USE OF MARYLAND HOSPITAL EMERGENCY DEPARTMENTS:

An Update and Recommended Strategies to Address Crowding

Maryland Health Care Commission

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Table of Contents

Table of Contents (continued)

Tables

Figures

ACKNOWLEDGEMENTS

In preparing this report, Commission staff relied on numerous experts, including individuals in state agencies, hospitals and physician groups, and those that face the daily challenge of crowded emergency departments. In this update of the 2002 report, staff gained additional insight into process improvement strategies and innovation that are attempting to address this important public policy issue in Maryland. The causes of emergency department crowding are multi-faceted with broad health care system implications. Solutions will require the joint efforts of all stakeholders.

The Commission wants to recognize Lisa Myers, RN, MS, Director, Program Development, Maryland Institute for Emergency Medical Services Systems (MIEMSS) for her assistance and expertise on pre-hospital care in the State of Maryland. The staff at MIEMSS provided assistance in providing data and expertise in understanding factors that impact the EMS system. In addition**,** John New, Director, Quality Management, provided data from the MIEMSS CHATS system, to analyze Red and Yellow Alerts as well as ambulance reroute data. James J. Scheulen, Administrator, Department of Emergency Medicine, The Johns Hopkins Hospital provided insight on the causes of emergency crowding and innovations to address the problem. Brian Hepburn, M.D., Executive Director, Mental Hygiene Administration provided an update on the mental health system and bed capacity in the State of Maryland. Analysis of hospital data was a crucial component of the report and we want to thank the staff of the Health Services Cost Review Commission and especially Nduka Udom, Chief, Special Projects, Health Services Cost Review Commission (HSCRC) for assistance in promptly answering questions concerning HSCRC data.

Case Studies

The Commission strived to report on innovations that have occurred since 2002 to address emergency crowding in the State. This would not have been possible without the assistance of the following emergency departments and staff at Maryland hospitals. Their willingness to share their time to discuss innovations was vital in developing the case studies. The Commission thanks Rebecca K. Vasse, RN, BSN, MAS, Director of Emergency Services and MJ Gadoury, RN, BSN, MBA, Operations Coordinator, Emergency Services, Germantown Emergency Center of **Shady Grove Adventist Hospital** for allowing us to tour and speak with them about the freestanding emergency center; Kevin H. Scruggs, M.D., Chairman, Department of Emergency Services at **Good Samaritan Hospital** for a tour of their emergency room and a discussion about the potential implementation of an "Adopt a Boarder" program; Sue Jalbert, Vice President, Patient Care Services at **Northwest Hospital** for sharing their experience with "Adopt a Boarder"; and, Mary R. Towe, RN, BSN, MBA, Vice President, Chief, Nursing Office and Bonnie Forsh, RN, BSN, Administrative Director, Emergency/Outpatient Services at **Washington County Hospital** for a tour of their Rapid Diagnostic Center and freestanding urgent care facilities. The Commission also thanks Jeff Johnson, Senior Vice President, System Development/External Operations, Anna Kusinitz, Admissions Coordinator, Chris Parker, Chief Nursing Officer, Chris Mitchell, Manager, Emergency Services, MHE, Donna Prahl, Manager, Case Management/Discharge Planning, Gerard Walsh, Chief Operating Officer, Molly Punzo, Chief, Quality Officer from **Shore Health System** on Bed Huddles and Planned Discharge as well as a tour of their emergency department. In addition, the discussion of critical success factors to implement an innovation was important. The assistance of Colleen Roach, Vice President/Chief Nurse Executive at **Baltimore Washington Medical Center**, for providing an understanding of InstaCare and the impact of change on staff and culture, was also helpful.

Review Committee

In the 2002 report, the Maryland Health Care Commission utilized a Joint Work Group to assist in analyzing the data, identifying contributing factors to emergency department crowding and developing recommended strategies. In this update of the report, the Commission invited individuals representing hospitals, state agencies, community health centers, physicians, and other interested organizations to serve as reviewers. The reviewers provided a broad perspective on the current issues and possible strategies to address emergency department crowding. The Commission held a briefing meeting on Wednesday November 29th to gather comments from the review committee. The briefing meeting provided background on the issues, reviewed state trends, and discussed possible recommendations. The review committee provided both written and verbal feedback on preliminary draft reports which shaped the final report.

The Review Committee consisted of Brian Hepburn, M.D., Executive Director, Mental Hygiene Administration; Cal Pierson, CEO, Maryland Hospital Association; Robert Murray, Executive Director, Health Services Cost Review Commission; Robert Bass, M.D., Executive Director, Maryland Institute for Emergency Medical Services Systems; James J. Scheulen, Administrator, Department of Emergency Medicine, The Johns Hopkins Hospital; Wendy Kronmiller, Esq., Director, Office of Health Care Quality, Department of Health and Mental Hygiene; Jon Mark Hirshon, M.D., FACEP, President, Maryland Chapter of the American College of Emergency Physicians; Andrew N. Pollak, M.D., Commissioner, Maryland Health Care Commission; Gena O'Keefe, M.D., Baltimore City Health Department, Office of the Commissioner; Miguel McInnis, MPH, Chief Executive Officer, Mid-Atlantic Association of Community Health Centers; William Minogue, M.D., FACP, Director, Maryland Patient Safety Center; and Grace Zaczek, Office of Performance Improvement and Patient Safety, Department of Health and Mental Hygiene, staff to the Maryland Community Health Resources Commission.

In addition, we received comments from Pegeen Townsend, Senior Vice President, Legislative Policy, Maryland Hospital Association; Steve Johnson, Director of Law and Advocacy Division, Med-Chi; Richard Alcorta, M.D., State EMS Medical Director, MIEMSS; Chris Hall, Director, Business Development, Adventist Healthcare; Linda DeFeo, M.D. with the Maryland Chapter of the American College of Emergency Physicians; and Jay Wolvovsky, President and CEO, Baltimore Medical Systems.

EXECUTIVE SUMMARY

Emergency departments have been referred to as "the canary in the coal mine" for the health care system – an early warning of system dysfunction. This sentinel role is a result of the many complex connections of the emergency department with the health care system – with acute medical and surgical inpatient care, with inpatient mental health services, with nursing homes, with the primary care system in the community, and with the payers who shape the system through payment and coverage policies. Federal law recognizes the special role of the emergency department by guaranteeing access to emergency services regardless of ability to pay.

The impact of emergency department crowding on the health care system reaches beyond the hospital and the emergency department. While potential concerns over emergency department patient safety due to delays in providing care are ongoing, federal, state, and local agencies have begun assessing the ability of the system to "surge up" in an event such as an act of bioterrorism or a pandemic flu outbreak. Currently, the system routinely operates close to capacity with little room for increased space or resources. An event such as an act of bioterrorism or a pandemic flu could incapacitate the system in its current state.

Maryland and National Trends in Emergency Department Utilization

- In fiscal year 2006, there were about 2.3 million visits to Maryland hospital emergency departments. Statewide, visits to Maryland emergency departments increased by 18 percent (from 1,480,712 to 1,746,981) during the decade of the 1990's. These increases have continued with emergency department visits growing 23 percent (from 1,839,205 to 2,259,004) between 2000 and 2006.

- There are substantial regional variations in emergency department utilization:

  ► Analysis of regional use patterns indicates that in Allegany and Garrett Counties, both emergency department visits and total population have not increased over the period 2000 to 2005.

  ► In Frederick and Washington Counties, the growth in emergency department use has generally kept pace with population increases. From 2000 to 2005, visits to emergency departments increased 14 percent while total population in these two counties combined grew by 11 percent.

  ► The largest growth in emergency department use occurred in the Metropolitan Washington area. In the Metropolitan Washington area, emergency department visits increased by about 26 percent from 2000 to 2005—far surpassing the 7.5 percent growth in population experienced over the same time period.

  ► Large increases in emergency department volume were also observed in the Central Maryland area where visits grew by 22 percent as compared to population growth of about 4 percent between 2000 and 2005.

  ► On the Eastern Shore, where total population grew by 7.5 percent, hospitals reported a 17.5 percent increase in visits to emergency departments.

- Growth in emergency department visits in Maryland is now well above the experience for the U.S. as a whole. Visits to hospital emergency departments in Maryland increased by about 18 percent between 2000 and 2004, compared to a 9 percent increase observed nationwide. Maryland also has a

higher rate of inpatient admissions from the emergency department of 17.8 percent in 2004, compared to the national average of 12.5 for the same year.

- While the number of acute care hospitals in Maryland has been stable since 2000, hospital emergency department treatment spaces have increased by 14.3 percent in the last four years (2003 to 2006). In addition, a new pilot project freestanding medical facility, which accepts patients via ambulance, opened in Montgomery County in August 2006.

- Despite additional treatment capacity, indicators of crowding such as ambulance diversion continue to increase. Maryland hospitals have reported increases in Yellow and Red Alert hours over the past four years. The vast majority of both Yellow and Red Alert hours are experienced in the Metropolitan Baltimore and Metropolitan Washington areas.

  ► There were about 43,003 Yellow Alert hours reported for fiscal year 2003 (9.8 percent of total available hours). Yellow Alert increased to 50,477 hours or 11.5 percent of total available hours in fiscal year 2006.
  ► In 2003, there were 23,132 Red Alert hours (5.3 percent of total available hours) reported by Maryland hospitals. Statewide, Red Alert hours reached 33,627 or 7.7 percent of total available hours in fiscal year 2006.

Ambulance return-to-service time, which reflects the difficultly in transferring a patient from first responders to the emergency department, has also increased.

Profile: Emergency Department Patients in Maryland

- Three major principal diagnosis categories combined account for more than one-half of all emergency department visits: injuries and poisonings; symptoms, signs, and ill-defined conditions; and respiratory diseases. Injuries and poisoning accounted for about 572,000 of all emergency department visits (26.1 percent) during 2005. Symptoms, signs and ill-defined conditions represented 16.7 percent, or about 365,000 visits to emergency departments in 2005. Respiratory diseases, which occurred less frequently in 2004 as compared with 2005, represented 11.5 percent of all patients seen in Maryland hospital emergency departments.

- Emergency department use is disproportionately high among the uninsured. Persons reporting no insurance (including self-pay and charity care) accounted for the largest volume of emergency department visits in 2005. In 2005, self-pay (18.8 percent) was the most frequent expected payment source for all emergency department visits, followed closely by Medicaid (18.3 percent) and Medicare (17.8 percent). The primary payment source differs between those patients who are discharged from the emergency department and those patients who are admitted from the emergency department to an inpatient bed. Medicare is the largest payment source by volume, of those patients who are admitted to an inpatient bed through the emergency department—accounting for almost one-half of the admissions from the emergency department to an inpatient bed. In 2005, the largest volume of visits for patients treated and released from emergency departments were categorized as self-pay (21.4 percent), followed by patients enrolled in an HMO (17.2 percent) or a Medicaid HMO (16.0 percent).

- Research on the appropriateness and urgency of emergency department visits suggests that a high proportion of use is for non-emergent conditions. Application of a classification methodology

developed by New York researchers to 2005 Maryland data on emergency department use, indicates that approximately 18.1 percent of visits were classified as non-emergent and 17.3 percent were emergent (i.e., requiring care within 12 hours) but could have been treated in a primary care setting.

- Use of Maryland hospital emergency departments for non-emergent care has increased in recent years. More than one-third (35.4 percent) of all emergency department visits in Maryland were classified as non-emergent or emergent but primary care treatable in 2005—an increase over experience in 2001. In 2001, 33.9 percent of visits to Maryland hospital emergency departments were classified as non-emergent or emergent but primary care treatable.

Emergency Department Crowding and Patient Flow

- 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) demand for emergency department services; (2) patient flow through the emergency department; and, (3) hospital and community health care system capacity to address treatment and other needs following discharge from the emergency department.

- Given that the pattern of increasing emergency department utilization experienced in Maryland over the past several years is likely to continue in the future, it is critical to examine ways to improve access to care and reduce reliance on emergency departments for non-emergent care. The work of the Maryland Community Health Resources Commission and Mid-Atlantic Association of Community Health Centers in studying a range of approaches should provide guidance to stakeholders on promising strategies for improving access to primary care.

- 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. The Maryland Hospital Association has worked with the Maryland Patient Safety Center on an ED Collaborative Project designed to enhance both quality and patient flow. In partnership with MIEMSS, the Maryland Hospital Association organized a Leadership Summit on Emergency Department Crowding in September 2006 that included presentations by out-of-state experts as well as innovative programs developed by Maryland hospitals to address crowding.

- With increases in the overall number of emergency department visits, the number of admissions occurring through the emergency department increased from 313,437 in 2000 to 412,446 in 2006—an increase of about 32 percent. Because continuing increases in emergency department utilization have an impact on inpatient bed capacity, the Commission worked with Maryland hospitals following the 2002 report to review the assumptions used to guide future estimates of projected bed need.

  ► The most recent bed need forecast showed that 18 of Maryland's 24 jurisdictions, at the minimum range, had a need for additional medical/surgical beds by 2010. At the maximum forecast range, 22 of Maryland's 24 jurisdictions were identified as having a need for additional medical/surgical beds by 2010, i.e., every jurisdiction containing an existing hospital. At the minimum range, the forecast projected need for 487 beds; at the maximum range 1,060 additional beds were projected to be needed.

► While 17-18 percent of emergency department patients are admitted, almost one-third of all psychiatric patients seen in the emergency department are subsequently hospitalized. Although the number of emergency department visits for patients with diagnoses of mental health disorders has increased in recent years, there have been declines in the number of inpatient beds for psychiatric patients across all settings—acute care hospitals, private psychiatric hospitals, and State psychiatric hospitals.

Recommended Strategies to Address Crowding

- ***INPUT/DEMAND FOR EMERGENCY DEPARTMENT SERVICES***

***RECOMMENDATION 1*.** **Strategies should be developed and implemented to encourage the use of primary care and urgent care services in the community rather than emergency departments. Effective strategies will combine efforts to improve the availability and convenience of services, to develop innovative service delivery models, and to provide incentives to both patient and provider.**

- **Private and public payers should examine ways to compensate providers for improving access to primary care services. These might include differential rates for providers' success in decreasing emergency department utilization, for providing prompt appointments for emergent conditions, for having evening and weekend hours, and for developing innovative service programs.**

- **Private and public payers should examine ways to provide incentives to patients for appropriate use of emergency services (beyond simply raising the emergency visit co-payment) and for appropriate self-management of chronic conditions.**

- **Providers should consider establishing urgent care and triage programs, navigator programs between hospital emergency departments and primary care practices, alternatives to access specialty care services, differential payment for evening and weekend visits, flexible appointment scheduling, telephone consultation with nurses, extended hours for community health centers, and other process reengineering efforts to provide another approach to improving access and care delivery.**

- **The Maryland Community Health Resources Commission should work with the Department of Health and Mental Hygiene, the Medical and Chirurgical Faculty of Maryland, Mid-Atlantic Association of Community Health Centers, and other interested organizations to pursue funding opportunities and study options for improving access to primary care and community-based mental health services in order to reduce use of hospital emergency department services for non-emergent problems.**

- **The Department of Health and Mental Hygiene should consider funding additional pilot hospital diversion programs for mental health patients, including crisis support teams.**

***RECOMMENDATION 2*.** **The Maryland Health Care Commission and Health Services Cost Review Commission should study the access, quality of care, and reimbursement issues associated with hospital and non-hospital based urgent care center models, including the pilot free-standing medical facility at the Germantown Emergency Center.**

RECOMMENDATION 3. **The Maryland Hospital and EMS Emergency Department Overload Mitigation Plan, developed by the Maryland Institute for Emergency Medical Services Systems (MIEMSS) with the assistance of the Yellow Alert Task Force, should be used to manage resources during periods of regional overload when ambulance diversion significantly reduces emergency department availability.**

- ***EMERGENCY DEPARTMENT THROUGHPUT***

RECOMMENDATION 4. **The Maryland Hospital Association should collect information on innovative approaches developed by Maryland hospitals and hospitals in other states for designing emergency departments, improving patient flow to enhance emergency department throughput, assessing the effectiveness of those approaches, and disseminating best practice models. Each Maryland hospital CEO should establish a hospital-wide multidisciplinary process to identify key factors that contribute to emergency department crowding and strategies to address crowding. There should be a hospital-wide plan with defined responsibilities and specific actions that implement and track appropriate measures of efficiency.**

RECOMMENDATION 5. **The Maryland Health Care Commission and Health Services Cost Review Commission, with consultation from Maryland hospitals and other interested organizations, should evaluate their existing data sets to determine if additional reporting would be necessary to assist in addressing emergency department utilization issues.**

- **The Hospital Ambulatory Care Data Set and Hospital Discharge Abstract Data Set should be evaluated to consider options such as the collection of data on the hour of patient and ambulance arrival and departure from the emergency department.**
- **The Annual Hospital Licensure Survey should be modified to collect data on number of the inpatient monitored beds by type.**
- **An annual report on Maryland hospital emergency department utilization should be prepared to monitor capacity and utilization trends.**

The Maryland Institute for Emergency Medical Services Systems (MIEMSS) should collect and report data measuring ambulance arrival time and the time that the ambulance is released by the hospital to return to serving the community.

RECOMMENDATION 6. **In consultation with the academic and research communities, the Maryland Patient Safety Center, the Maryland Chapter of the American College of Emergency Physicians, and hospitals, the Maryland Health Care Commission should develop standardized measures of emergency department utilization and patient flow that recognize differences in patient acuity and can be used to support performance evaluation and quality improvement. The development of measures should consider the recommendations in the *Consensus Statement: Emergency Department Performance Measures and Benchmarking Summit.***

RECOMMENDATION 7. **The update of the Acute Inpatient Services Chapter of the State Health Plan prepared by the Maryland Health Care Commission should include standards to guide the development of emergency department treatment space in hospitals. The development of standards should consider recommendations of the American College of Emergency Physicians in *Emergency Department Design: A Practical Guide to Planning for the Future.***

- ***OUTPUT/DISPOSITION FROM THE EMERGENCY DEPARTMENT***

RECOMMENDATION 8. **In updating the Acute Inpatient Services Chapter of the State Health Plan, the Maryland Health Care Commission, with the assistance of a work group composed of representatives of hospitals, state agencies, third party payers, and other interested organizations, should consider recent increases in admissions through the emergency department in projecting inpatient bed need. The update of the State Health Plan should consider options for measuring physical, staffed and licensed bed capacity; and, optimal service-specific occupancy thresholds.**

RECOMMENDATION 9. **The Department of Health and Mental Hygiene, in consultation with mental health providers and other interested organizations, should develop a plan to guide the future role and capacity of State psychiatric hospitals in the continuum of care for mental health patients. The Maryland Health Care Commission, with the assistance of a work group composed of representatives of hospitals, state agencies, third party payers, and other interested organizations, should develop projections of future bed need for acute inpatient psychiatric services.**

I. INTRODUCTION

Background

There have been substantial increases in the use of hospital emergency department services in Maryland, and across the United States, over the past 15 years. In fiscal year 2006, there were about 2.3 million visits to Maryland hospital emergency departments or about 398 visits per 1,000 persons. About 18 percent of these visits resulted in an admission to the hospital. Statewide, visits to Maryland emergency departments increased by 18 percent (from 1,480,712 to 1,746,981) during the decade of the 1990's. These increases have continued with emergency department visits growing 23 percent (from 1,839,205 to 2,259,004) between 2000 and 2006.

Concern about the impact of increasing patient volumes in emergency departments across the United States led the Institute of Medicine to form a Committee on the Future of Emergency Care in the United States Health System in September 2003. This Committee issued a series of three reports in June 2006—*Hospital-Based Emergency Care: At the Breaking Point; Emergency Medical Services At the Crossroads; and Emergency Care for Children: Growing Pains*.

The impact of emergency department crowding on the health care system reaches beyond the hospital and the emergency department. While potential concerns over emergency department patient safety due to delays in providing care are ongoing, federal, state, and local agencies have begun assessing the ability of the system to "surge up" in an event such as an act of bioterrorism or a pandemic flu outbreak. Currently, the system routinely operates close to capacity with little room for increased space or resources. An event such as an act of bioterrorism or a pandemic flu could incapacitate the system in its current state.

The State's emergency medical services system (EMS) is also being stretched to the limit. The ability of EMS providers to respond to 911 calls is becoming increasingly challenged due to extended waits with patients transported to emergency departments. In some instances, providers wait for more than an hour to transfer care to emergency department staff. Additionally, throughout Maryland's EMS system, which is staffed largely by volunteers, such delays are having a negative impact on efforts to recruit and retain volunteer EMS providers.

To examine the underlying causes of recent increases in emergency department utilization and assess the impact of these trends on Maryland hospitals, the Maryland Health Care Commission established a Joint Work Group in 2002. The Joint Work Group included representatives from Maryland hospitals, Maryland Hospital Association, Maryland Institute for Emergency Medical Services Systems, Office of Health Care Quality, and Health Services Cost Review Commission. With the assistance of the Joint Work Group, the Commission analyzed data on the utilization of emergency department services, compared Maryland experience with available national data, identified major factors contributing to increases in emergency department visits, and recommended strategies to address emergency department crowding. The findings and recommendations of the Joint Work Group are contained in an April 2002 report on *Trends in Maryland Hospital Emergency Department Utilization: An Analysis of Issues and Recommended Strategies to Address Crowding*. (www.mhcc.maryland.gov/hospitalservices/acute/acutecarehospital)

Purpose of the Report

The Joint Chairmen's Report (JCR) for the 2006 Session of the General Assembly[1] requested that the Secretary direct the Maryland Health Care Commission and Health Services Cost Review Commission to update the 2002 report "in order that the committees are provided with a comprehensive assessment of the reasons for this overcrowding. In submitting an updated report to the committees, DHMH should also include solutions to identified problems".

This report, *Use of Maryland Hospital Emergency Departments: An Update and Recommended Strategies to Address Crowding*, has been prepared by the Maryland Health Care Commission in response to the JCR. The updated report analyzes emergency department utilization patterns, including demographic characteristics of patients, major payer sources, and the types of diagnoses treated, examines the underlying causes of recent increases in utilization, identifies approaches used by hospitals to address patient flow, and outlines potential future strategies to address crowding.

To assist in preparing this report, the Commission invited a number of individuals to review and comment on the report in draft form. The reviewers were selected because of their expertise and perspective to assure that appropriate information and analysis is provided to the legislature regarding emergency department crowding. The Commission invited reviewers to a briefing on November 29, 2006 and then received written comments and suggestions on the draft. The Maryland Health Care Commission reviewed the report at its December 20, 2006 meeting and approved submission of the report to the Chairmen of the Senate Budget and Taxation Committee and House Committee on Appropriations.

Data Sources

Data used in this report to analyze Maryland trends in the utilization of emergency department services are based on three principal sources. For historical trends in emergency department visits, the report uses data from the Financial Data Base collected by the Health Services Cost Review Commission (HSCRC). This data base provides aggregate-level information, reflecting hospital fiscal year reporting periods, on total emergency department visits and visits resulting in admission for all Maryland hospitals.

The report also uses data collected by the HSCRC on emergency department encounters in the Hospital Ambulatory Care Data Set and on inpatient admissions from the Hospital Discharge Abstract Data Base. For these data sets, patient-level data is collected that includes demographic characteristics, expected payer, principal diagnosis, and total charges. The Hospital Ambulatory Care Data Set for emergency department encounters contains external cause of injury code, condition code, and occurrence span code. The Hospital Discharge Abstract Data Base includes ambulance run number, source of admission, discharge destination, and assigned major hospital service.

The Maryland Institute for Emergency Medical Services Systems (MIEMSS) County Hospital Alert Tracking System (CHATS) was used to analyze Yellow and Red Alerts across regions and hospitals. This data is self-reported by hospitals and includes the frequency and duration of alerts

[1] Chairmen of the Senate Budget and Taxation Committee and House Committee on Appropriations, *Report on the State Operating Budget (SB 110) and the State Capital Budget (SB 370) and Related Recommendations*, Joint Chairman's Report, Annapolis, Maryland, 2006 Session, p. 92.

as well as the number of ambulances that are rerouted. Information on emergency medical service return-to-service is captured from ambulance run sheets.

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 department visits from the American Hospital Association's (AHA) Annual Hospital Statistics has been used to compare Maryland experience with U.S. data.

Organization of the Report

This report is organized in five major sections.

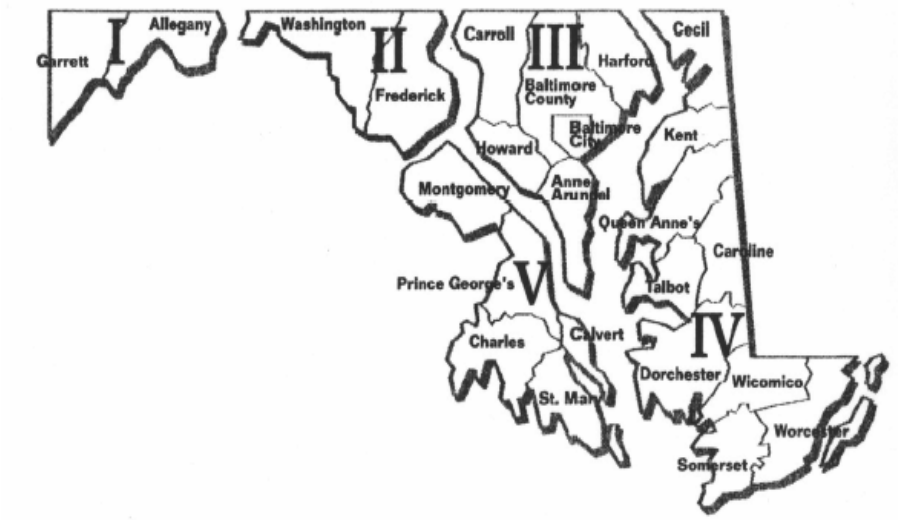
- *Overview: Maryland and National Trends in Emergency Department Utilization* includes trends in Maryland's emergency department utilization, compares Maryland to the nation, and examines indicators of emergency department crowding.
- *Profile: Emergency Department Patients in Maryland* reviews patient demographic characteristics as well as the nature and type of illness and injury. This section of the report discusses two special populations: the mentally ill and those patients enrolled in the Medicaid program.
- *Emergency Department Crowding and Patient Flow* reviews key research on input, throughput, and output and discusses Maryland data.
- *Strategies to Address Emergency Department Crowding* reviews innovations that have occurred in Maryland hospitals, strategies to address non-urgent patients, management of patients that require an admission, and alternative care models.
- *Recommendations* highlights future strategies to address emergency department crowding.

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

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 (Figure 1) for planning and delivering field emergency medical services (EMS): Region I (Allegany and Garrett Counties); Region II (Frederick and Washington Counties); Region III (Baltimore City and Anne Arundel, Baltimore, Carroll, Harford, and Howard Counties); Region IV (Caroline, Cecil, Dorchester, Kent, Queen Anne's, Somerset, Talbot, Wicomico, and Worcester Counties); and, Region V (Calvert, Charles, Montgomery, Prince George's, and St. Mary's Counties).

Figure 1
Maryland Emergency Medical Service Regions



Source: Maryland Institute for Emergency Medical Services Systems

MIEMSS has a number of responsibilities including coordinating the development of centers for treating emergency injuries and illnesses and coordinating the development of specialty referral centers for resuscitation, treatment, and rehabilitation of the critically ill and injured. As shown on Table 1, 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 poison center, a division of the University of Maryland School of Pharmacy. The Maryland Poison Center, which also serves as a consultation center for MIEMSS, provides emergency telephone poison information 24 hours a day to the general public and health professionals.

Trends in Maryland Hospital Emergency Department Utilization and Capacity

Statewide, visits to Maryland emergency departments grew by 18 percent (from 1,480,712 to 1,746,981) during the decade of the 1990's (Table 2). Visits to hospital emergency departments increased by 23 percent between 2000 and 2006, to about 2.3 million visits annually. After increasing modestly, by about 1.4 percent annually in the first half of the 1990's, emergency department visits grew by 3.1 percent annually between 1995 and 2000. Total emergency department visits have increased by about 4.2 percent annually in Maryland over the past six years.

As shown in Table 2, about 18 percent of visits to hospital emergency departments resulted in admission to the hospital for inpatient care in 2006. Over the past 10 years (1997 to 2006), admissions for inpatient care through the emergency department ranged from about 17.0 to 18.3 percent of total visits. Data reported by Maryland hospitals shows that the volume of patients admitted for inpatient care following an emergency department visit has increased in recent years. Between 2000 and 2005, admissions via the emergency department increased by an average of 4.4 percent annually—about twice the rate observed in the previous ten years (1990 to 2000).

Table 1
Acute Care Hospitals by MIEMSS Region, Total Licensed Beds, ED Treatment Spaces, Trauma Patients and Specialty Referral Center Designation: Maryland, 2006

MIEMSS Region	Jurisdiction	Hospital	Emergency Department Treatment Spaces	Total Licensed Beds	Trauma Center Designation	Trauma Patients	Specialty Referral Center*
Region 1	Allegany County	Memorial Hosp of Cumberland	21	120	Level III	668	
		Sacred Heart Hospital	16	148			
	Garrett County	Garrett Co. Memorial Hospital	16	31			
Region II	Frederick County	Frederick Memorial Hospital	59	227			
	Washington County	Washington County Hospital	38	243	Level III	938	
Region IIIa	Baltimore City	Bon Secours Hospital	27	141			
		Good Samaritan Hospital	34	265			
		Harbor Hospital	34	186			
		Johns Hopkins Bayview	39	323	Level II	1,497	1,7
		Johns Hopkins Hospital	88	958	Level I	1,900	2,6,7
		Maryland General Hospital	25	205			
		Mercy Medical Center	40	224			7
		Shock Trauma Center, UMMS		111	PARC	6,119	4,5
		Sinai Hospital of Baltimore	54	393	Level II	1,748	7
		St. Agnes Healthcare	48	323			7
		Union Memorial Hospital	37	279			3
		University of Maryland Hospital	65	558			7
	Baltimore County	Franklin Square Hospital	98	357			7
		Greater Baltimore Medical Ctr	43	292			7
		Northwest Hospital Center	38	214			
		St. Joseph Medical Center	39	370			7
Region IIIb	Anne Arundel County	Anne Arundel Medical Center	58	265			7
	Baltimore County	Baltimore Washington Medical Ctr.	46	286			
	Carroll County	Carroll County General Hosp	39	210			
	Harford County	Harford Memorial Hospital	25	94			
		Upper Chesapeake Medical Ctr	33	167			
	Howard County	Howard County General Hospital	61	208			7
Region IV	Cecil County	Union Hospital of Cecil	27	99			
	Dorchester County	Dorchester General Hospital	11	53			
	Kent County	Chester River Hospital Center	11	58			
	Somerset County	McCready Memorial Hospital	8	9			
	Talbot County	Memorial Hospital at Easton	23	120			
	Wicomico County	Peninsula Regional Medical Ctr	43	371	Level III	1,168	
	Worcester County	Atlantic General Hospital	19	49			
Region Va	Montgomery County	Holy Cross Hospital	45	379			7
		Montgomery General Hospital	30	144			
		Shady Grove Adventist Hosp	55	268			7
		Suburban Hospital	43	212	Level II	1,433	
		Washington Adventist Hospital	26	285			
Region Vb	Prince George's County	Doctors Community Hospital	32	186			
		Fort Washington Comm. Hosp	18	42			
		Laurel Regional Hospital	20	96			
		Prince George's Hosp Ctr	44	268	Level II	3,075	7
		Southern Maryland Hosp Ctr	36	257			
Region Vc	Calvert County	Calvert Memorial Hospital	24	107			
	Charles County	Civista Medical Center	19	109			
	St. Mary's County	St. Mary's Hospital	27	105			
Total			**1,682**	**10,415**	**9**	**18,546**	**16**

Source: Maryland Health Care Commission (Data on licensed beds is from the Maryland Health Care Commission's *Annual Report on Acute Care Hospital Services and Licensed Bed Capacity, Fiscal Year 2007*, Issued July 1, 2006; data on Trauma and Specialty Center Designation is from MIEMSS, *2005-2006 Annual Report*, page 35; data on volume of trauma patients reflects the period June 2005-May 2006). One hospital, James Lawrence Kernan Hospital, does not operate an emergency department. The ED treatment spaces reported for Johns Hopkins combine Main, Pediatric and Ophthalmology EDs.

**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

Table 2
Emergency Department Visits and Admissions Through the Emergency Department: Maryland, Fiscal Years 1990-2005

Fiscal Year	Admissions Through Emergency Department			Total Emergency Department Visits	
	Number	% Annual Change	% of Total ED	Number	% Annual Change
1990	245,330		16.57%	1,480,712	
1991	250,618	2.16%	16.98%	1,475,565	-0.35%
1992	264,675	5.61%	17.79%	1,487,712	0.82%
1993	269,746	1.92%	18.02%	1,496,704	0.60%
1994	276,412	2.47%	18.06%	1,530,453	2.25%
1995	281,720	1.92%	17.79%	1,583,624	3.47%
1996	282,235	0.18%	17.78%	1,587,149	0.22%
1997	283,749	0.54%	17.47%	1,624,121	2.33%
1998	289,622	2.07%	17.75%	1,631,416	0.45%
1999	309,216	6.77%	17.70%	1,746,981	7.08%
2000	313,437	1.37%	17.04%	1,839,205	5.28%
2001	335,707	7.11%	17.32%	1,937,838	5.36%
2002	352,766	5.08%	17.40%	2,027,006	4.60%
2003	369,626	4.78%	18.01%	2,052,442	1.25%
2004	385,798	4.38%	17.76%	2,171,877	5.82%
2005	400,832	3.90%	17.96%	2,231,768	2.76%
2006	412,446	2.90%	18.26%	2,259,004	1.22%
Change					
1990-1995	36,390	2.81%		102,912	1.36%
1995-2000	31,717	2.14%		255,581	3.14%
2000-2005	87,395	4.43%		392,563	4.18%

Source: Health Services Cost Review Commission, Financial Data Base, Fiscal Years 1990-2006. Data reported excludes the Bowie Health Center.

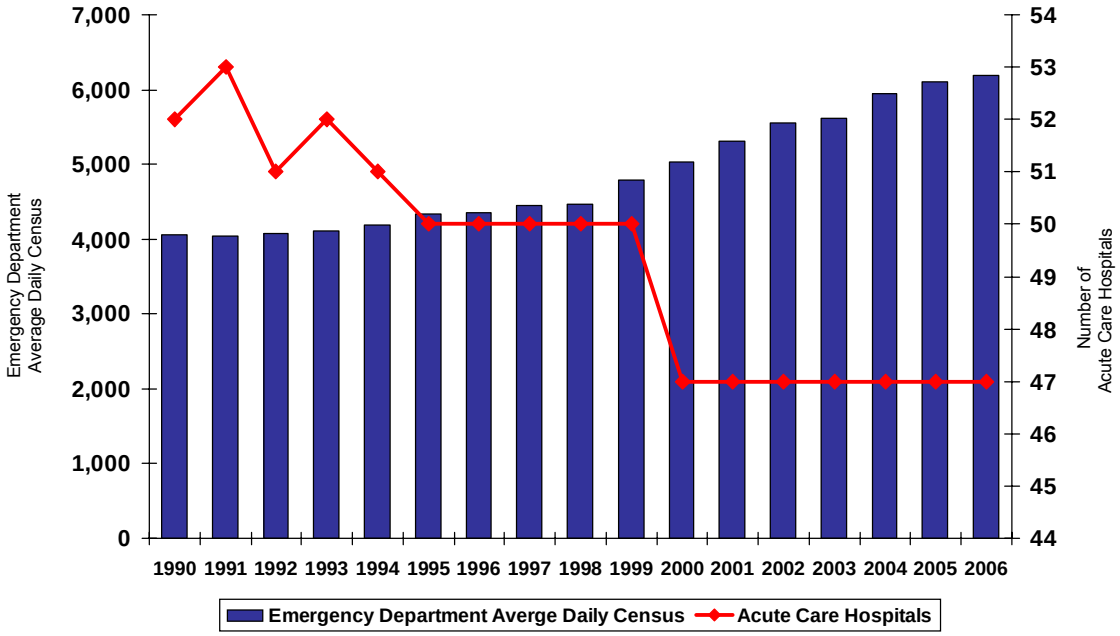
- **Emergency Department Capacity**

On an average daily basis, statewide emergency department volumes have increased from about 4,000 visits in 1990 to 6,200 visits in 2006 (Figure 2). The total number of non-federal, acute care hospitals in Maryland declined from 52 to 47 over this same time period. Emergency department services are currently offered by 46 of the 47 acute care hospitals.[2]

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.

[2] James Lawrence Kernan Hospital, a member of the University of Maryland Medical System located in Baltimore City, does not operate an emergency department.
[3] Children's Hospital, which closed in 1999, did not offer emergency department services.

Figure 2
Trends in Emergency Department Average Daily Census and Number of Acute Care Hospitals: Maryland, 1990-2006

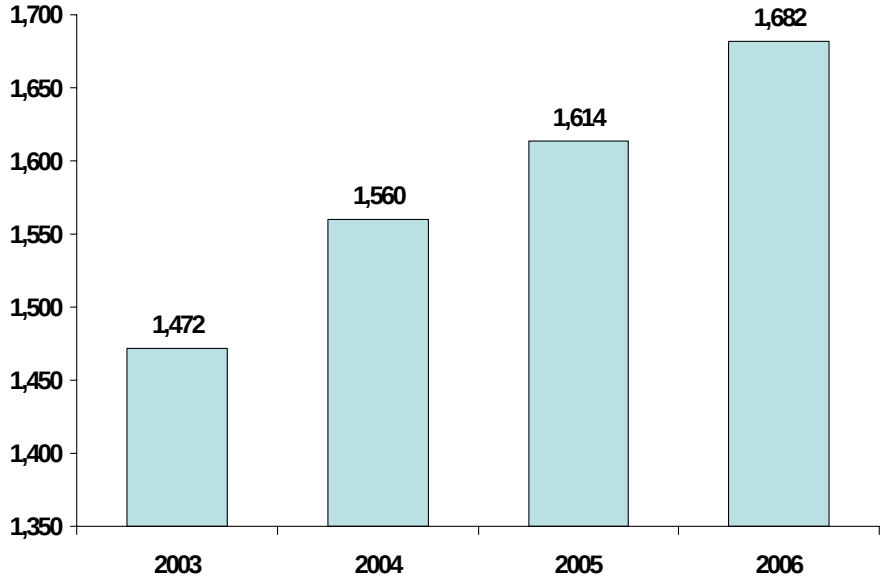


Source: Health Services Cost Review Commission, Financial Data Base, Fiscal Years 1990-2006.

In addition to acute care hospitals, there are two freestanding emergency centers without inpatient beds that accept patients transported via the public emergency medical services system. The Bowie Health Center, located in Prince George's County, operates 21 treatment spaces, 16 hours per day and is affiliated with Prince George's Hospital Center. The Bowie Health Center opened in 1979. During fiscal year 2006, the Bowie Health Center reported about 37,000 visits. The Germantown Emergency Center, located in Montgomery County, operates 24/7 and is affiliated with Shady Grove Adventist Hospital. This facility opened in August 2006 as a pilot freestanding medical facility.

While the number of acute care hospitals in Maryland has remained stable since 2000, there have been increases in the treatment capacity of emergency departments. Treatment spaces in hospital emergency departments increased by 14.3 percent between 2003 and 2006—from 1,472 to 1,682 (Figure 3) .

Figure 3
Emergency Department Treatment Capacity:
Maryland Acute General Hospitals, 2003-2006



Source: Maryland Health Care Commission, Supplemental Survey of Emergency Department Treatment Capacity, 2003-2006. Data reported reflects the number of treatment spaces as of June 1 for each year. Bowie Health Center is excluded.

- **Regional Variations in Emergency Department Utilization**

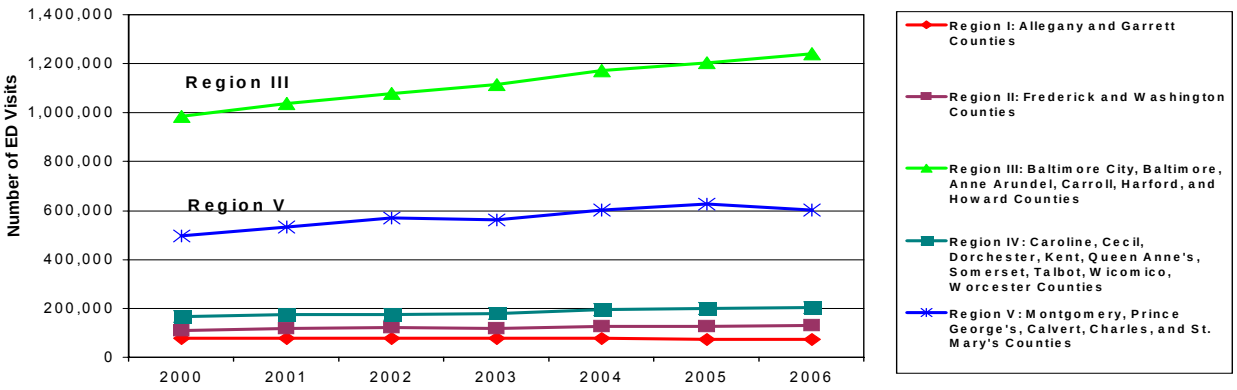
There are substantial regional variations in emergency department utilization. Table 3 compares emergency department visits and population change by MIEMSS region for 2000 and 2005. Analysis of regional use patterns indicates that in Region I, Allegany and Garrett Counties, both emergency department volumes and total population have not increased over the period 2000 to 2005. In Region II, Frederick and Washington Counties, the growth in emergency department use has generally kept pace with population increases. From 2000 to 2005, visits to emergency departments increased 14 percent while total population in Region II grew by 11 percent. The largest growth in emergency department use occurred in the Metropolitan Washington area or Region V. In the Metropolitan Washington area, emergency department visits increased by about 26 percent from 2000 to 2005—far surpassing the 7.5 percent growth in population experienced over the same time period. Large increases in emergency department volume were also observed in the Central Maryland area or Region III where visits grew by 22 percent as compared with population growth of about 4 percent between 2000 and 2005. On the Eastern Shore (Region IV), where total population grew by 7.5 percent, hospitals reported a 17.5 percent increase in visits to emergency departments.

Table 3
Number and Percent Change in Emergency Department Visits and Total Population by MIEMSS Region: Maryland, 2000 and 2005

Region	Emergency Department Visits			Total Population		
	2000	2005	% Change in ED Visits	2000	2005	% Change in Population
Region I: Allegany and Garrett Counties	75,335	74,629	-0.9%	104,776	104,050	-0.7%
Region II: Frederick and Washington Counties	111,850	127,881	14.3%	327,200	362,900	10.9%
Region III: Baltimore City, Baltimore, Anne Arundel, Carroll, Harford, Howard Counties	986,153	1,204,997	22.2%	2,512,431	2,611,550	3.9%
Region IV: Caroline, Cecil, Dorchester, Kent, Queen Anne's, Somerset, Talbot, Wicomico, Worcester Counties	168,124	197,487	17.5%	395,903	425,700	7.5%
Region V: Montgomery, Prince George's, Calvert, Charles, St. Mary's	497,743	626,774	25.9%	1,956,176	2,105,000	7.6%
Total	**1,839,205**	**2,231,768**	**21.3%**	**5,296,486**	**5,609,200**	**5.9%**

Sources: Health Services Cost Review Commission, Financial Data Base, Fiscal Years 2000 and 2005; and, Maryland Department of Planning, Total Population Projections by Age, Sex and Race, October 23, 2006.

Figure 4
Emergency Department Visits by MIEMSS Region: Maryland, Fiscal Years 2000-2006



Source: Health Services Cost Review Commission, Financial Data Base, Fiscal Years 2000-2006.

How Maryland Compares with the United States

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 department visits to U.S. hospitals increased by 19 percent during the decade of the 1990's. Over this same time period, Maryland hospitals reported a 24 percent increase in emergency department visits. More recent data shows that the growth in emergency department visits

in Maryland is now well above the experience for the U.S. as a whole. As shown in Table 4, visits to hospital emergency departments in Maryland increased by about 18 percent between 2000 and 2004, compared to a 9 percent increase observed nationwide. Maryland also has a higher rate of inpatient admission from the emergency department of 17.8 percent in 2004, compared to the national average of 12.5 for the same year.

Data reported by the American Hospital Association, shows considerable variation in the use of emergency department services across the United States.[4] In the Commission's prior 2002 report on emergency department crowding, Maryland was ranked 33rd, based on data reported for 2000, in emergency department use per 1,000 compared to all states and the District of Columbia. Data for 2004 shows that Maryland is now ranked 29th in emergency department use per 1,000 population. The District of Columbia has the highest emergency department use rate with 676.1 visits per 1,000 population; Hawaii the lowest use rate at 258 per 1,000 population.

In 2000, Maryland was below the national average with a use rate of 333 emergency department visits per 1,000 population compared to the U.S. average for the same time period of 374 per 1,000 lives. In 2004, Maryland had an emergency department use rate of 389 per 1,000 population compared to the national average for the same year of 384. While the nation has experienced a 5 percent growth in use rates between 2000-2004, Maryland's emergency department visits per 1,000 increased by about 17 percent.

Two recent national studies of emergency department utilization also provide comparative data for states. A Press Ganey survey of 1.5 million patients conducted in 2005 ranked Maryland 48th in emergency room wait time at 246.9 minutes compared to the national average of 222 minutes.[5] The American College of Emergency Physicians (ACEP) representing 23,000 emergency medical specialists recently developed a National Report Card on Emergency Room Medicine. ACEP assigned a letter grade based on four weighted categories: access, 40 percent; quality and patient safety, 25 percent; public health and injury prevention, 10 percent; and medical liability environment, 25 percent. According to ACEP, overall the United States earned a (C-) while Maryland ranked 10th with an overall grade of (B-).[6]

[4] American Hospital Association, *Hospital Statistics 2006*.
[5] Press Ganey Website, EDWaitTimes_http://www.pressganey.com/
[6] ACEP website http://www.acep.org/webportal/Newsroom/

Table 4
Emergency Department Visits, Annual Percent Change and Overall Change: Maryland and United States, 1990-2004

	United States		Maryland	
Year	Emergency Department Visits	% Annual Change	Emergency Department Visits	% Annual Change
1990	86,692,503		1,480,712	
1991	88,533,073	2.12%	1,475,565	-0.35%
1992	90,768,575	2.53%	1,487,712	0.82%
1993	92,554,898	1.97%	1,496,704	0.60%
1994	90,497,301	-2.22%	1,530,453	2.25%
1995	94,745,938	4.69%	1,583,624	3.47%
1996	93,111,592	-1.72%	1,587,149	0.22%
1997	92,819,892	-0.31%	1,624,121	2.33%
1998	94,771,405	2.10%	1,631,416	0.45%
1999	99,484,462	4.97%	1,746,981	7.08%
2000	103,144,030	3.68%	1,839,205	5.28%
2001	105,957,778	2.73%	1,937,838	5.36%
2002	109,951,738	3.77%	2,027,006	4.60%
2003	111,069,871	1.02%	2,052,442	1.25%
2004	112,603,969	1.38%	2,171,877	5.82%
2005	*Not Available*		2,231,768	2.76%
2006	*Not Available*		2,259,004	1.22%
Overall Change				
1990-2000	16,451,527	18.98%	358,493	24.21%
2000-2004	9,459,939	9.17%	332,672	18.09%

Source: American Hospital Association, Hospital Statistics, 1990-2006
(Data reported refers to utilization of non-federal, short-term general community hospitals; and, HSCRC Finanical Data Base, Fiscal Years 1990-2006.)

Table 5
Hospital Emergency Department Visits Per 1,000 Population by State (Ranked highest to lowest): United States, 2004

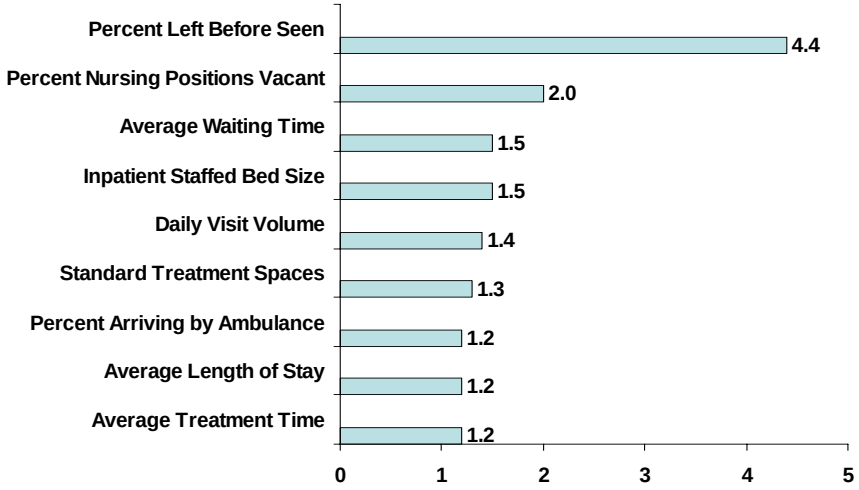
State	ER Visits Per 1,000 Population, 2004	
	Number	Rank
District of Columbia	676.1	1
Mississippi	551.9	2
Louisiana	546.7	3
Kentucky	544.5	4
Maine	540.2	5
Tennessee	501.2	6
Ohio	471.4	7
Massachusetts	448.1	8
Alabama	447.4	9
Missouri	445.1	10
Arkansas	443.5	11
New Hampshire	433.5	12
Pennsylvania	425.4	13
Wyoming	425.3	14
Vermont	421.1	15
Indiana	420.8	16
Michigan	410.9	17
North Carolina	407.8	18
Connecticut	405.1	19
South Carolina	403.6	20
North Dakota	401.0	21
Rhode Island	399.2	22
New York	395.9	23
Georgia	395.6	24
Delaware	392.2	25
Virginia	390.8	26
Florida	389.8	27
Illinois	389.2	28
Maryland	389.0	29
Alaska	386.6	30
Oklahoma	385.5	31
New Mexico	381.2	32
Iowa	360.8	33
Texas	354.2	34
New Jersey	348.0	35
Utah	347.0	36
Idaho	344.3	37
Kansas	341.4	38
Wisconsin	337.8	39
Washington	333.8	40
West Virginia	322.6	41
Oregon	319.1	42
Montana	317.6	43
Nebraska	315.8	44
Minnesota	305.6	45
Arizona	304.3	46
Colorado	292.4	47
California	279.6	48
South Dakota	279.1	49
Nevada	259.6	50
Hawaii	258.0	51
United States	**385.3**	

Source: Hospital Statistics 2006, Copyright by 2006 Health Forum LLC, an affiliate of the American Hospital Association

Emergency Department Crowding: What Do We Mean?

Crowding in the emergency department occurs when the demand for service exceeds the capacity to deliver the service. Increases in the utilization of emergency departments have focused attention on the need to understand and measure the capacity of emergency departments. The National Center for Health Statistics (NCHS) has studied emergency department staffing, capacity, and ambulance diversion and estimated the number of U.S. hospitals experiencing crowding based on the following criteria: (1) having any ambulance diversion hours; (2) having a mean waiting time for urgent cases greater than 60 minutes; or (3) having the percentage of cases left without being seen greater than or equal to 3 percent.[7] Based on these criteria, NCHS estimated that between 40 and 50 percent of U.S. hospitals experienced crowded conditions in the emergency department at some time during 2003 and 2004 with almost two-thirds of metropolitan emergency departments experiencing crowding. According to NCHS, the percent of cases left before being seen in crowded emergency departments was four times as high as the percent in uncrowded emergency departments (Figure 5). The percent of nursing positions vacant in crowded emergency departments was twice that of uncrowded emergency departments; average waiting time was 50 percent longer in crowded emergency departments compared with uncrowded emergency departments.

Figure 5
Ratio of Indexes with Significant Differences Between Crowded and Uncrowded Emergency Departments in Metropolitan Areas



Source: Burt CW, McCaig LF. Staffing, capacity, and ambulance diversion in emergency departments: United States, 2003-04. Advance data from vital and health statistics; No. 376. Hyattsville, MD: National Center for Health Statistics, September 27, 2006.

While data on waiting times and staffing indicators used by NCHS are not available for Maryland hospitals, MIEMSS collects data on ambulance diversion under its County Hospital Alert

[7] Burt CW, McCaig LF. Staffing, capacity, and ambulance diversion in emergency departments: United States, 2003-2004. Advance data from vital and health statistics; No. 376. Hyattsville, MD: National Center for Health Statistics. September 27, 2006.

Tracking System (CHATS).[8] The system collects a uniform data set on the frequency and duration of Yellow and Red Alerts by hospital in each MIEMSS region. 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.[9] During a Yellow Alert period, ambulances are diverted to the next closest 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, MIEMSS developed a plan in December 1999 with the assistance of a Yellow Alert Task Force. This voluntary plan, which was last updated in August 2001, outlines steps to be taken by State agencies, local health departments, hospitals, nursing homes, and EMS providers during periods when emergency departments are experiencing peak utilization (Appendix, Table A-1).

Maryland hospitals have reported increases in Yellow and Red Alert hours over the past four years (Appendix Table A-2). There were about 43,003 Yellow Alert hours reported for fiscal year 2003 (9.8 percent of total available hours). Yellow Alert increased to 50,477 hours or 11.5 percent of total available hours in fiscal year 2006. There were also increases reported in time on Red Alert status. In 2003, there were 23,132 Red Alert hours (5.3 percent of total available hours) reported by Maryland hospitals. Statewide, Red Alert hours reached 33,627 or 7.7 percent of total available hours in fiscal year 2006. The vast majority of both Yellow and Red Alert hours are experienced in the Metropolitan Baltimore (Region III) and Metropolitan Washington (Region V) areas.

In addition to Red and Yellow Alerts, data on reroute and return-to-service experience are important to review. MIEMSS believes that this data may more accurately reflect delays in patient care. While Red and Yellow Alerts are implemented by hospitals and may not be uniformly applied by individual hospitals or across the state, Reroute is implemented by EMS providers. Reroute occurs when EMS personnel have to wait longer than twenty minutes to complete a patient transfer and they have been notified that an emergency department bed will not be available in the next ten minutes.

In Baltimore City, the number of hours that hospitals were on reroute status increased markedly between 2002 and 2005, going from 432 hours to 1,144 hours. The Baltimore Metropolitan Region continues to experience a higher than average mean time in return-to-service.[10] In 2005, units in Region III, experienced an average time of 45 minutes before they were available to respond to another emergency. Ambulance return-to-service times in Baltimore City increased forty-five percent between 2002 and 2005 from a mean time of 30.20 minutes in 2002 to 43.86 minutes in 2005. In the fall of 2006, a Reverse Alert pilot project was initiated in Baltimore City in which MIEMSS contacts

[8] CHATS posts data on the yellow and red alert status of individual hospitals in each region continuously 24/7 on the MIEMSS website at www.miemss.org

[9] Under protocols established by MIEMSS for emergency medical services 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 patient's life; *Priority III*-non-emergent condition requiring medical attention but not on an emergency basis.

[10] Baltimore City Task Force on Emergency Department Crowding: Findings and Recommendations, June 2006

hospitals if the number of EMS units become critically short and asks hospitals to expedite the release of these units.

Table 6 shows several indicators of crowding, including annual Red and Yellow Alert occurrences, time on Red and Yellow Alert, and the annual emergency department volumes, for 2003 and 2006.

Table 6

Measures of Emergency Department Crowding: Maryland, 2003 and 2006

Measure	2003		2006	
	Number of EDs	% of EDs	Number of EDs	% of EDs
Annual Yellow Alert Occurrences (N=50)				
100-199	15	30.0%	11	22.0%
200-300	7	14.0%	15	30.0%
More than 300	6	12.0%	3	6.0%
Annual Red Alert Occurrences (N=50)				
100-199	3	6.0%	7	14.0%
200-300	0	0.0%	0	0.0%
More than 300	0	0.0%	0	0.0%
Annual Reroute Alert Occurrences (N=50)				
100-199	0	0.0%	6	12.0%
200-300	1	2.0%	0	0.0%
More than 300	0	0.0%	1	2.0%
Time on Yellow Alert (% of Annual Available Hours) (N=50)				
10-20%	6	12.0%	16	32.0%
More than 20%	11	22.0%	10	20.0%
Time on Red Alert (% of Annual Available Hours) (N=50)				
10-20%	4	8.0%	7	14.0%
More than 20%	4	8.0%	7	14.0%
Time on Reroute Alert (% of Annual Available Hours) (N=50)				
1-5%	5	10.0%	10	20.0%
More than 5%	0	0.0%	1	2.0%
ED Treatment Spaces (N=50)				
Less than 20	9	18.0%	7	14.0%
20-50	37	74.0%	35	70.0%
More than 50	4	8.0%	8	16.0%
Annual ED Visit Volume (N=46)				
Less than 50,000	29	63.0%	22	47.8%
50,000-75,000	13	28.3%	18	39.1%
More than 75,000	4	8.7%	6	13.0%
Annual ED Visit Volume per Treatment Space (N=46)				
Less than 1,200	12	26.1%	11	23.9%
Between 1,200-1,600	19	41.3%	23	50.0%
More than 1,600	15	32.6%	12	26.1%

Source: Maryland Institute of Emergency Medical Services Systems, CHATS Data, FY2003 and FY2006; Maryland Health Care Commission, Annual Report on Acute Care Hospitals Services and Licensed Bed Capacity, FY 2007; HSCRC Financial Data Base, FY 2003 and 2006. Note Bowie Health Center is included in ED Treatment Spaces.

Emergency Department Use: Outlook for 2015

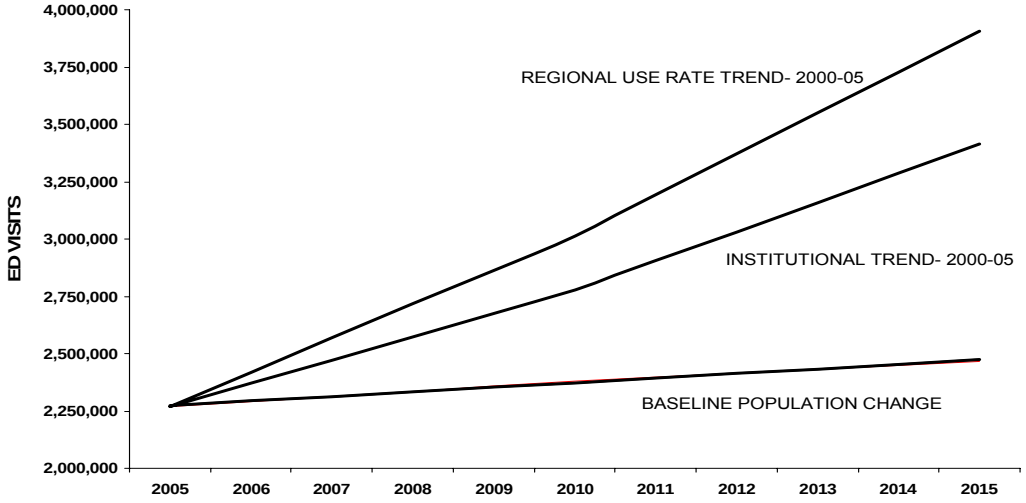
Given the pattern of increasing emergency department use experienced in Maryland, it is important to consider the impact of these trends on the future volume of emergency department visits. Table 7 profiles three hospital emergency department visit volume projection scenarios. It aggregates, at the statewide level, forecasts developed at the MIEMSS regional level. The first scenario, "Baseline Population Change," assumes that hospital emergency department use rates observed in 2005 (visits per MIEMSS regional population at hospital emergency departments in each region) will remain constant. Thus, this scenario predicts emergency department use if the population's use of emergency departments in 2010 and 2015 is unchanged from the per capita use observed in 2005. The second scenario, labeled "Institutional Trend – 2000-05," is based solely on an assumed continuation of the average annual change per year in emergency department visit volume observed from 2000 through 2005. The third scenario, labeled "Regional Use Rate Trend – 2000-05," is based on the observed trend, from 2000-2005, in regional use rates by age, again calculated as visits per MIEMSS regional population at hospital emergency departments in each region. It predicts demand by extending the best-fitting trend line, linear or natural logarithmic, through 2015.

Table 7
Actual 2005 Hospital Emergency Department Visits and Projected Visits: Maryland, 2010 and 2015

	Actual 2005	Projected 2010	Projected 2015
Baseline Population Change	2,268,471	2,379,702	2,466,872
Institutional Trend - 2000-2005		2,776,375	3,414,112
Regional Use Rate Trend - 2000-2005		3,014,389	3,905,942

Sources: Health Services Cost Review Commission, Financial Data Base, Fiscal Year 2005; and, Maryland Department of Planning, Total Population Projection by Age, Sex and Race, October 23, 2006. The actual 2005 hospital emergency department visits includes data for Bowie Health Center.

Figure 6
Hospital ED Visits, 2005, and
Projected Hospital ED Visits, 2005 - 2015
Maryland General Acute Care Hospitals



Data Sources: Health Services Cost Review Commission, Financial Data Base, Fiscal Year 2005: and, Maryland Department of Planning, Total Population Projections by Age, Sex and Race, October 23, 3006

At the regional level, the baseline forecast, accounting only for population growth (or decline) and aging and no changes in per capita use of emergency departments, ranges from relatively minimal growth in Region I, the two westernmost counties of Maryland, with less than a 2 percent increase in visit volume predicted between 2005 and 2015, to near 20 percent growth in the Region Vc, the southern Maryland counties of Charles, Calvert, and St. Mary's, and Region II, the west central counties of Frederick and Washington. Overall, the baseline forecast predicts that emergency department visit volume will increase 5 percent by 2010 and just under 9 percent by 2015.

Future use of emergency departments following the trend of average annual growth in visit volume observed over the last 5 years, the "institutional trend," yields a much stronger forecast of 22 percent growth in emergency department visit volume, statewide, by 2010 and approximately 50 percent by 2015. This trend is negative for Region I, where ED visits volumes have declined in recent years, but strongly positive throughout the rest of the state, most particularly in Region IIIb, suburban Baltimore, Region Va, Montgomery County, and Region Vc, Southern Maryland, where this forecast scenario predicts increases in emergency department visit volume greater than 75 percent between 2005 and 2015. Predicted growth ranges from 31 to 49 percent by 2015 in the state's other regions.

The trend based on regional use rates of the last five years, adjusted for age, yields the largest projections of growth in emergency department visit volume, 33 percent by 2010, statewide, and 72 percent by 2015. Every region is predicted to see growth when this forecast model is applied, ranging from 28 percent growth by 2015 in Region Vb, Prince George's County, to 95 percent growth in Region IIIb, suburban Baltimore.

III. PROFILE: EMERGENCY DEPARTMENT PATIENTS IN MARYLAND

More than one-half of all hospitalized patients are seen in the emergency department prior to admission. The proportion of hospitalized patients admitted via the emergency department increased between 2003 and 2005. In 2005, 60 percent of all inpatients were admitted to the hospital via the emergency department. Data for 2003 shows that 58.7 percent of hospital patients presented in the emergency department. As shown in Table 8, there are substantial differences in emergency department use by hospital service. While 67 percent of medical-surgical are admitted through the emergency department, about 74 percent of psychiatric patients are seen in the emergency department prior to hospitalization. In contrast, only about 1.0 percent of obstetric deliveries are admitted through the emergency department.

Table 8
Discharges Admitted Through the Emergency Department by Major Clinical Service: Maryland, 2003 and 2005

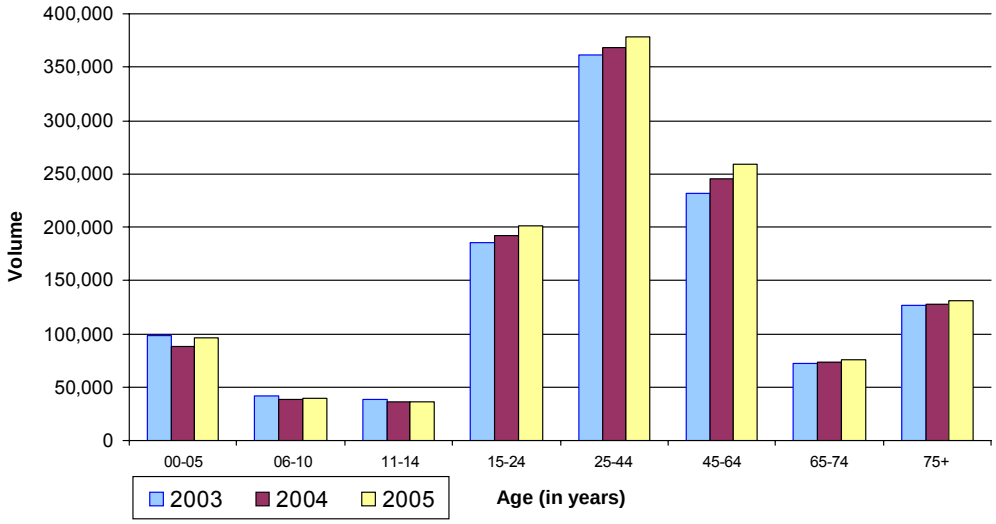
	2003			2005		
	Discharges		Percent	Discharges		Percent
Major Clinical Services	Total	Admitted Thru ED	Admitted Thru ED	Total	Admitted Thru ED	Admitted Thru ED
Medical-Surgical-Gyn-Addictions	495,859	325,168	65.58%	525,914	353,191	67.16%
Pediatric	24,044	15,994	66.52%	23,341	15,672	67.14%
Obstetric						
-Delivery	66,099	1,158	1.75%	66,982	826	1.23%
-Other	8,564	2,493	29.11%	8,991	2,911	32.38%
Psychiatric	29,550	21,619	73.16%	30,663	22,803	74.37%
TOTAL	624,116	366,432	58.71%	655,891	395,403	60.28%
TOTAL (Ex. OB Deliveries)	558,017	365,274	65.46%	588,909	394,577	67.00%

Source: Maryland Health Care Commission. Data reported is from the Hospital Discharge Abstract Data Base for Calendar Years 2003, and 2005.

Demographic Characteristics

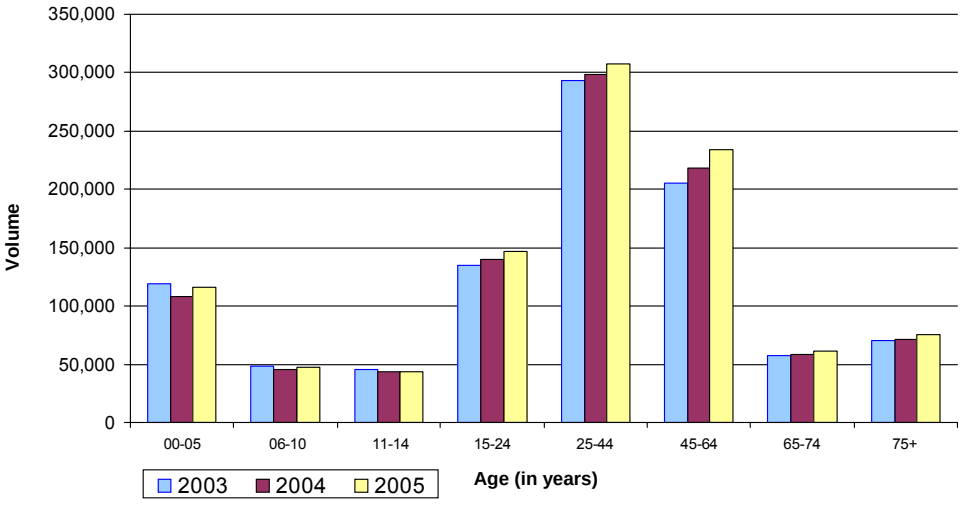
Females are more likely to use the emergency department than males. The utilization pattern by age for the combined emergency department population, those treated and released from the emergency department and those admitted from the emergency department to an inpatient bed, are very similar. Infants and young children (0-5 years) experience more visits than children 6-14 years. Increases in utilization occur in adolescence, peaking between the ages of 25-44 years, then use declines until increasing in the 75-year and older age group.

Figure 7
Emergency Department Utilization for Females by Age Group: Maryland, 2003-2005



Source: HSCRC Hospital Discharge Abstract Data Base and Hospital Ambulatory Care Data Set, CY 2003-2005.

Figure 8
Emergency Department Utilization for Males by Age Group: Maryland, 2003-2005



Source: HSCRC Hospital Discharge Abstract Data Base and Hospital Ambulatory Care Data Set, CY 2003-2005.

There are substantial differences in emergency department utilization by race. In 2005, about 20 percent of emergency department visits by white patients resulted in an inpatient admission compared to about 15 percent of visits by African American patients.

Table 9

Emergency Department Utilization by Race: Maryland, 2003-2005

Race	2003	2004	2005	Race as a % of Total Volume	% Distribution by Admission Status	% Change 2003 - 2005
White						
Admitted from the ED	230,021	231,674	239,927	10.7%	20.4%	4.3%
Treated and Released from the ED	925,501	920,209	937,361	41.7%	79.6%	1.3%
Total ED Visits	1,155,522	1,151,883	1,177,288	52.4%		1.9%
African American						
Admitted from the ED	123,789	127,548	137,720	6.1%	14.8%	11.3%
Treated and Released from the ED	736,257	745,962	790,150	35.1%	85.2%	7.3%
Total ED Visits	860,046	873,510	927,870	41.3%		7.9%
Bi-Racial						
Admitted from the ED			66			
Treated and Released from the ED			1,003			
Total ED Visits			1,069			
American Indian						
Admitted from the ED	607	677	701	0.0%	15.3%	15.5%
Treated and Released from the ED	3,477	3,488	3,891	0.2%	84.7%	11.9%
Total ED Visits	4,084	4,165	4,592	0.2%		12.4%
Asian						
Admitted from the ED	3,907	3,980	4,349	0.2%	16.4%	11.3%
Treated and Released from the ED	20,391	20,922	22,183	1.0%	83.6%	8.8%
Total ED Visits	24,298	24,902	26,532	1.2%		9.2%
Other						
Admitted from the ED	9,247	10,421	12,121	0.5%	11.4%	31.1%
Treated and Released from the ED	72,584	82,147	94,272	4.2%	88.6%	29.9%
Total ED Visits	81,831	92,568	106,393	4.7%		30.0%
Unknown						
Admitted from the ED	528	517	525	0.0%	9.5%	-0.6%
Treated and Released from the ED	4,604	4,583	5,012	0.2%	90.5%	8.9%
Total ED Visits	5,132	5,100	5,537	0.2%		7.9%
Total	2,130,913	2,152,128	2,248,212	100.0%		5.5%

Source: HSCRC, Hospital Discharge Abstract Data Base and Hospital Ambulatory Care Data Set, CY 2003-2005. Note: Bi-Racial is a new classification beginning in CY 2005.

Principal Payment Source

Persons reporting no insurance (including self-pay and charity care) accounted for the largest volume of emergency department visits in 2005. In 2005, self-pay (18.8 percent) was the most frequent expected payment source for all emergency department visits, followed closely by Medicaid (18.3 percent) and Medicare (17.8 percent). Over the three-year period, 2003-2005, the categories of other and charity care have increased significantly as payment sources, though the visit volume is small for both categories.

Table 10
Total Emergency Department Visits By Primary Payment Source: Maryland, 2003-2005

Payer	Total Emergency Department Visits			% of Total Visits	% Change Between
	2003	2004	2005	2005	2003 - 2005
Medicare	374,827	384,309	400,791	17.8%	6.9%
Medicaid	379,791	385,732	411,111	18.3%	8.2%
Other	28,410	31,823	38,841	1.7%	36.7%
Blue Cross	303,436	290,325	296,421	13.2%	-2.3%
Commercial	248,983	246,365	258,090	11.5%	3.7%
Workers Comp	45,640	44,338	41,323	1.8%	-9.5%
Self Pay	390,898	407,386	423,139	18.8%	8.2%
Charity	6,467	7,205	9,301	0.4%	43.8%
HMO	345,489	349,975	365,730	16.3%	5.9%
Unknown	5,246	4,619	4,534	0.2%	-13.6%
Total	2,129,187	2,152,077	2,249,281	100.0%	5.6%

Source: HSCRC, Hospital Discharge Abstract Data Base and Hospital Ambulatory Care Data Set, CY 2003-2005.

The primary payment source differs between those patients who are discharged from the emergency department and those patients who are admitted from the emergency department to an inpatient bed. Medicare is the largest payment source by volume, of those patients who are admitted to an inpatient bed through the emergency department—accounting for almost one-half of the admissions from the emergency department to an inpatient bed. In 2005, the largest volume of visits for patients treated and released from emergency departments are categorized as self-pay (21.4 percent), followed by patients enrolled in an HMO (17.2 percent) or a Medicaid HMO (16.0 percent). (Refer to Appendix Table A-8)

Principal Diagnosis Group

Three major principal diagnosis categories combined account for more than one-half of all emergency department visits: injuries and poisonings; symptoms, signs, and ill-defined conditions; and respiratory diseases. Injuries and poisoning accounted for about 572,000 of all emergency department visits (26.1 percent) during 2005. Symptoms, signs and ill-defined conditions represented 16.7 percent, or about 365,000 visits to the emergency department in 2005. Respiratory diseases, which occurred less frequently in 2004 as compared with 2005, represented 11.5 percent of all patients seen in Maryland hospital emergency departments.

There are differences in the leading causes of emergency department utilization when patients admitted to an inpatient bed and those treated and released are compared. For patients admitted for inpatient care following an emergency department visit, the leading principal diagnosis categories are: diseases of the circulatory system; diseases of the respiratory system; and diseases of the digestive system. The leading causes of emergency department visits for patients who do not require admission are: injuries and poisoning; symptoms, signs, and ill-defined conditions; and respiratory diseases.

Table 11

Total Emergency Department Visits by Primary Diagnosis: Maryland, 2003-2005

Primary Diagnosis	2003	2004	2005	% Change Between 2003-2005
All other diagnoses	10,559	10,881	11,470	8.6%
Diseases of genitourinary system	101,077	106,628	112,580	11.4%
Diseases of the digestive system	134,042	145,024	146,608	9.4%
Diseases of the musculosketal system & connective tissue	120,709	128,955	134,957	11.8%
Diseases of the circulatory system	112,202	113,560	113,826	1.4%
Diseases of the nervous system & sense organs	99,538	93,504	97,829	-1.7%
Diseases of the respiratory system	260,703	219,140	251,567	-3.5%
Diseases of the skin & subcutaneous tissue	70,312	79,912	88,743	26.2%
Endocrine, nutritional & metabolic diseases & immunity disorders	39,410	40,993	42,918	8.9%
Infectious and parasitic diseases	77,186	72,144	82,189	6.5%
Injury & poisoning	568,256	574,274	571,642	0.6%
Mental disorders	90,896	95,057	96,420	6.1%
Neoplasm	11,211	11,266	11,567	3.2%
Other	50,358	58,554	60,965	21.1%
Symptoms, signs & ill-defined conditions	332,760	344,921	365,107	9.7%
Unknown	527	613	580	10.1%
Total	2,079,747	2,095,426	2,188,968	5.3%

Source: HSCRC, Hospital Discharge Abstract Data Base and Hospital Ambulatory Care Data Set, CY 2003-2005.

Table 12

Primary Diagnosis for Patients Admitted from the Emergency Department: Maryland, 2005

Primary Diagnosis	2005	Ranking
Diseases of the circulatory system	78,948	20.0%
Diseases of the respiratory system	52,490	13.3%
Diseases of the digestive system	50,336	12.7%
Symptoms, signs & ill-defined conditions	37,811	9.6%
Injury & poisoning	37,705	9.5%
Mental disorders	28,229	7.1%
Infectious and parasitic diseases	23,106	5.8%
Disease of genitourinary system	19,922	5.0%
Endocrine, nutritional & metabolic diseases & immunity disorders	19,140	4.8%
All other diagnoses	11,470	2.9%
Diseases of the skin & subcutaneous tissue	11,236	2.8%
Neoplasm	9,118	2.3%
Diseases of the musculosketal system & connective tissue	8,150	2.1%
Diseases of the nervous system & sense organs	7,168	1.8%
Unknown	580	0.1%
Total	395,409	100.0%

Source: HSCRC, Hospital Discharge Abstract Data Base, CY 2005.

Table 13

Primary Diagnosis for Patients Treated and Released from the Emergency Department: Maryland, 2005

Primary Diagnosis	2005	Ranking
Injury & poisoning	533,937	29.8%
Symptoms, signs & ill-defined conditions	327,296	18.2%
Respiratory system	199,077	11.1%
Musculosketal system & connective tissue	126,807	7.1%
Digestive system	96,272	5.4%
Genitourinary system	92,658	5.2%
Nervous system & sense organs	90,661	5.1%
Skin & subcutaneous tissue	77,507	4.3%
Mental disorders	68,191	3.8%
Supplementary classification	60,965	3.4%
Infectious and parasitic diseases	59,083	3.3%
Circulatory system	34,878	1.9%
Endocrine, nutritional & metabolic diseases & immunity disorders	23,778	1.3%
Neoplasm	2,449	0.1%
Total	1,793,559	100.0%

Source: HSCRC, Hospital Ambulatory Care Data Set CY 2005.

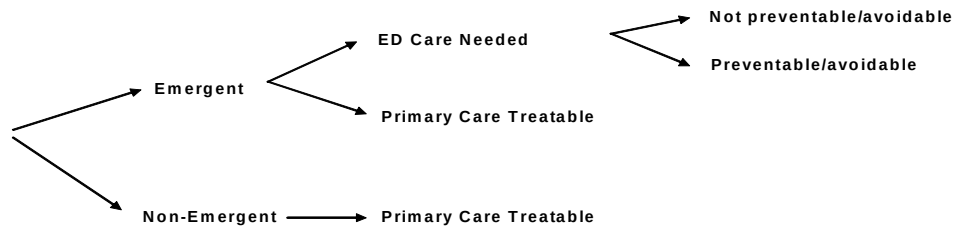
Classification of the Appropriateness and Urgency of Emergency Department Care

To examine how emergency department services are used, researchers in New York have developed a classification system (Figure 9) using four categories:

- **Non-Emergent** immediate medical care was not required within 12 hours.
- **Emergent/Primary Care Treatable** care was required within 12 hours but could have been safely provided in a primary care setting.
- **Emergent–ED Care Needed-Preventable/ Avoidable** emergency department care was required but the emergent nature of the condition was potentially preventable if adequate ambulatory care was received.
- **Emergent–ED Care Needed- Not Preventable/ Avoidable** emergency department care was required and ambulatory care could not prevent the condition.
- **Other Categories – Injuries, Inpatient Admission, Mental Health, Substance Abuse**[11]

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

Figure 9
Emergency Department Classification Process



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

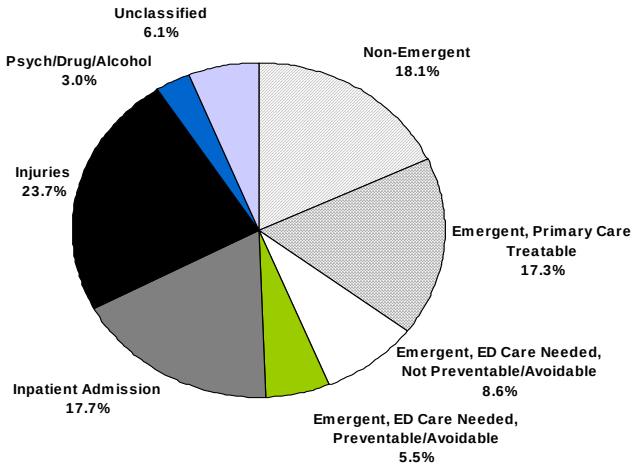
The NYU ED Classification Algorithm was developed in 2002 to categorize non-admitted emergency department visits by clinical characteristics. The algorithm is based on the input of an expert panel composed of emergency department and primary care physicians. The reviewers examined 6,000 emergency department medical records including initial complaint, presenting symptoms, vital signs, medical history, age, gender, diagnosis, procedure performed and resources used in the emergency department. This information was then used to develop an algorithm based on admitting diagnosis. The algorithm assigns a probability or percentage to each of four categories: non-emergent, emergent/primary care treatable, emergent/ED care needed-preventable/avoidable, emergent/ED care needed-not preventable/avoidable. The probability across all four categories will be one. The algorithm was later modified to categorize mental health, injury, and drug and alcohol abuse conditions. These conditions are binary and are not part of the weighted percentage. In addition, there is a category of unclassified admitting diagnosis which are conditions that do not have a probability or binary indicator assigned.

There are several limitations to the NYU study and its application to Maryland emergency department utilization. The algorithm was developed using emergency department cases from New York, and may not be representative of practice patterns in other geographic areas. Given that the study was conducted using 1994 and 1999 data, it also may not reflect changes in the practice of medicine regarding emergency department treatment. In addition, the author makes clear that the algorithm is not a "triage tool or a mechanism to determine whether ED use in a specific case is appropriate". Despite these limitations, a number of other states and the Robert Wood Johnson Foundation's Urgent Matters project have used the methodology as a tool to understand the extent to which communities rely on emergency departments for care that could be delivered in a primary care

setting.[12] The use of Maryland emergency departments for non-emergent and emergent care based on this tool is discussed below.

The results of the classification of Maryland emergency department visits by urgency and appropriateness are shown in Figure 10. Overall, approximately one-third of visits are classified as not requiring care in an emergency department. Within this one-third, about one-half (18.0 percent of total visits) were considered to be non-emergent and half (17.2 percent of total visits) were considered to be emergent but primary care treatable. Visits related to injuries accounted for 23.7 percent of all emergency department use in 2005.

Figure 10
Classification of Hospital Emergency Department Visits: Maryland, 2005



Source: Maryland Health Care Commission (The classification of emergency department visits is based on the methodology developed by John Billings and colleagues at the Robert F. Wagner School of Public Service, New York University. The emergency department visit data reported is from the Hospital Discharge Data Base and Hospital Ambulatory Care Data Base for January-December 2005.)

The results of the classification by patient characteristics is highlighted below.

Payment Source

- The largest users of non-emergent care are patients without insurance (2005–21.7 percent) followed closely by Medicaid recipients (2005-21.3 percent). Medicare recipients (2005-10.3 percent) are least likely to be seen in the emergency department for non-emergent care. The trend for all payment sources reflects an increased use of the emergency department for non-emergent care.

- Medicaid recipients (2005-20.7 percent) and those patients without insurance (2005–19.1 percent) are most likely to receive care for conditions classified as primary care, treatable in

[12] Regenstein, M. et al. *Walking a Tightrope: The State of the Safety Net in Ten U.S. Communities*. Urgent Matters, May 2004, p. 37.

the emergency department. Patients that are classified in the payer group other, including other government programs and worker's compensation, (2005-10.2 percent) are least likely to seek care for conditions that are classified as primary care, treatable.

- Visits classified as emergency department care needed, avoidable also have a high use by Medicaid recipients (2005-7.3 percent) and patients without insurance (2005–6.1 percent). Medicare beneficiaries are three percentage points less than Medicaid recipients. Over the five-year period (2001-2005), Medicaid recipients' use of the emergency department for care that is avoidable has trended downward while patients without insurance have experienced a slight increase.

- For conditions classified as emergency department care needed, not preventable/avoidable, the most common payer was managed care (2005-10.5 percent) and the least frequent payer, by volume of visits, was classified as unknown (2005-6.0 percent).

Table 14
Classification of Emergency Department Visits by Payment Source:
Maryland, 2005

Payment Source	Non- Emergent	Emergent, PC Treatable	Emergent, Preventable/ Avoidable	Emergent, Not Preventable/ Avoidable	Other*
Commercial/Blue Cross	18.6%	17.7%	5.2%	9.6%	48.8%
Medicaid	21.3%	20.7%	7.3%	7.3%	43.4%
Medicare	10.3%	11.0%	4.1%	7.7%	66.9%
Private HMO	18.8%	18.9%	5.6%	10.5%	46.3%
No Insurance	21.7%	19.1%	6.1%	8.4%	44.8%
Other**/Unknown	13.5%	10.2%	2.7%	6.0%	67.6%
Total	**18.0%**	**17.2%**	**5.5%**	**8.6%**	**50.6%**

Source: The classification system is from Billings, J., et al. Emergency Department Use: The New York Story. The Commonwealth Fund Issue Brief, November 2000. Data HSCRC, Hospital Discharge Abstract Data Base and Hospital Ambulatory Care Data Set, CY 2005. * Other includes injuries, inpatient admission, mental health, substance abuse. **Other is defined as Worker's Compensation, Government Programs, and Title V.

Race

- African Americans (2005-21.0 percent) are the largest users of the emergency department for non-emergent care compared to whites (2005–15.5 percent). The fastest growing group by race to use the emergency department for non-emergent care are patients classified as other, which has increased by almost 2 percent between 2001 (17.5 percent) and 2005 (19.9 percent).

- Biracial (2005-22.4 percent) and African Americans (2005-19.7 percent) are also the largest group of users for emergency department visits classified as primary care, treatable compared to white patients (2005–15.2 percent).

- Biracial (2005-7.6 percent) and African Americans (2005-7.0 percent) are more likely to use the emergency department for care that is classified as emergency department care needed,

avoidable with whites (2005– 4.5 percent) having the lowest use. These numbers have remained relatively stable over a five-year period of time (2001-2005).

- Visits classified as emergency department care needed, not preventable/avoidable are most likely to be used by those classified as other (2005-9.1 percent). Those classified as bi-racial have the lowest number of visits in this category (2005–6.8 percent). Over the five-year period (2001-2005), African Americans have trended downward and whites (.4 percent increase) and other (.1 percent increase) have trended upward.

Table 15
Classification of Emergency Room Visits by Race:
Maryland, 2005

Race	Non- Emergent	Emergent, PC Treatable	Emergent, Preventable/ Avoidable	Emergent, Not Preventable/ Avoidable	Other*
African American	21.0%	19.7%	7.0%	8.3%	44.1%
American Indian	18.3%	18.4%	5.0%	9.9%	48.4%
Asian	17.3%	16.7%	4.8%	9.2%	52.1%
Bi-Racial	20.6%	22.4%	7.6%	6.8%	42.6%
White	15.5%	15.2%	4.5%	8.8%	56.0%
Other	19.9%	19.1%	4.9%	9.1%	47.0%
Unknown	21.1%	18.6%	4.6%	8.4%	47.3%
Total	**18.0%**	**17.2%**	**5.5%**	**8.6%**	**50.6%**

Source: The classification system is from Billings, J., et al. Emergency Department Use: The New York Story. The Commonwealth Fund Issue Brief, November 2000. Data HSCRC, Hospital Discharge Abstract Data Base and Hospital Ambulatory Care Data Set, CY 2005. * Other includes injuries, inpatient admission, mental health, and substance abuse.

Age

- Persons between the ages of 25-44 years (2005-32 percent) are the largest users of emergency departments, followed next by those between 45-64 years of age (2005–19 percent).

- The largest users of non-emergent care are infants and young children ages 0-5 years (2005-23.2 percent) and the lowest those 75 years and older (2005-8.1 percent). Over the five-year period (2001-2005), all ages have experienced an increase in using the emergency department for visits classified as non-emergent.

- The above use pattern holds true for visits classified as primary care, treatable with infants and young children between the ages of 0-5 years being the highest users (2005-27.6 percent) and those 75 years and older the lowest users. The fastest growing age brackets over the last five years (2001-2005) are those between ages 11-14 years (increased by 1.3 percent) and ages 6-10 years (increased by 1.7 percent).

- Visits classified as emergency department care needed, preventable/avoidable are most often used by infants and young children ages 0-5 years (2005-9.8 percent) with those 75 years and older having the lowest use (2005–3.4 percent). Emergency department visits that could be avoided have been increasing in children and decreasing in adults.

- The most common age for visits classified as emergency department care needed, not avoidable are between the ages of 45-64 (2005-10.1 percent); children between the ages of 11-14 years (2005-5.1 percent) have the lowest emergency department use for visits classified as not avoidable. All age groups have experienced a slight increase in visits classified as not avoidable.

Table 16
Classification of Emergency Department Visits by Age Group:
Maryland, 2005

Age	Non- Emergent	Emergent, PC Treatable	Emergent, Preventable/ Avoidable	Emergent, Not Preventable/ Avoidable	Other*
0-5 Years	23.2%	27.6%	9.8%	6.8%	32.7%
6-10 Years	19.8%	18.7%	8.7%	5.2%	47.6%
11-14 Years	15.3%	13.6%	6.1%	5.1%	59.8%
15-24 Years	21.5%	18.1%	5.3%	7.8%	47.3%
25-44 Years	20.8%	18.6%	5.2%	9.9%	45.6%
45-64 Years	15.8%	15.6%	5.0%	10.1%	53.7%
65-74 Years	11.1%	12.3%	4.2%	8.8%	63.6%
75+ Years	8.1%	9.0%	3.4%	7.0%	72.5%
Unknown	16.1%	6.4%	27.5%	0.0%	50.0%
Total	**18.0%**	**17.2%**	**5.5%**	**8.6%**	**50.6%**

Source: The classification system is from Billings, J., et al. Emergency Department Use: The New York Story. The Commonwealth Fund Issue Brief, November 2000. Data HSCRC, Hospital Discharge Abstract Data Base and Hospital Ambulatory Care Data Set, CY 2005. * Other includes injuries, inpatient admission, mental health, and substance abuse.

MIEMSS Region

- The Metropolitan Baltimore region accounts for 54 percent of all emergency department visits in the state of Maryland by volume, with the Washington Metropolitan region accounting for 24 percent. All other regions are less than 10 percent.

- The Metropolitan Washington region (2005-18.6 percent) experienced the highest number of visits classified as non-emergent care followed closely by the Baltimore Region III, Baltimore and the surrounding counties (2005-18.2 percent). The Eastern Shore region (2005-16.9 percent) experienced the lowest volume of emergency department visits classified as non-emergent. The trend is upward for all regions over the last four years.

- The Metropolitan Washington region has the highest number of emergency department visits classified as primary care, treatable (2005-17.8 percent) almost 1 percent higher than the Metropolitan Baltimore region (2005-17.0 percent). The lowest use occurs on the Eastern Shore (2005-16.7 percent).

- The largest users of emergency department care needed, preventable/avoidable reside in Metropolitan Baltimore (2005-5.7 percent), the lowest users are located in Allegany and Garrett counties, Region I (2005-4.7 percent). This trend is stable over all regions for the three-year period (2002-2005).

- Emergency department care needed, not avoidable is highest in Frederick and Washington counties or Region II (2005-10.1 percent). The lowest users reside in Allegany and Garrett counties, Region I, at (2005-7.3 percent). The trend is slightly increasing from 2002 (2002 - 8.4 percent to 2005 -8.6 percent).

Table 17
Classification of Emergency Department Visits by MIEMSS Region: Maryland, 2005

MIEMSS Region	Non- Emergent	Emergent, PC Treatable	Emergent, Preventable/ Avoidable	Emergent, Not Preventable/ Avoidable	Other*
Region I	17.6%	17.4%	4.7%	7.3%	52.9%
Region II	17.3%	18.2%	4.9%	10.1%	49.5%
Region III	18.2%	17.0%	5.7%	8.4%	50.7%
Region IV	16.9%	16.7%	5.6%	8.1%	52.7%
Region V	17.7%	17.4%	5.4%	8.7%	50.8%
Total	**18.0%**	**17.2%**	**5.5%**	**8.6%**	**50.6%**

Source: The classification system is from Billings, J., et al. Emergency Department Use: The New York Story. The Commonwealth Fund Issue Brief, November 2000. Data HSCRC, Hospital Discharge Abstract Data Base and Hospital Ambulatory Care Data Set, CY 2005. * Other includes injuries, inpatient admission, mental health, and substance abuse.

Region I (Allegany and Garrett Counties); Region II (Frederick and Washington Counties); Region III (Baltimore City and Anne Arundel, Baltimore, Carroll, Harford, and Howard Counties); Region IV (Caroline, Cecil, Dorchester, Kent, Queen Anne's, Somerset, Talbot, Wicomico, and Worcester Counties); and, Region V (Calvert, Charles, Montgomery, Prince George's, and St. Mary's Counties).

Maryland Compared to Other States

A number of states and the Urgent Matters project of the Robert Wood Johnson Foundation have used this classification system to analyze the appropriateness and urgency of emergency department utilization. As part of the Urgent Matters project, this classification system was used to analyze emergency department utilization at ten participating hospitals in the following locations: Atlanta, Boston, Detroit, Fairfax County, Lincoln, Memphis, Phoenix, Queens, San Antonio, and San Diego. [13] Table 18 compares data from ten Urgent Matters participants, to Maryland's emergency department visits. While almost about one-third of the visits presenting to Maryland emergency departments could be treated in other settings, this is well below the experience of the Urgent Matters project sites. For the ten Urgent Matter sites, 42 percent of the emergency department visits were avoidable.

[13] Regenstein, M et al. *Walking A Tightrope: The State of the Safety Net in Ten U.S. Communities*, Urgent Matters, May 2004.

Table 18
Emergency Department Visits by Urgency and Appropriateness:
Urgent Matter Hospital Sites vs. Maryland, 2004

	Urgent Matters	Maryland	Difference
Non-Emergent	21.4%	17.6 %	+3.8
Emergent, Primary Care Treatable	20.6%	16.6 %	+4.0
Total Avoidable ED Visits	**42.0%**	**34.2%**	**+7.8**
Emergent, Preventable	7.8%	5.4 %	+2.4
Emergent, Not Preventable	10.3%	8.5 %	+1.8
All Other Categories	39.9%	51.9 %	-12.0

Source: Regenstein, M. et al. *Walking a Tightrope: The State of the Safety Net in Ten U.S. Communities*. Urgent Matters, May 2004. The classification system is from Billings, J., et al. Emergency Department Use: The New York Story. The Commonwealth Fund Issue Brief, November 2000. The data reported for all Maryland hospitals is from the HSCRC Hospital Discharge Abstract Data Base and Hospital Ambulatory Care Data Set for calendar year 2004.

Special Populations

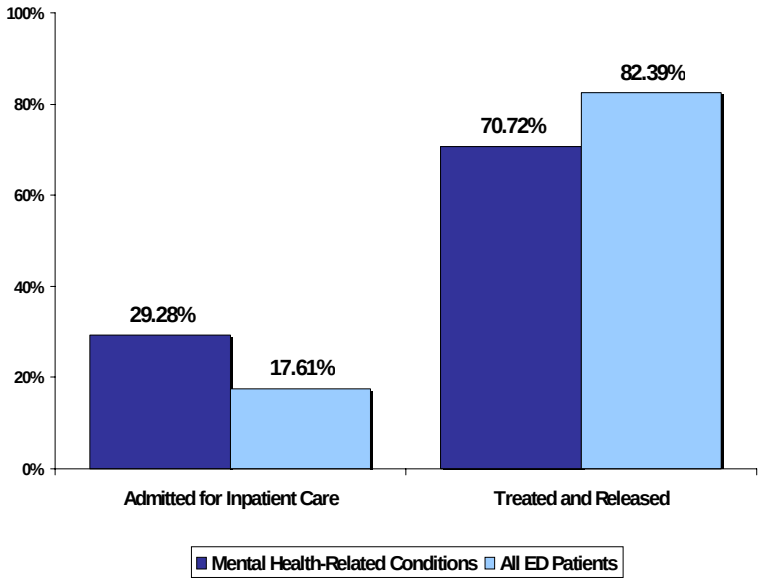
- **Persons with Mental Health-Related Conditions**

Of the 2.3 million visits to Maryland hospital emergency departments during 2005, about 96,000, or 4.3 percent, were due to mental health problems as defined by principal diagnosis codes. The number of emergency department visits for mental health conditions increased from 91,203 to 96,413 between 2002 and 2005—an increase of 5.7 percent. Over this same time period, overall use of Maryland emergency departments increased by 10.4 percent.

About 68 percent of all mental health related visits in 2005 involved psychoses, neuroses, and personality disorders; 28 percent involved substance abuse disorders; and about 4 percent involved other mental disorders. Almost 43 percent of mental health-related emergency department visits were among young adults 25-44 years of age. For all emergency department visits, about 30 percent of patients were in the 25-44 year age group.

Patients with mental health-related conditions who visit hospital emergency departments are more likely to be admitted. Following an emergency department visit, 29 percent of patients with a mental health-related principal diagnosis were admitted for inpatient care and about 71 percent were treated and released.

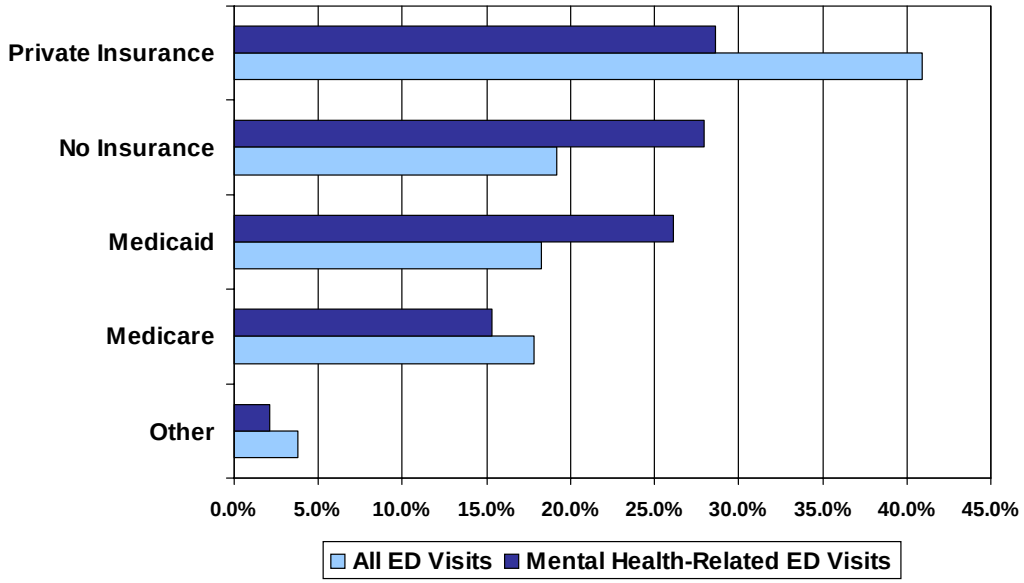
Figure 11
Disposition of All Emergency Department Patients and Patients with Mental Health-Related Conditions: Maryland, 2005



Source: Maryland Health Care Commission (Data reported is from the Hospital Discharge Abstract Data Base; and Hospital Ambulatory Care Data Base for calendar year 2005. Patients with mental disorders include ICD-9 codes 290-319.)

When compared with overall emergency department use, a higher proportion of mental health-related visits are covered by public sector programs or have no reported insurance coverage. Of all visits with a mental health-related primary diagnosis in 2005, 26 percent had coverage under the Medicaid program and 15 percent were enrolled in the Medicare program; 28 percent reported no insurance (i.e., self-pay or no charge). For all emergency department visits, about 36 percent were covered by public sector programs (Medicaid, 18 percent; Medicare, 17.8 percent); 19 percent report no insurance. While private insurance programs (including Blue Cross and commercial plans) accounted for 41 percent of all emergency department visits, they covered only 29 percent of visits for patients with diagnoses of mental health conditions in 2005.

Figure 12
Total Emergency Department Visits and Mental Health-Related Visits by Major Payment Source: Maryland, 2005



Source: Maryland Health Care Commission (Data reported is from the Hospital Discharge Abstract Data Base; and Hospital Ambulatory Care Data Base for calendar year 2005. Patients with mental disorders include ICD-9 codes 290-319. No insurance includes patients reported as self pay and no charge.)

Table 19
Emergency Department Visits for Mental Health-Related Conditions by Principal Payment Source: Maryland, 2002 and 2005

Principal Payment Source	ED Visits for Mental Health-Related Conditions			
	2002	2005	Change, 2002-2005	% Change, 2002-2005
No Insurance	26,129	26,886	757	2.90%
Medicaid	21,952	25,148	3,196	14.56%
Medicare	13,080	14,723	1,643	12.56%
Private Insurance	28,505	27,594	-911	-3.20%
Other and Unknown	1,537	2,062	525	34.16%
Total	**91,203**	**96,413**	**5,210**	**5.71%**

Source: Maryland Health Care Commission (Data reported is from the Hospital Discharge Abstract Data Base and Hospital Ambulatory Surgery Data Base from calendar year 2005. Patients with mental disorders includes ICD-9 codes 2990-319. The category of no insurance includes patients reported as self pay and no charge.)

Between 2002 and 2005, the number of emergency department visits for patients with mental health-related conditions who had no insurance increased only slightly. Patients reporting Medicaid as the principal payment source increased by about 15 percent between 2002 and 2005—from 21,952 to 25,148. The number of mental health-related emergency department visits for Medicare patients increased by about 13 percent. There were declines in the number of emergency department visits for privately insured patients with mental health-related conditions over the 2002 to 2005 period.

- **Medicaid Recipients**

Research on the use of emergency departments by Medicaid recipients indicates that they are more likely to have health problems, including chronic conditions. When asked to self assess their health status, 40 percent of adult Medicaid recipients describe their health as poor, compared to 25 percent of the uninsured and 13 percent of those privately insured. Medicaid recipients have a higher use for all medical services including the emergency department. Contributing factors include, an increased need for services, lower cost sharing and limited access to primary and specialty care.[14]

Medicaid recipients accounted for 411,486 emergency department visits in 2005 or 18.3 percent of all emergency department visits in Maryland. Medicaid is the third most common payment source for those admitted from the emergency department to the hospital. In 2005, Medicaid accounted for 15.9 percent of all admissions from the emergency department. Between 2002 and 2005, Medicaid patients admitted from the emergency department to an inpatient bed increased by 8.5 percent. Medicaid is also the second most common payment source for patients that are treated and released from the emergency department, accounting for 18.8 percent of all visits in this category. Medicaid recipients that are treated and released has also grown—increasing between 2002 and 2005 by 8.4 percent.

In 1997, Maryland implemented HealthChoice, a managed Medicaid program. HealthChoice had approximately 483,000 beneficiaries in 2004. The program has grown by almost 75,000 lives between 2000 and 2004. The number of ambulatory care visits has increased, suggesting an improvement in access to care. During the initial phase of the HealthChoice implementation an increase in the use of the emergency department was noted. According to the HealthChoice evaluation, use stabilized beginning in CY 2001.[15] There are variations in emergency department use by age, region and program enrollment. The highest users by age are children 1 to 2 years old, the highest regional use occurs in Baltimore City and Western Maryland and the highest users by coverage group are those recipients that are enrollees with disability in the SSI coverage group.

Classification of Medicaid visits for 2005 using the NYU ED Classification Algorithm applied to primary diagnosis found that 42.0 percent of all Medicaid visits could have been treated in a less costly setting. Non-emergent visits accounted for 21.3 percent of all emergency department visits, 20.7 percent were classified as primary care, treatable and 7.3 percent of the emergency department visits could have been avoided if earlier ambulatory care had been sought.

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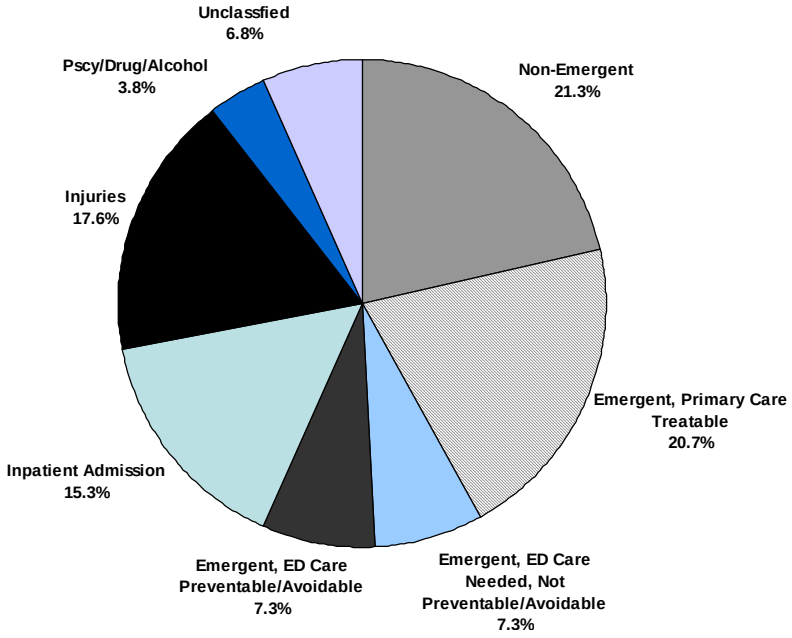
[14] Cunningham, P. 2006 Medicaid/SCHIP Cuts and Hospitals Emergency Department Use. *Health Affairs*. Volume 25; Number 1.

[15] Health Choice Evaluation, March 2006.

Figure 13
Classification of Medicaid Emergency Department Visits: Maryland, 2005



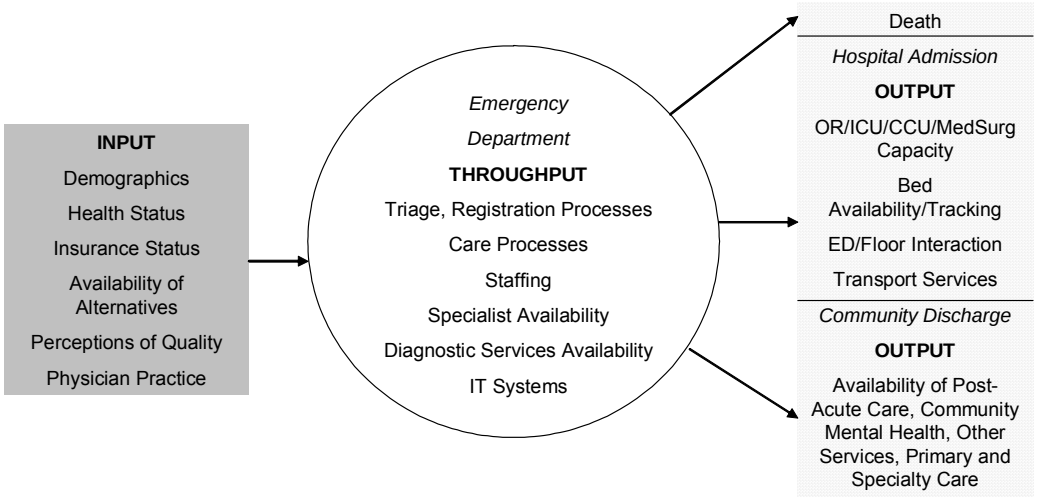
Source: Maryland Health Car Commission (The classification of emergency department visits is based on the methodology developed by John Billings and colleagues at the Robert F. Wagner School of Public Service, New York University. The emergency department visits data reported is for the Hospitals Discharge Data Base and Hospitals Ambulatory Care Data Base for CY 2005.)

IV. Emergency Department Crowding and Patient Flow

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) demand for emergency department services; (2) patient flow through the emergency department; and, (3) hospital and community health care system capacity to address treatment and other needs following discharge from the emergency department. Taken together, these complex and interrelated factors drive how hospital emergency departments are utilized.

The Urgent Matters project uses an Input/Throughput/Output (I/T/O) model as a framework for understanding why problems with patient flow can result in backup in the emergency department.[16] As shown in Figure 14, input includes factors that influence the volume of patients likely to demand care in the emergency department. Throughput refers to the processes of care that impact how quickly a patient can move through the emergency department. Output refers to the ability to discharge emergency department patients to the appropriate inpatient or community-based service.

Figure 14
Input/Throughput/Output Model of Emergency Department Patient Flow



Source: Urgent Matters, The George Washington University Medical Center, *Bursting at the Seams: Improving Patient Flow to Help America's Emergency Departments*, September 2004.

[16] Wilson, MJ and Nguyen, K. *Bursting at the Seams: Improving Patient Flow to Help America's Emergency Departments*. Urgent Matters, The George Washington University Medical Center, September 2004, p. 5.

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.

Input: Demand for Emergency Department Services

Maryland's total statewide population increased by 5.9 percent between 2000 and 2005. Over this same time period, visits to hospital emergency departments grew by about 18 percent. This data suggest 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, noted in the Commission's 2002 report on emergency department crowding, 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 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. [17] 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.[18, 19]

Another factor contributing to increased use concerns the use of emergency department services for non-emergent care. While the use of emergency departments for primary care has been a long-standing issue, recent analyses by the Center for Studying Health System Change from site visits to 12 nationally representative communities suggest that this problem has intensified in recent years.[20] Data collected in the National Hospital Ambulatory Medical Care Survey for emergency department services in 1999 indicate that only 17 percent of visits were for emergent conditions.[21] 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

[17] 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.
[18] Blendon, RJ et al., "Understanding the Managed Care Backlash", *Health Affairs* (July-August 1998), Vol. 17:4, pp. 80-94.
[19] Draper, DA et al., "The Changing Face of Managed Care", *Health Affairs* (January-February 2002), Vol. 21:1, pp. 11-23.
[20] O'Malley, AS, et al., *Rising Pressure: Hospital Emergency Departments as Barometers of the Health Care System*, Issue Brief Findings from the Center for Study Health System Change, No. 101, November 2005. The 12 communities are: Boston; Cleveland; Greenville, SC; Indianapolis; Lansing, Mich.; Little Rock, Ark.; Miami; northern New Jersey; Orange County, California; Phoenix; Seattle; and, Syracuse, NY.
[21] 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.

(requiring care within 1-2 hours), 9 percent were classified as non-urgent (requiring care between 2 – 24 hours), and 27 percent were unknown. Data reported for 2004 in this national survey shows that the percentage of emergency department visits for non-urgent (12.5 percent) or semi-urgent (21.8 percent) reasons has increased over the past five years.[22]

A recent study examining the growth in emergency department visits in California found four key factors driving avoidable users to the emergency department: lack of access to medical care outside the emergency department; lack of advice from physicians on how to handle sudden medical conditions; lack of alternatives to the emergency department; and positive attitudes toward emergency departments.[23] Data from this California study show that 46 percent of recent emergency department users reported that their problem could have been handled by a primary care physician had one been available. Of those who thought that their problem could have been handled by a primary care provider, two in three said they would have gone to a primary care physician instead of the emergency department had an appointment been available.

Available data suggest that use of Maryland hospital emergency department for non-emergent care has also increased in recent years. As noted in Part III of this report, more than one-third (35.4 percent) of all emergency department visits in Maryland were classified as non-emergent or emergent but primary care treatable in 2005—an increase over experience in 2001. In 2001, 33.9 percent of visits to Maryland hospital emergency departments were classified as non-emergent or emergent, but primary care treatable.

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.

Access to primary care physicians is another factor that potentially contributes to the increase in emergency department visits for non-urgent care. 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

[22] McCaig LF, Nawar, EW. National Hospital Ambulatory Medical Care Survey: 2004 Emergency Department Summary. *Advance Data from Vital and Health Statistics*. No. 372. National Center for Health Statistics, June 23, 2006.

[23] California Health Foundation, *Overuse of Emergency Departments Among Insured Californians*, Issue Brief, October 2006. The study methodology involved interviews conducted by telephone of 1,400 adult consumers and a mail survey of 107 emergency medicine and 400 primary care physicians. The response rate for primary care physicians was 41 percent and the response rate for emergency medicine physicians was 54 percent. The physician survey included only physicians who spend at least 20 hours per week on direct patient care. The telephone survey was conducted between February 23-March 19, 2006; the mail survey was conducted in March-June 2006.

emergency department care.[24] 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.[25]

Given the increase in emergency department use and the proportion of visits for non-emergent care, there has been increased attention to improving access to primary care services and redirecting non-emergent care from hospital emergency departments to other community resources. The formation of the Maryland Community Health Resources Commission under the Community Health Care Access and Safety Net Act of 2005 is a key Maryland initiative in strengthening the primary care infrastructure. Under Health-General Article §19-2102, the purpose of this commission is to increase access to health care through community health resources[26]. The Maryland Community Health Resources Commission has a wide range of duties that include: identifying programs and policies to encourage specialist providers to serve individuals referred from community health resources; identifying programs and policies to encourage hospitals and community health resources to partner to increase access to health care services; establishing a reverse referral pilot program under which a hospital will identify and assist patients in accessing health care services through a community health resource; and, work with community health resources, hospital systems, and others to develop a unified information and data management system for use by all community health resources that is integrated with the local hospital systems to track the treatment of individual patients and that provides real-time indicators of available resources.

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.[27, 28, 29] On the other hand, 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.

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[24] 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.

[25] 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.

[26] Under §19-2101, community health resource includes: federally qualified health center; federally qualified health center "look alike"; community health center; migrant health center; health care program for the homeless; primary care program for a public housing program; local nonprofit and community-owned health care program; school-based health center; teaching clinic; wellmobile; health center controlled operating network; historic Maryland primary care provider; outpatient mental health clinic; and any other center or program identified by the commission as a community health resource.

[27] Page, L. Marketing the Emergency Department. *American Medical News*, September 4, 2000, http://www.ama-assn.org/sci-pubs/amnews

[28] 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

[29] InstaCare Program, Baltimore Washington Medical Center, advertisement in the *Baltimore Sun*, November 12, 2006; Franklin Square Hospital Center, advertisement in the *Baltimore Sun.*

Emergency Department Throughput

Other factors influencing emergency department throughput include 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 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.[30]

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.[31] Consultations by specialists are frequently required to treat patients in the emergency department or subsequently admit them 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.[32]

Overall staffing issues including physicians, nurses and support staff impact the emergency department patient flow. The report *Emergency Care Workforce in the United States*[33] indicates that there are 25,500 self-identified emergency medicine physicians in the country. Between 1990 and 2002, the number of emergency physicians increased by 79 percent, compared to overall physician growth of 39 percent. The number of Board-Certified Emergency Medicine physicians increased by 41 percent between 1997 and 2000. These numbers need to be reviewed in the context that not all physicians practicing in the emergency department are Board-Certified nor are all Board-Certified emergency medicine physicians engaged in active practice in the emergency department.

In 2000, 95,000 registered nurses and 4,500 nurse practitioners indicated that they practice in the emergency department. The number of physician assistants working in the emergency department in 2003 was 2,325. Between 1988 and 2000, the number of registered nurses indicating their primary

[30] EMTALA Fact Sheet, American College of Emergency Physicians, June 2000.
[31] 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.
[32] Advisory Board Daily Briefing, *ED Round-up: Phoenix EDs face shortage of on-call specialists.* June 5, 2001.
[33] McGinnis S, Moore J, and Armstrong D. *The Emergency Care Workforce in the United States*. Rensselae Health Workforce Studies, School of Public Health, SUNY Albany. August 2006.

work setting was the emergency department increased by 41 percent from 67,249 to 94,912. Registered nurse positions in the emergency department are open 12 percent of the time. These vacancies are the third most common open nursing position after general medical/surgical and critical care units.

In 2003, the State Office of Emergency Medical Services reported 757,000 licensed EMT's or paramedics in the country. According to the 2005 Maryland EMS Work Force Report, EMS providers in Maryland have kept pace with the increase in population over the last several years. [34] The report noted that the call volume has increased 10 percent over the past four years with a 13 percent decrease in the number of priority calls between CY 1999 to CY 2003. The EMS work force has increased by a corresponding 11 percent resulting in a steady state of calls to EMS providers. Changing staffing patterns by jurisdiction may be of concern as some jurisdictions require two ALS personnel to respond to calls. The EMS work force is 50 percent volunteer. A survey in job satisfaction indicated that the top reason EMS providers consider leaving is that their work is not valued or recognized by the public. This mirrors the ongoing concern that the public does not understand the appropriate use of the EMS system and its role in the overall health care system.

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.[35]

Output: 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. The lack of inpatient beds is a frequently cited factor contributing to increases in time on diversion and boarding of patients in the emergency department. The most common type of beds that were unavailable were intensive care unit (ICU) or critical care unit (CCU) beds, followed by instrument-monitored or telemetry beds.[36] When beds are not available, patients must be held in the emergency department, thus occupying resources that otherwise would be available to treat incoming patients.

Annually between 17-18 percent of all Maryland emergency department visits result in admission for inpatient care. With increases in the overall number of emergency department visits, the number of admissions occurring through the emergency department increased from 313,437 in

[34] Maryland Institute for Emergency Medical Services System, 2005 Maryland EMS Work Force Report.
[35] 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.

[36] U.S. General Accounting Office, *Hospital Emergency Departments: Crowded Conditions Vary Among Hospitals and Communities*, March 2003, GAO-03-460, p. 23.

2000 to 412,446 in 2006—an increase of about 32 percent. As a consequence, continuing increases in emergency department utilization have an impact on inpatient bed capacity.

Maryland's hospital licensure law was amended, effective in 2000, to peg maximum licensed acute care (medical-surgical-gynecological-addictions or medical/surgical) bed capacity to the average daily census of acute care patients reported by hospitals. On July 1 of each year, hospital licenses are revised to reflect that the hospital is licensed (and, thus, may legally operate) a total number of acute care beds equal to 140% of the average daily census of acute care patients reported by that hospital for the twelve month period ending on March 31 of that same year The Certificate of Need (CON) law was also amended to allow hospitals to construct acute care bed capacity equal to their current licensed capacity without reference to any need standards of the State Health Plan. This law had the effect of eliminating over 2,700 beds from hospital licenses when it went into effect. Currently, Maryland hospitals report that, in the aggregate, they have physical capacity for 967 more acute care beds than are licensed. Twelve of the state's 47 hospitals (26 percent) report having less physical capacity for acute care beds than is currently licensed.

Following the 2002 report on emergency department crowding, the Commission worked with Maryland hospitals to review trends in hospital utilization and the assumptions used to guide future estimates of projected bed need. MHCC projects the need for medical/surgical beds and uses this bed need projection in evaluating proposals to establish new acute care hospitals, replace existing hospitals, or expand the MSGA bed capacity of existing hospitals. The Commission uses an occupancy rate scale in projecting the need for beds based on:

- An assumption that as the average daily census of medical/surgical patients increases, hospitals can manage patient census at a higher level of average annual occupancy; and

- A policy that a hospital should operate at the highest level of average annual occupancy, given its level of patient census, which allows it to accommodate emergent and urgent needs for admission immediately, with only rare exceptions, and to accommodate less urgent and more elective needs for admission within a reasonable period of time.

The current medical/surgical average annual bed occupancy rate scale was adopted in 2004 and is lower than the scale previously used in the State Health Plan to account for the higher level of bed turnover which occurs as average length of stay declines. The current scale, the previous scale (in parentheses), and the distribution of Maryland's 47 acute care hospitals on this scale are shown below:

Projected Average Daily Census	Average Annual Occupancy Rate	Number of Hospitals Falling within the Standard
0-49 patients	70% (75%)	8
50-99 patients	75% (80%)	11
100-299 (499) patients	80% (85%)	26
300+ patients	83% (87%)	2
	79% weighted average	47

The updated bed need forecast, which was adopted in April 2004, showed that 18 of Maryland's 24 jurisdictions, at the minimum range, had a need for additional medical/surgical beds

by 2010. At the maximum forecast range, 22 of Maryland's 24 jurisdictions were identified as having a need for additional medical/surgical beds by 2010, i.e., every jurisdiction with an existing hospital. At the minimum range, the forecast projected need for 487 beds; at the maximum range, 1,060 additional beds were projected to be needed. The medical/surgical bed need forecast includes intensive and critical care beds. No additional need for pediatric beds was forecasted.

Although Maryland, like many states, had experienced excess acute care bed capacity during the past two decades, the 2010 forecast reversed that pattern by identifying the need for some additional capacity. Since 2004, 369 additional medical/surgical beds have been approved through CON in ten jurisdictions: Montgomery, Calvert, Charles, Prince George's, Anne Arundel, Baltimore, Harford, Howard, Cecil, and Wicomico Counties. Medical/surgical bed capacity has been or will be constructed in three jurisdictions (Baltimore City, Baltimore County, and Carroll County) solely through the automatic action of the state's licensure rule (i.e., the 140% rule) and hospitals taking the pledge on capital projects that will include construction of more bed capacity or through hospitals obtaining CONs for capital projects that involved this addition of beds within their current licensed capacity.

In addition, along with the CON approved bed increases and pledges, additional "effective" medical/surgical bed capacity in Maryland, has been produced or is in development since 2004 through projects that essentially convert semi-private room capacity to private room capacity. This has occurred in over one-half of Maryland's jurisdictions and allows hospitals in these jurisdictions to use, on average, substantially higher levels of their total bed capacity at any given time:

Allegany	Baltimore City
Frederick	Baltimore County
Washington	Carroll
Montgomery	Harford
Calvert	Howard
Charles	Cecil
Prince George's	Wicomico
Anne Arundel	

Finally, shelled-in building space intended to allow for expansion of medical/surgical bed capacity has been authorized at two hospitals, Upper Chesapeake Medical Center in Harford County and Baltimore Washington Medical Center in Anne Arundel County. This shelled-in space will allow approximately 60 beds to be added fairly quickly at these two facilities.

As part of the current update of the Acute Inpatient Services chapter of the State Health Plan, the Commission is preparing bed need forecasts for the 2012/2015 period. This next update should consider recent trends in emergency department utilization, the relationship between the emergency department and inpatient bed capacity, options for measuring physical, staffed and licensed bed capacity, and optimal service-specific occupancy thresholds.

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]

While 17-18 percent of emergency department patients are admitted, almost one-third of all psychiatric patients seen in the emergency department are subsequently hospitalized. The current chapter of the State Health Plan for acute inpatient services provides bed need projections for medical-surgical (including gynecology and addictions) and pediatric services but does not include a forecast for psychiatric beds in acute care hospitals. Although the number of emergency department visits for patients with diagnoses of mental health disorders has increased in recent years, there have been declines in the number of inpatient beds for psychiatric patients across all settings—acute care hospitals, private psychiatric hospitals, and State psychiatric hospitals. Because about one-half of the psychiatric service beds in Maryland are currently operated by the State, the Department of Health and Mental Hygiene should develop a plan to guide the future role and capacity of State psychiatric hospitals in the continuum of care for mental health patients. As part of the update of the State Health Plan chapter for Acute Inpatient Services, the Commission should develop projections of future bed need for acute inpatient psychiatric services.

The Evolving Role of the Hospital Emergency Department

The role of the hospital emergency department will evolve in the future with consideration of alternative models for providing non-emergent care. During the 2005 session of the General Assembly, House Bill 426 (Chapters 549 and 550, Acts of 2005) was passed creating a freestanding medical facility pilot project in Montgomery County. The freestanding medical facility pilot is required to provide the Maryland Health Care Commission with information on the operation and utilization of the facility. The Commission, in consultation with HSCRC, is required to conduct a study of the operations, utilization, and financing of freestanding medical facilities, using information from the pilot project and report its findings to the Senate Finance Committee and House Health and Government Operations Committee on or before December 31, 2007. The Commission, in consultation with the Department and the Health Services Cost Review Commission, is also required to propose emergency regulations by July 1, 2008 to establish a review process to approve facilities in the State that may seek licensure as a freestanding medical facility. After being signed by the Governor on May 26, 2005, the Act took effect June 1, 2005.

The freestanding medical facility pilot project was established under the auspices of Shady Grove Adventist Hospital in Germantown, Maryland on Route 118, west of I-270. The facility, which is located in a new building adjacent to a physician office building, opened in August 2006. To implement the data reporting requirements of the law, the Commission adopted regulations (*COMAR 10.24.06 Data Reporting by Freestanding Medical Facilities*) that became effective October 23, 2006 (33:21 Md. R. 1675). The regulations, consistent with the law, identify the two major categories of data to be reported to the Commission: facility-level or aggregate data; and, patient-level data. The patient-level data will be reported to the Commission on a quarterly basis. (A description of the patient-level data set is provided in Appendix A-7).

The data set for freestanding medical facilities, which the Germantown Emergency Center started collecting on October 1, 2006, is based on the HSCRC patient-level data set for hospital emergency department visits with several additional items: registration time; discharge time; mode of

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

arrival; priority status for fire department ambulance transports; mode of departure; patient disposition at end of visit; acute care hospital transfer site ID; and type of service. The Commission will work with the Health Services Cost Review Commission and other interested organizations during 2007 to study the access, quality of care and reimbursement issues related to alternative urgent care models using the freestanding medical facilities data set and other available information.

The emergency department is also a key focus in the debate on strengthening disaster response. The Governor's Emergency Management Advisory Council formed the Health and Medical Surge Technical Advisory Group Committee (the Surge TAG Committee) in January 2005. The Surge TAG Committee is charged with developing an all encompassing management plan to respond to a sudden increase in demand for health care services as a result of a catastrophic event caused by an act of terrorism, a naturally occurring infectious disease outbreak, or other public health emergencies.[38]

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.[39]

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] Governor's Emergency Management Advisory Council, Maryland Health and Mental Surge Capacity Plan: Concept of Operations (CONOPS), draft April 2006.
[39] Institute of Medicine, *Crossing the Quality Chasm*, Committee on Quality of Health Care in America, National Academy Press, 2001, p.28.

V. Strategies to Address Emergency Department Crowding

Modify Input

Several hospitals have developed innovations to divert non-emergent patients to alternative settings. Some have taken steps such as providing education on the appropriate use of the emergency department. Anne Arundel Medical Center, for example, has a website outlining "When you need to go to the Emergency Department" and encourages patients to consult their primary care physician prior to coming. Washington County Health System has funded a telephone triage system designed to reduce the use of the emergency department for non-emergent conditions. The phone service is staffed by a registered nurse with access to computerized medical decision trees. Patient conditions are assessed via telephone and a recommendation made on the most appropriate action and setting for treatment. Washington County Hospital and several others hospitals have developed Urgent Care Centers off campus from the main hospital. These centers offer extended hours, require no appointment, and are staffed by physicians that can treat minor illnesses, injuries, and provide primary care.

A recent Task Force, convened to examine emergency department crowding in Baltimore City, recommended a number of strategies to reduce the number of unnecessary visits to hospital emergency departments. Recommendations included establishing an emergency department diversion center for care and triage of certain patients with substance abuse and mental health problems, increasing access to primary care, and promoting case management of individuals who are chronically homeless.[40]

Beyond the above outlined innovations, few incentives exist to modify the use of emergency department use for non-urgent care. As in all businesses, volume is a positive indicator for success. The majority of Maryland hospitals have expanded their capacity to match increased demand and several advertise the advantage of the newest innovation and additional space in their emergency department services. The evolution to a more outpatient driven treatment system has resulted in emergency department visits comprising almost one-half of all hospital visits. In addition, a significant portion of patients admitted to inpatient beds originate from the emergency department.

There are not strong incentives for physicians to keep patients out of the emergency department and, as a result, physicians often refer patients for treatment, especially for after-hours or weekend care. With concern about medical liability and no financial incentives to treat patients outside of traditional office hours, the emergency department is frequently a convenient referral destination. Payers also do not offer incentives for physicians to maintain extended hours with a corresponding reimbursement differential for after-hours care.

Insurance companies have developed less restrictive products in response to consumer and employer demands. Patients may determine that a premium co-pay, often $100 for an emergency visit is well worth the expense for "one stop care" in the emergency department. Insurance companies have determined that utilization review is no longer a cost effective deterrent to

[40] Baltimore City Task Force on Emergency Department Crowding, Findings and Recommendations, June 2006, p. ii, 9-10.

emergency department use; this appears to be driven by the implementation of prudent lay person standards. Denial decisions can and are overturned based on these standards. Insurance companies appear to have redirected their effort to avoid unnecessary inpatient admissions. The high use of the emergency department by patients with commercial insurance and HMO's is a symptom of this shift. The long term impact results in higher premiums, as a result of treatment provided in a higher cost setting, further fueling the cost of rising health insurance premiums. This in turn decreases access to affordable health insurance, resulting in higher numbers of uninsured that are relying on the emergency departments for "safety net" care.

The demographic profile of patients who use Maryland emergency departments indicate that more than one-third of visits do not require the care that an emergency department provides. What may be less clear is why patients seek care in the emergency department as opposed to alternative settings. Certainly portions of the population are using the emergency department as a "safety net" due to financial barriers. Yet, a significant number of patients with insurance still selected the emergency department to obtain primary and non-urgent care.[41] It remains unclear if this is a matter of convenience, limitation of access to primary care, or other factors that drive current consumer use patterns. At present, data on emergency department visits by time of day to determine peak usage time periods is not routinely collected.

Data from the Rutgers Center for State Health Policy, which analyzed timed emergency department usage data in the New Jersey for 2004, found that 49 percent of patients seen in the emergency department between 8 a.m. and 5 p.m. did not require hospital admission and 37 percent of patients presenting to the emergency department between 5 p.m. and midnight did not require hospital admission. On the other hand, only 14 percent of patients seen between midnight and 8 a.m. were not admitted. This data suggests that less seriously ill patents are presenting to the emergency department during the day. This study further applies the NYU classification algorithm previously discussed to timed emergency department data. The majority of non-emergent and primary care, treatable visits arrived in the emergency department between 8 a.m. and 5 p.m.

Table 20
Emergency Department Patients Treated and Released by Time of Day and Type of Visit: New Jersey, 2004

	Business Hours 8 am to 5 pm	Evening/Night 5 pm to midnight	Overnight Midnight to 8 am
Injury	49 %	41 %	10 %
Emergent, Primary Care Treatable	**48 %**	**36 %**	**16 %**
Non-Emergent	**50 %**	**35 %**	**15 %**
Emergent, ED Care Not Needed	49 %	33 %	18 %
Unclassified	51 %	36 %	14 %
Emergent, ED Care needed	47 %	36 %	17 %
Mental health	48 %	36 %	16 %
Alcohol related	29 %	43 %	28 %
Drug Related	44 %	35 %	21 %

Source: DeLia, D. Potentially Avoidable Use of Hospital Emergency Departments in New Jersey. A Report to the New Jersey Department of Health and Senior Services, Rutgers Center for State Health Policy, July 2006.

[41] DeLia, D. Potentially Avoidable Use of Hospital Emergency Departments in New Jersey. A Report to the New Jersey Department of Health and Senior Services, Rutgers Center for State Health Policy, July 2006.

Given that the pattern of increasing emergency department utilization experienced in Maryland over the past several years is likely to continue in the future, it is critical to examine ways to improve access to care and reduce reliance on emergency departments for non-emergent care. The work of the Maryland Community Health Resources Commission and Mid-Atlantic Association of Community Health Centers in studying a range of approaches should provide guidance to stakeholders on promising strategies for improving access to primary care.

The Maryland Community Health Resources Commission has established a grant program *Aligning Community Health Resources: Improving Access to Care for Marylanders* and will award grants in early 2007 to community health resources in three areas: redirecting non-emergency use of hospital emergency departments to community health resources; integrating community-based mental health and substance abuse services with somatic services; and other initiatives to develop coordinated, integrated systems of community-based care. The Mid-Atlantic Association of Community Health Centers and federally-qualified health centers in Maryland are also doing important work to improve access to primary care through innovative programs, such as the Reverse Referral Project between Johns Hopkins Bayview Medical Center and Baltimore Medical System.

Modify Throughput

There are a number of innovations that look at modifying throughput. The Maryland Patient Safety Center, in collaboration with the Maryland Chapter of the American College of Emergency Physicians and Emergency Nurses Association, convened an ED Collaborative in 2006 to develop innovative strategies care for emergency department patients. Twenty-nine Maryland hospitals participated in the collaborative.[42]

Discussions with hospitals that have developed process improvement strategies suggest that there are several consistent themes important for the success of the innovation. First, the staff must "own" the innovation and play a significant role in its implementation. The team needs to have the decision making ability to influence critical success factors for the innovation to produce results. Second, physician acceptance and participation, including both hospital and community-based physicians, are key ingredients for success. Third, hospital leadership must empower members of the team and remove barriers to facilitate change, include reallocating space, hiring needed staff and removing department and function silos. In addition, a critical success factor is recognizing that the issue is not an emergency department problem but a system-wide issue that impacts the acute care hospitals and the entire community.[43]

In addition to these consistent themes, none of the current innovations appears static, and often, additional innovations occur at the same time to address other areas of opportunity to improve patient flow in the emergency department. None of the five hospitals interviewed for the outlined case studies had implemented just a single innovation but several innovations over a period of time or at the same time.

Hospitals take different approaches, from revamping the entire emergency department patient flow process to addressing a specific aspect of that process. The goal and results are evaluated differently including reduced frequency and duration of diversion times, decreased waiting room

[42] Maryland Patient Safety Center ED Collaborative, www.marylandpatientsafety.org accessed 11/10/06.
[43] Wilson, MJ, Siegel, B., Williams, M. *Perfecting Patient Flow: America's Safety Net Hospitals and Emergency Department Crowding*. National Association of Public Hospitals and Health Systems. May 2005.

time, decreased number of patients leaving without treatment, or improved patient satisfaction scores. Below are two highlighted innovations that address throughput by implementing a process improvement. The first, InstaCare, redesigned the entire patient flow through the emergency department and, the second, a Rapid Diagnostic Unit, redesigned the flow for specific types of patients.

Baltimore Washington Medical Center
Innovation: InstaCare

InstaCare is a proprietary emergency department patient flow process implemented by BWMC to reduce delays in patient care caused by overcrowding. The InstaCare model incorporates a rapid RN screening process, shortens time-to-provider, uses the concept of care teams that are deployed to a geographic area of the emergency department to increase accountability for patient flow and outcomes, and exit registration for ambulatory patients. The process is designed to protect emergency department space to ensure there is always at least some space available in which patients can continue to be processed when crowding occurs, and creation of a staging area in which a provider can rapidly diagnosis, treat and discharge patients or initiate a lengthier diagnostic process. Baltimore Washington Medical Center believes that this innovation will:

- provide a safer environment for patients and improve patient satisfaction
- reduce ambulance diversion time (diversion time decreased 23 percent during FY 06, despite a 5 percent increase in volume)
- decrease time from patient screening to patient-in-room (results indicate a 40 percent reduction)
- result in a cultural change among the staff that long wait times are no longer acceptable and empower staff to deal with an influx of patients

Implementation and Timeline

To implement the InstaCare process, BWMC modified space to facilitate the exit registration process, screening function, and treatment space. The consultation fees are dependent on BWMC's meeting certain established performance criteria. To date, over $300,000 has been invested. The annual cost of increasing non-provider staffing is approximately $600,000 for one year, although it is difficult to say what portion of this expense was simply due to increases in patient volume rather than implementation of the InstaCare model. BWMC believes that the expense is more than offset by gains in patient safety, patient satisfaction, and ensuring access through decreased ambulance diversions.

Key Success Factors

A driving principal was to create a safe patient environment by decreasing the time in the emergency department waiting room. It required a willingness to make dramatic changes to the entire emergency department process and patient flow. InstaCare requires a willingness to modify the patient flow process and protocols in a continuous improvement process. Other key success factors include the participation of hospital administration and emergency department physicians, and the staff's willingness to be flexible and develop a culture of patient safety.

Source: Telephone interview and email correspondence with Colleen Roach, Vice President/Chief Nurse Executive, Baltimore Washington Medical Center.

Washington County Hospital
Innovation: Rapid Diagnostic Center

The Rapid Diagnostic Center (RDC) implemented by Washington County Hospital, is designed to observe patients with seventeen specific conditions before a decision to admit or discharge is determined. The unit consists of five beds in a distinct area located in close proximity to the emergency department. Two-thirds of the patients in the Rapid Diagnostic Center have cardiac symptoms. The unit, which is managed by an emergency department nurse, offers a relaxed atmosphere with a dedicated staff of nurses that closely monitor patient vital signs and expedite required testing, including stress testing. The patient is managed by emergency department physicians. The average stay in the unit is 17 hours with 70% of patients being discharged home from the unit. Washington County Hospital believes that this innovation will:

- increase availability of inpatient beds
- decrease the number of denials from insurance companies
- decrease the cost to both patients and payers
- provide a safer and more controlled environment for specific patient types
- decrease the frequency of moving patients to different locations to free up emergency department treatment space

Implementation and Timeline

The original innovation was attempted in the main emergency department, but was not effective. This innovation requires a distinct physical space/unit and designated staff as well as a willingness of the emergency department physician to be responsible for patients not located in the main emergency department. This particular unit, while on the same floor, is not immediately adjacent to the emergency department. One of the most significant challenges may be in finding an appropriate space. Staff efficiencies are reduced as the unit staff cannot float between other activities in the main emergency department unless the RDC is empty.

Key Success Factors

The success of the RDC is driven by staff developing the concept, designing the unit, and implementing the protocols including patient selection criteria. Senior management supported the project by locating a suitable space, funding the cost of construction (approximately $600,000) and approving additional staffing. According to Washington County Hospital, a significant challenge includes the ability to find space close to the emergency department and identifying staff dedicated to managing an RDC unit and patients. Avoidance of using the unit for overflow is a critical success factor as well as supportive hospital and community-based physicians.

Source: Site visit to Washington County Hospital on November 9, 2006 and interview with Mary R. Towe, RN, BSN, MBA, Vice President, Chief Nursing Officer and Bonnie Forsh, RN, BSN, Administrative Director, Emergency/Outpatient Services.

The on-going work of Maryland hospitals to address emergency department crowding has contributed to the body of knowledge regarding best practices for addressing crowded emergency departments. To encourage and support innovative projects designed to be cost effective and improve the operation of the emergency department, the collection and dissemination of best practice information should be continued.

To better understand underlying reasons for growth in hospital emergency department visits and the factors that precipitate ambulance diversion, there is a need to invest in data collection and

analysis. 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). Because understanding emergency department crowding involves, at least in part, analysis of patterns of utilization by time of day, a number of states (e.g., Massachusetts, Florida, New Jersey) include arrival time data in their emergency department data sets. To assist analysis of throughput issues, Maryland should consider incorporating arrival and departure times in its emergency department data sets.

Following the 2002 study of emergency department crowding, the Maryland Health Care Commission worked with MIEMSS and others to develop and implement a survey of Emergency Department Treatment Capacity. This survey, which is conducted annually in conjunction with the Commission's hospital bed licensure process, collects important information on the capacity of Maryland hospital emergency departments and allows system capacity to be tracked over time. The Commission reports emergency department treatment capacity data collected in this survey as part of its annual report on licensed hospital beds and services.

As part of the Maryland Patient Safety Center's ED Collaborative, participating hospitals began collecting performance benchmark data. As part of the Urgent Matters program there also have been efforts to develop standard measures that can be used to understand utilization, patient acuity, and patient flow. A consensus group, with representatives of major national organizations, has developed recommendations to address the standardization of performance measures for emergency departments.[44] In consultation with the academic and research communities, the Maryland Patient Safety Center, the Maryland Chapter of the American College of Emergency Physicians, and hospitals, the development of standardized measures of emergency department utilization and patient flow should be continued.

Modifying Output

In order for hospitals to continue to manage throughput they also must manage output. Emergency departments are oriented to quickly assess, treat and discharge patients. They are not designed for treating patients on a short or long term basis; the physicians and staff are focused on immediate response. There are four possible outputs from the emergency department: (1) death; (2) admission to the hospital; (3) transfer to another facility; and (4) treat and release.

While focus has remained on throughput, a shift has occurred to improve the process around output. This appears to be a result of an acceptance that emergency department crowding is a hospital-wide issue. Innovations have ranged from improving the availability of inpatient beds to reducing the time to admit patients from the emergency department. The efficient and effective transfer of the patient to the acute care hospital requires extensive coordination and resources. Staffing alone requires transportation, environmental services, nursing and case management. As with emergency department treatment space, acute care hospital beds have expanded and the number of single occupancy rooms has increased in the State, ultimately reducing the number of blocked beds.

[44] Welch, S. et al. Emergency Department Performance Measures and Benchmarking Summit. *Society for Academic Emergency Medicine*. October 2006, Vol. 13. No. 10, p. 1074-1080.

A large portion of patients are discharged to the community. A concern is the rising numbers of patients receiving treatment for primary and chronic conditions with few follow-up options. To address this issues, Shore Health System, for example, has developed a post-emergency department program with a local Nurse Practitioner; patients can attended a clinic the next morning for follow-up care. Periodically hospitals have run reverse referral programs, working to find patients a primary care provider and medical home. Unfortunately, significant efforts will be required to strengthen follow-up for patients, particularly those with chronic conditions.

Several innovations have occurred in an attempt to improve the output process, specifically expediting the decision to admit the patient to an inpatient bed. Two of these innovations, Bed Huddles at Shore Health System and Adopt a Boarder at Northwest Hospital, are highlighted below. Both of these approaches work to transfer patients from a crowded emergency department to an inpatient unit. Shady Grove Adventist Hospital is also highlighted for the results that lead to the receipt in 2005 of the Ernest A. Codman Award presented by the Joint Commission of Accreditation of Health Care Organization. Shady Grove Adventist launched numerous innovations over the course of several years to manage the increasing volume of their emergency department and maintain access to care in a growing area of the State.

Shore Health System Innovation: Bed Huddles

Bed Huddles is a proactive strategy to manage anticipated inpatient admissions from the emergency department. Huddles occur three times a day for fifteen minutes, at 10 a.m., 2 p.m., and 8 p.m. Key decision makers meet at Memorial Hospital of Easton with Dorchester General Hospital staff participating by phone. This team has the ability to redeploy resources, including staffing, from one hospital to another. As an adjunct to Bed Huddles, Shore Health System has developed an additional innovation focusing on scheduled inpatient discharge. Shore Health System believes that the Bed Huddle innovation will:

- improve door to doctor time
- reduce average length of stay
- decrease denied days to less than 100
- decrease diversion time

Implementation and Timeline

This is a low cost, low technology innovation. In 2004, Shore Health System developed an initial template so that appropriate information was brought to the Huddle meeting. Patient flow including Bed Huddles and Scheduled Discharges report to Case Management rather than Nursing, the result being a more global picture of patient placement as opposed to a short term view.

Key Success Factors

Leadership with decision making power needs to be involved at the meeting on a daily basis. A willingness by staff to be redeployed to units and another hospital is also a requirement. In addition, ownership of the issue by all hospital staff including environmental services and participation by community providers, such as local nursing homes, to efficiently process admissions are key components. This approach requires creating a culture that is focused on patient flow and the role all members of the staff play in moving patients safely through the system.

Source: Site visit to Easton Memorial Hospital on November 13, 2007 and interview with Jeff Johnson, Sr. VP, System Development / External Operations; Anna Kusinitz, Admissions Coordinator; Chris Parker, Chief Nursing Officer; Chris Mitchell, Manager, Emergency Services, MHE; Donna Prahl, Manager, Case Management /Discharge Planning; Gerard Walsh, Chief Operating Officer; and Molly Punzo, Chief, Quality Officer.

Northwest Hospital
Innovation: Adopt a Boarder

Adopt a Boarder involves relocating a patient who is awaiting inpatient admission from the emergency department, to a bed in an inpatient hallway until a room becomes available. Since 2005, 188 patients have participated in the Adopt a Boarder program with an average waiting time of 90 minutes for a bed. The vast majority of patients are happy with the care they received in the hallway and pleased to be out of the busy emergency department. Northwest Hospital has expanded the types of patients who are able to be in the hallway. Northwest believes that this innovation will:

- increase the throughput of the hospital. Northwest states that on average 85 percent of its admissions come from the emergency department. Over the past year, the percentage has increased to 89.
- decrease waiting time in the emergency department, results suggest that waiting time has decreased between 45-60 minutes.
- decrease the number of patients leaving the emergency room without being treated. In the last year, the number of patients leaving the emergency room without being seen has decreased from 6 to 3.9 percent.

Northwest Hospital has implemented no fewer than 15 practice improvements on emergency department throughput, including the inpatient hallway protocol. The improvement cited is most likely the result of a combination of all of the best practices.

Process of implementation and timeline

Northwest spent approximately $20,000 for 10 new stretchers, overbed tables, privacy screens, and call bells. The implementation time frame was approximately 10 weeks from discussion to the first hallway patient in November 2005.

Key Success Factors

The initial phases of implementation involved getting buy-in from all members of the executive and management team (directors, managers, supervisors, and team leaders). It is also important to provide in-depth education for the Nurse Managers, Clinical Leaders, Charge Nurses, and RN/tech staff. The process must be carefully implemented and managed or dissatisfaction among the inpatient nursing staff may result.

Source: Telephone interview and e-mail correspondence with Sue Jalbert, VP, Patient Care Services, Northwest Hospital Center.

Shady Grove Adventist Hospital: The Ernest A. Codman Award by the Joint Commission on Accreditation of Health Care Organizations

In 2005, Shady Grove Adventist Hospital (SGAH) was awarded the Ernest A. Codman Award by the Joint Commission on Accreditation of Health Care Organizations. The award was in recognition of hospital-wide process improvements to assure access to acute care in a growing community.

SGAH consistently has one of the top three busiest emergency departments in the State of Maryland. In 2004, they treated 91,322 visits in their emergency department. The hospital was concerned about emergency department crowding, frequent ambulance diversion, and lack of available beds impacting patients' access to care. SGAH serves a growing population, which increased 17 percent between 2000 and 2010.[42] The hospital also faced other challenges including the increase in the number of patients without primary care physicians, limitation on continued hospital expansion, and the rise in diagnoses that required single patient rooms. The emergency department experienced declining patient satisfaction, increased waiting times and ambulance diversion. SGAH focused on capacity management, performed root cause analyses, identified best practices, and created a process improvement team to focus on patient flow, which included developing measures on patient flow.[43] Over a two-year period, the Hospital developed several strategies including twice daily census meetings, census forecasting (including beds and staff), a clinical bed coordinator position, and installation of an electronic bed tracking system. [43]

Shady Grove Adventist Hospital documented the following results on the Joint Commission's website.

- 72 percent reduction in hours of ambulance diversion; from a high of 2,365 hours in 2003 to only 655 hours in 2004. Ambulance diversions are now sustained at less than 50 hours per month.
- Decrease in number of patients "boarded" in the Emergency Department from an average of 190 monthly to an average of 120 monthly.
- Patient satisfaction in the Emergency Department increased from a score of 3.96 to 4.11 (based on a 1 – 5 scale).
- Emergency Department average length of stay for admitted patients was shortened by 25 minutes.

Source:
[42]http://www.jointcommission.org/Codman/05_shady_grove.htm?HTTP___JCSEARCH.JCAHO.ORG_CGI_BIN_MSMFIND.EXE?RESMASK=MssResEN.mskhttp%3A//jcsearch.jcaho.org/cgi-bin/MsmFind.exe%3Fhttp%3A//jcsearch.jcaho.org/cgi-bin/MsmFind.exe%3FRESMASK%3DMssResEN.msk
[43] Presentation at the Maryland Emergency Department Overcrowding Leadership Summit (2006), Assuring Access to Acute Care in a Rapidly Growling Community.

VI. RECOMMENDATIONS

Emergency departments have been referred to as "the canary in the coal mine" for the health care system – an early warning of system dysfunction. This sentinel role is a result of the many complex connections of the emergency department with the health care system – with acute medical and surgical inpatient care, with inpatient mental health services, with nursing homes, with the primary care system in the community, and with the payers who shape the system through payment and coverage policies. Federal law recognizes the special role of the emergency department by guaranteeing access to emergency services regardless of ability to pay.

Emergency department use is disproportionately high among the uninsured. There is little question that improving access to health insurance would also improve access to primary care and reduce inappropriate emergency department use by the uninsured. It could also improve the likelihood of timely dispositions for patients with psychiatric illnesses. At the same time, better insurance coverage by itself won't create more timely and convenient access to primary care, won't incentivize new community care providers, won't change inappropriate patterns of emergency department use by individuals with insurance, won't improve the patient flow within the emergency department, and won't assure the timely availability of beds for patients being admitted.

Improving access to health insurance and reducing the number of uninsured Marylanders is a vital part of reform of our health care system, but is not a goal that stakeholders alone can accomplish. The specific recommendations in this report therefore focus more narrowly on actions that key stakeholders in the health care community can take to address the problem of emergency department crowding.

INPUT/DEMAND FOR EMERGENCY DEPARTMENT SERVICES

1. Strategies should be developed and implemented to encourage the use of primary care and urgent care services in the community rather than emergency departments. Effective strategies will combine efforts to improve the availability and convenience of services, to develop innovative service delivery models, and to provide incentives to both patient and provider.

- **Private and public payers should examine ways to compensate providers for improving access to primary care services. These might include differential rates for providers' success in decreasing emergency department utilization, for providing prompt appointments for emergent conditions, for having evening and weekend hours, and for developing innovative service programs.**

- **Private and public payers should examine ways to provide incentives to patients for appropriate use of emergency services (beyond simply raising the emergency visit co-payment) and for appropriate self-management of chronic conditions.**

- **Providers should consider establishing urgent care and triage programs, navigator programs between hospital emergency departments and primary care practices, alternatives to access specialty care services, differential payment for evening and weekend visits, flexible appointment scheduling, telephone consultation with nurses, extended hours for community health centers, and other process reengineering efforts to provide another approach to improving access and care delivery.**

- **The Maryland Community Health Resources Commission should work with the Department of Health and Mental Hygiene, the Medical and Chirurgical Faculty of Maryland, Mid-Atlantic Association of Community Health Centers, and other interested organizations to pursue funding opportunities and study options for improving access to primary care and community-based mental health services in order to reduce use of hospital emergency department services for non-emergent problems.**

- **The Department of Health and Mental Hygiene should consider funding additional pilot hospital diversion programs for mental health patients, including crisis support teams.**

Research on the appropriateness and urgency of emergency department visits suggests that a high proportion of use is for non-emergent conditions. Applying a classification methodology developed by New York researchers to Maryland data on emergency department use, indicates that approximately one-third of all visits are classified as not requiring care in an emergency department.

While use of emergency departments for primary care has been a long-standing issue, recent analyses by the Center for Studying Health System Change in site visits to 12 nationally representative communities suggest that this problem has intensified in recent years. Available data suggests that use of Maryland hospital emergency departments for non-emergent care has also increased in recent years. More than one-third (35.4 percent) of all emergency department visits in Maryland were classified as non-emergent or emergent but primary care treatable in 2005—an increase over experience in 2001. In 2001, 33.9 percent of visits to Maryland hospital emergency departments were classified as non-emergent or emergent but primary care treatable.

Given the increase in emergency department use and the proportion of visits for non-emergent care, there has been increased attention to improving access to primary care services and redirecting non-emergent care from hospital emergency departments to other community resources. The formation of the Maryland Community Health Resources Commission under the Community Health Care Access and Safety Net Act of 2005 is a key Maryland initiative in strengthening the primary care infrastructure. The Maryland Community Health Resources Commission has established a grant program *Aligning Community Health Resources: Improving Access to Care for Marylanders* and will award grants in early 2007 to community health resources in three areas: redirecting non-emergency use of hospital emergency departments to community health resources; integrating community-based mental health and substance abuse services with somatic services; and other initiatives to develop coordinated, integrated systems of community-based care. The Mid-Atlantic Association of Community Health Centers and federally-qualified health centers in Maryland are also doing important work to improve access to primary care through innovative programs, such as the Reverse Referral Project between Johns Hopkins Bayview Medical Center and Baltimore Medical System.

Given that the pattern of increasing emergency department utilization experienced in Maryland over the past several years is likely to continue in the future, it is critical to examine ways to re-engineer primary care practices to improve access to care and reduce reliance on emergency departments for non-emergent care. The work of the Maryland Community Health Resources Commission and Mid-Atlantic Association of Community Health Centers in studying a range of approaches should provide guidance to stakeholders on promising strategies for improving access to primary care.

2. The Maryland Health Care Commission and Health Services Cost Review Commission should study the access, quality of care, and reimbursement issues associated with hospital and non-hospital based urgent care center models, including the pilot free-standing medical facility at the Germantown Emergency Center.

There are a number of models that provide alternative approaches to delivering urgent care services. Washington County Hospital and other hospitals have developed Urgent Care Centers off campus from the main hospital. These centers offer extended hours, require no appointment, and are staffed by physicians that can treat minor illness, injuries, and provide primary care. Other models include retail medical clinics, physician-owned urgent care clinics, and clinics targeted to serving special populations on weekends and evenings (e.g., evening pediatric care).

During the 2005 session of the General Assembly, House Bill 426 (Chapters 549 and 550, Acts of 2005) was passed, creating a freestanding medical facility pilot project in Montgomery County. The freestanding medical facility pilot is required to provide the Maryland Health Care Commission with information on the operation and utilization of the facility. The Commission, in consultation with HSCRC, is required to conduct a study of the operations, utilization, and financing of freestanding medical facilities, using information from the pilot project and report its findings to the Senate Finance Committee and House Health and Government Operations Committee on or before December 31, 2007. The Commission, in consultation with the Department and the Health Services Cost Review Commission, is also required to propose emergency regulations by July 1, 2008 to establish a review process to approve facilities in the State that may seek licensure as a freestanding medical facility.

The freestanding medical facility pilot project was established under the auspices of Shady Grove Adventist Hospital in Germantown, Maryland on Route 118, west of I-270. The facility, which is located in a new building adjacent to a physician office building, opened in August 2006. To implement the data reporting requirements of the law, the Commission adopted regulations (*COMAR 10.24.06 Data Reporting by Freestanding Medical Facilities*) that became effective October 23, 2006 (33:21 Md. R. 1675). The data set for freestanding medical facilities, which the Germantown Emergency Center started collecting on October 1, 2006, is based on the HSCRC patient-level data set for hospital emergency department visits with several additional items: registration time; discharge time; mode of arrival; priority status for fire department ambulance transports; mode of departure; patient disposition at end of visit; acute care hospital transfer site ID; and type of service.

The Commission will work with the Health Services Cost Review Commission and other interested organizations in 2007 to study the access, quality of care, and reimbursement issues related to alternative urgent care models using the freestanding medical facilities data set and other available information.

3. The Maryland Hospital and EMS Emergency Department Overload Mitigation Plan, developed by the Maryland Institute for Emergency Medical Services Systems (MIEMSS) with the assistance of the Yellow Alert Task Force, should be used to manage resources during periods of regional overload when ambulance diversion significantly reduces emergency department availability.

Diversion of ambulances away from hospital emergency departments, or Yellow Alerts, occurs when hospitals accept only critically ill patients arriving by ambulance for immediate stabilization and divert all other ambulance transports to alternate hospitals for treatment. Red Alerts occur when hospitals do not have inpatient-monitored beds available.

Maryland hospitals have reported increases in Yellow and Red Alert hours over the past four years. There were about 43,003 Yellow Alert hours reported for fiscal year 2003 (9.8 percent of total available hours). Yellow Alert increased to 50,477 hours or 11.5 percent of total available hours in fiscal year 2006. There were also increases reported in time on Red Alert status. In 2003, there were 23,132 Red Alert hours (5.3 percent of total available hours) reported by Maryland hospitals. Statewide, Red Alert hours reached 33,627 or 7.7 percent of total available hours in fiscal year 2006. The vast majority of both Yellow and Red Alert hours are experienced in the Metropolitan Baltimore (Region III) and Metropolitan Washington (Region V) areas. High levels of Red and Yellow Alert diversion have a major impact on reducing the availability of emergency department services.

The Maryland Institute for Emergency Medical Services Systems (MIEMSS) oversees and coordinates all components of the statewide emergency medical services system (EMS), 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.

While data on Red and Yellow Alert frequency and duration provide a crowding benchmark, there are significant limitations to this data that require study. The alerts are voluntary and may not be uniformly applied by individual hospitals or across the State. With continuing increases in Maryland hospital emergency department visits it is likely that ambulance diversion will persist in the immediate future. As a consequence, there should be consideration given to strengthening diversion measures. To manage ambulance diversion and hospital emergency department crowding, MIEMSS has developed and adopted a voluntary plan. This plan, which outlines steps to be taken by State agencies, local health departments, hospitals, nursing homes and EMS providers, should continue to guide resource management when ambulance diversion significantly reduces regional emergency department availability.

EMERGENCY DEPARTMENT THROUGHPUT

4. The Maryland Hospital Association should collect information on innovative approaches developed by Maryland hospitals and hospitals in other states for designing emergency departments, improving patient flow to enhance emergency department throughput, assessing the effectiveness of those approaches, and disseminating best practice models. Each Maryland hospital CEO should establish a hospital-wide multidisciplinary process to identify key factors that contribute to emergency department crowding and strategies to address crowding. There should be a hospital-wide plan with defined responsibilities and specific actions that implement and track appropriate measures of efficiency.

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. The Maryland Hospital Association has worked with the Maryland Patient Safety Center on an ED Collaborative Project designed to enhance both quality and patient flow. In partnership with MIEMSS, the Maryland Hospital Association organized a Leadership Summit on Emergency Department Crowding in September 2006 that included presentations by out-of-state experts as well as innovative programs developed by Maryland hospitals to address crowding. To encourage and support innovative projects designed to be cost effective and improve the operation of

the emergency department, the collection and dissemination of best practice information should be continued. The on-going work of Maryland hospitals to address emergency department crowding has contributed to the body of knowledge regarding best practices for addressing crowded emergency departments. In addition to sharing best practices, the development of a hospital-wide plan to address, implement, and measure progress in reducing crowding would benefit each hospital.

5. The Maryland Health Care Commission and Health Services Cost Review Commission, with consultation from Maryland hospitals and other interested organizations, should evaluate their existing data sets to determine if additional reporting would be necessary to assist in addressing emergency department utilization issues.

- **The Hospital Ambulatory Care Data Set and Hospital Discharge Abstract Data Set should be evaluated to consider options such as the collection of data on the hour of patient and ambulance arrival and departure from the emergency department.**
- **The Annual Hospital Licensure Survey should be modified to collect data on number of the inpatient monitored beds by type.**
- **An annual report on Maryland hospital emergency department utilization should be prepared to monitor capacity and utilization trends.**

The Maryland Institute for Emergency Medical Services Systems (MIEMSS) should collect and report data measuring ambulance arrival time and the time that the ambulance is released by the hospital to return to serving the community.

To better understand the underlying reasons for growth in hospital emergency department visits and the factors that precipitate ambulance diversion, there is a 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).

Following the 2002 study of emergency department crowding, the Maryland Health Care Commission worked with MIEMSS and others to develop and implement a survey of Emergency Department Treatment Capacity. This survey, which is conducted annually in conjunction with the Commission's hospital bed licensure process, collects important information on the capacity of Maryland hospital emergency departments and allows system capacity to be tracked over time. The Commission reports emergency department treatment capacity data collected in this survey as part of its annual report on licensed hospital beds and services.

Because understanding emergency department crowding involves, at least in part, analysis of patterns of utilization by time of day, a number of states (e.g., Massachusetts, Florida, New Jersey) include patient arrival time data in their emergency department data sets. Maryland should consider incorporating patient arrival and departure time measures in its emergency department data sets. The addition of these data elements should consider the pros and cons, the efficacy of collecting such data, the potential reliability of the data, the level of burden on hospitals, and whether the data will

appropriately assist in understanding and attempting to resolve emergency department utilization issues.

Because ambulance wait times are also important to understanding how the pre-hospital system is functioning, MIEMSS should collect and report data measuring ambulance arrival time and the time that the hospital assumes responsibility for the patient.

6. In consultation with the academic and research communities, the Maryland Patient Safety Center, the Maryland Chapter of the American College of Emergency Physicians, and hospitals, the Maryland Health Care Commission should develop standardized measures of emergency department utilization and patient flow that recognize differences in patient acuity and can be used to support performance evaluation and quality improvement. The development of measures should consider the recommendations in the *Consensus Statement: Emergency Department Performance Measures and Benchmarking Summit.*

As part of the Maryland Patient Safety Center's ED Collaborative, participating hospitals began collecting performance benchmark data. As part of the Urgent Matters program there also have been efforts to develop standard measures that can be used to understand utilization, patient acuity, and patient flow. A consensus group, with representatives of major national organizations, has developed recommendations to address the standardization of performance measures for emergency departments. In consultation with the academic and research communities, the Maryland Patient Safety Center, the Maryland Chapter of the American College of Emergency Physicians, and hospitals, the development of standardized measures of emergency department utilization and patient flow should be continued.

7. The update of the Acute Inpatient Services Chapter of the State Health Plan prepared by the Maryland Health Care Commission should include standards to guide the development of emergency department treatment space in hospitals. The development of standards should consider recommendations of the American College of Emergency Physicians in *Emergency Department Design: A Practical Guide to Planning for the Future.*

Since 2001, MHCC has considered a large number of capital projects under the Certificate of Need program. More than one-half of these projects have involved major renovation and expansion of hospital emergency departments that have added treatment space and reconfigured the design of emergency departments to organize units or areas for special populations (e.g., pediatric patients, mental health patients, patient awaiting inpatient admission). In proposals considered to date, the Commission has considered the recommendations of the American College of Emergency Physicians (ACEP) regarding emergency department treatment space required to serve different volume levels. To provide guidance to hospitals in future projects, the update of the Acute Inpatient Services Chapter of the State Health Plan should include standards for emergency department projects. In developing these State Health Plan standards, the Commission should consider the ACEP recommendations, experience of Maryland hospitals, and recommendations of other organizations with expertise in the organization and delivery of emergency department services.

OUTPUT/DISPOSITION FROM THE EMERGENCY DEPARTMENT

8. In updating the Acute Inpatient Services Chapter of the State Health Plan, the Maryland Health Care Commission, with the assistance of a work group composed of representatives of hospitals, state agencies, third party payers, and other interested organizations, should consider recent increases in admissions through the emergency department in projecting inpatient bed need. The update of the State Health Plan should consider options for measuring physical, staffed and licensed bed capacity; and, optimal service-specific occupancy thresholds.

Annually between 17-18 percent of all Maryland emergency department visits result in admission for inpatient care. With increases in the overall number of emergency department visits, the number of admissions occurring through the emergency department increased from 313,437 in 2000 to 412,446 in 2006—an increase of about 32 percent. As a consequence, continuing increases in emergency department utilization have an impact on inpatient bed capacity.

Following the 2002 report on emergency department crowding, the Commission worked with Maryland hospitals to review trends in hospital utilization and the assumptions used to guide future estimates of projected bed need. The updated bed need forecast, which was adopted in April 2004, showed that 18 of Maryland's 24 jurisdictions, at the minimum range, had a need for additional medical/surgical beds by 2010. At the maximum forecast range, 22 of Maryland's 24 jurisdictions were identified as having a need for additional medical/surgical beds by 2010, i.e., every jurisdiction containing an existing hospital. At the minimum range, the forecast projected need for 487 beds; at the maximum range 1,060 additional beds were projected to be needed. No additional need for pediatric beds was forecasted.

Since 2004, 369 additional medical/surgical beds have been approved through CON in ten jurisdictions: Montgomery, Calvert, Charles, Prince George's, Anne Arundel, Baltimore, Harford, Howard, Cecil, and Wicomico Counties. Medical/surgical bed capacity has been or will be constructed in three jurisdictions (Baltimore City, Baltimore County, and Carroll County) solely through the automatic action of the state's licensure rule (i.e., the 140% rule) and hospitals taking the pledge on capital projects that will include construction of more bed capacity or obtaining CONs for capital projects that involved this addition of beds within their current licensed capacity.

In addition, along with the CON approved bed increases and pledges, additional "effective" medical/surgical bed capacity in Maryland, has been produced or is in development since 2004 through projects that essentially convert semi-private room capacity to private room capacity. This has occurred in over one-half of Maryland's jurisdictions and allows hospitals in these jurisdictions to use, on average, substantially higher levels of their total bed capacity at any given time:

Allegany	Baltimore City
Frederick	Baltimore County
Washington	Carroll
Montgomery	Harford
Calvert	Howard
Charles	Cecil
Prince George's	Wicomico
Anne Arundel	

Finally, shelled-in building space intended to allow for expansion of medical/surgical bed capacity has been authorized at two hospitals, Upper Chesapeake Medical Center in Harford County and Baltimore Washington Medical Center in Anne Arundel County. This shelled-in space will allow for approximately 60 beds to be added fairly quickly at these two facilities.

As part of the current update of the Acute Inpatient Services chapter of the State Health Plan, the Commission is preparing bed need forecasts for the 2012/2015 period. This next update should consider recent trends in emergency department utilization, the relationship between the emergency department and inpatient bed capacity, options for measuring physical, staffed and licensed bed capacity, and optimal service-specific occupancy thresholds.

9. The Department of Health and Mental Hygiene, in consultation with mental health providers and other interested organizations, should develop a plan to guide the future role and capacity of State psychiatric hospitals in the continuum of care for mental health patients. The Maryland Health Care Commission, with the assistance of a work group composed of representatives of hospitals, state agencies, third party payers, and other interested organizations, should develop projections of future bed need for acute inpatient psychiatric services.

While 17-18 percent of emergency department patients are admitted, almost one-third of all psychiatric patients seen in the emergency department are subsequently hospitalized. The current chapter of the State Health Plan for acute inpatient services provides bed need projections for medical-surgical (including gynecology and addictions) and pediatric services but does not include a forecast for psychiatric beds in acute care hospitals. Although the number of emergency department visits for patients with diagnoses of mental health disorders has increased in recent years, there have been declines in the number of inpatient beds for psychiatric patients across all settings—acute care hospitals, private psychiatric hospitals, and State psychiatric hospitals. Because about one-half of the psychiatric service beds in Maryland are currently operated by the State, the Department of Health and Mental Hygiene should develop a plan to guide the future role and capacity of State psychiatric hospitals in the continuum of care for mental health patients. As part of the update of the State Health Plan chapter for Acute Inpatient Services, the Commission should develop projections of future bed need for acute inpatient psychiatric services.

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	• 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

Red Alert, Yellow Alert and Reroute Hours by MIEMSS Region: Maryland, 2003-2006

Red Alert

MIEMSS Region	2003			2004			2005			2006		
	Number of Alerts	Alert Hours	% Time on Alert	Number of Alerts	Alert Hours	% Time on Alert	Number of Alerts	Alert Hours	% Time on Alert	Number of Alerts	Alert Hours	% Time on Alert
Region I: Allegany and Garrett Counties (3 EDs)	3.00	41.90	0.16%	12.00	299.67	1.14%	2.00	19.30	0.07%	9.00	62.97	0.24%
Region II: Frederick and Washington Counties (2 EDs)	3.00	53.52	0.31%	24.00	470.07	2.68%	28.00	1,027.95	5.87%	36.00	748.82	4.27%
Region III: Baltimore County, Baltimore City, Anne Arundel, Carroll, Harford, Howard (24 EDs)	1,197.00	15,244.10	7.25%	1,292.00	18,625.14	8.86%	1,216.00	18,295.55	8.70%	1,354.00	18,965.99	9.02%
Region IV: Caroline, Cecil, Dorchester, Kent, Queen Anne's, Somerset, Talbot, Wicomico, Worcester (6 EDs)	16.00	180.75	0.34%	19.00	107.33	0.20%	18.00	176.70	0.34%	25.00	262.78	0.50%
Region V: Montgomery, Prince George's, Calvert, Charles, St. Mary's (15 EDs)	852.00	7,611.68	5.79%	751.00	7,308.36	5.56%	729.00	8,368.83	6.37%	798.00	13,586.39	10.34%
Total	2,071.00	23,131.95	5.28%	2,098.00	26,810.57	6.12%	1,993.00	27,888.33	6.37%	2,222.00	33,626.95	7.68%

Yellow Alert

MIEMSS Region	2003			2004			2005			2006		
	Number of Alerts	Alert Hours	% Time on Alert	Number of Alerts	Alert Hours	% Time on Alert	Number of Alerts	Alert Hours	% Time on Alert	Number of Alerts	Alert Hours	% Time on Alert
Region I: Allegany and Garrett Counties (3 EDs)	4.00	104.90	0.40%	6.00	237.20	0.90%	7.00	54.08	0.21%	5.00	46.92	0.18%
Region II: Frederick and Washington Counties (2 EDs)	14.00	66.21	0.38%	14.00	136.35	0.78%	25.00	304.63	1.74%	36.00	357.59	2.04%
Region III: Baltimore County, Baltimore City, Anne Arundel, Carroll, Harford, Howard (24 EDs)	4,411.00	33,009.12	15.70%	4,428.00	36,636.86	17.43%	3,961.00	32,037.77	15.24%	4,589.00	36,856.92	17.53%
Region IV: Caroline, Cecil, Dorchester, Kent, Queen Anne's, Somerset, Talbot, Wicomico, Worcester (6 EDs)	63.00	280.73	0.53%	53.00	208.48	0.40%	67.00	348.95	0.66%	70.00	379.83	0.72%
Region V: Montgomery, Prince George's, Calvert, Charles, St. Mary's (15 EDs)	1,859.00	9,542.32	7.26%	1,861.00	10,622.19	8.08%	1,814.00	10,343.50	7.87%	2,018.00	12,835.83	9.77%
Total	6,351.00	43,003.28	9.82%	6,362.00	47,841.08	10.92%	5,874.00	43,088.93	9.84%	6,718.00	50,477.09	11.52%

Table A-2 (Continued)
Red Alert, Yellow Alert and Reroute Hours by MIEMSS Region: Maryland, 2003-2006

Reroute / MIEMSS Region	2003			2004			2005			2006		
	Number of Reroutes	Reroute Hours	% Time on Reroute	Number of Reroutes	Reroute Hours	% Time on Reroute	Number of Reroutes	Reroute Hours	% Time on Reroute	Number of Reroutes	Reroute Hours	% Time on Reroute
Region I: Allegany and Garrett Counties (3 EDs)	0.00	0.00	0.00%	0.00	0.00	0.00%	0.00	0.00	0.00%	0.00	0.00	0.00%
Region II: Frederick and Washington Counties (2 EDs)	0.00	0.00	0.00%	0.00	0.00	0.00%	0.00	0.00	0.00%	0.00	0.00	0.00%
Region III: Baltimore County, Baltimore City, Anne Arundel, Carroll, Harford, Howard (24 EDs)	841.00	928.11	0.44%	1,268.00	1,615.82	0.77%	1,868.00	2,371.47	1.13%	1,894.00	2,432.44	1.16%
Region IV: Caroline, Cecil, Dorchester, Kent, Queen Anne's, Somerset, Talbot, Wicomico, Worcester (6 EDs)	0.00	0.00	0.00%	0.00	0.00	0.00%	0.00	0.00	0.00%	0.00	0.00	0.00%
Region V: Montgomery, Prince George's, Calvert, Charles, St. Mary's (15 EDs)	142.00	443.39	0.34%	150.00	417.91	0.32%	200.00	491.02	0.37%	266.00	721.60	0.55%
Total	983.00	1,371.50	0.31%	1,418.00	2,033.73	0.46%	2,068.00	2,862.49	0.65%	2,160.00	3,154.04	0.72%

Source: Maryland Institute for Emergency Medical Services Systems, County Hospital Alert Tracking System (CHATS). Note: Union Hospital of Cecil is reported in Region III data.

Table A-3

Licensed Beds, Emergency Department Visits, Discharges, Discharges Per Bed, Percent ED Visits Admitted, and Percent Discharges Admitted Through ED: Maryland, 2005

MIEMSS Region	Jurisdiction	Hospitals	Licensed Beds		Emergency Department Visits	Discharges (Ex. OB and Newborn)	ED Visits per Bed (Ex. OB)	% ED Visits Admitted to Hospital	% Discharges Admitted Thru ED (Ex. OB)
			All Services	Ex. OB					
Region I	Allegany County	Memorial Hosp. of Cumberland	120	111	31,752	6,833	286	15.41%	72.9%
		Sacred Heart Hospital	148	148	23,273	9,175	157	27.52%	69.0%
	Garrett County	Garrett County Hospital	31	27	17,704	2,214	656	9.05%	72.0%
Region II	Frederick County	Frederick Memorial Hospital	227	200	61,804	12,765	309	14.89%	70.6%
	Washington Co.	Washington County Hospital	243	227	68,268	13,491	301	14.03%	70.9%
Region III	Anne Arundel Co.	Anne Arundel Medical Center	265	215	69,288	17,061	322	17.17%	65.0%
		Balto. Wash. Medical Center	286	286	83,723	18,377	293	18.63%	80.1%
	Baltimore City	Bon Secours Hospital	141	141	19,934	7,346	141	32.96%	83.5%
		Good Samaritan Hospital	265	265	56,140	15,824	212	22.41%	78.5%
		Harbor Hospital	186	156	42,295	10,631	271	18.46%	68.5%
		Johns Hopkins Bayview	323	306	51,002	19,459	167	26.59%	65.6%
		Johns Hopkins Hospital	958	923	86,925	43,849	94	22.22%	43.5%
		Maryland General Hospital	205	185	36,387	9,509	197	20.95%	77.0%
		Mercy Medical Center	224	198	51,595	14,219	261	14.65%	52.5%
		Sinai Hospital of Baltimore	393	370	71,249	20,593	193	18.20%	59.6%
		St. Agnes Hospital	323	294	83,367	19,260	284	18.39%	76.1%
		Union Memorial Hospital	279	279	55,601	18,891	199	20.21%	56.9%
		University of Maryland	669	639	62,071	30,825	97	17.38%	56.1%
	Baltimore County	Franklin Square Hospital	357	320	98,270	22,323	307	19.85%	81.8%
		GBMC	292	232	58,897	16,936	254	19.52%	61.8%
		Northwest Hospital Center	214	214	54,274	12,871	254	21.46%	82.1%
		St. Joseph Medical Center	370	350	50,577	21,202	145	20.72%	49.9%
	Carroll County	Carroll County General	210	190	49,102	13,844	258	23.93%	80.2%
	Harford County	Harford Memorial Hospital	94	94	31,519	5,915	335	15.21%	78.0%
		Upper Chesapeake Medical Ctr.	167	153	54,230	11,681	354	19.12%	80.8%
	Howard County	Howard County General Hospital	208	177	76,283	10,790	431	11.50%	80.8%
Region IV	Cecil County	Union Hospital of Cecil	99	93	33,849	7,539	364	15.78%	56.9%
	Dorchester County	Dorchester General Hospital	53	53	17,551	3,739	331	15.87%	79.7%
	Kent County	Chester River Hospital	58	54	13,967	3,132	259	17.53%	69.4%
	Somerset County	McCready Memorial	9	9	6,390	827	710	10.16%	74.1%
	Talbot County	Memorial at Easton	120	106	37,397	8,074	353	16.57%	72.8%
	Wicomico County	Peninsula Regional Medical Ctr.	371	351	67,355	18,834	192	18.53%	60.8%
	Worchester County	Atlantic General	49	49	27,269	3,271	557	10.85%	80.1%
Region V	Montgomery Co.	Holy Cross Hospital	379	291	67,692	16,412	233	17.37%	64.3%
		Montgomery General Hospital	144	133	32,395	8,312	244	22.58%	83.5%
		Shady Grove Adventist Hospital	268	209	87,935	14,981	421	13.12%	76.2%
		Suburban Hospital	212	212	39,302	13,560	185	26.15%	75.6%
		Washington Adventist Hospital	285	260	42,836	15,857	165	21.60%	56.8%
	Calvert County	Calvert Memorial Hospital	107	97	33,061	6,956	341	16.51%	77.1%
	Charles County	Civista Medical Center	109	98	33,007	6,508	337	15.68%	75.7%
	Prince George's Co.	Doctors Community Hospital	186	186	53,625	11,442	288	18.60%	85.6%
		Fort Washington Hospital	42	42	38,624	2,882	920	6.28%	86.6%
		Laurel Regional Hospital	96	86	35,729	5,693	415	12.40%	81.8%
		Prince George's Hospital	268	228	47,973	12,866	210	21.92%	78.7%
		Southern Maryland Hospital	257	227	56,710	14,825	250	19.28%	61.7%
	St. Mary's County	St. Mary's Hospital	105	93	40,807	7,315	439	17.71%	84.4%
		Total	10,415	9,577	2,259,004	588,909	236	18.26%	67.0%

Source: Maryland Health Care Commission, *Annual Report on Acute Care Hospitals Services and Licensed Bed Capacity, FY 2007* ; HSCRC, Financial Data Base, FY 2006; HSCRC Hospital Discharge Data Base,CY 2005. Discharges exclude OB and newborn. Data reported excludes James L. Kernan Hospital which does not operate an emergency department.

Table A-4
Hours and Percent Time on Red and Yellow Alert and Reroute: Maryland, 2006

MIEMSS Region	Jurisdiction	Hospitals	Hours on Red Alert	% Time on Red Alert	Hours on Yellow Alert	% Time on Yellow Alert	Hours on Reroute	% Time on Reroute
Region I	Allegany County	Memorial Hosp. of Cumberland	-	0.0%	1.62	0.0%	-	0.0%
		Sacred Heart Hospital	62.97	0.7%	45.30	0.5%	-	0.0%
	Garrett County	Garrett County Hospital	-	0.0%	-	0.0%	-	0.0%
Region II	Frederick County	Frederick Memorial Hospital	666.97	7.6%	256.07	2.9%	-	0.0%
	Washington Co.	Washington County Hospital	81.85	0.93%	101.52	1.2%	-	0.0%
Region III	Anne Arundel Co.	Anne Arundel Medical Center	374.78	4.3%	1,119.87	12.8%	276.75	3.2%
		Balto. Wash. Medical Center*	106.68	1.2%	268.47	3.1%	601.72	6.9%
	Baltimore City	Bon Secours Hospital	624.33	7.1%	1,344.57	15.3%	63.30	0.7%
		Good Samaritan Hospital	1,560.02	17.8%	2,344.20	26.8%	64.38	0.7%
		Harbor Hospital	6.32	0.1%	514.15	5.9%	187.45	2.1%
		Johns Hopkins Bayview	2,025.68	23.1%	2,575.58	29.4%	120.63	1.4%
		Johns Hopkins Hospital	104.27	1.2%	3,052.20	34.8%	14.92	0.2%
		Maryland General Hospital	884.95	10.1%	1,034.67	11.8%	4.45	0.1%
		Mercy Medical Center	3.43	0.0%	337.07	3.8%	56.52	0.6%
		Sinai Hospital of Baltimore	1,706.77	19.5%	2,921.53	33.4%	333.37	3.8%
		St. Agnes Hospital	759.85	8.7%	1,881.35	21.5%	151.28	1.7%
		Union Memorial Hospital	1,802.37	20.6%	1,823.27	20.8%	15.95	0.2%
		University of Maryland	2,306.82	26.3%	2,184.88	24.9%	57.38	0.7%
	Baltimore County	Franklin Square Hospital	481.98	5.5%	3,392.18	38.7%	55.53	0.6%
		GBMC	836.67	9.6%	1,352.40	15.4%	7.07	0.1%
		Northwest Hospital Center	1,113.53	12.7%	3,205.03	36.6%	84.75	1.0%
		St. Joseph Medical Center	790.03	9.0%	948.85	10.8%	13.53	0.2%
	Carroll County	Carroll County General	1,159.58	13.2%	1,955.85	22.3%	6.53	0.1%
	Harford County	Harford Memorial Hospital	187.17	2.1%	1,439.85	16.4%	126.67	1.4%
		Upper Chesapeake Medical Ctr.	1,969.80	22.5%	1,576.18	18.0%	173.83	2.0%
	Howard County	Howard County General Hospital	147.33	1.7%	1,571.35	17.9%	18.43	0.2%
Region IV	Cecil County	Union Hospital of Cecil	13.63	0.2%	-	0.0%	-	0.0%
	Dorchester County	Dorchester General Hospital	2.40	0.0%	92.80	1.1%	-	0.0%
	Kent County	Chester River Hospital	189.13	2.2%	163.35	1.9%	-	0.0%
	Somerset County	McCready Memorial	61.05	0.7%	-	0.0%	-	0.0%
	Talbot County	Memorial at Easton	10.20	0.1%	123.68	1.4%	-	0.0%
	Wicomico County	Peninsula Regional Medical Ctr.	-	0.0%	-	0.0%	-	0.0%
	Worchester County	Atlantic General	-	0.0%	-	0.0%	-	0.0%
Region V	Montgomery Co.	Holy Cross Hospital	1,631.67	18.6%	1,133.75	12.9%	15.38	0.2%
		Montgomery General Hospital	443.12	5.1%	598.40	6.8%	8.15	0.1%
		Shady Grove Adventist Hospital	122.40	1.4%	420.03	4.8%	24.65	0.3%
		Suburban Hospital	113.52	1.3%	656.33	7.5%	11.70	0.1%
		Washington Adventist Hospital	82.77	0.9%	1,493.23	17.0%	55.90	0.6%
	Calvert County	Calvert Memorial Hospital	2,417.18	27.6%	938.17	10.7%	-	0.0%
	Charles County	Civista Medical Center**	865.22	9.9%	1,092.52	12.5%	43.17	0.5%
	Prince George's Co.	Doctors Community Hospital	776.82	8.9%	1,371.53	15.7%	100.55	1.1%
		Fort Washington Hospital	92.65	1.1%	146.42	1.7%	0.43	0.0%
		Laurel Regional Hospital	444.37	5.1%	1,640.55	18.7%	18.03	0.2%
		Prince George's Hospital	968.32	11.1%	1,698.93	19.4%	206.20	2.4%
		Southern Maryland Hospital	25.20	0.3%	61.82	0.7%	234.42	2.7%
	St. Mary's County	St. Mary's Hospital	2,617.65	29.9%	1,434.20	16.4%	3.02	0.0%
		Total	30,641.45	7.6%	50,313.72	12.5%	3,156.04	0.8%

Source: MIEMSS CHATS Data, FY2006. Note: Bowie Health Center and Johns Hopkins Pediatric are not included in the Alert Data. Total percentages are averages.

74

Table A-5

ED Visits Admitted to the Hospital, ED Visits Treated and Released, Total ED Visits, Percent of ED Visits Admitted, ED Treatment Spaces, ED Visits Per Treatment Space: Maryland, 2006

MIEMSS Region	Jurisdiction	Hospitals	ED Visits Admitted to the Hospital	ED Visits Treated and Released	Total ED Visits	% of ED Visits Admitted	ED Treatment Spaces	ED Visits Per Treatment Space
Region I	Allegany County	Memorial Hosp. of Cumberland	4,893	26,859	31,752	15.4%	21	1,512.0
		Sacred Heart Hospital	6,404	16,869	23,273	27.5%	16	1,454.6
	Garrett County	Garrett County Hospital	1,602	16,102	17,704	9.0%	16	1,106.5
Region II	Frederick County	Frederick Memorial Hospital	9,204	52,600	61,804	14.9%	59	1,047.5
	Washington Co.	Washington County Hospital	9,576	58,692	68,268	14.0%	38	1,796.5
Region III	Anne Arundel Co.	Anne Arundel Medical Center	11,895	57,393	69,288	17.2%	58	1,194.6
		Balto. Wash. Medical Center	15,594	68,129	83,723	18.6%	46	1,820.1
	Baltimore City	Bon Secours Hospital	6,570	13,364	19,934	33.0%	27	738.3
		Good Samaritan Hospital	12,581	43,559	56,140	22.4%	34	1,651.2
		Harbor Hospital	7,809	34,486	42,295	18.5%	34	1,244.0
		Johns Hopkins Bayview	13,563	37,439	51,002	26.6%	39	1,307.7
		Johns Hopkins Hospital	19,313	67,612	86,925	22.2%	88	987.8
		Maryland General Hospital	7,623	28,764	36,387	20.9%	25	1,455.5
		Mercy Medical Center	7,558	44,037	51,595	14.6%	40	1,289.9
		Sinai Hospital of Baltimore	12,968	58,281	71,249	18.2%	54	1,319.4
		St. Agnes Hospital	15,333	68,034	83,367	18.4%	48	1,736.8
		Union Memorial Hospital	11,236	44,365	55,601	20.2%	37	1,502.7
		University of Maryland	10,789	51,282	62,071	17.4%	65	954.9
	Baltimore County	Franklin Square Hospital	19,508	78,762	98,270	19.9%	98	1,002.8
		GBMC	11,494	47,403	58,897	19.5%	43	1,369.7
		Northwest Hospital Center	11,646	42,628	54,274	21.5%	38	1,428.3
		St. Joseph Medical Center	10,481	40,096	50,577	20.7%	39	1,296.8
	Carroll County	Carroll County General	11,752	37,350	49,102	23.9%	39	1,259.0
	Harford County	Harford Memorial Hospital	4,793	26,726	31,519	15.2%	25	1,260.8
		Upper Chesapeake Medical Ctr.	10,369	43,861	54,230	19.1%	33	1,643.3
	Howard County	Howard County General Hospital	8,771	67,512	76,283	11.5%	61	1,250.5
Region IV	Cecil County	Union Hospital of Cecil	5,340	28,509	33,849	15.8%	27	1,253.7
	Dorchester County	Dorchester General Hospital	2,785	14,766	17,551	15.9%	11	1,595.5
	Kent County	Chester River Hospital	2,448	11,519	13,967	17.5%	11	1,269.7
	Somerset County	McCready Memorial	649	5,741	6,390	10.2%	8	798.8
	Talbot County	Memorial at Easton	6,198	31,199	37,397	16.6%	23	1,626.0
	Wicomico County	Peninsula Regional Medical Ctr.	12,481	54,874	67,355	18.5%	43	1,566.4
	Worchester County	Atlantic General	2,958	24,311	27,269	10.8%	19	1,435.2
Region V	Montgomery Co.	Holy Cross Hospital	11,761	55,931	67,692	17.4%	45	1,504.3
		Montgomery General Hospital	7,315	25,080	32,395	22.6%	30	1,079.8
		Shady Grove Adventist Hospital	11,535	76,400	87,935	13.1%	55	1,598.8
		Suburban Hospital	10,277	29,025	39,302	26.1%	43	914.0
		Washington Adventist Hospital	9,253	33,583	42,836	21.6%	26	1,647.5
	Calvert County	Calvert Memorial Hospital	5,459	27,602	33,061	16.5%	24	1,377.5
	Charles County	Civista Medical Center**	5,176	27,831	33,007	15.7%	19	1,737.2
	Prince George's Co.	Doctors Community Hospital	9,973	43,652	53,625	18.6%	32	1,675.8
		Fort Washington Hospital	2,425	36,199	38,624	6.3%	18	2,145.8
		Laurel Regional Hospital	4,415	31,314	35,729	12.4%	20	1,786.5
		Prince George's Hospital	10,516	37,457	47,973	21.9%	44	1,090.3
		Southern Maryland Hospital	10,931	45,779	56,710	19.3%	36	1,575.3
	St. Mary's County	St. Mary's Hospital	7,226	33,581	40,807	17.7%	27	1,511.4
		Total	412,446	1,846,558	2,259,004	18.3%	1,682	1,343.0

Source: Annual Report on Acute Care Hospitals Services and Licensed Bed Capacity, FY2007 and HSCRC, Financial Data Base, FY2006.

Table A-6
Classification of Emergency Department Visits:
Maryland, 2005

Age	Non-Emergent	Emergent, PC Treatable	Emergent, Preventable	Emergent, Not Preventable	Other*
0-5 Years	23.2%	27.6%	9.8%	6.8%	32.7%
6-10 Years	19.8%	18.7%	8.7%	5.2%	47.6%
11-14 Years	15.3%	13.6%	6.1%	5.1%	59.8%
15-24 Years	21.5%	18.1%	5.3%	7.8%	47.3%
25-44 Years	20.8%	18.6%	5.2%	9.9%	45.6%
45-64 Years	15.8%	15.6%	5.0%	10.1%	53.7%
65-74 Years	11.1%	12.3%	4.2%	8.8%	63.6%
75+ Years	8.1%	9.0%	3.4%	7.0%	72.5%
Unknown	16.1%	6.4%	27.5%	0.0%	50.0%
Total	18.0%	17.2%	5.5%	8.6%	50.6%
Race					
African American	21.0%	19.7%	7.0%	8.3%	44.1%
American Indian	18.3%	18.4%	5.0%	9.9%	48.4%
Asian	17.3%	16.7%	4.8%	9.2%	52.1%
Biracial	20.6%	22.4%	7.6%	6.8%	42.6%
White	15.5%	15.2%	4.5%	8.8%	56.0%
Other	19.9%	19.1%	4.9%	9.1%	47.0%
Unknown	21.1%	18.6%	4.6%	8.4%	47.3%
Total	18.0%	17.2%	5.5%	8.6%	50.6%
Payer					
Commercial/Blue Cross	18.6%	17.7%	5.2%	9.6%	48.8%
Medicaid	21.3%	20.7%	7.3%	7.3%	43.4%
Medicare	10.3%	11.0%	4.1%	7.7%	66.9%
Private HMO	18.8%	18.9%	5.6%	10.5%	46.3%
Self Pay/No Charge	21.7%	19.1%	6.1%	8.4%	44.8%
Unknown	13.5%	10.2%	2.7%	6.0%	67.6%
Total	18.0%	17.2%	5.5%	8.6%	50.6%
MIEMSS Region					
Region I	17.6%	17.4%	4.7%	7.3%	52.9%
Region II	17.3%	18.2%	4.9%	10.1%	49.5%
Region III	18.2%	17.0%	5.7%	8.4%	50.7%
Region IV	16.9%	16.7%	5.6%	8.1%	52.7%
Region V	17.7%	17.4%	5.4%	8.7%	50.8%
Total	18.0%	17.2%	5.5%	8.6%	50.6%

Source: The classification system is from Billings, J., et al. Emergency Department Use: The New York Story. The Commonwealth Fund Issue Brief, November 2000. Data HSCRC, Hospital Discharge Abstract Data Base and Hospital Ambulatory Care Data Set, CY 2005. * Other includes injuries, inpatient admission, mental health, substance abuse. (Percentages may not add to 100% because of rounding.)

Table A-7
MARYLAND HEALTH CARE COMMISSION
Freestanding Medical Facilities: Patient-Level Data Set
COMAR 10.24.06

Provider Number
Record Number
From Date of Service
Thru Date of Service
Record Type
Encounter Type
Patient Age
Sex
Race
Residence Zip Code
Primary Health Plan Payer
Secondary Health Plan Payer
Expected Payer for Most of This Bill
Secondary Payer
Principal Diagnosis
Other Diagnosis 1-15
E-Code
Recurring Patient Number of Visits
Admitting Diagnosis
Condition Code 1-5
Occurrence Spancode and Date
Value Code
Bill Type
Registration Time
Discharge Time
Mode of Arrival
Maryland Ambulance Information System Number
Priority Status for Fire Department Ambulance Transports to Facility
Mode of Departure from Facility
Time of Request for Ground or Air Ambulance Transportation from Facility
Time of Departure from Facility Following Request for Ground or Air Ambulance Transportation
Patient Disposition at End of Visit
Hospital Transfer Site ID
Type of Service (ECG Monitoring, Extended Observation)
UB-92 Revenue Code
Units of Service
Charges
CPT/HCPCS Code

Table A-8
Total Emergency Department Vistis and ED Visits with Principal Diagnoses of Mental Disorders by Payer Source and Admission Status: Maryland, 2005

Payer Source	All ED Visits Not Admitted		ED Visits Not Admitted with Principal Diagnoses of Mental Disorders (ICD Codes 290-319)					
	Total Visits	% of Total	Mental Disorders	Drug and Alcohol	Mental Retardation	Other Mental Disorders	Total Mental Disorders	% of Total
MEDICARE	209,988	11.33%	5,873	1,536	8	766	8,183	12.00%
MEDICAID	51,705	2.79%	1,713	905	6	89	2,713	3.98%
TITLE V	450	0.02%	2	2	0	0	4	0.01%
BLUE CROSS	146,154	7.88%	2,503	864	1	152	3,520	5.16%
COMMERCIAL	229,379	12.37%	3,919	1,412	1	254	5,586	8.19%
OTHER GOVT	24,150	1.30%	593	181	0	23	797	1.17%
WORKMANS COMP	39,964	2.16%	96	19	0	3	118	0.17%
SELF PAY	396,331	21.38%	10,005	10,430	4	493	20,932	30.70%
NO CHARGE	8,365	0.45%	308	488	0	12	808	1.19%
OTHER	9,454	0.51%	566	104	0	12	682	1.00%
HMO	319,772	17.25%	6,394	2,272	5	384	9,055	13.28%
MDCAID - HMO	296,943	16.02%	9,098	3,378	24	317	12,817	18.80%
MDCARE - HMO	4,165	0.22%	86	40	0	25	151	0.22%
BCBS - NCA	59,850	3.23%	879	323	0	67	1,269	1.86%
BCBS - OTHER	52,848	2.85%	1,055	352	0	57	1,464	2.15%
UNKNOWN	4,348	0.23%	51	35	0	0	86	0.13%
TOTAL	**1,853,866**	**100.00%**	**43,141**	**22,341**	**49**	**2,654**	**68,185**	**100.00%**

Payer Source	All ED Visits Admitted		ED Visits Admitted with Principal Diagnoses of Mental Disorders (ICD Codes 290-319)					
	Total Visits	% of Total	Mental Disorders	Drug and Alcohol	Mental Retardation	Other Mental Disorders	Total Mental Disorders	% of Total
MEDICARE	182,489	46.05%	4,860	778	2	639	6,279	22.24%
MEDICAID	28,116	7.10%	2,989	622	0	33	3,644	12.91%
TITLE V	20	0.01%	0	0	0	0	0	0.00%
BLUE CROSS	20,659	5.21%	631	174	0	23	828	2.93%
COMMERCIAL	28,816	7.27%	1,485	287	0	23	1,795	6.36%
OTHER GOVT	3,176	0.80%	113	33	0	7	153	0.54%
WORKMANS COMP	1,359	0.34%	19	1	0	0	20	0.07%
SELF PAY	26,835	6.77%	3,661	1,415	0	16	5,092	18.04%
NO CHARGE	936	0.24%	28	26	0	0	54	0.19%
OTHER	1,600	0.40%	142	40	0	1	183	0.65%
DONOR	4	0.00%	0	0	0	0	0	0.00%
HMO	46,152	11.65%	2,440	528	0	46	3,014	10.68%
MDCAID - HMO	34,722	8.76%	5,362	579	1	32	5,974	21.16%
MDCARE - HMO	4,154	1.05%	89	16	0	5	110	0.39%
BCBS - NCA	8,706	2.20%	472	102	0	8	582	2.06%
BCBS - OTHER	8,334	2.10%	406	68	0	7	481	1.70%
UNKNOWN	187	0.05%	14	5	0	0	19	0.07%
TOTAL	**396,265**	100.00%	**22,711**	**4,674**	**3**	**840**	**28,228**	**100.00%**

Payer Source	All ED Visits		All ED Visits with Principal Diagnoses of Mental Disorders (ICD Codes 290-319)					
	Total Visits	% of Total	Mental Disorders	Drug and Alcohol	Mental Retardation	Other Mental Disorders	Total Mental Disorders	% of Total
MEDICARE	392,477	17.44%	10,733	2,314	10	1,405	14,462	15.00%
MEDICAID	79,821	3.55%	4,702	1,527	6	122	6,357	6.59%
TITLE V	470	0.02%	2	2	0	0	4	0.00%
BLUE CROSS	166,813	7.41%	3,134	1,038	1	175	4,348	4.51%
COMMERCIAL	258,195	11.47%	5,404	1,699	1	277	7,381	7.66%
OTHER GOVT	27,326	1.21%	706	214	0	30	950	0.99%
WORKMANS COMP	41,323	1.84%	115	20	0	3	138	0.14%
SELF PAY	423,166	18.81%	13,666	11,845	4	509	26,024	26.99%
NO CHARGE	9,301	0.41%	336	514	0	12	862	0.89%
OTHER	11,054	0.49%	708	144	0	13	865	0.90%
DONOR	4	0.00%	0	0	0	0	0	0.00%
HMO	365,924	16.26%	8,834	2,800	5	430	12,069	12.52%
MDCAID - HMO	331,665	14.74%	14,460	3,957	25	349	18,791	19.49%
MDCARE - HMO	8,319	0.37%	175	56	0	30	261	0.27%
BCBS - NCA	68,556	3.05%	1,351	425	0	75	1,851	1.92%
BCBS - OTHER	61,182	2.72%	1,461	420	0	64	1,945	2.02%
UNKNOWN	4,535	0.20%	65	40	0	0	105	0.11%
TOTAL	**2,250,131**	**100.00%**	**65,852**	**27,015**	**52**	**3,494**	**96,413**	**100.00%**

Source: Maryland Health Care Commission (Data reported is based on the HSCRC Hospital Discharge Abstract Data Base and Hospital Ambulatory Care Data Base for calendar year 2005.)

Table A-9
Total Emergency Department Vistis and ED Visits with Principal Diagnoses of Mental Disorders by Payer Source and Admission Status: Maryland, 2002

Payer Source	All ED Visits Not Admitted		ED Visits Not Admitted with Principal Diagnoses of Mental Disorders (ICD Codes 290-319)					
	Total Visits	% of Total	Mental Disorders	Drug and Alcohol	Mental Retardation	Other Mental Disorders	Total Mental Disorders	% of Total
MEDICARE	184,468	10.95%	5,090	1,383	36	757	7,266	11.43%
MEDICAID	36,861	2.19%	1,644	520	8	68	2,240	3.52%
TITLE V	88	0.01%	0	0	0	0	0	0.00%
BLUE CROSS	175,594	10.43%	3,402	1,097	5	225	4,729	7.44%
COMMERCIAL	224,157	13.31%	4,381	1,586	1	272	6,240	9.82%
OTHER GOVT	14,275	0.85%	344	71	0	10	425	0.67%
WORKMANS COMP	45,593	2.71%	91	9	0	9	109	0.17%
SELF PAY	345,617	20.52%	9,106	10,378	15	463	19,962	31.41%
NO CHARGE	4,660	0.28%	186	286	0	8	480	0.76%
OTHER	5,281	0.31%	297	91	0	3	391	0.62%
HMO	296,846	17.63%	6,225	2,015	6	345	8,591	13.52%
MDCAID - HMO	254,991	15.14%	7,755	2,735	41	254	10,785	16.97%
MDCARE - HMO	3,041	0.18%	48	18	0	23	89	0.14%
BCBS - NCA	46,201	2.74%	700	211	0	51	962	1.51%
BCBS - OTHER	40,184	2.39%	811	275	2	47	1,135	1.79%
Unknown	6,140	0.36%	98	54	0	1	153	0.24%
TOTAL	**1,683,997**	**100.00%**	**40,178**	**20,729**	**114**	**2,536**	**63,557**	**100.00%**

Payer Source	All ED Visits Admitted		ED Visits Admitted with Principal Diagnoses of Mental Disorders (ICD Codes 290-319)					
	Total Visits	% of Total	Mental Disorders	Drug and Alcohol	Mental Retardation	Other Mental Disorders	Total Mental Disorders	% of Total
MEDICARE	164,235	46.44%	4298	693	3	660	5,654	20.45%
MEDICAID	23,206	6.56%	2804	545	1	32	3,382	12.23%
TITLE V	24	0.01%	0	0	0	0	0	0.00%
BLUE CROSS	24,799	7.01%	1030	239	0	31	1,300	4.70%
COMMERCIAL	28,060	7.93%	1719	415	0	28	2,162	7.82%
OTHER GOVT	2,050	0.58%	81	90	0	0	171	0.62%
WORKMANS COMP	1,233	0.35%	17	4	0	0	21	0.08%
SELF PAY	21,579	6.10%	3639	1787	1	21	5,448	19.71%
NO CHARGE	1,128	0.32%	208	31	0	0	239	0.86%
OTHER	957	0.27%	129	101	0	1	231	0.84%
DONOR	1	0.00%	0	0	0	0	0	0.00%
HMO	40,034	11.32%	2018	502	1	50	2,571	9.30%
MDCAID - HMO	30,462	8.61%	5008	497	4	36	5,545	20.06%
MDCARE - HMO	3,094	0.87%	51	4	0	16	71	0.26%
BCBS - NCA	6,248	1.77%	324	119	0	16	459	1.66%
BCBS - OTHER	6,067	1.72%	293	60	0	3	356	1.29%
Unknown	502	0.14%	27	8	0	1	36	0.13%
TOTAL	**353,679**	**100.00%**	**21,646**	**5,095**	**10**	**895**	**27,646**	**100.00%**

Payer Source	All ED Visits		All ED Visits with Principal Diagnoses of Mental Disorders (ICD Codes 290-319)					
	Total Visits	% of Total	Mental Disorders	Drug and Alcohol	Mental Retardation	Other Mental Disorders	Total Mental Disorders	% of Total
MEDICARE	348,703	17.11%	9,388	2,076	39	1,417	12,920	14.17%
MEDICAID	60,067	2.95%	4,448	1,065	9	100	5,622	6.16%
TITLE V	112	0.01%	0	0	0	0	0	0.00%
BLUE CROSS	200,393	9.83%	4,432	1,336	5	256	6,029	6.61%
COMMERCIAL	252,217	12.38%	6,100	2,001	1	300	8,402	9.21%
OTHER GOVT	16,325	0.80%	425	161	0	10	596	0.65%
WORKMANS COMP	46,826	2.30%	108	13	0	9	130	0.14%
SELF PAY	367,196	18.02%	12,745	12,165	16	484	25,410	27.86%
NO CHARGE	5,788	0.28%	394	317	0	8	719	0.79%
OTHER	6,238	0.31%	426	192	0	4	622	0.68%
DONOR	1	0.00%	0	0	0	0	0	0.00%
HMO	336,880	16.53%	8,243	2,517	7	395	11,162	12.24%
MDCAID - HMO	285,453	14.01%	12,763	3,232	45	290	16,330	17.91%
MDCARE - HMO	6,135	0.30%	99	22	0	39	160	0.18%
BCBS - NCA	52,449	2.57%	1,024	330	0	67	1,421	1.56%
BCBS - OTHER	46,251	2.27%	1,104	335	2	50	1,491	1.63%
	6,642	0.33%	125	62	0	2	189	0.21%
TOTAL	**2,037,676**	**100.00%**	**61,824**	**25,824**	**124**	**3,431**	**91,203**	**100.00%**

Source: Maryland Health Care Commission (Data reported is based on the HSCRC Hospital Discharge Abstract Data Base and Hospital Ambulatory Care Data Base for calendar year 2002.)

Table A-10
Total Emergency Department Vistis and ED Visits with Principal Diagnoses of Mental Disorders by Age Group and Admission Status: Maryland, 2005

Age Group	All ED Visits Not Admitted		ED Visits Not Admitted with Principal Diagnoses of Mental Disorders (ICD Codes 290-319)					
	Total Visits	% of Total	Mental Disorders	Drug and Alcohol	Mental Retardation	Other Mental Disorders	Total Mental Disorders	% of Total
00 - 05 Years	201,372	10.86%	148	23	1	43	215	0.32%
06 - 10 Years	83,786	4.52%	1,101	5	0	81	1,187	1.74%
11 - 14 Years	76,920	4.15%	3,452	204	2	106	3,764	5.52%
15 - 24 Years	328,840	17.74%	10,290	4,021	18	444	14,773	21.67%
25 - 44 Years	610,871	32.95%	17,008	10,476	16	789	28,289	41.49%
45 - 64 Years	375,439	20.25%	8,925	7,019	11	410	16,365	24.00%
65 - 74 Years	80,049	4.32%	1,066	431	1	189	1,687	2.47%
75 - 84 Years	67,084	3.62%	841	123	0	329	1,293	1.90%
85+ Years	29,505	1.59%	310	39	0	263	612	0.90%
Total	**1,853,866**	**100.00%**	**43,141**	**22,341**	**49**	**2,654**	**68,185**	**100.00%**

Age Group	All ED Visits Admitted		ED Visits Admitted with Principal Diagnoses of Mental Disorders (ICD Codes 290-319)					
	Total Visits	% of Total	Mental Disorders	Drug and Alcohol	Mental Retardation	Other Mental Disorders	Total Mental Disorders	% of Total
00 - 05 Years	11,054	2.79%	14	1	0	1	16	0.06%
06 - 10 Years	3,071	0.77%	138	1	0	0	139	0.49%
11 - 14 Years	2,966	0.75%	409	2	0	3	414	1.47%
15 - 24 Years	19,714	4.97%	3,572	257	1	29	3,859	13.67%
25 - 44 Years	74,641	18.84%	10,695	1,923	0	61	12,679	44.92%
45 - 64 Years	118,028	29.79%	6,592	2,032	1	114	8,739	30.96%
65 - 74 Years	56,701	14.31%	723	226	1	121	1,071	3.79%
75 - 84 Years	69,887	17.64%	412	173	0	293	878	3.11%
85+ Years	40,203	10.15%	156	59	0	218	433	1.53%
Total	**396,265**	**100.00%**	**22,711**	**4,674**	**3**	**840**	**28,228**	**100.00%**

Age Group	All ED Visits		All ED Visits with Principal Diagnoses of Mental Disorders (ICD Codes 290-319)					
	Total Visits	% of Total	Mental Disorders	Drug and Alcohol	Mental Retardation	Other Mental Disorders	Total Mental Disorders	% of Total
00 - 05 Years	212,426	9.44%	162	24	1	44	231	0.24%
06 - 10 Years	86,857	3.86%	1,239	6	0	81	1,326	1.38%
11 - 14 Years	79,886	3.55%	3,861	206	2	109	4,178	4.33%
15 - 24 Years	348,554	15.49%	13,862	4,278	19	473	18,632	19.33%
25 - 44 Years	685,512	30.47%	27,703	12,399	16	850	40,968	42.49%
45 - 64 Years	493,467	21.93%	15,517	9,051	12	524	25,104	26.04%
65 - 74 Years	136,750	6.08%	1,789	657	2	310	2,758	2.86%
75 - 84 Years	136,971	6.09%	1,253	296	0	622	2,171	2.25%
85+ Years	69,708	3.10%	466	98	0	481	1,045	1.08%
Total	**2,250,131**	**100.00%**	**65,852**	**27,015**	**52**	**3,494**	**96,413**	**100.00%**

Source: Maryland Health Care Commission (Data reported is based on the HSCRC Hospital Discharge Abstract Data Base and Hospital Ambulatory Care Data Base for calendar year 2005.)

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