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Evaluation of the New Jersey Health Initiatives Expecting Success: Excellence in Cardiac Care Program

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Evaluation of the New Jersey Health Initiatives

Expecting Success: Excellence in Cardiac Care Program

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Executive Summary

In 2007 the Robert Wood Johnson Foundation (RWJF) established the New Jersey Health Initiatives Expecting Success: Excellence in Cardiac Care (NJHI-ES) program with a focus on reducing racial and ethnic disparities in health and health care and improving the quality of health care for African Americans and Latinos. Through a competitive process, RWJF awarded grants to 10 hospitals in New Jersey (see Appendix A) that provided a high volume of care to patients with congestive heart failure (CHF) and that serve large numbers of minority patients. The Health Research and Education Trust of the New Jersey Hospital Association was chosen to convene a learning network to assist grantee hospitals to develop plans to improve care for CHF patients, and the Rutgers Center for State Health Policy (CSHP) was engaged to measure the impact of program efforts. This report summarizes a three-part evaluation, consisting of a survey of project directors, an assessment of trends in publicly reported process-of-care measures, and an analysis of changes in hospital readmissions and return visits to emergency departments following initial CHF discharge.

Project Director Survey

A confidential end-of-grant survey of NJHI-ES project directors reveals a high-level program engagement and valuation of program resources. All of the grantees embraced efforts to improve race/ethnicity data and some reported that their hospitals were more routinely using these data in quality improvement efforts. A major focus of NJHI-ES was to help grantees adopt the American Heart Association's Get With the Guidelines (GWTG) program for heart failure, and all of them did. Many of the hospitals reported that extensive resource requirements of maintaining GWTG data were burdensome; and some said that they would stop using the program after their grant ended. Others reported plans to continue or expand its use.

Involving advance practice registered nurses (APRNs) in CHF care management was the approach used by the majority of the NJHI projects. APRNs engaged with patients and families in inpatient and post-inpatient settings. Seven of the 10 participating hospitals initiated use of APRNs under their grant, and others expanded their activities. Most of the participating hospitals reported plans to continue APRN activities following the grant.

The hospitals adopted a variety of care-management tools during the project, with grants supporting new or expanded engagement in APRN-led care management, patient education group work, and post-discharge follow-up activities. The project directors reported that most of these activities would continue following their grants, with some reporting plans to expand their use beyond CHF patients.

Process-of-Care Measures

NJHI-ES sought to improve process of care for CHF patients as reflected in measures publicly reported by the Centers for Medicare & Medicaid Services (CMS). Trends in these measures for participating hospitals are compared to other similar hospitals. Comparison hospitals were carefully selected using formal matching procedures, and trends before (2004–06) and during (2007–09) program participation were compared to detect whether NJHI-ES participation was associated with improved care. All of the process measures improved for both NJHI-ES and comparison hospitals for the period before and during the program, in many cases reaching process objectives more than 95% of the time. Nevertheless, multivariate analysis controlling for hospital and patient characteristics showed statistically significant improvements over comparison hospitals in two of four measures: adherence to recommended care guidelines for assessment of left ventricular function (LVF) and complete discharge instructions. While significant, LVF score improvement attributable to NJHI-ES participation was small, but a larger “program effect” was found for discharge instruction scores. For this measure, NJHI-ES hospitals achieved the recommended care goal 13.4 percentage points more often than comparison hospitals.

Readmission and Emergency Department Use After Discharge

If successful, efforts to improve CHF care should lead to reduced rates of readmission and “treat-and-release” visits to an emergency department (ED) following an initial discharge among CHF patients. These rates were examined at 30 and 90 days post-discharge for a first or “index” admission for CHF in NJHI-ES compared to other New Jersey hospitals. We examined both all-cause and CHF-specific inpatient readmissions and the all-cause return to the ED rate. Multivariate methods were used to control for patient case mix and hospital characteristics. Trends from 2002 to 2009 were compared to determine if NJHI-ES hospitals reduced these rates more after the program began. In addition to overall trends, trends by payer and racial/ethnic group were examined.

No “program effect” (i.e., lower readmission or ED use rate) was observed for 30-day rates of either inpatient admissions or return to the ED. However, at 90-days post index admission, we observed a statistically significant reduction in rates of both inpatient readmissions and return to the ED. For example, program participation is associated with a

reduction of 58.5 all-cause readmissions per 1,000 CHF index admissions compared to nonparticipating facilities. Subgroup analysis generally did not uncover significant program effects for most measures, possibly because subgroups may be too small to detect differences. Nevertheless, subgroup analysis suggests (often without conventional levels of statistical significance) that the program benefited Medicare and non-Hispanic black patients.

Conclusions

NJHI-ES provided a test of the impact of participating in a robust quality improvement collaborative for hospitals serving large numbers of minority CHF patients in New Jersey. A survey of project directors reveals engagement in a broad range of quality improvement activities, with a focus on improving process of care and preparing patients and families for return to the community after hospitalization. Consistent with the focus of the program hospitals' efforts, the evaluation detects positive program effects on the likelihood of meeting standards of care in providing complete discharge instructions. Reductions in 90-day readmissions and return visits to emergency departments also show statistically significant program impacts. Analyses of other process-of-care indicators and 30-day readmission and return-to-the ED rates fail to detect clinically meaningful or statistically significant program effects.

The evaluation has limitations that should be noted. First, only a single end-of-grant project director survey was used to measure program engagement and activities. A more in-depth process evaluation would likely have provided a more nuanced description of program implementation successes and challenges. Second, available data did not permit the evaluation to focus on individual patients targeted by intervention activities; rather it focused mainly on hospital-wide averages. NJHI-ES impacts on the patients most engaged in program activities are likely to have been substantially greater than average program effects. In spite of this limitation, we find significant program impacts using rigorous statistical techniques.

Evaluation of the New Jersey Health Initiatives Expecting Success: Excellence in Cardiac Care Program

Joel C. Cantor, Sc.D., Derek DeLia, Ph.D., and Manisha Agrawal, M.P.H., M.B.B.S.

Introduction

Health care disparities result from multiple factors including unequal access to quality care and health care systems, social and environmental conditions, socioeconomic status, care-seeking behavior, health insurance status, and other factors (Center for Health Statistics 2007). The Institute of Medicine's report in 2002, *Unequal Treatment: Confronting Racial and Ethnic Disparities in Healthcare*, documented that studies of cardiovascular care provide some of the most convincing evidence on the existence of racial and ethnic disparities in health care (Institute of Medicine 2002; Ayanian et al. 1999). This body of evidence demands that solutions be found to close gaps among minority groups in access to and outcomes of cardiovascular services in the United States.

African-American and Latino populations constitute just slightly more than one in three New Jersey residents, compared to 28.7% nationally (U.S. Census Bureau 2011). African Americans in New Jersey have higher mortality rates from cardiovascular disease than do whites both for heart disease (229.1 versus 205.4 per 100,000) and for stroke (52.2 versus 33.6 per 100,000) (New Jersey Department of Health and Senior Services 2011). The quality of care in hospitals remains an important priority for the state and its residents. As a group, the quality of care for Medicare patients within New Jersey's hospitals has ranked low in nationwide comparisons in previous years (Jencks, Huff and Cuerdon 2003; Jencks et al. 2000). Since these comparisons were released, the New Jersey Department of Health and Senior Services (NJDHSS) and the state's hospitals have worked to improve their performance, yet there is still room for improvement. Recent policy initiatives focusing on public release of hospital performance data appear to be having their desired impact, with average hospital performance scores improving more in New Jersey compared to national trends (New Jersey Department of Health and Senior Services 2010a, 2010b).

Researchers have found that readmissions for heart failure are common among Medicare beneficiaries, with almost half of all patients readmitted within six months (Krumholz et al. 1997). Higher readmission rates are related to both race and to the site where care was received (Joynt, Orav and Jha 2011). Furthermore, research suggests that more than 40% of these readmissions could have been prevented (Vinson et al. 1990). A study by the New Jersey

DHSS found significant racial and ethnic differences in age-adjusted hospitalization rates for CHF. The rates were found to be considerably higher for Latinos (442.5 per 10,000) and African Americans (355.1 per 10,000) than for non-Hispanic whites (216.5 per 10,000) (Li and Hempstead 2005).

The Expecting Success Program

The Robert Wood Johnson Foundation (RWJF) has a long-standing commitment to improving the quality of health care for all Americans and is working to reduce racial and ethnic disparities in the care of targeted diseases. In 2005, RWJF introduced a national program, *Expecting Success: Excellence in Cardiac Care*, which sought to improve the quality of health care provided to minority Americans. Building on this effort and their commitment to New Jersey, RWJF established the New Jersey Health Initiatives Expecting Success: Excellence in Cardiac Care (NJHI-ES) program to bring together two efforts to improve health care—reducing racial and ethnic disparities in health care and improving the quality of health care. The Foundation provided a grant to the Rutgers Center for State Health Policy (CSHP) to examine outcomes of the NJHI-ES program. This report summarizes the evaluation findings.

The NJHI-ES program was developed by the NJHI program office in consultation with George Washington University, the national program office of RWJF's national *Expecting Success: Excellence in Cardiac Care* program. NJHI-ES had four specific goals:

- To improve cardiac care for African Americans and Latinos in New Jersey
- To develop effective and replicable quality improvement strategies, models, and resources
- To encourage the spread of such strategies and models to additional clinical areas
- To disseminate relevant lessons to policy and provider audiences

The Quality Institute of the Health Research and Education Trust, a subsidiary of the New Jersey Hospital Association, (NJHA QI) was engaged by RWJF to work with the NJHI program office to provide technical assistance to hospital grantees and to convene a learning network. More details about grantee engagement in the learning network and technical assistance resources are provided below.

NJHI issued a call for proposals to New Jersey hospitals in November 2006 and conducted a formal review process with the following selection criteria:

- Hospital cardiovascular volume, with a focus on heart failure
- Numbers of African-American and/or Latino patients
- Commitment to using rapid cycle quality improvement theory techniques
- Track record of successful performance improvement initiatives
- Organizational commitment to improving care for underserved minorities

- Demonstrated commitment of hospital leadership and professional staff
- Strong demonstrated involvement and support of medical staff, specifically with endorsement of medical staff executive committee and other physician partners (e.g., medical school or faculty practices, local cardiology groups)
- Demonstrated involvement and commitment of the physician and nurse managers of the emergency department
- Ability and performance in collecting and reporting patient-level data by race/ethnicity
- Ability and willingness to provide monthly data on a selected set of metrics on a timely basis
- Likelihood of long-term sustainability of initiatives

Ten hospitals were selected and provided grant support to participate in NJHI-ES. (See Appendix A.) The grants spanned the period May 2007 through August 2009. The participating hospitals were located in seven of the 21 counties in New Jersey. All met the minimum criteria of having at least 20 percent of their patients from minority populations. The hospitals represented several hospital types, including community hospitals, teaching hospitals, and academic health centers.

Each hospital received an RWJF award of up to \$180,000 to support staffing, supplies, travel, and other items. In addition, each hospital received financial support to access Get With the Guidelines (GWTG), a web-based data tool of the American Heart Association that allows participating hospitals to monitor adherence to evidence-based guidelines for each heart failure patient admitted and compare results to other hospitals. Using this tool, the participating hospitals collected data, reported their heart failure measures, designed hospital specific projects, and monitored the results from quality improvement strategies.

Under the RWJF grant each NJHI-ES participating hospital was expected to:

- Develop an interdisciplinary team with an identified project director and executive sponsor
- Engage the medical staff
- Obtain the chief executive officer's approval and participation in selected learning network sessions
- Develop a heart failure care improvement plan
- Have each team attend learning network sessions on rapid cycle quality improvement theory techniques
- Collect heart failure clinical data by race and ethnicity
- Share the findings with other participating hospitals
- Provide monthly updates about the progress of their improvement plan

- Develop a communications strategy that informed their hospital stakeholders about the NJHI-ES program and its progress
- Plan to sustain the changes that were made to improve heart failure care to all inpatients and apply the improvement techniques to patients with other health conditions

NJHI-ES began in June 2007 with a two-day learning session. Over the course of the two years, the hospitals were supported in their work through an additional five one-day learning sessions, one half-day learning session, monthly conference calls and webinars, a listserv, and a dedicated website. The website helped participants to share data, reports, resources developed, and success and barriers encountered. Additionally, coaching and mentoring was provided by NJHA QI staff as well as staff from the NJHI program office. The teams received additional training and resources, including the American Hospital Association/Health Research and Education Trust's (HRET) toolkit and a conference call with HRET staff on how to collect data by the race and ethnicity, barriers that might be encountered, and strategies to overcome them. The following summarizes workshop topics:

- Session 1: June 25–26, 2007—topics included heart failure care, the collection of accurate data on race and ethnicity, implementing highly reliable systems of care, and the importance of leadership in performance improvement work.
- Session 2: October 16, 2007—focused on promising practices from the national RWJF *Expecting Success* initiative for patient-centered communications with vulnerable populations.
- Session 3: March 5, 2008—topics included identifying evidenced-based practices used to effectively manage vulnerable populations and establish community partnerships; discussion of lessons learned and success stories used to eliminate racial and ethnic disparities in cardiac care, presented by a panel of hospital participants from the national *Expecting Success* program; and analysis of heart failure data, stratified by race and ethnicity.
- Session 4: June 18, 2008—included a presentation by *Expecting Success* National Program Director Bruce Siegel, M.D., M.P.H., on lessons learned from the national collaborative in addition to sessions on using concurrent data for quality management, making the business case for GWTG, the role of hospital CEOs in eliminating health disparities, and discussions of the progress of each of the NJHI-ES projects.
- Session 5: November 13, 2008—topics covered included identification of new resources to enable providers to develop targeted culturally and linguistically appropriate services and to understand hospital strategies to integrate equity into existing performance improvement projects and hospital initiatives to insure all patients receive quality care.

- Session 6: January 30, 2009—Focused on the use of equity reports in contemporary healthcare organizations.
- Session 7: May 12, 2009—shared preliminary findings of the NJHI-ES evaluation along with review of managing transitions of care and sharing individual accomplishments and best practices for heart failure patients developed during NJHI-ES.

Overview of the Evaluation of New Jersey Health Initiatives Expecting Success

The evaluation of the NJHI-ES program draws on available data from public agencies to examine the impact of the program on process-of-care scores and readmission rates. NJHI-ES hospitals were compared to nonparticipating hospitals to draw inferences about program impact. Two types of outcomes were examined: 1) heart failure process-of-care scores and 2) inpatient readmission and emergency department (ED) use (without admission) following an initial heart failure admission. The readmission/ED use analysis also takes patient mortality into account. The research team used process-of-care measures from the Centers for Medicare & Medicaid Services (CMS), and readmission data are from NJDHSS. Multivariate statistical techniques were used to adjust for hospital and patient characteristics in these analyses. These analyses are supplemented by information from a survey of NJHI-ES project directors. Methodological details are provided in the sections below. The evaluation study period includes a pre-program baseline from 2004 for process-of-care measures and 2003 for readmission measures through the years of program support in 2009.

Evaluation findings are provided and discussed in the following four sections. The first provides findings of the project director survey conducted in March and April 2009. The survey describes how each of the 10 participating hospitals engaged in the program and reports on project directors' perceptions of program impacts. Next, trends in CMS process-of-care indicators for NJHI-ES and groups of comparison hospitals are presented. This is followed by a section presenting analyses of readmissions and ED use following initial heart failure admissions. The final section summarizes and integrates these findings and draws implications about the NJHI-ES effort.

Project Director Survey

The survey of NJHI-ES project directors at each of the 10 program hospitals was conducted in March and April 2009 to collect information to systematically describe NJHI activities and gather confidential feedback on the perceived value of the program and its perceived impact from the perspective of the directors. This section describes the survey and its findings. (See Appendix B for the survey questionnaire.)

Methods

CSHP developed a confidential end-of-grant survey of the 10 NJHI-ES project directors at the request of and in collaboration with the NJHI-ES program office. The survey included questions on six topics: 1) ratings of the value of NJHI-ES program resources (e.g., GWTG, learning network workshops); 2) status of and improvements in race/ethnic and preferred language data used in hospital quality initiatives; 3) use of advance practice registered nurses in quality improvement activities; 4) use of specific care management strategies in improvement activities, 5) engagement of senior hospital officials in NJHI-ES activities; and 6) whether and how NJHI-ES participation led to lasting and continuing quality improvement. All project directors completed the survey on time; a 100% response rate. A human subject protocol for the study was reviewed and approved by the Rutgers University Institutional Review Board.

Findings

Ratings of Program Resources. The program directors were asked to rate the overall value of participating in NJHI-ES compared to expectations. All but one program participant rated their experience high; specifically, six indicated that participation in NJHI-ES “greatly exceeded” their expectations, three indicated that it modestly exceeded their expectations, while one director indicated that it “greatly fell short” of his or her expectations.

The directors were also asked to rank the value of six specific NJHI-ES program resources for their efforts to improve heart failure care during their grant. The rating scale ranged from 1.0 (least valuable) to 5.0 (most valuable). Ratings were generally high for all components (Table 1.1). The two components with the highest ratings were interactions with other NJHI-ES grantees and the NJHI-ES exercise of developing heart failure improvement plans, with average scores of 4.2 and 4.1 respectively. Other technical assistance provided by NJHA QI staff was rated an average 3.9; use of GWTG and the NJHI learning network workshops were each rated an average 3.9. The NJHI-ES listserv was the least highly rated element with average of 3.6.

Table 1.1: Ratings of the Value of NJHI-ES Program Resources

Program Resources	Mean	Range
Interactions with other NJHI-ES grantees	4.2	3–5
Required NJHI-ES heart failure improvement plan	4.1	3–5
Technical assistance provided by NJHA Quality Institute staff	3.9	3–5
Get With the Guidelines program	3.9	2–5
NJHI learning network workshops	3.9	1–5
NJHI-ES listserv	3.6	1–5

In an open-ended question, the directors reported other resources that they valued, including site visits by the NJHI team, re-engineered discharge process, heart failure quality measurement and process instrument, project tools, and quality reports.

In a separate question, the directors were asked to reflect on specific benefits of NJHI-ES participation. A broad range of benefits were reported:

- Great opportunity for networking among NJ hospitals for care of heart failure patients
- Increased awareness of the special needs of the diverse population
- Creation of a cohesive and multidisciplinary approach to patient care
- Excellent source of expertise and information
- Ability to utilize quality improvement strategies developed successfully by other participants
- Ability to disseminate program lessons broadly and gain senior leadership support for the program application
- Awareness raised about resources available to assist heart failure patients to achieve and maintain wellness
- Great leverage provided to strengthen and give sustainability to the heart failure program
- Help in achieving goals to improve overall quality of care for cardiac patients

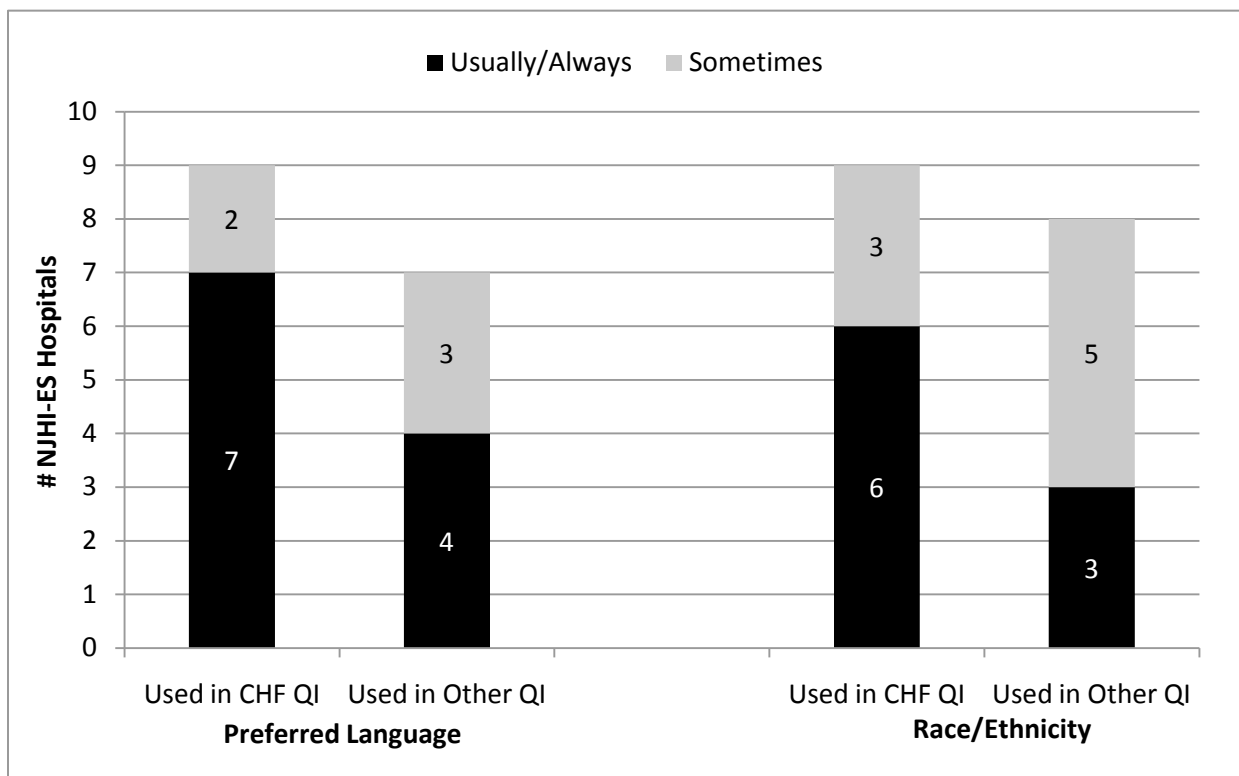
Program Activities. The survey also inventoried the specific activities in which participating hospitals engaged and, in some cases, assessed barriers to successful implementation or likelihood of continued or expanded use. Specifically, the questionnaire asked the extent to which patient demographic data was used in quality assessment, the extent to which GWTG was used and likelihood of future or expanded use, the extent to which and strategies for employing advanced practice nursing in heart failure improvement efforts, and the use of specific care-management strategies.

Data on Preferred Language and Race/Ethnicity. All 10 directors reported that preferred language is “usually or always” recorded accurately (Figure 1.1). Nine directors reported using data on patient-preferred language in heart failure quality improvement “usually or always” or “sometimes,” as a result of their participation in NJHI-ES. One director reported that his or her hospital never used this information for quality improvement. In addition, seven directors reported using preferred language information in quality improvement efforts for diagnoses *other than* heart failure “usually or always” or “sometimes” as a result of their participation in NJHI-ES. Three others reported rarely (2) or never (1) using this information in quality work outside of heart failure care.

The majority of directors (7) reported that NJHI-ES helped them improve the completeness and accuracy of race/ethnicity data, one other reported that their data recording

was good so improvement was not needed, and one reported that their problems continued even after the program (Figure 1.1). Nine project directors reported using race/ethnicity data in heart failure quality improvement “usually or always” or “sometimes” as a result of their participation. One director reported rarely using such information. Finally, eight project directors reported using race/ethnicity data in quality improvement for diagnosis *other than* heart failure at least sometimes as a result of program participation.

Figure 1.1: Use of Data on Preferred Language and Race/Ethnicity in Quality Measurement and Improvement (QI) Activities

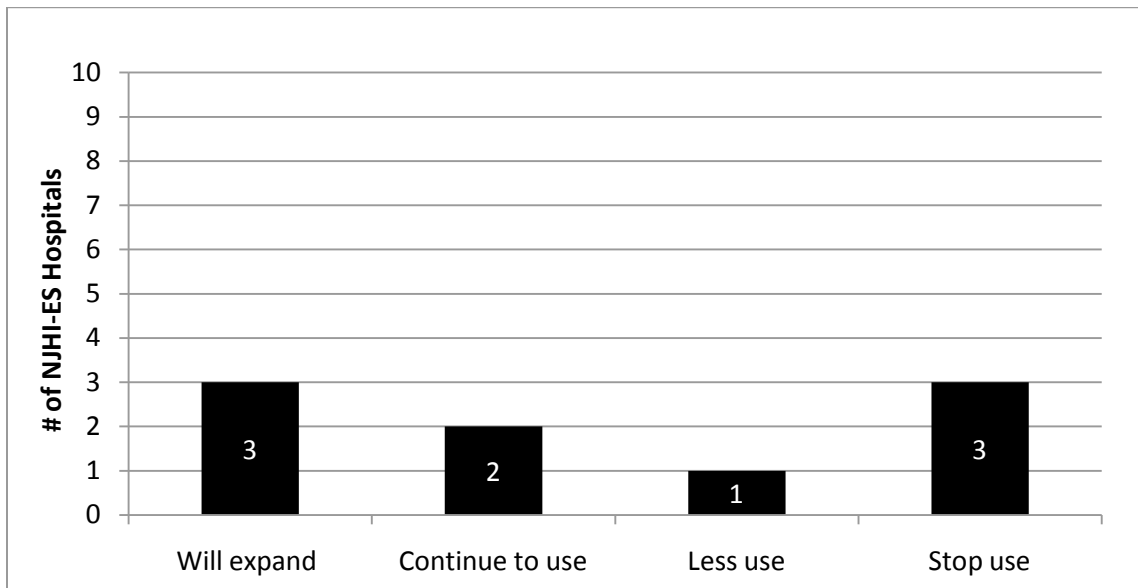


Overall, nine project directors reported that their hospital used race/ethnicity data in quality measurement and improvement “much more often” (7) or “a little more often” (2) as a result of their participation in NJHI-ES. One other reported no change in the use as a result of participation.

Use of Get With the Guidelines (GWTG). Five directors reported that their hospitals adopted GWTG for congestive heart failure (CHF) improvement work during NJHI-ES. The remaining facilities had adopted GWTG for CHF prior to NJHI-ES participation. Among the participating hospitals, six project directors reported that GWTG met their expectations, three reported that it modestly exceeded their expectations, and one reported that it greatly exceeded his or her

expectations. Nevertheless, they all reported that it would be challenging to sustain use of GWTG for CHF after NJHI-ES as it is very time and labor intensive. Two directors said their hospitals will continue to use the program after the project is over; three would stop using it; one would reduce the use; but three directors reported their hospitals will expand the use of the program (Figure 1.2). One director did not report on their plans to use the program. When asked about using GWTG for conditions other than CHF, five project directors reported using it for stroke and one for coronary artery disease.

Figure 1.2: Extent of Use of GWTG After the End of the Grant



Respondents were asked to list important benefits and problems with using GWTG in their quality improvement efforts for CHF.

Perceived benefits of using GWTG:

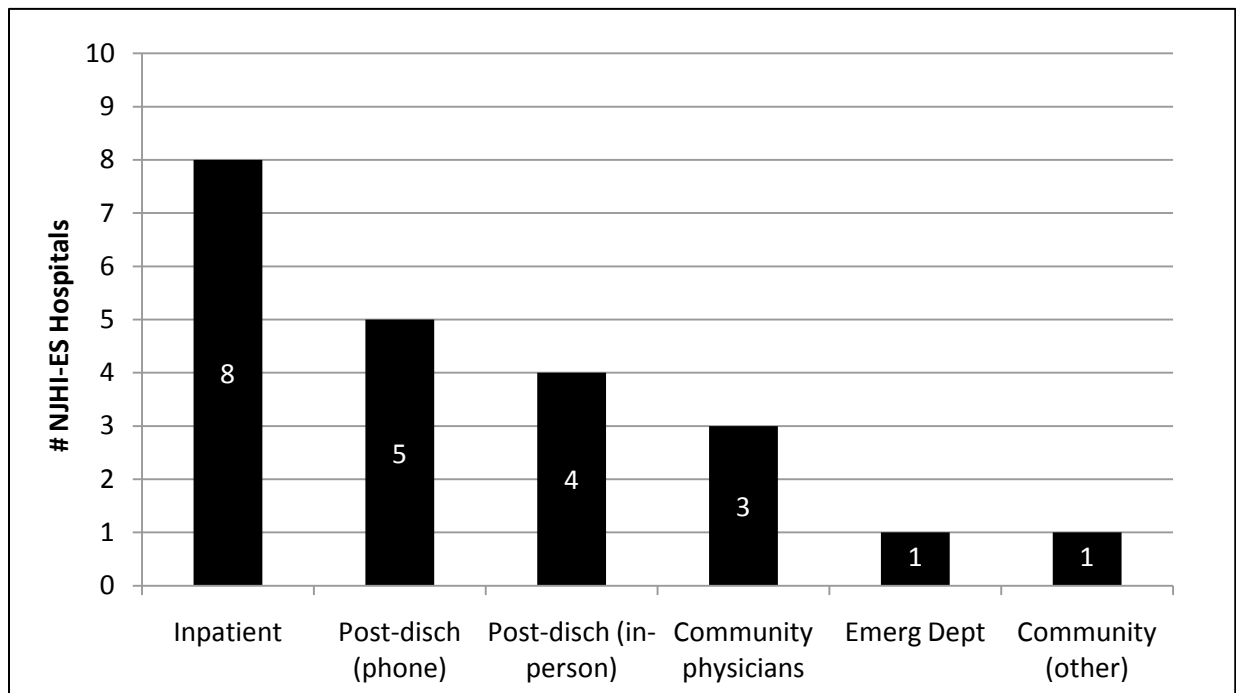
- Current “real time data”
- Data accuracy
- Comprehensive data
- Easy access and retrieval of data
- Availability and accessibility of resources/tools
- Great technical support
- Availability of current/up-to-date CHF guidelines

Perceived problems of using GWTG:

- Labor intensive
- Time consuming
- Interface with the hospital system/not compatible with other documentation systems
- Extensive number of questions
- Data entry
- Technical support problems
- Frequent loss of data while in the program

Advance Practice Registered Nurses. All participating hospitals employed advance practice registered nurses (APRNs), such as nurse practitioners, as part of NJHI-ES. The number of APRNs employed ranged from 0.2 full-time equivalent (FTE) nurses to 5.0 FTEs, with a mean of 1.5 FTE APRNs. Even after the end of the NJHI-ES funding, they all planned to continue employing APRNs in managing CHF strategies. Six directors reported continuing the APRN in the same roles as during the program, three reported expanding the role and one reported reducing the role after the project is over. The APRNs were involved in working with patients and families, communication/liaison with medical and nursing staff, patient education, follow up, home visits, and direct clinical care. Seven directors reported that the APRNs “usually or always” work with patients family members and three others reported that they “sometimes” work with family members. The project directors reported that their APRNs work with patients and their caregivers in a variety of settings, with most focusing on reaching patients and caregivers in the hospital and post-discharge (Figure 1.3).

Figure 1.3: Advance Practice Registered Nurses Work Across Settings



Respondents were asked to list the major roles and responsibilities of the APRNs in the care of heart failure patients during the NJHI-ES project. Some of the major responsibilities reported are education, data collection, compliance with core measures, liaison with nursing staff, patient/family education, follow up with physicians, and follow-up phone calls.

Care Management Strategies and Tools. The project directors were asked about care management strategies or tools adopted for heart failure before or during their participation in NJHI-ES and if they plan to continue their use after the program. They were also asked to indicate if they plan to use these strategies/tools for conditions other than heart failure. The results are in Tables 1.2 and 1.3.

Table 1.2: Use of Care Management Strategies or Tools

Care management strategies/tools	Used before NJHI-ES	Adopted during NJHI-ES	Not used
Standard/standing orders	9	1	
APRN care managers*	4	7	
Medication reconciliation	10	0	
Patient education materials	6	4	
Patient education groups		7	3
Discharge check list procedure*	7	3	1
Post-discharge follow up*	2	8	1

* Total 11 as more than 1 box checked

Table 1.3: Use of Strategies/Tools After the Grant and for Conditions Other Than Heart Failure

Care management strategies/tools	Plan to use the strategies/tools after the NJHI-ES grant			Plan to use the strategies/tools for conditions other than heart failure		
	Yes	No	No response/ Unsure	Yes	No	No response/ Unsure
Standard/standing orders	9		1	1	5	4
APRN care managers	8		2	2	5	3
Medication reconciliation	9		1	3	4	3
Patient education materials	8		2	2	5	3
Patient education groups	7	1	2	2	3	5
Discharge check list procedure	8		2	5	5	
Post-discharge follow up	7		3	2	5	3

Overall, a broad array of care-management activities was adopted during the project (some may have been adopted prior). APRN care managers, patient education groups, and post-discharge follow up were most likely to be adopted during the grant period. In most cases, hospitals planned to continue their care-management activities after the grant, although for

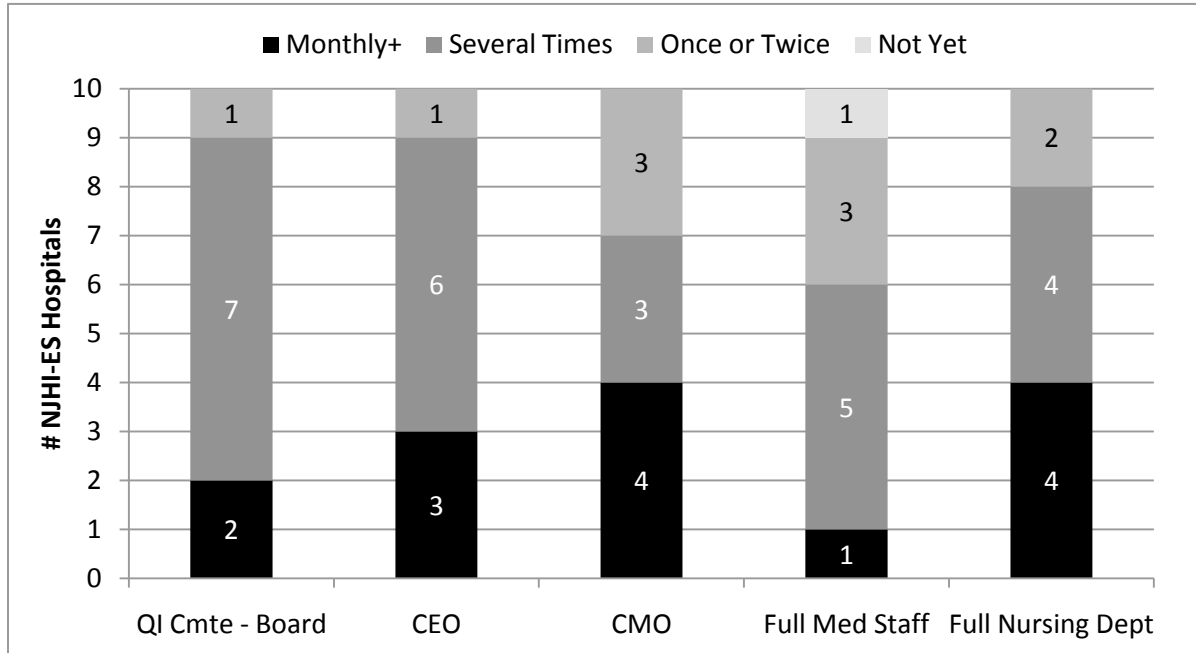
about half of the strategies/tools project directors reported that they would not be used for other conditions, and most others were unsure about expanded use.

Some other care-management strategies or tools adopted by some hospitals during the grant were:

- Beck depression screening
- Telephone follow up post discharge
- 1:1 patient education ("teach back" process)
- Home visits
- Teaching, demonstration, use of weighing scale
- Awareness of health literacy
- Management Information System (MIS) produce Risk Assessment Screening (RAS) reports for patients with increased Brain Natriuretic Peptide (BNP)
- Ambulator (restorative aid)
- Video on demand
- Support group—cardiac rehab

Leadership Engagement. NJHI-ES encouraged hospital leaders to engage in the quality improvement and disparity reduction efforts of the funded projects. As one metric of the extent to which such engagement took place, project directors were asked to report how often they briefed their leadership and other project stakeholders on the progress and outcomes on the project. Briefings of the full membership of nursing departments occurred most often across NJHI-ES hospitals and chief medical officers were briefed frequently by most projects (Figure 1.4). Engagement with other project constituencies, including the quality improvement committee of hospital boards, chief executive officers, and medical staffs was more varied across hospitals.

Figure 1.4: Frequency of NJHI-ES Briefings of Hospital Executives Other Stakeholders



CMS Process-of-Care Indicators

The NJHI-ES program sought to improve process of care for heart failure patients by employing the strategies identified in the prior section. Process-of-care metrics reported publicly by the Centers for Medicare & Medicaid Services (CMS) are among the most highly visible measures of quality of patient care. This section shows the relationship between NJHI-ES participation and changes in CMS process-of-care measure performance. Trends in these measures for participating hospitals were compared to other similar hospitals inside and outside New Jersey. Comparison hospitals were carefully selected so they would match NJHI-ES facilities along important characteristics (e.g., size, payer mix) at baseline (i.e., before the program began). Trends before (2004–06) and during (2007–09) participation within each group of hospitals were compared to draw inferences about program impact.

CMS with the Joint Commission created a national standardized “core” set of four heart failure performance metrics related to appropriate management and treatment of heart failure patients (Joint Commission 2010). We used all of these measures listed below in our analysis:

- *Evaluation of left ventricular systolic (LVS) function, previously called left ventricular function (LVF) assessment*—percent of heart failure patients with documentation in the hospital record that LVS function was evaluated before arrival, during hospitalization, or planned for after discharge.

- *Angiotensin converting enzyme inhibitors (ACEI) or angiotensin receptor blockers (ARB) for left ventricular systolic dysfunction (LVSD)*—percent of heart failure patients with LVSD and without contraindications who were prescribed an ACEI or an ARB at hospital discharge.
- *Discharge instructions*—percent of heart failure patients discharged home with written instructions or educational material given to patient or caregiver at discharge or during the hospital stay addressing all of the following: activity level, diet, discharge medications, follow-up appointment, weight monitoring, and what to do if symptoms worsen.
- *Adult smoking-cessation advice/counseling*—percent of heart failure patients with a history of smoking cigarettes who were given smoking-cessation advice or counseling during a hospital stay.

Methods

We obtained a complete set of CMS quality indicator data for CHF for 2004–09 for acute care hospitals across the nation (U.S. Department of Health & Human Services 2011). CMS publishes these data quarterly with an approximate nine-month delay between the time that the data is collected and the time that a full set of data is available for public use. In order to create relevant comparison groups for the NJHI-ES hospitals, the CMS quality indicator database was merged with hospital characteristics data from annual hospital survey database of the American Hospital Association (AHA) (American Hospital Association 2011). Hospital records in these two databases did not share a common identifier which necessitated hospital name and address matching of more than 5,000 hospital records nationally. The linked hospital database included CMS hospital quality variables and AHA variables such as number of beds, teaching status, and payer mix (i.e., percentage of admissions from Medicare and Medicaid).

We used the AHA survey data to identify a set of peer hospitals for the NJHI-ES participants based on pre-intervention (2006) hospital characteristics. The comparison groups selected matched NJHI-ES hospitals exactly on the AHA metropolitan area size category and auspices (public, nonprofit). We used a formal “nearest neighbor” procedure to match hospitals at baseline on CHF patient volume, LVF score, number of staffed beds, residents per bed, percent Medicare discharges, percent Medicaid discharges, and county demographics (Rubin 1980). LVF patient volume was used for matching this measure because it is based on larger numbers of CHF patients than the other metrics and is therefore a more robust measure of CHF volume.

Using this method, 10 peer matches for each NJHI-ES hospital were identified for hospital-level comparisons. Since NJHI-ES hospitals are fairly similar on a number of characteristics, they often share matched peer hospitals in common. To avoid double counting

in our analysis of overall program effects, we used five unique peer matches that most closely matched each program hospital in our modeling for this purpose (described below). The “pre” intervention period in these data is 2004 through 2006 and “post” period is 2007 through 2009.

In descriptive analysis we compared each NJHI-ES participant to its 10 matched facilities. We then used multiple regression analysis to compare the change in each indicator during the pre (2004–06) and post (2007–09) intervention periods for NJHI-ES hospitals relative to the 50 uniquely matched comparison facilities (five per NJHI-ES hospital). Our estimate of the program effect, known as the “difference-in-differences” estimator, measures how the *change* (pre to post period) in each indicator for NJHI-ES hospitals is different (i.e., higher or lower) from the corresponding *change* in the comparison hospitals (Monheit et al. 2011; Monheit and Steinberg Schone 2004; Buchmueller and DiNardo 2002). The regression analysis controls for changes in hospital-level characteristics described above as well as unobservable hospital characteristics that do not change over time (known as hospital “fixed effects”) (Greene 1997). To ensure that statistical inferences are valid, the models also account for clustering of standard errors within matched sets of hospitals (i.e., each NJHI-ES facility and its five matches). Data were analyzed using Microsoft Excel 2007 and Stata 11.1.

Findings

Descriptive Comparisons. Figures 2.1 to 2.4 show score indicators for intervention and 10 matched comparison hospitals for each of the four CHF process-of-care metrics. Across measures, scores rose throughout the study period, with few indications that NJHI-ES improvement accelerated in the post-implementation period relative to comparison hospitals. The slope of process indicators for ACE/ARB and hospital discharge instruction scores appear a bit steeper (more improvement) in NJHI-ES hospitals relative to comparison hospitals by the end of the NJHI-ES intervention. NJHI-ES performance on the ACE/ARB metric is only marginally better than comparison hospitals, although average scores for both groups were near perfect by 2009. Discharge instruction scores for NJHI-ES hospitals were better than comparison hospitals throughout the study period, and appear to have risen faster than comparison hospitals between 2007 and 2009. Similar patterns are seen in median scores (Table 2.1), suggesting that the patterns we observed are not driven by a few outlier hospitals. In fact, these patterns are evident even in the lower-performing hospitals (10th percentile) in both groups (Table 2.2). This table illustrates that the improvement over time in each metric—except discharge scores—left little room for the program to lead to improvement in scores beyond the sweeping upward trends on these measures.

Figure 2.1: Mean LVF Score NJHI-ES and Comparison Hospitals

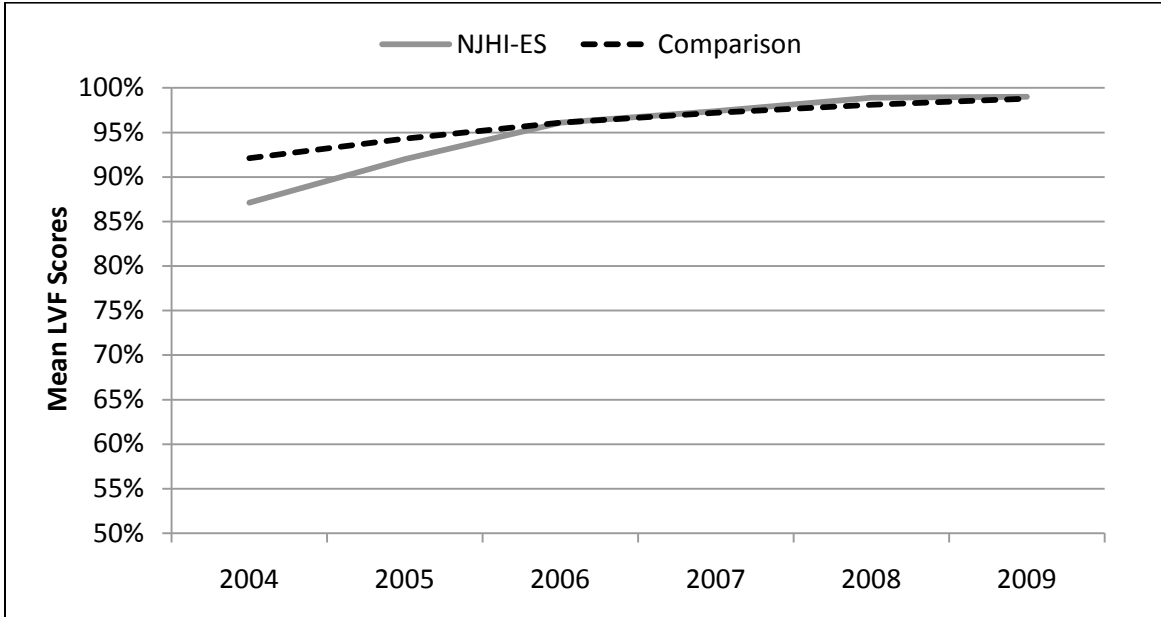


Figure 2.2: Mean ACEI/ARB Scores—NJHI-ES and Comparison Hospitals

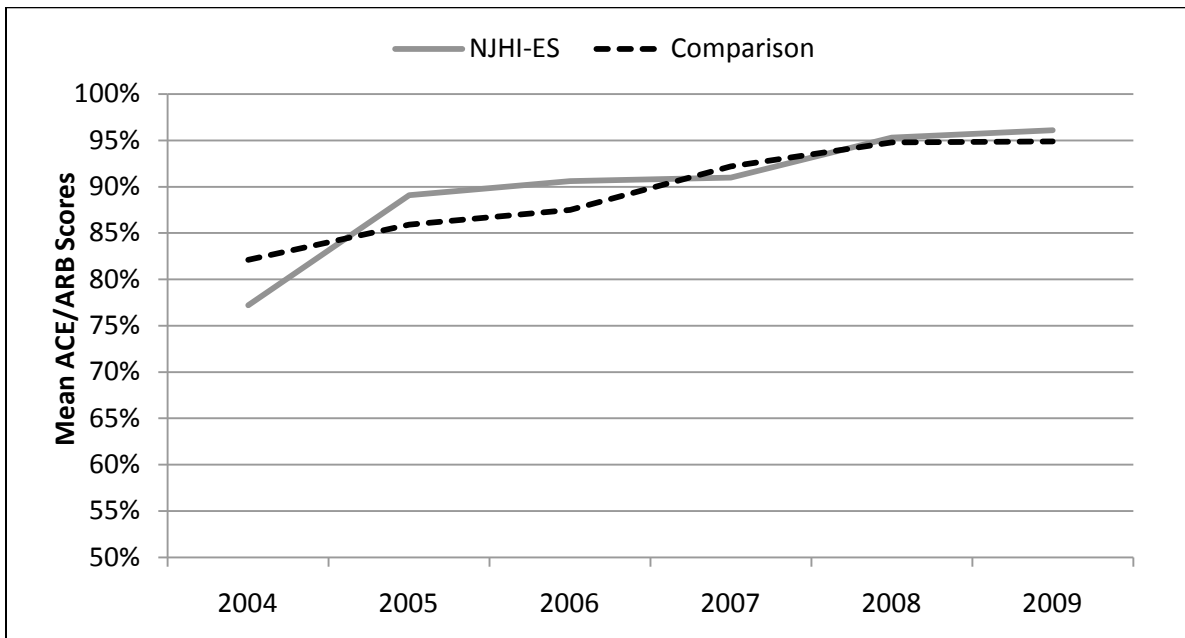


Figure 2.3: Mean Discharge Instruction Scores—NJHI-ES and Comparison Hospitals

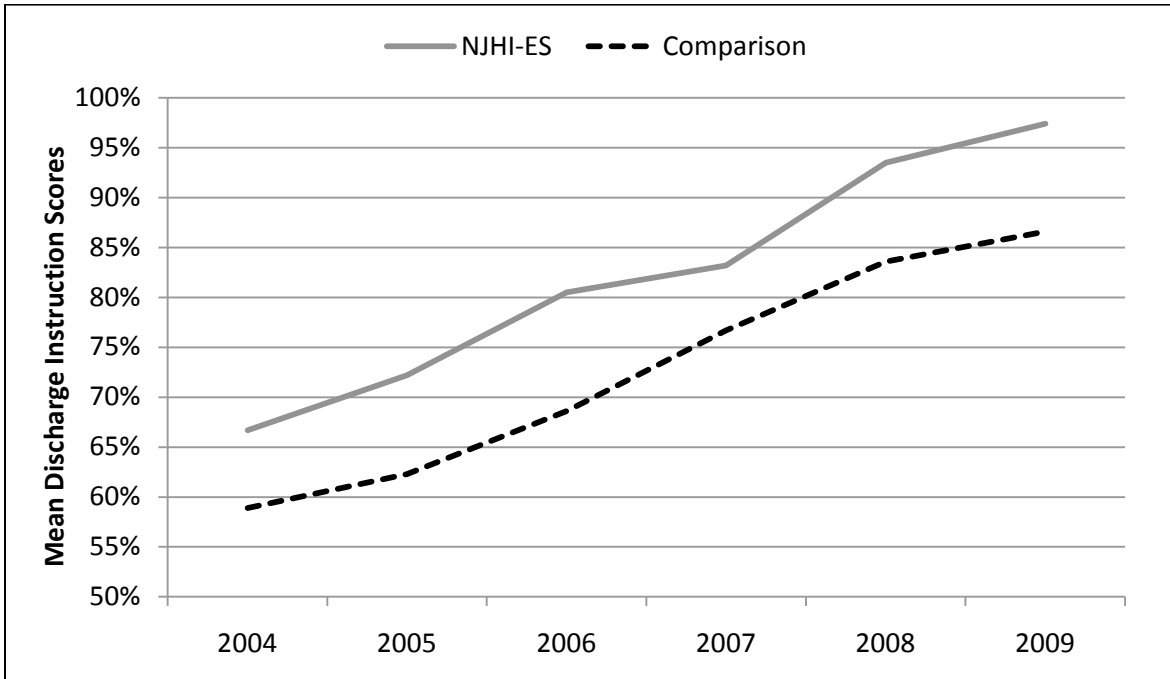


Figure 2.4: Mean Smoking-Cessation Counseling Scores—NJHI-ES and Comparison Hospitals

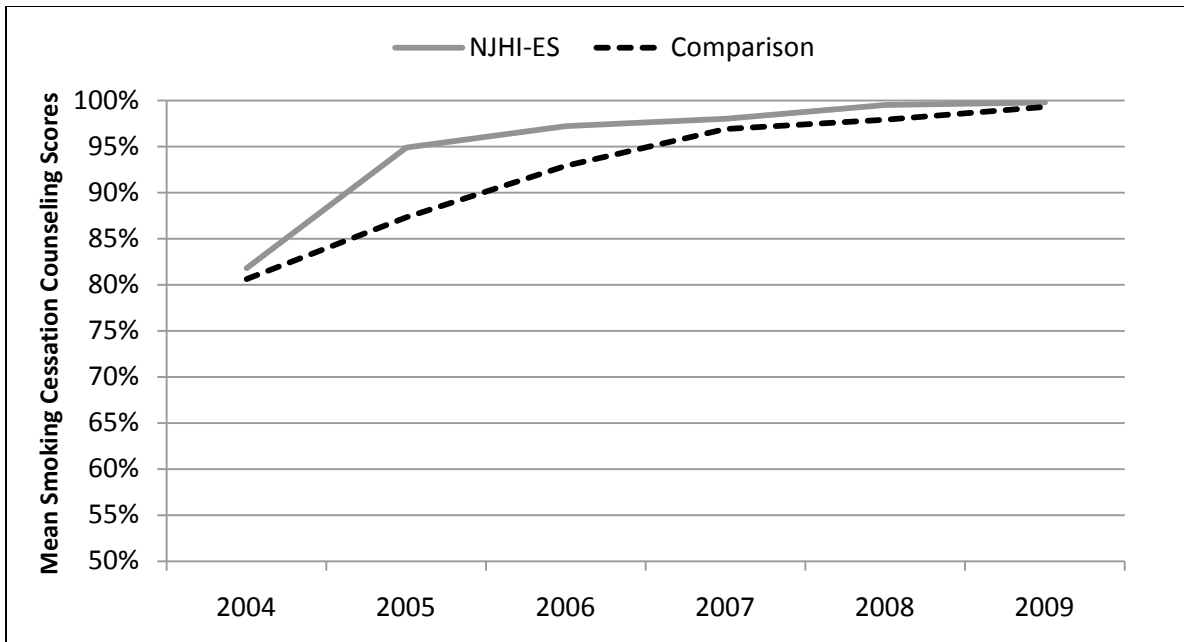


Table 2.1: Median Scores—NJHI-ES and Comparison Hospitals

	LVF scores		ACEI/ARB scores		Discharge instruction scores		Smoking-cessation counseling scores	
	NJHI-ES	Comparison	NJHI-ES	Comparison	NJHI-ES	Comparison	NJHI-ES	Comparison
2004	0.90	0.925	0.78	0.84	0.64	0.60	0.89	0.82
2005	0.96	0.95	0.90	0.86	0.81	0.64	0.98	0.91
2006	0.97	0.96	0.94	0.89	0.90	0.70	1	0.97
2007	0.99	0.98	0.95	0.93	0.93	0.80	1	0.99
2008	0.99	0.99	0.97	0.96	0.98	0.85	1	1
2009	1	0.99	0.97	0.96	0.99	0.92	1	1

Table 2.2: Trend Analysis for 10th percentile—NJHI-ES and Comparison Hospitals

	LVF scores		ACEI/ARB scores		Discharge instruction scores		Smoking-cessation counseling scores	
	NJHI-ES	Comparison	NJHI-ES	Comparison	NJHI-ES	Comparison	NJHI-ES	Comparison
2004	0.70	0.84	0.53	0.72	0.33	0.34	0.35	0.61
2005	0.77	0.90	0.79	0.77	0.27	0.37	0.84	0.65
2006	0.92	0.93	0.74	0.76	0.48	0.38	0.88	0.85
2007	0.92	0.94	0.73	0.86	0.46	0.50	0.90	0.93
2008	0.98	0.96	0.88	0.89	0.77	0.64	0.98	0.94
2009	0.97	0.96	0.91	0.88	0.91	0.67	0.99	0.98

Multivariate Analysis. Results of multiple regression analyses show a positive program impact in two measures, LVF assessment and discharge instructions (Table 2.3). Regression findings for ACE/ARB and smoking-cessation indicators fail to find a program impact. The LVF finding, while statistically significant, is quite small, indicating that the average NJHI-ES hospitals improved by 3.38 percentage points more than the corresponding change among comparison hospitals from the pre-to-post intervention period, adjusting for selected hospital characteristics. Discharge instruction score improvement attributable to NJHI-ES appears to be more clinically significant. The model estimates that NJHI-ES hospitals average scores were 13.4 percentage points higher than comparison hospitals during 2007–09.

Table 2.3: Multiple Regression Results

	Number of observations	Difference-in-differences coefficient	Standard error	t-statistic	p-value	95% confidence interval	
LVF scores	355	0.0338	0.0128	2.63	0.027	0.0047	0.0628
ACEI/ARB scores	355	-0.0011	0.0167	-0.07	0.950	-0.0388	0.0366
Discharge instruction scores	349	0.1337	0.0437	3.06	0.014	0.0349	0.2325
Smoking cessation counseling scores	348	-0.0787	0.0397	-1.99	0.078	-0.1685	0.0110

Readmissions and Emergency Department Use After Discharge

This section examines rates of inpatient readmission and emergency department (ED) use following discharge among CHF patients overall and by race and ethnicity for participant hospitals compared to nonparticipant hospitals in New Jersey. Ultimately, high quality care for CHF patients should reduce readmission rates and rates of ED visits (without admission) after an initial hospitalization. These measures are important indicators of program effectiveness in general and on the program’s focus on patient education and discharge planning in particular. The inpatient readmission rate is a widely used as an indicator of hospital performance, and these rates are now subject to public disclosure and reimbursement policy. If the intervention is effective, then readmission and ED use rates will decline following the program implementation in participating hospitals relative to changes in these rates among nonparticipants.

Methods

In collaboration with the Center for Health Statistics (CHS) of NJDHSS, we used NJ uniform billing (UB) data to analyze the effect of NJHI-ES on hospital readmissions and return the ED (without admission). All CHF patients with an initial admission for CHF (referred to as the index admission) were identified from 2002 to 2009. We used data from 2001 to verify that the admissions classified as index admissions for 2002 were not preceded by an earlier admission in 2001. Using confidential patient identifiers (e.g., names, Social Security numbers), CHS created a file that links each index admission to all subsequent hospital inpatient or ED use at any New Jersey hospital. CHS also linked information from death records to the readmission files. CHS then provided CSHP a de-identified file (i.e., with confidential identifiers removed) that allows longitudinal analysis of patient utilization. We then calculated six primary outcome measures:

- 30-day all-cause readmission
- 30-day CHF readmission
- 90-day all-cause readmission
- 90-day CHF readmission
- 30-day all-cause return ED visit
- 90-day all-cause return ED visit

We also considered 30- and 90-day return ED visits specifically for CHF but found that these visits occurred too infrequently to support reliable analysis.

Although NJHI-ES was not expected to affect patient mortality from CHF, patients who die soon after discharge are not subject to readmission or return to the ED, confounding the analysis. Therefore, patients who died within 30 or 90 days of discharge of the index admission were excluded from analysis of the respective measures. We also included analysis of 30-day and 90-day mortality as supplemental outcome measures.

To determine the impact of NJHI-ES, we first tabulated the trend in each outcome measure at program hospitals and all remaining (nonprogram) general acute care hospitals in New Jersey, which serve as a control group. Specifically, the average value for each hospital group is shown at six-month intervals for the study period 2002–09. We considered the second half (July-December) of 2007 to be the beginning of the intervention period. If NJHI-ES effectively reduced readmission and return to the ED rates, then average values for program hospitals should fall relative to the control hospitals following initiation of the intervention.

Our outcome measures may be affected by other factors such as patient severity that could differ between program and control hospitals and may change over time. Thus, we analyzed the outcome variables more thoroughly using multivariable regression models. Using the index admission as the unit of analysis, we estimated a linear probability model to predict the likelihood of each outcome (e.g., readmission within 30 days) within the difference-in-differences (DD) framework used widely in econometric analysis of health programs and policies (Monheit et al. 2011; Monheit and Steinberg Schone 2004; Buchmueller and DiNardo 2002). Using this framework, we calculated the change in each outcome variable from the pre-intervention to the post-intervention period for index admissions at program hospitals and did the same for index admissions at control hospitals. We identified the NJHI-ES program effect by subtracting the change in control hospitals from the change in program hospitals. If NJHI-ES hospitals were effective at reducing readmissions and return ED visits, then the DD parameter in our modeling should be negative and statistically significant.

In our modeling, we controlled for a variety of patient characteristics including age, sex, race/ethnicity, insurance coverage, a linear time trend, and the Charlson co-morbidity index. To account for the nesting of patient index admissions within hospitals, we included hospital-level

fixed effects and estimated standard errors with an adjustment for within-hospital clustering of observations using STATA 11.1.

Many NJHI-ES hospitals have placed special emphasis on specific patient subgroups in their efforts to reduce CHF readmissions. To determine whether the program had different effects across subpopulations, we conducted additional analyses for the following groups of CHF patients:

- Expected payer Medicaid or self (i.e., uninsured)
- Expected payer Medicare
- Expected payer private
- Black, non-Hispanic patients
- Hispanic patients

Findings

Figure 3.1 shows the unadjusted trend in 30-day all-cause readmission rates for CHF index admissions in NJHI-ES and control (nonparticipating) hospitals in New Jersey. Although there is a slight decrease in these readmissions during the post-intervention period, the decline is small and similar for patients in both groups of hospitals. Figures 3.2 to 3.6 show the corresponding trends for the remaining five outcome measures. These trends convey similar information—i.e., there are slight declines in readmissions and return ED visits during the post-intervention period but trends are not different between patients in program and control hospitals.

Figure 3.1: 30-Day All-Cause Readmissions, NJHI-ES and Control Hospitals

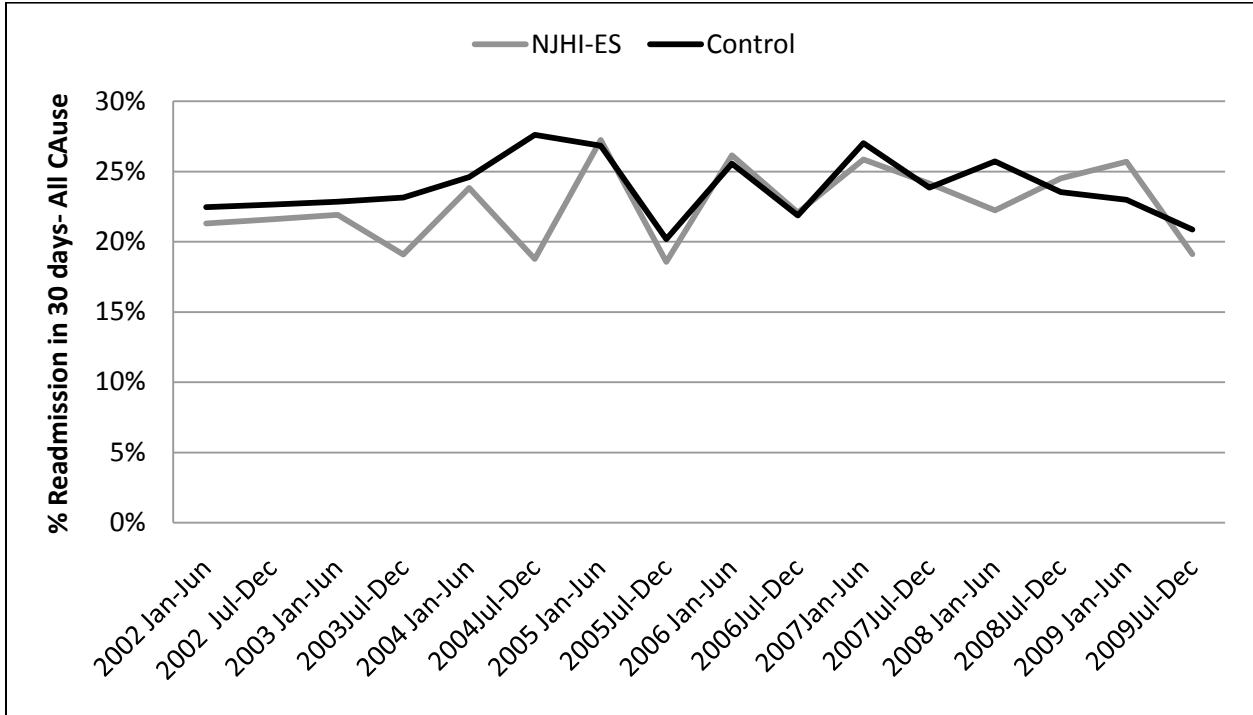


Figure 3.2: 90-Day All-Cause Readmissions, NJHI-ES and Control Hospitals

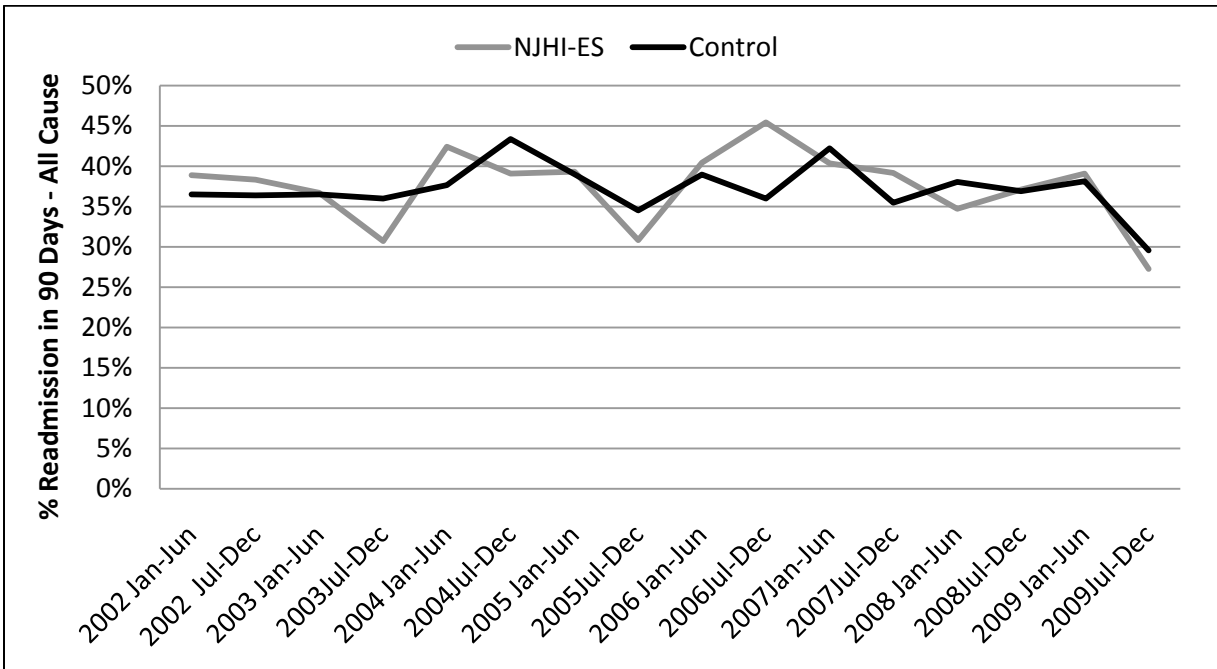


Figure 3.3: 30-Day CHF-Specific Readmissions, NJHI-ES and Control Hospitals

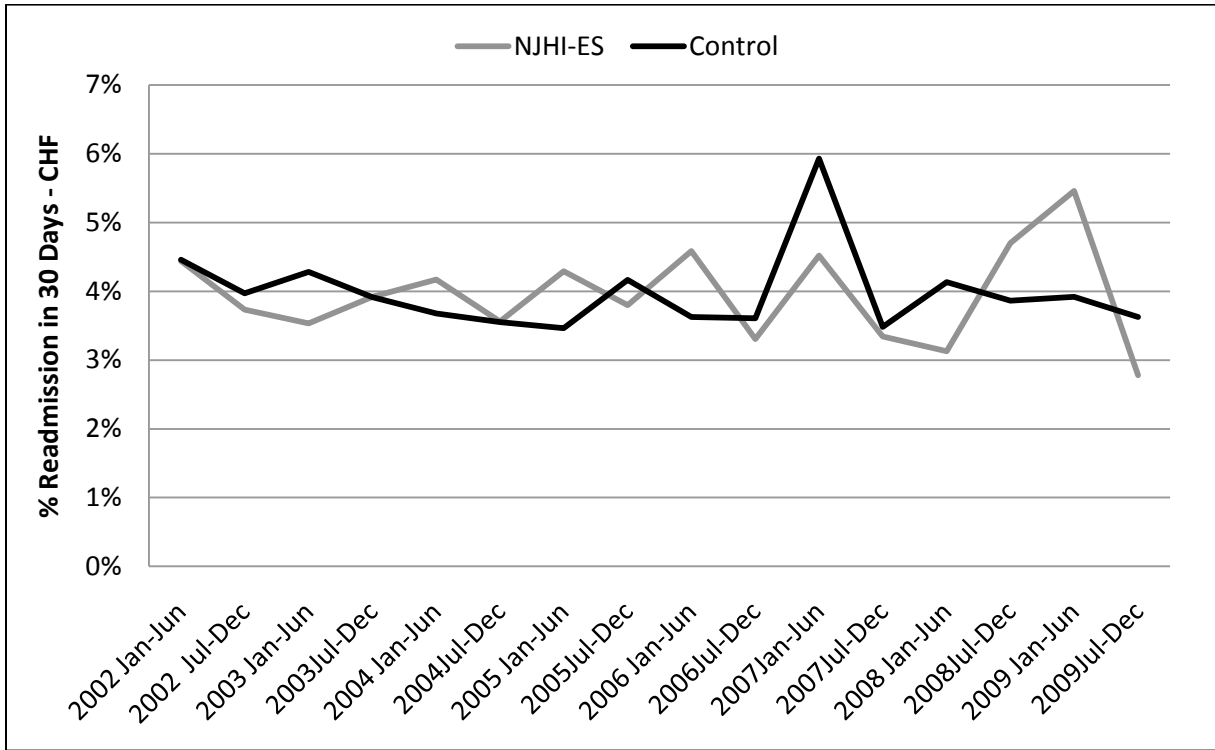


Figure 3.4: 90-Day CHF-Specific Readmissions, NJHI-ES and Control Hospitals

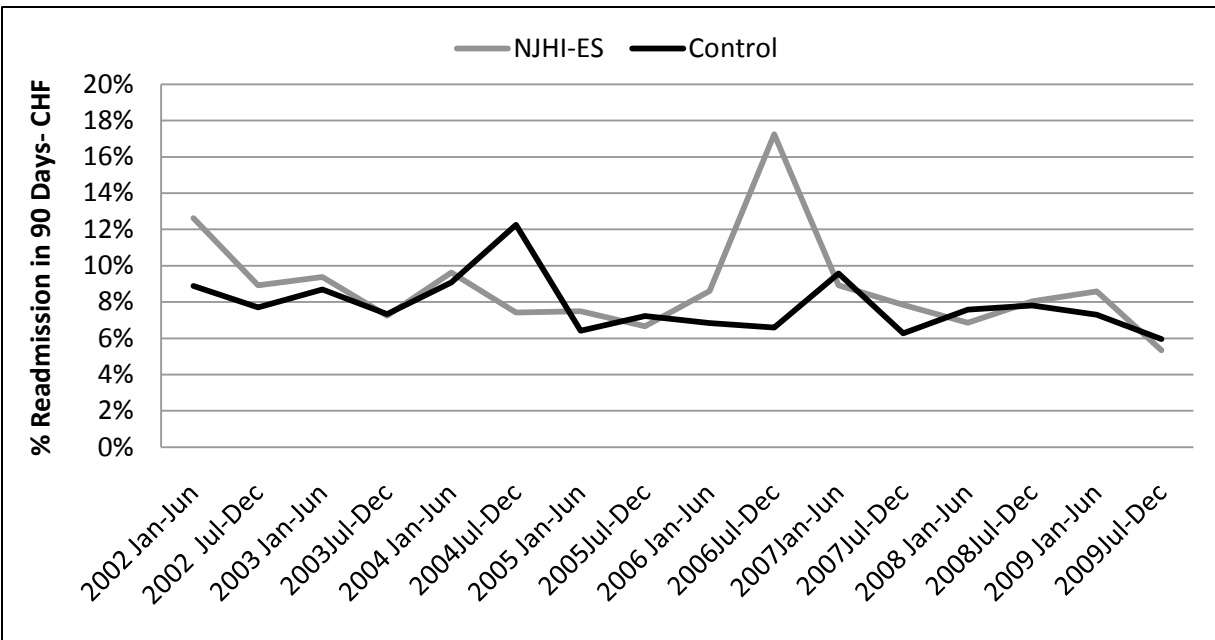


Figure 3.5: 30-Day All-Cause Return to the Emergency Department, NJHI-ES and Control Hospitals

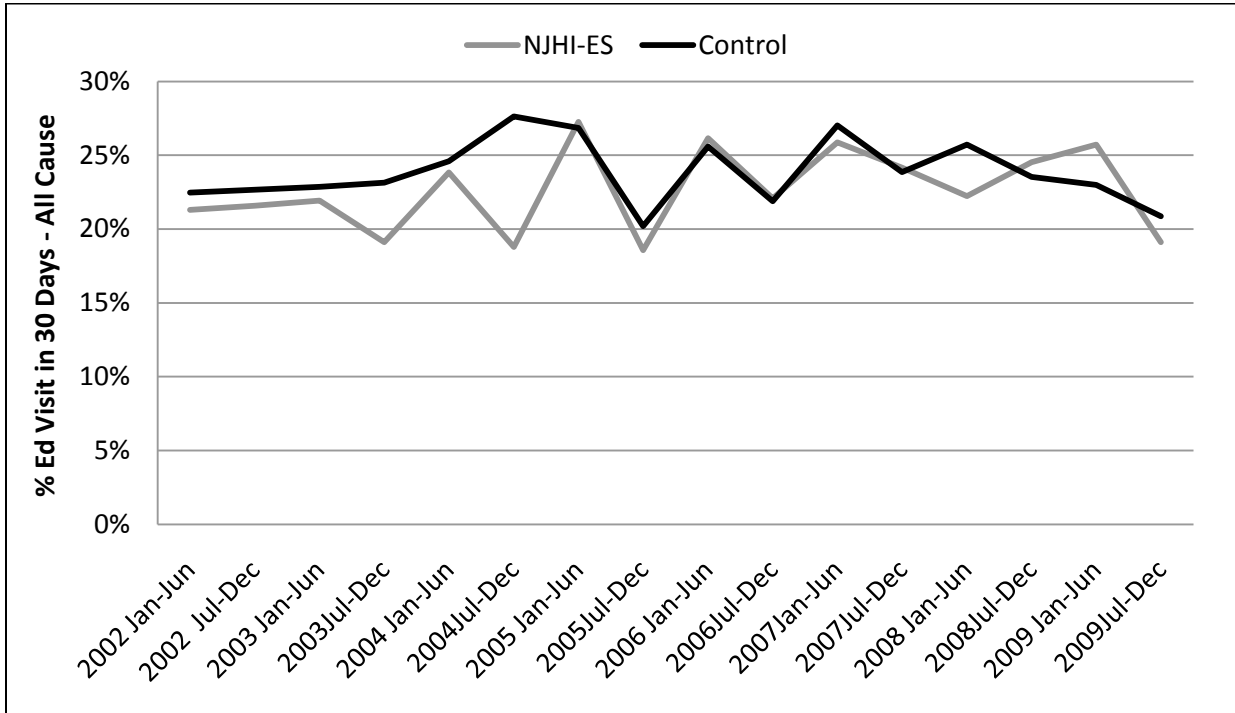


Figure 3.6: 90-Day ED All-Cause Return to the Emergency Department, NJHI-ES and Control Hospitals

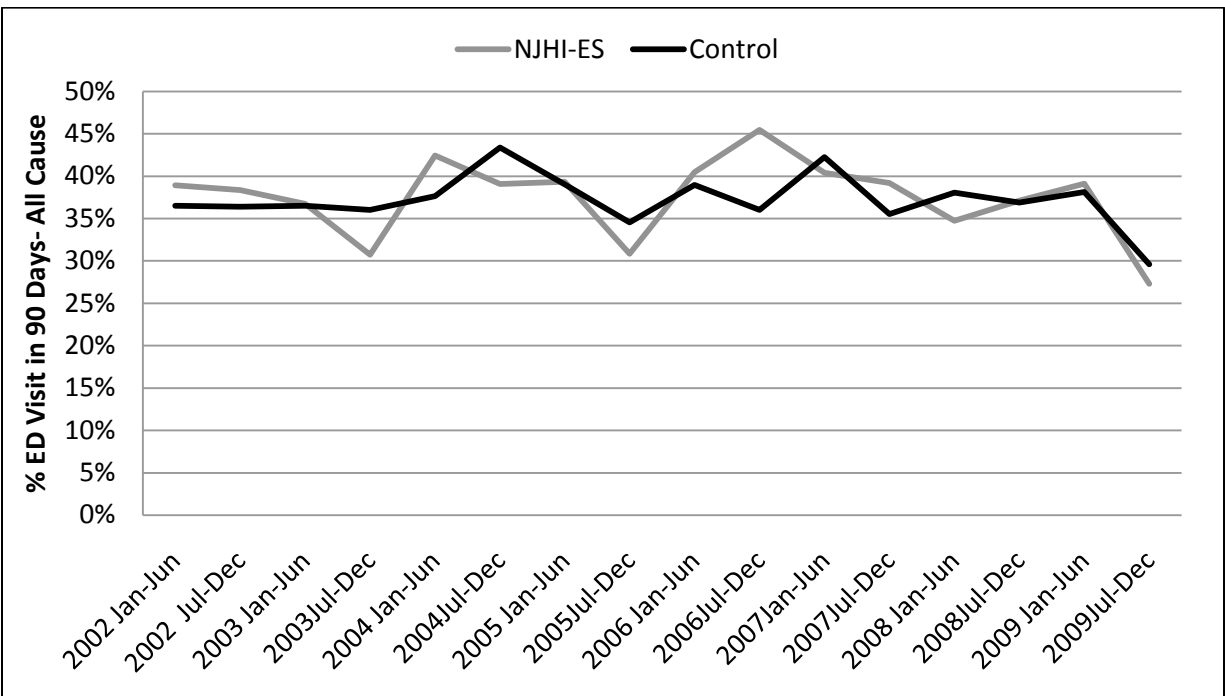


Table 3.1 shows the results of our DD analysis for 30-day all-cause and CHF-specific readmissions. Controlling for the potentially confounding factors listed above, the direction of program effects (i.e., the negative sign on the DD parameter) is consistent with a small reduction in the likelihood of all-cause readmission attributable to program participation. In other words, the DD estimate of - 0.0021 is consistent with a reduction attributable to program participation of 2.1 readmissions within 30 days per 1,000 index admissions for CHF. This difference is, however, not statistically significant. The remaining coefficients in the table are interpreted similarly. All but one of the DD coefficients in Table 3.1 is negative, which is consistent with the hypothesis that the program reduces readmissions. Nevertheless, many of the coefficients are small in magnitude and none is statistically significant at the conventional 5% level. As a result, we cannot rule out the possibility that the program had no effect on 30-day readmissions.

Table 3.1: Multiple Regression Results, 30-Day Readmissions

30-Day all cause readmission	Number of observations	Difference-in-differences coefficient	Standard error	t-stat.	p-value	95% Confidence interval	
Overall	510,258	-0.0021	0.0125	-0.1700	0.8670	-0.0269	0.0227
Medicaid/uninsured	44,299	0.0134	0.0521	0.2600	0.7980	-0.0903	0.1170
Medicare	377,838	-0.0010	0.0142	-0.0700	0.9450	-0.0292	0.0272
Private	83,010	-0.0238	0.0252	-0.9500	0.3470	-0.0738	0.0262
Non-Hispanic black	71,909	-0.0501	0.0524	-0.9600	0.3410	-0.1542	0.0540
Hispanic	42,888	-0.0131	0.0295	-0.4500	0.6570	-0.0717	0.0454
30-Day CHF Readmission							
Overall	510,258	-0.0205	0.0151	-1.3600	0.1780	-0.0506	0.0095
Medicaid/uninsured	44,299	-0.0248	0.0179	-1.3900	0.1690	-0.0603	0.0107
Medicare	377,838	-0.0231	0.0185	-1.2500	0.2140	-0.0598	0.0136
Private	83,010	-0.0144	0.0083	-1.7500	0.0840	-0.0308	0.0020
Non-Hispanic black	71,909	-0.1153	0.0808	-1.4300	0.1570	-0.2759	0.0452
Hispanic	42,888	-0.0217	0.0120	-1.8100	0.0730	-0.0456	0.0021

We found stronger evidence of a program impact in 90-day readmissions. Table 3.2 shows the results of our DD analysis for 90-day all-cause and CHF readmission. Overall, the program is associated with a reduction of 58.5 all-cause readmissions per 1,000 index admissions. This association is statistically significant at the 5% level. A similar association is found in subgroup analyses but none meets the 5% significance threshold, possibly due to smaller sample sizes available for each subgroup.

NJHI-ES participation is also associated with a reduction of 32.3 CHF-specific readmissions per 1,000 index admissions (Table 3.2). This association is statistically significant at the 5% level. Among the subgroups, only Medicare shows a statistically significant reduction in CHF readmissions.

Table 3.2: Multiple Regression Results, 90 Day Readmissions

90-Day all cause readmission	Number of observations	Difference-in-differences coefficient	Standard error	t-stat.	p-value	95% Confidence interval	
Overall	503,231	-0.0585	0.0271	-2.1600	0.0340	-0.1124	-0.0047
Medicaid/uninsured	44,087	-0.1618	0.0975	-1.6600	0.1000	-0.3555	0.0319
Medicare	371,761	-0.0310	0.0255	-1.2100	0.2280	-0.0817	0.0198
Private	82,303	-0.0474	0.0414	-1.1400	0.2560	-0.1297	0.0349
Non-Hispanic black	71,229	-0.1413	0.0744	-1.9000	0.0610	-0.2892	0.0065
Hispanic	42,459	-0.0203	0.0445	-0.4600	0.6500	-0.1088	0.0682
90-Day CHF readmission							
Overall	503,231	-0.0323	0.0158	-2.0500	0.0430	-0.0636	-0.0010
Medicaid/uninsured	44,087	0.0012	0.0391	0.0300	0.9750	-0.0765	0.0790
Medicare	371,761	-0.0466	0.0228	-2.0500	0.0430	-0.0919	-0.0014
Private	82,303	-0.0105	0.0120	-0.8700	0.3860	-0.0343	0.0134
Non-Hispanic black	71,229	-0.1179	0.0630	-1.8700	0.0650	-0.2432	0.0075
Hispanic	42,459	-0.0282	0.0198	-1.4300	0.1570	-0.0676	0.0111

Like 30-day readmission rates, return to the ED following CHF discharge following program implementation point “in the right direction” but generally do not achieve conventional levels of statistical significance. In all but one case, return ED visits within 30-days were less likely when the index admission occurred at an NJHI-ES hospital but none of the associations is statistically significant at the 5% level (Table 3.3). Similarly, return ED visits within 90 days are less likely within all patient groups examined when the index admission occurred at a program hospital, but again none of the associations is statistically significant at the 5% level.

Finally, we observe negative associations between the NJHI-ES program and CHF patient mortality at 30 or 90 days (Table 3.4). As expected, none of these associations, however, is statistically significant suggesting that the ES program had no impact on CHF patient mortality.

Table 3.3: Multiple Regression Results, 30-Day and 90-Day Return to ED Visits

30-Day ED visit	Number of observations	Difference-in-differences coefficient	Standard error	t-stat	p-value	95% Confidence interval	
Overall	510,371	-0.0021	0.0125	-0.1700	0.8650	-0.0269	0.0226
Medicaid/uninsured	44,299	0.0134	0.0521	0.2600	0.7980	-0.0903	0.1170
Medicare	377,944	-0.0010	0.0142	-0.0700	0.9420	-0.0292	0.0271
Private	83,016	-0.0238	0.0252	-0.9500	0.3460	-0.0738	0.0261
Non-Hispanic black	71,915	-0.0501	0.0523	-0.9600	0.3410	-0.1541	0.0539
Hispanic	42,892	-0.0131	0.0295	-0.4500	0.6560	-0.0717	0.0454
90-Day ED visit							
Overall	503,344	-0.0584	0.0271	-2.1600	0.0340	-0.1122	-0.0046
Medicaid/uninsured	44,087	-0.1618	0.0975	-1.6600	0.1000	-0.3555	0.0319
Medicare	371,867	-0.0309	0.0255	-1.2100	0.2290	-0.0815	0.0198
Private	82,309	-0.0473	0.0414	-1.1400	0.2560	-0.1296	0.0349
Non-Hispanic black	71,235	-0.1414	0.0744	-1.9000	0.0600	-0.2891	0.0064
Hispanic	42,463	-0.0204	0.0445	-0.4600	0.6480	-0.1088	0.0680

Table 3.4: Multiple Regression Results, 30-Day and 90-Day Mortality

30-Day mortality	Number of observations	Difference-in-differences coefficient	Standard error	t-stat	p-value	95% Confidence interval	
Overall	535,679	-0.0029	0.0043	-0.6800	0.5000	-0.0113	0.0056
Medicaid/uninsured	45,252	-0.0010	0.0057	-0.1700	0.8680	-0.0123	0.0104
Medicare	399,207	-0.0055	0.0046	-1.1800	0.2410	-0.0147	0.0037
Private	85,939	-0.0039	0.0066	-0.6000	0.5500	-0.0170	0.0091
Non-Hispanic black	73,809	-0.0045	0.0029	-1.5300	0.1300	-0.0102	0.0013
Hispanic	44,239	-0.0078	0.0105	-0.7500	0.4570	-0.0286	0.0130
90-Day mortality							
Overall	535,679	-0.0028	0.0064	-0.4400	0.6620	-0.0154	0.0098
Medicaid/uninsured	45,252	-0.0045	0.0085	-0.5200	0.6020	-0.0214	0.0125
Medicare	399,207	-0.0035	0.0074	-0.4700	0.6360	-0.0182	0.0112
Private	85,939	-0.0060	0.0091	-0.6600	0.5110	-0.0240	0.0120
Non-Hispanic black	73,809	-0.0026	0.0053	-0.4900	0.6230	-0.0131	0.0079
Hispanic	44,239	-0.0138	0.0146	-0.9500	0.3440	-0.0427	0.0151

Conclusion

The New Jersey Health Initiatives Expecting Success: Excellence in Cardiac Care (NJHI-ES) initiative was designed to support hospital projects with the goal of reducing health disparities and improving the quality of health care provided to minority inpatient populations in selected New Jersey communities. Specifically, the program developed a learning network of hospitals in New Jersey to demonstrate best practices for improving inpatient treatment of patients diagnosed with congestive heart failure (CHF) and developed data systems that will identify and track the progress of these patients over time.

Most project directors reported in a confidential survey conducted at the end of the grant period that participation in this program greatly or modestly exceeded their expectations. Meeting one important program goal, most project directors reported extensive and expanded use of preferred language and gathering race/ethnicity data during their programs. Many also reported improved data quality. The survey also shows that NJHI-ES projects developed an extensive array of programmatic activities, including use of the Get With the Guidelines program, employing advanced practice nurses, and applying a variety of care-management strategies. The survey reveals a high level of satisfaction with these resources.

Using rigorous statistical techniques, the evaluation reveals positive program impacts on some of the process and outcome measures examined. CMS process measures for CHF improved for both NJHI-ES and comparison hospitals for the period before and during the program, in many cases reaching process objectives more than 95% of the time. Nevertheless, multivariate analysis controlling for hospital and patient characteristics shows statistically significant improvements over comparison hospitals in two of four measures: adherence to recommended care guidelines for evaluation of left ventricular function (LVF) and complete discharge instructions. While significant, the LVF score improvement attributable to NJHI-ES participation is small, but a larger “program effect” is found for discharge instruction scores. For this measure, NJHI-ES hospitals achieved the recommended care goal 13.4 percentage points more often than comparison hospitals.

In addition, we observed some significant improvements in hospital readmission and “treat-and-release” visits to the emergency department (ED) following an initial discharge among CHF patients. While no program impact is evident at 30-days post discharge, multivariate models controlling for patient case mix and hospital characteristics showed significant program effects on both measures at 90 days post discharge. Improvements appear to be clinically meaningful as well as statistically significant. For example, program participation was associated with a reduction of 58.5 all-cause readmissions per 1,000 CHF index admissions. Subgroup analyses generally do not uncover significant program effects for most measures, possibly because subgroups may be too small to detect differences. Nevertheless, subgroup analysis suggests (often without conventional levels of statistical significance) that the program

benefited Medicare and non-Hispanic black patients. As expected, we observed no impact on mortality rates.

The observed relationships between program participation and process and outcome metrics in careful multivariate analysis provide compelling evidence that the program did, in fact, achieve its intended impact. This conclusion is strengthened when viewed in conjunction with information from project directors about where and how they committed program resources. Specifically, the end-of-grant director survey shows that considerable emphasis was placed on patient education and care management in the transition from hospital to the community. It is reasonable, then, that we observed significant improvement in discharge instruction scores and readmission rates. It is less clear why reductions in readmissions were evident at 90-days post discharge but not at 30 days.

The evaluation has limitations that should be noted. First, only a single end-of-grant project director survey was used to measure program engagement and activities. A more in-depth process evaluation would likely have provided a more nuanced description of program implementation successes and challenges. Second, available data did not permit the evaluation to focus on individual patients targeted by intervention activities; rather it focused mainly on hospital-wide averages. NJHI-ES impacts on the patients most engaged in program activities are likely to have been substantially greater than average program effects. In spite of this limitation, we found significant program impacts using rigorous statistical techniques.

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Appendix A: Participating Hospitals—NJHI-ES

AtlantiCare Regional Medical Center, Atlantic City, Atlantic County

Christ Hospital, Jersey City, Hudson County

Cooper Health System, Camden, Camden County

East Orange General Hospital, East Orange, Essex County

Newark Beth Israel Medical Center, Newark, Essex County

Palisades Medical Center, North Bergen, Hudson County

St Joseph's Hospital and Medical Center, Paterson, Passaic County

South Jersey Regional Medical Center, Vineland, Cumberland County

Trinitas Regional Medical Center, Elizabeth, Union County

University of Medicine and Dentistry of New Jersey—University Hospital, Newark, Essex County

Appendix B: Confidential Project Director Close-of-Grant Survey

NJHI Expecting Success: Excellence in Cardiac Care (NJHI-ES) Confidential Project Director Close-of-Grant Survey

OVERVIEW AND PURPOSE

The Center for State Health Policy at Rutgers is evaluating the New Jersey Health Initiatives Expecting Success: Excellence in Cardiac Care initiative. Much of the evaluation will be based on publically available data, such as CMS core measures and NJ hospital discharge data. Data from this **Close-of-Grant Survey** will help us understand – from the perspectives of NJHI-ES grantees – the value of the elements of this multi-faceted program.

As you know, the overarching goal of NJHI-ES is to improve cardiac care for African Americans and Latinos in New Jersey. It aimed to do so by developing effective and replicable quality-improvement strategies, models and resources. Ultimately, NJHI-ES seeks to spread the strategies and lessons of the program to additional clinical areas and disseminate program lessons broadly to policy and provider audiences.

CONFIDENTIALITY

Your participation in the Close-of-Grant Survey is **voluntary and confidential**. The Rutgers evaluation team will aggregate responses across the 10 NJHI-ES grantees and prepare a summary report. **Our report will include only aggregated information and no individual survey respondents or hospitals will be associated with specific responses.** Further, individual survey responses will not be shared with the NJHI program office, grantee hospitals, the Robert Wood Johnson Foundation, or anyone else outside of the Rutgers evaluation team.

INSTRUCTIONS

Please provide your candid responses to all of the questions that follow. Feel free to add comments or explanations of your answers next to the questions provided. If you have any questions about the Survey, please contact Manisha Agrawal, Research Analyst, at the Center for State Health Policy. Manisha can be reached at magrawal@ifh.rutgers.edu or 732-932-4631. The principal investigator for the NJHI-ES evaluation is Joel Cantor, he can be reached at jcantor@ifh.rutgers.edu or 732-932-4653. **Please return the survey in the enclosed postage paid envelop (or see address on last page) by April 8, 2009.**

March 30, 2009

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1) Please **rate the value** of each of the following **NJHI-ES program resources** to your efforts to improve **heart failure** care during your grant (check one box per row)

	Lower Value		←————→		Higher Value
	1	2	3	4	5
a. Required NJHI-ES Heart Failure Improvement Plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Technical assistance provided by NJHA Quality Institute staff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. NJHI-ES List Serve	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Interactions with other NJHI-ES grantees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Get with the Guidelines sm (GWTG)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. NJHI Learning Network Workshops	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2) Please list any **other** NJHI-ES program resources that you found to be valuable:

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3) In general, which of the following statements best describes the **completeness and accuracy** of patient **race and ethnicity** data collected by your hospital? (check one box)

- Race/ethnicity data were good before NJHI-ES began, so improvement was not needed
- My hospital had problems collecting complete and accurate race/ethnicity data before NJHI-ES began, but data collection has significantly improved as a result of participation in the program
- My hospital had problems collecting complete and accurate race/ethnicity data before NJHI-ES began, and most of those problems continue today
- None of the above (explain: _____)

4) How often does your hospital **accurately record the preferred language** of patients? (check one box)

- Usually or always
- Sometimes
- Rarely
- Never (skip to question #5 below)
- Unknown (skip to question #5 below)

4a) How often are data on patients' **preferred language** used in **heart failure quality measurement and improvement** at your hospital? (check one box)

- Usually or always
- Sometimes
- Rarely
- Never

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4b) How often are data on patients' **preferred language** used in **quality measurement and improvement for diagnoses other than heart failure** at your hospital? (check one box)

- Usually or always
- Sometimes
- Rarely
- Never

5) How often are patient **race/ethnicity** data used in **heart failure quality measurement and improvement** at your hospital? (check one box)

- Usually or always
- Sometimes
- Rarely
- Never

6) How often are patient race/ethnicity data used in **quality measurement and improvement for diagnoses other than heart failure** at your hospital? (check one box)

- Usually or always
- Sometimes
- Rarely
- Never

7) To what extent, if at all, did the **use of race/ethnicity data** in quality measurement and improvement change as a result of your **participation in NJHI-ES?** (check the one best answer)

- Race/ethnicity data used **much more often**
- Race/ethnicity data used **a little more often**
- Use of race/ethnicity data has **not changed**
- Race/ethnicity data used **less often**

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8) Did your hospital use **Get With the Guidelinessm** in quality improvement efforts for **heart failure** before your NJHI-ES grant?

- Yes, used GWTG before NJHI-ES
- No, did not use GWTG before NJHI-ES

9) Please rate the extent to which your use of **Get With the Guidelinessm** in quality improvement efforts for **heart failure** met your **expectations?** (check one box)

- Greatly exceeded expectations
- Modestly exceeded expectations
- Met expectations
- Modestly fell short of expectations
- Greatly feel short of expectations

10) Please list the three most important **benefits** of and **problems** with using **Get With the Guidelinessm** in quality improvement efforts for **heart failure**.

Most Important <u>Benefits</u> of using GWTG	Most Important <u>Problems</u> with using GWTG
1.	1.
2.	2.
3.	3.

11) Following the **end of your NJHI-ES grant**, to what extent will your hospital use **Get With the Guidelinessm** in quality improvement efforts for **heart failure**? (check one box)

- Will expand the use of GWTG after the grant
- Continue to use GWTG about the same as during the grant
- Will continue to use GWTG, but less intensively after the grant
- Will no longer use GWTG for heart failure after the grant

12) Does your hospital use **Get With the Guidelinessm** for **stroke** or **coronary artery disease** (check one box per row and enter date, if applicable)?

	GWTG <u>not</u> used for this condition	GWTG <u>is</u> used for this condition	Month and Year began using GWTG for this condition (best estimate is fine)
Stroke	<input type="checkbox"/>	<input type="checkbox"/> ➡	___ / ___
Coronary Artery Disease	<input type="checkbox"/>	<input type="checkbox"/> ➡	___ / ___

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13) How many **full-time equivalent nurse practitioners (NP) or other advance practice nurses (APN)** worked as part of your NJHI-ES project? (enter FTE count below, exclude time spent in other duties)

← # FTEs (If none, enter '0' and skip to Question #13)

13a) Please list the major the **roles and responsibilities of the NPs/APNs** in the care of heart failure patients during the NJHI-ES project.

13b) In what **settings** did the **NPs/APNs** on the NJHI-ES grant work with patients and their caregivers?
(check all that apply)

- Emergency department
- Inpatient settings
- By telephone following discharge
- In-person visits following discharge
- Contact with patients' community cardiologist or other physician
- Other (specify: _____)

13c) How often did the **NPs/APNs** on the NJHI-ES grant also work with **patients' family members**? (check one box)

- Usually or always
- Sometimes
- Rarely
- Never

13d) After the end of your NJHI-ES grant, to what extent will the NPs/APNs continue to be involved in the care of **heart failure** patients? (check one box)

- Continue in the same roles
- Roles will be entirely eliminated
- Roles will be change (describe below)

Duties to be reduced/eliminated: _____

Duties to be increased/added: _____

14) Please indicate which **care management strategies or tools** were before, during, and after your NJHI-ES project (answer parts a-c below):

Care management strategies/tools used with heart failure patients ...	a. Did you use each strategy/tool for heart failure before NJHI-ES, was adopted during the program, or has it not been used at all? (Check one box per row)			b. Do you plan to use this strategy/tool for heart failure after your NJHI-ES grant ? (Yes/No)	c. Did your NJHI-ES experience lead your hospital to adopt this strategy/tool for other (not HF) diagnoses ? (Yes/No)
	Used before NJHI-ES	Adopted during NJHI-ES	Not Used		
a. Standard/Standing orders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
b. NP/APN care managers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
c. Medication reconciliation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
d. Patient education materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
e. Patient education groups	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
f. Discharge check list procedure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
g. Post-discharge follow-up	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Other strategies (specify below)...					
h.	<input type="checkbox"/>	<input type="checkbox"/>			
i.	<input type="checkbox"/>	<input type="checkbox"/>			
j.	<input type="checkbox"/>	<input type="checkbox"/>			

Note: If needed, add additional pages to list other care management strategies/tools

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15) Please indicate the extent to which **participation in NJHI-ES** met your expectations:

- Greatly exceeded expectations
- Modestly exceeded expectations
- Met expectations
- Modestly fell short of expectations
- Greatly fell short of expectations

16) What is the **title of the most senior** hospital or medical staff official who served as the “**senior sponsor**” of the NJHI-ES project (e.g., CEO, CNO, CMO, other clinical leader, etc.):

Title: _____

17) Please indicate whether and how often each of the following has been **briefed on the progress and outcomes** of your NJHI-ES project? (check one box per row)

	Briefed Monthly or More Frequently	Briefed Several Times During Project	Briefed Once or Twice	Not Briefed, but Have Briefing Planned	Never Briefed/No Plans at This Time
Hospital CEO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hospital CMO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality Improvement committee of Hospital Board of Trustees/Directors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Full Medical Staff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Full Nursing Department	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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18) Please provide any other comments or reflections on the value of NJHI-ES for patients at your hospital:

THANK YOU

Return Questionnaire to:

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