ExpCard	Expired I-94 (True, False)
Other	Other residence status description
DMElig	Eligible for Disease Management Program (True, False)
DMDate	All values are blank (not used in HITS)
DMRef	Date of Referral to Disease Management Program
DMRefNo	Referral Number to Disease Management Program (not used in HITS, all values are 0)

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tbl_INS

Number of Records	**6,297**
Field Name	**Field Description**
ParID	HITS Program Participant ID Number (unique - no duplicates); 349 Clients were enrolled more than once in the Phases and Projects of HITS - they received a distinct ParID for each enrollment.
Medicaid	No insurance, considered potentially eligible for Medicaid at intake (True, False)
MedicaidDoc	Date documentation for Medicaid application was collected (not used)
MedicaidApp	Application was submitted for Medicaid (True, False)
MedicaidAppDate	Date application was submitted for Medicaid
MedicaidPend	Application for Medicaid is pending
MedicaidApproved	Application for Medicaid was approved (True, False)
MedApprDate	Date application for Medicaid was approved
MedicaidDen	Application for Medicaid was denied (True, False)
MedDateDen	Date application for Medicaid was denied
MedicaidNon	Client is non-compliant, lacks information, application abandoned (True, False)
MedicaidNonDate	Date when determination of non-compliant was made
MedicaidCertEnd	Date Medicaid certification ends
KidCare	No insurance, considered potentially eligible for KidCare at intake (True, False)
KidCareDoc	Date documentation for KidCare application was collected (not used)
KidCareApp	Application was submitted for Florida KidCare (True, False)
KidCareAppDate	Date application was submitted for Florida KidCare
KidCarePend	Application for Florida KidCare is pending (True, False)
KidCareApproved	Application for Florida KidCare was approved (True, False)
KidApprDate	Date application for Florida KidCare was approved
KidCareCertEnd	Date Florida KidCare certification ends
PCC	No insurance, considered potentially eligible for Primary Care Card at intake (True, False)
PCCDoc	Date documentation for Primary Care Card application was collected (not used)
PCCApp	Application was submitted for MHS Primary Care Card (True, False)
PCCAppDate	Date application was submitted for MHS Primary Care Card
PCCPend	Application for MHS Primary Care Card is pending (True, False)
PCCApproved	Application for MHS Primary Care Card was approved (True, False)
PCCApprDate	Date application for MHS Primary Care Card was approved
PCCDen	Application for MHS Primary Care Card was denied (True, False)
PCCDateDen	Date application for MHS Primary Care Card was denied
PCCNon	Client is non-compliant, lacks information, application abandoned (True, False)
PCCNonDate	Date when determination of non-compliant was made
PCCCertEnd	Date MHS Primary Care Card certification ends
History	Comments/notes regarding insurance status

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tbl_DMDemographics

Number of Records	138

Field Name	Field Description
MedRec	Medical Record Number, used systemwide by MHS (7-digit ID, unique to each individual client); numbers beginning with 9999 were created outside of MHS system to account for 50 Clients with no MedRec identified as duplicates.
LName	Last Name
FName	First Name
Gender	Gender (Female, Male)
Ethnicity	Race / Ethnicity (Asian, Black, Hispanic non-white, Hispanic white, Native Hawaiian/Pacific Islander, White non-Hispanic)
DOB	Date of Birth
SSN	Social Security Number
Zip	Residential Zip Code
PGM	Specific Disease Management Program (HTC = Cardiovascular Disease, HTD = Diabetes)
EnrDate	Date of Enrollment in the Disease Management Program
DisDate	Date of Disenrollment in the Disease Management Program
DisReason	Reason for Disenrollment in the Disease Management Program

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tbl_DMHbA1c

Number of Records	283
Field Name	**Field Description**
MedRec	Medical Record Number, used systemwide by MHS (7-digit ID, unique to each individual client); numbers beginning with 9999 were created outside of MHS system to account for 50 Clients with no MedRec identified as duplicates.
LName	Last Name
FName	First Name
PGM	Specific Disease Management Program (HTD = Diabetes)
Test	Name of Lab Test Performed (HbA1C = Hemoglobin A1c)
TestDate	Date of Lab Test
Result	Result of Lab Test

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tbl_DMLipids

Number of Records	283
Field Name	**Field Description**
MedRec	Medical Record Number, used systemwide by MHS (7-digit ID, unique to each individual client); numbers beginning with 9999 were created outside of MHS system to account for 50 Clients with no MedRec identified as duplicates.
LName	Last Name
FName	First Name
PGM	Specific Disease Management Program (HTC = Cardiovascular Disease)
Test	Name of Lab Test Performed (CHOLL = Cholesterol; HDLC = High-Density Lipoprotein; LDLC = Low-Density Lipoprotein)
TestDate	Date of Lab Test
Result	Result of Lab Test

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tbl_DMSF12

Number of Records	283
Field Name	**Field Description**
MedRec	Medical Record Number, used systemwide by MHS (7-digit ID, unique to each individual client); numbers beginning with 9999 were created outside of MHS system to account for 50 Clients with no MedRec identified as duplicates.
LName	Last Name
FName	First Name
PGM	Specific Disease Management Program (HTC = Cardiovascular Disease, HTD = Diabetes)
QDate	Date SF-12 Health Survey was completed
PTotal	SF-12 Summary Physical Score
MTotal	SF-12 Summary Mental Score

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tbl_DMPrescriptions

Number of Records	283
Field Name	**Field Description**
MedRec	Medical Record Number, used systemwide by MHS (7-digit ID, unique to each individual client); numbers beginning with 9999 were created outside of MHS system to account for 50 Clients with no MedRec identified as duplicates.
LName	Last Name
FName	First Name
PGM	Specific Disease Management Program (HTC = Cardiovascular Disease)
Med	Name of primary medication
Med2	Name of secondary medication

tbl_HITSEncounters

Number of Records	37,174
Field Name	**Field Description**
GroupKey	A code assigned to identify the major type of payor for the encounter
GroupName	A description of GroupKey
PatientTypeKey	A code assigned to identify the type of patient for the particular encounter's visit/admission
PatientType	A description of the PatientTypeKey
PCCPayerClassKey	A code associated with the Memorial Primary Health Care Payor Class for the encounter
PCCPayerClass	A description of the PCCPayerClassKey
PlanKey	The code associated with a specific insurance payment plan
PlanName	A description of the PlanKey
EncounterKey	The unique identifier for the patient's visit/admission (includes the hospital code for the visit/admission)
encounternumber	The unique identifier for the patient's visit/admission
PatientName	Patient's name
Cases	Case count
Chgs	Total charges for the admission/visit
PriPay	Primary insurance payments posted to the account
SecPay	Secondary insurance payments posted to the account
PtPay	Patient payments posted to the account
TotPayments	Total of primary, secondary, and patient payments posted to the account
Allow	Allowance writeoffs posted to the accounts (adjustments to balance)
BD	Bad debt writeoffs posted to the account
Char	Charity writeoffs posted to the account
Contr	Contractual writeoffs posted to the account.
Small Bal	Small balance writeoffs posted to the account
MedicalRecordNumber	Medical Record Number, used systemwide by MHS (7-digit ID, unique to each individual client); numbers beginning with 9999 were created outside of MHS system to account for 50 Clients with no MedRec identified as duplicates.
DischargeDt	Discharge date for encounter
AdmitDt	Admit date of the encounter
ActVarDirectCost	Total variable cost related to labor, supplies, and equipment to provide direct patient care services
ActFixedDirectCost	Total fixed cost related to labor, supplies, and equipment to provide direct patient care services
ActFixedIndirCost	Total fixed cost related to overhead
NetRevenue	Expected reimbursement including a reality adjustment
ActTotalCost	Total of variable and fixed costs
RMSPrimaryRevenue	Full terms expected reimbursement
Entity	A code assigned to the hospital associated with the visit/admission (40 Regional, 41 South, 43 West, 44 Pembroke, 45 Miramar)
DX1 - DX10	ICD9 (International Statistical Classification of Diseases and Related Health Problems) diagnosis codes (up to 10)
Pr1 - Pr17	ICD9 (International Statistical Classification of Diseases and Related Health Problems) procedure codes (up to 17)

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tbl_HITSCharges

Number of Records	406,756
Field Name	**Field Description**
EncounterKey	The unique identifier for the patient's visit/admission (includes the Hospital Code for the visit/admission)
MedicalRecordNumber	Medical Record Number, used systemwide by MHS (7-digit ID, unique to each individual client); numbers beginning with 9999 were created outside of MHS system to account for 50 Clients with no MedRec identified as duplicates.
ChargeKeyDD	Code associated with a particular charge for a service (from the DSS system)
ChargeKey	Code associated with a particular charge for a service (from the mainframe system)
ChargeName	Description of ChargeKey
HCPCSCodeDD	Healthcare Common Procedure Coding System (HCPCS) code related to ChargeKey
CPT4CodeDD	CPT4 code related to ChargeKey (CPT4 codes ensure billing standardization and organize all medical services available)
chgActFixedDirectCost	Total Fixed cost related to labor, supplies, and equipment to provide the specific direct patient care service identified by the ChargeKey
chgActFixedIndirCost	Total Fixed cost related to overhead that have been allocated to the specific service identified by the ChargeKey
chgActVarDirectCost	Total Variable cost related to labor, supplies, and equipment to provide direct patient care service identified by the ChargeKey
chgActTotalCost	Total of Variable and Fixed costs equipment to provide direct patient care service identified by the ChargeKey
chgQuantity	Quantity of the direct patient care service identified by the ChargeKey
chgChgs	Total Charges for the direct patient care service identified by the ChargeKey