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**REPORT OF THE  
CALIFORNIA HOSPITAL OUTCOMES PROJECT**

**Volume Two:  
Technical Appendix**

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# Report of the California Hospital Outcomes Project

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Andra Zach, R.R.A., M.P.A., had overall responsibility for all aspects of the project, serving as liaison between OSHPD, the research team, and the included hospitals. Toni Richards, Ph.D., provided valuable input regarding report preparation.

The contract team was supervised by Harold S. Luft, Ph.D., Patrick S. Romano, M.D., M.P.H., Linda L. Remy, Ph.D., and Julie Rainwater, Ph.D. Drs. Romano, Luft, and Remy had primary responsibility for writing Volume One, *Study Overview and Results Summary*. Drs. Romano, Remy, and Luft had primary responsibility for writing Volume Two, *Technical Appendix*. Drs. Luft, Romano, and Remy had primary responsibility for writing materials accompanying the *Detailed Statistical Tables*. Drs. Remy, Romano, and Luft, had primary responsibility for writing the *Hospital Guide to the Annual Report of the California Hospital Outcomes Project*.

Hong Zhou, Ph.D., Ayesha Gil, Ph.D., and Susan L. Rosenkranz, Ph.D. were responsible for resolving statistical issues. In addition, Dr. Gil performed most of the risk-adjustment procedures. Deborah Rennie provided overall programming supervision and review. Jessica Gallegos, Deborah Rennie, and Angie Wang created the study files. Patricia Kha, Angie Wang, and Reiling Lee wrote programs to summarize statistical results and prepare project report tables. Drs. Rainwater and Remy, and Pamela Weatherford had primary responsibility for preparing statistical tables. Margo DeLong arranged meetings of the clinical advisory panel and transcribed minutes of those meetings. Brad Jones of OSHPD designed the report covers.

The data collection instrument for the validation study was prepared by Jane Dulski and Neil Solomon, under the supervision of Drs. Romano and Rainwater. Michael Schembri implemented the sample selection procedures. The staff of California Medical Review, Inc. developed a computerized version of the data collection instrument and abstracted the medical records obtained from participating hospitals. Analyses of the resulting data were performed by Benjamin Chan, with assistance from Drs. Solomon and Romano.

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## SUMMARY OF THE CALIFORNIA HOSPITAL OUTCOMES PROJECT REPORT

The California Hospital Outcomes Project is the result of a legislative mandate requiring the Office of Statewide Health Planning and Development (OSHPD) to study and report on risk-adjusted measures of patient outcomes in California hospitals. This report focuses on risk-adjusted mortality following acute myocardial infarction (AMI or heart attack).

The Project's public report has two volumes: Volume One, *Study Overview and Results Summary* and Volume Two, *Technical Appendix*. In addition, a set of *Detailed Statistical Tables* is available. Before the report is released, hospitals receive the *Hospital Guide to the Annual Report of the California Hospital Outcomes Project* and draft copies of the *Study Overview and Results Summary*, the *Technical Appendix*, and their hospital-specific detailed statistics. These documents are sent to help hospitals prepare their response to the annual report. Each hospital has 60 days to file a response, which is reproduced in Volume One.

Volume One, *Study Overview*, is the principal volume of interest. It contains a general description of the study, the classification of hospitals into one of three categories according to their risk-adjusted mortality rates, and the letters received from hospitals in response to the study. Volume Two, *Technical Appendix*, details the methods used to conduct the analyses and presents the results of OSHPD's validation study for acute myocardial infarction. The *Detailed Statistical Tables* contain the numerical results upon which Volume One is based.

### STRENGTHS AND WEAKNESSES

This report uses data routinely collected by OSHPD and therefore imposes no new data collection burden on hospitals. Before the data are publicly released and available for outcomes analyses, they are carefully edited with hospitals making corrections and attesting to their data's accuracy. Data quality also is monitored through periodic reabstraction studies conducted by OSHPD. The data are quite detailed, including up to 25 diagnoses and procedures for each hospital discharge. All California hospital discharges are included, except those from Veterans Affairs and Department of Defense hospitals.

Heart attacks were chosen for study according to established legislative guidelines. The guidelines require that: 1) the discharge data are appropriate for risk adjustment, 2) the conditions and procedures are important in terms of cost and number of cases, and 3) the outcomes selected are influenced by quality of care.

To select risk factors for inclusion in the risk adjustment models, the relevant literature was reviewed and a panel of medical experts was consulted. The resulting set of risk factors was screened carefully for statistical importance, and the final models were tested extensively.

A number of concerns have been raised about using patient discharge abstracts for these studies. Despite the efforts of OSHPD and hospital health information management departments, medical record coding and reporting practices may vary across hospitals. With the advent of the California Hospital Outcomes Project, coding and reporting practices also are expected to vary across years. These variations in practice may affect the accuracy of risk adjustment.

In addition, despite the presence of relatively detailed information on diagnoses and procedures on the discharge abstract, this information does not always provide a precise picture of how sick the patient was on admission. Additional clinical information may be desirable for a more comprehensive risk adjustment. To address these concerns, OSHPD commissioned a validation study whose results are included in this release.