

**THE CALIFORNIA REPORT ON  
CORONARY ARTERY  
BYPASS GRAFT SURGERY**

2000-2002 Hospital Data

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Additional copies of the report can be obtained through the PBGH ([www.pbgh.org](http://www.pbgh.org)) and OSHPD ([www.oshpd.ca.gov](http://www.oshpd.ca.gov)) Web sites. PBGH posts the hospital performance results on its California Consumer HealthScope Web site ([www.healthscope.org](http://www.healthscope.org)), a public source of information on healthcare quality for California consumers.



## PREFACE

February 2005

We are pleased to release ***The California Report on Coronary Artery Bypass Graft Surgery 2000-2002 Hospital Data***, the third and final voluntary report from the California Coronary Artery Bypass Graft (CABG) Mortality Reporting Program (CCMRP). This report brings to a close an important partnership between the State of California, purchasers, and hospitals to voluntarily collect and release hospital performance data on mortality associated with heart bypass surgery.

Data on 77 of the 121 non-federal California hospitals that regularly performed heart bypass surgery during the 2000-2002 period are summarized in this report. These 77 hospitals performed approximately 73% of all isolated coronary artery bypass graft surgeries in California during this period, with an overall in-hospital death rate of 2.61%. The mortality rate for all California hospitals during this period was 2.84%.

All 77 participating hospitals are to be commended for their explicit commitment to quality improvement. Measurement and public accountability are requisite steps in the quality improvement process. The transparency of hospital performance information is critical to national efforts to close the quality gap identified in the Institute of Medicine's report *Crossing the Quality Chasm* (2001). Through concerted, collaborative efforts to measure and reduce performance variation, we take concrete steps to ensure that inpatient care is safe, effective, and efficiently delivered.

The important work of CCMRP over the last seven years has laid the foundation for public reporting of CABG outcomes and highlighted differences in death rates between participating and non-participating hospitals, which set the stage for compulsory reporting of heart bypass surgery outcomes for hospitals and surgeons in California. The passage of Senate Bill 680 (Chapter 898, Statutes of 2001) replaced the voluntary program with the California CABG Outcomes Reporting Program (CCORP), which began data collection in January 2003. The first CCORP hospital-level report is scheduled for release in the second half of 2005.



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## SUMMARY

The CCMRP 2000-2002 Hospital Data Report presents findings for 77 of California's 121 non-federal hospitals that regularly performed adult CABG surgery during 2000-2002. The report uses risk-adjusted in-hospital mortality as the outcome measure.<sup>1</sup> The report includes results for calendar years 2000-2002 and all participating hospitals submitted at least one year of complete and continuous data during this period. This three-year analysis includes a total of 57,388 isolated CABG surgeries, making it one of the largest public reporting programs on CABG outcomes in the United States.<sup>2</sup> This report also provides information on performance over time for hospitals that submitted data from 1997 to 2002, and examines the relationship between hospital surgery volume and mortality.

Key findings from the 2000-2002 analyses are:

- The overall in-hospital death rate for isolated CABG surgery in California among participating hospitals was 2.61% for 2000-2002. This compares to 2.76% for participating hospitals in 1999. Among California hospitals that did not participate in CCMRP, the in-hospital death rate was 3.35% for 2000-2002.<sup>3</sup> For all non-federal California hospitals, the in-hospital death rate was 2.84% for the 2000-2002 period. Nationally, the Society of Thoracic Surgeons (STS) reports an “operative mortality” rate for isolated CABG surgery of 2.90% for 2000-2002.<sup>4</sup>
- Most participating hospitals performed within the range of what was expected. Sixty of the 77 hospitals performed “**as expected**,” meaning that death rates at these institutions were within range of what was expected given the complexity of cases treated.
- Eight of the 77 hospitals performed significantly “**better than expected**,” meaning that their actual death rate was lower than expected given the complexity of cases they treated. The eight hospitals were:

<b>Hoag Memorial Hospital Presbyterian</b>	<b>Orange County</b>
<b>Loma Linda University Medical Center</b>	<b>Inland Empire, Riverside, and San Bernardino</b>
<b>Mercy General Hospital</b>	<b>Sacramento Valley and Northern California</b>
<b>Mills-Peninsula Hospital</b>	<b>San Francisco Bay Area and San Jose</b>
<b>Sequoia Hospital</b>	<b>San Francisco Bay Area and San Jose</b>
<b>Summit Medical Center</b>	<b>San Francisco Bay Area and San Jose</b>
<b>Sutter Memorial Hospital</b>	<b>Sacramento Valley and Northern California</b>
<b>Torrance Memorial Medical Center</b>	<b>Greater Los Angeles</b>

<sup>1</sup> Risk adjustment is a statistical technique that allows for fair comparison of hospital mortality rates even though some have sicker or healthier patients than average. In-hospital mortality means that the patient expired prior to discharge from the hospital that performed the operation, regardless of length of stay. Deaths are not counted after discharge. If a patient is transferred post-operatively to rehabilitation or a transitional care facility and dies before going home, this death is not counted.

<sup>2</sup> 57,388 cases were used in the analysis, including six hospitals that provided data but did not want their results published. Their 4,198 cases are included in the risk-adjustment model even though they are not listed as participants.

<sup>3</sup> OSHPD, Patient Discharge Data, 2000-2002.

<sup>4</sup> Operative mortality refers to patient death up to 30 days after surgery, regardless of patient location. Most deaths “in hospital” occur within 30 days. The “operative mortality” rate is somewhat higher than the “in hospital” mortality rate.

- Nine of the 77 hospitals performed significantly **“worse than expected,”** meaning their actual death rate was higher than expected given the complexity of cases they treated. The nine hospitals were:

<b>Alta Bates Medical Center</b>	<b>San Francisco Bay Area and San Jose</b>
<b>Alvarado Hospital Medical Center</b>	<b>Greater San Diego</b>
<b>California Pacific Medical Center - Pacific Campus</b>	<b>San Francisco Bay Area and San Jose</b>
<b>Desert Regional Medical Center</b>	<b>Inland Empire, Riverside, and San Bernardino</b>
<b>Glendale Adventist Medical Center - Wilson Terrace</b>	<b>San Fernando Valley, Antelope Valley, Ventura, and Santa Barbara</b>
<b>Providence Holy Cross Medical Center</b>	<b>San Fernando Valley, Antelope Valley, Ventura, and Santa Barbara</b>
<b>San Jose Medical Center</b>	<b>San Francisco Bay Area and San Jose</b>
<b>Scripps Mercy</b>	<b>Greater San Diego</b>
<b>Valley Presbyterian Hospital</b>	<b>San Fernando Valley, Antelope Valley, Ventura, and Santa Barbara</b>

- Of the 77 hospitals participating in 2000-2002, 25 have participated in this program every year since 1997. Of these, four had Observed to Expected (O/E) mortality ratios below 1.0 throughout the six-year period, meaning their actual death rates were below their expected death rates. One hospital had an O/E ratio above 1.0 for the entire six-year period, meaning its observed death rate was consistently higher than its expected rate. For the remaining 20 hospitals, performance was not consistent over time though patterns of improvement and decline were seen in some cases.

Other major findings in this report include:

- The expected death rate ranged from 1.6% to 5.3%, revealing wide variation among California hospitals with respect to the average pre-operative risk of patients they treat. This variation underscores the importance of adjusting for differences in case mix to produce comparative outcome scores.
- There was close agreement between the actual number of deaths and the predicted numbers of deaths from the risk-adjustment model, especially for the most severely ill patients. This means that the risk model gives hospitals appropriate credit for treating more clinically complex cases. Consequently, hospitals and surgeons should not exclude high-risk patients from appropriate CABG surgeries as a means to improve performance scores.
- Higher volume hospitals were found to have lower risk-adjusted in-hospital mortality rates, on average, than low volume hospitals, and this finding was statistically significant. The volume-outcome relationship, however, was not extremely strong. For example, if all isolated CABG patients were sent to hospitals with an annual volume of  $\geq 250$  cases, the model predicts an overall reduction in predicted mortality of 0.51%. In other words, assuming 25,000 CABG procedures are performed each year, 50 lives would be saved annually. If all CABG patients went to hospitals with annual volume  $\geq 450$  cases, a reduction in predicted mortality of 0.64% would result, or 110 lives saved annually. These projections assume, among other things, that higher-volume hospitals would continue to perform at their current standard of quality despite increased volume. However, it should be noted that some low-volume hospitals have very low risk-adjusted mortality rates.

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**TABLE OF CONTENTS**

Preface ..... v

Summary .....vii

Acknowledgements ..... ix

California CABG Mortality Reporting Program Clinical Advisory Panel..... x

Table of Contents ..... xi

Tables and Figures .....xii

Glossary of Frequently Used Acronyms .....xiii

**REPORT**

I. Introduction..... 1

II. Hospital Participation ..... 3

III. Data ..... 13

    Data Quality Review and Verification..... 14

IV. Risk Model for Adjusting Hospital Mortality Rates, 2000-2002..... 17

    Guide for Interpreting the Risk Model ..... 19

    Discrimination..... 19

    Calibration ..... 20

    Key Findings Regarding the Risk Model..... 21

V. Hospital Risk-Adjusted Mortality Rates, 2000-2002 ..... 23

VI. Hospital Performance Over Time, 1997-2002 ..... 38

VII. Hospital Volume and Coronary Artery Bypass Graft Surgery Outcomes ..... 44

**APPENDICES**

Appendix A: Clinical Definition of Isolated CABG for Data Years 2000-2002 ..... 50

Appendix B: CCMRP 2000-2002 Participating Hospitals Data Submissions by Year, 1997-2002 ..... 52

References ..... 56

California Health Policy and Data Advisory Commission ..... 62

Pacific Business Group on Health Purchaser Members ..... 63

## TABLES AND FIGURES

### TABLES

Table 1: California Hospitals that Perform Adult CABG Surgeries: 2000-2002 CCMRP Participation Status and Volume of Heart and Isolated CABG Surgeries in 2002.....	4
Table 2: CCMRP Data Elements, 2000-2002.....	13
Table 3: Logistic Regression Risk Model, 2000-2002 Analysis.....	18
Table 4: Calibration of 2000-2002 Model.....	20
Table 5: Risk-Adjusted Results for CCMRP Hospitals, 2000-2002, Sorted Alphabetically.....	24
Table 6: Hospital Volume Groups and Predicted Mortality Outcomes.....	45

### FIGURES

Figure 1: California Hospital Isolated CABG Surgery Volumes, 2002 OSHPD Patient Discharge Data ...	1
Figure 2: Comparison of Observed to Expected Mortality Rate, 2000-2002.....	28
Figure 3: O/E Ratios Over Time for 67 CCMRP Participating Hospitals that Have at Least Two Years of Continuous O/E Ratios Available Between 2000 and 2002.....	38
Figure 4: Plot of Observed to Expected Ratio Versus Annualized Hospital Volume Using Results from the Hierarchical Logistic Regression Model.....	45

**GLOSSARY OF FREQUENTLY USED ACRONYMS**

BMI	Body mass index
BSA	Body surface area
CABG	Coronary artery bypass graft
CAP	Clinical Advisory Panel
CASTS	California Society of Thoracic Surgeons
CCMRP	California CABG Mortality Reporting Program (Voluntary)
CCORP	California CABG Outcomes Reporting Program (Mandatory)
CHF	Congestive heart failure
COPD	Chronic obstructive pulmonary disease
ICD-9-CM	International Classification of Diseases, 9 <sup>th</sup> Revision, Clinical Modification
MDC 5	Major Diagnostic Category 5 (Diseases and Disorders of Circulatory System)
MI	Myocardial infarction
NYHA	New York Heart Association
O/E ratio	Observed to expected ratio
OSHPD	Office of Statewide Health Planning and Development
PBGH	Pacific Business Group on Health
PCI	Percutaneous coronary intervention
PDD	Patient Discharge Data (OSHPD)
PTCA	Percutaneous transluminal coronary angioplasty
STS	Society of Thoracic Surgeons

