APPENDIX A. Methods

A. Individual-Level Data

These analyses utilize claims, enrollment and laboratory data available to UCLA, and present findings based on the following time periods:

- Baseline Year: September 1, 2006 – August 31, 2007
- Program Year 1: September 1, 2007 – August 31, 2008
- Program Year 2: September 1, 2008 – August 31, 2009

At the time this report was prepared partial or full years of data were not available for select counties (Exhibit 1).

1. Utilization Measures

UCLA utilization analyses (Exhibits 17, 24, 25.1, and 26.1) are based on claims or encounter data provided to UCLA by the 10 counties. Depending on existing county reporting requirements, billing, and practice management systems, data for services delivered were provided either on an encounter basis or a claims basis (Exhibit A.1).

All measures presented are based on active enrollees. An active enrollee is defined as an enrollee who has had at least 1 charge/claim/encounter in the claims data.

a) The number of active enrollees with at least one ER or inpatient service

The number of active enrollees with at least one ER or inpatient service is obtained by counting the number of unique enrollees with at least one ER or inpatient charge/claim/encounter in the claims data provided by each county, with the exception of San Diego County. To control for delays in enrollment, the number of active enrollees with at least one ER or inpatient service in program Year 1 in San Diego County is obtained by multiplying the number of unique enrollees with at least one ER or inpatient service in the fourth quarter of program Year 1 by 4.

b) Inpatient Admissions

Long-term, skilled nursing, and inpatient psychiatric care are excluded from the count of inpatient admissions in the counties that provide such care (Exhibit 11), with the exception of Alameda County, where the type of care provided cannot be identified.

Due to variations in data structure and availability, the method for identifying and counting individual inpatient admissions varies across the counties (Exhibit A.1).

Where encounter level data are provided (Kern, Los Angeles, and Santa Clara counties), every inpatient record is counted as one inpatient admission. Where an encounter identifier is provided (San Francisco and San Mateo counties), inpatient records with the same encounter ID are counted as part of the same inpatient admission. For Alameda, Contra Costa, Orange, and San Diego counties, inpatient records with matching dates of admission and discharge are counted as part of the same inpatient admission. In Ventura County, a mixed method is utilized. Where an encounter identifier is provided (program Years 1 and 2), inpatient records with the same encounter ID are counted as part of the same inpatient admission. In the Baseline Year, inpatient records with the date of service on consecutive days are counted as part of the same inpatient admission.

To control for delays in enrollment in San Diego County, the number of inpatient admissions in program Year 1 is obtained by multiplying the number of inpatient admissions in the fourth quarter of program Year 1 by 4.

Due to partial data availability in the Baseline Year for Santa Clara County, an annualized estimate is used for that year, which is obtained by multiplying the number of inpatient admissions in the Baseline Year by 1.5.

c) Inpatient Days

For all counties, with the exception of Ventura, the following method was used to calculate the number of inpatient days. For inpatient stays with admission and discharge on the same day, the number of inpatient days is equal to 1. For inpatient stays with admission and discharge on different days, the number of inpatient days is calculated as the difference between the date of discharge and the date of admission.

In Ventura, the number of inpatient days is obtained from the count of room and bed records with the date of service on consecutive days, minus 1. If there is only 1 room and bed record, the number of inpatient days is equal to 1.

To control for delays in enrollment in San Diego County, the number of inpatient days in program Year 1 is obtained by multiplying the number of inpatient days in the fourth quarter of program Year 1 by 4.

Due to partial data availability in the Baseline Year for Santa Clara County, an annualized estimate is used for that year, which is obtained by multiplying the number of inpatient days in the Baseline Year by 1.5.

d) Emergency Department Visits

Due to variations in data structure and availability, the method for identifying individual ER visits varies across the counties (Exhibit A.1).

In all counties, ER records with the same date of service or the date of service on consecutive days are counted as part of the same ER visit.

For San Diego County , the number of ER visits only includes ER visits that did not result in hospital admission. To control for delays in enrollment, the number of ER visits in Program Year 1 is obtained by multiplying the number of ER visits in the fourth quarter of program Year 1 by 4.

Due to partial data availability in the Baseline Year for Santa Clara County, an annualized estimate is used for that year, which is obtained by multiplying the number of ER visits in the Baseline Year by 1.5.

At this time, it is not possible to use population characteristics, length of enrollment period, or other possible factors as control variables in our analyses. However, we expect to merge enrollment and claim/encounter files to allow for analyses based on population characteristics, environmental variables, and other influences in our final report.

Exhibit A.1: Description of Data and Methodology for Identifying Inpatient and ER Encounters, by County.

	Alameda	San Diego	Contra Costa	Kern	Los Angeles	Orange	San Francisco	San Mateo	Santa Clara	Ventura
Type of data	Claims (aggregated)	Claims (2 files: aggregated & disaggregated)	Claims (aggregated)	Encounter	Encounter	Claims (disaggregated)	Claims (aggregated)	Claims (disaggregated)	Encounter	Claims (disaggregated)
Encounter ID (important when data are not at the encounter level)							x	x		x (program Years 1 and 2 only)
Claim type (inpatient, emergency, outpatient)	x	Site of service is used instead	x	x	x	Site of service is used instead	x	x	x	x
To identify inpatient records	Claim type = inpatient	Site of service = inpatient hospital & the number of approved inpatient days is not null & revenue code ≠ 128	Claim type = inpatient & the number of inpatient days ≠ 0 & site of service ≠ "INP Psych Inpatient"	Encounter type = inpatient	Encounter type = inpatient	Site of service = Inpatient Hospital & specialty = "Hospital"	Claim type = "Non-nursery ICU" or "Med/Surg Semi-ICU" or "L&D/OBSRV/ POSTPART" or "Semi-Private" or "Cardiac Telemetry CCU" & total charges ≠ 0 & date of discharge ≠ null	Record type = "Intensive care unit" or "Medical/ surgical" & date of discharge ≠ null	Encounter type = inpatient & service description ≠ "Rehabilitation" or "Barbara Arons PA"	Record type = inpatient & site of service = "VCMC STAR = Room & Bed" or "VCMC STAR - SP Room & Bed" & procedure description ≠ "IP Psychiatric"
To identify an inpatient admission	Claims that match on date of admission and date of discharge are counted as 1 admission	Records that match on date of admission and date of discharge are counted as 1 admission	Claims that match on date of admission and date of discharge are counted as 1 admission	1 record = 1 admission	1 record = 1 admission	Records that match on date of admission and date of discharge are counted as 1 admission	Claims with the same encounter ID are counted as 1 admission	Records with the same encounter ID are counted as 1 admission	1 record = 1 admission	Baseline Year: records on consecutive days are counted as 1 admission. Program Years 1 and 2: records with the same encounter ID are counted as 1 admission

Exhibit A.1: Description of Data and Methodology for Identifying Inpatient and ER Encounters, by County.

	Alameda	San Diego	Contra Costa	Kern	Los Angeles	Orange	San Francisco	San Mateo	Santa Clara	Ventura
Inpatient days	Calculated as date of discharge – date of admit. Exception: if the result is 0, inpatient days = 1									Count of ”Room & Bed” charges that occurred on consecutive days.
To identify ER records not resulting in hospital admission	Claim type = emergency.	Site of service = “Emergency Room” & approved days is not null	Claim type = emergency & Site of service = “3-B Emergency Dept” or “Emergency Room” & charge amount ≠ 0 & discharge status ≠ “Disch to CCRMC CCU” or “Disch to CCRMC IMC” or “Disch to CCRMC MED” or “Disch to CCRMC SUR” or “Short Term Hosp"	Encounter type = other & patient type = “ECC Regular Reg” or “ER Psych” or” ECC Quick Reg” or “Immediate Care Cente” or “ECC OB Registration” or “ECC Jail “ & ER charges ≠ 0	Encounter type = emergency	.Site of service = “Emergency Room – Hospital” & revenue code = 450 & CPT code = 99281, 99282, 99283, 99284, 99285	Claim type = emergency or psychiatric emergency	Record type = emergency room or psychiatric emergency	Encounter type = outpatient & service description = “Emergency Room” OR “Emergency Psychiatric Services”	Record type = emergency & (procedure = “Emergency Department Visit” or (site of service = “VCMC STAR = SP Emergency Room” & procedure = “Emergency Room Brief”, “Emergency Room Complex”, “Emergency Room Comprehensive”, “Emergency Room Critical Care”, “Emergency Room Expanded”, “Emergency Room Intermediate”)) & Billed > 0

Exhibit A.1: Description of Data and Methodology for Identifying Inpatient and ER Encounters, by County.

	Alameda	San Diego	Contra Costa	Kern	Los Angeles	Orange	San Francisco	San Mateo	Santa Clara	Ventura
To identify ER records resulting in hospital admission	Cannot be identified separately. Included when the selection criteria above are applied.	Cannot be identified from the data provided. Excluded from the analyses.	Claim type = inpatient & admission type = "From our ER" or "Emergency" & site of service ≠ “INP Psych Inpatient”	Encounter type = inpatient & ER charges ≠ 0	Encounter type = emergency visits resulting in inpatient admission	Site of service = "Inpatient Hospital" or "Inpatient Psychiatric Hospital" or " Comprehensive Inpatient Rehabilitation Facility" & revenue code = 450	Claim type = "Non-nursery ICU" or "Med/Surg Semi-ICU" or "L&D/OBSRV/ POSTPART" or "Semi-Private" or "Cardiac Telemetry CCU" & admit source = ""Emergency Outpatient Unit" or "Psych Emergency (PES)"	Record type = "Intensive care unit" or "Medical/ surgical" or "Psychiatry" or "LTC-Inpatient" & admission source = “Emergency room”	Encounter type = inpatient & admit source = “EMR” or “EMR-Trauma”	ER visits resulting in inpatient admission are identified using the procedure above.
To identify an ER visit	Records that occurred on the same or consecutive days are counted as 1 visit									

2. *Demographics*

The demographic characteristics of members are based on the time of initial enrollment into the program. All measures except poverty level are displayed as reported by counties. Poverty level was calculated by UCLA based on 2009 Federal Poverty Level Guidelines, utilizing family size and monthly or annual income information provided by counties.

UCLA investigated six chronic disease conditions. For each member, chronic disease status was assigned if specific ICD-9 diagnostic codes ever occur within the available claims history for the individual. In some cases, diagnostic groups were included by selecting all ICD-9 codes with a specific three-digit ICD-9 code root (for example, root '250' includes all non-gestational diabetes diagnoses). The following diagnostic codes or diagnostic code roots were used to assign disease status:

- diabetes: 250, 357.2, 362.0, 366.41, 648.0;
- congestive heart failure: 428;
- asthma/chronic obstructive pulmonary disease: 492, 493, 496;
- coronary artery disease: 410, 411, 412, 413, 414;
- dyslipidemia: 272; and
- hypertension 401, 402, 403, 404.

Disease categories are not mutually exclusive; members are assigned all applicable disease categories.

It is important to note that the date range and structure of claims data, including the number of available ICD-9 codes provided in each claim, impacts our ability to identify diagnoses (Appendix B). The following number of ICD-9 codes per claim was available in each county: Alameda (up to 2); Contra Costa (up to 1); Kern (up to 15); Los Angeles (up to 3); Orange (up to 8); San Diego (up to 3); San Francisco (up to 1); San Mateo (up to 1); Santa Clara (up to 12); and Ventura (up to 4). In counties with fewer available ICD-9 codes, the sensitivity of diagnosis assignment may be lower.

3. *Clinical Outcome Measures*

Clinical outcome measures are drawn from laboratory or disease registry data and are controlled for chronic disease status as identified by UCLA. Laboratory or disease registry data are available from selected demonstration counties (Appendix B), and include lab results for a subset of the population. Results are not controlled for length of enrollment period.

A variety of clinical outcome measures are presented, including: average monthly results, average annual results, and average results of initial vs. follow-up measurements. Initial and follow-up results are based on the first and last available result for each individual, and do not control for the elapsed time between measurements.

B. Member-Month and Member-Year Calculations

Enrollment, utilization, and expenditure data from annual county progress reports to DHCS were converted by UCLA into standardized rates to facilitate comparisons across counties regardless of the size of the county's enrolled population. Depending on the time period studied, raters per 1,000 members per month or annualized rates per 1,000 members are presented. Member months and member years are calculated by UCLA based on enrollment data contained in county progress reports to DHCS. HCCI counties report the number of enrollees and disenrollees in each quarter, but are not required to report the number of months of enrollment per member within each quarter, which is needed for calculation of these rates. Therefore, the rates presented using this method are estimates, and may differ from those derived from claims data.

To estimate the total number of member months in each county, UCLA estimated the count of enrollees in each quarter (unduplicated count of new enrollees minus unduplicated count of disenrollees) for the first eight quarters of program implementation (September 1, 2007 – August 31, 2009) for each county. The total number of months of enrollment accrued by these enrollees was then estimated by assuming two months of enrollment on average per quarter for individuals who newly enrolled or disenrolled during each quarter, and three months of enrollment on average per quarter for continuous enrollees. Similarly the number of member years was then estimated by dividing the total number of member months by twelve.

Utilization rates per 1,000 members per month were calculated by dividing overall utilization of a given service (e.g., inpatient days) by the total number of member months for the same time period and multiplying the result by 1,000. Similarly, annualized rates per 1,000 members were calculated by dividing overall utilization of a given service (e.g., inpatient days) by the total number of member years (i.e., the number of member months divided by 12) for the same time period and multiplying the result by 1,000.

C. Caveats

An important limitation of individual-level data presented in this report is that no county is able to provide data on all covered services for all enrollees provided under the demonstration waiver. This is due to a range of factors, including network design and health information technology limitations. For example, data are not captured for any services received by a member outside of the contracted network, or from sectors of the network for which electronic data are not available. In addition, data from periods during which a member may have a lapse in coverage are not available. As a result, the utilization rates in this report may understate the actual services provided by HCCI counties, and also understate the total utilization of enrollees if they received services outside of the CI provider network in their county.

Data from the baseline year include individuals who were enrolled in HCCI at some time during the program period, and who had previously received care through the county

indigent care program. Therefore, the baseline measures are based on a subset of the same individuals included in Year 1 and Year 2 analyses. It is unknown whether the subset of HCCI enrollees included in the baseline year data is a representative sample.

It is also important to note that while the rates per 1,000 members per month or annualized rates per 1,000 members control for differences in enrollment or population size, but do not account for variations in program implementation or population characteristics of each county. The HCCI programs are diverse in both regards. Utilization analyses controlling for these aspects of the HCCI programs are not possible at this time, using either individual-level or progress report calculations. Such findings will be presented in our final report, contingent upon receipt of necessary data.