TRENDS IN MARYLAND HOSPITAL EMERGENCY DEPARTMENT UTILIZATION:

An Analysis of Issues and Recommended Strategies to Address Crowding

Report of the Joint Work Group on
Emergency Department Utilization

Maryland Health Care Commission
Health Services Cost Review Commission

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Executive Summary

In Maryland, and across the United States, there have been substantial increases in the utilization of acute care hospital emergency department services over the past twelve years. In fiscal year 2001, there were 1.9 million visits to the emergency department services operated by Maryland's acute care hospitals. Between 1990 and 2001, the emergency department utilization increased by 454,000 visits or 30.6 percent. Over this same time period, Maryland's total population increased by about 11.6 percent.

Because emergency department services are a vital component of the health care system, the Maryland Health Care Commission (MHCC) and the Health Services Cost Review Commission (HSCRC) convened a Joint Work Group to examine the underlying causes of the recent increases in utilization, assess the impact of future trends on the provision of these services, and ensure that public policy is coordinated in developing effective strategies to address emergency department crowding. The findings and recommendations of the Joint Work Group are contained in *Trends in Maryland Hospital Emergency Department Utilization: An Analysis of Issues and Recommended Strategies to Address Crowding.*

STATE AND NATIONAL TRENDS IN EMERGENCY DEPARTMENT UTILIZATION

- Emergency department services accounted for 52 percent of the total patients served by Maryland acute care hospitals in 2000. In comparison, inpatient services represented about 16 percent of hospital caseloads.

- Fifteen of the 46 Maryland acute care hospitals with emergency departments had 50,000 or more visits during fiscal year 2001. Four (Johns Hopkins Hospital, Sinai Hospital of Baltimore, St. Agnes Hospital, and University of Maryland Hospital) of the 15 hospitals with 50,000 or more visits were located in Baltimore City; and three hospitals (Shady Grove Adventist Hospital, Prince George's Hospital Center, and Holy Cross Hospital) were located in the metropolitan Washington jurisdictions of Montgomery and Prince George's counties.

- Analyses of trend data on yellow and red alerts over the past several years shows substantial increases in the number of hours that hospital emergency departments are on ambulance diversion. In the metropolitan Baltimore region, there was a more than four fold increase in yellow alert hours between fiscal years 1996-2001. Yellow alert hours accounted for 16.4 percent of available emergency department hours and red alert for 14.2 percent of available hours in fiscal year 2001.

- The pattern of increasing emergency department utilization experienced in Maryland during recent years is consistent with national data. According to the American Hospital Association, the number of emergency room visits to U.S. hospitals increased by 19 percent between 1990 and 2000. Over this same time period, Maryland hospitals reported a 23 percent increase in emergency department use.

- More than one-half of all hospitalized patients are seen in the emergency department prior to admission. In 2000, 55.2 percent of all admissions for inpatient care came through the hospital emergency department. For the psychiatric service, almost three-quarters (72.6 percent) of patients are admitted through the emergency department.

- Heart failure and shock, which accounted for slightly more than 5.3 percent of all admissions through the emergency department, were the primary reason for hospitalization. The second leading cause of hospitalization for patients admitted through the emergency department was psychoses. Other leading conditions important to admission through the emergency department were pneumonia, chest pain, cerebrovascular disorders, chronic obstructive pulmonary disease, digestive disorders, and blood infections or septicemia.

FACTORS INFLUENCING EMERGENCY DEPARTMENT UTILIZATION

A large number of interrelated factors influence how hospital emergency department services are utilized and the frequency of diversions and crowding. These factors can be broadly categorized as follows: (1) increased demand for emergency department services; (2) changes in the management of emergency department patients; and, (3) the capacity of hospital and community health care system resources to address treatment and other needs following discharge from the emergency department.

Increased Demand for Emergency Department Services

- While HMO's sharply curtailed use of emergency department services in the early 1990's, this pattern has changed in response to consumer concerns about managed care combined with less rigid interpretations of what constitutes a medical emergency, particularly under recent prudent layperson laws. One consequence of this move away from strong utilization controls has been the increased use of emergency department services by managed care enrollees.

- Although managed care organizations may have eased restrictions on using emergency department services, the increase in managed care enrollment has at the same time increased use of primary care physicians and other clinicians. As a consequence, patients may be increasingly turning to the hospital emergency department when they need urgent care and cannot schedule a timely appointment with their own primary care physician. Busy primary care physicians also may be referring patients to the emergency department when appointments are not readily available.

- Many of the reasons that patients cite for using the emergency department for non-urgent care relate to access to care issues, both financial and non-financial, including lack of health insurance, clinic services not being available at night, not being able to leave work, not being able to get an appointment soon enough, and the convenience of emergency department care. While having a regular source of primary care may not entirely eliminate hospital emergency department use, available research suggests

that it is associated with more appropriate utilization of the emergency department. Further analyses of the Maryland emergency department data set are required to more fully understand the reasons underlying the use of the emergency department for non-urgent conditions.

- Although only a small proportion of emergency department visits result in admission for inpatient care, more than one-half of all inpatient discharges from Maryland hospitals entered through the emergency department. As the major doorway to the hospital, the emergency department is a key service in maintaining a viable inpatient base. In an increasingly competitive health care market, this factor in and of itself may create conflicting incentives for hospitals.

Changes in the Management of Emergency Department Patients

- Recent efforts to more strictly enforce EMTALA requirements may contribute to crowding by increasing the length of time patients spend in the emergency department as well as encouraging physicians to refer and patients to self-refer to emergency department services.

- Problems with the availability of on-call specialists to provide a consultation is another factor that contributes to longer stays and crowding in the emergency department. Delays in specialists making themselves available for emergency department coverage stem from several factors, including lack of payment by uninsured patients, managed care policies, technological advances that have enabled more physicians to operate in their offices making them less reliant on hospital privileges, and EMTALA rules governing transfers of patients.

- Changes in the way health care services are delivered have also had an impact on the operation of the emergency department. Many of the conditions that once resulted in admission to the hospital now are treated and released following intensive therapy and observation in the emergency department.

Hospital and Community Health System Capacity

- Discussions with Maryland hospital staff suggest that delays in the ability to transfer patients from the emergency department to appropriate inpatient units within the hospital, particularly critical care units, is a significant factor contributing to congestion. When this occurs, patients must be held in the emergency department, thus occupying resources that otherwise would be available to treat incoming patients.

- The current nursing shortage may limit the number of licensed beds that hospitals are able to staff and operate. Factors responsible for constraining the supply of nurses, including decreased job satisfaction, expanded career opportunities, and a shrinking pool of new nurses to replace those retiring, are likely to persist and may worsen in the future. As a consequence, nursing staff shortages can be expected to have a

continuing impact on hospital operations, including the ability to operate a full complement of licensed beds.

- Seasonal variation in hospital utilization patterns is another factor that increases pressure on available beds. For medical-surgical services, utilization predictably peaks during the winter months of January-February. On the peak census day in January 2000, statewide occupancy based on licensed beds was 93.3 percent. By comparison, the lowest patient census generally occurs during the summer months or December. In December, at the lowest point during 2000, occupancy was 60.0 percent based on licensed beds.

- The impact of the way beds are used on patient census at peak hours of operation is a third factor that may increase pressure on hospital system capacity. As length of stay has declined and outpatient services have increased it is not uncommon for patients to be admitted for up to 23 hour stays that occupy resources but may not necessarily be counted in the patient census. A related issue concerns how to count patients who experience extremely long lengths of stay in the emergency department and may eventually be discharged before being admitted.

- The capacity of the community health care system to provide needed services also has an impact on the ability of hospitals to discharge patients. Discussions with hospital staff suggest that this problem particularly impacts vulnerable populations with serious and chronic illnesses, such as psychiatric patients.

HOSPITAL EMERGENCY DEPARTMENT CAPITAL PROJECTS

- The renovation and expansion of hospital emergency departments has been a significant trend in capital expenditure projects over the past several years in Maryland. Between 1997-2001, eight hospitals completed capital projects to expand or renovate emergency department services. Those eight projects cost $44,369,063. Seventeen Maryland hospitals have submitted plans for capital projects costing $81,891,679 to upgrade emergency department services between 2002-2004. An additional 10 hospitals have future plans to renovate or expand their emergency department services.

- Based on current plans, emergency department beds will increase by about 25 percent (from 1,303 to 1,627) between 1999 and 2004. Data reported to the Commission indicates that the size of emergency departments, as measured by square feet, will increase from 579,934 to 779, 721 (34.4 percent) over this same time period. Almost one-half of the projected growth in the emergency department will be in beds allocated to fast track and multi-purpose use (165 of the 324 additional beds).

RECOMMENDATIONS

RECOMMENDATION 1. The academic and research communities in Maryland, in collaboration with hospitals and state agencies, should seek funding from federal agencies and/or private foundations to support a research agenda designed to: (1) analyze the role of the emergency department in serving vulnerable populations; (2) evaluate options for organizing emergency department services to meet future community needs; and (3) identify best practices.

RECOMMENDATION 2. The Health Services Cost Review Commission's Hospital Ambulatory Care Data Set, which collects information on emergency department encounters from all Maryland acute care hospitals, should be used to monitor utilization patterns and guide policy formulation. In consultation with hospitals and relevant state agencies, HSCRC should develop comparative statistics and indicators and provide feedback to hospitals through preparation and dissemination of quarterly and annual reports on emergency department use.

RECOMMENDATION 3. The Yellow Alert Task Force, convened by the Maryland Institute for Emergency Medical Services Systems as a collaborative effort involving EMS providers, hospitals, and state agencies, should continue to serve as the forum for developing strategies to manage hospital emergency department diversions, including educating the public and health care providers about the appropriate use of emergency services.

RECOMMENDATION 4. The Maryland Health Care Commission, with the assistance of a Work Group composed of representatives from hospitals and relevant state agencies, should study the relationship between increased admissions through the emergency department and other sources and inpatient bed capacity. This study should include an analysis of staffed versus licensed beds, options for measuring occupancy and licensed capacity, optimal occupancy thresholds, emergency department capacity, and other appropriate factors. The Commission should use results from this study in updating and revising the acute inpatient services component of the State Health Plan for Services and Facilities and Certificate of Need regulations, in recommending statutory changes where appropriate, and in other policy development efforts involving acute care hospitals.

RECOMMENDATION 5. The Health Services Cost Review Commission should consider innovative programs from hospitals that can be shown to be cost effective and improve the operation of the emergency department. The HSCRC should consider supplying hospitals with start-up funds to begin these programs if it can be clearly demonstrated that the public from the implementation of these programs will realize savings. This start-up money should only be supplied if there is a back-end guarantee by the hospitals that savings will be realized from the programs.

RECOMMENDATION 6. The Association of Maryland Hospitals and Health Systems should give priority in reviewing applications for the Hospital Bond Project Review Program to innovative projects designed to improve access to urgent and non-emergency care services for vulnerable populations.

RECOMMENDATION 7. The Maryland Health Care Commission, Office of Health Care Quality, Health Services Cost Review Commission, Maryland Institute for Emergency Medical Services Systems, and The Association of Maryland Hospitals and Health Systems should jointly study the access, quality of care, and reimbursement issues associated with hospital and non-hospital based urgent care centers, including freestanding emergency care centers.

I.
INTRODUCTION

Background and Issues

In Maryland, and across the United States, there have been substantial increases in the utilization of acute care hospital emergency department services over the past twelve years. In fiscal year 2001, there were 1.9 million visits to the emergency department services operated by Maryland's acute care hospitals. Statewide, visits to emergency departments increased by 8.1 percent (from 1,615,511 to 1,746,312) between 1998 and 1999; and 4.3 percent (from 1,746,312 to 1,821,760) between 1999 and 2000. These increases continued in fiscal year 2001 with emergency department visits growing to 1,937,268—an increase of 6.3 percent when compared with the previous fiscal year.

Because emergency department services are a vital component of the health care system, the Maryland Health Care Commission (MHCC) and the Health Services Cost Review Commission (HSCRC) convened a Joint Work Group to examine the underlying causes of the recent increases in utilization, assess the impact of future trends on the provision of these services, and ensure that public policy is coordinated in developing effective strategies to address emergency department crowding. The MHCC is responsible for preparing the State Health Plan for Acute Inpatient Services and for administering the Certificate of Need program, which requires approval of certain large capital expenditure projects. The MHCC is concerned about the potential impact of recent trends on access to services and on the ability of the system to meet future community needs. The HSCRC is empowered under state law to set the rates that all Maryland hospitals may charge. This rate setting authority applies to all inpatient and outpatient services at a hospital. The HSCRC is concerned about the sharp increase that Maryland hospitals are experiencing in emergency department visits and the effect that this increase may have on the hospitals' overall financial situation.

Purpose of the Joint Work Group

The purpose of the Joint Work Group on Emergency Department Utilization is to:

(1) Analyze data on the organization and utilization of emergency department services, including the demographic characteristics of patients, major payer sources, the types of diagnoses treated in emergency department, and other relevant indicators;
(2) Compare the utilization of Maryland emergency department services with available national data;
(3) Identify the major factors contributing to increases in hospital emergency department visits; and
(4) Recommend strategies to address emergency department crowding, including additional analyses required to develop effective long-range policies.

This report summarizes the findings and recommendations from the Joint Work Group. A list of Joint Work Group members is provided in Figure 1.

Data Sources

Data used in this report to analyze Maryland trends in the utilization of emergency department services is based on two principal sources. For historical trends in emergency department visits, the report uses data collected by the Health Services Cost Review Commission (HCSRC) in their Financial Data Base. This data base collects annual statistics, reflecting the fiscal year July 1-June 30 reporting period, on the number of emergency department visits by hospital. In addition, the report uses data collected by the HSCRC on emergency department encounters in the Hospital Ambulatory Care Data Set.[1] The Hospital Ambulatory Care Data Set was initiated by HSCRC in 1997 and collects patient-level data on emergency department encounters, including patient demographic characteristics, expected payer for most of the bill, secondary payer, principal diagnosis and other diagnoses, external cause of injury code, condition code, occurrence span code and data, and charges.

Statistics comparing Maryland with the U.S. experience are based on data collected in the National Hospital Ambulatory Medical Care Survey (NHAMCS). NHAMCS is part of the ambulatory care component of the National Health Care Survey that measures health care utilization across various types of providers. NHAMCS is a national probability survey of visits to hospital emergency and outpatient departments of non-federal, short-stay, and general hospitals in the United States. The sample data collected in this survey are weighted to produce annual national estimates. In addition, data on emergency outpatient visits from the American Hospital Association's Annual Survey has been used to compare Maryland with other hospitals.

Organization of the Report

This report is organized in five major sections. Following this Introduction, is an Overview: State and National Trends in Emergency Department Utilization. This section of the report analyzes available data on Maryland trends in the use of emergency department services and compares Maryland with national statistics. In Chapter III, factors influencing emergency department utilization are outlined and discussed. Data on hospital emergency department capital projects are provided in Chapter IV. A summary of the findings and recommendations of the Joint Work Group is provided in Chapter V.

[1] COMAR 10.37.04, *Submission of Hospital Ambulatory Care Data Set to the Commission*. For the calendar year 2000 reporting period, HSCRC required 12 hospitals to resubmit data. Because the revised data set was not yet available, the preliminary 2000 data on emergency room encounters has been included in this report.

Figure 1

MEMBERS OF THE
JOINT WORK GROUP ON EMERGENCY DEPARTMENT UTILIZATION

PAMELA W. BARCLAY (Chairman), Deputy Director, Health Resources, Maryland Health Care Commission

WILLIAM T. BRADEL, Executive Director and Chief Operating Officer, St. Agnes Hospital

PATRICIA G. CAMERON, Chief, Acute and Ambulatory Care Services, Health Resources Division, Maryland Health Care Commission

LINDA M. DEFEO, M.D., JD, Chairman, Department of Emergency Medicine, Prince George's Hospital Center

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BARBARA GILL MCLEAN, Executive Director, Maryland Health Care Commission

FRANK MONIUS, Vice President for Administration, The Association of Maryland Hospitals and Health Systems

ROBERT MURRAY, Executive Director, Health Services Cost Review Commission

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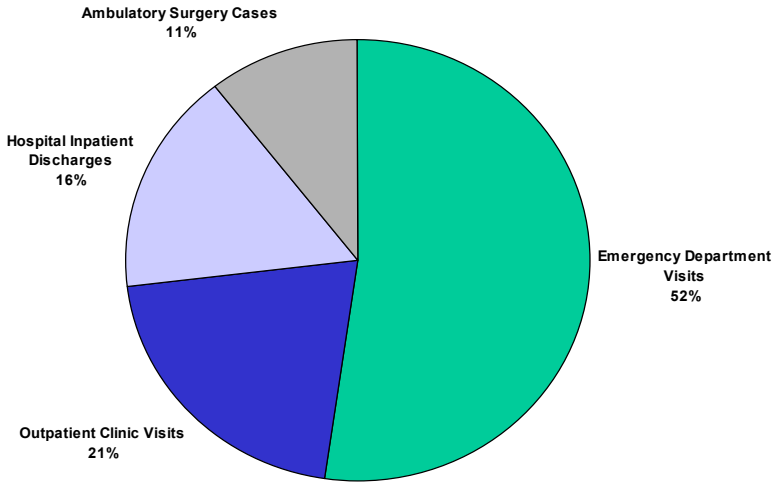
II.
OVERVIEW: STATE AND NATIONAL TRENDS IN EMERGENCY DEPARTMENT UTILIZATION

Trends in Maryland Hospital Emergency Department Utilization

Emergency department services are a major and growing component of the acute care hospital system in Maryland. Emergency department services are currently maintained by 46 of the 47 non-federal, acute care hospitals in Maryland.[2] In addition, federal hospitals, including Walter Reed Army Medical Center, Bethesda Naval Hospital, Malcolm Grow Air Force Medical Center provide emergency services to eligible patients. In 2000, emergency department services accounted for more than one-half of the total patients served by Maryland acute care hospitals. (Refer to Figure 2).

Figure 2
Utilization of Acute Care Hospitals by Service Type: Maryland, 2000



Source: Maryland Health Care Commission (Data reported on inpatient utilization is from the Hospital Discharge Abstract Data Base for calendar year 2000; data reported on ambulatory surgery cases is from the Hospital Ambulatory Surgery Data Base for calendar year 2000; data reported on emergency department and outpatient clinic visits are from the HSCRC Financial Data Bases for Fiscal Year 2000).

[2] One acute care facility, James Lawrence Kernan Hospital located in Baltimore City, does not offer emergency department services.

The importance of the emergency department in terms of the volume of patients served is part of the larger trend of substantial growth in outpatient services offered by acute care hospitals. As shown in Table 1, inpatient services declined from about 18 to 16 percent of total acute care hospital patient volumes between 1991 and 2000. Over this same time period, total outpatient services delivered by Maryland hospitals increased from about 82 to 84 percent of overall volumes. As a proportion of total utilization, emergency department visits increased from about 47 to 52 percent over the past decade.

Table 1
Trends in the Utilization of Acute Care Hospitals by Type of Service:
Maryland, 1991-2000

		Outpatient Services					Outpatient Services			
Year	Inpatient Discharges	Ambulatory Surgery Cases	Outpatient Clinic Visits	Emergency Department Visits	ALL SERVICES	Inpatient Discharges	Ambulatory Surgery Cases	Outpatient Clinic Visits	Emergency Department Visits	ALL OUT-PATIENT SERVICES
1991	555,498	253,301	879,840	1,475,565	3,164,204	17.56%	8.01%	27.81%	46.63%	82.44%
1992	556,418	285,265	895,158	1,487,712	3,224,553	17.26%	8.85%	27.76%	46.14%	82.74%
1993	548,858	292,766	877,663	1,455,886	3,175,173	17.29%	9.22%	27.64%	45.85%	82.71%
1994	552,480	322,359	862,778	1,529,522	3,267,139	16.91%	9.87%	26.41%	46.82%	83.09%
1995	552,562	344,566	864,531	1,583,624	3,345,283	16.52%	10.30%	25.84%	47.34%	83.48%
1996	547,886	344,278	779,382	1,587,149	3,258,695	16.81%	10.56%	23.92%	48.71%	83.19%
1997	538,757	347,338	792,254	1,625,106	3,303,455	16.31%	10.51%	23.98%	49.19%	83.69%
1998	542,261	353,969	734,149	1,615,511	3,245,890	16.71%	10.91%	22.62%	49.77%	83.29%
1999	553,455	352,369	748,619	1,746,312	3,400,755	16.27%	10.36%	22.01%	51.35%	83.73%
2000	568,361	370,220	722,291	1,821,760	3,482,632	16.32%	10.63%	20.74%	52.31%	83.68%

Source: Maryland Health Care Commission (Data reported on inpatient utilization is from the Hospital Discharge Abstract Data Base for calendar years 1991-2000; data reported on ambulatory surgery cases is from the Hospital Ambulatory Surgery Data Base for calendar years 1991-2000; data reported on emergency department and outpatient clinic visits are from the HSCRC Financial Data Bases for fiscal years 1991-2000.)

Organization of Emergency Medical Services in Maryland

Under the direction of the Maryland Institute for Emergency Medical Services Systems (MIEMSS), the state is organized into five regions for planning and delivering emergency services. These regions are used to monitor hospital yellow and red alert frequency and duration. (Table 2 summarizes the geographic areas and Maryland hospitals included within each region.) Under MIEMSS, trauma and specialty referral centers have been designated to ensure that injured and critically ill patients are promptly sent to the most appropriate hospital. The R. Adams Cowley Shock Trauma Center at the University of Maryland Medical System serves as the Primary Adult Resource Center (PARC) for the State. Eight Maryland hospitals are categorized as Level I, II, or III Trauma Centers by MIEMSS based on physician availability and dedicated resources. In addition, MIEMSS designates Specialty Referral Centers in seven areas: (1) burn care; (2) eye trauma; (3) hand/upper extremity trauma; (4) hyperbaric medicine; (5) neurotrauma (head and spinal cord injuries); (6) pediatric trauma; and (7) perinatal referral centers. The Department of Health and Mental Hygiene has designated, as the State's regional

Table 2
Acute Care Hospitals by EMS Region, Number of Beds, and Trauma and Specialty Referral Center Designation: Maryland, 2001

EMS Region	Jurisdiction	Hospitals	Licensed Beds 07/01/01	Trauma Center Designation	Specialty Referral Center*
Region 1	Allegany County	Memorial Hosp of Cumberland	127	Level III	
		Sacred Heart Hospital	132		
	Garrett County	Garrett Co. Memorial Hospital	35		
Region II	Frederick County	Frederick Memorial Hospital	233		
	Washington Co	Washington County Hospital	234	Level II	
Region IIIa	Baltimore City	Bon Secours Hospital	157		
		Good Samaritan Hospital	204		
		Harbor Hospital	170		
		Johns Hopkins Bayview	311	Level II	1,7
		Johns Hopkins Hospital	927	Level I	2,6,7
		Maryland General Hospital	183		
		Mercy Medical Center	217		7
		Shock Trauma Center, UMMS	110	PARC	4,5
		Sinai Hospital of Baltimore	368	Level II	7
		St. Agnes Healthcare	281		7
		Union Memorial Hospital	250		3,7
		University of Maryland Hospital	519		7
	Baltimore County	Franklin Square Hospital	329		7
		GBMC	323		7
		Northwest Hospital Center	181		
		St. Joseph Medical Center	306		7
Region IIIb	Anne Arundel Co	Anne Arundel Medical Center	244		7
		North Arundel Hospital	230		
	Carroll County	Carroll County General Hosp	172		
	Harford County	Harford Memorial Hospital	99		
		Upper Chesapeake Medical Ctr	151		
	Howard County	Howard County General Hospital	179		7
Region IV	Cecil County	Union Hospital of Cecil	103		
	Dorchester County	Dorchester General Hospital	68		
	Kent County	Kent and Queen Anne's Hosp	49		
	Somerset County	McCready Memorial Hospital	13		
	Talbot County	Memorial Hospital at Easton	138		
	Wicomico County	Peninsula Regional Medical Ctr	317	Level III	
	Worcester County	Atlantic General Hospital	39		
Region Va	Montgomery Co	Holy Cross Hospital	344		7
		Montgomery General Hospital	142		
		Shady Grove Adventist Hosp	248		7
		Suburban Hospital	230	Level II	2
		Washington Adventist Hospital	338		
Region Vb	Prince George's Co	Doctors Community Hospital	175		
		Fort Washington Comm. Hosp	39		
		Laurel Regional Hospital	107		
		Prince George's Hosp Ctr	284	Level II	7
		Southern Maryland Hosp Ctr	204		
Region Vc	Calvert County	Calvert Memorial Hospital	92		
	Charles County	Civista Medical Center	98		
	St. Mary's County	St. Mary's Hospital	83		
Total			9,791		

Source: Maryland Health Care Commission (Data on licensed beds is from the Maryland Health Care Commission's *Annual Report on Licensed Acute Care Hospital Bed Capacity, Fiscal Year 2002*, Issued July 19, 2001; and data on Trauma and Specialty Center Designation is from MIEMSS, 2000-*2001 Annual Report*, page 21).

**Key to Specialty Referral Center Codes:* 1=Burn Care; 2=Eye Trauma; 3=Hand/Upper Extremity Trauma; 4=Hyperbaric Medicine; 5=Neurotrauma (Head and Spinal Cord Injuries); 6=Pediatric Trauma; 7=Perinatal Referral Centers

poison center, a division of the University of Maryland School of Pharmacy. The Maryland Poison Center provides emergency telephone poison information 24 hours a day to the general public and health professionals.

Hospital Emergency Department Utilization: 1990-2001

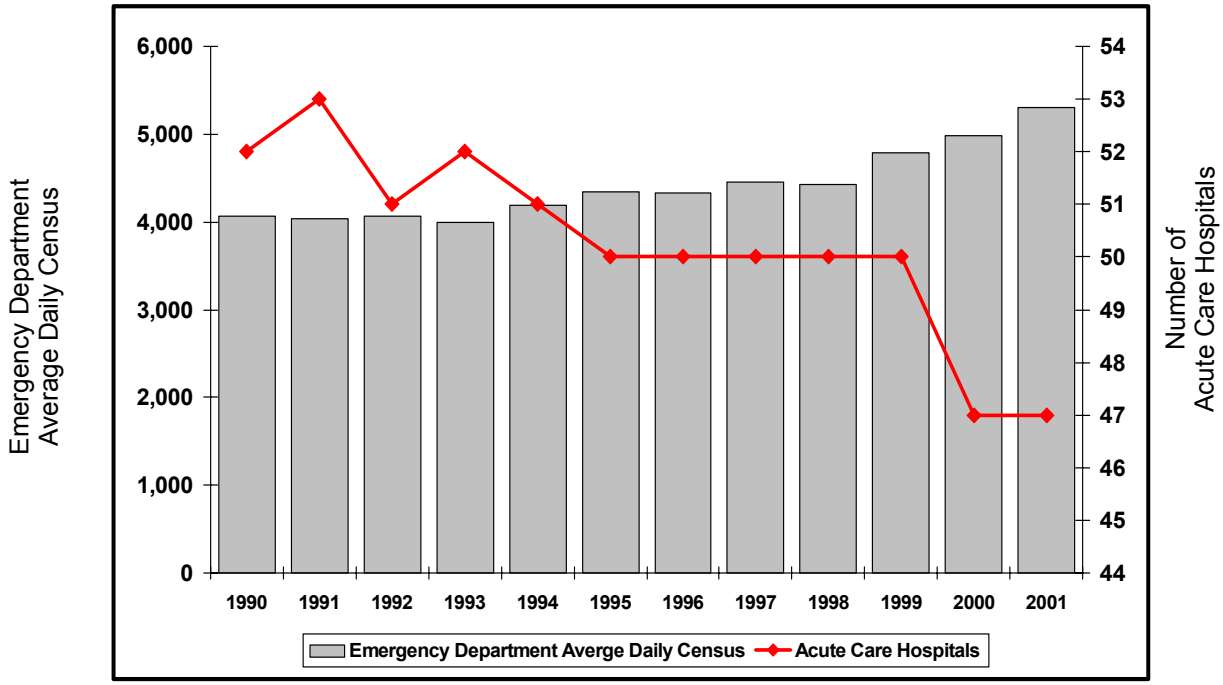
Maryland acute care hospitals reported 1.9 million visits to emergency departments during fiscal year 2001 (Refer to Table 3). Over the past twelve years (1990-2001), emergency department utilization increased by 454,000 visits or 30.6 percent. Maryland's total population increased by about 11.6 percent during this same time period. Although emergency department utilization was fairly stable during the early 1990's, that pattern changed between 1993 and 1995 when Maryland hospitals experienced annual increases in visits of 5.1 percent (1993-1994) and 3.5 percent (1994-1995). After another period of relative stability between 1996-1998, large increases in emergency department utilization have occurred during the most recent three years of available data. Between 1998-1999, emergency department utilization grew by 8.1 percent or 131,000 visits. Hospitals experienced an increase in emergency department visits of about 4.3 percent between 1999-2000. The number of emergency department visits increased by 6.3 percent or about 116,000 visits between fiscal years 2000-2001.

Table 3
Emergency Department Visits and Admissions Through the Emergency Department: Maryland, Fiscal Years 1990-2001

Fiscal Year	Admissions Through Emergency Department			Total Emergency Department Visits	
	Number	% Change	% of Total ED	Number	% Change
1990	247,890		16.71%	1,483,272	
1991	250,618	1.10%	16.98%	1,475,565	-0.52%
1992	264,675	5.61%	17.79%	1,487,712	0.82%
1993	261,641	-1.15%	17.97%	1,455,886	-2.14%
1994	276,267	5.59%	18.06%	1,529,522	5.06%
1995	281,720	1.97%	17.79%	1,583,624	3.54%
1996	282,235	0.18%	17.78%	1,587,149	0.22%
1997	284,048	0.64%	17.48%	1,625,106	2.39%
1998	296,249	4.30%	18.34%	1,615,511	-0.59%
1999	311,171	5.04%	17.82%	1,746,312	8.10%
2000	307,791	-1.09%	16.90%	1,821,760	4.32%
2001	335,136	8.88%	17.30%	1,937,268	6.34%
Change					
1990-2001	87,246	35.20%		453,996	30.61%
1990-1995	33,830	13.65%		100,353	6.77%
1996-2001	52,901	18.74%		350,119	22.06%

Source: Maryland Health Care Commission (Data reported is based on the HSCRC Financial Data Base, Fiscal Years 1990-2001)

Figure 3
Trends in Emergency Department Average Daily Census and Number of Acute Care Hospitals: Maryland, 1990-2001



Source: Maryland Health Care Commission

On an average daily basis, statewide emergency department volumes have increased from about 4,000 to 5,300 visits over the past decade (Refer to Figure 3). The total number of non-federal, acute care hospitals in Maryland declined from 52 to 47 over this same time period. Since 1990, six acute care hospitals have closed in Maryland. Four of those hospitals (North Charles Hospital, Liberty Medical Center, Children's Hospital, and Church Hospital) were located in Baltimore City.[3] The remaining two hospitals were located in Prince George's County (Leland Memorial Hospital) and Allegany County (Frostburg Community Hospital). In addition, one new hospital, Atlantic General Hospital located in Worcester County on the Eastern Shore, opened in 1993.

About 17 percent of emergency department visits (335,136) resulted in admission to the hospital in fiscal year 2001. Between 1990 and 2001, admissions for inpatient care through the emergency department ranged between 16.7 and 18.3 percent of total visits. There was a sharp increase in the number of admissions through the emergency department between fiscal years 2000-2001—from 307,791 to 335,136 (an increase of 8.9 percent).

[3] Children's Hospital, which closed in 1999, did not offer emergency department services.

There are substantial regional variations in emergency department utilization (Refer to Table 4). Analysis of regional trends in emergency department visits indicates that Western Maryland jurisdictions and the Central Maryland jurisdictions of Baltimore City and Baltimore County experienced either no growth or slower growth in overall volumes between fiscal years 1990 and 2001 when compared with the statewide average increase in utilization. In contrast, four regions experienced increases in emergency department utilization well above the statewide average. Between fiscal years 1990 and 2001, the six hospitals in Region IV of Central Maryland (Anne Arundel, Carroll, Harford, and Howard Counties) reported the highest growth in emergency department volumes—a 67 percent increase in visits (from 174,887 to 291,686). Large increases in emergency department caseloads also occurred in both the Eastern Shore and Southern Maryland regions of the state. On the Eastern Shore, the volume of emergency department visits increased by about 46 percent—from 118,885 to 174,048 between fiscal years 1990 and 2001. Over this same time period, hospitals in the Southern Maryland counties of Calvert, Charles, and St. Mary's reported a 54 percent increase in emergency department utilization—from 56,406 to 87,204 visits. In the metropolitan Washington region, Montgomery County hospitals reported a 39 percent increase (167,601 to 232,804) in emergency department visits. For Prince George's County, there was also a 39 percent increase (152,748 to 212,545) in visits made to hospital emergency department services between 1990 and 2001.

Table 4
Emergency Department Visits by EMS Region:
Maryland, Fiscal Years 1990 and 2001

EMS Region	Emergency Department Visits		Change, 1990-2001	
	1990	2001	Number	Percent
Western Maryland				
Region I	87,561	74,945	-12,616	-14.41%
Region II	91,494	118,786	27,292	29.83%
Sub-total	179,055	193,731	14,676	8.20%
Central Maryland				
Region IIIa	633,690	745,250	111,560	17.60%
Region IIIb	174,887	291,686	116,799	66.79%
Sub-total	808,577	1,036,936	228,359	28.24%
Eastern Shore				
Region IV	118,885	174,048	55,163	46.40%
Metropolitan Washington				
Region Va	167,601	232,804	65,203	38.90%
Region Vb	152,748	212,545	59,797	39.15%
Region Vc	56,406	87,204	30,798	54.60%
Sub-total	376,755	532,553	155,798	41.35%
TOTAL	**1,483,272**	**1,937,268**	**453,996**	**30.61%**

Source: Maryland Health Care Commission (Data reported is based on the HSCRC Financial Data Base, Fiscal Years 1990 and 2001; refer to Table 1 for jurisdictions included in each region.)

Fifteen of the 46 Maryland acute care hospitals with emergency department services had 50,000 or more visits during fiscal year 2001 (Refer to Table 5). Four (Johns Hopkins Hospital, Sinai Hospital of Baltimore, St. Agnes Hospital, and University of Maryland Hospital) of the 15 hospitals with 50,000 or more visits during fiscal year 2001 were located in Baltimore City; and three hospitals (Shady Grove Adventist Hospital, Prince George's Hospital Center, and Holy Cross Hospital) were located in the metropolitan Washington jurisdictions of Montgomery and Prince George's counties.

Ambulance Diversions: Red and Yellow Alert Patterns

To monitor and address ambulance diversions when hospital emergency departments are overcrowded, MIEMSS operates the County/Hospital Alert Tracking System (CHATS).[4] This system collects a uniform data set on the frequency and duration of yellow and red alerts for specific geographic areas.[5] Under this system, authorized persons, which include the emergency department director or designee, the emergency department administrator/manager or designee, or hospital administrator or designee, contact the Emergency Medical Resources Center (EMRC) at MIEMSS to request ambulance diversion. A yellow alert occurs when the emergency department requests that it receive absolutely no patients in need of urgent medical care via ambulance. Yellow alert is initiated because the emergency department is experiencing a temporary overwhelming overload such that Priority II and III patients may not be managed safely.[6] During a yellow alert period, ambulances are diverted to the next closet appropriate hospital for all but the most critically ill patients. A red alert occurs when a hospital has no inpatient ECG monitored beds available. These ECG monitored beds include all inpatient critical care areas as well as telemetry beds. Under guidelines developed in conjunction with the regional councils, hospitals are encouraged to declare a yellow alert status only for a limited period of time.

To monitor and manage ambulance diversion and hospital emergency department crowding, a Yellow Alert Task Force established by MIEMSS adopted a plan in December 1999. This voluntary plan, which was updated in August 2001, outlines steps to be taken by State agencies, local health departments, hospitals, nursing homes, and EMS providers during periods

[4] Data on the yellow and red alert status of individual hospitals in each region is posted continuously 24/7 on the MIEMSS website at www.miemss.umaryland.edu. For Region V, the website includes the following Washington, D.C. hospitals: Georgetown University Hospital; Greater Southeast Community Hospital; Hadley Memorial Hospital; Washington Hospital Center; Providence Hospital; and Sibley Memorial Hospital.

[5] MIEMSS also collects data on the frequency of hospital re-route. A hospital may be put on what is referred to as re-route status when a basic or advanced life support ambulance unit is held at a hospital emergency department because a bed is unavailable in a reasonable time frame.

[6] Under protocols established by MIEMSS for emergency medical service providers, patients are classified as follows: *Priority I*-critically ill or injured person requiring immediate attention; unstable patients with potentially life-threatening injury or illness; *Priority II*-less serious condition requiring emergency medical attention but not immediately endangering the patients life; *Priority III*-non-emergent condition requiring medical attention but not on an emergency basis; and *Priority IV*-does not require medical attention.

when emergency departments are overloaded (Refer to Appendix A-1). The plan defines two levels of crowding:

> *Regional EMS Overload*-when hospitals within a defined geographic area are on Yellow Alert status more than 35 percent of the total collective time, for a period determined by regional committees until total Yellow Alert time drops below 25 percent for a period determined by regional committees.
>
> *Extended Regional EMS Overload*-when hospitals within a defined geographic area are on Overload status for more than 30 days.

During the initial overload situation, the plan includes a number of steps to ease emergency department congestion, including public service announcements to encourage use of primary care providers for non-emergent care and scheduling non-emergent surgery at times of low incidence of ambulance bypass. For extended regional overloads, stronger steps are recommended in the plan, including temporary, centralized patient routing to maximize hospital resources, conversion of surgical recovery areas to critical care units, and cancellation of all elective and non-emergency surgery.

In fiscal year 1996, emergency department programs in the metropolitan Baltimore region reported a total of 7,525 hours (3.6 percent of total available hours) on yellow alert status (Refer to Figure 4).[7] There were about 31,600 yellow alert hours (16.4 percent of total available hours) in fiscal year 2001— a more than four fold increase when compared with the 1996 experience. Although there have been annual increases in yellow alert hours, the largest increases occurred between 1996-1997 and 1998-1999. While red alert hours were higher than yellow alert hours in fiscal year 1996, diversion due to the lack of critical care beds actually declined in 1997 and 1998 before increasing substantially between 1999-2001. Red alert hours reached 27,300 or about 14 percent of available hours for metropolitan Baltimore hospitals in fiscal year 2001.

While ambulance diversion used to occur in Maryland principally during the winter flu season, recent experience suggests that the need to divert ambulances to the next closest appropriate facility is now a more prevalent, year-round problem. Data for the most recent period (fiscal year 2001) show, for example, a high number of diversion hours for April and June (Refer to Appendix A-2). The diversion of ambulances to manage emergency department crowding is not unique to Maryland. Although a wide range of definitions and procedures are used across the nation, the increased incidence of ambulance diversion has been widely reported.[8] [9]

Analyses of Region III (Metropolitan Baltimore) trend data on the number of yellow and red alert hours over the past several years shows alarming increases in the number of hours that

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[7] The collection of data on red and yellow alerts for Regions I, II, and IV was initiated in September 2001. This analysis focuses on Region III (Metropolitan Baltimore Region) because of the availability of trend data.

[8] 60 Minutes II: No Vacancy, January 23, 2002; Shute, N and Marcus MB. "Code Blue: Crisis in the ER". *U.S. News and World Report*, September 10, 2001; and Orenstein, JB. "State of Emergency", *The Washington Post*, April 22, 2001.

[9] Yeh, CS. *ED Supply and Demand and Ambulance Diversion …Massachusetts Experience*. Presentation Before the Council on the Economic Impact of Health System Change, January 22, 2002.

hospital emergency departments are on bypass. While policies governing yellow and red alerts were developed several years ago and may need to be updated, the reported data is an important indicator of increasing pressure on available system capacity. The level of yellow alert status experienced in fiscal year 2001 for the Baltimore region is equivalent to having almost four fewer emergency departments available to receive patients transported via ambulance. In calendar year 2001, six of the 22 emergency departments in metropolitan Baltimore reported 300 or more yellow alert occurrences; four hospitals were on yellow alert status for 30 percent or more of available hours (Refer to Table 6). While data for red alerts shows fewer occurrences, four hospitals also reported red alert status for almost one-third of available hours. Data on yellow and red alert occurrences and hours raises important public policy issues and suggests the need for further analyses to understand the reasons underlying extended alert periods and the system impact on access to emergency services.

Table 6
Annual Alert Occurences and Percent of Available Annual Hours on Alert Status by Type: Maryland, Region III Hospitals, 2001

Region III Alert Occurrences/Hours	Number of Region III Hospitals (N=22)	
	Yellow Alert	Red Alert
Annual Number of Occurrences		
300 or More	6	0
200-299	4	1
100-199	9	4
50- 99	1	9
1- 49	2	8
% of Available Annual Hours on Alert Status		
30.0% or More	4	4
20.0%-29.9%	5	2
10.0%-19.9%	5	4
5.0%- 9.9%	5	7
.01%- 4.9%	3	5

Source: Maryland Institute of Emergency Medical Services Systems
(Data reported is from the County/Hospital Alert Tracking System for Region III, including Baltimore City and Anne Arundel, Baltimore, Carroll, Harford, and Howard Counties. The data includes 22 hospital emergency department services. Shock Trauma and Johns Hopkins Pediatric Emergency Department, which do not divert ambulances, are excluded.)

Table 5

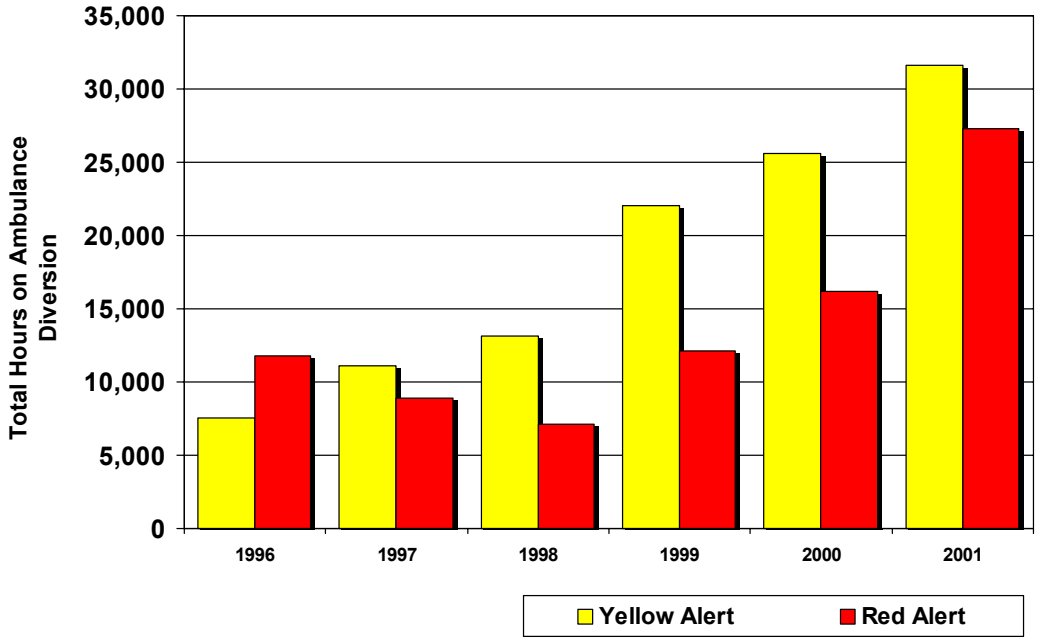
Emergency Department Visits by Hospital Ranked According to Volume:

Maryland, Fiscal Year 2001

Rank	Hospital	Location	Number of Visits
1	Johns Hopkins Hospital	Baltimore City	84,839
2	St. Agnes Healthcare	Baltimore City	75,645
3	North Arundel Hospital	Anne Arundel County	73,917
4	Shady Grove Adventist Hospital	Montgomery County	73,684
5	Franklin Square Hospital	Baltimore County	71,113
6	Sinai Hospital	Baltimore City	69,905
7	Washington County Hospital	Washington County	61,939
8	Peninsula Regional Medical Center	Wicomico County	57,981
9	Prince George's Hospital Center	Prince George's County	57,690
10	Holy Cross Hospital	Montgomery County	57,050
11	Frederick Memorial Hospital	Frederick County	56,847
12	Howard County General Hospital	Howard County	56,140
13	Anne Arundel Medical Center	Anne Arundel County	55,463
14	Greater Baltimore Medical Center	Baltimore County	51,758
15	University of Maryland Hospital	Baltimore City	51,502
16	Johns Hopkins Bayview Medical Center	Baltimore City	48,842
17	Southern Maryland Hospital Center	Prince George's County	48,469
18	Mercy Medical Center	Baltimore City	47,935
19	Northwest Hospital Center	Baltimore County	45,014
20	Union Memorial Hospital	Baltimore City	44,949
21	Doctors Community Hospital	Prince George's County	44,483
22	Carroll County General Hospital	Carroll County	39,419
23	Washington Adventist Hospital	Montgomery County	38,280
24	Upper Chesapeake Medical Center	Harford County	36,930
25	Suburban Hospital	Montgomery County	36,907
26	Laurel Regional Hospital	Prince George's County	36,834
27	Memorial Hospital at Easton	Talbot County	35,805
28	Good Samaritan Hospital	Baltimore City	35,733
29	St. Joseph Medical Center	Baltimore County	34,343
30	Memorial Hospital of Cumberland	Allegany County	34,028
31	Civista Medical Center	Charles County	33,088
32	Harbor Hospital	Baltimore City	31,837
33	Maryland General Hospital	Baltimore City	30,475
34	Harford Memorial Hospital	Harford County	29,817
35	St. Mary's Hospital	St. Mary's County	28,508
36	Union Hospital of Cecil	Cecil County	28,115
37	Montgomery General Hospital	Montgomery County	26,883
38	Calvert Memorial Hospital	Calvert County	25,608
39	Ft. Washington Medical Center	Prince George's County	25,069
40	Sacred Heart Hospital	Allegany County	22,388
41	Bon Secours Hospital	Baltimore City	21,360
42	Atlantic General Hospital	Worcester County	20,572
43	Garrett County Memorial Hospital	Garrett County	18,529
44	Dorchester General Hospital	Dorchester County	15,328
45	Kent & Queen Anne's Hospital	Kent County	10,501
46	McCready Memorial Hospital	Somerset County	5,746
	Maryland Total		**1,937,268**

Source: Maryland Health Care Commission (Data reported is based on the HSCRC Financial Data Base, Fiscal Year 2001)

Figure 4
Yellow and Red Alert Status Hours for Hospital Emergency Departments: Region III, Fiscal Years 1996-2001



Source: Maryland Health Care Commission (Data reported is from the Maryland Institute of Emergency Medical Services Systems for hospitals in Region III, including Baltimore City and the Counties of Anne Arundel, Baltimore, Carroll, Harford, and Howard.)

Characteristics of Emergency Department Patients

More than one-half of all hospitalized patients are seen in the emergency department prior to admission. In 2000, 55.2 percent of all inpatients were admitted to the hospital via the emergency department. As shown in Table 7, there are substantial differences in emergency department use by hospital service. While 62 percent of medical-surgical patients are admitted through the emergency department, about 73 percent of psychiatric patients are seen in the emergency department prior to hospitalization. In contrast, only 1.3 percent of obstetric deliveries are admitted through the emergency department.

The leading causes of hospitalization, classified by diagnosis-related group (DRG), for patients admitted through the emergency department are shown in Table 7. The 10 DRGs shown on Table 7 represented almost one-third of all patients admitted through the emergency department. Heart failure and shock, which accounted for slightly more than 5.3 percent of all admissions through the emergency department, were the primary reason for hospitalization. The second leading cause of hospitalization for patients admitted through the emergency department was psychoses. Other leading conditions important to admission through the emergency department were pneumonia, chest pain, cerebrovascular disorders, chronic obstructive pulmonary disease, digestive disorders, and blood infections or septicemia.

Analysis of data on the source of admissions through the emergency department indicates that the vast majority (86 percent) of admissions come from home. The other leading sources of admission through the emergency department were on-site hospital outpatient surgery services, nursing homes, and other health care facilities. Preliminary data from the Ambulatory Care Data Base for 2000 indicates that almost three quarters of emergency department visits were for children, adolescents, and adults up to age 44 years. About 10 percent of all patients using hospital emergency departments were 65 years of age or older.

Table 7
Discharges Admitted Through the Emergency Department
by Major Clinical Service: Maryland, 2000

Major Clinical Service	Discharges		Percent Admitted Thru ED
	Total	Admitted Thru ED	
Medical-Surgical	439,803	274,514	62.42%
Pediatric	23,070	14,073	61.00%
Obstetric			
-Delivery	65,176	813	1.25%
-Other	7,888	2,097	26.58%
Psychiatric	25,857	18,766	72.58%
Addictions	7,378	4,089	55.42%
TOTAL	569,172	314,352	55.23%
TOTAL (Ex. OB Deliveries)	503,996	313,539	62.21%

Source:Maryland Health Care Commission, Hospital Discharge Data Base, Calendar Year 2000.

Table 8

Top Ten Diagnosis-Related Groups for Admissions through the Emergency Department: Maryland, 2000

DRG	Description	Number of Discharges	Percent of Total Discharges
127	Heart Failure and Shock	16,637	5.32%
430	Psychoses	14,321	4.58%
089	Simple Pneumonia and Pleurisy, Age > 17 with complications and comorbidities	12,199	3.90%
143	Chest Pain	11,816	3.78%
014	Specific Cerebrovascular Disorders, Except Transient Ischemic Attack	8,845	2.83%
088	Chronic Obstructive Pulmonary Disease	8,467	2.71%
182	Esophagitis, Gastroenteritis and Miscellaneous Digestive Disorders, Age > 17 with complications and comorbidities	6,645	2.12%
174	GI Hemorrhage with complications and comorbidities	6,037	1.93%
296	Nutritional and Miscellaneous Metabolic Disorders, Age > 17 with complications and comorbidities	5,567	1.78%
416	Septicimia, Age > Greater than 17	5,498	1.76%
	Top Ten DRGs	96,032	30.70%
	All Other DRGs	216,757	69.30%
	TOTAL DISCHARGES	**312,789**	**100.00%**

Source: Health Services Cost Review Commission, Hospital Discharge Data Base, calendar year 2000.

How Maryland Compares with the Nation

The pattern of increasing emergency department utilization experienced in Maryland during recent years is consistent with national data. According to the American Hospital Association, the number of emergency room visits to U.S. hospitals increased by 19 percent between 1990 and 2000 (Refer to Table 9). Over this same time period, Maryland hospitals reported a 23 percent increase in emergency department visits.

Table 9
Emergency Department Visits and Annual Percent Change:
Maryland and United States, 1990-2001

	United States		Maryland	
Year	Emergency Department Visits	% Change	Emergency Department Visits	% Change
1990	86,692,503		1,483,272	
1991	88,533,073	2.12%	1,475,565	-0.52%
1992	90,768,575	2.53%	1,487,712	0.82%
1993	92,554,898	1.97%	1,455,886	-2.14%
1994	90,497,301	-2.22%	1,529,522	5.06%
1995	94,745,938	4.69%	1,583,624	3.54%
1996	93,111,592	-1.72%	1,587,149	0.22%
1997	92,819,892	-0.31%	1,625,106	2.39%
1998	94,771,405	2.10%	1,615,511	-0.59%
1999	99,484,462	4.97%	1,746,312	8.10%
2000	103,144,030	3.68%	1,821,760	4.32%
2001			1,937,268	6.34%
Change 1990-2000	16,451,527	18.98%	338,488	22.82%

Source: American Hospital Association, *Hospital Statistics*, 1990-2002
(Data reported refers to utilization of non-federal, short-term general community hospitals.);
HSCRC Financial Data Base, Fiscal Years 1990-2001.

There is considerable variation across the United States in the use of emergency room services. In 2000, emergency room use rates per 1,000 population ranged from a high of 567 in the West Virginia to a low of 221 in Hawaii. Analysis of overall use rates suggests that Maryland does not have an exceptionally high population-based use rate for emergency room services. Data reported to the American Hospital Association indicates that Maryland ranked 33rd among

all States and the District of Columbia. Maryland's use rate, 346 emergency department visits per 1,000 population, was slightly below the rate (374) for the United States as a whole in 2000. Data comparing use rates for emergency department services with proportion of persons without health insurance is included in Appendix A-5.

Table 10
Hospital Emergency Department Visits Per 1,000 Population by State (Ranked from Highest to Lowest): United States, 2000

State	ER Visits Per 1,000 Population, 2000	
	Number	Rank
Alabama	466	10
Alaska	296	47
Arizona	311	41
Arkansas	449	11
California	280	50
Colorado	330	37
Connecticut	399	21
Delaware	365	29
District of Columbia	562	2
Florida	400	19
Georgia	403	18
Hawaii	221	51
Idaho	326	39
Illinois	366	28
Indiana	376	24
Iowa	367	27
Kansas	344	35
Kentucky	497	6
Louisiana	509	5
Maine	534	3
Maryland	346	33
Massachusetts	435	13
Michigan	373	26
Minnesota	304	43
Mississippi	533	4
Missouri	422	15
Montana	310	42
Nebraska	303	44
Nevada	288	48
New Hampshire	424	14
New Jersey	345	34
New Mexico	298	45
New York	396	22
North Carolina	400	19
North Dakota	413	16
Ohio	445	12
Oklahoma	347	32
Oregon	297	46
Pennsylvania	395	23
Rhode Island	471	8
South Carolina	486	7
South Dakota	282	49
Tennessee	468	9
Texas	359	31
Utah	317	40
Vermont	375	25
Virginia	360	30
Washington	332	36
West Virginia	567	1
Wisconsin	330	37
Wyoming	408	17
United States	**374**	

Source: 2000 AHA Annual Survey. Copyright 2002 by Health Forum LLC, an affiliate of the AHA.

Table 11
Selected Characteristics of Emergency Department Patients: Maryland and United States, 1999

Characteristic	Percent of Total	
	United States	Maryland
Age Group		
Under 15 Years	21.3%	21.1%
15 - 44 Years	46.1%	51.4%
45 - 64 Years	17.4%	17.1%
65 Years and Over	15.3%	10.4%
Admitted to Hospital	12.9%	16.9%
Admitted to ICU/CCU	1.4%	NA

Source: McCaig LF, Burt CW. National Hospital Ambulatory Medical Care Survey: 1999 Emergency Department Summary. Advance data from vcital and health statistics; no. 320. Hyattsville, Maryland: National Center for Health Statistics. 2001; and Maryland Health Care Commission, Ambulatory Care Data Base, 1999.

Summary

Emergency department services are a major and growing component of the acute care hospital system in Maryland. Highlights of data analyzing State and national trends in emergency department utilization include the following:

- The importance of the emergency department in terms of the volume of patients served is part of the larger trend of substantial growth in outpatient services offered by acute care hospitals. In 2000, emergency department services accounted for 52 percent of the total patients served by Maryland acute care hospitals. In comparison, inpatient services represented about 16 percent of hospital caseloads.

- Maryland acute care hospitals reported 1.9 million visits to emergency departments during fiscal year 2001. Between 1990 and 2001, the emergency department utilization increased by 454,000 visits or 30.6 percent. Over this same time period, Maryland's total population increased by about 11.6 percent.

- The pattern of increasing emergency department utilization experienced in Maryland during recent years is consistent with national data. According to the American Hospital Association, the number of emergency room visits to U.S. hospitals increased by 19 percent between 1990 and 2000. Over this same time period, Maryland hospitals reported a 23 percent increase in emergency department use.

- About 17 percent of emergency department visits resulted in admission to the hospital in fiscal year 2001.

- Between fiscal years 1990 and 2001, the six hospitals in Region IIIb of Central Maryland (Anne Arundel, Carroll, Harford, and Howard Counties) reported the highest growth in emergency department volumes—a 67 percent increase in visits (from 174,887 to 291,686). Large increases in emergency department caseloads occurred in both the Eastern Shore and Southern Maryland regions of the state.

- Fifteen of the 46 Maryland acute care hospitals with emergency departments had 50,000 or more visits during fiscal year 2001. Four (Johns Hopkins Hospital, Sinai Hospital of Baltimore, St. Agnes Hospital, and University of Maryland Hospital) of the 15 hospitals with 50,000 or more visits during fiscal year 2001 were located in Baltimore City; and three hospitals (Shady Grove Adventist Hospital, Prince George's Hospital Center, and Holy Cross Hospital) were located in the metropolitan Washington jurisdictions of Montgomery and Prince George's counties.

- Analyses of trend data on the number of yellow and red alert hours over the past several years shows substantial increases in the number of hours that hospital emergency departments are on ambulance diversion. In the metropolitan Baltimore region, there was a more than four fold increase in yellow alert hours between fiscal years 1996-2001. Yellow alert hours accounted for 16.4 percent of available emergency department hours and red alert for 14.2 percent of available hours in fiscal year 2001.

- More than one-half of all hospitalized patients are seen in the emergency department prior to admission. In 2000, 55.2 percent of all admissions for inpatient care came through the hospital emergency department. For the psychiatric service, almost three-quarters (72.6 percent) of patients are admitted through the emergency department.

- Heart failure and shock, which accounted for slightly more than 5.3 percent of all admissions through the emergency department, were the primary reason for hospitalization. The second leading cause of hospitalization for patients admitted through the emergency department was psychoses. Other leading conditions important to admission through the emergency department were pneumonia, chest pain, cerebrovascular disorders, chronic obstructive pulmonary disease, digestive disorders, and blood infections or septicemia.

- There is considerable variation across the United States in the use of emergency room services. In 2000, emergency room use rates per 1,000 population ranged from a high of 567 in the West Virginia to a low of 221 in Hawaii. Data reported to the American Hospital Association indicates that Maryland ranked 33rd among all States and the District of Columbia. Maryland's use rate, 346 emergency department visits per 1,000 population, was slightly below the rate (374) for the United States as a whole in 2000.

III.
Factors Influencing Trends in Hospital Emergency Department Utilization

For many patients, the hospital emergency department is the initial point of entry to the health care system. Historically, hospital emergency departments have served multiple functions, including administering immediate, high tech lifesaving measures to patients suffering from trauma and illness; providing primary care during evenings, weekends, and holidays; and, serving as the caregiver of last resort for those who have nowhere else to go. In Maryland, and across the United States, recent growth in the utilization of emergency department services has increased the incidence of diversions (or Yellow Alerts) when ambulances are redirected from one hospital emergency department to another.

A large number of factors influence how hospital emergency department services are utilized and the frequency of diversions and crowding. These factors can be broadly categorized as follows: (1) increased demand for emergency department services; (2) changes in the management of emergency department patients; and, (3) hospital and community health care system capacity to address treatment and other needs following discharge from the emergency department. Finally, the evolving role of the emergency department as more care is provided on an outpatient basis must be considered. Taken together, these interrelated factors drive how hospital emergency departments are utilized.

Increased Demand for Emergency Department Services

Maryland's total statewide population increased by 11.6 percent between 1990 and 2001. Over this same time period, visits to hospital emergency departments grew by 30.6 percent. This data suggests that the overall growth in emergency department patient visits exceeds what would be expected solely from increased population and reflects, at least in part, changes in how consumers use emergency department services.

One of those changes concerns the response of managed care organizations to consumer demands for fewer restrictions on access to care. While HMO's sharply curtailed use of emergency department services in the early 1990's, this pattern has changed in response to consumer concerns about managed care combined with less rigid interpretations of what constitutes a medical emergency, particularly under recent prudent layperson laws. [10] The so-called "managed care backlash" has been well documented and has led plans to develop products offering more choice and flexibility designed to include rather than exclude providers.[11] [12] Recent trends in health plan enrollment data show substantial increases in less restrictive

[10] Brewster, LR, Rudell, LS, and Lesser, CS. *Emergency Room Diversions: A Symptom of Hospitals Under Stress*. Issue Brief Findings from the Center for Studying Health System Change, No. 38, May 2001.
[11] Blendon, RJ et al., "Understanding the Managed Care Backlash", *Health Affairs* (July-August 1998), Vol. 17:4, pp. 80-94.
[12] Draper, DA et al., "The Changing Face of Managed Care", *Health Affairs* (January-February 2002), Vol. 21:1, pp. 11-23.

preferred provider organizations (PPO) and point-of-service (POS) plans. [13] National trend data from the SMG Marketing Group also illustrates some of the recent changes that have occurred in the managed care industry, including fewer practice guidelines and less restrictive policies governing the use of brand name drugs.[14] [15] Several researchers have observed that one consequence of this move away from strong utilization controls has been the increased use of emergency department services by managed care enrollees. Because HMO market share in Maryland is high (45 percent of all insured) this policy shift may be a factor contributing to the recent patterns of increased emergency department use.[16]

Another factor contributing to increased use identified by the Joint Work Group concerns the use of emergency department services for non-emergent care. Data collected in the National Hospital Ambulatory Medical Care Survey for emergency department services in 1999 indicates that only 17 percent of visits were for emergent conditions.[17] In this national survey, emergent is defined as a visit for which the triage practitioner determines that the patient should receive care immediately (i.e., less than 15 minutes) to combat danger to life or limb, and where any delay would likely result in deterioration. Visits for urgent care, which is defined as requiring care within 15-60 minutes, accounted for 30 percent of all emergency department visits in 1999. Of the remaining visits, 17 percent were classified as semi-urgent (requiring care within 1-2 hours), 9 percent were classified as non-urgent (requiring care between 2 –24 hours), and 27 percent were unknown.

To further examine how emergency department services are used, researchers in New York have developed a classification scheme using four categories: (1) non-emergent; (2) emergent/primary care treatable; (3) emergent/ED care needed, but preventable/avoidable; and (4) emergent/ED care needed, not preventable/avoidable.[18] (Refer to Figure 5) Analysis of emergency department utilization by adults age 18-64 years in 1998 for New York hospitals based on this classification algorithm indicates that the overwhelming majority of patients had conditions that were non-emergent (41.7 percent) or emergent/primary care treatable (32.4 percent). This study indicated that 18.8 percent of patients using emergency department services had conditions requiring emergency care that were not preventable or avoidable.

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[13] Heffler, S. et al. "Health Spending Growth Up in 1999; Faster Growth Expected in the Future", *Health Affairs* (March-April 2001), Vol. 20:2, pp. 193-203.

[14] Aventis Pharmaceuticals, *HMO-PPO/Medicare-Medicaid Digest 2000*, pages 35 and 45.

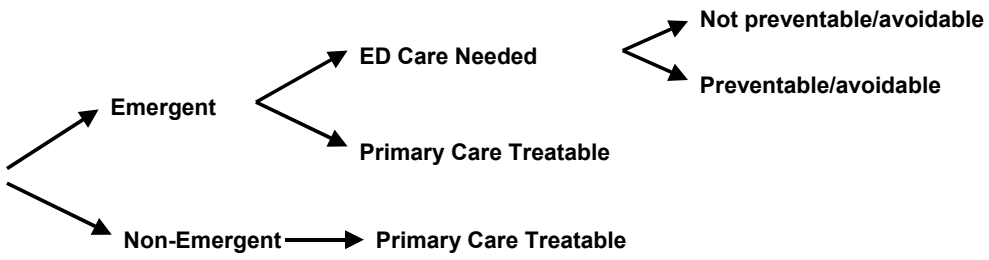
[15] Hoechst Marion Roussel, Inc., Managed Care Digest Series, *HMO-PPO Digest 1996*, page 43.

[16] Maryland Health Care Commission, Analysis and Data Systems Division, *Spotlight on Maryland*, "HMO Enrollment", February 2001. In 1999, the market share for HMOs by type of insurer was as follows: privately insured, 49 percent; Medicaid, 86 percent; and, Medicare, 13 percent. The proportion of Maryland residents enrolled in an HMO by region for 1999 was as follows: National Capital Area, 46 percent; Baltimore Metropolitan Area, 47 percent; Eastern Shore, 47 percent; Southern Maryland, 34 percent; and Western Maryland, 41 percent.

[17] McCaig LF, Burt CW. National Hospital Ambulatory Medical Care Survey: 1999 Emergency Department Summary. *Advance Data from Vital and Health Statistics*. No. 320. National Center for Health Statistics, June 25, 2001.

[18] Billings, J et al. Emergency Department Use: The New York Story. *The Commonwealth Fund Issue Brief*. November 2000, p. 2.

Figure 5
Emergency Department
Classification Process



Source: Billings, J et al. Emergency Department Use: The New York Story. *Issue Brief: The Commonwealth Fund*, November 2000, p.2.

While managed care organizations may have eased restrictions on using emergency department services, the increase in managed care enrollment has at the same time increased use of primary care physicians and other clinicians. As a consequence, patients may be increasingly turning to the hospital emergency department when they need urgent care and cannot schedule a timely appointment with their own primary care physician. Anecdotal information suggests that the recent trend of peak yellow alert occurrences on Mondays and Tuesdays may in part reflect patients who are ill over the weekend and then unable to obtain an appointment with their physician when the office opens Monday morning. This trend increases the number of patients self-referring to the emergency department for urgent care services. Busy primary care physicians also may be referring patients to the emergency department when appointments are not readily available. Further analyses of the Maryland emergency department data set are required to more fully understand the reasons underlying the use of the emergency department for non-urgent conditions.

A related development that has also impacted emergency departments concerns the decline in physician risk sharing arrangements. In recent years, a number of large physician groups entered into risk sharing arrangements with insurers where the physician group was responsible for all of the care for a particular insured population. The physician group, in these cases, had the incentive to open urgent care clinics to treat patients with weekend and evening hours. Most of these risk-sharing arrangements proved unsuccessful and many of these urgent care clinics have closed thus increasing reliance on the emergency department for care.

Other factors influencing the use of hospital emergency departments concern the policies of the Medicaid program, particularly the 48-hour rule of the Health Choice program. Under this rule, Health Choice managed care organizations require all patients to make an appointment 48

hours in advance for urgent care. For patients with urgent care needs, this rule may contribute to increasing use of the emergency department.

Access to primary care physicians is another factor identified by the Joint Work Group that potentially contributes to the increase in emergency department visits for non-urgent care. According to the Institute of Medicine, *primary care* is the provision of integrated, accessible health care services by clinicians who are accountable for addressing a large majority of personal health care needs, developing a sustained partnership with patients, and practicing in the context of family and community.[19] Many of the reasons that patients cite for using the emergency department for non-urgent care relate to access to care issues, both financial and non-financial, including lack of health insurance, clinic services not being available at night, not being able to leave work, not being able to get an appointment soon enough, and the convenience of emergency department care.[20] While having a regular source of primary care may not entirely eliminate hospital emergency department use, available research suggests that it is associated with more appropriate utilization of the emergency department.[21]

In an effort to study models that decrease hospital emergency department utilization by the uninsured, the Maryland Health Care Foundation recently funded two programs that link emergency department users to a primary care physician.[22] The *Reverse Referrals* program links uninsured individuals using the emergency department at Johns Hopkins Bayview Medical Center with primary care providers at the Baltimore Medical System. At the Western Maryland Health System, the *WellCheck Prevention* program was funded by the Maryland Health Care Foundation to provide preventive health care services, identify high risk individuals and link them to health and human services, including health education, and decrease preventable hospital emergency room visits and admissions. The program services are delivered through Western Maryland Health System's established community clinics in Allegany and Garrett counties.

Although only a small proportion of emergency department visits result in admission for inpatient care, more than one-half of all inpatient discharges from Maryland hospitals entered through the emergency department. As the major doorway to the hospital, the emergency department is a key service in maintaining a viable inpatient base. In an increasingly competitive health care market, this factor in and of itself may create conflicting incentives for hospitals. On the one hand, a busy emergency department is desirable from the standpoint of ensuring that inpatient services are well used. The recent trend toward advertising emergency department services, particularly pediatric emergency care and "fast track" urgent care suggests that hospitals are taking steps to encourage utilization of this service.[23] [24] On the other hand,

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[19] Donaldson, MS, et al. *Primary Care: America's Health in a New Era*, Committee on the Future of Primary Care, Institute of Medicine, National Academy Press, 1996, p. 31.
[20] Weinick, R, Billings, J. and Burstin, H. *What is the role of primary care in emergency department overcrowding?*, Paper presented at the Conference Sponsored by the Council on Economic Impact of Health System Change on Overcrowded Emergency Rooms: Do We Need More Capacity or Fewer Patients?, January 22, 2002.
[21] Grumbach, K, Dean D, and Bindman, A. Primary Care and Public Emergency Department Overcrowding. *American Journal of Public Health*. March 1993, Volume 83:3, p. 372-378.
[22] Maryland Health Care Foundation, *Foundations for Health*, Issues Spotlight: Is The Hospital Emergency Department Your Primary Care Provider?, Winter 2001, Volume 1, No. 1, p. 2.
[23] Page, L. Marketing the Emergency Department. *American Medical News*, September 4, 2000, http://www.ama-assn.org/sci-pubs/amnews

emergency department congestion can produce unacceptable strains on available resources. From a public policy perspective, it is important to address these competing interests to ensure that the system functions to meet emergent as well as non-urgent care needs.

Changes in the Management of Emergency Department Patients

Another factor considered by the Joint Work Group concerns changes in the management of patient care that increase the amount of time patients spend in the emergency department. Factors in this category include Federal requirements for providing emergency care under the Emergency Medical Treatment and Labor Act (EMTALA), the shortage of on-call specialists to provide needed consultations, and the trend toward intensive care and observation in the emergency department to avoid an inpatient admission.

Congress enacted the Emergency Medical Treatment and Labor Act (EMTALA) in 1986 as part of the Consolidated Omnibus Budget Reconciliation Act (COBRA) of 1985. The law is designed to prevent hospitals from refusing to treat patients and requires that emergency care be provided to anyone who needs it, regardless of their ability to pay or insurance status. Under EMTALA, hospitals with emergency departments that participate in the Medicare program have two basic obligations. First, they must provide an individual who comes to the emergency department a medical screening examination to determine whether an emergency medical condition exists. Second, where an emergency medical condition exists, the hospital must either provide treatment until the patient is stabilized, or if it does not have the capability, transfer the patient to another hospital.[25]

While EMTALA was enacted into law more than a decade ago, implementation of this law has evolved over a fairly long time period because of delays in issuing final regulations and growing concerns about the impact of managed care on access to emergency department services.[26] In May 1998, the Centers for Medicare and Medicaid Services (CMS) issued Interpretive Guidelines that provide policy guidance on several issues, including what is a medical screening exam, what it means to stabilize a patient, and the requirement to maintain an on-call physician roster. In November 1999, CMS and the Office of the Inspector General jointly issued a Special Advisory Bulletin that focused on the application of EMTALA provisions for individuals insured by managed care plans. The bulletin notes that it is inappropriate for a hospital to seek, or direct a patient to seek, authorization to provide screening or stabilizing services from the individual's health plan until after the hospital has provided a screening examination and initiated stabilizing treatment for an emergency medical condition. In addition, the bulletin advises against informing patients that they would be responsible for paying for care if their health plan does not provide payment, or otherwise attempting to obtain payment for services, before the patient is stabilized.[27] Recent efforts to more strictly enforce EMTALA

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[24] Voelker, R. Emergency Departments Open New Doors to Technology, Patient Service, *JAMA Medical News and Perspectives*, Vol. 28 No.8, August 25, 1999, http://jama.ama-assn.org/issues/v282n8

[25] EMTALA Fact Sheet, American College of Emergency Physicians, June 2000.

[26] Department of Health and Human Services, Office of Inspector General, *The Emergency Medical Treatment and Labor Act: The Enforcement Process*, January 2001 (OEI-09-98-00221), page 9.

[27] United States General Accounting Office, *Emergency Care: EMTALA Implementation and Enforcement Issues*, June 2001 (GAO-01-747), p. 5.

requirements may contribute to crowding by increasing the length of time patients spend in the emergency department as well as encouraging physicians to refer and patients to self-refer to emergency department services.[28]

Problems with the availability of on-call specialists to provide a consultation is another factor that contributes to longer stays and crowding in the emergency department.[29] Consultations by specialists are frequently required to treat patients in the emergency department or subsequently admit to the hospital. Delays in specialists making themselves available for emergency department coverage stem from several factors, including lack of payment by uninsured patients, managed care policies, technological advances that have enabled more physicians to operate in their offices making them less reliant on hospital privileges, and EMTALA rules governing transfers of patients.[30]

Changes in the way health care services are delivered have also had an impact on the operation of the emergency department. Many of the conditions that once resulted in admission to the hospital now are treated and released following intensive therapy and observation in the emergency department. Examples of this practice include: the patient with asthma who instead of being admitted to the hospital after an hour in the emergency department undergoes treatment and observation for 6-8 hours before being discharged to home; the patient with a concussion who is discharged following extensive diagnostic studies, including a CT scan and laboratory tests; and patients with certain infections who received intravenous antibiotics in the emergency department and are discharged home after an observation period.[31]

Hospital and Community Health System Capacity

Another factor that must be examined to understand the underlying causes of emergency department crowding is the timely availability of resources to care for patients requiring further treatment. Discussions with Maryland hospital staff suggest that delays in the ability to transfer patients from the emergency department to appropriate inpatient units within the hospital are a significant factor contributing to congestion. When this occurs, patients must be held in the emergency department, thus occupying resources that otherwise would be available to treat incoming patients.

Historically, the number of licensed beds, as reported on the license application processed by the Office of Health Care Quality in the Department of Health and Mental Hygiene, has measured the capacity of the acute care hospital system. Licensed capacity includes beds that are staffed and available for inpatient care as well as beds that are not staffed and available for inpatient care. Beds that are not available for patient care include beds that have been temporarily converted to an alternate use and beds that have been permanently taken out of

[28] Shactman, D. and Altman, SH. *Utilization and Overcrowding of Hospital Emergency Departments*, Council on the Economic Impact of Health System Change, January 2002, p. 14.
[29] Johnson, LA, Taylor TB, Lev R. The Emergency Department On-Call Backup Crisis: Finding Remedies for a Serious Public Health Problem. *Annals of Emergency Medicine*. May 2001, 37:5, p. 495-499.
[30] Advisory Board Daily Briefing, *ED Round-up: Phoenix EDs face shortage of on-call specialists*. June 5, 2001.
[31] Derlet, RW and Richards, JR. Overcrowding in the Nation's Emergency Departments: Complex Causes and Disturbing Effects. *Annals of Emergency Medicine*. January 2000, 35:1, p. 65.

service (i.e., space would require renovation to return to patient care) yet still remain on the hospital's license. One consequence of the substantial declines in hospital utilization that occurred over the past two decades was the fact that reported licensed capacity for most hospitals no longer reflected actual staffed bed capacity. As a result, in practice the definition of licensed beds reflected the number of beds the hospital would be entitled to operate rather than actual, staffed beds.

To address the discrepancy between licensed and staffed/available beds, a new licensing scheme for acute general hospital beds in Maryland was implemented in October 2000. Mandated by Health-General Article §19-307.2, this new approach established a baseline for the licensed capacity of each acute care hospital reflecting actual utilization and provided added flexibility in allocating beds by major clinical service. Under this new system, the Department of Health and Mental Hygiene annually calculates the average daily census of each hospital for a 12-month reporting period based on the number of patient days report to the Health Services Cost Review Commission. Licensed bed capacity is established at 140 percent of the hospital's total average daily census. This level of utilization is equivalent to an overall occupancy of 70 percent. Hospitals can request a temporary adjustment to their licensed bed capacity whenever and as often as needed to respond to peak census demands in excess of their licensed capacity.

While implementation of the new licensing law in October 2000 reduced the number of licensed beds from 12,328 to 9,562 (an overall reduction of about 23 percent), true capacity was largely unaffected.[32] This occurred because of the large number of "paper beds" reflected on hospital licenses. Although data on the precise number of staffed versus unstaffed beds was not collected in implementing the new licensure process, a previous survey conducted by the Maryland Hospital Association provides a valuable proxy. The Maryland Hospital Association conducted a survey in October-November 1995 to determine the number of staffed versus unstaffed acute care beds. Data from this survey indicated that 23 percent of reported licensed acute care hospital beds in Maryland were unstaffed.[33] The proportion of unstaffed beds, based on this survey, ranged from about 11 percent of licensed capacity in Western Maryland to 34 percent on the Eastern Shore.

Given reported problems with bed availability as a significant factor in emergency department crowding, it is important to consider whether adjustments should be made to the current method of determining licensed bed capacity. Of the 47 acute care hospitals, 15 requested temporary licensed bed adjustments at some time between November 2000-March 2001. The 15 hospitals were small and medium sized hospitals, ranging in size from 13 to 299 beds. Four of the hospitals had less than 50 beds, four were between 50 and 100 beds, three were 100-150 beds, one was between 150-200 beds and three were over 200 beds. Table 12 summarizes the hospitals requesting temporary adjustments in their bed capacity and the number of days over licensed capacity requested by each hospital. About one-half of the hospitals requesting

[32] Maryland Health Care Commission, *Report on the Implementation of Acute Care Hospital Licensure Regulations: Fact Sheet*, October 25, 2000. (Note: The statewide total increased automatically by 7 beds from 9,555 to 9,562 with the completion of the replacement of Fallston General Hospital (calculated licensed bed capacity of 113) with Upper Chesapeake Medical Center (authorized bed capacity of 120 beds).

[33] Maryland Health Resources Planning Commission, Projected (Year 2000) Maryland Acute Care Bed Need, November 21, 1995, p. 2.

temporary increases in licensed beds reported needing those additional beds for fewer than 10 days. The number of additional beds requested in the temporary adjustments ranged from 1 to a high of 21 per hospital on any given day over the November 2000-March 2001 period. While analyses of requests for temporary adjustments in licensed beds during the first year of the new licensing system suggest that overall the system is functioning well, caution should be used in interpreting this data. It is possible, for example, that the number of additional beds specified may not have been needed for the entire time period requested. On the other hand, because this is a new system, some hospitals may not have reported all instances where total licensed beds were exceeded to meet increased demand. Moreover, it is important to recognize that the requests for temporary adjustments occur at the total facility level and do not reflect instances where hospitals may have had to increase beds to accommodate peak utilization in one clinical unit but could accommodate by using beds in another service.

Table 12
Hospitals Requesting Temporary Adjustments to Licensed Bed Capacity: Maryland, November 2000-March 2001

Hospital	Licensed Bed Capacity (10/2000)	Total Days Over Licensed Bed Capacity	Minimum and Maximum Beds Over Capacity
Memorial Hospital at Easton	130	90	1 - 21
Washington County Health System	223	76	1 - 21
Kent & Queen Anne's Hospital	45	27	2 - 16
Dorchester General Hospital, Inc.	65	23	1 - 10
Upper Chesapeake Medical Center	120	22	3 - 18
Edward W. McCready Memorial Hospital	13	21	1 - 5
St. Mary's Hospital	84	19	1 - 11
Atlantic General Hospital	37	8	1 - 6
Maryland General Hospital	154	8	1 - 12
Garrett County Memorial Hospital	35	5	1 - 4
Calvert Memorial Hospital	88	5	1 - 7
Civista Medical Center, Inc.	97	5	1 - 3
Sacred Heart Hospital	145	5	1 - 2
Anne Arundel Medical Center	237	4	1 - 5
Franklin Square Hospital	299	1	2

Source: Health Services Cost Review Commission, Days/Beds Over Capacity Monthly Report for Acute Care Hospitals, November 2000-March 2001.

There are several factors that may contribute to increasing pressure on hospital capacity. First, the current nursing shortage may limit the number of licensed beds that hospitals are able to staff and operate. The Maryland Hospital Association recently characterized current nurse vacancy rates as the most severe shortage experienced by Maryland hospitals in more than a decade.[34] According to the annual Hospital Personnel Survey conducted by the Maryland Hospital Association, the vacancy rate for registered nurses in Maryland hospitals was 14.7 percent during the first quarter of 2000. By comparison, vacancy rates for registered nurses ranged between 3.3-5.5 percent between 1995-1997. Factors responsible for constraining the supply of nurses, including decreased job satisfaction, expanded career opportunities, and a shrinking pool of new nurses to replace those retiring, are likely to persist and may worsen in the future.[35] As a consequence, nursing staff shortages can be expected to have a continuing impact on hospital operations, including the ability to operate a full complement of licensed beds.

[34] MHA: The Association of Maryland Hospitals and Health Systems, *The Nursing Shortage Dilemma*, Presentation Before the Health Services Cost Review Commission, September 6, 2000.
[35] Scanlon, WJ. *Nursing Workforce: Recruitment and Retention of Nurses and Nurse Aides Is a Growing Concern*, Testimony Before the Committee on Health, Education, Labor, and Pensions, U.S. Senate, May 17, 2001 (GAO-01-75OT), p.2.

A second factor that increases pressure on available beds concerns seasonal variations in hospital utilization patterns. Table 13 displays the minimum, maximum, and average daily patient census by month for major hospital services. For medical-surgical services, utilization predictably peaks during the winter months of January-February. On the peak census day in January 2000, statewide occupancy based on licensed beds was 93.3 percent. (The average occupancy for the month of January 2000 was 84.8 percent.) By comparison, the lowest patient census generally occurs during the summer months or December. In December, at the lowest point during 2000, occupancy was 60.0 percent based on licensed beds. These statewide variations would clearly be magnified in smaller hospitals and in clinical services with smaller numbers of beds.

Problems with the availability of critical care beds, for example, are often cited as a significant factor that contributes to emergency department crowding and ambulance diversion. In fiscal year 2002, critical care represented only about 12 percent of acute care capacity or 1,137 beds (Refer to Appendix A-4). The average size of critical care units in Maryland hospitals is 26 beds.

The impact of the way beds are used on patient census at peak hours of operation is a third factor that may increase pressure on hospital system capacity. As length of stay has declined and outpatient services have increased it is not uncommon for patients to be admitted for up to 23 hour stays that occupy resources but may not necessarily be counted in the patient census. A related issue concerns how to count patients who experience extremely long lengths of stay in the emergency department and may eventually be discharged before being admitted. Data analyzed for Massachusetts found that census as measured by total patients/staffed beds at midday differs tremendously from census measured in the traditional manner (registered patients/licensed beds at midnight). In one Massachusetts region, the occupancy measured at noon exceeded 96 percent compared with an occupancy of 77 percent when measured at midnight.[36]

Finally, the capacity of the community health care system to provide needed services also has an impact on the ability of hospitals to discharge patients. Discussions with hospital staff suggest that this problem particularly impacts vulnerable populations with serious and chronic illnesses, such as psychiatric patients. For chronically ill psychiatric patients, the downsizing of the State hospital system, changes in reimbursement for psychiatric care, and public policy directives to treat people in the least restrictive setting possible have contributed to increasing pressure on acute care hospitals. The referral and disposition of psychiatric patients can be particularly difficult given legal, treatment, and insurance issues.[37] To help address this issue, the Maryland chapter of the American College of Emergency Physicians (ACEP) has established a workgroup to study emergency placement for psychiatric patients. This workgroup is partnering with MIEMSS to develop a system for tracking the availability of psychiatric beds on a statewide basis.

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[36] McManus, M. Emergency Department Overcrowding in Massachusetts: Making Room in Our Hospitals. *Issue Brief: The Massachusetts Health Policy Forum.*

[37] American College of Emergency Physicians, Psychiatric Patients in the Emergency Department: Rule Out Organic and Then What? www.acep.org.

Table 13
Minimum, Maximum and Average Daily Patient Census by Month and Major Clinical Service: Maryland Acute Care Hospitals, 2000

Major Clinical Service/PatientCensus	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Medical/Surgical												
(Licensed Beds=7,484)												
Minimum	5,551	5,612	5,154	4,998	5,032	5,070	4,980	5,114	4,994	5,293	4,957	4,491
Maximum	6,981	6,534	6,242	6,056	6,135	5,988	5,967	5,928	6,097	6,263	6,317	6,164
Average	6,349	6,176	5,802	5,626	5,672	5,589	5,468	5,577	5,615	5,769	5,723	5,585
Obstetrics												
(Licensed Beds=898)												
Minimum	399	392	399	394	418	427	432	416	421	401	418	292
Maximum	608	625	636	598	634	653	686	653	647	665	630	664
Average	517	532	536	515	526	556	543	541	553	537	533	521
Pediatrics												
(Licensed Beds=488)												
Minimum	169	187	162	154	160	146	139	146	144	175	159	143
Maximum	263	249	235	231	228	214	195	209	236	229	243	239
Average	226	216	201	196	198	173	171	172	190	204	203	199
Psychiatric												
(Licensed Beds=692)												
Minimum	378	381	462	422	413	404	418	422	437	447	412	369
Maximum	508	534	531	520	522	509	502	527	527	526	543	506
Average	446	467	491	462	455	462	459	459	473	483	470	446
ALL SERVICES												
(Licensed Beds=9,562)												
Minimum	6,611	6,814	6,318	6,083	6,142	6,179	6,060	6,181	6,119	6,475	6,012	5,372
Maximum	8,260	7,804	7,535	7,325	7,373	7,268	7,268	7,202	7,365	7,560	7,590	7,423
Average	7,538	7,390	7,031	6,799	6,850	6,779	6,641	6,749	6,831	6,994	6,929	6,752

Source: Maryland Health Care Commission, Division of Data Systems and Analysis (Data reported is based on the Hospital Discharge Abstract Data Base for calendar year 2000.)

The Evolving Role of the Hospital Emergency Department

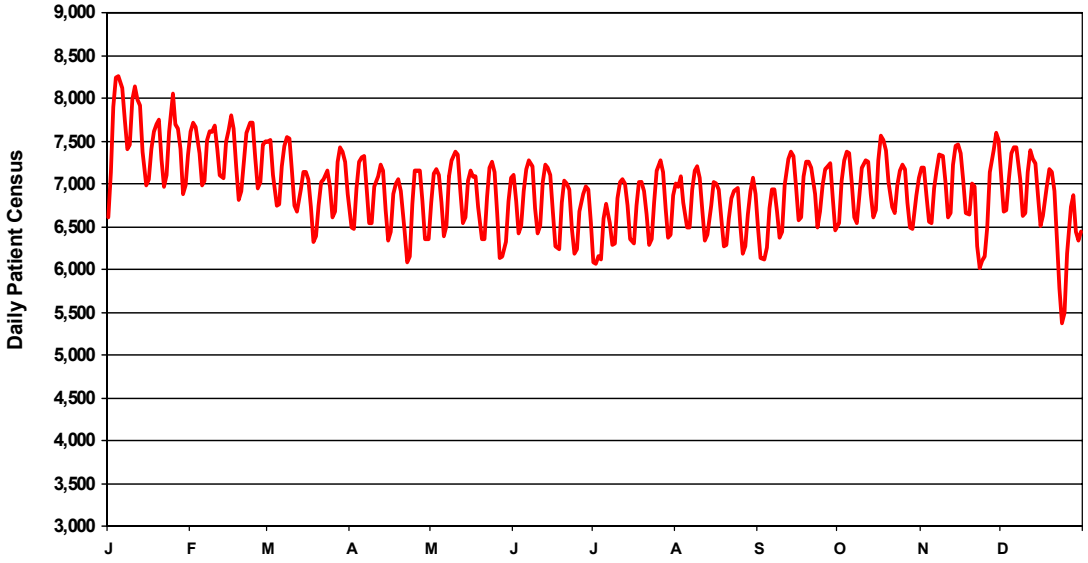
In many ways, the emergency department is at the center of the tremendous changes that have occurred in the health care delivery system over the past two decades. While inpatient services have historically defined acute care hospitals, today's hospital is increasingly defined by services provided on an outpatient basis. At the same time, services that continue to be provided on an inpatient basis are more complex and resource intensive.

The aging of the population has been well documented. Due in large part to the aging of the baby boom generation (i.e., those born between 1946 and 1964), a larger proportion of the total population will be 65 and older during future decades. In 1900, persons 65 and older accounted for 4.1 percent of the U.S. population. By 2040, it is estimated that the 65 and over population in the U.S. will be 20.3 percent of the total population. Similarly, in Maryland, about 11 percent of the population in 2000 was 65 years or older. The older population is expected to rise to 16 percent of Maryland's total population in 2020. A recent Institute of Medicine report noted that these demographic changes have important implications for the organization of the health care delivery system that have not yet been addressed in any serious way. One consequence of the aging of the population, as noted by the Institute of Medicine, is an increase in the incidence and prevalence of chronic conditions.[38]

This demographic shift combined with continuing advances in medical treatment that will move more services to an outpatient setting may increase pressure on hospital emergency departments to provide non-urgent care in the future. Given these factors, there is a clear need to have a better understanding of the relationship between emergency department volumes and optimal inpatient bed capacity. Another important policy issue that requires analysis concerns the potential role of freestanding emergency centers and urgent care centers in providing care to persons not requiring emergent treatment.

[38] Institute of Medicine, *Crossing the Quality Chasm*, Committee on Quality of Health Care in America, National Academy Press, 2001, p.28.

Figure 6
Daily Patient Census for All Services (Excluding Newborns):
Maryland Acute Care Hospitals, 2000



Source: Maryland Health Care Commission, Division of Data Systems and Analysis (Data reported Is based on the Hospital Discharge Abstract Data Base for calendar year 2000.)

Summary

In summary, a large number of interrelated factors influence how hospital emergency department services are utilized and the frequency of diversions and crowding. These factors can be broadly categorized as follows: (1) increased demand for emergency department services; (2) changes in the management of emergency department patients; and, (3) the availability of needed services, both within the hospital and the community health care system, to address treatment and other needs following discharge from the emergency department. The factors identified by the Joint Work Group within each category include:

Increased Demand for Emergency Department Services

- While HMO's sharply curtailed use of emergency department services in the early 1990's, this pattern has changed in response to consumer concerns about managed care combined with less rigid interpretations of what constitutes a medical emergency, particularly under recent prudent layperson laws. One consequence of this move away from strong utilization controls has been the increased use of emergency department services by managed care enrollees.

- Although managed care organizations may have eased restrictions on using emergency department services, the increase in managed care enrollment has at the same time increased use of primary care physicians and other clinicians. As a consequence, patients may be increasingly turning to the hospital emergency department when they need urgent care and cannot schedule a timely appointment with their own primary care physician. Busy primary care physicians also may be referring patients to the emergency department when appointments are not readily available.

- Many of the reasons that patients cite for using the emergency department for non-urgent care relate to access to care issues, both financial and non-financial, including lack of health insurance, clinic services not being available at night, not being able to leave work, not being able to get an appointment soon enough, and the convenience of emergency department care. While having a regular source of primary care may not entirely eliminate hospital emergency department use, available research suggests that it is associated with more appropriate utilization of the emergency department. Further analyses of the Maryland emergency department data set are required to more fully understand the reasons underlying the use of the emergency department for non-urgent conditions.

- Although only a small proportion of emergency department visits result in admission for inpatient care, more than one-half of all inpatient discharges from Maryland hospitals entered through the emergency department. As the major doorway to the hospital, the emergency department is a key service in maintaining a viable inpatient base. In an increasingly competitive health care market, this factor in and of itself may create conflicting incentives for hospitals.

Changes in the Management of Emergency Department Patients

- Recent efforts to more strictly enforce EMTALA requirements may contribute to crowding by increasing the length of time patients spend in the emergency department as well as encouraging physicians to refer and patients to self-refer to emergency department services.

- Problems with the availability of on-call specialists to provide a consultation is another factor that contributes to longer stays and crowding in the emergency department. Delays in specialists making themselves available for emergency department coverage stem from several factors, including lack of payment by uninsured patients, managed care policies, technological advances that have enabled more physicians to operate in their offices making them less reliant on hospital privileges, and EMTALA rules governing transfers of patients.

- Changes in the way health care services are delivered have also had an impact on the operation of the emergency department. Many of the conditions that once resulted in admission to the hospital now are treated and released following intensive therapy and observation in the emergency department.

Hospital and Community Health System Capacity

- Discussions with Maryland hospital staff suggest that delays in the ability to transfer patients from the emergency department to appropriate inpatient units within the hospital, particularly critical care units, is a significant factor contributing to congestion. When this occurs, patients must be held in the emergency department, thus occupying resources that otherwise would be available to treat incoming patients.

- The current nursing shortage may limit the number of licensed beds that hospitals are able to staff and operate. Factors responsible for constraining the supply of nurses, including decreased job satisfaction, expanded career opportunities, and a shrinking pool of new nurses to replace those retiring, are likely to persist and may worsen in the future. As a consequence, nursing staff shortages can be expected to have a continuing impact on hospital operations, including the ability to operate a full complement of licensed beds.

- Seasonal variation in hospital utilization patterns is another factor that increases pressure on available beds. For medical-surgical services, utilization predictably peaks during the winter months of January-February. On the peak census day in January 2000, statewide occupancy based on licensed beds was 93.3 percent. By comparison, the lowest patient census generally occurs during the summer months or December. In December, at the lowest point during 2000, occupancy was 60.0 percent based on licensed beds.

- The impact of the way beds are used on patient census at peak hours of operation is a third factor that may increase pressure on hospital system capacity. As length of stay has declined and outpatient services have increased it is not uncommon for patients to be admitted for up to 23 hour stays that occupy resources but may not necessarily be counted in the patient census. A related issue concerns how to count patients who experience extremely long lengths of stay in the emergency department and may eventually be discharged before being admitted.

- The capacity of the community health care system to provide needed services also has an impact on the ability of hospitals to discharge patients. Discussions with hospital staff suggest that this problem particularly impacts vulnerable populations with serious and chronic illnesses, such as psychiatric patients. For chronically ill psychiatric patients, the downsizing of the State hospital system, changes in reimbursement for psychiatric care, and public policy directives to treat people in the least restrictive setting possible have contributed to increasing pressure on acute care hospitals.

Finally, it should be noted that while inpatient services have historically defined acute care hospitals, today's hospital is increasingly defined by services provided on an outpatient basis. At the same time, services that continue to be provided on an inpatient basis are more complex and resource intensive. The aging of the population, combined with expected increases

in chronic conditions and advances in medical treatment that will move more services to an outpatient setting may increase pressure on hospital emergency departments to provide non-urgent care in the future. These factors suggest the need to have a better understanding of the relationship between emergency department volumes and optimal inpatient bed capacity. Another important policy issue that requires analysis concerns the potential role of freestanding emergency centers and urgent care centers in providing care to persons not requiring emergent treatment.

IV.
Hospital Emergency Department Capital Projects

The renovation and expansion of hospital emergency departments has been a significant trend in capital expenditure projects over the past several years in Maryland. Between 1997-2001, eight hospitals completed capital projects to expand or renovate emergency department services (Refer to Table 14). Those eight projects cost $44,369,063. Seventeen Maryland hospitals have submitted plans for capital projects costing $81,891,679 to upgrade emergency department services between 2002-2004. A recent survey conducted by the Maryland Health Care Commission indicates that an additional 10 hospitals have future plans to renovate or expand their emergency department services.

The vast majority of capital expenditure projects (21 of the 25 projects) involving the emergency department received letters of determination from the Maryland Health Care Commission indicating that Certificate of Need approval was not required. For existing acute care hospitals, a Certificate of Need is not required for capital projects involving new construction or renovation over the review threshold (currently $1.45 million) provided that the hospital agrees not to increase patient charges or rates more than $1.5 million over the entire period or schedule of debt service associated with the project. The Maryland Health Care

Table 14
Number of Hospital Emergency Department Capital Projects by Approval Type and Capital Cost: Maryland, 1997-2004

Project Completion Date	Number of Projects by Approval Type			Total Capital Cost
	Determinations of Non-Coverage	Certificate of Need/ CON Exemption	Total	
1997-2001 (1)	7	1	8	$44,369,063
2002-2004 (2)	14	3	17	$81,891,679
Total (1997-2004)	21	4	25	$126,260,742

Source: Maryland Health Care Commission (Data reported is based on the Survey of Hospital Emergency Department Resources conducted November 2001-February 2002; and Commission Certificate of Need files.)

Notes:
(1) Data reported excludes the replacement emergency department that received CON approval as a component of the Upper Chesapeake Medical Center.
(2) Data reported includes four emergency department projects submitted as part of the 2002 Maryland Hospital Association Bond Program (Peninsula Regional Medical Center, Atlantic General Hospital, Sacred Heart Hospital, and Bon Secours Hospital).

Commission makes this determination after consultation with the Health Services Cost Review Commission. For capital projects over the review threshold at an existing hospital, a Certificate of Need is required if the hospital plans to seek a rate increase or desires to preserve the option to seek a future rate increase. Only four of the emergency department capital expenditure projects (Anne Arundel Medical Center, Greater Baltimore Medical Center, Holy Cross Hospital, and Carroll County General Hospital) received Certificate of Need approval or an exemption from the Commission.

Based on current plans, emergency department beds will increase by about 25 percent (from 1,303 to 1,627) between 1999 and 2004 (Refer to Table 15). Data reported to the Commission indicates that the size of emergency departments, as measured by square feet, will increase from 579,934 to 779, 721 over this same time period. Given that at least ten additional hospitals report future plans to upgrade emergency department services these projections may be considered conservative. Analysis of the projected change in emergency department beds by type is shown in Table 16. Almost one-half of the projected growth in the emergency department will be in beds allocated to fast track and multi-purpose use (165 of the 324 additional beds). Other services projected to increase between 1999 and 2004 include: pediatric (from 66 to 101 beds), psychiatric (from 58 to 82 beds), cardiac (from 114 to 152 beds), and observation (from 31 to 57 beds).

Table 15
Projected Change in Emergency Department Capacity Measures:
Maryland, 1999-Projected 2004

Capacity Measure	1999	Projected 2004	Change	
			Number	Percent
Emergency Department Beds	1,303	1,627	324	24.87%
Emergency Department Space (Square Footage)	579,934	779,655	199,721	34.44%

Source: Maryland Health Care Commission, Survey of Hospital Emergency Department Resources, November 2001-February 2002. Data reported includes responses from 45 of the 46 Maryland acute care hospitals with emergency departments. Montgomery General Hospital did not respond to the survey. Two hospitals with emergency departments that closed during the reporting period are also excluded: Liberty Medical Center and Church Hospital.

Table 16
Change in Emergency Department Beds by Type:
Maryland, 1999-Projected 2004

Bed Type	1999	Projected 2004	Change	
			Number	Percent
Triage	32	42	10	31.25%
Fast Track	200	260	60	30.00%
Multi-Purpose	702	807	105	14.96%
Pediatric	66	101	35	53.03%
Psychiatric	58	82	24	41.38%
Decontamination	16	33	17	106.25%
Cardiac Care	114	152	38	33.33%
Gynecology	25	34	9	36.00%
Observation	31	57	26	83.87%
Trauma	29	30	1	3.45%
Other	30	29	-1	-3.33%
TOTAL	**1,303**	**1,627**	**324**	**24.87%**

Source: Maryland Health Care Commission, Survey of Hospital Emergency Department Resources, November 2001-February 2002. Data reported includes responses from 45 of the 46 Maryland acute care hospitals with emergency departments. Montgomery General Hospital did not respond to the survey. Two hospitals with emergency departments that closed during the reporting period are also excluded: Liberty Medical Center and Church Hospital.

V.
FINDINGS AND RECOMMENDATIONS

RECOMMENDATION 1. The academic and research communities in Maryland, in collaboration with hospitals and state agencies, should seek funding from federal agencies and/or private foundations to support a research agenda designed to: (1) analyze the role of the emergency department in serving vulnerable populations; (2) evaluate options for organizing emergency department services to meet future community needs; and (3) identify best practices.

To inform health policy development related to emergency department services, the academic and research communities in Maryland should collaborate with the Maryland Health Care Commission, Health Services Cost Review Commission, hospitals, and other appropriate organizations to develop a research agenda and obtain available grant funds to support in-depth study of key issues. Given the policy significance of the hospital emergency department crowding issue and the preeminent academic and research credentials of the University of Maryland and Johns Hopkins University, Maryland has a unique opportunity to develop projects capable of addressing issues of great importance to decision-makers at the State and national levels.

RECOMMENDATION 2. The Health Services Cost Review Commission's Hospital Ambulatory Care Data Set, which collects information on emergency department encounters from all Maryland acute care hospitals, should be used to monitor utilization patterns and guide policy formulation. In consultation with hospitals and relevant state agencies, HSCRC should develop comparative statistics and indicators and provide feedback to hospitals through preparation and dissemination of quarterly and annual reports on emergency department use.

To better understand the underlying reasons for the growth in hospital emergency department visits and develop effective policies to address crowding there is a critical need to invest in data collection and analysis. Maryland has long recognized the value of health data and has a strong commitment to collecting and using data to support health policy development. Under the leadership of the Health Services Cost Review Commission, Maryland became one of a small number of states to mandate the collection of data on emergency department encounters in 1997. Data on emergency department encounters, collected as a component of the HSCRC Hospital Ambulatory Care Data Set, includes demographic (e.g., patient age, gender, and sex), clinical (e.g., diagnoses and procedures), and payer data (e.g., expected source of payment and charges). Experience to date with this new data set is limited and there is a need for HSCRC to review the completeness and accuracy of submissions to ensure that the data set provides reliable and valid information.

It is important, in order to strengthen this data set, for state agencies and hospitals to use the data more extensively. HSCRC should work with hospitals and state agencies to develop

comparative statistics on emergency department utilization and provide feedback to hospitals through the preparation and dissemination of routine reports. With more extensive use, it is likely that the quality of the existing data elements will improve. At the same time, increased use of the data set will raise important questions for further investigation and make it possible to evaluate the adequacy of existing data elements for addressing emerging policy issues involving the emergency department. Finally, the HSCRC Hospital Ambulatory Care Data Set should be used as the baseline to determine how and why utilization changes as hospitals and state agencies develop strategies to improve the delivery of health care services.

RECOMMENDATION 3. The Yellow Alert Task Force, convened by the Maryland Institute for Emergency Medical Services Systems as a collaborative effort involving EMS providers, hospitals, and state agencies, should continue to serve as the forum for developing strategies to manage hospital emergency department diversions, including educating the public and health care providers about the appropriate use of emergency department services.

The Maryland Institute for Emergency Medical Services Systems (MIEMSS) oversees and coordinates all components of the statewide emergency medical services (EMS) system, provides leadership and medical direction, conducts and/or supports EMS educational programs, operates and maintains a statewide communications system, designates trauma and specialty centers, licenses and regulates commercial ambulance services, and participates in EMS related public education and prevention programs.

Emergency department diversions or yellow alerts occur when hospital emergency departments accept only very critically ill patients arriving by ambulance for immediate stabilization and divert all other ambulance transports to alternate hospitals for treatment. To manage recent increases in hospital emergency department diversions, MIEMSS established a Yellow Alert Task Force composed of EMS providers, hospitals, and state agencies. This Task Force should continue to serve as the central forum for developing strategies to manage emergency department diversions at the statewide level. In developing overall strategies for managing diversions, MIEMSS should continue to address the need to educate the public and health care providers about the appropriate use of emergency services.

RECOMMENDATION 4. The Maryland Health Care Commission, with the assistance of a Work Group composed of representatives from hospitals and relevant state agencies, should study the relationship between increased admissions through the emergency department and other sources and inpatient bed capacity. This study should include an analysis of staffed versus licensed beds, options for measuring occupancy and licensed capacity, optimal occupancy thresholds, emergency department capacity, and other appropriate factors. The Commission should use results from this study in updating and revising the acute inpatient services component of the State Health Plan for Services and Facilities and Certificate of Need regulations, in recommending statutory changes where appropriate, and in other policy development efforts involving acute care hospitals.

In October 2000, a new licensing scheme for acute general hospital beds in Maryland was implemented. Mandated by Health General Article § 19-307.2, this new approach to licensure established a baseline for the licensed capacity of each acute care hospital reflecting their actual utilization. The Department of Health and Mental Hygiene annually calculates the average daily census of each hospital for a 12-month reporting period and licensed bed capacity is established at 140 percent of the hospital's average daily census. This level of utilization assumes that all hospitals should operate at a 70 percent occupancy rate. The initial implementation of this new licensing process resulted in a statewide reduction in licensed hospital bed capacity from 12,328 to 9,555—a decline of 23 percent. While this new licensure approach has standardized the measurement of licensed beds, several other important issues require study. Those issues include the need to have a better understanding of the variation between licensed and staffed beds, options for measuring occupancy that consider fluctuations in average daily census that occur during daily operations, and the relationship between emergency department volumes and optimal inpatient bed capacity. The Maryland Health Care Commission should examine these issues with the assistance of a Work Group composed of representatives of hospitals, state agencies, and other appropriate organizations.

RECOMMENDATION 5. The Health Services Cost Review Commission should consider innovative programs from hospitals that can be shown to be cost effective and improve the operation of the emergency department. The HSCRC should consider supplying hospitals with start-up funds to begin these programs if it can be clearly demonstrated that the public from the implementation of these programs will realize savings. This start-up money should only be supplied if there is a back-end guarantee by the hospitals that savings will be realized from the programs.

In response to recent utilization trends, many Maryland hospitals are undertaking projects to improve the organization and delivery of emergency department services. These projects range from expanding and reconfiguring emergency department space to developing programs and technology to enhance operations. To encourage and support innovative projects designed to be cost effective and improve the operation of the emergency department, the HSCRC should provide start-up funds necessary to initiate the programs if there is demonstrated benefit to the public and agreement on the savings to be realized from the programs.

RECOMMENDATION 6. The Association of Maryland Hospitals and Health Systems should give priority in reviewing applications for the Hospital Bond Project Review Program to innovative projects designed to improve access to urgent and non-emergency care services for vulnerable populations.

On an annual basis, the Governor and General Assembly allocate up to approximately $5.0 million for the Hospital Bond Project Review Program. Under this program, which is administered by the Maryland Hospital Association, hospitals apply for state funds to support private hospital capital projects. According to guidelines established for project review, proposals requesting funds should: (1) improve patient care, particularly access to primary and preventive services, and focus on unmet community health and related social needs; and (2)

encourage collaboration with other community partners. In addition, the guidelines suggest that serious consideration be given to the unique needs of hospitals which are sole community providers, proposing projects located in underserved areas, proposing projects of special regional or statewide significance, or proposing projects not requiring multi-year state bond funding. Within the guidelines established for the Hospital Bond Project Review Program, the Maryland Hospital Association should give priority to projects designed to improve access to urgent and non-emergency care services for vulnerable populations who otherwise may relay on the emergency department for primary care.

RECOMMENDATION 7. The Maryland Health Care Commission, Office of Health Care Quality, Health Services Cost Review Commission, Maryland Institute for Emergency Medical Services Systems, and The Association of Maryland Hospitals and Health Systems should jointly study the access, quality of care, and reimbursement issues associated with hospital and non-hospital based urgent care centers, including freestanding emergency care centers.

With the exception of the Bowie Health Center, operated by Dimensions Health Care System, all emergency department services in Maryland are hospital-based. In some other states, hospitals operate freestanding emergency centers that are JCAHCO accredited and equipped to handle most types of emergencies. These freestanding emergency centers arrange ambulance transport to an acute care hospital, if necessary. One of the policy issues related to emergency department services concerns the potential role of freestanding emergency care centers and non-hospital based urgent care centers in the future health care delivery system. To consider this question, the Maryland Health Care Commission, Office of Health Care Quality, Health Services Cost Review Commission, Maryland Institute for Emergency Medical Services Systems, and the Association of Maryland Hospitals and Health Systems should jointly study the access, quality of care, and reimbursement issues associated with both hospital and non-hospital based urgent care centers, including freestanding emergency care centers.

Appendices

Table A-1
Maryland Hospital and EMS Emergency Department
Overload Mitigation Plan: Amended August 2001

	Status		
Agency	**Pre-Event; Preparatory; Normal**	**Regional EMS Overload (1)**	**Extended Regional EMS Overload (2)**
State Health Agencies	• Develop committees within EMS Regional Councils, to include Local Health Officers and hospitals, that will track alerts and recommend implementation and termination of overload strategies • MIEMSS, in conjunction with regional committees, to determine and distribute uniform, acceptable guidelines for hospital placement on yellow alert status • MIEMSS, in conjunction with regional committees, to develop contingency plans for patient destinations • MIEMSS (regional administrators) to review when hospitals are on yellow alert and/or re-route for more than 6 hours in a 24-hour period • MIEMSS to identify and notify hospitals of alert utilization to ensure hospital awareness • With MHA, initiate efforts to compile and distribute hospital "best practices" • Encourage communication and collaboration among affected hospitals to facilitate development and implementation of cooperative short and long-term solutions • DHMH Mental Hygiene Administration and MHA to educate state and private psychiatric facility staff regarding system-wide impact of delays in emergency department patient transfer • DHMH Mental Hygiene Administration to continue to work with emergency departments to facilitate the transfer of uninsured psychiatric patients	• MIEMSS and DHMH alert all state and local health agencies of overload implementation • Issue public service announcements directing sick individuals to seek non-emergent care from primary care providers • CDC and DHMH epidemiology/tracking/ management teams	• Expand public service announcements from overload to press releases/health alerts, if necessary. Respiratory precaution requirements may be included here • Temporary, centralized patient routing to maximize hospital resources and minimize patient care delays • Allow participation of retired/inactive nurses and physicians in health care delivery

	Status		
Agency	**Pre-Event; Preparatory; Normal**	**Regional EMS Overload (1)**	**Extended Regional EMS Overload (2)**
State Health Agencies	• MIEMSS to develop alternative destination criteria for ambulance patient transports • DHMH to work with nursing homes to expedite appropriate patient transfers to and from the hospital and to address transfer delays extending beyond 6 hours • DHMH, in conjunction with the nursing home associations, to develop a plan to evaluate patients, without transfer to an emergency department, whenever possible.		
Local Health Dept.			• Establishment of local screening centers and activation of volunteer services for "walking ill" evaluation and triage, prior to going to emergency department (coordination through DHMH with local emergency managers and local health officers**)**
Hospitals	• Each hospital with an emergency department to develop a formal plan to effectively handle emergency room admissions in the event of emergency department/critical care/hospital saturation. Individual plans may be collected by the Best Practices Committee and distributed to other hospitals within the geographic area and to the Yellow Alert Task Force. *("Saturation": all stations or beds are filled to capacity and/or traditional staff to patient ratios are at maximum under the hospitals written staffing plan.)*	• Hospitals attempt to schedule non-emergent surgeries at times of low incidence of hospital bypass • Hospitals within the affected geographic region attempt to increase staff • Hospitals review infection control procedures and augment as necessary *(Non-emergent includes procedures requiring overnight admission or 23-hr. stay that may be rescheduled without risk of physical harm to the patient.)*	*Hospitals encouraged to implement or prepare to implement appropriate portions of individual internal disaster plans to include:* • Reporting bed availability (staffed and unstaffed) to MIEMSS every 6 or 12 hours • Conversion of all available bed space to patient management areas • Scheduling efforts to maximize utilization of staff on a twenty-four hour basis • Conversion of surgical recovery areas into critical care units

	Status		
Agency	**Pre-Event; Preparatory; Normal**	**Regional EMS Overload (1)**	**Extended Regional EMS Overload (2)**
Hospitals (continued)	• The plans shall include: ◊ a monitoring system to track patient flow in the ED and criteria to identify pre-yellow alert situations and plans to prevent yellow alert requests ◊ a list, including names, of all hospital officials that have the authority to call a yellow alert; the list shall include senior clinical staff ◊ the procedure to call yellow alert; and ◊ specific procedures for implementing overload strategies • Utilize available "best practices" to eliminate delays in discharge or transfer of patients • Utilize available "best practices" to maximize availability of critical care beds, by eliminating delays in transfer of patients to step-down or other beds • All hospitals within the affected area encourage direct admissions that bypass the ED when clinically appropriate • Encourage hospitals to offer flu immunizations within their catchment area • Establish liaisons with outpatient facilities to provide expedited post-emergency follow-up		• Cancellation of all elective and non-emergent surgery • Conversion of outpatient facilities into primary treatment centers with potential inpatient service capabilities

	Status		
Agency	**Pre-Event; Preparatory; Normal**	**Regional EMS Overload (1)**	**Extended Regional EMS Overload (2)**
EMS	• EMS to determine feasibility of alternative ambulance destinations meeting MIEMSS criteria, and develop plans for implementation • EMS operational programs to prepare contingency plans for staffing and resources • All EMS providers required to abide by alert policies according to regional policies • Commercial EMS encouraged to respond within two hours for hospital discharges	• EMS transports stable (priority 3) patients to alternative ambulance destinations meeting MIEMSS criteria when possible • Jurisdictions within the affected geographic region(s) attempt to increase EMS provider staff	• Encourage jurisdictions to increase staffing to maximize utilization of staff on a 24-hour basis • EMS providers authorized to select alternative destinations for priority 3 patients. • EMS providers may refer patients requesting emergency department transport, to a non-emergent treatment facility if patients meet the referral protocol
Nursing Homes			• DHMH requests nursing home maximization of nursing staff to allow patient admissions on a 24-hour basis • DHMH requests nursing home medical directors to schedule on-site physician coverage as necessary to manage patients in the facility and minimize referrals to hospitals • DHMH requests conversion of nursing homes associated with existing hospital – based programs, into in-patient health care facilities where feasible
State Agencies, Hospitals, EMS	• Implement physician education regarding referrals of patients to emergency departments and system-wide impact of such referrals • Implement and/or reinforce public education regarding: ◊ importance of obtaining flu immunization and infection control strategies; and ◊ appropriate use of "911", the EMS system, and hospital ED		

Source: Maryland Institute for Emergency Medical Services Systems (Approved by the Yellow Alert Task Force, December 1999, Amended August 22, 2001)

(1) Regional EMS Overload: Regional coordinating committees shall consider implementation when hospitals within a defined geographic area are on yellow alert status more than 35 percent of the total collective time (this means a 35 percent reduction in ED availability), for a period determined by regional committees until total yellow alert time drops below 25 percent for a period determined by regional committees.
(2) Extended Regional EMS Overload: Regional coordinating committees shall consider implementation after 30 days on regional EMS overload.

Table A-2

Monthly Region III Yellow and Red Alert Hours Ranked from High to Low: Maryland. Fiscal Year 1996-2001

(1) Yellow Alert

Fiscal Year 1996		Fiscal Year 1997		Fiscal Year 1998		Fiscal Year 1999		Fiscal Year 2000		Fiscal Year 2001	
Jul-95	889.50	Dec-96	1,960.71	Jan-98	1,806.31	Feb-99	4,192.03	Jan-00	2,986.12	Jan-01	4,404.12
Dec-95	827.17	Feb-97	1,215.76	Feb-98	1,765.98	Jan-99	2,462.64	Feb-00	2,561.08	Apr-01	3,033.48
Apr-96	763.67	Jan-97	1,105.96	May-98	1,342.29	Mar-99	2,324.63	May-00	2,498.01	Jun-01	2,916.57
May-96	647.78	Mar-97	942.15	Apr-98	1,139.53	Apr-99	1,797.50	Jun-00	2,397.92	Oct-00	2,777.02
Sep-95	643.59	Oct-96	874.24	Mar-98	1,124.08	May-99	1,668.05	Dec-99	2,397.73	May-01	2,726.43
Mar-96	638.19	Apr-97	827.69	Dec-97	1,032.46	Jun-99	1,556.00	Jul-99	2,088.04	Mar-01	2,665.63
Jun-96	573.93	May-97	827.11	Jun-98	1,031.74	Dec-98	1,531.82	Mar-00	1,980.46	Feb-01	2,621.49
Aug-95	561.33	Jun-97	818.28	Sep-97	923.51	Sep-98	1,438.43	Sep-99	1,957.22	Sep-00	2,416.63
Feb-96	502.49	Aug-96	703.91	Aug-97	788.37	Nov-98	1,390.50	Nov-99	1,873.66	Dec-00	2,206.42
Oct-95	499.02	Jul-96	668.41	Jul-97	785.23	Aug-98	1,298.94	Apr-00	1,792.99	Aug-00	2,083.22
Jan-96	498.08	Sep-96	647.74	Oct-97	738.02	Jul-98	1,259.00	Oct-99	1,685.40	Jul-00	2,064.91
Nov-95	480.60	Nov-96	549.40	Nov-97	638.66	Oct-98	1,145.89	Aug-99	1,415.43	Nov-00	1,707.55
Total FY Hours	7,525.35		11,141.36		13,116.18		22,065.43		25,634.06		31,623.47
Average Yellow Alert Hours Per Month	627		928		1,093		1,839		2,136		2,635
Annual Available Hours	210,816		210,240		210,240		207,312		195,624		192,720
% Annual Yellow Alert Hours	3.57%		5.30%		6.24%		10.64%		13.10%		16.41%

(2) Red Alert

Nov-95	1,682.94	Dec-96	2,236.41	Feb-98	1,946.62	Feb-99	4,098.10	Jan-00	4,396.92	Jan-01	4,601.70
Apr-96	1,416.04	Jan-97	1,482.09	Jan-98	1,467.84	Mar-99	2,081.07	Feb-00	2,679.04	Mar-01	3,302.27
May-96	1,276.11	Mar-97	987.53	Mar-98	745.35	Jan-99	1,108.02	Dec-99	1,710.72	Feb-01	3,249.01
Jan-96	1,260.81	Feb-97	856.88	Dec-97	447.05	Dec-98	768.70	Mar-00	1,319.54	Apr-01	2,669.10
Oct-95	1,197.03	Oct-96	602.31	Sep-97	425.06	Nov-98	762.75	May-00	1,154.85	Jun-01	2,169.58
Dec-95	1,110.49	Apr-97	516.92	Apr-98	414.46	Apr-99	749.27	Apr-00	992.42	May-01	2,107.28
Mar-96	905.73	Nov-96	474.67	Nov-97	374.85	May-99	578.43	Nov-99	959.49	Dec-00	1,953.29
Feb-96	816.19	Jun-97	456.49	Oct-97	330.04	Oct-98	503.97	Jun-00	955.02	Nov-00	1,858.75
Sep-95	747.47	Aug-96	387.72	Jul-97	318.33	Jun-99	468.15	Jul-99	614.61	Oct-00	1,699.99
Jun-96	535.49	May-97	314.61	May-98	294.83	Sep-98	456.85	Oct-99	555.25	Aug-00	1,363.67
Jul-95	496.93	Jul-96	286.38	Jun-98	260.22	Jul-98	309.58	Sep-99	483.71	Sep-00	1,325.84
Aug-95	343.04	Sep-96	263.68	Aug-97	132.36	Aug-98	231.94	Aug-99	331.38	Jul-00	999.03
Total FY Hours	11,788.27		8,865.69		7,157.01		12,116.83		16,152.95		27,299.51
Average Red Alert Hours Per Month	982		739		596		1,010		1,346		2,275
Annual Available Hours	210,816		210,240		210,240		207,312		195,624		192,720
% Annual Red Alert Hours	5.59%		4.22%		3.40%		5.84%		8.26%		14.17%

Source: Maryland Institute for Emergency Medical Services Systems, County/Hospital Alert Tracking System, Fiscal Years 1996-2001.

Table A-3
Licensed Beds, Emergency Department Visits, Discharges, Discharges Per Bed, Visits Per Bed, Percent ED Visits Admitted to the Hospital, and Percent Discharges Admitted Through the ED: Maryland, 2000

EMS Region	Jurisdiction	Hospital	Licensed Beds: All Services	Licensed Beds: Ex. OB	Emergency Department Visits	Med-Surg/ Pediatric/ Psych Disch	Discharges Per Bed (Ex. OB)	ED Visits Per Bed (Ex. OB)	% ED Visits Admitted to Hospital	% Discharges Admitted Thru ED (Ex. OB)
Region I	Allegany County	MEMORIAL OF CUMBERLAND	140	130	32,024	7,066	54.35	246.34	17.55%	74.04%
		SACRED HEART HOSPITAL	145	145	29,221	6,799	46.89	201.52	14.07%	72.78%
	Garrett County	GARRETT CTY. MEM. HOSP	35	31	17,102	2,447	78.94	551.68	9.09%	72.51%
Region II	Frederick Co.	FREDERICK MEMORIAL HOSP	241	218	53,800	12,152	55.74	246.79	14.19%	66.53%
	Washington Co.	WASHINGTON CTY. HOSPITAL	223	209	56,164	12,720	60.86	268.73	10.96%	67.37%
Region IIIa	Baltimore City	BON SECOURS HOSPITAL	147	147	22,470	7,621	51.84	152.86	27.17%	85.85%
		GOOD SAMARITAN HOSPITAL	196	196	31,258	10,738	54.79	159.48	24.12%	65.09%
		HARBOR HOSPITAL CENTER	162	129	30,660	9,611	74.50	237.67	19.34%	61.58%
		JOHNS HOPKINS BAYVIEW	296	280	47,415	17,106	61.09	169.34	24.35%	67.89%
		JOHNS HOPKINS HOSPITAL	922	883	74,618	37,216	42.15	84.51	18.08%	38.56%
		MARYLAND GENERAL HOSP	154	134	27,580	7,965	59.44	205.82	20.35%	73.58%
		MERCY MEDICAL CENTER	211	181	43,442	11,538	63.75	240.01	12.95%	51.96%
		SINAI HOSPITAL	350	327	70,252	18,291	55.94	214.84	16.85%	62.02%
		ST. AGNES HEALTHCARE	284	253	66,897	15,936	62.99	264.42	15.44%	70.04%
		UNION MEMORIAL HOSPITAL	247	234	43,250	14,569	62.26	184.83	15.63%	46.94%
		UNIVERSITY OF MD HOSPITAL	629	597	55,206	25,916	43.41	92.47	14.90%	41.72%
	Baltimore Co.	FRANKLIN SQUARE HOSPITAL	299	242	65,649	17,695	73.12	271.28	19.46%	73.88%
		GBMC	308	248	49,786	16,001	64.52	200.75	16.54%	37.31%
		NORTHWEST HOSPITAL CTR	171	171	39,846	10,698	62.56	233.02	20.62%	82.10%
		SAINT JOSEPH HOSPITAL	308	280	34,569	16,208	57.89	123.46	22.05%	44.17%
Region IIIb	Anne Arundel Co.	ANNE ARUNDEL MED. CTR.	237	191	50,929	14,652	76.71	266.64	18.57%	61.23%
		NORTH ARUNDEL HOSPITAL	231	231	68,448	14,854	64.30	296.31	16.87%	76.66%
	Carroll County	CARROLL CTY. GEN HOSP	166	146	36,197	9,858	67.52	247.92	21.00%	76.63%
	Harford County	HARFORD MEMORIAL HOSP	102	102	28,224	6,062	59.43	276.71	18.01%	80.94%
		UPPER CHESAPEAKE	120	111	28,265	8,000	72.07	254.64	11.85%	84.76%
	Howard County	HOWARD CTY. GEN HOSP	167	135	48,627	9,102	67.42	360.20	12.60%	71.92%
Region IV	Cecil County	UNION OF CECIL HOSPITAL	98	87	25,037	6,220	71.49	287.78	15.47%	69.93%
	Dorchester Co.	DORCHESTER GEN HOSP	65	65	14,379	4,114	63.29	221.22	14.48%	72.11%
	Kent County	KENT & QUEEN ANNE'S HOSP	45	41	9,501	2,792	68.10	231.73	17.37%	60.57%
	Somerset Co.	MCCREADY MEMORIAL HOSP	13	13	4,125	1,072	82.46	317.31	5.24%	53.96%
	Talbot County	MEMORIAL HOSP. AT EASTON	130	105	35,184	7,870	74.95	335.09	20.92%	66.10%
	Wicomico Co.	PENINSULA REGIONAL MED CTR	305	281	57,684	15,486	55.11	205.28	16.82%	57.30%
	Worcester Co.	ATLANTIC GENERAL HOSP	37	37	19,789	2,510	67.84	534.84	12.00%	86.23%
Region Va	Montgomery Co.	HOLY CROSS HOSPITAL	340	258	52,635	15,152	58.73	204.01	16.82%	55.23%
		MONTGOMERY GEN HOSP	140	126	24,473	7,425	58.93	194.23	21.12%	72.30%
		SHADY GROVE ADVENTIST HOS	253	194	67,975	10,910	56.24	350.39	11.62%	70.36%
		SUBURBAN HOSPITAL	217	217	35,201	12,113	55.82	162.22	22.49%	66.64%
		WASHINGTON ADVENTIST HOSP	344	311	36,937	12,727	40.92	118.77	18.84%	54.03%
Region Vb	Prince George's	DOCTORS COMMUNITY HOSP	166	166	40,187	9,475	57.08	242.09	16.37%	74.71%
	County	FORT WASH MEDICAL CTR.	36	36	22,328	2,156	59.89	620.22	7.47%	80.30%
		LAUREL REGIONAL HOSP	109	99	34,768	5,475	55.30	351.19	11.52%	69.87%
		PRINCE GEORGES HOSP. CTR.	276	236	60,578	11,346	48.08	256.69	14.67%	64.66%
		SOUTHERN MARYLAND HOSP	221	201	43,997	10,955	54.50	218.89	16.17%	62.46%
Region Vc	Calvert County	CALVERT MEMORIAL HOSP.	88	80	24,200	5,552	69.40	302.50	15.64%	67.91%
	Charles County	CIVISTA MEDICAL CENTER	97	82	30,295	5,299	64.62	369.45	13.59%	90.07%
	St. Mary's Co.	ST. MARY'S HOSPITAL	84	71	24,169	5,086	71.63	340.41	10.28%	72.31%
		TOTAL	**9,555**	**8,657**	**1,815,341**	**494,556**	**57.13**	**209.70**	**16.90%**	**62.21%**

Source: Maryland Health Care Commission (Data reported for licensed beds is from the *Report on the Implementation of Acute Care Hospital Licensure Regulations: Fact Sheet,* October 25, 2000; data reported for hospital discharges is from the Hospital Discharge Abstract Data Base for calendar year 2000;and data report on emergency department utlization is from the HSCRC Financial Data Base for fiscal year 2000.)

Table A-4
Critical Care Beds by Hospital: Maryland, Fiscal Years 2001 and 2002

EMS Region	Jurisdiction	Hospital	Critical Care Beds FY 2001	Critical Care Beds FY 2002
Region I	Allegany County	MEMORIAL OF CUMBERLAND HOSP.	15	15
		SACRED HEART HOSPITAL	10	10
	Garrett County	GARRETT COUNTY MEM. HOSPITAL	4	4
		Total	**29**	**29**
Region II	Frederick County	FREDERICK MEMORIAL HOSPITAL	18	18
	Washington County	WASHINGTON COUNTY HOSPITAL	20	20
		Total	**38**	**38**
Region IIIa	Baltimore City	BON SECOURS HOSPITAL	14	14
		GOOD SAMARITAN HOSPITAL	16	16
		HARBOR HOSPITAL CENTER	15	15
		JOHNS HOPKINS BAYVIEW MED. CTR	52	52
		JOHNS HOPKINS HOSPITAL	76	92
		MARYLAND GENERAL HOSPITAL	13	16
		MERCY MEDICAL CENTER	24	24
		SINAI HOSPITAL	39	39
		ST. AGNES HEALTHCARE	28	26
		UNION MEMORIAL HOSPITAL	36	36
		UNIVERSITY OF MD HOSPITAL	150	150
	Baltimore County	FRANKLIN SQUARE HOSPITAL	28	28
		GREATER BALTIMORE MED. CTR.	41	49
		NORTHWEST HOSPITAL CENTER	20	20
		SAINT JOSEPH MEDICAL CENTER	52	50
		Total	**604**	**627**
Region IIIb	Anne Arundel County	ANNE ARUNDEL MED. CTR.	18	18
		NORTH ARUNDEL HOSPITAL	24	24
	Carroll County	CARROLL CTY. GENERAL HOSPITAL	10	10
	Harford County	HARFORD MEMORIAL HOSPITAL	6	6
		UPPER CHESAPEAKE MED. CTR.	14	14
	Howard County	HOWARD CTY. GENERAL HOSPITAL	12	16
		Total	**84**	**88**
Region IV	Cecil County	UNION OF CECIL HOSPITAL	8	8
	Dorchester County	DORCHESTER GENERAL HOSPITAL	10	10
	Kent County	KENT & QUEEN ANNE'S HOSPITAL	6	6
	Somerset County	MCCREADY MEMORIAL HOSPITAL	0	0
	Talbot County	MEMORIAL HOSPITAL AT EASTON	8	8
	Wicomico County	PENINSULA REGIONAL MED CTR	33	36
	Worcester County	ATLANTIC GENERAL HOSPITAL	0	0
		Total	**65**	**68**
Region Va	Montgomery County	HOLY CROSS HOSPITAL	28	28
		MONTGOMERY GENERAL HOSPITAL	12	12
		SHADY GROVE ADVENTIST HOSPITAL	28	28
		SUBURBAN HOSPITAL	46	46
		WASHINGTON ADVENTIST HOSPITAL	42	42
		Total	**156**	**156**
Region Vb	Prince George's County	DOCTORS COMMUNITY HOSPITAL	24	24
		FORT WASHINGTON MEDICAL CTR.	4	4
		LAUREL REGIONAL HOSPITAL	16	16
		PRINCE GEORGE'S HOSP. CTR.	34	34
		SOUTHERN MARYLAND HOSP. CTR.	30	30
		Total	**108**	**108**
Region Vc	Calvert County	CALVERT MEMORIAL HOSPITAL	7	7
	Charles County	CIVISTA MEDICAL CENTER	10	10
	St. Mary's County	ST. MARY'S HOSPITAL	6	6
		Total	**23**	**23**
		TOTAL	**1,107**	**1,137**

Source: Maryland Health Care Commission (Data reported is from the Acute Care Hospital Inventory Data Base for fiscal years 2001 and 2002.)

Table A-5

Emergency Department Visits Per 1,000 and Persons without Health Insurance by State (Ranked from Highest to Lowest): United States, 2000 and 1998-2000

State	ER Visits Per 1,000 Population, 2000		Persons without Health Insurance, 1998-2000	
	Number	Rank	Percent	Rank
Alabama	466	10	14.2%	19
Alaska	296	47	18.1%	7
Arizona	311	41	19.6%	3
Arkansas	449	11	15.3%	13
California	280	50	19.2%	5
Colorado	330	37	14.1%	20
Connecticut	399	21	9.3%	43
Delaware	365	29	11.2%	35
District of Columbia	562	2	14.5%	18
Florida	400	19	17.2%	10
Georgia	403	18	15.3%	14
Hawaii	221	51	9.8%	41
Idaho	326	39	16.6%	11
Illinois	366	28	13.4%	24
Indiana	376	24	11.4%	33
Iowa	367	27	8.1%	50
Kansas	344	35	11.0%	36
Kentucky	497	6	13.1%	26
Louisiana	509	5	19.6%	4
Maine	534	3	11.4%	34
Maryland	346	33	11.8%	32
Massachusetts	435	13	9.2%	44
Michigan	373	26	10.7%	38
Minnesota	304	43	8.2%	49
Mississippi	533	4	15.7%	12
Missouri	422	15	8.9%	46
Montana	310	42	18.3%	6
Nebraska	303	44	9.4%	42
Nevada	288	48	17.5%	9
New Hampshire	424	14	8.7%	47
New Jersey	345	34	13.0%	27
New Mexico	298	45	22.6%	1
New York	396	22	15.3%	15
North Carolina	400	19	13.7%	21
North Dakota	413	16	12.0%	30
Ohio	445	12	10.2%	39
Oklahoma	347	32	17.7%	8
Oregon	297	46	13.7%	22
Pennsylvania	395	23	8.3%	48
Rhode Island	471	8	6.8%	51
South Carolina	486	7	13.7%	23
South Dakota	282	49	12.0%	31
Tennessee	468	9	10.8%	37
Texas	359	31	22.2%	2
Utah	317	40	13.2%	25
Vermont	375	25	10.2%	40
Virginia	360	30	12.9%	28
Washington	332	36	12.7%	29
West Virginia	567	1	15.2%	16
Wisconsin	330	37	9.2%	45
Wyoming	408	17	15.1%	17
United States	**374**		**14.4%**	

Source: 2000 AHA Annual Survey. Copyright 2002 by Health Forum LLC, an affiliate of AHA; and U.S. Census Bureau, Current Population Survey, March 1999, 2000, and 2001.