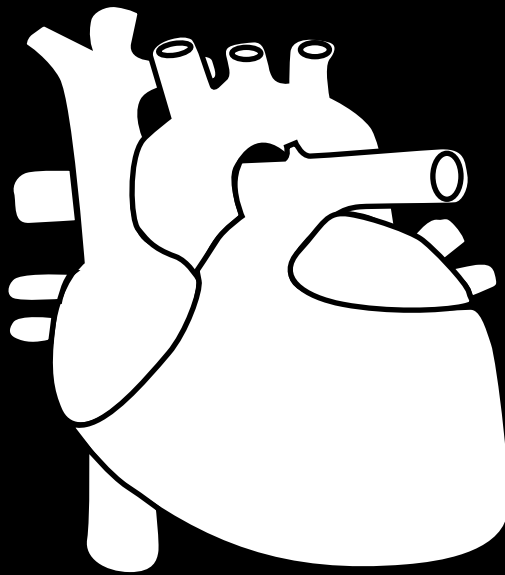


# **ANGIOPLASTY**

## **in New York State**

### **1995**



**NEW YORK STATE DEPARTMENT OF HEALTH**

# NEW YORK STATE DEPARTMENT OF HEALTH

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## MESSAGE FROM THE COMMISSIONER

The information contained in this booklet is intended primarily for cardiac centers for use in their quality improvement efforts. It may also be helpful to patients in considering treatment options for cardiovascular disease. Analyses are presented which identify risk factors associated with in-hospital mortality after angioplasty, along with hospital specific mortality rates which have been risk adjusted to account for differences in patient severity of illness.

The Coronary Angioplasty Reporting System, which is the cooperative data set upon which these analyses are based, represents the largest collection of data available in which all patients subject to angioplasty have been reported. I am pleased to report that the New York State experience continues to compare favorably with studies reported in the literature.

The analyses in this report represent a first step toward providing more comprehensive assessment tools for evaluating and studying angioplasty. Future reports will include analysis of mortality, emergency surgery and heart attack — all important outcome measures for the procedure. In the interim, we believe that the information included in this report provides an important resource and stimulus for quality improvement efforts.

I extend my appreciation to the providers in this state and to the Cardiac Advisory Committee for their efforts in developing and refining this remarkable system. The Department of Health will continue to work in partnership with hospitals and physicians to ensure high quality of care for patients with heart disease. Reports such as this and the coronary artery bypass report will continue to be provided on an annual basis, and we look forward to providing expanded outcomes in the near future.



Barbara A. DeBuono, M.D., M.P.H., *Commissioner*  
New York State Department of Health



## INTRODUCTION

The analyses contained in this report are based on information collected on each of the 21,707 patients who underwent angioplasty in New York State during 1995. This process is part of a cooperative effort between hospitals, the Department of Health and the New York State Cardiac Advisory Committee, which is intended to improve the quality of care for patients with heart disease.

The analysis of risk-adjusted mortality rates and associated risk factors represents a first step toward providing comprehensive assessment tools for evaluating and studying angioplasty. One program has been identified with a risk-adjusted mortality rate that is significantly higher than the statewide average for elective angioplasty cases. The Department of Health will be working with that program to see if there are areas that can be identified to improve patient care.

It should be noted that there are limitations to the use of mortality as a quality indicator for angioplasty. The Department of Health and the Cardiac Advisory Committee believe that the triad of mortality, emergency surgery and acute myocardial infarction are interdependent, key factors in the assessment of angioplasty. This conclusion is supported by strategies used in large clinical trials. In order to provide this information in future reports, various initiatives are being undertaken to assure accurate and consistent reporting of nonfatal outcomes for angioplasty.

Postangioplasty myocardial infarction has been one of the more difficult outcomes for hospitals to consistently identify and report. The importance of identifying myocardial infarction is based on evidence that such an event could have an adverse impact on short and long term outcomes for the patient, and an increasing need to identify infarctions occurring during or after the procedure. This latter point will be particularly important as the use of new interventional devices and procedures are being developed and used with increasing frequency.

In order to address this issue, guidelines for assessment of myocardial infarction have been developed by the Cardiac Advisory Committee and distributed to cardiac centers for incorporation into standard protocols. In addition, at the recommendation of the Cardiac Advisory Committee, the Department of Health has initiated an audit process to assure statewide consistency in the interpretation and reporting of myocardial infarction beginning with the 1997 data set.

## THE HEALTH DEPARTMENT PROGRAM

The New York State Department of Health has been studying the effects of patient and treatment characteristics on outcomes for patients with heart disease for several years. Under the guidance of the Cardiac Advisory Committee, a group of independent practicing cardiac surgeons, cardiologists and other professionals in related fields, detailed statistical analyses of the information received from the study have been conducted.

The results have been used to create a cardiac profile system which assesses the performance of hospitals and doctors over time, taking into account the severity of individual patients' pre-operative conditions. Coronary artery bypass surgery results have been assessed since 1989; angioplasty (also known as percutaneous transluminal coronary angioplasty or PTCA) results were released last year for the first time.

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

- understanding the health factors that may adversely affect how patients will fare in angioplasty;
- improving the results of different treatments of heart disease;
- improving cardiac care;
- providing information to help patients make better decisions about their own care.

## PATIENT POPULATION

All patients undergoing angioplasty in New York State hospitals who were discharged during the 1995 calendar year are included in results presented here. Observed and risk-adjusted mortality rates are reported for the patients undergoing angioplasty in each of the 32 New York hospitals with approval to perform the procedure.

## RISK ADJUSTMENT FOR ASSESSING PROVIDER PERFORMANCE

Hospital or physician performance is an important factor that directly relates to patient outcomes. Whether patients recover quickly, experience complications 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 among hospitals when assessing performance, because different hospitals treat different types of patients. Hospitals with sicker patients may have higher rates of complications and death than other hospitals in the state. The following describes how the New York State Department of Health adjusts for patient risk in assessing outcomes of care in different hospitals.

## DATA COLLECTION

As part of the risk-adjustment process, hospitals in New York State at which angioplasty is performed provide information to the Department of Health for each patient undergoing those procedures. Data concerning demographic and clinical characteristics of patients are collected by hospitals' cardiac catheterization laboratories. Approximately 40 of these characteristics (or risk factors) are collected for each patient. Along with information about the hospital, physician and the patient status at discharge, these data are entered into a personal computer, and sent to the Health Department for analysis.

## ASSESSING PATIENT RISK

Each person who develops coronary artery 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 his or her risk profile. An 80-year-old patient with a heart attack in the past six hours, for example, has a very different risk profile than a 40-year-old who has never suffered a heart attack.

The statistical analyses conducted by the department determine which of the risk factors collected are significantly related to in-hospital death, and determine how to weight the significant risk factors to predict the chance each patient will have of dying in the hospital given his or her specific characteristics.

## PREDICTING PATIENT MORTALITY RATES FOR PROVIDERS

The statistical methods used to predict mortality are tested to determine if 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 angioplasty.

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

Individual physician (cardiologist) outcomes are not evaluated in this report. In order to prevent misinterpretation of results based on insufficient data, our policy provides that results for individual physicians will be analyzed only after three years of data are available. This policy is consistent with the analysis of coronary artery bypass surgery data.

## COMPUTING THE RISK-ADJUSTED 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 risk-adjusted mortality rate 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 on an identical group of patients.

To get the risk-adjusted mortality rate, the observed mortality rate is first divided by the provider's expected mortality rate. 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. The ratio is then multiplied by the overall statewide rate (0.89%) to obtain the provider's risk-adjusted rate.

## INTERPRETING THE RISK-ADJUSTED MORTALITY RATE

If the risk-adjusted mortality rate is lower than the statewide mortality rate, the hospital has a better performance than the state as a whole; if the risk-adjusted mortality rate is higher than the statewide mortality rate, the hospital has a worse performance than the state as a whole.

The risk-adjusted mortality rate 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 risk-adjusted rate 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 rates are more likely to occur than for high-volume providers. For this reason, data for cardiologists performing angioplasties are not yet reported because many cardiologists do not perform high volumes of angioplasties in one year. Another attempt to prevent misinterpretation of differences caused by chance variation is the use of expected ranges (confidence intervals) in the reported results.

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

Some commentators have suggested that patient severity of illness may not be accurately estimated because some risk factors are not included in the data system, and this could lead to misleading risk-adjusted rates. This is not likely because the New York State data system has been reviewed by practicing physicians in the field and updated continually. It now contains virtually every risk factor that has ever been demonstrated to be related to patient mortality in national and international studies.

## **FUTURE ADVERSE OUTCOME MEASURES**

The New York State Department of Health and its Cardiac Advisory Committee are of the opinion that other measures of adverse patient outcomes in addition to in-hospital mortality rates should be reported in future public releases. This is particularly important for angioplasty because of its low mortality rate.

In particular, coronary artery bypass surgery during the same hospital admission as the angioplasty, and myocardial infarction (heart attack) during or after the angioplasty in the same hospital admission will be reported as soon as possible, probably in 1999 (using 1997 data).

These two measures are not reported here because current data on myocardial infarctions are not judged to be sufficiently accurate by the Cardiac Advisory Committee. Also, coronary artery bypass graft surgery may be related to myocardial infarctions in that the tendency not to perform bypass surgery when it is necessary could lead to a myocardial infarction. Consequently, it is the opinion of the Department of Health and the Cardiac Advisory Committee that although data on bypass surgery during or after angioplasty are available and accurate, it may be misleading to report these data without accompanying information on myocardial infarctions.

## **HOW THIS CONTRIBUTES TO QUALITY IMPROVEMENT**

The goal of the Department of Health and the Cardiac Advisory Committee is to improve the quality of care in relation to coronary artery bypass graft surgery and angioplasty in New York State. Providing the hospitals, cardiac surgeons (who perform coronary artery bypass graft surgery) and cardiologists (who perform angioplasty) in New York State with data about their own outcomes for these procedures allows them to examine the quality of their own care, and to identify opportunities to improve that care.

The data collected and analyzed in this program are also given to the Cardiac Advisory Committee, who assist with interpretation and advise the Department of Health regarding which hospitals and physicians 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. For example, the

Department of Health and the Cardiac Advisory Committee directed the review of all cardiac surgeons performing fewer than 50 coronary artery bypass operations per year by participating hospitals, and of the surgeons whose risk-adjusted mortality rates for coronary artery bypass operations exceeded 150 percent of the statewide rate. It is expected that similar initiatives will be undertaken in response to future analyses of angioplasty outcomes.

## **RESULTS**

### **1995 RISK FACTORS FOR ANGIOPLASTY IN-HOSPITAL MORTALITY**

The significant preprocedural risk factors for in-hospital mortality following angioplasty in 1995 are presented in Table 1 and Table 2. Table 1 presents this information for all patients undergoing angioplasty; Table 2 presents significant risk factors for the subset of elective patients (those who were not in shock or hemodynamically unstable [very low blood pressure] at the time of the procedure, and who did not suffer a heart attack within 24 hours prior to the angioplasty).

Roughly speaking, the odds ratio for a risk factor represents the number of times more likely a patient with that risk factor is of dying in the hospital during or after angioplasty than a patient without the risk factor, all other risk factors being the same. For example, the odds ratio for the risk factor “diabetes” (Table 1) is 1.886. This means that a patient with diabetes is approximately 1.886 times as likely to die in the hospital during or after undergoing angioplasty as a patient without diabetes who has the same or other significant risk factors.

For all risk factors except age (Table 1 and 2), body surface area (Table 2) and ejection fraction (Table 2) there are only two possibilities — having the risk factor or not having it. (For example, a patient either has diabetes or does not have it.) Interpretation of odds ratios for the risk factors measured on a continuum is as follows:

- Age: the odds ratio roughly represents the number of times more likely a patient is to die in the hospital than another patient who is one year younger, all other significant risk factors being the same. Thus, a patient undergoing angioplasty who is 63 years old has a chance of dying in the hospital that is approximately 1.062 times the chance that a patient 62 years old undergoing angioplasty has of dying in the hospital, all other risk factors being the same.
- Body Surface Area (BSA): BSA is determined using height and weight. Odds ratios for this risk factor are interpreted in the same way as age. That is, the odds ratio of 0.113 represents the approximate number of times more likely an angioplasty patient is to die in the hospital than a patient with a body surface area that is one unit smaller. (Note: the range of values for body surface area is from 1.1 to 3.1.)

- Ejection Fraction (EF): EF is the percentage of blood in the heart's left ventricle that is expelled when it contracts (with more denoting a healthier heart). This risk factor is subdivided into four ranges (0-19%, 20-29%, 30-39% and 40% or more). The last range, which does not appear in Table 2, is referred to as the reference category. This means that the odds ratios that appear for the other ejection fraction categories in Table 2 are relative to patients with an ejection fraction of 40 percent or more. Thus, an angioplasty patient with an ejection fraction of between 20 percent and 29 percent is about 4.957 times as likely to die in the hospital as a patient with an ejection fraction of 40 percent or higher, all other significant risk factors being the same.

**Table 1**

Multivariable Risk Factor Equation for Hospital Deaths During or Following Angioplasty in New York State — 1995 (All Cases)

Patient Risk Factor	Regression		
	Coefficient	P-Value	Odds Ratio
<b>Demographic</b>			
Age	0.0599	<.0001	1.062
<b>Ventricular Function</b>			
Previous MI < 24 hours	1.2271	<.0001	3.411
Congestive Heart Failure, This Admission	0.8429	<.0001	2.323
<b>Comorbidities</b>			
Hemodynamic Instability	1.9170	<.0001	6.801
Shock	3.4364	<.0001	31.076
Diabetes	0.6342	.0002	1.886
Renal Failure-on Dialysis	2.1171	<.0001	8.307
<b>Previous Open Heart Surgery</b>	0.6114	.0012	1.843

Intercept = -9.6995  
MI = myocardial infarction  
C=.858

**Table 2**

Multivariable Risk Factor Equation for Hospital Deaths During or Following Angioplasty in New York State — 1995 (Elective Patients Only)

Patient Risk Factor	Regression		
	Coefficient	P-Value	Odds Ratio
<b>Age</b>	0.0419	.0002	1.043
<b>Body Surface Area</b>	-2.1833	<.0001	0.113
<b>Worst Lesion Attempted is of Type C</b>	0.7374	.0009	2.091
<b>Two or Three Vessel Disease</b>	0.5418	.0184	1.719
<b>Renal Failure, Dialysis</b>	1.8940	<.0001	6.646
<b>Ejection Fraction</b>			
0-19%	2.2380	<.0001	9.374
20-29%	1.6008	<.0001	4.957
30-39%	0.8593	.0081	2.362

Intercept = -4.8686

C = .793

### 1995 HOSPITAL RISK-ADJUSTED MORTALITY FOR ANGIOPLASTY

Table 3 presents the 1995 angioplasty mortality results for the 32 hospitals performing angioplasty in New York in 1995. The table contains, for each hospital, the number of angioplasties resulting in 1995 discharges, the number of in-hospital deaths, the observed mortality rate, the expected mortality rate based on the statistical model presented in Table 1, the risk-adjusted mortality rate and a 95 percent confidence interval for the risk-adjusted rate. Also, it contains each hospital's risk-adjusted mortality rate for elective patients. Nonelective patients are defined to be patients in shock, a state of hemodynamic instability (very low blood pressure) or patients who experienced a heart attack within 24 hours prior to undergoing angioplasty. The hospital risk-adjusted rates for elective angioplasty patients are provided because many studies are confined to this group of patients, and because these patients comprise the majority of all angioplasty patients (92.1% in 1995).



Definitions of key terms are as follows:

The **observed mortality rate (OMR)** is the number of in-hospital deaths divided by the number of patients.

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 similar to the statewide mix. It is obtained by first dividing the observed mortality rate by the expected mortality rate, and then multiplying that quotient by the statewide mortality rate (0.89% for all angioplasty patients).

Confidence intervals indicate which hospitals had significantly more or fewer deaths than expected given the risk factors of their patients. Hospitals with significantly higher rates than expected after adjusting for risk are those with confidence intervals entirely above the statewide rate. Hospitals with significantly lower rates than expected given the severity of illness of their patients before the angioplasty have confidence intervals entirely below the statewide rate.

The overall mortality rate for the 21,707 angioplasties performed at the 32 hospitals was 0.89 percent. Observed mortality rates ranged from 0.00 percent to 2.39 percent. The range in expected mortality rates, which measure patient severity of illness, was between 0.44 percent and 1.53 percent. The risk-adjusted rates, which measure hospital performance, range from 0.00 percent to 1.86 percent. Based on confidence intervals for risk-adjusted rates, no hospital had a significantly higher risk-adjusted mortality rate than the statewide rate. One hospital, St. Francis, had a significantly lower risk-adjusted mortality rate than the statewide rate.

The last column of Table 3 presents the hospital risk-adjusted mortality rates for elective cases only (based on the statistical model presented in Table 2). As presented in the last row, the statewide mortality rate for elective cases is 0.43 percent, which is comparable to rates reported in the literature for these cases. The range of risk-adjusted rates was from 0.00 percent to 2.43 percent. One hospital, Arnot-Ogden, had a significantly higher risk-adjusted mortality rate than the statewide rate. No hospitals had a significantly lower risk-adjusted mortality rate than the statewide rate.

**Table 3**

Hospital Observed, Expected and Risk-Adjusted Mortality Rates (RAMR) for Angioplasty in New York State — 1995 Discharges

	All Cases						Elective Cases
	Cases	Deaths	OMR	EMR	RAMR	95% CI	RAMR
Albany Medical Center	630	7	1.11	0.62	1.61	(0.65, 3.32)	0.81
Arnot-Ogden	251	6	2.39	1.26	1.69	(0.62, 3.68)	2.43*
Bellevue	136	0	0.00	0.83	0.00	(0.00, 2.92)	0.00
Beth Israel	388	5	1.29	0.62	1.86	(0.60, 4.34)	0.81
Buffalo General	518	0	0.00	0.44	0.00	(0.00, 1.45)	0.00
Crouse-Irving	484	2	0.41	0.47	0.78	(0.09, 2.82)	0.00
Ellis Hospital	362	2	0.55	0.58	0.86	(0.10, 3.09)	0.47
Erie County	133	1	0.75	0.48	1.40	(0.02, 7.81)	0.00
Lenox Hill	1498	24	1.60	1.09	1.31	(0.84, 1.95)	0.44
LIJ Medical Center	411	5	1.22	0.70	1.55	(0.50, 3.61)	0.95
Maimonides	900	6	0.67	0.76	0.78	(0.29, 1.70)	0.27
Millard Fillmore	658	6	0.91	1.04	0.79	(0.29, 1.71)	0.22
Montefiore-Moses	338	2	0.59	1.24	0.43	(0.05, 1.54)	0.00
Montefiore-Weiler	437	10	2.29	1.10	1.86	(0.89, 3.43)	1.30
Mount Sinai	993	15	1.51	1.01	1.34	(0.75, 2.21)	0.55
New York Hospital-Cornell	674	6	0.89	0.90	0.89	(0.32, 1.93)	0.48
NYU Medical Center	516	6	1.16	1.11	0.94	(0.34, 2.04)	0.60
North Shore	1464	8	0.55	0.91	0.54	(0.23, 1.06)	0.27
Presbyterian	426	4	0.94	1.53	0.55	(0.15, 1.40)	0.32
Rochester General	1497	12	0.80	0.92	0.78	(0.40, 1.36)	0.31
St. Francis	2114	9	0.43	0.94	0.40**	(0.18, 0.77)	0.18
St. Joseph's	1078	10	0.93	0.85	0.97	(0.47, 1.79)	0.35
St. Luke's/Roosevelt	426	3	0.70	0.82	0.76	(0.15, 2.23)	0.29
St. Peter's	774	3	0.39	0.73	0.47	(0.10, 1.39)	0.62
St. Vincent's	824	6	0.73	0.50	1.30	(0.47, 2.83)	0.58
Strong Memorial	387	9	2.33	1.38	1.51	(0.69, 2.86)	0.00
United Health Services	621	4	0.64	1.05	0.55	(0.15, 1.40)	0.25
Univ. Hospital of Brooklyn	251	2	0.80	0.61	1.17	(0.13, 4.24)	1.13
Univ. Hospital - StonyBrook	518	3	0.58	0.67	0.78	(0.16, 2.27)	0.57
Upstate Medical Center	112	2	1.79	1.07	1.50	(0.17, 5.40)	0.00
Westchester County	1025	8	0.78	1.03	0.68	(0.29, 1.33)	0.59
Winthrop University Hospital	863	8	0.93	0.90	0.92	(0.39, 1.81)	0.66
<b>Total</b>	<b>21,707</b>	<b>194</b>	<b>0.89</b>	<b>0.89</b>	<b>0.89</b>		<b>0.43</b>

\* Risk-adjusted mortality rate significantly higher than statewide rate

\*\* Risk-adjusted mortality rate significantly lower than statewide rate

OMR - observed mortality rate

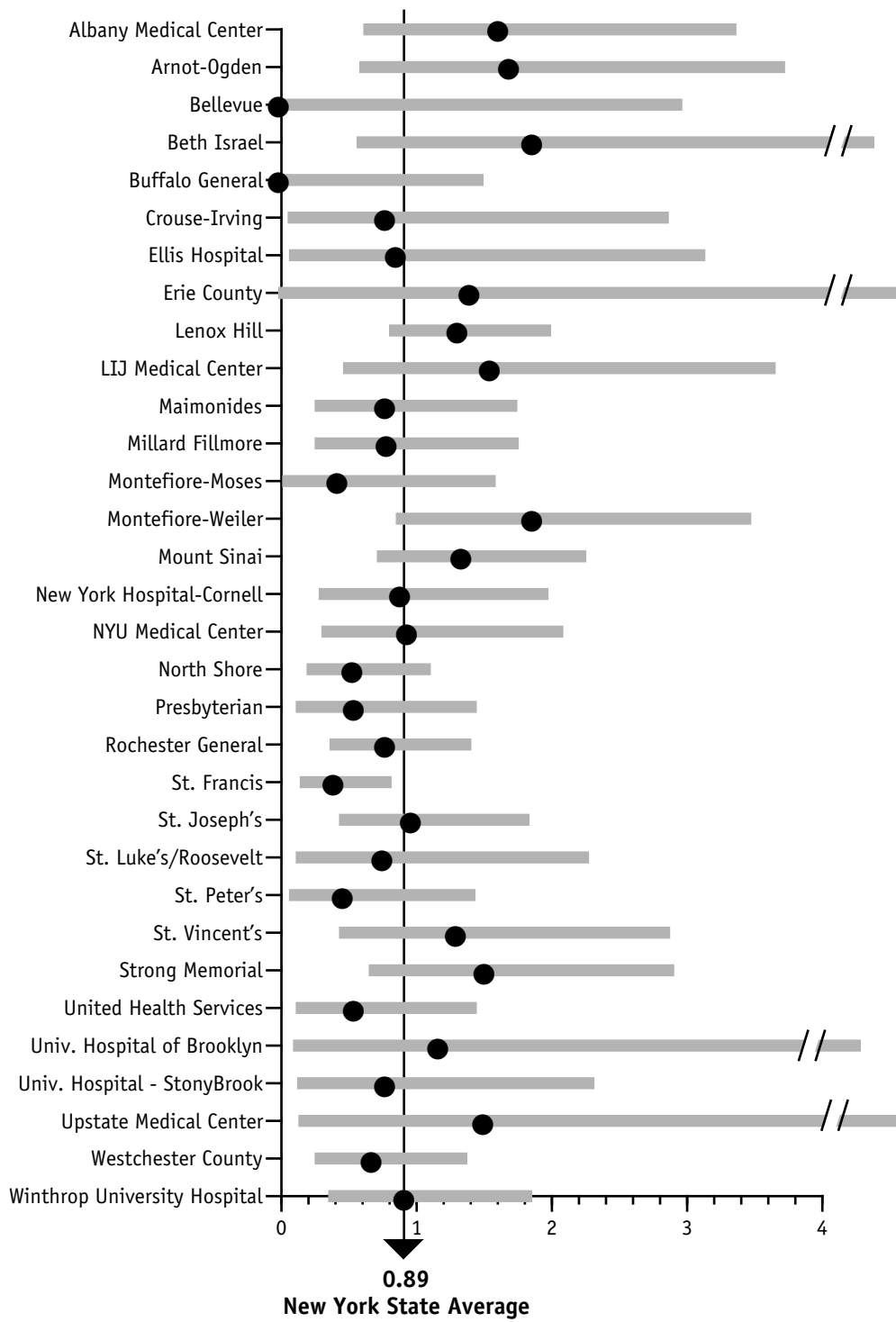
EMR - expected mortality rate

RAMR - risk adjusted mortality rate

CI - confidence interval

**Figure 1:**

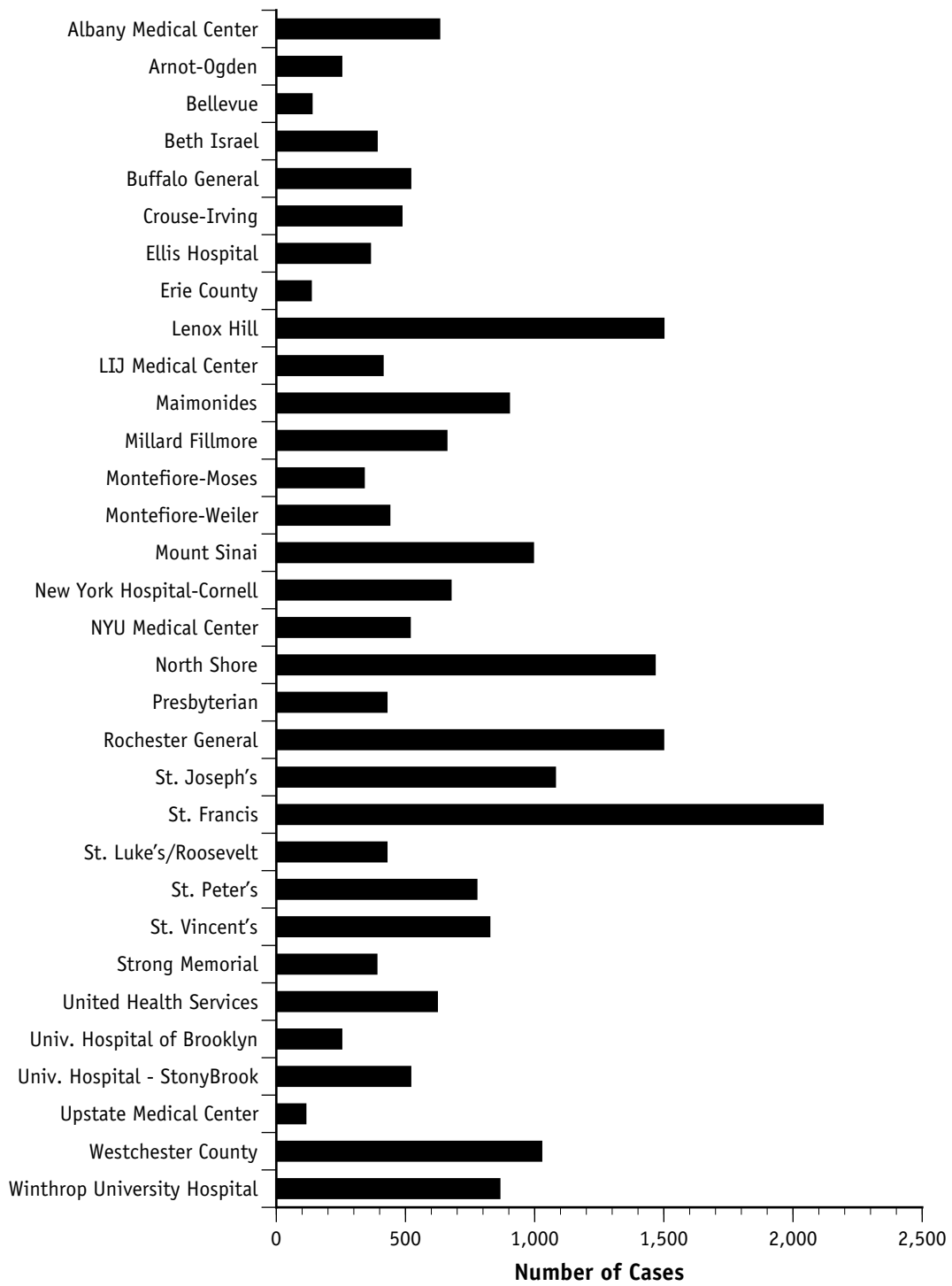
Hospital Observed, Expected and Risk-Adjusted Mortality Rates (RAMR) for Angioplasty in New York State — 1995 All Cases



**KEY**  
 ● Risk Adjusted mortality rate, 1995  
 ■ Potential margin of statistical error

**Figure 2:**

Case Volume by Hospital for Angioplasty in New York State – 1995



# MEDICAL TERMINOLOGY

**angioplasty**, also known as percutaneous transluminal coronary angioplasty (PTCA) - 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 (such as atherectomy, laser or ultrasound) are sometimes used in conjunction with the catheter to remove plaque.

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

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

**atherosclerosis** - one form of arteriosclerosis in which plaques or fatty deposits form in the inner layer of the arteries.

**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 artery bypass surgery or angioplasty is performed.

**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, blood and oxygen cannot flow freely to the heart muscle or myocardium.

**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, 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.

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

**lesion** - an irregular growth of fiber and tissue. Lesions of type C are more problematic than lesions of type B, which in turn are more dangerous than lesions of type A.

**myocardial infarction** - partial destruction of the heart muscle due to interrupted blood supply, also called a *heart attack* or *coronary thrombosis*.

**plaque** - also called *atheroma*, 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 can 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. The risk increases with age, so that half of all cases are in those who are more than 75 years old.

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 stress or type A personality characteristics.

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

## NEW YORK STATE ANGIOPLASTY PROGRAMS

Albany Medical Center Hospital  
New Scotland Avenue  
Albany, New York 12208

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

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

Beth Israel Medical Center  
10 Nathan D. Perlman Place  
New York, New York 10003

Buffalo General Hospital  
100 High Street  
Buffalo, New York 14203

Crouse Irving Memorial Hospital  
736 Irving Avenue  
Syracuse, New York 13210

Erie County Medical Center  
462 Grider Street  
Buffalo, New York 14215

Ellis Hospital  
1101 Nott Street  
Schenectady, New York 12308

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

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-Weiler Hospital  
1825 Eastchester Road  
Bronx, New York 10461

Mount Sinai Medical Center  
One Gustave L. Levy Place  
New York, New York 10026

New York Hospital-Cornell Medical Center  
525 East 68th Street  
New York, New York 10021

New York Hospital Medical Center-Queens  
56-45 Main Street  
Flushing, New York 11355  
(beginning 1996)

New York University Medical Center  
550 First Avenue  
New York, New York 10016

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

Presbyterian Hospital-Atchley Pavillion  
161 Fort Washington Avenue  
New York, New York 11576

Rochester General Hospital  
1425 Portland Avenue  
Rochester, New York 14621-3079

St. Francis Hospital  
Port Washington Boulevard  
Roslyn, New York 10025

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

St. Luke's Roosevelt Hospital Center  
11-11 Amsterdam Avenue at 114th Street  
New York, New York 10025

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

St. Vincent's Hospital & Medical Ctr of New York  
Wilson Hospital Division  
153 West 11th Street  
New York, New York 10011

Strong Memorial Hospital  
601 Elmwood Avenue  
Rochester, New York 14642

United Health Services - Wilson Hospital Division  
33-57 Harrison Street  
Johnson City, New York 13790

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

University Hospital - Stonybrook  
SUNY at Stonybrook  
Stonybrook, New York 11794-8410

SUNY Upstate Medical Center  
750 East Adams Street  
Syracuse, New York 13210

Westchester County Medical Center  
Grasslands Reservation  
Valhalla, New York 10595

Winthrop University Hospital  
259 First Street  
Mineola, New York 11501

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Cardiac  
Box 2000  
New York State Department of Health  
Albany, New York 12220



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George E. Pataki, Governor

Department of Health  
Barbara A. DeBuono, M.D., M.P.H., Commissioner