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HI-DESERT MEDICAL CENTER

MARKET DEMAND ANALYSIS

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ICU & OB UNIT EXPANSION

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Introduction

Hi-Desert Medical Center (HDMC) administration has contracted K&B Enterprises and Fontana and Associates to provide a demand forecast and capacity projections for the hospital focusing on its Intensive Care Unit (ICU) and Obstetric (OB) services including C-section operating suite capabilities.

The facility presently has four (4) Labor Delivery-Post Partum Rooms (LDRP) and four (4) ICU beds. Over the past two years, HDMC has seen an increasing demand for both OB and ICU beds forcing the use of "overflow" beds on the Medical/Surgical (M/S) unit with increasing frequency. This unavoidable overflow utilization, of necessity, utilizes M/S beds that are needed for less clinically demanding inpatient services, impedes optimal patient care, and presents security challenges to HDMC patients. Additionally, patients for whom the facility would otherwise provide care are often transferred to other hospitals for treatment when beds are unavailable at HDMC.

The purpose of this report is to estimate the current demand for ICU and OB services at HDMC and to forecast bed need requirements to adequately serve the Morongo Basin through 2019, excluding managerial initiatives that may further generate volume growth.

Demand forecasting for theses two services has been conducted through the utilization of historical data including peak month utilization and average length of stay, population growth and trends, patient origin and market share, relevant benchmarks, comparable market use rates, modeling existing conditions, developing core assumptions and forecasting future demand.

Hospital data was evaluated and same store analysis conducted for both services based on standard acceptable practices to project the number of beds necessary to meet the current patient care demands without patient "overflow" ("Current Requirement"). The Current Requirement was then modeled for anticipated population growth using standard methodologies to establish the requirement through 2019 ("Future Requirement"). Future requirements in the ICU are very conservative and while we did consider actions that would generate increased volume through reduced outmigration and increased surgical capabilities, we feel additional management initiatives would warrant growth above our forecast.

This report has reviewed the medical service area and services, a demographic snapshot based on recent economic trends identified by 2009 CLARITAS INC, a brief summary of patient outmigration and discharge information based on OSHPD hospital reporting for first 6 months of 2008, analysis of daily census for OB & ICU 2008-2009 and calculations for peak month census and utilization of services, key demand drivers, relevant benchmarks, and core assumptions to forecast future demand.

Findings Summary

It is the finding of this report that HDMC is significantly under-bedded in both OB and ICU currently, and that demand, as a result of projected population growth and mitigated outmigration through 2019 will necessitate a further expansion in capacity. We project the demand for beds require expanding the Obstetrical unit from four beds to twelve beds. Consistent with present treatment approaches, the existing four LDRPs should be used as LDRs and eight post-partum beds should be added. Similarly, we project the demand for the Intensive Care Unit will require that HDMC add a minimum of six beds to a total compliment of ten. When coupled with management growth initiatives, additional beds should be considered.

Background

The San Bernardino/Riverside region presents substantial healthcare access challenges for residents because of its vast geographic area. Unlike Riverside County, where the majority of primary care for low-income residents is delivered by the county, most primary care in San Bernardino County is delivered by private organizations. While it has been presumed the County hospital for San Bernardino would function as the "safety net" for low income residents, this has not been the case for the Morongo Basin communities.

HDMC provides a primary and secondary healthcare delivery system to the Morongo Basin communities and serves a 1,800 square mile area with a population of an estimated 73,981 people (2009 CLARITAS INC).

The County hospital is located 75 miles away preventing Hi-Desert area residents from reasonable access to safety-net acute care or clinical services. HDMC offers the only inpatient services within a 37 mile radius. As a result, HDMC's emergency department is a vital safety net for patients requiring urgent or emergent medical attention. The cost of transportation to distant facilities and the tightening economy make it prohibitive for many local residents to access care outside the area. HDMC's role as a provider for core medical services requires its leadership to determine shortfalls in providing services and fiscally responsible ways of meeting current community inpatient needs and growing future needs.

HDMC is currently licensed for 55 acute-care beds and 4 labor and delivery beds for a total of 59 beds. The OB service includes one C-section OR. The licensed bed capacity and daily census reports do not, however, offer a true picture of available beds or whether patients and medical staff can access services when they are needed.

The hospital is challenged by capacity constraints even when the total occupancy is lower than licensed bed capacity. The daily census reports do not account for patients treated as outpatients without formal admission. It also misses patients who are admitted and discharged on the same day. Hospital beds must be staffed in order to constitute available capacity on a specific day, and hospitals may not be able to adequately alter staffing levels in response to short-term or quickly changing fluctuations in demand.

Finally, because of limited substitutability in facilities and equipment between specialized hospital departments the facility may be at capacity even when the number of patients is less than the hospital's stated bed capacity. An example of this would be utilization of OB and nursery beds. These would be unsuitable for adult male surgical patients even if bed capacity was available.

Demographic Snapshot

The downtrend in the economy over the past 18 months has had a tremendous impact on the nation. This is very visible in California where the state is experiencing resident outmigration as job losses continue, the cost of living remains higher than other states and a 12.2% unemployment rate was reported in September, 2009. The unemployment rates reported during the same time period for Riverside and San Bernardino Counties were 15% and 13.9% respectively.

Recent data obtained through 2009 CLARITAS INC. has taken current economic factors into consideration and has modeled new projections for 2014 based on trending 2000 census data. These data projection have been used for the purpose of projecting demographic and household trends for 2014 in this report.

Economists expect economic recovery will be more widely visible in late 2010, however, since this remains largely speculative the most recent CLARITAS projections will be used beyond 2014 for the purposes of this analysis.

The zip codes used for CLARITAS INC reports include: 92252, 92277, 92284, 92256, 92278, and 92285 and comprise the primary service area (PSA) and secondary service area (SSA)

Because 2000 census data is used for this report, PO Box zip codes are not included.

The population in the United States is estimated to have increased by 9% from 2000 to present. The nation's population is projected to grow by 5.1% between 2009 and 2014.

Between 2000 and 2009 the Morongo basin is estimated to have experienced a 12.26% growth and is expected to see an 8.03% growth over the next 5 years. When viewing the population by Age and Sex trend, the average age and median age are both projected to remain essentially unchanged between 2009 and 2014. This would indicate that current utilization trends will continue.

From 2000-2009, the service area for HDMC averaged a 1.5% annual population growth rate. The projected population trend is slightly less for the period 2009-2014 and then as California recovers from the current recession is projected to return to its previous average.

Population Trend

Population			
2014 Projection		79,921	
1990 Census			
		PSA/SSA	United States
Growth	2009-2014	8.03%	9%
Growth	2000-2009	12.26%	5.1%

Current Status

OB Current Requirements

HDMC is currently comprised of an OB unit that consists of 4 rooms serving as labor, delivery, recovery and postpartum (LDRP) suites. These rooms require more square footage than a standard patient room and are designed to house mother and baby from the time of mom's arrival in labor until mother and baby are discharged. The theory of LDRP rooms is for patients to complete their entire birth experience from admission to discharge in one room. The limitation of having an OB service comprised of only 4 LDRPs has impeded this practice. Once patients have labored and given birth they are often moved into another room for the remainder of their stay often off the unit and onto Med/Surg. The average length of stay for OB patients from 6/30/2007 – 4/30/09 was 1.9 days, which is consistent with the industry average. Based on daily census and overflow data provided by the Hospital's Finance Department for July, 2008 through June, 2009, the unit is full and overflowing (more than four patients) 38% of the time.

In evaluating the Patient Origin and Discharge Data supplied for the first 6 months of 2008, the majority of noted outmigration for OB patients from HDMC's primary service area was to Desert Regional Medical Center in Palm Springs (OSHPD, Jan-June 2008). HDMC retained a 50% market share of OB patients and Desert Regional Medical Center realized a 37.5% market share. Another 12.5% of the patients received services at Loma Linda Medical Center. In drilling down the data further, the patients discharged from Loma Linda had discharge diagnosis related to high risk pregnancy and were in need of a higher level of care than could be provided by HDMC. This was partially true for the patients from HDMC's primary service area who received services at Desert Regional Medical Center. However, a larger number of patients out-migrating to that facility received OB care consistent with the capability of HDMC, and are appropriate for retention.

Since the service opened with 4 LDRPs and one c-section room in 2003, the unit has shown steady growth and has maintained a positive reputation in the community. The OB service has been running at 80% occupancy with a 50% market share.

To accommodate the existing OB volume, the length of time patients labor, post partum stay and the fact OB services are largely unscheduled occurrences, the lack of distinct postpartum rooms at HDMC has required the staff to utilize swing beds on the medical surgical floor for this purpose. These post partum patients are accommodated in the LDRP rooms for as long as possible but admissions of other patients who are in labor and require a labor room necessitate transfers to the Med/Surg floor for post partum care.

OB patients prefer and expect to have a private room for their entire maternity experience. Private post partum rooms with adequate space to accommodate family members have become the standard of care in the community and sought after by patients. During focus groups with OB patients, during the strategic planning process they indicated an important factor in choosing a facility was personal comfort. Since maternity services are not typically viewed as "illness" related, OB patients are more willing to travel to other facilities for what they perceive to be more private and comfortable accommodations.

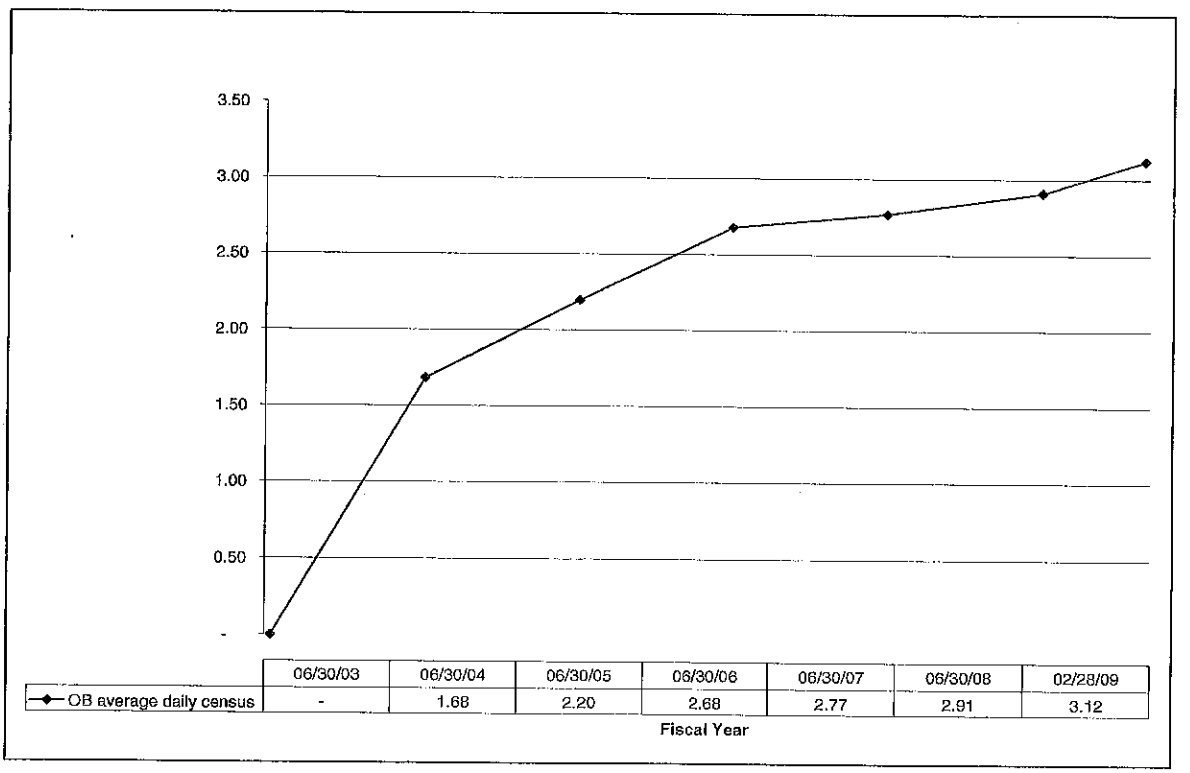
OB Bed Demand Vs C-Section Operating Room Demand

HDMC's current OB service has one C-section OR located in the department. This report reviewed the facility's OB service statistical information for January-September 2008. It was noted that during the first nine months of 2009 a total of 96 c-sections were performed. The highest number of C-sections performed in a month was sixteen and the lowest volume was eight.

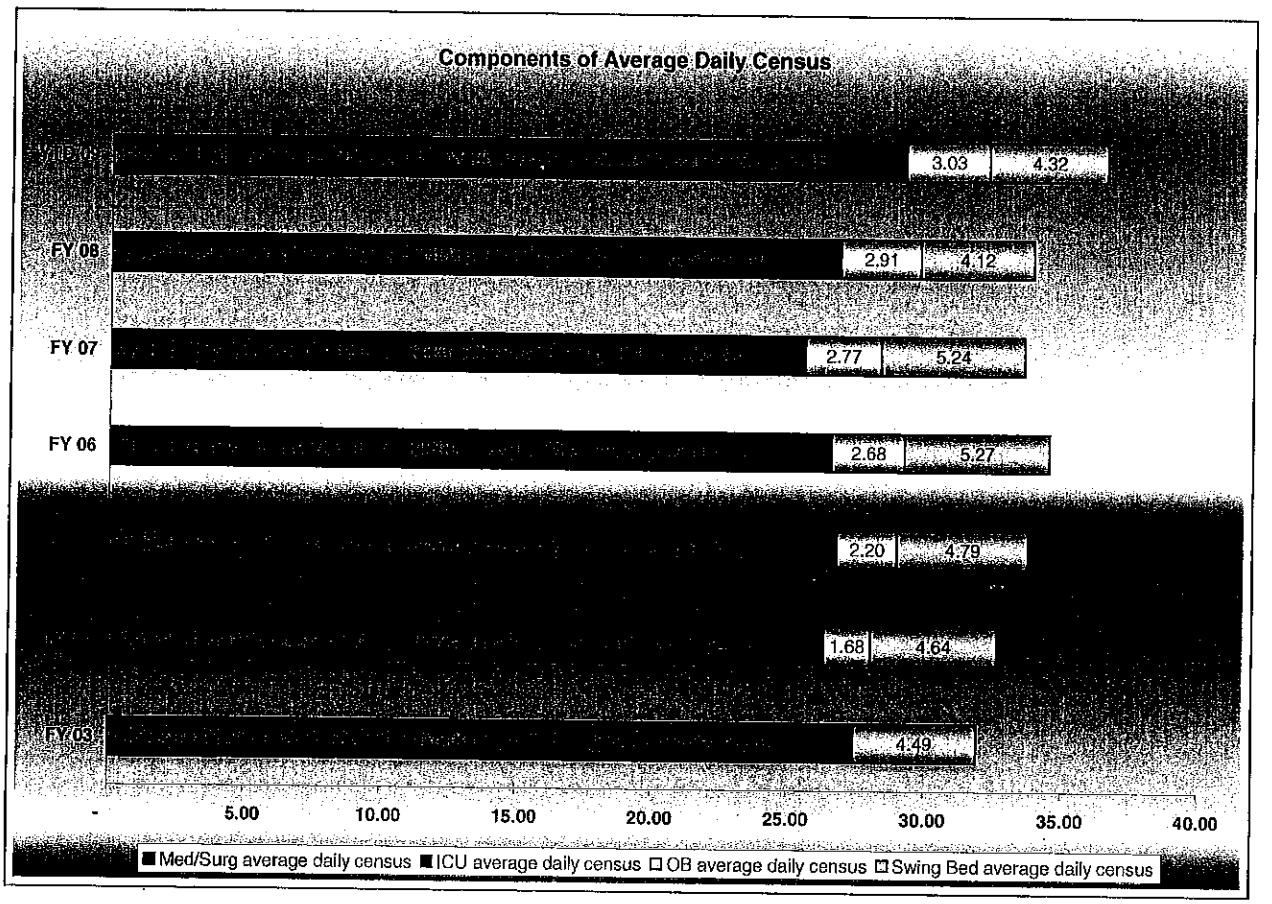
The industry standard is typically one dedicated C-section OR per 1100 C-section cases per year. In surveying facilities with locations, maternity volume and level of care comparable to HDMC, one C-section room with OR for back up in the event of a simultaneous crash C-section is the standard of care. We do not forecast adequate demand to require an additional c-section OR.

OB Average Daily Census

The following graph is included to show growth in obstetric patient days. There were no gynecological days included in the data. Many of these days occurred when the unit was full and post-delivery patients were often located on the med/surg unit.



In spite of some continued out migration for maternity care, the OB services at HDMC have seen a steady growth since 2003. The demand for OB care has, because of the limited size of the unit, required beds on med/surg to be utilized with more frequency as a result. This has a domino effect on Med/Surg during peak census times. The effect is to provide less than necessary space for OB services and in the process taking room needed for Med/Surg patients. Both units become compressed for space and the delivery of services has a higher potential for becoming fragmented.



The graph above illustrates the growth in average daily census for all departments on an annual basis between 2003 – 2009.

OB Demand Projection

Using the Standard Deviation with the Mean allowed us to approximate the number of beds needed to accommodate the variation in the Hospitals census. The variation is measured on either side of the mean. One Standard Deviation on each side of the mean would capture 68% of the demand. Two Standard Deviations would capture 95% of the demand, and three Standard Deviations would accommodate 99% of the demand. These are measurement tools used to indicate direction and do not include any assumptions for internal growth or the capture of out migration.

The calculation was performed twice. The first calculation was based on 365 days of data (July 1, 2008 to June 30, 2009). The second calculation was done for the peak month (October, 2008). Moving three Standard Deviations beyond the Mean for the complete year indicated a current demand for 8.64 beds. The calculations for the peak month indicated a current demand for 9.86 beds. Based on current peak census on a same store basis, for HDMC were to guarantee an OB bed availability eliminating overflow to med/surg, it would currently require a 10 bed unit. The calculations are as follows:

x = Daily Census
μ = Mean
σ = Standard Deviation
N = Number of Observations

$$\sigma = \sqrt{\frac{\Sigma (x-\mu)\,\hat{}\,2}{N}} = \sqrt{\frac{1189.744}{365}} = \sqrt{3.26} = 1.80$$

$$\mu = \frac{1181}{365} = 3.24 \quad + 1.80 = 5.04 \text{ beds}$$
$$+ \ 1.80 = 6.84 \text{ beds}$$
$$+ 1.80 + 8.64 \text{ beds}$$

$$\sigma = \sqrt{\frac{\Sigma (x-\mu)\,\hat{}\,2}{N}} = \sqrt{\frac{113.7839}{31}} = \sqrt{3.660} = 1.91$$

$$\mu = \frac{128}{31} = 4.13 \quad + 1.91 = 6.04 \text{ beds}$$
$$+ 1.91 = 7.95 \text{ beds}$$
$$+ 1.91 = 9.86 \text{ beds}$$

Assumptions:

1. HDMC's current OB outmigration for level 1 maternity service is 37%.
2. Population growth will occur at 3% per year. This includes an assumption of annual population growth plus recapture of market share and increased demand for services through physician recruitment and patient preference to receive services locally.
3. The birthrate will remain at the present level through 2019.
4. Additional OB physician(s) will be recruited.
5. Increased OB capacity will strengthen the likelihood patients will choose HDMC for OB services rather than seeking services outside the community resulting in increased market share.

The following table projects OB volume based on 3% annual growth with a standard deviation of 1.91.

[redacted]

OBSTETRICS
PEAK MONTH - OCTOBER
Based on 3% Annual Growth
SD = 1.91

YEAR	PATIENT DAYS	MEAN	1 SD	2 SD	3 SD
2008-09	128	4.13	6.04	7.95	9.86
2009-10	132	4.25	6.16	8.07	9.98
2010-11	136	4.38	6.29	8.20	10.11
2011-12	140	4.51	6.42	8.33	10.24
2012-13	144	4.65	6.56	8.47	10.38
2013-14	148	4.79	6.70	8.61	10.52
2014-15	153	4.93	6.84	8.75	10.66
2015-16	157	5.08	6.99	8.90	10.81
2016-17	162	5.23	7.14	9.05	10.96
2017-18	167	5.39	7.30	9.21	11.12
2018-19	172	5.55	7.46	9.37	11.28

Summary of OB Findings

It is the finding of this report that HDMC is currently significantly under-bedded in OB. The unit has been running at 80% occupancy and is full and overflowing (with more than four patients) 38% of the time.

The lack of adequate bed availability to meet demand exists while HDMC has realized only a 50% OB market share for PSA/SSA deliveries. Based on these findings, there is ample market share growth potential for the service at HDMC.

Based on the industry standards for ORs per C-section rates, the current OR in the OB service is adequate and will continue to be adequate even with future market demand and growth.

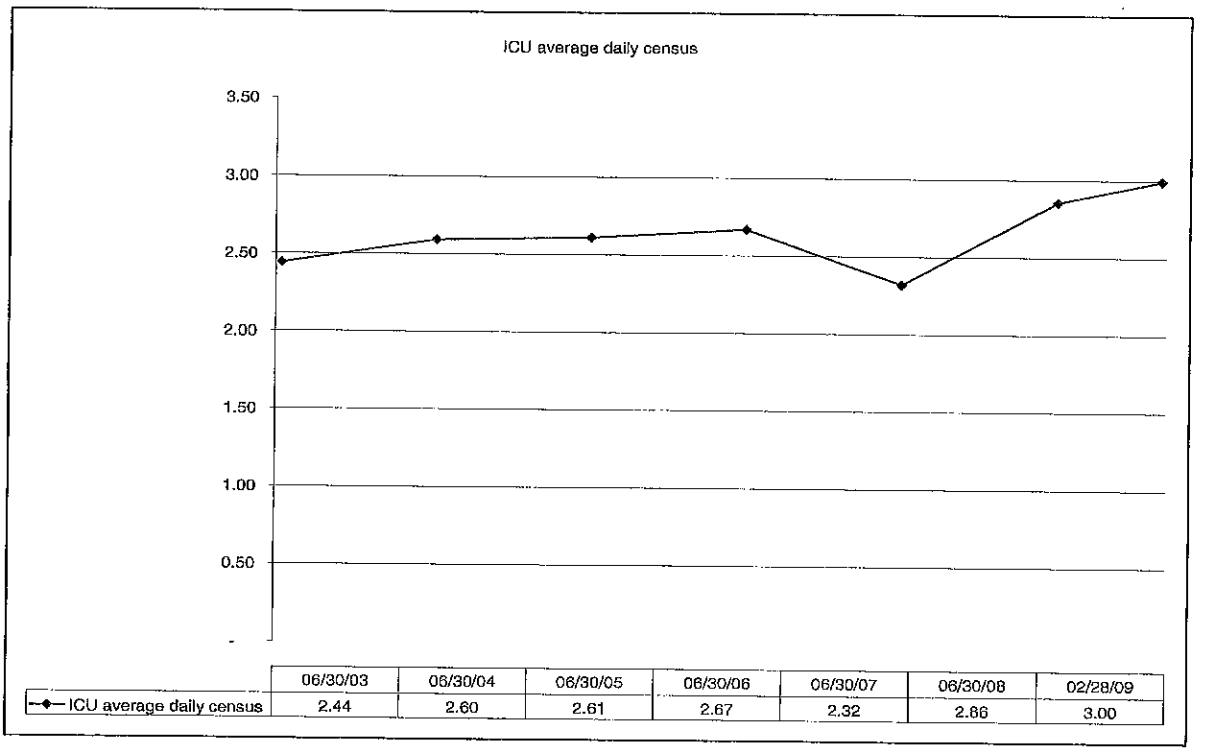
We project the demand for HDMC requires expanding its Obstetrical unit from four beds to twelve beds. Consistent with present treatment approaches, the existing four LDRPs should be used as LDRs and eight post-partum beds should be added.

ICU Current Requirement

The current ICU is a 4-bed unit. Based on daily ICU census and overflow data provided by the Hospital's Finance Department for July 2008 – June 2009, the current unit is full (four or more patients) 40% of the time. At these times additional patients requiring intensive care are either transferred to other facilities or on "overflow" to med/surg.

The graph below, illustrates the average daily census for the ICU since 2003. When additionally evaluating the period from May through June 2009, the average daily census for the ICU increased to 3.18 patients per day.

ICU Average Daily Census: Included to show the growth in ICU patient days.



	06/30/03	06/30/04	06/30/05	06/30/06	06/30/07	06/30/08	02/28/09
ICU average daily census	2.44	2.60	2.61	2.67	2.32	2.86	3.00

The facility was not able to capture census data for patients who required ICU level care and, due to lack of an ICU bed, were held in the ED overnight or longer than a 24 hour period. This additional volume of patients would further increase the frequency the unit would run at or over capacity. Because these ICU level patients require a higher level of nursing care than can be provided on the medical surgical floor, if such nursing, or appropriate bed, is unavailable they have historically been retained in the ED under the care of nursing staff proficient in managing critical patients. During our research, we were only able to obtain anecdotal information regarding these patients and were informed this does occur with increasing frequency and is a source of growing concern and frustration for staff, physicians, and patients.

During months historical of higher incidence for respiratory illness, which typically increase ICU admissions, an overflow situation will occur more frequently. Physicians understandably may find ways to have their patients admitted directly to other facilities to avoid admission delays

and/or delays in care. This patient volume cannot be clearly quantified but is included in the general medicine outmigration discharges noted in patient origin reports. Data obtained from the California Office of Statewide Health Planning and Development (OSHPD) for the first six months of 2008 indicates HDMC maintains a 50% market share for patients discharged with residence zip codes in the hospitals primary service area. OB patients and patients receiving services not offered by HDMC, such as interventional cardiac services, were excluded from this report.

Given a reliable and clinically appropriate choice at HDMC the medical staff indicated they would prefer to accommodate care for their patients closer to home. Patients interviewed during focus groups during the Strategic Planning process stated they preferred to receive core acute care services in the community. All cited that driving outside the Morongo Basin for their hospitalization or to be with a loved one who is hospitalized placed additional hardship on the family. This would support the facility's ability to recapture market share outmigration occurring due to lack of available ICU resources.

ICU Demand Projection

The information for the Standard Deviation was derived using 365 days of information for FY 2008-2009 for the ICU beds.

Again, the calculation was performed twice. The first calculation was based on 365 days of data (July 1, 2008 to June 30, 2009). The second calculation was done for the peak month (November, 2008). Moving three Standard Deviations beyond the Mean for the complete year indicated a demand for 6.65 beds. The calculations for the peak month indicated a demand for 8.27 beds. Based on current peak census on a same store basis, for HDMC to assure an ICU bed availability eliminating overflow to med/surg, it would currently require a 9 bed unit.

The calculations are as follows:

x = Daily Census
μ = Mean
σ = Standard Deviation
N = Number of Observations

$$\sigma = \sqrt{\frac{\Sigma (x-\mu)\,\hat{}\,2}{N}} = \sqrt{\frac{5.19}{365}} = \sqrt{1.422} = 1.19$$

$$\mu = \frac{1123}{366} = 3.08 \quad + 1.19 = 4.27 \text{ beds}$$
$$+ \ 1.19 = 5.46 \text{ beds}$$
$$+ 1.19 + 6.65 \text{ beds}$$

$$\sigma = \sqrt{\frac{\Sigma (x-\mu)\,\hat{}\,2}{N}} = \sqrt{\frac{57.467}{30}} = \sqrt{1.916} = 1.38$$

$$\mu = \frac{124}{30} = 4.13 \quad + 1.38 = 5.51 \text{ beds}$$
$$+ 1.38 = 6.89 \text{ beds}$$
$$+ 1.38 = 8.27 \text{ beds}$$

Assumptions:

1. A third OR will be online in the OR department before expansion of the ICU is completed.
2. An additional OR suite will increase demand for ICU availability and services.
3. Population growth will occur at 3% per year allowing for historical population growth, unrecorded patients held in the ED and patients diverted to other facilities due to lack of ICU bed availability at HDMC.
4. Average and Median Ages for the population will be unchanged.

			INTENSIVE CARE UNIT		
			PEAK MONTH- NOVEMBER		
			Based on 3% Annual Growth		
			SD = 1.38		
YEAR	PATIENT DAYS	MEAN	1 SD	2 SD	3 SD
2008-09	124	4.13	5.51	6.89	8.27
2009-10	128	4.26	5.64	7.02	8.40
2010-11	132	4.39	5.77	7.15	8.53
2011-12	135	4.52	5.90	7.28	8.66
2012-13	140	4.65	6.03	7.41	8.79
2013-14	144	4.79	6.17	7.55	8.93
2014-15	148	4.94	6.32	7.70	9.08
2015-16	153	5.08	6.46	7.84	9.22
2016-17	157	5.24	6.62	8.00	9.38
2017-18	162	5.39	6.77	8.15	9.53
2018-19	167	5.55	6.93	8.31	9.69

Summary of ICU Findings

It is the finding of this report that HDMC is also notably under-bedded in ICU. Based on daily ICU census and overflow data provided, the current unit is full (four or more patients) 40% of the time. At these times additional patients requiring intensive care are either transferred to another facility or on "overflow" to med/surg.

Overflow from the ICU onto the Med/Surg unit encroaches on the available bed space for medical surgical patient care. Patients with infectious diseases who require isolation additionally reduce available beds and patient mix due to patient condition (if they require a private room) and gender compatibility further erodes the available bed space.

Based on current peak census on a same store basis, for HDMC to assure an ICU bed availability eliminating overflow to med/surg, it would currently require a 9 bed unit (5 additional beds).

Future Requirement

HDMC's inability to meet present demand will be compounded as the population and market grows. The projections provided in this report are felt by the authors to be conservative given historical population growth, market share growth potential through recapturing outmigration, physician recruitment activities and the remote location of the facility. The patients who were admitted to other facilities because an ICU bed was not available at HDMC and the patients retained in the ED and provided ICU level care when the four-bed ICU was at capacity are additional sources that justify a 3% projected annual growth for the ICU.

Accordingly, we project the Future Requirement in ICU of 1 bed beyond the Current Requirement of 9 beds to a total of 10 beds (6 over existing capacity), and a Future Requirement in OB of 2 beds beyond the Current Requirement of 10 beds to a total of 12 beds (8 over existing capacity). No additional C-section rooms are required.

	ICU	OB	C-Section
Existing Capabilities	4	4	1
Current Requirement	9	10	0
Additional Needs for Current Requirement	**5**	**6**	**1**
Future Requirement	10	12	1
Additional Needs for Future Requirement	**1**	**2**	**0**
TOTAL NEW BEDS/ROOMS REQUIRED	**6**	**8**	**0**

The total projection forecast does not take into consideration managerial actions that may result in additional patient volume. Bed requirements for such actions must be added to the above projections.

References

Office of Statewide Health Planning and Development. Jan – June 2008 report.

CLARITAS, INC. 2009 Demographic Snapshot Report

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Michael E. Fontana
Principal Owner

Michael E. Fontana and Associates, with thirty years of healthcare experience, is a consulting and project management firm specializing in planning, market analysis, design management, strategic planning, entitlement, and construction administration. Project valuation is more that $800 million dollars. Past and present clients include: Desert Health Care District, Desert Hospital Corporation, Tenet Health Systems, Valley Health System, Eisenhower Medical Center, High Desert Medical Center, Palo Verde Hospital District, Starwood Hotels, Lowe's Development Corporation-Destination Resorts, Lowe's Home Improvement Centers, Toll Brothers, MSA Consulting, City of Palm Springs, City of Palm Desert Redevelopment Agency, Institute of Critical Care Medicine, Critical Care Associates, Desert Cardiology, Scott Arronson, M.D., Pacific Sleep Centers.

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L. Kris Kington-Barker
Principal

Kris has 22 years healthcare administration experience and has served as a senior executive for Delano Regional Medical Center, Tenet Healthcare, National Medical Enterprises and Summit Healthcare. Her responsibilities and areas of focus as both a healthcare administrator and consultant have included strategy development, demand forecasting, competitive positioning, program and business planning, clinical support operations and management skills assessment and training.

K&B Enterprises provides consulting services specializing market analysis, strategic planning, business development, leadership and workforce consulting, and management skills training for healthcare organizations. K&B also provides construction project management, development and quality control; verification of processes, materials and methods for both healthcare and industrial institutions. Past and Present medical clients include: Tenet Healthcare, French Hospital Medical Center, Mee Memorial Hospital, County of San Luis Obispo, Hanford Community Medical Center, United Medical Services.