

ADULT CARDIAC SURGERY

in New York State

2011-2013



**Department
of Health**

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INTRODUCTION

For over twenty years, the NYS Cardiac Data Reporting System has been a powerful resource for quality improvement in the areas of cardiac surgery and percutaneous coronary interventions (PCI). Building on this strong foundation, we are pleased to include in one report information on mortality after coronary artery bypass graft (CABG) surgery and valve repair or replacement surgery, readmissions after CABG, and preliminary information on transcatheter aortic valve replacement (TAVR) in NYS.

New York State (NYS) has taken a leadership role in setting standards for cardiac services, monitoring outcomes and sharing performance data with patients, hospitals and physicians. Hospitals and doctors involved in cardiac care have worked in cooperation with the NYS Department of Health (Department of Health) and the NYS Cardiac Advisory Committee (Cardiac Advisory Committee) to compile accurate and meaningful data that can and have been used to enhance quality of care. We believe that this process has been instrumental in achieving the excellent outcomes that are evidenced in this report for centers across NYS.

The information contained in this report is intended for health care providers, patients and families of patients who are considering cardiac surgery. It includes:

- Mortality rates, adjusted for patient severity of illness, for CABG surgery and valve repair or replacement surgery at NYS hospitals.
- Readmission rates, adjusted for patient severity of illness, following CABG at NYS hospitals.
- Mortality rates, adjusted for patient severity of illness, following CABG for surgeons performing the procedure.
- Volume (number of cases) of all cardiac surgery for NYS hospitals and surgeons.
- Volume (number of cases) of TAVR at NYS hospitals.
- Description of the patient risk factors associated with mortality for CABG and valve surgery and those associated with readmissions after CABG surgery.

The data that serve as the basis for this report are collected by the NYS Department of Health cooperatively with hospitals throughout the state. Careful auditing and rigorous analysis assure that these reports represent meaningful outcome assessments. The report was developed with clinical guidance from the NYS Cardiac Advisory Committee, an advisory body to the Commissioner of Health consisting of nationally recognized cardiac surgeons, cardiologists and others from related disciplines working both in New York State and elsewhere. The Cardiac Advisory Committee is to be commended for sustained leadership in these efforts.

As they develop treatment plans, we encourage doctors to discuss this information with their patients and colleagues. While these statistics are an important tool in making informed health care choices, individual treatment plans must be made by doctors and patients together after careful consideration of all pertinent factors. It is important to recognize that many factors can influence the outcome of cardiac surgery. These include the patient's health before the procedure, the skill of the operating team and general after-care. In addition, keep in mind that the information in this booklet does not include data after 2013. Important changes may have taken place in hospitals during that time period.

It is important that patients and physicians alike give careful consideration to the importance of healthy lifestyles for all those affected by heart disease. While some risk factors, such as heredity, gender and age cannot be controlled, others certainly can. Controllable risk factors that contribute to a higher likelihood of developing coronary artery disease are high cholesterol levels, cigarette smoking, high blood pressure, obesity and sedentary lifestyle. Careful attention to these risk factors after surgery will continue to be important in promoting good health and preventing recurrence of disease.

Hospitals and physicians in NYS can take pride in the excellent patient care provided and in their role in contributing to this unique collaborative quality improvement system. The Department of Health will continue to work in partnership with hospitals and physicians to ensure that continued high-quality cardiac surgery is available to NYS residents.

CORONARY ARTERY BYPASS GRAFT SURGERY (CABG)

Heart disease is the leading cause of death in NYS, and the most common form of heart disease is atherosclerotic coronary artery disease. Different treatments are recommended for patients with coronary artery disease. For some people, changes in lifestyle, such as dietary changes, not smoking and regular exercise, can result in great improvements in health. In other cases, medication prescribed for high blood pressure or other conditions can make a significant difference.

Sometimes, however, an interventional procedure is recommended. The two common procedures performed on patients with coronary artery disease are CABG surgery and percutaneous coronary intervention (PCI).

CABG surgery is an operation in which a vein or artery from another part of the body is used to create an alternate path for blood to flow to the heart muscle, bypassing the arterial blockage. Typically, a section of one of the large (saphenous) veins in the leg, the radial artery

in the arm or the mammary artery in the chest is used to construct the bypass. One or more bypasses may be performed during a single operation, since providing several routes for the blood supply to travel is believed to improve long-term success for the procedure. CABG surgery is one of the most common, successful major operations currently performed in the United States.

As is true of all major surgery, risks must be considered. The patient is totally anesthetized and there is generally a substantial recovery period in the hospital followed by several weeks of recuperation at home. Even in successful cases, there is a risk of relapse causing the need for another operation.

Those who have CABG surgery are not cured of coronary artery disease; the disease can still occur in the grafted blood vessels or other coronary arteries. In order to minimize new blockages, patients should continue to reduce their risk factors for heart disease.

CARDIAC VALVE PROCEDURES

Heart valves control the flow of blood as it enters the heart and is pumped from the chambers of the heart to the lungs for oxygenation and back to the body. There are four valves: the tricuspid, mitral, pulmonary and aortic valves. Heart valve disease occurs when a valve cannot open all the way because of disease or injury, thus causing a decrease in blood flow to the next heart chamber. Another type of valve problem occurs when the valve does not close completely, which leads to blood leaking backward into the previous chamber. Either of these problems causes the heart to work harder to pump blood or causes blood to back up in the lungs or lower body.

When a valve is stenotic (too narrow to allow enough blood to flow through the valve opening) or incompetent (cannot close tightly enough to prevent the backflow of blood), one of the treatment options is to repair the valve. Repair of a stenotic valve typically involves widening the valve opening, whereas repair

of an incompetent valve is typically achieved by narrowing or tightening the supporting structures of the valve. The mitral valve is particularly amenable to valve repairs because its parts can frequently be repaired without having to be replaced.

In many cases, defective valves are replaced rather than repaired, using either a mechanical or biological valve. Mechanical valves are built using durable materials that generally last a lifetime. Biological valves are made from tissue taken from pigs, cows or humans. Mechanical and biological valves each have advantages and disadvantages that can be discussed with referring physicians.

The most common heart valve surgeries involve the aortic and mitral valves. Patients undergoing heart surgery are totally anesthetized and are usually placed on a heart-lung machine, whereby the heart is stopped for a short period of time using special drugs. As is the case for CABG surgery, there is a recovery period of

several weeks at home after being discharged from the hospital. Some patients require replacement of more than one valve and some patients with both coronary artery disease and valve disease require valve replacement and CABG surgery. This report contains outcomes for the following valve surgeries when done alone or in combination with CABG: Aortic Valve Replacement, Mitral Valve Repair, Mitral Valve Replacement and Multiple Valve Surgery.

In recent years, a new technique for replacement of the aortic valve has been tested and approved for use in the United States under certain circumstances. This procedure, known as Transcatheter Aortic Valve Replacement (TAVR, also sometimes called Transcatheter Aortic Valve Implantation or TAVI), differs from traditional surgical valve replacement in that the replacement valve is delivered to the

heart through a catheter rather than through a standard surgical incision. The procedure is performed collaboratively by cardiologists and cardiac surgeons.

During the time-period included in this report (2011-2013), the procedure was performed relatively infrequently at a limited number of hospitals. The volume of cases in this time period is not large enough to adequately risk-adjust outcomes at the hospital or physician level. In the interest of providing some information about this emerging procedure while avoiding the risk of drawing invalid conclusions based on limited data, this report contains the volume of TAVR cases in 2013 for each hospital as well as the volume of cases for NYS and in-hospital / 30-Day mortality rate for all TAVR procedures performed in NYS in Table 5.

THE DEPARTMENT OF HEALTH PROGRAM

For many years, the Department of Health has been studying the effects of patient and treatment characteristics (called risk factors) on outcomes for patients with heart disease. Detailed statistical analyses of the information received from the study have been conducted under the guidance of the Cardiac Advisory Committee, a group of independent practicing cardiac surgeons, cardiologists and other professionals in related fields.

The results have been used to create a cardiac profile system which assesses the performance of hospitals and surgeons over time,

independent of the severity of each individual patient's pre-operative conditions.

Designed to improve health in people with heart disease, this program is aimed at:

- understanding the health risks of patients that adversely affect how they will fare in coronary artery bypass surgery and/or valve surgery;
- improving the results of different treatments of heart disease;
- improving cardiac care; and
- providing information to help patients make better decisions about their own care.

PATIENT POPULATION

This report is based on data for patients discharged between December 1, 2010, and November 30, 2013, provided by all non-federal hospitals in NYS where cardiac surgery is performed. The analysis period for this report includes patients discharged in December 2010 but not those discharged in December 2013. This strategy allows for more timely report publication by eliminating the need to track patients for 30-day mortality into the following calendar year. Inclusion of cases from

the previous December allows for meaningful comparison of 12-month volume as found in previous reports. The single year analysis for 2013 cases includes patients discharged from December 1, 2012 through November 30, 2013. In total there were 57,623 cardiac surgical procedures performed during this time period.

For various reasons, some of these cases are excluded from analysis in this report. The reasons for exclusion and number of cases affected are described below.

Records for 118 patients residing outside the United States were excluded because these patients could not be followed after hospital discharge. There were 12 cases excluded from analysis because each 30-day mortality can only be associated with a single cardiac surgery.

Beginning with patients discharged in 2006, the Department of Health, with the advice of the Cardiac Advisory Committee, began a trial period of excluding from publicly released reports any patients meeting the Cardiac Data System definition of pre-operative cardiogenic shock. Cardiogenic shock is a condition associated with severe hypotension (very low blood pressure). [The technical definition used in this report can be found on page 43.] Patients in cardiogenic shock are extremely high-risk, but for some, cardiac surgery may be their best chance for survival. Furthermore, the magnitude of the risk is not always easily determined using registry data. These cases were excluded after careful deliberation and input from NYS providers and others in an effort to ensure that physicians could accept these cases where appropriate without concern over a detrimental impact on their reported outcomes. In total, 569 cases with cardiogenic shock were removed from the data. This accounts for 0.99 percent of all cardiac surgeries (CABG, valve surgery and other cardiac surgery reported in this data system) in the three years.

After all of the above exclusions, there were 56,924 cardiac surgeries analyzed in this report. Isolated CABG surgery represented 43.81

percent of all adult cardiac surgery included in this report. Valve or combined valve/CABG surgery represented 39.02 percent of all adult cardiac surgery for the same period. TAVR represented 2.37 percent of all cardiac surgeries reported. Total cardiac surgery, isolated CABG, valve surgery and other cardiac surgery volumes are tabulated in Table 8 by hospital and surgeon for the period 2011 through 2013.

While there were 8,168 CABG cases included in the mortality analysis for 2013 discharges, some additional exclusions were required for the readmission analysis. Records belonging to patients residing outside NYS were excluded because there is no reliable way to track out-of state readmissions. This accounted for 287 cases. Another 127 patients were excluded because they died in the same admission as their index CABG, so readmission was impossible. Two patients were transferred after CABG and discharged from the second hospital in December, making them ineligible for 30-day follow-up.

In total, the number of exclusions was 416, leaving 7,755 cases to be examined for 30-day readmission rates.

Note on Hospitals Not Performing Cardiac Surgery During Entire 2011 – 2013 Period

Southside Hospital began performing cardiac surgery in February 2011. Millard Fillmore Hospital closed in 2013 and performed the last cardiac surgery in March of that year.

RISK ADJUSTMENT

FOR ASSESSING PROVIDER PERFORMANCE

Provider performance is directly related to patient outcomes. Whether patients recover quickly, experience complications, require another hospitalization, or die following a procedure is, in part, a result of the kind of medical care they receive. It is difficult, however, to compare outcomes across hospitals when assessing provider performance because different hospitals treat different types of patients. Hospitals with sicker patients may have higher rates of death and readmission than other hospitals in the state. The following describes how the Department of Health adjusts for patient risk in assessing provider outcomes.

Data Collection, Data Validation and Identifying In-Hospital/30-Day Deaths and 30-Day Readmission

As part of the risk-adjustment process, NYS hospitals where cardiac surgery is performed provide information to the Department of Health for each patient undergoing that procedure. Cardiac surgery departments collect data concerning patients' demographic and clinical characteristics. Approximately 40 of these characteristics (called risk factors) are collected for each patient. Along with information about the procedure, physician and the patient's status at discharge, these data are entered into a computer and sent to the Department of Health for analysis.

Data are verified through review of unusual reporting frequencies, cross-matching of cardiac surgery data with other Department of Health databases and a review of medical records for a selected sample of cases. These activities are extremely helpful in ensuring consistent interpretation of data elements across hospitals.

The analyses in this report base mortality on deaths occurring during the same hospital stay in which a patient underwent cardiac surgery and on deaths that occur after discharge but within 30 days of surgery.

An in-hospital death is defined as a patient who died subsequent to CABG or valve surgery during the same admission or was discharged to hospice care and expired within 30 days.

Deaths that occur after hospital discharge but within 30 days of surgery are also counted in the risk-adjusted mortality analyses. This is done because hospital length of stay has been decreasing and, in the opinion of the Cardiac Advisory Committee, most deaths that occur after hospital discharge but within 30 days of surgery are related to complications of surgery.

Data on deaths occurring after discharge from the hospital are obtained from the Department of Health, the New York City Department of Health and Mental Hygiene Bureau of Vital Statistics, and the National Death Index.

Data on readmissions are obtained from the Department of Health's acute care hospital dataset, the Statewide Planning and Research Cooperative System (SPARCS), which contains data pertaining to all acute care hospital discharges in the state.

Thirty-day readmission is defined as admission to a NYS non-Federal hospital within 30 days of discharge from the index hospitalization. For patients whose index hospitalization ends in transfer to another acute care facility, the 30 day period begins upon discharge from the second hospital.

Assessing Patient Risk

Each person who develops heart disease has a unique health history. A cardiac profile system has been developed to evaluate the risk of treatment for each individual patient based on his or her history, weighing the important health factors for that person based on the experiences of thousands of patients who have undergone the same procedures in recent years. All important risk factors for each patient are combined to create a risk profile. For example, an 80-year-old patient with renal failure requiring dialysis has a very different risk profile than a 40-year-old with no renal failure.

The statistical analyses conducted by the Department of Health consist of determining which of the risk factors collected are significantly related to death or readmission following CABG and/or valve surgery and

determining how to weigh the significant risk factors to predict the chance each patient will have of dying or being readmitted, given his or her specific characteristics.

Doctors and patients should review individual risk profiles together. Treatment decisions must be made by doctors and patients together after consideration of all the information.

Predicting Patient Mortality Rates for Providers

The statistical methods used to predict mortality on the basis of the significant risk factors are tested to determine whether they are sufficiently accurate in predicting mortality for patients who are extremely ill prior to undergoing the procedure as well as for patients who are relatively healthy. These tests have confirmed that the models are reasonably accurate in predicting how patients of all different risk levels will fare when undergoing cardiac surgery.

The mortality rate for each hospital and surgeon is also predicted using the relevant statistical models. This is accomplished by summing the predicted probabilities of death for each of the provider's patients and dividing by the number of patients. The resulting rate is an estimate of what the provider's mortality rate would have been if the provider's performance were identical to the state performance. The percentage is called the predicted or expected mortality rate (EMR). A hospital's EMR is contrasted with its observed mortality rate (OMR), which is the number of patients who died divided by the total number of patients.

Computing the Risk-Adjusted Mortality Rate

The risk-adjusted mortality rate (RAMR) represents the best estimate, based on the associated statistical model, of what the provider's mortality rate would have been if the provider had a mix of patients identical to the statewide mix. Thus, the RAMR has, to the extent possible, ironed out differences among providers in patient severity of illness, since it arrives at a mortality rate for each provider for an identical group of patients. To calculate the RAMR, the OMR is first divided by the provider's EMR. If the resulting ratio is larger than one, the provider has a higher mortality rate than expected on the basis of its patient

mix; if it is smaller than one, the provider has a lower mortality rate than expected from its patient mix. For isolated CABG patients the ratio is then multiplied by the overall statewide mortality rate of 1.84 percent (in-hospital/30-day mortality in 2013) to obtain the provider's RAMR. For the three-year period 2011-2013, the ratio is multiplied by 1.51 percent (in-hospital/30-day mortality rate) for isolated CABG patients or 3.45 percent (in-hospital/30-day mortality rate) for valve or valve/CABG patients.

There is no Statewide EMR or RAMR, because the statewide data is not risk-adjusted. The Statewide OMR (number of total cases divided by number of total deaths) serves as the basis for comparison for each hospital's EMR and RAMR.

Interpreting the Risk-Adjusted Mortality Rate

If the RAMR is significantly lower than the statewide mortality rate, the provider has a significantly better performance than the state as a whole; if the RAMR is significantly higher than the statewide mortality rate, the provider has a significantly worse performance than the state as a whole.

The RAMR is used in this report as a measure of quality of care provided by hospitals and surgeons. However, there are reasons that a provider's RAMR may not be indicative of its true quality. For example, extreme outcome rates may occur due to chance alone. This is particularly true for low-volume providers, for whom very high or very low mortality rates are more likely to occur than for high-volume providers. To prevent misinterpretation of differences caused by chance variation, confidence intervals are reported in the results. The interpretations of those terms are provided later when the data are presented.

Differences in hospital coding of risk factors could be an additional reason that a provider's RAMR may not be reflective of quality of care. The Department of Health monitors the quality of coded data by reviewing samples of patients' medical records to ascertain the presence of key risk factors. When significant coding problems are discovered, hospitals are required to correct these data and are subjected to subsequent monitoring.

Although there are reasons that RAMRs presented here may not be a perfect reflection of quality of care, the Department of Health feels that this information is a valuable aid in choosing providers for cardiac surgery.

Predicting Patient Readmission and Computing and Interpreting Risk-Adjusted Readmission Rates

Patient risk of 30-day readmission is assessed using the same methods used for assessing mortality risk as described above. All potential risk factors are considered and those that are independently related to readmission are identified and given weights so as to best predict the risk of 30-day readmission for each patient. Observed readmission rates (ORR), expected readmission rates (ERR) and risk-adjusted readmission rates (RARR) are calculated in the same way that OMR, EMR and RAMR are calculated. ERR and RARR are compared to the statewide observed readmission rate (13.72 percent in 2013).

This analysis is based on all-cause readmission, not just readmission directly related to the CABG procedure. Not all readmissions represent a poor patient outcome or reflect poor patient care. However, by risk-adjusting and comparing the results across the many hospitals that perform this procedure we are able to look for meaningful differences from the overall statewide experience. If the RARR is significantly lower than the statewide readmission rate, the hospital has a better performance than the state as a whole; if the RARR is significantly higher than the statewide readmission rate, the hospital has a worse performance than the state as a whole.

As described above for mortality, there are reasons that a provider's RARR may not be indicative of its true quality. Confidence intervals and careful attention to data quality are used in the same way for readmission as they are for mortality.

How This Initiative Contributes to Quality Improvement

One goal of the Department of Health and the Cardiac Advisory Committee is to improve the quality of care related to cardiac surgery in NYS. Providing the hospitals and cardiac surgeons in NYS with data about their own outcomes for these procedures allows them to examine the quality of the care they provide and to identify areas that need improvement.

The data collected and analyzed in this program are reviewed by the Cardiac Advisory Committee. Committee members assist with interpretation and advise the Department of Health regarding hospitals and surgeons that may need special attention. Committee members have also conducted site visits to particular hospitals and have recommended that some hospitals obtain the expertise of outside consultants to design improvements for their programs.

The overall results of this program of ongoing review show that significant progress is being made. In response to the program's results for surgery, facilities have refined patient criteria, evaluated patients more closely for pre-operative risks and directed them to the appropriate surgeon. More importantly, many hospitals have identified medical care processes that have led to less than optimal outcomes, and have altered those processes to achieve improved results

DEFINITIONS OF KEY TERMS

The **observed mortality rate (OMR)** is the observed number of deaths divided by the total number of cases.

The **expected mortality rate (EMR)** is the sum of the predicted probabilities of death for all patients divided by the total number of patients.

The **risk-adjusted mortality rate (RAMR)** is the best estimate, based on the statistical model, of what the provider's mortality rate would have been if the provider had a mix of patients identical to the statewide mix. It is obtained by first dividing the OMR by the EMR, and then multiplying by the relevant statewide mortality rate (for example, 1.84 percent for Isolated CABG patients in 2013 or 3.45 percent for Valve or Valve/CABG patients in 2011-2013).

The **observed readmission rate (ORR)** is the observed number of 30-day readmissions divided by the total number of analyzed cases.

The **expected readmission rate (ERR)** is the sum of the predicted probabilities of readmission for all patients divided by the total number of analyzed cases.

The **risk-adjusted readmission rate (RARR)** is the best estimate, based on the statistical model, of what the provider's readmission rate would have been if the provider had a mix of patients similar to the statewide mix. It is obtained by first dividing the ORR by the ERR, and then multiplying that quotient by the statewide readmission rate (13.72 percent 30-day readmission rate for all CABG patients discharged in 2013).

Confidence Intervals are used to identify which hospitals had significantly more or fewer deaths or readmissions than expected given the risk factors of their patients. The confidence interval identifies the range in which the risk-adjusted rate may fall. Hospitals with significantly higher rates than expected after adjusting for risk are those where the confidence interval range falls entirely above the statewide mortality rate. Hospitals with significantly lower rates than expected, given the severity of illness of their patients before surgery, have confidence intervals entirely below the statewide mortality rate. The more cases a provider performs, the narrower their confidence interval will be. This is because as a provider performs more cases, the likelihood of chance variation in the risk-adjusted rate decreases.

2013 HOSPITAL OUTCOMES FOR CABG SURGERY

Table 1 and Figure 1 present the CABG surgery results for the 39 hospitals performing this operation in NYS in 2013. The table contains, for each hospital, the number of isolated CABG operations (CABG operations with no other major heart surgery earlier in the hospital stay) for patients discharged in 2013, the number of in-hospital/30-day deaths, the OMR, the EMR based on the statistical model presented in Appendix 1, the RAMR and a 95 percent confidence interval for the RAMR.

As indicated in Table 1, the overall in-hospital/30-day mortality rate for the 8,168 CABG surgeries was 1.84 percent. In-hospital/30-day OMRs ranged from 0.00 percent to 4.03 percent. The range of EMRs, which measure patient severity of illness, was 0.98 percent to 2.68 percent.

The RAMRs, which are used to measure performance, ranged from 0.00 percent to 5.09 percent. No hospitals had RAMRs that were significantly lower than the statewide rate. One hospital (Buffalo General Hospital) had a mortality rate that was significantly higher than the statewide rate.

The 2013 in-hospital/30-day mortality rate of 1.84 percent for Isolated CABG is higher than the 1.46 percent observed in 2012.

The in-hospital OMR for 2013 Isolated CABG discharges (not shown in Table 1) was 1.42 percent for all 8,168 patients included in the analysis.

Figure 1 provides a visual representation of the data displayed in Tables 1. For each hospital, the black dot represents the RAMR and the gray bar represents the confidence interval, or potential statistical error, for the RAMR. The black vertical line is the NYS in-hospital/30-day mortality rate. A gray bar that extends far above and/or below the statewide average indicates that a hospital has a wide confidence interval. This

is common when the hospital has a very small number of cases. It does not necessarily mean that the risk-adjusted mortality rate is very high or very low. For any hospital where the gray bar crosses the state average line, the RAMR is not statistically different from the state as a whole. Hospitals that are statistical outliers will have gray bars (confidence intervals) that are either entirely above or entirely below the line for the statewide rate.

Table 2 presents the 30-day readmission results for the 39 hospitals performing CABG in NYS in 2013 for which data could be analyzed. The table contains, for each hospital, the number of CABGs resulting in 2013 discharges, the number of 30-Day readmissions, the ORR, the ERR based on the statistical model presented in Appendix 2, the RARR and a 95 percent confidence interval for the RARR.

The overall ORR for the 7755 CABGs included in this 2013 analysis was 13.72 percent. Observed readmission rates ranged from 7.56 percent to 26.60 percent. The range in ERRs, which measure patient severity of illness, was between 11.30 percent and 15.68 percent. The RARRs, which measure hospital performance, range from 7.65 percent to 28.11 percent.

Based on confidence intervals for RARRs, three hospitals (Good Samaritan in Suffern, New York Methodist in Brooklyn, and New York Presbyterian - Queens) had RARRs that were significantly higher than the statewide average. Two hospitals (New York Presbyterian - Columbia in Manhattan and St. Peter's Hospital in Albany) had RARRs that were significantly lower than the statewide average.

Figure 2 provides a visual representation of the data displayed in Table 2. It is interpreted in the same way as Figure 1 described above.

Table 1**In-Hospital/30-Day Observed, Expected and Risk-Adjusted Mortality Rates for Isolated CABG Surgery in New York State, 2013 Discharges**

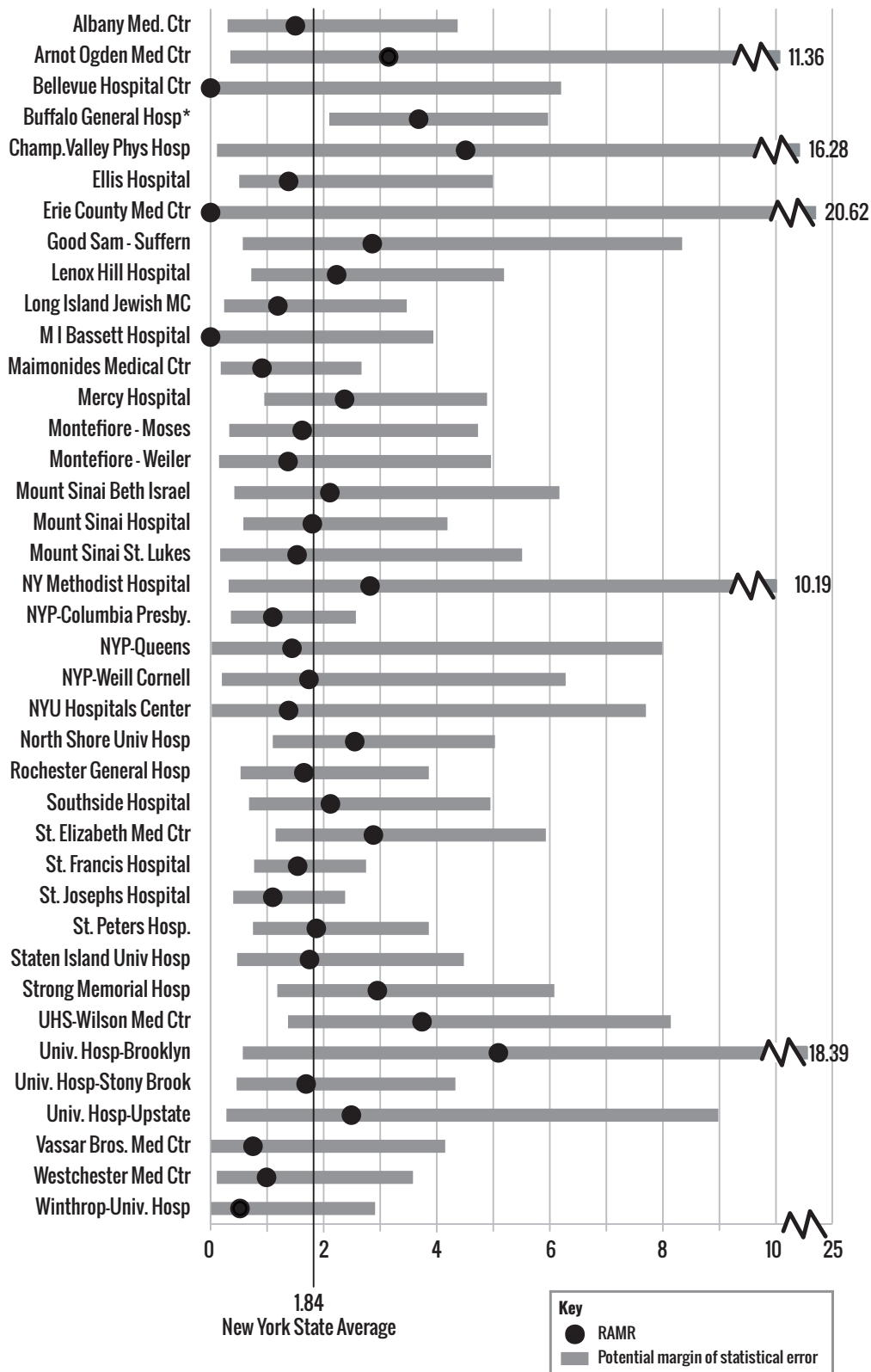
(Listed Alphabetically by Hospital)

Hospital	Cases	Deaths	OMR	EMR	RAMR	95% CI for RAMR
Albany Med. Ctr	205	3	1.46	1.80	1.50	(0.30, 4.37)
Arnot Ogden Med Ctr	69	2	2.90	1.69	3.15	(0.35,11.36)
Bellevue Hospital Ctr	84	0	0.00	1.29	0.00	(0.00, 6.20)
Buffalo General Hosp	448	16	3.57	1.78	3.68 *	(2.10, 5.97)
Champ. Valley Phys Hosp	67	2	2.99	1.22	4.51	(0.51,16.28)
Ellis Hospital	177	2	1.13	1.50	1.38	(0.16, 4.99)
Erie County Med Ctr	22	0	0.00	1.49	0.00	(0.00,20.62)
Good Sam - Suffern	108	3	2.78	1.79	2.86	(0.57, 8.34)
Lenox Hill Hospital	256	5	1.95	1.61	2.23	(0.72, 5.19)
Long Island Jewish MC	173	3	1.73	2.68	1.19	(0.24, 3.47)
M I Bassett Hospital	79	0	0.00	2.16	0.00	(0.00, 3.94)
Maimonides Medical Ctr	267	3	1.12	2.26	0.91	(0.18, 2.67)
Mercy Hospital	326	7	2.15	1.66	2.37	(0.95, 4.89)
Montefiore - Moses	190	3	1.58	1.79	1.62	(0.33, 4.73)
Montefiore - Weiler	174	2	1.15	1.54	1.37	(0.15, 4.96)
Mount Sinai Beth Israel	174	3	1.72	1.50	2.11	(0.42, 6.17)
Mount Sinai Hospital	385	5	1.30	1.33	1.80	(0.58, 4.19)
Mount Sinai St. Lukes	116	2	1.72	2.07	1.53	(0.17, 5.51)
NY Methodist Hospital	97	2	2.06	1.34	2.82	(0.32,10.19)
NYP-Columbia Presby.	419	5	1.19	1.99	1.10	(0.36, 2.57)
NYP-Queens	90	1	1.11	1.42	1.44	(0.02, 7.99)
NYP-Weill Cornell	176	2	1.14	1.20	1.74	(0.20, 6.28)
NYU Hospitals Center	135	1	0.74	0.98	1.38	(0.02, 7.70)
North Shore Univ Hosp	290	8	2.76	1.98	2.55	(1.10, 5.03)
Rochester General Hosp	306	5	1.63	1.81	1.65	(0.53, 3.86)
Southside Hospital	163	5	3.07	2.65	2.12	(0.68, 4.95)
St. Elizabeth Med Ctr	211	7	3.32	2.12	2.88	(1.15, 5.93)
St. Francis Hospital	658	11	1.67	2.00	1.54	(0.77, 2.75)
St. Josephs Hospital	391	6	1.53	2.57	1.10	(0.40, 2.38)
St. Peters Hospital	302	7	2.32	2.27	1.87	(0.75, 3.86)
Staten Island Univ Hosp	238	4	1.68	1.76	1.75	(0.47, 4.48)
Strong Memorial Hosp	232	7	3.02	1.88	2.95	(1.18, 6.08)
UHS-Wilson Med Ctr	149	6	4.03	1.98	3.74	(1.37, 8.14)
Univ. Hosp-Brooklyn	51	2	3.92	1.41	5.09	(0.57,18.39)
Univ. Hosp-Stony Brook	243	4	1.65	1.79	1.69	(0.46, 4.33)
Univ. Hosp-Upstate	70	2	2.86	2.11	2.49	(0.28, 8.98)
Vassar Bros. Med Ctr	166	1	0.60	1.48	0.75	(0.01, 4.15)
Westchester Med Ctr	231	2	0.87	1.60	0.99	(0.11, 3.58)
Winthrop-Univ. Hosp	230	1	0.43	1.52	0.52	(0.01, 2.91)
STATEWIDE TOTAL	8168	150	1.84			

* Risk-adjusted mortality rate significantly higher than the statewide rate based on 95 percent confidence interval.

Figure 1

In-Hospital/30-Day Risk-Adjusted Mortality Rates for Isolated CABG in New York State, 2013 Discharges



* Risk-adjusted mortality rate significantly higher than the statewide rate based on 95 percent confidence interval.

Table 2**In-Hospital/30-Day Observed, Expected and Risk-Adjusted Readmission Rates for Isolated CABG Surgery in New York State, 2013 Discharges**

(Listed Alphabetically by Hospital)

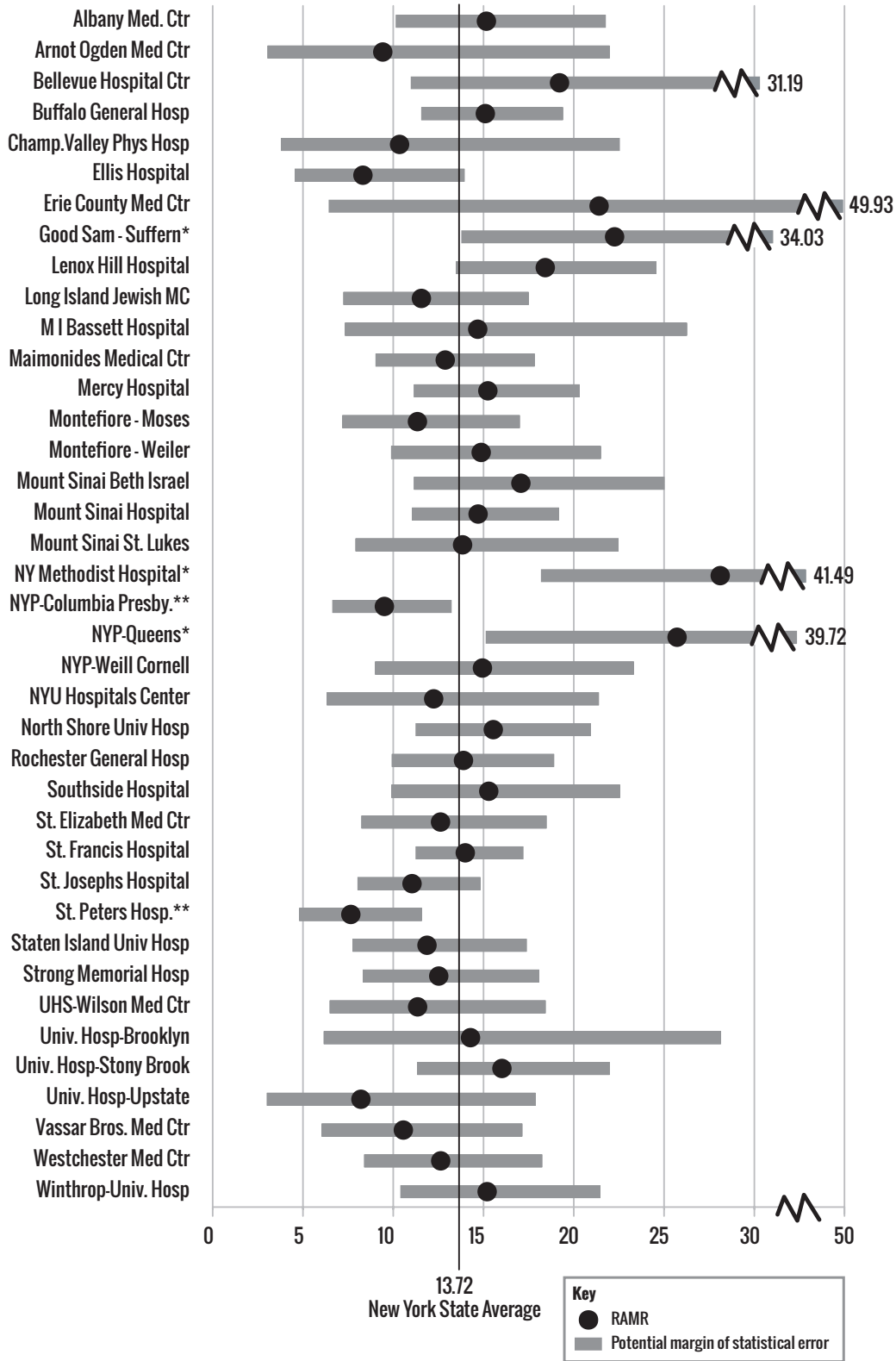
Hospital	Cases	Readmits	ORR	ERR	RARR	95% CI for RARR
Albany Med. Ctr	186	29	15.59	14.11	15.16	(10.15,21.77)
Arnot Ogden Med Ctr	59	5	8.47	12.34	9.42	(3.04,21.98)
Bellevue Hospital Ctr	83	16	19.28	13.77	19.21	(10.97,31.19)
Buffalo General Hosp	430	61	14.19	12.89	15.10	(11.55,19.40)
Champ.Valley Phys Hosp	65	6	9.23	12.23	10.35	(3.78,22.54)
Ellis Hospital	173	14	8.09	13.35	8.32	(4.54,13.95)
Erie County Med Ctr	22	5	22.73	14.57	21.40	(6.90,49.93)
Good Sam - Suffern	93	21	22.58	13.92	22.26*	(13.77,34.03)
Lenox Hill Hospital	241	46	19.09	14.22	18.42	(13.48,24.57)
Long Island Jewish MC	170	22	12.94	15.36	11.56	(7.24,17.50)
M I Bassett Hospital	79	11	13.92	13.01	14.68	(7.32,26.27)
Maimonides Medical Ctr	260	36	13.85	14.75	12.88	(9.02,17.83)
Mercy Hospital	317	46	14.51	13.07	15.24	(11.15,20.32)
Montefiore - Moses	182	23	12.64	15.29	11.34	(7.18,17.01)
Montefiore - Weiler	172	28	16.28	15.02	14.87	(9.88,21.50)
Mount Sinai Beth Israel	166	26	15.66	12.59	17.07	(11.15,25.02)
Mount Sinai Hospital	358	54	15.08	14.08	14.70	(11.04,19.18)
Mount Sinai St. Lukes	105	16	15.24	15.10	13.84	(7.91,22.48)
NY Methodist Hospital	94	25	26.60	12.98	28.11*	(18.18,41.49)
NYP-Columbia Presby.	352	35	9.94	14.34	9.51**	(6.63,13.23)
NYP-Queens	88	20	22.73	12.12	25.72*	(15.70,39.72)
NYP-Weill Cornell	142	19	13.38	12.29	14.94	(8.99,23.33)
NYU Hospitals Center	119	12	10.08	11.30	12.24	(6.32,21.39)
North Shore Univ Hosp	281	43	15.30	13.51	15.54	(11.25,20.94)
Rochester General Hosp	299	40	13.38	13.22	13.89	(9.92,18.91)
Southside Hospital	156	25	16.03	14.38	15.29	(9.89,22.57)
St. Elizabeth Med Ctr	205	26	12.68	13.79	12.62	(8.24,18.49)
St. Francis Hospital	633	90	14.22	13.94	13.99	(11.25,17.20)
St. Josephs Hospital	384	44	11.46	14.24	11.04	(8.02,14.83)
St. Peters Hospital	291	22	7.56	13.55	7.65**	(4.79,11.59)
Staten Island Univ Hosp	223	26	11.66	13.48	11.87	(7.75,17.39)
Strong Memorial Hosp	223	28	12.56	13.76	12.52	(8.31,18.09)
UHS-Wilson Med Ctr	137	16	11.68	14.11	11.35	(6.48,18.44)
Univ. Hosp-Brooklyn	49	8	16.33	15.68	14.28	(6.15,28.15)
Univ. Hosp-Stony Brook	237	38	16.03	13.73	16.02	(11.33,21.99)
Univ. Hosp-Upstate	68	6	8.82	14.74	8.21	(3.00,17.88)
Vassar Bros. Med Ctr	165	16	9.70	12.60	10.56	(6.03,17.15)
Westchester Med Ctr	221	28	12.67	13.76	12.63	(8.39,18.25)
Winthrop-Univ. Hosp	227	32	14.10	12.72	15.20	(10.40,21.47)
STATEWIDE TOTAL	7755	1064	13.72			

* Risk-adjusted readmission rate significantly higher than the statewide rate based on 95 percent confidence interval.

** Risk-adjusted readmission rate significantly lower than the statewide rate based on 95 percent confidence interval.

Figure 2

30-Day Risk-Adjusted Readmission Rates for Isolated CABG in New York State, 2013 Discharges



* Risk-adjusted readmission rate significantly higher than the statewide rate based on 95 percent confidence interval.

** Risk-adjusted readmission rate significantly lower than the statewide rate based on 95 percent confidence interval.

2011-2013 HOSPITAL OUTCOMES FOR VALVE SURGERY

Table 3 and Figure 3 present the combined Valve Only and Valve/CABG surgery results for the 40 hospitals performing these operations in NYS during the years 2011-2013. The table contains, for each hospital, the combined number of Valve Only and Valve/CABG operations resulting in 2011-2013 discharges, the number of in-hospital/30-day deaths, the OMR, the EMR based on the statistical models presented in Appendices 3-4, the RAMR and a 95 percent confidence interval for the RAMR.

As indicated in Table 3, the overall in-hospital/30-day mortality rate for the 22,213 combined Valve Only and Valve/CABG procedures performed at the 40 hospitals was 3.45 percent. The OMRs ranged from 0.00 percent to 8.25 percent. The range of EMRs, which measure patient severity of illness, was 1.56 percent to 4.55 percent.

The RAMRs, which are used to measure performance, ranged from 0.00 percent to 14.37 percent. Three hospitals (Arnot Ogden Medical Center in Elmira, Rochester General Hospital, and Strong Memorial Hospital in Rochester) had RAMRs that were significantly higher than the statewide rate. One hospital (St. Joseph's Hospital in Syracuse) had a RAMR that was significantly lower than the statewide rate.

Figure 3 provides a visual representation of the data displayed in Table 3. It is interpreted in the same way as Figure 1 described above.

Table 4 presents valve procedures performed at the 40 cardiac surgery hospitals in NYS during 2011-2013. The table contains, for each hospital, the number of valve operations (as

defined by eight separate groups: Aortic Valve Replacements, Aortic Valve Repair or Replacements plus CABG, Mitral Valve Replacement, Mitral Valve Replacement plus CABG, Mitral Valve Repair, Mitral Valve Repair plus CABG, Multiple Valve Surgery and Multiple Valve Surgery plus CABG) resulting in 2011-2013 discharges. In addition to the hospital volumes, the rate of in-hospital/30-day death for the state (Statewide Mortality Rate) is given for each group. Unless otherwise specified, when the report refers to Valve or Valve/CABG procedures it is referring to the last column of Table 4.

The 2011-2013 in-hospital/30-day OMR of 3.45 percent for Valve and Valve/CABG surgeries is lower than the 3.74 percent observed for 2010-2012. The in-hospital OMR for 2011-2013 valve surgeries (not shown in Table 3) is 2.90 percent for the 22,213 patients included in this analysis.

Table 5 presents the number of transcatheter aortic valve replacement (TAVR) procedures performed at the 20 hospitals performing TAVR during the 2013 discharge period. Table 5 also presents the statewide in-hospital / 30-day mortality rate of 6.37 percent for the 1350 TAVR discharges during that time period. It is important to note that TAVR was a relatively new procedure during the time period in question and the number of cases performed in 2013 may be very different from current program volume. Some hospitals listed in Table 5 began performing the procedure during 2013 and the number of cases listed does not represent a full year's program activity. Other hospitals have begun performing the procedure more recently.

Table 3**In-Hospital/30-Day Observed, Expected, and Risk-Adjusted Mortality Rates for Valve or Valve/CABG Surgery in New York State, 2011-2013 Discharges.**

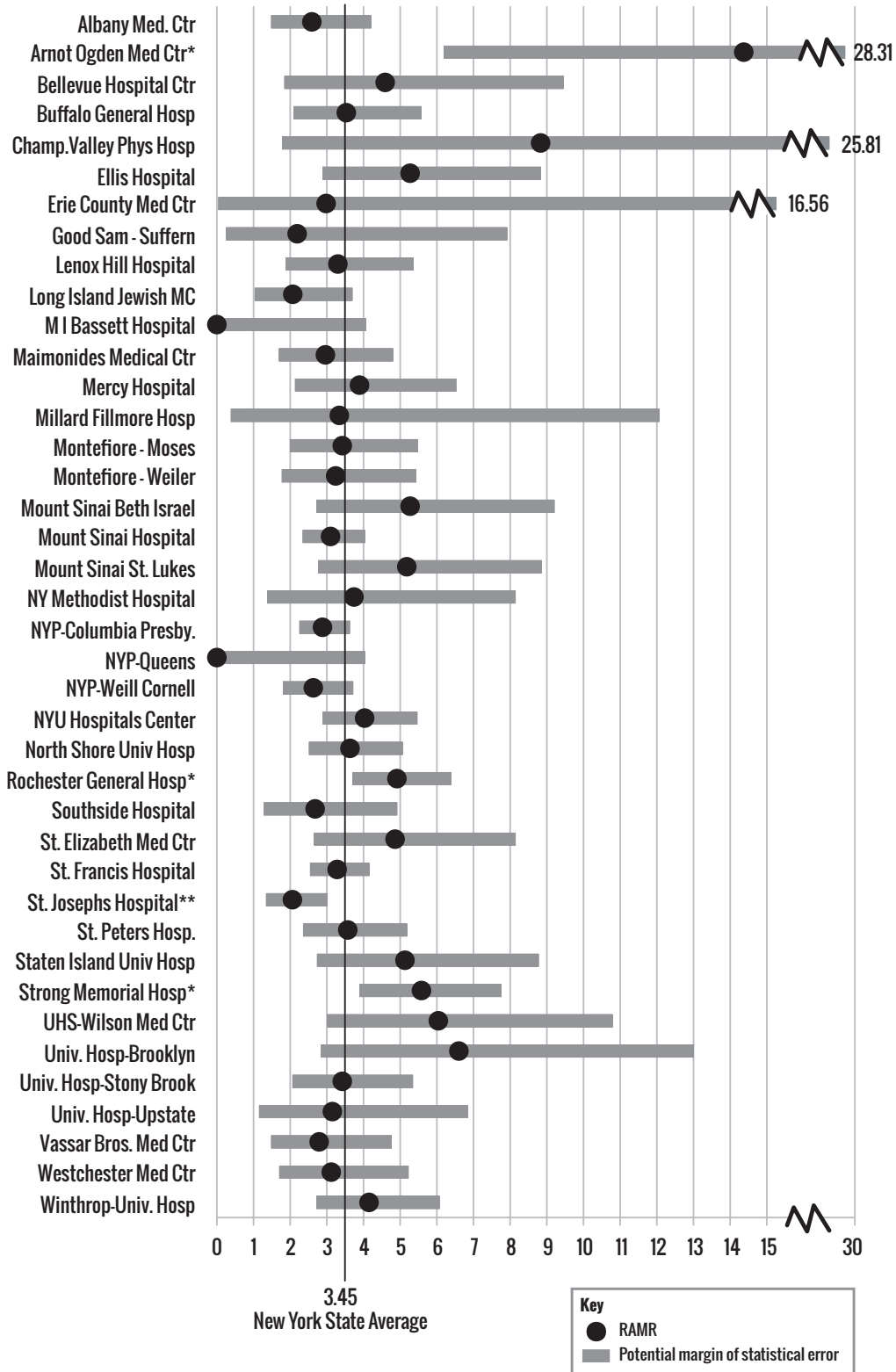
Hospital	Cases	Deaths	OMR	EMR	RAMR	95% CI for RAMR
Albany Med. Ctr	623	16	2.57	3.42	2.59	(1.48, 4.21)
Arnot Ogden Med Ctr	99	8	8.08	1.94	14.37 *	(6.19,28.31)
Bellevue Hospital Ctr	226	7	3.10	2.33	4.59	(1.84, 9.46)
Buffalo General Hosp	631	18	2.85	2.79	3.53	(2.09, 5.58)
Champ.Valley Phys Hosp	75	3	4.00	1.56	8.83	(1.78,25.81)
Ellis Hospital	299	14	4.68	3.07	5.27	(2.88, 8.84)
Erie County Med Ctr	30	1	3.33	3.87	2.98	(0.04,16.56)
Good Sam - Suffern	129	2	1.55	2.44	2.19	(0.25, 7.92)
Lenox Hill Hospital	479	16	3.34	3.50	3.30	(1.88, 5.36)
Long Island Jewish MC	534	11	2.06	3.44	2.07	(1.03, 3.70)
M I Bassett Hospital	102	0	0.00	3.05	0.00	(0.00, 4.07)
Maimonides Medical Ctr	490	16	3.27	3.81	2.96	(1.69, 4.81)
Mercy Hospital	481	14	2.91	2.58	3.89	(2.13, 6.53)
Millard Fillmore Hosp	98	2	2.04	2.11	3.34	(0.38,12.07)
Montefiore - Moses	426	17	3.99	4.02	3.42	(1.99, 5.48)
Montefiore - Weiler	328	14	4.27	4.55	3.24	(1.77, 5.44)
Mount Sinai Beth Israel	244	12	4.92	3.22	5.27	(2.72, 9.21)
Mount Sinai Hospital	1820	55	3.02	3.36	3.10	(2.34, 4.04)
Mount Sinai St. Lukes	271	13	4.80	3.20	5.18	(2.76, 8.86)
NY Methodist Hospital	182	6	3.30	3.04	3.74	(1.37, 8.15)
NYP-Columbia Presby.	2228	71	3.19	3.82	2.88	(2.25, 3.63)
NYP-Queens	117	0	0.00	2.68	0.00	(0.00, 4.04)
NYP-Weill Cornell	1303	32	2.46	3.22	2.63	(1.80, 3.72)
NYU Hospitals Center	1308	41	3.13	2.69	4.03	(2.89, 5.47)
North Shore Univ Hosp	932	34	3.65	3.47	3.63	(2.51, 5.07)
Rochester General Hosp	1025	55	5.37	3.77	4.91 *	(3.70, 6.39)
Southside Hospital	344	10	2.91	3.75	2.68	(1.28, 4.92)
St. Elizabeth Med Ctr	324	14	4.32	3.07	4.86	(2.65, 8.15)
St. Francis Hospital	1831	67	3.66	3.86	3.28	(2.54, 4.16)
St. Josephs Hospital	1104	26	2.36	3.95	2.06 **	(1.34, 3.01)
St. Peters Hospital	717	27	3.77	3.64	3.57	(2.35, 5.19)
Staten Island Univ Hosp	275	13	4.73	3.18	5.13	(2.73, 8.78)
Strong Memorial Hosp	642	35	5.45	3.37	5.58 *	(3.89, 7.76)
UHS-Wilson Med Ctr	249	11	4.42	2.53	6.04	(3.01,10.80)
Univ. Hosp-Brooklyn	97	8	8.25	4.31	6.60	(2.84,13.01)
Univ. Hosp-Stony Brook	476	19	3.99	4.03	3.42	(2.06, 5.35)
Univ. Hosp-Upstate	211	6	2.84	3.12	3.15	(1.15, 6.85)
Vassar Bros. Med Ctr	468	13	2.78	3.44	2.79	(1.48, 4.77)
Westchester Med Ctr	381	14	3.67	4.07	3.12	(1.70, 5.23)
Winthrop-Univ. Hosp	614	26	4.23	3.53	4.15	(2.71, 6.08)
STATEWIDE TOTAL	22213	767	3.45			

* Risk-adjusted mortality rate significantly higher than the statewide rate based on 95 percent confidence interval.

** Risk-adjusted mortality rate significantly lower than the statewide rate based on 95 percent confidence interval.

Figure 3

In-Hospital/30-Day Risk-Adjusted Mortality Rates for Valve or Valve/CABG Surgery in New York State, 2011-2013 Discharges



* Risk-adjusted mortality rate significantly higher than the statewide rate based on 95 percent confidence interval.

** Risk-adjusted mortality rate significantly lower than the statewide rate based on 95 percent confidence interval.

Table 4**Hospital Volume for Valve Surgery in New York State, 2011-2013 Discharges**

Hospital	Aortic Valve Replace Surgery	Aortic Valve and CABG	Mitral Valve Replace Surgery	Mitral Replace and CABG	Mitral Valve Repair Surgery	Mitral Repair and CABG	Multiple Valve Surgery	Multiple Valve and CABG	Total Valve/ CABG
Albany Med. Ctr	232	168	30	16	78	32	45	22	623
Arnot Ogden Med Ctr	44	37	7	0	5	3	3	0	99
Bellevue Hospital Ctr	80	14	41	8	21	6	52	4	226
Buffalo General Hosp	238	218	46	17	54	29	22	7	631
Champ.Valley Phys Hosp	45	28	2	0	0	0	0	0	75
Ellis Hospital	114	96	24	12	22	10	13	8	299
Erie County Med Ctr	9	8	4	4	1	0	2	2	30
Good Sam - Suffern	45	32	5	10	23	6	6	2	129
Lenox Hill Hospital	163	65	50	8	85	22	72	14	479
Long Island Jewish MC	143	103	73	32	68	44	52	19	534
M I Bassett Hospital	38	44	5	3	2	2	3	5	102
Maimonides Medical Ctr	157	96	101	26	30	14	60	6	490
Mercy Hospital	168	134	32	17	77	20	21	12	481
Millard Fillmore Hosp	33	37	6	0	13	2	6	1	98
Montefiore - Moses	119	47	78	28	42	45	52	15	426
Montefiore - Weiler	86	55	56	17	23	38	38	15	328
Mount Sinai Beth Israel	66	53	34	18	30	17	21	5	244
Mount Sinai Hospital	311	148	24	8	214	65	891	159	1820
Mount Sinai St. Lukes	52	49	26	13	66	30	29	6	271
NY Methodist Hospital	73	33	26	10	7	4	27	2	182
NYP-Columbia Presby.	939	404	201	59	253	74	244	54	2228
NYP-Queens	49	20	14	6	9	6	12	1	117
NYP-Weill Cornell	541	220	130	37	150	23	161	41	1303
NYU Hospitals Center	512	110	100	18	342	40	167	19	1308
North Shore Univ Hosp	345	226	114	48	50	27	91	31	932
Rochester General Hosp	370	236	66	26	128	72	80	47	1025
Southside Hospital	104	73	30	12	33	33	41	18	344
St. Elizabeth Med Ctr	100	84	16	17	30	30	30	17	324
St. Francis Hospital	695	385	95	32	185	123	216	100	1831
St. Josephs Hospital	330	257	76	47	130	81	115	68	1104
St. Peters Hospital	227	221	27	20	38	50	77	57	717
Staten Island Univ Hosp	104	54	39	22	26	10	14	6	275
Strong Memorial Hosp	297	158	41	9	69	12	37	19	642
UHS-Wilson Med Ctr	104	103	12	9	4	3	8	6	249
Univ. Hosp-Brooklyn	25	13	16	1	11	9	16	6	97
Univ. Hosp-Stony Brook	165	119	35	20	32	28	42	35	476
Univ. Hosp-Upstate	73	37	19	3	47	7	22	3	211
Vassar Bros. Med Ctr	152	153	48	25	29	16	24	21	468
Westchester Med Ctr	131	101	29	12	38	27	28	15	381
Winthrop-Univ. Hosp	212	169	71	36	43	45	28	10	614
Total	7691	4608	1849	706	2508	1105	2868	878	22213
STATEWIDE MORTALITY RATE (%)	2.35	3.58	4.54	5.10	1.28	4.07	5.02	9.11	3.45

Table 5

Hospital Volume for Transcatheter Aortic Valve Replacement in New York State, 2013 Discharges (Listed Alphabetically by Hospital)

Hospital	Cases
Albany Med. Ctr	67
Buffalo General Hosp	42
Lenox Hill Hospital	38
Long Island Jewish MC	86
Maimonides Medical Ctr	35
Montefiore - Moses	31
Mount Sinai Hospital	107
NY Methodist Hospital	4
NYP-Columbia Presby.	298
NYP-Weill Cornell	103
NYU Hospitals Center	27
North Shore Univ Hosp	69
Southside Hospital	39
St. Francis Hospital	106
St. Josephs Hospital	51
St. Peters Hospital	6
Strong Memorial Hosp	42
Univ. Hosp-Stony Brook	27
Westchester Med Ctr	26
Winthrop-Univ. Hosp	146
STATEWIDE TOTAL	1350
STATEWIDE MORTALITY RATE (%)	6.37

2011-2013 HOSPITAL AND SURGEON OUTCOMES

Table 6 provides the number of Isolated CABG operations, number of CABG patients who died in the hospital or after discharge but within 30 days of surgery, OMR, EMR, RAMR and the 95 percent confidence interval for the RAMR for Isolated CABG patients in 2011-2013. In addition, the final two columns provide the number of Isolated CABG, Valve and Valve/CABG procedures and the RAMR for these patients in 2011-2013 for each of the 40 hospitals performing these operations during the time period. Surgeons and hospitals with RAMRs that are significantly lower or higher than the statewide mortality rate (as judged by the 95 percent confidence interval) are also noted.

The hospital information is presented for each surgeon who met at least one of the following criteria: (a) performed 200 or more cardiac operations during 2011-2013, (b) performed at least one cardiac operation in each of the years, 2011-2013. A cardiac operation is defined as any reportable adult cardiac operation and may include cases not listed in Tables 6 or 7.

The results for surgeons not meeting either of the above criteria are grouped together and reported as "All Others" in the hospital in which the operations were performed. Surgeons who met the above criteria and who performed operations in more than one hospital during 2011-2013 are noted in Table 6 and listed under all hospitals in which they performed these operations. Also, surgeons who met either criterion (a) or (b) above and have performed Isolated CABG, Valve or operations in two or more NYS hospitals are listed separately in Table 7. This table contains the same information as Table 6 across all hospitals in which the surgeon performed operations.

Table 6

In-Hospital / 30-Day Observed, Expected and Risk-Adjusted Mortality Rates by Surgeon for Isolated CABG and Valve Surgery (done in combination with or without CABG) in New York State, 2011-2013 Discharges

	No of Cases	Deaths	Isolated CABG			95% CI for RAMR	Isolated CABG, or Valve or Valve/CABG	
			OMR	EMR	RAMR		Cases	RAMR
STATEWIDE TOTAL	24937	376	1.51				47150	2.42
Albany Med. Ctr								
#Akujuo A C	46	0	0.00	2.25	0.00	(0.00, 5.34)	72	0.00
#Bennett E	65	0	0.00	1.33	0.00	(0.00, 6.39)	239	2.80
Britton L	162	1	0.62	1.94	0.48	(0.01, 2.67)	319	0.96
Depan H	241	2	0.83	2.17	0.58	(0.06, 2.08)	392	1.49
Devejian N	.	.	.	.	.	(. . .)	1	0.00
Miller S	177	4	2.26	1.82	1.88	(0.50, 4.80)	291	1.79
Total	691	7	1.01	1.95	0.78	(0.31, 1.61)	1314	1.60 **
Arnot Ogden Med Ctr								
Nast E	127	1	0.79	1.45	0.82	(0.01, 4.56)	188	4.15
Raudat C W	96	3	3.13	1.58	2.98	(0.60, 8.72)	131	6.40
All Others	12	0	0.00	0.67	0.00	(0.00, 68.54)	15	15.03
Total	235	4	1.70	1.46	1.76	(0.47, 4.49)	334	5.43 *

Table 6 continued

	Isolated CABG						Isolated CABG, or Valve or Valve/CABG	
	No of Cases	Deaths	OMR	EMR	RAMR	95% CI for RAMR	Cases	RAMR
Bellevue Hospital Ctr								
#Balsam L B	129	1	0.78	0.94	1.24	(0.02, 6.89)	246	1.31
##Culliford A	1	0	0.00	2.93	0.00	(0.00,100.0)	1	0.00
##Deanda A	112	3	2.68	0.81	4.97	(1.00,14.51)	187	4.89
#Grossi E	1	0	0.00	0.45	0.00	(0.00,100.0)	1	0.00
##Loulmet D F	24	1	4.17	1.04	6.05	(0.08,33.65)	58	9.98 *
##Zias E	2	0	0.00	2.55	0.00	(0.00,100.0)	2	0.00
Total	269	5	1.86	0.92	3.06	(0.99, 7.15)	495	3.76
Buffalo General Hosp								
##Aldridge J	109	6	5.50	1.45	5.71 *	(2.08,12.43)	119	9.40 *
#Ashraf M	325	6	1.85	1.31	2.13	(0.78, 4.63)	420	2.99
##Downing S W	8	1	12.50	0.99	18.99	(0.25,100.0)	11	11.36
Grosner G	659	10	1.52	1.40	1.64	(0.78, 3.01)	1175	2.44
All Others	22	1	4.55	1.56	4.40	(0.06,24.46)	29	5.05
Total	1123	24	2.14	1.38	2.34	(1.50, 3.48)	1754	3.08
Champ.Valley Phys Hosp								
Cahill A T	173	3	1.73	1.16	2.25	(0.45, 6.58)	244	4.67
#El Amir N	14	0	0.00	0.78	0.00	(0.00,50.48)	17	0.00
All Others	42	1	2.38	1.07	3.37	(0.04,18.74)	43	5.34
Total	229	4	1.75	1.12	2.35	(0.63, 6.02)	304	4.54
Ellis Hospital								
Choumarov K	224	2	0.89	1.26	1.07	(0.12, 3.87)	287	3.78
#Reich H	110	2	1.82	1.37	2.00	(0.22, 7.21)	259	2.40
Singh C	193	1	0.52	1.44	0.54	(0.01, 3.03)	280	2.39
Total	527	5	0.95	1.35	1.06	(0.34, 2.48)	826	2.83
Erie County Med Ctr								
#Bell-Thomson J	1	0	0.00	0.57	0.00	(0.00,100.0)	1	0.00
##Downing S W	154	0	0.00	1.29	0.00	(0.00, 2.77)	180	0.79
All Others	18	0	0.00	0.81	0.00	(0.00,37.91)	22	0.00
Total	173	0	0.00	1.24	0.00	(0.00, 2.58)	203	0.73
Good Sam - Suffern								
#Lundy E F	144	1	0.69	1.62	0.65	(0.01, 3.60)	215	1.12
Salenger R	160	2	1.25	1.29	1.46	(0.16, 5.29)	210	2.46
All Others	49	1	2.04	1.80	1.71	(0.02, 9.51)	57	2.15
Total	353	4	1.13	1.49	1.14	(0.31, 2.93)	482	1.73
Lenox Hill Hospital								
##Galloway A	4	0	0.00	1.16	0.00	(0.00,100.0)	15	0.00
##Loulmet D F	4	0	0.00	1.52	0.00	(0.00,90.78)	9	0.00
Patel N C	556	4	0.72	1.22	0.89	(0.24, 2.28)	772	1.89
Plestis K A	67	3	4.48	1.34	5.05	(1.02,14.76)	192	2.43
Subramanian V	95	2	2.11	2.38	1.34	(0.15, 4.82)	144	3.05
##Zias E	1	0	0.00	0.62	0.00	(0.00,100.0)	4	0.00
All Others	43	1	2.33	1.11	3.16	(0.04,17.59)	113	3.93
Total	770	10	1.30	1.36	1.44	(0.69, 2.64)	1249	2.31

Table 6 continued

	Isolated CABG						Isolated CABG, or Valve or Valve/CABG	
	No of Cases	Deaths	OMR	EMR	RAMR	95% CI for RAMR	Cases	RAMR
Long Island Jewish MC								
Graver L	186	3	1.61	1.76	1.38	(0.28, 4.04)	439	1.93
#Manetta F	4	1	25.00	0.56	67.54	(0.88,100.0)	6	79.95
Meyer D B	1	0	0.00	0.69	0.00	(0.00,100.0)	2	0.00
Palazzo R	167	0	0.00	1.28	0.00	(0.00, 2.58)	265	1.24
Parnell V	.	.	.	.	.	( . , . )	1	0.00
Scheinerman S J	135	1	0.74	2.02	0.55	(0.01, 3.08)	313	0.60 **
##Singh V A	2	0	0.00	2.86	0.00	(0.00,96.84)	3	0.00
Total	495	5	1.01	1.66	0.92	(0.30, 2.14)	1029	1.46 **
M I Bassett Hospital								
Kelley J	131	2	1.53	1.45	1.59	(0.18, 5.73)	196	1.29
Lancey R A	92	0	0.00	1.61	0.00	(0.00, 3.73)	129	0.00
Total	223	2	0.90	1.52	0.89	(0.10, 3.22)	325	0.75
Maimonides Medical Ctr								
Abrol S	131	1	0.76	2.00	0.58	(0.01, 3.21)	207	2.12
Crooke G	86	2	2.33	1.81	1.94	(0.22, 7.01)	143	2.01
Jacobowitz I	269	2	0.74	2.06	0.54	(0.06, 1.96)	390	0.89 **
Ribakove G	84	2	2.38	2.24	1.60	(0.18, 5.78)	198	2.62
#Saunders P	50	1	2.00	1.46	2.07	(0.03,11.53)	58	2.73
Stephens G A	37	0	0.00	1.38	0.00	(0.00,10.86)	68	5.82
Vaynblat M	135	1	0.74	1.52	0.73	(0.01, 4.08)	218	1.29
All Others	2	0	0.00	0.70	0.00	(0.00,100.0)	2	0.00
Total	794	9	1.13	1.88	0.91	(0.42, 1.73)	1284	1.81
Mercy Hospital								
##Aldridge J	7	0	0.00	1.14	0.00	(0.00,69.45)	9	0.00
#Bell-Thomson J	394	7	1.78	1.37	1.95	(0.78, 4.03)	732	3.00
##Downing S W	250	5	2.00	1.50	2.01	(0.65, 4.69)	305	3.18
Lico S	342	4	1.17	1.33	1.32	(0.36, 3.38)	428	2.26
Total	993	16	1.61	1.39	1.75	(1.00, 2.84)	1474	2.77
Millard Fillmore Hosp								
##Aldridge J	17	0	0.00	1.15	0.00	(0.00,28.21)	27	0.00
#Ashraf M	250	2	0.80	1.46	0.83	(0.09, 2.99)	332	1.82
All Others	3	0	0.00	0.84	0.00	(0.00,100.0)	9	0.00
Total	270	2	0.74	1.43	0.78	(0.09, 2.81)	368	1.63
Montefiore - Moses								
#Bello R A	10	0	0.00	2.36	0.00	(0.00,23.42)	12	0.00
#D Alessandro D A	216	2	0.93	1.29	1.08	(0.12, 3.90)	333	3.02
#Derose J J	26	0	0.00	2.06	0.00	(0.00,10.34)	28	0.00
#Goldstein D J	124	2	1.61	1.29	1.89	(0.21, 6.81)	234	1.51
#Jakobleff W A	105	3	2.86	1.28	3.38	(0.68, 9.87)	128	5.11
#Michler R E	83	0	0.00	1.10	0.00	(0.00, 6.07)	254	1.90
Weinstein S	.	.	.	.	.	( . , . )	1	0.00
Total	564	7	1.24	1.31	1.42	(0.57, 2.94)	990	2.37

Table 6 continued

	Isolated CABG						Isolated CABG, or Valve or Valve/CABG	
	No of Cases	Deaths	OMR	EMR	RAMR	95% CI for RAMR	Cases	RAMR
Montefiore - Weiler								
#Bello R A	183	0	0.00	1.40	0.00	(0.00, 2.16)	271	1.43
#D Alessandro D A	1	0	0.00	10.47	0.00	(0.00,52.82)	3	0.00
#Derose J J	292	3	1.03	1.17	1.33	(0.27, 3.88)	460	2.78
#Goldstein D J	51	0	0.00	1.34	0.00	(0.00, 8.10)	95	0.74
#Jakobleff W A	2	0	0.00	4.76	0.00	(0.00,58.11)	3	0.00
#Michler R E	3	0	0.00	1.00	0.00	(0.00,100.0)	28	0.00
Total	532	3	0.56	1.29	0.66	(0.13, 1.92)	860	1.89
Mount Sinai Beth Israel								
##Culliford A	.	.	.	.	.	( . , . )	3	51.81
##Deanda A	.	.	.	.	.	( . , . )	1	0.00
Dimitrova K R	3	0	0.00	1.21	0.00	(0.00,100.0)	6	0.00
##Galloway A	.	.	.	.	.	( . , . )	1	0.00
Geller C M	56	0	0.00	1.73	0.00	(0.00, 5.72)	86	2.06
Hoffman D	149	2	1.34	1.04	1.94	(0.22, 7.01)	187	3.33
##Loulmet D F	.	.	.	.	.	( . , . )	1	0.00
Tranbaugh R	250	2	0.80	0.96	1.25	(0.14, 4.52)	373	3.05
##Zias E	2	0	0.00	1.00	0.00	(0.00,100.0)	6	0.00
All Others	21	1	4.76	2.40	2.99	(0.04,16.64)	61	3.46
Total	481	5	1.04	1.14	1.37	(0.44, 3.20)	725	3.09
Mount Sinai Hospital								
Adams D H	17	0	0.00	0.82	0.00	(0.00,39.52)	994	1.51**
Anyanwu A C	48	2	4.17	1.34	4.70	(0.53,16.95)	145	5.96*
Chikwe J Y	154	2	1.30	1.08	1.81	(0.20, 6.55)	258	1.83
DiLuozzo G	3	0	0.00	0.62	0.00	(0.00,100.0)	15	13.78
Filsoufi F	269	3	1.12	1.03	1.63	(0.33, 4.75)	409	3.06
Milla F	58	0	0.00	1.04	0.00	(0.00, 9.14)	117	1.00
Reddy R C	306	7	2.29	1.30	2.65	(1.06, 5.47)	407	3.36
Stelzer P	44	1	2.27	0.88	3.91	(0.05,21.76)	315	1.80
#Stewart A S	2	0	0.00	0.70	0.00	(0.00,100.0)	3	0.00
Tannous H J	56	0	0.00	0.89	0.00	(0.00,11.08)	96	0.00
Varghese R	46	0	0.00	0.57	0.00	(0.00,20.97)	62	0.00
All Others	5	0	0.00	0.45	0.00	(0.00,100.0)	7	0.00
Total	1008	15	1.49	1.09	2.05	(1.15, 3.39)	2828	2.35
Mount Sinai St. Lukes								
Balaram S K	80	1	1.25	2.07	0.91	(0.01, 5.06)	138	3.15
Swistel D	258	4	1.55	1.82	1.28	(0.35, 3.28)	471	2.82
Total	338	5	1.48	1.88	1.19	(0.38, 2.77)	609	2.90
NY Methodist Hospital								
#Gulkarov I M	80	0	0.00	1.21	0.00	(0.00, 5.71)	142	0.00
#Tortolani A	135	3	2.22	1.13	2.97	(0.60, 8.68)	217	5.47*
All Others	60	0	0.00	1.63	0.00	(0.00, 5.66)	98	0.00
Total	275	3	1.09	1.26	1.30	(0.26, 3.81)	457	2.42

Table 6 continued

	Isolated CABG						Isolated CABG, or Valve or Valve/CABG	
	No of Cases	Deaths	OMR	EMR	RAMR	95% CI for RAMR	Cases	RAMR
NYP-Columbia Presby.								
Argenziano M	185	2	1.08	0.93	1.75	(0.20, 6.32)	467	2.26
#Bacha E	.	.	.	.	.	(. , .)	13	0.00
#Chen J M	.	.	.	.	.	(. , .)	1	0.00
Naka Y	242	2	0.83	1.27	0.98	(0.11, 3.55)	479	2.79
Quaegebeur J	.	.	.	.	.	(. , .)	1	0.00
Smith C	136	1	0.74	1.01	1.10	(0.01, 6.13)	729	1.46
#Stewart A S	193	6	3.11	1.93	2.43	(0.89, 5.28)	590	2.37
Takayama H	304	7	2.30	1.87	1.86	(0.75, 3.83)	507	2.85
Williams M R	86	1	1.16	1.54	1.14	(0.01, 6.33)	547	1.63
All Others	57	1	1.75	1.97	1.34	(0.02, 7.46)	97	2.09
Total	1203	20	1.66	1.50	1.67	(1.02, 2.59)	3431	2.14
NYP-Queens								
#Lang S	286	3	1.05	1.18	1.34	(0.27, 3.93)	403	1.12
Total	286	3	1.05	1.18	1.34	(0.27, 3.93)	403	1.12
NYP-Weill Cornell								
#Bacha E	.	.	.	.	.	(. , .)	1	0.00
#Chen J M	.	.	.	.	.	(. , .)	3	0.00
Girardi L	231	0	0.00	1.34	0.00	(0.00, 1.79)	955	1.51
#Gulkarov I M	3	0	0.00	0.95	0.00	(0.00,100.0)	5	0.00
Isom O	12	0	0.00	0.69	0.00	(0.00,66.67)	51	0.00
Krieger K	166	3	1.81	1.13	2.40	(0.48, 7.02)	577	2.64
#Lang S	4	0	0.00	0.78	0.00	(0.00,100.0)	11	0.00
Salemi A	104	2	1.92	1.03	2.83	(0.32,10.20)	215	1.61
#Tortolani A	1	1	100.00	0.93	100.00	(2.12,100.0)	1	100.00
All Others	1	0	0.00	1.06	0.00	(0.00,100.0)	6	0.00
Total	522	6	1.15	1.19	1.46	(0.53, 3.17)	1825	1.91
NYU Hospitals Center								
#Balsam L B	1	0	0.00	0.36	0.00	(0.00,100.0)	8	3.56
##Culliford A	60	1	1.67	0.86	2.93	(0.04,16.33)	139	1.48
##Deanda A	4	0	0.00	0.64	0.00	(0.00,100.0)	15	0.00
##Galloway A	58	1	1.72	1.02	2.54	(0.03,14.12)	584	2.99
#Grossi E	6	0	0.00	0.91	0.00	(0.00,100.0)	14	7.20
##Loulmet D F	62	0	0.00	0.73	0.00	(0.00,12.21)	365	2.66
Mosca R S	.	.	.	.	.	(. , .)	1	0.00
##Zias E	149	4	2.68	0.82	4.93	(1.33,12.62)	440	2.82
All Others	60	1	1.67	1.00	2.52	(0.03,14.04)	142	5.99
Total	400	7	1.75	0.87	3.05	(1.22, 6.28)	1708	3.01
North Shore Univ Hosp								
Esposito R	267	1	0.37	1.45	0.39	(0.01, 2.17)	496	3.08
Hall M	189	2	1.06	1.74	0.92	(0.10, 3.31)	349	2.18
#Hartman A	34	0	0.00	1.33	0.00	(0.00,12.27)	198	1.28
#Kalimi R	78	2	2.56	1.66	2.32	(0.26, 8.39)	171	2.76
Pogo G	162	5	3.09	1.81	2.58	(0.83, 6.01)	276	3.56
Vatsia S	192	5	2.60	1.55	2.53	(0.82, 5.91)	352	1.73
All Others	10	0	0.00	1.80	0.00	(0.00,30.80)	22	4.24
Total	932	15	1.61	1.61	1.51	(0.84, 2.49)	1864	2.51

Table 6 continued

	Isolated CABG					Isolated CABG, or Valve or Valve/CABG		
	No of Cases	Deaths	OMR	EMR	RAMR	95% CI for RAMR	Cases	RAMR
Rochester General Hosp								
Cheeran D	484	11	2.27	1.72	1.99	(0.99, 3.56)	866	2.92
Kirshner R	428	12	2.80	1.63	2.60	(1.34, 4.54)	1050	3.85 *
All Others	52	2	3.85	1.91	3.04	(0.34,10.96)	73	6.29
Total	964	25	2.59	1.69	2.31	(1.50, 3.42)	1989	3.53 *
Southside Hospital								
#Hartman A	53	1	1.89	2.06	1.38	(0.02, 7.68)	222	1.59
#Kalimi R	197	4	2.03	1.95	1.57	(0.42, 4.03)	323	1.96
#Manetta F	133	3	2.26	1.96	1.73	(0.35, 5.06)	177	3.06
##Singh V A	16	1	6.25	1.67	5.65	(0.07,31.42)	21	10.32
Total	399	9	2.26	1.96	1.74	(0.79, 3.30)	743	2.22
St. Elizabeth Med Ctr								
#Akujuo A C	131	2	1.53	1.20	1.92	(0.22, 6.93)	204	3.97
#El Amir N	214	3	1.40	1.53	1.38	(0.28, 4.03)	321	3.20
Joyce F	265	7	2.64	1.72	2.32	(0.93, 4.78)	409	3.00
Total	610	12	1.97	1.54	1.92	(0.99, 3.36)	934	3.26
St. Francis Hospital								
Bercow N	381	8	2.10	1.68	1.88	(0.81, 3.70)	628	2.97
Colangelo R	662	9	1.36	1.53	1.34	(0.61, 2.55)	1166	1.71
#Fernandez H A	197	0	0.00	2.22	0.00 **	(0.00, 1.26)	283	1.15
Lamendola C	285	5	1.75	1.73	1.53	(0.49, 3.57)	514	3.31
#Lundy E F	24	1	4.17	1.97	3.18	(0.04,17.70)	27	4.03
Robinson N	292	1	0.34	1.53	0.34	(0.00, 1.87)	747	2.19
#Taylor J	186	1	0.54	1.46	0.55	(0.01, 3.09)	487	1.54
All Others	21	0	0.00	2.25	0.00	(0.00,11.71)	27	0.00
Total	2048	25	1.22	1.66	1.11	(0.72, 1.64)	3879	2.13
St. Josephs Hospital								
Green G R	230	4	1.74	1.64	1.59	(0.43, 4.08)	490	1.42
#Lutz C J	107	1	0.93	1.77	0.80	(0.01, 4.42)	223	0.91
Marvasti M	172	3	1.74	1.80	1.46	(0.29, 4.26)	398	1.21
Nazem A	312	4	1.28	2.02	0.95	(0.26, 2.44)	516	1.33
Zhou Z	323	5	1.55	1.84	1.27	(0.41, 2.97)	604	2.00
All Others	25	1	4.00	1.82	3.32	(0.04,18.46)	42	8.81 *
Total	1169	18	1.54	1.84	1.26	(0.75, 2.00)	2273	1.64 **
St. Peters Hosp.								
#Bennett E	11	0	0.00	1.07	0.00	(0.00,47.08)	42	0.00
Canavan T	174	2	1.15	1.62	1.07	(0.12, 3.87)	205	1.38
Edwards N	146	1	0.68	1.12	0.92	(0.01, 5.12)	316	2.02
#Reich H	5	0	0.00	2.32	0.00	(0.00,47.67)	5	0.00
Saifi J	199	1	0.50	1.49	0.51	(0.01, 2.83)	579	2.78
Terrien C M	290	6	2.07	1.39	2.25	(0.82, 4.89)	392	2.29
All Others	80	2	2.50	1.55	2.43	(0.27, 8.78)	83	5.40
Total	905	12	1.33	1.43	1.40	(0.72, 2.45)	1622	2.42

Table 6 continued

	Isolated CABG					Isolated CABG, or Valve or Valve/CABG		
	No of Cases	Deaths	OMR	EMR	RAMR	95% CI for RAMR	Cases	RAMR
Staten Island Univ Hosp								
Asgarian K T	129	1	0.78	0.99	1.18	(0.02, 6.55)	208	3.86
McGinn J	308	6	1.95	1.34	2.19	(0.80, 4.76)	452	3.86
Rosell F M	272	2	0.74	1.59	0.70	(0.08, 2.52)	324	0.82
##Singh V A	10	1	10.00	1.21	12.46	(0.16,69.32)	10	20.03
All Others	8	1	12.50	1.06	17.72	(0.23,98.57)	8	28.48
Total	727	11	1.51	1.37	1.67	(0.83, 2.98)	1002	3.11
Strong Memorial Hosp								
Alfieris G	.	.	.	.	.	(. , .)	1	0.00
Gensini P F	.	.	.	.	.	(. , .)	2	0.00
Hicks G	208	5	2.40	1.45	2.51	(0.81, 5.85)	313	4.35
Knight P	468	14	2.99	1.46	3.09 *	(1.69, 5.18)	944	3.99 *
Massey H	88	2	2.27	2.01	1.71	(0.19, 6.17)	146	4.12
Total	764	21	2.75	1.52	2.73 *	(1.69, 4.17)	1406	4.08 *
UHS-Wilson Med Ctr								
Wong K	225	9	4.00	1.77	3.42 *	(1.56, 6.48)	359	4.11
Yousuf M	233	7	3.00	1.64	2.77	(1.11, 5.70)	348	5.20 *
Total	458	16	3.49	1.70	3.10 *	(1.77, 5.03)	707	4.65 *
Univ. Hosp-Brooklyn								
Burack J H	11	0	0.00	1.07	0.00	(0.00,46.96)	15	0.00
Lee D C	32	1	3.13	2.68	1.76	(0.02, 9.80)	44	1.90
Tak V M	123	4	3.25	1.93	2.54	(0.68, 6.49)	204	4.83 *
Total	166	5	3.01	2.02	2.25	(0.72, 5.25)	263	4.18
Univ. Hosp-Stony Brook								
Bilfinger T	38	3	7.89	1.85	6.45	(1.30,18.83)	54	8.42 *
#Fernandez H A	95	1	1.05	1.44	1.10	(0.01, 6.12)	169	1.59
Gupta S	147	2	1.36	1.70	1.21	(0.14, 4.36)	273	0.74
McLarty A	7	0	0.00	1.61	0.00	(0.00,49.05)	11	10.69
Seifert F	214	3	1.40	1.59	1.33	(0.27, 3.88)	281	2.75
#Taylor J	111	0	0.00	1.54	0.00	(0.00, 3.25)	236	1.07
All Others	71	2	2.82	2.05	2.08	(0.23, 7.50)	135	4.39
Total	683	11	1.61	1.65	1.47	(0.74, 2.64)	1159	2.39
Univ. Hosp-Upstate								
Fink G W	191	3	1.57	1.42	1.67	(0.34, 4.88)	287	2.45
#Lutz C J	157	2	1.27	1.57	1.22	(0.14, 4.42)	266	2.15
All Others	28	2	7.14	2.19	4.91	(0.55,17.73)	34	6.11
Total	376	7	1.86	1.54	1.82	(0.73, 3.76)	587	2.55
Vassar Bros. Med Ctr								
Bhutani A K	66	1	1.52	1.26	1.82	(0.02,10.13)	74	2.42
Sarabu M	148	0	0.00	1.41	0.00	(0.00, 2.66)	385	1.08
Shahani R B	147	2	1.36	1.76	1.17	(0.13, 4.21)	236	2.46
Zakow P	201	3	1.49	1.50	1.50	(0.30, 4.38)	335	2.61
Total	562	6	1.07	1.51	1.06	(0.39, 2.31)	1030	1.87

Table 6 continued

	Isolated CABG						Isolated CABG, or Valve or Valve/CABG	
	No of Cases	Deaths	OMR	EMR	RAMR	95% CI for RAMR	Cases	RAMR
Westchester Med Ctr								
Lafaro R	112	0	0.00	1.46	0.00	(0.00, 3.38)	166	1.98
Lansman S	62	0	0.00	1.49	0.00	(0.00, 5.97)	106	2.40
Malekan R	200	3	1.50	1.89	1.19	(0.24, 3.49)	263	2.57
#Saunders P	1	0	0.00	1.37	0.00	(0.00,100.0)	1	0.00
Sett S S	.	.	.	.	.	( . , . )	1	0.00
Spielvogel D	246	3	1.22	1.61	1.14	(0.23, 3.35)	429	1.50
All Others	59	0	0.00	2.23	0.00	(0.00, 4.20)	95	0.00
Total	680	6	0.88	1.71	0.78	(0.28, 1.69)	1061	1.79
Winthrop-Univ. Hosp								
Goncalves J A	203	3	1.48	1.37	1.62	(0.33, 4.74)	450	2.38
Kokotos W J	210	3	1.43	1.67	1.29	(0.26, 3.76)	387	2.79
Lee W W	147	0	0.00	1.73	0.00	(0.00, 2.18)	186	1.28
Schubach S	176	0	0.00	1.21	0.00	(0.00, 2.60)	327	2.35
All Others	4	0	0.00	0.50	0.00	(0.00,100.0)	4	0.00
Total	740	6	0.81	1.49	0.82	(0.30, 1.79)	1354	2.38
STATEWIDE TOTAL	24937	376	1.51				47150	2.42

* RAMR significantly higher than statewide rate based on 95 percent confidence interval.

** RAMR significantly lower than statewide rate based on 95 percent confidence interval.

Performed operations in another NYS hospital.

Performed operations in two or more other NYS hospitals.

Table 7**Summary Information for Surgeons Practicing at More Than One Hospital, 2011-2013.**

	Isolated CABG					95% CI for RAMR	Isolated CABG, or Valve or Valve/CABG	
	Cases	Deaths	OMR	EMR	RAMR		Cases	RAMR
Akujuo A C	177	2	1.13	1.47	1.16	(0.13, 4.18)	276	2.74
Albany Med. Ctr	46	0	0.00	2.25	0.00	(0.00, 5.34)	72	0.00
St. Elizabeth Med Ctr	131	2	1.53	1.20	1.92	(0.22, 6.93)	204	3.97
Aldridge J	133	6	4.51	1.40	4.86 *	(1.78, 10.59)	155	6.28 *
Buffalo General Hosp	109	6	5.50	1.45	5.71 *	(2.08, 12.43)	119	9.40 *
Mercy Hospital	7	0	0.00	1.14	0.00	(0.00, 69.45)	9	0.00
Millard Fillmore Hosp	17	0	0.00	1.15	0.00	(0.00,28.21)	27	0.00
Ashraf M	575	8	1.39	1.37	1.53	(0.66, 3.01)	752	2.47
Buffalo General Hosp	325	6	1.85	1.31	2.13	(0.78, 4.63)	420	2.99
Millard Fillmore Hosp	250	2	0.80	1.46	0.83	(0.09, 2.99)	332	1.82
Bacha E	.	.	.	.	.	( . , . )	14	0.00
NYP-Columbia Presby.	.	.	.	.	.	( . , . )	13	0.00
NYP-Weill Cornell	.	.	.	.	.	( . , . )	1	0.00
Balsam L B	130	1	0.77	0.94	1.24	(0.02, 6.87)	254	1.66
Bellevue Hospital Ctr	129	1	0.78	0.94	1.24	(0.02, 6.89)	246	1.31
NYU Hospitals Center	1	0	0.00	0.36	0.00	(0.00, 100.0)	8	3.56
Bell-Thomson J	395	7	1.77	1.37	1.95	(0.78, 4.02)	733	3.00
Erie County Med Ctr	1	0	0.00	0.57	0.00	(0.00,100.0)	1	0.00
Mercy Hospital	394	7	1.78	1.37	1.95	(0.78, 4.03)	732	3.00
Bello R A	193	0	0.00	1.45	0.00	(0.00, 1.98)	283	1.37
Montefiore - Moses	10	0	0.00	2.36	0.00	(0.00, 23.42)	12	0.00
Montefiore - Weiler	183	0	0.00	1.40	0.00	(0.00, 2.16)	271	1.43
Bennett E	76	0	0.00	1.29	0.00	(0.00, 5.63)	281	2.36
Albany Med. Ctr	65	0	0.00	1.33	0.00	(0.00, 6.39)	239	2.80
St. Peters Hosp.	11	0	0.00	1.07	0.00	(0.00, 47.08)	42	0.00
Chen J M	.	.	.	.	.	( . , . )	4	0.00
NYP-Columbia Presby.	.	.	.	.	.	( . , . )	1	0.00
NYP-Weill Cornell	.	.	.	.	.	( . , . )	3	0.00
Culliford A	61	1	1.64	0.89	2.78	(0.04,15.45)	143	2.18
Bellevue Hospital Ctr	1	0	0.00	2.93	0.00	(0.00,100.0)	1	0.00
Mount Sinai Beth Israel	.	.	.	.	.	( . , . )	3	51.81
NYU Hospitals Center	60	1	1.67	0.86	2.93	(0.04,16.33)	139	1.48
D Alessandro D A	217	2	0.92	1.33	1.04	(0.12, 3.76)	336	2.92
Montefiore - Moses	216	2	0.93	1.29	1.08	(0.12, 3.90)	333	3.02
Montefiore - Weiler	1	0	0.00	10.47	0.00	(0.00,52.82)	3	0.00

Table 7 continued

	Isolated CABG						Isolated CABG, or Valve or Valve/CABG	
	Cases	Deaths	OMR	EMR	RAMR	95% CI for RAMR	Cases	RAMR
Deanda A	116	3	2.59	0.81	4.83	(0.97,14.11)	203	4.56
Bellevue Hospital Ctr	112	3	2.68	0.81	4.97	(1.00,14.51)	187	4.89
Mount Sinai Beth Israel	.	.	.	.	.	(. , .)	1	0.00
NYU Hospitals Center	4	0	0.00	0.64	0.00	(0.00,100.0)	15	0.00
Derose J J	318	3	0.94	1.24	1.15	(0.23, 3.36)	488	2.63
Montefiore - Moses	26	0	0.00	2.06	0.00	(0.00,10.34)	28	0.00
Montefiore - Weiler	292	3	1.03	1.17	1.33	(0.27, 3.88)	460	2.78
Downing S W	412	6	1.46	1.41	1.55	(0.57, 3.38)	496	2.75
Buffalo General Hosp	8	1	12.50	0.99	18.99	(0.25,100.0)	11	11.36
Erie County Med Ctr	154	0	0.00	1.29	0.00	(0.00, 2.77)	180	0.79
Mercy Hospital	250	5	2.00	1.50	2.01	(0.65, 4.69)	305	3.18
EI Amir N	228	3	1.32	1.49	1.34	(0.27, 3.90)	338	3.13
Champ.Valley Phys Hosp	14	0	0.00	0.78	0.00	(0.00,50.48)	17	0.00
St. Elizabeth Med Ctr	214	3	1.40	1.53	1.38	(0.28, 4.03)	321	3.20
Fernandez H A	292	1	0.34	1.97	0.26 **	(0.00, 1.46)	452	1.31
St. Francis Hospital	197	0	0.00	2.22	0.00 **	(0.00, 1.26)	283	1.15
Univ. Hosp-Stony Brook	95	1	1.05	1.44	1.10	(0.01, 6.12)	169	1.59
Galloway A	62	1	1.61	1.03	2.36	(0.03,13.10)	600	2.93
Lenox Hill Hospital	4	0	0.00	1.16	0.00	(0.00,100.0)	15	0.00
Mount Sinai Beth Israel	.	.	.	.	.	(. , .)	1	0.00
NYU Hospitals Center	58	1	1.72	1.02	2.54	(0.03,14.12)	584	2.99
Goldstein D J	175	2	1.14	1.30	1.32	(0.15, 4.77)	329	1.25
Montefiore - Moses	124	2	1.61	1.29	1.89	(0.21, 6.81)	234	1.51
Montefiore - Weiler	51	0	0.00	1.34	0.00	(0.00, 8.10)	95	0.74
Grossi E	7	0	0.00	0.85	0.00	(0.00,93.39)	15	7.10
Bellevue Hospital Ctr	1	0	0.00	0.45	0.00	(0.00,100.0)	1	0.00
NYU Hospitals Center	6	0	0.00	0.91	0.00	(0.00,100.0)	14	7.20
Gulkarov I M	83	0	0.00	1.20	0.00	(0.00, 5.55)	147	0.00
NY Methodist Hospital	80	0	0.00	1.21	0.00	(0.00, 5.71)	142	0.00
NYP-Weill Cornell	3	0	0.00	0.95	0.00	(0.00,100.0)	5	0.00
Hartman A	87	1	1.15	1.77	0.98	(0.01, 5.44)	420	1.46
North Shore Univ Hosp	34	0	0.00	1.33	0.00	(0.00,12.27)	198	1.28
Southside Hospital	53	1	1.89	2.06	1.38	(0.02, 7.68)	222	1.59
Jakobleff W A	107	3	2.80	1.34	3.15	(0.63, 9.22)	131	4.85
Montefiore - Moses	105	3	2.86	1.28	3.38	(0.68, 9.87)	128	5.11
Montefiore - Weiler	2	0	0.00	4.76	0.00	(0.00,58.11)	3	0.00
Kalimi R	275	6	2.18	1.87	1.76	(0.64, 3.84)	494	2.23
North Shore Univ Hosp	78	2	2.56	1.66	2.32	(0.26, 8.39)	171	2.76
Southside Hospital	197	4	2.03	1.95	1.57	(0.42, 4.03)	323	1.96
Lang S	290	3	1.03	1.17	1.33	(0.27, 3.89)	414	1.09
NYP-Queens	286	3	1.05	1.18	1.34	(0.27, 3.93)	403	1.12
NYP-Weill Cornell	4	0	0.00	0.78	0.00	(0.00,100.0)	11	0.00

Table 7 continued

	Isolated CABG						Isolated CABG, or Valve or Valve/CABG	
	Cases	Deaths	OMR	EMR	RAMR	95% CI for RAMR	Cases	RAMR
Loulmet D F	90	1	1.11	0.85	1.98	(0.03,10.99)	433	3.56
Bellevue Hospital Ctr	24	1	4.17	1.04	6.05	(0.08,33.65)	58	9.98 *
Lenox Hill Hospital	4	0	0.00	1.52	0.00	(0.00,90.78)	9	0.00
Mount Sinai Beth Israel	.	.	.	.	.	( . , . )	1	0.00
NYU Hospitals Center	62	0	0.00	0.73	0.00	(0.00,12.21)	365	2.66
Lundy E F	168	2	1.19	1.67	1.08	(0.12, 3.88)	242	1.47
Good Sam - Suffern	144	1	0.69	1.62	0.65	(0.01, 3.60)	215	1.12
St. Francis Hospital	24	1	4.17	1.97	3.18	(0.04,17.70)	27	4.03
Lutz C J	264	3	1.14	1.65	1.04	(0.21, 3.03)	489	1.55
St. Josephs Hospital	107	1	0.93	1.77	0.80	(0.01, 4.42)	223	0.91
Univ. Hosp-Upstate	157	2	1.27	1.57	1.22	(0.14, 4.42)	266	2.15
Manetta F	137	4	2.92	1.92	2.29	(0.62, 5.86)	183	3.64
Long Island Jewish MC	4	1	25.00	0.56	67.54	(0.88,100.0)	6	79.95
Southside Hospital	133	3	2.26	1.96	1.73	(0.35, 5.06)	177	3.06
Michler R E	86	0	0.00	1.09	0.00	(0.00, 5.88)	282	1.71
Montefiore - Moses	83	0	0.00	1.10	0.00	(0.00, 6.07)	254	1.90
Montefiore - Weiler	3	0	0.00	1.00	0.00	(0.00,100.0)	28	0.00
Reich H	115	2	1.74	1.41	1.85	(0.21, 6.69)	264	2.36
Ellis Hospital	110	2	1.82	1.37	2.00	(0.22, 7.21)	259	2.40
St. Peters Hosp.	5	0	0.00	2.32	0.00	(0.00,47.67)	5	0.00
Saunders P	51	1	1.96	1.45	2.03	(0.03,11.31)	59	2.69
Maimonides Medical Ctr	50	1	2.00	1.46	2.07	(0.03,11.53)	58	2.73
Westchester Med Ctr	1	0	0.00	1.37	0.00	(0.00,100.0)	1	0.00
Singh V A	28	2	7.14	1.59	6.77	(0.76,24.46)	34	10.92
Long Island Jewish MC	2	0	0.00	2.86	0.00	(0.00,96.84)	3	0.00
Southside Hospital	16	1	6.25	1.67	5.65	(0.07,31.42)	21	10.32
Staten Island Univ Hosp	10	1	10.00	1.21	12.46	(0.16,69.32)	10	20.03
Stewart A S	195	6	3.08	1.92	2.42	(0.88, 5.26)	593	2.37
Mount Sinai Hospital	2	0	0.00	0.70	0.00	(0.00,100.0)	3	0.00
NYP-Columbia Presby.	193	6	3.11	1.93	2.43	(0.89, 5.28)	590	2.37
Taylor J	297	1	0.34	1.49	0.34	(0.00, 1.90)	723	1.39 **
St. Francis Hospital	186	1	0.54	1.46	0.55	(0.01, 3.09)	487	1.54
Univ. Hosp-Stony Brook	111	0	0.00	1.54	0.00	(0.00, 3.25)	236	1.07
Tortolani A	136	4	2.94	1.13	3.94	(1.06,10.08)	218	6.07 *
NY Methodist Hospital	135	3	2.22	1.13	2.97	(0.60, 8.68)	217	5.47 *
NYP-Weill Cornell	1	1	100.00	0.93	100.00	(2.12,100.0)	1	100.00
Zias E	154	4	2.60	0.84	4.64	(1.25,11.87)	452	2.74
Bellevue Hospital Ctr	2	0	0.00	2.55	0.00	(0.00,100.0)	2	0.00
Lenox Hill Hospital	1	0	0.00	0.62	0.00	(0.00,100.0)	4	0.00
Mount Sinai Beth Israel	2	0	0.00	1.00	0.00	(0.00,100.0)	6	0.00
NYU Hospitals Center	149	4	2.68	0.82	4.93	(1.33,12.62)	440	2.82

* RAMR significantly higher than statewide rate based on 95 percent confidence interval.

** RAMR significantly lower than statewide rate based on 95 percent confidence interval.

SURGEON AND HOSPITAL VOLUMES FOR TOTAL ADULT CARDIAC SURGERY, 2011-2013

Table 8 presents, for each hospital and for each surgeon performing at least 200 cardiac operations in any hospital in 2011-2013 and/or performing one or more cardiac operations in each of the years 2011-2013, the total number of Isolated CABG operations, the total number of Valve or Valve/CABG operations, the total number of Other Cardiac operations and Total Cardiac operations. As in Table 6, results for surgeons not meeting the above criteria are grouped together in an “All Others” category.

The Isolated CABG column includes patients who undergo bypass of one or more of the coronary arteries with no other major heart

surgery earlier in the same admission. Valve or Valve/CABG volumes include the total number of cases for the eight Valve or groups that were identified in Table 4. Other Cardiac Surgery refers to cardiac procedures not represented by Isolated CABG, and Valve or Valve/CABG operations and includes, but is not limited to: repairs of congenital conditions, heart transplants, aneurysm repairs, ventricular reconstruction and ventricular assist device insertions. Total Cardiac Surgery is the sum of the previous three columns and includes any surgery on the heart or great vessels.

Table 8

Surgeon and Hospital Volume for Isolated CABG, Valve or Valve/CABG, Other Cardiac Surgery, and Total Adult Cardiac Surgery, 2011-2013

	Isolated CABG	Valve or Valve/CABG	Other Cardiac Surgery	Total Cardiac Surgery
Albany Med. Ctr				
Akujuo A C	46	26	5	77
Bennett E	65	174	112	351
Britton L	162	157	80	399
Depan H	241	151	48	440
Devejian N	0	1	12	13
Miller S	177	114	26	317
Total	691	623	283	1597
Arnot Ogden Med Ctr				
Nast E	127	61	12	200
Raudat C W	96	35	11	142
All Others	12	3	0	15
Total	235	99	23	357
Bellevue Hospital Ctr				
Balsam L B	129	117	55	301
Culliford A	1	0	1	2
Deanda A	112	75	97	284
Grossi E	1	0	1	2
Loulmet D F	24	34	3	61
Zias E	2	0	0	2
All Others	0	0	1	1
Total	269	226	158	653

Table 8 continued

	Isolated CABG	Valve or Valve/CABG	Other Cardiac Surgery	Total Cardiac Surgery
Buffalo General Hosp				
Aldridge J	109	10	38	157
Ashraf M	325	95	54	474
Downing S W	8	3	2	13
Grosner G	659	516	110	1285
All Others	22	7	1	30
Total	1123	631	205	1959
Champ.Valley Phys Hosp				
Cahill A T	173	71	12	256
El Amir N	14	3	1	18
All Others	42	1	1	44
Total	229	75	14	318
Ellis Hospital				
Choumarov K	224	63	6	293
Reich H	110	149	24	283
Singh C	193	87	14	294
Total	527	299	44	870
Erie County Med Ctr				
Bell-Thomson J	1	0	1	2
Downing S W	154	26	25	205
All Others	18	4	7	29
Total	173	30	33	236
Good Sam - Suffern				
Lundy E F	144	71	6	221
Salenger R	160	50	12	222
All Others	49	8	0	57
Total	353	129	18	500
Lenox Hill Hospital				
Galloway A	4	11	0	15
Loulmet D F	4	5	1	10
Patel N C	556	216	33	805
Plestis K A	67	125	176	368
Subramanian V	95	49	21	165
Zias E	1	3	0	4
All Others	43	70	88	201
Total	770	479	319	1568
Long Island Jewish MC				
Graver L	186	253	45	484
Manetta F	4	2	1	7
Meyer D B	1	1	14	16
Palazzo R	167	98	68	333
Parnell V	0	1	21	22
Scheinerman S J	135	178	91	404
Singh V A	2	1	0	3
All Others	0	0	2	2
Total	495	534	242	1271

Table 8 continued

	Isolated CABG	Valve or Valve/CABG	Other Cardiac Surgery	Total Cardiac Surgery
M I Bassett Hospital				
Kelley J	131	65	14	210
Lancey R A	92	37	6	135
Total	223	102	20	345
Maimonides Medical Ctr				
Abrol S	131	76	51	258
Crooke G	86	57	52	195
Jacobowitz I	269	121	26	416
Ribakove G	84	114	37	235
Saunders P	50	8	18	76
Stephens G A	37	31	5	73
Vaynblat M	135	83	19	237
All Others	2	0	1	3
Total	794	490	209	1493
Mercy Hospital				
Aldridge J	7	2	0	9
Bell-Thomson J	394	338	83	815
Downing S W	250	55	17	322
Lico S	342	86	37	465
Total	993	481	137	1611
Millard Fillmore Hosp				
Aldridge J	17	10	3	30
Ashraf M	250	82	12	344
All Others	3	6	1	10
Total	270	98	16	384
Montefiore - Moses				
Bello R A	10	2	15	27
D Alessandro D A	216	117	87	420
Derose J J	26	2	45	73
Goldstein D J	124	110	72	306
Jakobleff W A	105	23	14	142
Michler R E	83	171	45	299
Weinstein S	0	1	27	28
All Others	0	0	4	4
Total	564	426	309	1299
Montefiore - Weiler				
Bello R A	183	88	29	300
D Alessandro D A	1	2	2	5
Derose J J	292	168	67	527
Goldstein D J	51	44	8	103
Jakobleff W A	2	1	2	5
Michler R E	3	25	1	29
Total	532	328	109	969

Table 8 continued

	Isolated CABG	Valve or Valve/CABG	Other Cardiac Surgery	Total Cardiac Surgery
Mount Sinai Beth Israel				
Culliford A	0	3	0	3
Deanda A	0	1	1	2
Dimitrova K R	3	3	5	11
Galloway A	0	1	0	1
Geller C M	56	30	11	97
Hoffman D	149	38	12	199
Loulmet D F	0	1	0	1
Tranbaugh R	250	123	41	414
Zias E	2	4	0	6
All Others	21	40	16	77
Total	481	244	86	811
Mount Sinai Hospital				
Adams D H	17	977	141	1135
Anyanwu A C	48	97	215	360
Chikwe J Y	154	104	44	302
DiLuozzo G	3	12	114	129
Filsoufi F	269	140	20	429
Milla F	58	59	28	145
Reddy R C	306	101	66	473
Stelzer P	44	271	220	535
Stewart A S	2	1	5	8
Tannous H J	56	40	6	102
Varghese R	46	16	10	72
All Others	5	2	61	68
Total	1008	1820	930	3758
Mount Sinai St. Lukes				
Balaram S K	80	58	32	170
Swistel D	258	213	39	510
Total	338	271	71	680
NY Methodist Hospital				
Gulkarov I M	80	62	28	170
Tortolani A	135	82	4	221
All Others	60	38	15	113
Total	275	182	47	504
NYP-Columbia Presby.				
Argenziano M	185	282	49	516
Bacha E	0	13	151	164
Chen J M	0	1	15	16
Naka Y	242	237	198	677
Quaegebeur J	0	1	56	57
Smith C	136	593	61	790
Stewart A S	193	397	369	959
Takayama H	304	203	137	644
Williams M R	86	461	682	1229
All Others	57	40	355	452
Total	1203	2228	2073	5504

Table 8 continued

	Isolated CABG	Valve or Valve/CABG	Other Cardiac Surgery	Total Cardiac Surgery
NYP-Queens				
Lang S	286	117	24	427
Total	286	117	24	427
NYP-Weill Cornell				
Bacha E	0	1	6	7
Chen J M	0	3	26	29
Girardi L	231	724	676	1631
Gulkarov I M	3	2	1	6
Isom O	12	39	7	58
Krieger K	166	411	23	600
Lang S	4	7	2	13
Salemi A	104	111	282	497
Tortolani A	1	0	0	1
All Others	1	5	0	6
Total	522	1303	1023	2848
NYU Hospitals Center				
Balsam L B	1	7	20	28
Culliford A	60	79	17	156
Deanda A	4	11	38	53
Galloway A	58	526	44	628
Grossi E	6	8	6	20
Loulmet D F	62	303	80	445
Mosca R S	0	1	31	32
Zias E	149	291	54	494
All Others	60	82	20	162
Total	400	1308	310	2018
North Shore Univ Hosp				
Esposito R	267	229	84	580
Hall M	189	160	22	371
Hartman A	34	164	61	259
Kalimi R	78	93	19	190
Pogo G	162	114	37	313
Vatsia S	192	160	37	389
All Others	10	12	13	35
Total	932	932	273	2137
Rochester General Hosp				
Cheeran D	484	382	120	986
Kirshner R	428	622	86	1136
All Others	52	21	5	78
Total	964	1025	211	2200
Southside Hospital				
Hartman A	53	169	70	292
Kalimi R	197	126	35	358
Manetta F	133	44	34	211
Singh V A	16	5	3	24
Total	399	344	142	885

Table 8 continued

	Isolated CABG	Valve or Valve/CABG	Other Cardiac Surgery	Total Cardiac Surgery
St. Elizabeth Med Ctr				
Akujuo A C	131	73	7	211
El Amir N	214	107	35	356
Joyce F	265	144	14	423
Total	610	324	56	990
St. Francis Hospital				
Bercow N	381	247	39	667
Colangelo R	662	504	46	1212
Fernandez H A	197	86	15	298
Lamendola C	285	229	32	546
Lundy E F	24	3	0	27
Robinson N	292	455	195	942
Taylor J	186	301	38	525
All Others	21	6	5	32
Total	2048	1831	370	4249
St. Josephs Hospital				
Green G R	230	260	98	588
Lutz C J	107	116	24	247
Marvasti M	172	226	52	450
Nazem A	312	204	54	570
Zhou Z	323	281	88	692
All Others	25	17	7	49
Total	1169	1104	323	2596
St. Peters Hosp.				
Bennett E	11	31	1	43
Canavan T	174	31	1	206
Edwards N	146	170	58	374
Reich H	5	0	0	5
Saifi J	199	380	61	640
Terrien C M	290	102	17	409
All Others	80	3	0	83
Total	905	717	138	1760
Staten Island Univ Hosp				
Asgarian K T	129	79	18	226
McGinn J	308	144	16	468
Rosell F M	272	52	19	343
Singh V A	10	0	2	12
All Others	8	0	1	9
Total	727	275	56	1058
Strong Memorial Hosp				
Alfieris G	0	1	27	28
Gensini P F	0	2	44	46
Hicks G	208	105	59	372
Knight P	468	476	196	1140
Massey H	88	58	147	293
Total	764	642	473	1879

Table 8 continued

	Isolated CABG	Valve or Valve/CABG	Other Cardiac Surgery	Total Cardiac Surgery
UHS-Wilson Med Ctr				
Wong K	225	134	11	370
Yousuf M	233	115	16	364
Total	458	249	27	734
Univ. Hosp-Brooklyn				
Burack J H	11	4	2	17
Lee D C	32	12	5	49
Tak V M	123	81	21	225
Total	166	97	28	291
Univ. Hosp-Stony Brook				
Bilfinger T	38	16	14	68
Fernandez H A	95	74	21	190
Gupta S	147	126	48	321
McLarty A	7	4	48	59
Seifert F	214	67	12	293
Taylor J	111	125	45	281
All Others	71	64	5	140
Total	683	476	193	1352
Univ. Hosp-Upstate				
Fink G W	191	96	55	342
Lutz C J	157	109	23	289
All Others	28	6	2	36
Total	376	211	80	667
Vassar Bros. Med Ctr				
Bhutani A K	66	8	2	76
Sarabu M	148	237	39	424
Shahani R B	147	89	15	251
Zakow P	201	134	24	359
Total	562	468	80	1110
Westchester Med Ctr				
Lafaro R	112	54	17	183
Lansman S	62	44	24	130
Malekan R	200	63	75	338
Saunders P	1	0	5	6
Sett S S	0	1	4	5
Spielvogel D	246	183	118	547
All Others	59	36	40	135
Total	680	381	283	1344
Winthrop-Univ. Hosp				
Goncalves J A	203	247	290	740
Kokotos W J	210	177	32	419
Lee W W	147	39	3	189
Schubach S	176	151	13	340
All Others	4	0	0	4
Total	740	614	338	1692
STATEWIDE TOTAL	24937	22213	9774	56924

Criteria Used in Reporting Significant Risk Factors (2013)

Based on Documentation in Medical Records

Patient Risk Factor	Definitions
Demographic	
Body Surface Area	<p>Body surface area (BSA) is a function of height and weight and increases for larger heights and weights. The statistical formula used to calculate BSA in this report is:</p> $BSA (m^2) = 0.0003207 \times H^{0.3} \times W^{(0.7285 - (0.0188 \times \text{LOG}))}$ <p>Where H is Height in centimeters and W is Weight in grams.</p>
Hemodynamic State	
Unstable	<p>Determined in the immediate pre-operative period, defined as the period prior to anesthesia taking responsibility for the patient.</p> <p>Patient requires pharmacologic or mechanical support to maintain blood pressure or cardiac index.</p>
Shock	<p>Acute hypotension (systolic blood pressure < 80 mmHg) or low cardiac index (< 2.0 liters/min/m²), despite pharmacologic or mechanical support.</p> <p>Records with this risk factor were excluded from all analyses in this report.</p>
Comorbidities	
Cerebrovascular Disease	<p>Cerebrovascular disease prior to surgery documented by any one of the following:</p> <ul style="list-style-type: none"> • CVA (symptoms > 24 hrs after onset, presumed to be from vascular etiology); • TIA (recovery within 24 hrs); • Non-invasive carotid test with > 79% diameter occlusion.; or • Prior carotid surgery or stenting or prior cerebral aneurysm clipping or coil. <p>Does not include neurological disease processes such as metabolic and/or anoxic ischemic encephalopathy.</p>
Chronic Lung Disease	<p>The patient has chronic lung disease with pre-operative findings of one of the following:</p> <ul style="list-style-type: none"> • Mild - FEV₁ 60% to 75% of predicted, and/or on chronic inhaled or oral bronchodilator therapy. • Moderate - FEV₁ 50% to 59% of predicted, and/or on chronic steroid therapy aimed at lung disease. • Severe - FEV₁ <50% predicted, and/or Room Air pO₂ < 60 or Room Air pCO₂ > 50.
Diabetes	<p>The patient has a history of diabetes diagnosed and/or treated by a physician.</p>
Endocarditis	<p>Patients with two or more positive blood cultures without other obvious source with demonstrated valvular vegetations or acute valvular dysfunction caused by infection.</p> <p>Includes patients who are on antibiotics at the time of surgery.</p> <p>Excludes patients who have completed antibiotic therapy and have no evidence of residual infection.</p>

Patient Risk Factor	Definitions
Comorbidities, <i>continued</i>	
Extensive Aortic Atherosclerosis	Ascending, transverse, and/or descending aortic atherosclerosis marked by either extensive calcification or luminal atheroma such that the intended surgical procedure is altered.
Peripheral Vascular Disease	Angiographic demonstration of at least 50% narrowing in a major aortoiliac or femoral/popliteal vessel, previous surgery for such disease, absent femoral or pedal pulses, or the inability to insert a catheter or intra-aortic balloon due to iliac aneurysm or obstruction of the aortoiliac or femoral arteries Ankle-Brachial Index < 0.9 is also acceptable documentation.
Renal Failure, Creatinine	Last pre-operative creatinine was in the indicated range.
Renal Failure Requiring Dialysis	The patient is undergoing peritoneal or hemodialysis at the time of admission.
Ventricular Function	
Ejection Fraction	Value of the ejection fraction taken closest to but before the start of the procedure. Intraoperative direct observation of the heart is not an adequate basis for a visual estimate of the ejection fraction. Intra-operative TEE is acceptable, if no pre-operative Ejection Fraction is available. If no ejection fraction is reported, the ejection fraction is considered “normal” for purposes of analysis and is classified with the reference category.
Previous MI	One or more myocardial infarctions (MI) in the specified time period prior to surgery.
Previous Procedures	
Previous Organ Transplant	The patient has had any organ transplant prior to the current cardiac surgery. This includes, but is not limited to, heart, lung, kidney, and liver transplants.
Previous PCI, Before this Episode of Care	The patient has had a Percutaneous Coronary Intervention before this episode of care.
Previous Valve Surgery	Prior to this cardiac surgery, the patient has previously undergone surgery or catheter based intervention for valve repair or replacement.
Previous CABG Surgery	Prior to this cardiac surgery, the patient has previously undergone CABG surgery. This include any surgeries that occurred prior to this one including those earlier in the current admission.
Any Previous Cardiac Surgery	Prior to this cardiac surgery, the patient has previously undergone a cardiac surgery other than CABG. This would include a previous catheter-based valve repair or replacement but not other catheter-based interventions.
Vessels Diseased	
Left Main Disease	The patient has at least a 50 percent blockage in the Left Main Coronary Artery.
Three Vessels Diseased	The patient has at least a 70 percent blockage in each of the three native coronary arteries including the Left Anterior Descending (LAD), the Right Coronary Artery (RCA) and the Left Circumflex (LCX) or their major branches.

MEDICAL TERMINOLOGY

angina pectoris – The pain or discomfort felt when blood and oxygen flow to the heart are impeded by blockages in the coronary arteries. Can also be caused by an arterial spasm.

angioplasty – Also known as percutaneous transluminal coronary angioplasty (PTCA) or percutaneous coronary intervention (PCI). In this procedure, a balloon catheter is threaded up to the site of blockage in an artery in the heart, and is then inflated to push arterial plaque against the wall of the artery to create a wider channel in the artery. Other procedures or devices are frequently used in conjunction with, or in place of, the balloon catheter. In particular, stents are used for most patients and devices such as rotoblators and ultrasound are sometimes used.

arteriosclerosis – Also called atherosclerotic coronary artery disease or coronary artery disease, the group of diseases characterized by thickening and loss of elasticity of the arterial walls, popularly called “hardening of the arteries.”

atherosclerosis – One form of arteriosclerosis in which plaques or fatty deposits form in the inner layer of the arteries.

coronary artery bypass graft surgery (CABG)

– A procedure in which a vein or artery from another part of the body is used to create an alternate path for blood to flow to the heart muscle, bypassing the arterial blockage. Typically, a section of one of the large saphenous veins in the leg, the radial artery in the arm or the mammary artery in the chest is used to construct the bypass. One or more bypasses may be performed during a single operation. When no other major heart surgery (such as valve replacement) is included, the operation is referred to as an isolated CABG. The average number of bypass grafts created during CABG is three or four. Generally, all significantly blocked arteries are bypassed unless they enter areas of the heart that are permanently damaged by previous heart attacks. Five or more bypasses are occasionally created. Multiple bypasses are often performed to provide several alternate routes for the blood flow and to improve the long-term success of the procedure, not necessarily because the patient’s condition is more severe.

cardiac catheterization – Also known as coronary angiography, a procedure for diagnosing the condition of the heart and the arteries connecting to it. A thin tube threaded through an artery to the heart releases a dye, which allows doctors to observe blockages with an X-ray camera. This procedure is generally required before coronary bypass surgery.

cardiovascular disease – Disease of the heart and blood vessels, the most common form is coronary artery disease.

coronary arteries – The arteries that supply the heart muscle with blood. When they are narrowed or blocked, oxygen-rich blood cannot flow freely to the heart muscle or myocardium.

heart valve – Gates that connect the different chambers of the heart so that there is a one-way flow of blood between the chambers. The heart has four valves: the tricuspid, mitral, pulmonic and aortic valves.

incompetent valves – A valve that does not close tightly.

ischemic heart disease (ischemia) – Heart disease that occurs as a result of inadequate blood supply to the heart muscle or myocardium.

myocardial infarction (MI) – Also called a heart attack, partial destruction of the heart muscle due to interrupted blood supply.

plaque – Also called atheroma, this is the fatty deposit in the coronary artery that can block blood flow.

risk factors for heart disease – Certain risk factors have been found to increase the likelihood of developing heart disease. Some are controllable or avoidable and some cannot be controlled. The biggest heart disease risk factors are heredity, gender and age, none of which can be controlled. Men are much more likely to develop heart disease than women before the age of 55, although it is the number one killer of both men and women. Some controllable risk factors that contribute to a higher likelihood of developing coronary artery disease are high cholesterol levels, cigarette smoking, high blood pressure (hypertension), obesity, a sedentary lifestyle or lack of exercise, diabetes and poor stress management.

stenosis - The narrowing of an artery due to blockage. Restenosis is when the narrowing recurs after surgery.

stenotic valve – A valve that does not open fully.

valve disease – Occurs when a valve cannot open all of the way (reducing flow to the next heart chamber) or cannot close all of the way (causing blood to leak backwards into the previous heart chamber).

valve repair – Widening valve openings for stenotic valves or narrowing or tightening valve openings for incompetent valves without having to replace the valves.

valve replacement – Replacement of a diseased valve. New valves are either mechanical (durable materials such as Dacron or titanium) or biological (tissues taken from pigs, cows or human donors).

Appendix 1

Risk Factors for CABG In-Hospital / 30-Day Deaths in New York State in 2013

The significant pre-operative risk factors for death in the hospital during the same admission as the surgery or after hospital discharge but within 30 days of surgery (in-hospital/30-day mortality) for CABG in 2013 are presented in Appendix Table 1.

Roughly speaking, the odds ratio for a risk factor represents the number of times more likely to die in the hospital during or after CABG or after discharge but within 30 days of the surgery a patient with that risk factor is than a patient without the risk factor, all other risk factors being the same. For example, the odds ratio for the risk factor Cerebrovascular Disease is 1.912. This means that a patient who has Cerebrovascular Disease prior to surgery is approximately 1.912 times as likely to die in the hospital or after discharge within 30 days of surgery as a patient who does not have Cerebrovascular Disease but who has the same other significant risk factors.

For all of the risk factors in the table except Age: Number of years greater than 65 and Chronic Lung Disease, there are only two possibilities: having the risk factor and not having it.

For age, the odds ratio roughly represents the number of times more likely to die a patient who is older than 65 is compared to a patient who is one year younger but otherwise has the same significant risk factors. Thus, the chance of in-hospital / 30-day death for a patient undergoing CABG who is 66 years old is approximately 1.065 times that of a patient 65 years old undergoing CABG, if all other risk factors are the same. All patients age 65 and younger have roughly the same odds of in-hospital / 30-day mortality if their other risk factors are identical.

In this model Chronic Lung Disease is divided into three categories: Mild to Moderate, Severe, and None. The odds ratios for patients with either of the first two levels are compared to patients with no chronic lung disease. Thus, a CABG patient with severe chronic lung disease is 4.326 times as likely to die in the hospital or within 30 days as a patient without chronic lung disease, all other significant risk factors being the same.

Appendix Table 1

Multivariable Risk Factor Equation for CABG In-Hospital / 30-Day Deaths in New York State in 2013.

Patient Risk Factor	Prevalence (%)	Logistic Regression		
		Coefficient	P-Value	Odds Ratio
Demographic				
Age: Number of years greater than 65	—	0.0629	<0.0001	1.065
Female Gender	24.65	0.4901	0.0056	1.632
Ventricular Function				
Ejection Fraction < 30%	8.01	1.0350	<0.0001	2.815
Previous MI < 24 hours	3.10	1.4278	<0.0001	4.170
Hemodynamic State				
Unstable	0.73	1.1465	0.0141	3.147
Comorbidities				
Cerebrovascular Disease	14.75	0.6482	<0.0008	1.912
Chronic Lung Disease				
None	79.91	— Reference —		1.000
Mild to Moderate	15.46	0.6308	0.0028	1.879
Severe	4.63	1.4646	<0.0001	4.326
Renal Failure				
Creatinine >2.5 mg/dl or requiring dialysis	4.52	0.9775	0.0007	2.658
Previous Procedures				
Previous CABG Surgery	1.97	1.2258	0.0008	3.407
Vessels Diseased				
LMT Disease	33.68	0.5060	0.0032	1.659
Intercept	=	-5.5040		
C Statistic	=	0.791		

Appendix 2

Risk Factors for CABG 30-Day Readmissions in New York State in 2013

The significant pre-procedural risk factors for 30-day readmissions following CABG in 2013 are presented in the table that follows. Female Gender, Ejection Fraction, Previous MI, and Chronic Lung Disease are interpreted in the same way as Cerebrovascular Disease in Appendix 1. The patient either has the risk factor or does not. For example, the odds ratio for the risk factor Previous MI within 20 days is 1.260. This means that a patient with a previous MI within 20 days is approximately 1.260 times more likely to be readmitted to a hospital within 30 days following discharge after CABG than a patient without a previous MI within 20 days who has the same other significant risk factors.

The interpretation for Age is very similar to that presented in Appendix 1 except in this case each

year of age over age 50 is associated with an increased risk of readmission.

In this model, the risk factor for Diabetes is divided into three categories: Patients who do not have diabetes or have diabetes that is treated without insulin; those with untreated diabetes; those with diabetes treated with insulin. Patients in each of the latter two categories are compared to patients in the first category.

Renal Failure is expressed in terms of renal failure with dialysis and elevated creatinine without dialysis. The odds ratios for all three Renal Failure categories are relative to patients with no dialysis and whose last creatinine measured prior to surgery was not greater than 1.5 mg/dL.

Appendix Table 2

Multivariable Risk Factor Equation for CABG 30-Day Readmission in New York State in 2013.

Patient Risk Factor	Prevalence (%)	Logistic Regression		
		Coefficient	P-Value	Odds Ratio
Demographic				
Age: Number of years greater than 50	—	0.0139	<0.0001	1.014
Female Gender	24.68	0.3305	<0.0001	1.392
Ventricular Function				
Ejection Fraction < 30%	7.75	0.4098	0.0002	1.507
Previous MI within 20 days	29.97	0.2309	0.0013	1.260
Comorbidities				
Chronic Lung Disease	20.18	0.2293	0.0036	1.258
Diabetes				
Diabetes, No disease or treatment other than insulin	79.74	— Reference —		1.000
Diabetes, No Therapy	3.66	0.3723	0.0235	1.451
Diabetes, Insulin Therapy	16.60	0.4677	<0.0001	1.596
Renal Failure				
No Renal Failure	89.16	— Reference —		1.000
Renal Failure, Creatinine 1.6-2.0 mg/dl	5.05	0.4347	0.0013	1.544
Renal Failure, Creatinine \geq 2.1 mg/dl	2.57	0.6224	0.0003	1.863
Renal Failure, Requiring Dialysis	3.22	0.9813	<0.0001	2.668
Intercept	=	-2.5199		
C Statistic	=	0.630		

Appendix 3

Risk Factors For Valve Surgery In-Hospital / 30-Day Mortality in 2011-2013

The significant pre-procedural risk factors for in-hospital/30-day mortality following valve surgery in the 2011-2013 time period are presented in the table that follows.

Age: number of years greater than 55 is interpreted in a similar fashion to Appendix 1 and 2 except in this case each year over age 55 is associated with an increased risk of mortality.

Body surface area (BSA) is a function of height and weight and increases for larger heights and weights. This model includes terms for both BSA and BSA-squared, reflecting the complex relationship between BSA and in-hospital/ 30-day mortality. The quadratic function of BSA (BSA-squared) used in this statistical model reflects the fact that patients with very high or very low BSAs tend to have higher risks of in-hospital/30-day mortality than patients with intermediate levels of BSA. This functional form is used to improve the model's ability to predict mortality, but it means that the odds ratios for these terms do not have a straightforward interpretation.

The odds ratio for type of valve surgery represents the number of times a patient with a specific valve surgery is more likely to die in the hospital during or after that particular surgery or after discharge but within 30 days of surgery than a patient who has had aortic

valve replacement surgery, all other risk factors being the same. For example, a patient who has a mitral valve replacement surgery is 1.725 times as likely to die in the hospital during or after surgery or after discharge but within 30 days of surgery as a patient with aortic valve replacement surgery, all other significant risk factors being the same.

In this model, vessels diseased includes patients with disease of the left main coronary artery and/or three diseased vessels. Left main disease is defined as at least a 50 percent blockage of the Left Main coronary artery. Three vessels diseased refers to patients with at least a 70 percent blockage in three of the native coronary arteries including the Left Anterior Descending (LAD), the Right Coronary Artery (RCA) and the Left Circumflex (LCX) or their major branches. The odds ratio is relative to patients who have neither left main disease nor three vessels disease.

The interpretation of renal failure in this model is similar to that provided in Appendix 2 except in this case there is only one level of elevated creatinine.

All other variables can be interpreted in the same way as described in Appendix 1 for risk factors with only two possibilities.

Appendix 3

Multivariable Risk Factor Equation for Valve Surgery In-Hospital / 30-Day Deaths In NYS, 2011-2013.

Patient Risk Factor	Prevalence (%)	Logistic Regression		
		Coefficient	P-Value	Odds Ratio
Demographic				
Age: Number of years greater than 55	—	0.0492	<0.0001	1.050
Female Gender	47.22	0.4088	0.0004	1.505
Body Surface Area (10 m ²)	—	-0.4740	0.0048	—
Body Surface Area – squared (100 m ⁴)	—	0.0113	0.0072	—
Type of Valve Surgery				
Aortic Valve Replacement	51.56	— Reference —		1.000
Mitral Valve Replacement	12.40	0.5454	0.0002	1.725
Mitral Valve Repair	16.81	-0.1237	0.5372	0.884
Multiple Valve Repair/Replacement	19.23	0.7346	<0.0001	2.085
Hemodynamic State				
Unstable	0.52	1.4658	<0.0001	4.331
Comorbidities				
Endocarditis	4.90	0.5472	0.0026	1.728
Peripheral Vascular Disease	7.12	0.5661	<0.0001	1.761
Renal Failure				
No Renal Failure	88.72	— Reference —		1.000
Renal Failure, Creatinine > 1.5 mg/dl	8.22	0.8566	<0.0001	2.355
Renal Failure, Requiring Dialysis	3.06	1.8101	<0.0001	6.111
Previous Procedures				
Any Previous CABG Surgery	8.83	0.5948	<0.0001	1.813
Any Previous Cardiac Surgery	12.09	0.4228	0.0011	1.526
Vessels Diseased				
Left Main Disease or Three Vessels Diseased	1.78	0.5665	0.0210	1.762
Intercept	=	-0.4354		
C Statistic	=	0.762		

Appendix 4

Risk Factors for Valve and CABG Surgery In-Hospital/30-Day Mortality in New York State in 2011-2013

The significant pre-procedural risk factors for in-hospital/30-day mortality following valve and CABG surgery in the 2011-2013 time period are presented in the table that follows.

Age and Body Surface Area are interpreted as described earlier. The interpretation for Renal Failure is similar to that presented in Appendix 2, except that in this case there are five categories: no renal failure, three different levels of elevated creatinine without dialysis, and renal failure requiring dialysis. The reference for all other groups is patients without dialysis whose last pre-operative creatinine was less than 1.6 mg/dl.

The odds ratio for Type of Valve with CABG surgery represents the number of times a

patient with a specific Valve with CABG surgery is more likely to die in the hospital during or after that particular surgery or after discharge but within 30 days than a patient who has had aortic valve repair or replacement and CABG surgery, all other risk factors being the same. For example, a patient who has a mitral valve replacement and CABG surgery is 1.131 times as likely to die in the hospital or within 30 days after discharge as a patient with aortic valve repair or replacement and CABG surgery, all other significant risk factors being the same.

All other risk factors are interpreted as described in Appendix 1 for risk factors with only two possibilities.

Appendix Table 4

Multivariable Risk Factor Equation for Valve and CABG Surgery In-Hospital/ 30-Day Deaths in NYS, 2011-2013.

Patient Risk Factor	Prevalence (%)	Logistic Regression		
		Coefficient	P-Value	Odds Ratio
Demographic				
Age: Number of years greater than 55	—	0.0425	<0.0001	1.043
Female Gender	35.11	0.4589	0.0007	1.582
Body Surface Area (10 m ²)	—	-0.6929	0.0007	—
Body Surface Area – squared (100 m ⁴)	—	0.0169	0.0009	—
Type of Valve (with CABG)				
Aortic Valve Replacement	63.15	— Reference —		1.000
Mitral Valve Replacement	9.68	0.1233	0.5408	1.131
Mitral Valve Repair	15.14	0.0686	0.7107	1.071
Multiple Valve Repair/Replacement	12.03	0.8615	<0.0001	2.367
Hemodynamic State				
Unstable	0.86	1.0703	0.0073	2.916
Ventricular Function				
Ejection Fraction < 30%	8.98	0.5647	0.0011	1.759
Any Previous MI	32.85	0.3056	0.0142	1.357
Comorbidities				
Peripheral Vascular Disease	13.90	0.3755	0.0093	1.456
Renal Failure				
No Renal Failure	83.83	— Reference —		1.000
Renal Failure, Creatinine 1.6 – 2.0 mg/dl	8.03	0.5389	0.0033	1.714
Renal Failure, Creatinine 2.1 – 3.0 mg/dl	3.10	0.6781	0.0085	1.970
Renal Failure, Creatinine > 3.0 mg/dl	1.00	1.3308	0.0004	3.784
Renal Failure Requiring Dialysis	4.04	1.4694	<0.0001	4.347
Previous Procedures				
Any Previous CABG Surgery	5.48	0.8210	<0.0001	2.273
Organ Transplant	0.59	1.2580	0.0057	3.518
Intercept	=	2.1357		
C Statistic	=	0.726		

Appendix 5

Risk Factors for Isolated CABG In-Hospital/30-Day Mortality in New York State 2011-2013

The significant pre-procedural risk factors for in-hospital/30-day mortality following isolated CABG in the 2011-2013 time period are presented in the table that follows. The risk factors in this model are interpreted as described in Appendices 1 – 4.

Appendix Table 5

Multivariable Risk Factor Equation for CABG In-Hospital / 30-Day Deaths in New York State in 2011-2013.

Patient Risk Factor	Prevalence (%)	Logistic Regression		
		Coefficient	P-Value	Odds Ratio
Demographic				
Age: Number of years greater than 50	—	0.0527	<0.0001	1.054
Female Gender	25.04	0.4254	0.0006	1.530
Body Surface Area (10 m ²)	—	-0.4186	0.0150	—
Body Surface Area – squared (100 m ⁴)	—	0.0114	0.0051	—
Hemodynamic State				
Unstable	0.74	0.8431	0.0082	2.324
Ventricular Function				
Ejection Fraction				
Ejection Fraction 50% or greater	64.34	— Reference —		1.000
Ejection Fraction < 30%	7.59	1.1904	<0.0001	3.288
Ejection Fraction 30-49%	28.07	0.4504	0.0002	1.569
Previous MI				
Previous MI less than 1 day	2.94	1.1749	<0.0001	3.238
Previous MI 1 - 14 days	25.14	0.5209	<0.0001	1.684
Comorbidities				
Cerebrovascular Disease	16.33	0.5529	<0.0001	1.738
Chronic Lung Disease	22.88	0.3603	0.0014	1.434
Extensive Aortic Atherosclerosis	4.05	0.4193	0.0193	1.521
Peripheral Vascular Disease	11.63	0.3304	0.0130	1.391
Renal Failure Requiring Dialysis	3.02	1.0956	<0.0001	2.991
Vessels Diseased				
Left Main Disease	33.44	0.2187	0.0443	1.244
Previous Procedures				
Previous Valve Surgery	0.37	1.4621	0.0002	4.315
PCI Before This Admission	25.27	0.2919	0.0131	1.339
Intercept	=	-2.6741		
C Statistic	=	0.784		

NEW YORK STATE CARDIAC SURGERY CENTERS

Albany Medical Center
New Scotland Avenue
Albany, New York 12208

Arnot Ogden Medical Center
600 Roe Avenue
Elmira, New York 14905

Bassett Medical Center
Atwell Road
Cooperstown, New York 13326

Bellevue Hospital Center
First Avenue and 27th Street
New York, New York 10016

Buffalo General Medical Center
100 High Street
Buffalo, New York 14203

Champlain Valley Physicians Hospital^{l***}
75 Beekman Street
Plattsburgh, New York 12901

Ellis Hospital
1101 Nott Street
Schenectady, New York 12308

Erie County Medical Center ^{***}
462 Grider Street
Buffalo, New York 14215

Good Samaritan Hospital Medical Center^{**}
1000 Montauk Highway
West Islip, New York 11795

Good Samaritan Hospital of Suffern
255 Lafayette Avenue
Suffern, New York 10901

Lenox Hill Hospital
100 East 77th Street
New York, New York 10021

Long Island Jewish Medical Center
270-05 76th Avenue
New Hyde Park, New York 11040

Maimonides Medical Center
4802 Tenth Avenue
Brooklyn, New York 11219

Mercy Hospital of Buffalo
565 Abbott Road
Buffalo, New York 14220

Millard Fillmore Hospital ^{***}
3 Gates Circle
Buffalo, New York 14209

Montefiore Medical Center @ Henry & Lucy
Moses Division
111 East 210th Street
Bronx, New York 11219

Montefiore Medical Center @ Jack D. Weiler
Hospital of A. Einstein College
1825 Eastchester Road
Bronx, New York 10461

Mount Sinai Beth Israel
10 Nathan D. Perlman Place
New York, New York 10003

Mount Sinai Hospital
One Gustave L. Levy Place
New York, New York 10019

Mount Sinai St. Luke's
11-11 Amsterdam Avenue at 114th Street
New York, New York 10025

New York Hospital Medical Center – Queens
56-45 Main Street
Flushing, New York 11355

New York Methodist Hospital
506 Sixth Street
Brooklyn, New York 11215

NY Presbyterian Hospital @ Columbia
Presbyterian Center
161 Fort Washington Avenue
New York, New York 10032

NY Presbyterian Hospital @ New York Weill –
Cornell College
525 East 68th Street
New York, New York 10021

NYU Hospitals Center
550 First Avenue
New York, New York 10016

North Shore University Hospital
300 Community Drive
Manhasset, New York 11030

Rochester General Hospital
1425 Portland Avenue
Rochester, New York 14621

St. Elizabeth Medical Center
2209 Genesee Street
Utica, New York 13413

St. Francis Hospital
Port Washington Boulevard
Roslyn, New York 11576

St. Joseph's Hospital Health Center
301 Prospect Avenue
Syracuse, New York 13203

St. Peter's Hospital
315 South Manning Boulevard
Albany, New York 12208

Southside Hospital
301 East Main Street
Bayshore, New York 11706

Staten Island University Hospital – North
475 Seaview Avenue
Staten Island, New York 10305

Strong Memorial Hospital
601 Elmwood Avenue
Rochester, New York 14642

UHS Wilson Medical Center
33-57 Harrison Street
Johnson City, New York 13790

University Hospital at Stony Brook
Stony Brook, New York 11794-8410

University Hospital of Brooklyn
450 Lenox Road
Brooklyn, New York 11203

Upstate University Hospital – State University of
New York
750 East Adams Street
Syracuse, New York 13210

Vassar Brothers Medical Center
45 Reade Place
Poughkeepsie, New York 12601

Westchester Medical Center
Grasslands Road
Valhalla, New York 10595

Winthrop University Hospital
259 First Street
Mineola, New York 11501

** Began performing cardiac surgery after 2013

*** No longer performing cardiac surgery.

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