STATE OF MARYLAND
DEPARTMENT OF HEALTH AND MENTAL HYGIENE

Frederick W. Puddester
Chairman

Kevin J. Sexton
Vice Chairman

Joseph R. Antos, Ph.D.

George H. Bone, M.D.

C. James Lowthers

Herbert S. Wong, Ph.D.

HEALTH SERVICES COST REVIEW COMMISSION
4160 PATTERSON AVENUE, BALTIMORE, MARYLAND 21215
Phone: 410-764-2605 · Fax: 410-358-6217
Toll Free: 1-888-287-3229
www.hscrc.state.md.us

Robert Murray
Executive Director

Stephen Ports
Principal Deputy Director
Policy & Operations

Gerard J. Schmith
Deputy Director
Hospital Rate Setting

Mary Beth Pohl
Deputy Director
Research and Methodology

478th MEETING OF THE HEALTH SERVICES COST REVIEW COMMISSION
June 1, 2011

PUBLIC SESSION OF THE
HEALTH SERVICES COST REVIEW COMMISSION
10:00 a.m.

1. **Review of the Public Meeting Minutes of April 15, 2011**

2. **Executive Director's Report**

3. **Docket Status – Cases Closed**
   2108N – Adventist Behavioral Health
   2109A – University of Maryland Medical Center
   2111A – Johns Hopkins Health System

4. **Docket Status – Cases Open**
   2110N – Western Maryland Health System
   2112N – University Specialty Hospital
   2113A – University of Maryland Medical Center
   2114N – Adventist Behavioral Health
   2115A – Holy Cross Hospital
   2116A – Germantown Emergency Center
   2117A – Johns Hopkins Health System
   2118N – Bowie Emergency Center

5. **Final Recommendation on Funding Support of the Maryland Patient Safety Center**

6. **Final Recommendation on FY 2012 NSPII Competitive Institutional Grant**

7. **Draft Recommendation on Quality Based Reimbursement Methodology for FY 2012 Scaling**
   a.) AHRQ - MD Dashboard on Health Care Quality handout and web links

8. **Update on Status of Scaling Methodology for the FY2012 Update**

9. **Summary of Maryland Physician Work Force Study**

10. **Legal Report**

11. **Hearing and Meeting Schedule**

H.S.C.R.C's CURRENT LEGAL DOCKET STATUS (OPEN)

AS OF MAY 24, 2011

A: PENDING LEGAL ACTION : NONE
B: AWAITING FURTHER COMMISSION ACTION: NONE
C: CURRENT CASES:

Docket Number	Hospital Name	Date Docketed	Decision Required by:	Rate Order Must be Issued by:	Purpose	Analyst's Initials	File Status
2110N	Western Maryland Health System	3/31/2011	6/1/2011	8/29/2011	HYP	CO	OPEN
2112N	University Specialty Hospital	5/9/2011	6/8/2011	10/8/2011	ORC	CO	OPEN
2113A	University of Maryland Medical Center	4/21/2011	N/A	N/A	ARM	DNP	OPEN
2114N	Adventist Behavioral Health	5/18/2011	6/17/2011	10/17/2011	PSI	CO	OPEN
2115A	Holy Cross Hospital	5/18/2011	N/A	N/A	ARM	DNP	OPEN
2116A	Germantown Emergency Center	5/18/2011	6/17/2011	10/17/2011	FSE	GS	OPEN
2117A	Johns Hopkins Health System	5/18/2011	N/A	N/A	ARM	DNP	OPEN
2118N	Bowie Emergency Center	5/24/2011	6/23/2011	10/23/2011	FSE	GS	OPEN

PRCEEDINGS REQUIRING COMMISSION ACTION - NOT ON OPEN DOCKET

IN RE: THE PARTIAL RATE	*****	**BEFORE THE HEALTH SERVICES**
APPLICATION OF THE	*****	**COST REVIEW COMMISSION**
WESTERN MARYLAND	*****	**DOCKET: 2011**
HEALTH SYSTEM	*****	**FOLIO: 1920**
CUMBERLAND, MARYLAND	*****	**PROCEEDING: 2110N**

Staff Recommendation

June 1, 2011

This recommendation was approved by the Commission on June 1, 2011.

Introduction

On March 25, 2011, Western Maryland Health System ("Hospital") submitted a partial rate application to the Commission requesting a rate for Hyperbaric Chamber (HYP) services. The Hospital is requesting the statewide median rate for HYP services to be effective May 1, 2011.

Staff Evaluation

To determine if the Hospital's HYP rate should be set at the statewide median or at a rate based on its own cost experience, the staff requested that the Hospital submit to the Commission all cost and statistical data for HYP services for FY 2011. Based on information received, it was determined that the HYP rate based on the Hospital's actual data would be $180.24 per Hour of Treatment, while the statewide median rate for HYP services is $286.72 per Hour of Treatment.

Recommendation

After reviewing the Hospital's application, the staff recommends as follows:

1. That COMAR 10.37.10.07 requiring that rate applications be filed 60 days before the opening of a new service be waived;
2. That an HYP rate of $180.24 per Hour of Treatment be approved effective May 1, 2011; and
3. That the HYP rate not be rate realigned until a full year's cost experience data have been reported to the Commission.

.

IN RE: THE PARTIAL RATE	*	**BEFORE THE HEALTH SERVICES**
APPLICATION OF THE	*	**COST REVIEW COMMISSION**
UNIVERSITY SPECIALTY	*	**DOCKET: 2011**
HOSPITAL	*	**FOLIO: 1922**
BALTIMORE, MARYLAND	*	**PROCEEDING: 2112N**

Staff Recommendation

June 1, 2011

This recommendation was approved by the Commission on June 1, 2011.

Introduction

On May 9, 2011, University Specialty Hospital ("Hospital"), a member of the University of Maryland Medical System, submitted a partial rate application to the Commission requesting a rate for Operating Room Clinic (ORC) services, due to the establishment of a new Pediatric Clinic at the Hospital. The Hospital is requesting the lower of $13.57 per minute based on its costs and volumes or the statewide median rate for ORC services to be effective June 1, 2011.

Staff Evaluation

To determine if the Hospital's ORC rate should be set at the statewide median or at a rate based on its own cost experience, the staff requested that the Hospital submit to the Commission all cost and statistical data for ORC services for FY 2011. Based on information received, it was determined that the ORC rate based on the Hospital's actual data would be $13.57 per minute, while the statewide median rate for ORC services is $12.25 per minute.

Recommendation

After reviewing the Hospital's application, the staff recommends as follows:

1. That COMAR 10.37.10.07 requiring that rate applications be filed 60 days before the opening of a new service be waived;
2. That an ORC rate of $12.25 per minute be approved effective June 1, 2011; and
3. That the ORC rate not be rate realigned until a full year's cost experience data have been reported to the Commission.

.

IN RE: THE APPLICATION FOR	*	**BEFORE THE MARYLAND HEALTH**	
ALTERNATIVE METHOD OF RATE	*	**SERVICES COST REVIEW**	
DETERMINATION	*	**COMMISSION**	
UNIVERSITY OF MARYLAND	*	**DOCKET:**	**2011**
MEDICAL CENTER	*	**FOLIO:**	**1923**
BALTIMORE, MARYLAND	*	**PROCEEDING:**	**2113A**

Staff Recommendation

June 1, 2011

This recommendation was approved by the Commission on June 1, 2011.

I. INTRODUCTION

On April 22, 2011, the University of Maryland Medical Center (“UMMC,” or the “Hospital”) filed an application with the Commission for an alternative method of rate determination, pursuant to COMAR 10.37.10.06. The Hospital has requested approval to continue to participate in a renegotiated global rate arrangement with the Gift of Life Foundation (GOL) for the collection of bone marrow and peripheral blood stem cells from GOL on an outpatient basis, donors to facilitate Hematopoietic Stem Cell transplants into unrelated GOL recipients. The Hospital seeks approval of the arrangement for one year beginning April 1, 2011.

II. OVERVIEW OF APPLICATION

The contract will continue to be held and administered by University Physicians, Inc. ("UPI"), which is a subsidiary of the University of Maryland Medical System. UPI will manage all financial transactions related to the global price contract including payments to the Hospital and bear all risk relating to services associated with the contract.

III. FEE DEVELOPMENT

The hospital portion of the global rates for the collection of bone marrow and peripheral blood stem cells has been updated and is based on actual experience in FY 2010 and 2011 for cases performed at UMMC. The remainder of the global rates comprised of physician services has been negotiated with the participating physician group.

IV. IDENTIFICATION AND ASSESSMENT OF RISK

The Hospital will continue to submit bills to UPI for all contracted and covered services. UPI will continue to be responsible for billing the payer, collecting payments, reimbursing physicians, and disbursing payments to the Hospital at its full HSCRC

approved rates. The Hospital contends that the arrangement between UPI and the Hospital holds the Hospital harmless from any shortfalls in payment from the global price contract.

V. STAFF EVALUATION

Staff found that the Hospital's experience under this arrangement for the last year was slightly unfavorable. However, in addition to recalibrating the hospital portion of the global rate, UMMC has implemented several utilization reduction initiatives.

VI. STAFF RECOMMENDATION

After reviewing the revised global rates and recognizing the efforts to reduce hospital charges through utilization reduction, staff recommends that: 1) the Commission waive the requirement that applications be filed at least 30 days before the requested effective date (COMAR 10.37.06(5); and 2) the Commission approve the Hospital's request for an alternative method of rate determination for the collection of bone marrow and peripheral stem cells for one year commencing April 1, 2011. UMMC will be required to file a renewal application for review to be considered for continued participation in the arrangement.

Consistent with its policy paper regarding applications for alternative methods of rate determination, the staff recommends that this approval be contingent upon the execution of the standard Memorandum of Understanding ("MOU") with the Hospital for the approved contract. This document would formalize the understanding between the Commission and the Hospital, and would include provisions for such things as payments of HSCRC-approved rates, treatment of losses that may be attributed to the contract, quarterly and annual reporting, confidentiality of data submitted, penalties for noncompliance, project termination and/or alteration, on-going monitoring, and other issues specific to the proposed contract. The MOU will also stipulate that operating losses under the contract cannot be used to justify future requests for rate increases.

IN RE: THE PARTIAL RATE	*	**BEFORE THE HEALTH SERVICES**	
APPLICATION OF	*	**COST REVIEW COMMISSION**	
HOLY CROSS HOSPITAL	*	**DOCKET:**	**2011**
	*	**FOLIO:**	**1925**
SILVER SPRING, MARYLAND	*	**PROCEEDING:**	**2115A**

*** ***

Staff Recommendation

June 1, 2011

This recommendation was approved by the Commission on June 1, 2011.

Introduction

On May 18, 2011, Holy Cross Hospital (Holy Cross or the Hospital) requested that the Commission approve its continued participation in the alternative method of rate determination (ARM) arrangement with the Kaiser Health Plan of the Mid-Atlantic States, Inc. (Kaiser).

This arrangement was first approved as a Demonstration Project, approved July 1, 2005 for two years, was extended for two additional years at the Commission's July 18, 2007 public meeting, and extended for another two years at the Commission's June 3, 2009 public meeting. Under the arrangement, Holy Cross was grants a reduction in rates of 3.15% to Kaiser members to reflect three discrete activities by Kaiser that generate cost savings to Holy Cross. The activities are: 1) the reduction of Kaiser's retroactive denials, valued at 0.53%; 2) the provision of case managers, valued at 1.25%; and 3) the elimination of collection costs and the immediate access to payment, valued at 1.37%.

In addition, to the rate reduction, the Commission permitted Kaiser to utilize its greater purchasing power to reduce the cost of major medical devices (surgically implanted vender-delivered devices costing a minimum of $2,500) for its members at Holy Cross. The rationale for the Commission's approval was that: 1) Holy Cross would reduce its CPC target by the invoice cost it would have paid for the devices if it had purchased them; 2) this would reduce the Hospital's total allowable revenue; and 3) since the System is capped, the amount of revenue removed from the Hospital's allowable revenue would be available to other hospitals.

Holy Cross has requested that the Demonstration Project be allowed to continue

indefinitely.

Findings

As a condition for continued approval, Holy Cross was required to provide a letter of attestation, 30 days after the end of its fiscal year, that the activities of Kaiser continued to justify the 3.15% discount approved by the Commission. The fiscal 2009 attestation letter indicated that the savings associated with Kaiser's three cost cutting activities produced savings of 3.27%, and the fiscal 2010 letter indicated savings of 3.07% (an average of 3.17% over the two year period).

In addition, in accordance with the terms of the arrangement, Holy Cross' total allowed revenue for FY 2009 and FY 2010 was reduced by $652,724 and $589,994 respectively, which is equal to the cost of the medical devices not provided by Holy Cross to Kaiser's patients.

Staff Recommendation

The Demonstration Project shows that the cost cutting activities of Kaiser continue to justify the discount approved by the Commission, and that Kaiser's provision of medical devices has produced Savings to the system. Therefore, staff recommends:

1) that the Demonstration Project be continued for an additional two years, beginning July 1, 2011;

2) that 30 days after the end of its fiscal year the Hospital provide a letter of attestation that Kaiser's three cost savings activities continue to justify the 3.15%

discount;

3) that in regard to the provision of major medical devices by Kaiser for its members, the Hospital provide the data as prescribed by staff in the letter from Dennis N. Phelps to Gary Vogan dated June 15, 2005, attached; and

4) that the Hospital be required to apply for continuation of this arrangement beyond June 30, 2013.

IN RE: THE APPLICATION FOR	*	**BEFORE THE MARYLAND HEALTH**	
ALTERNATIVE METHOD OF RATE	*	**SERVICES COST REVIEW**	
DETERMINATION	*	**COMMISSION**	
JOHNS HOPKINS HEALTH	*	**DOCKET:**	**2011**
SYSTEM	*	**FOLIO:**	**1927**
BALTIMORE, MARYLAND	*	**PROCEEDING:**	**2117A**

Staff Recommendation

June 1, 2011

This recommendation was approved by the Commission on June 1, 2011.

I. INTRODUCTION

Johns Hopkins Health System (“System”) filed an application with the HSCRC on May 19, 2011 on behalf of Johns Hopkins Hospital and Johns Hopkins Bayview Medical Center (the “Hospitals”) for an alternative method of rate determination, pursuant to COMAR 10.37.10.06. The System requests approval from the HSCRC to continue to participate in a global rate arrangement for solid organ and bone marrow transplants services with INTERLINK Health Services, Inc. The System requests approval for a period of three years beginning June 1, 2011.

II. OVERVIEW OF APPLICATION

The contract will continue to be held and administered by Johns Hopkins HealthCare, LLC ("JHHC"), which is a subsidiary of the System. JHHC will manage all financial transactions related to the global price contract including payments to the Hospitals and bear all risk relating to regulated services associated with the contract.

III. FEE DEVELOPMENT

The hospital portion of the global rates was developed by calculating mean historical charges for patients receiving the procedures for which global rates are to be paid. The remainder of the global rate is comprised of physician service costs. Additional per diem payments were calculated for cases that exceed a specific length of stay outlier threshold.

IV. IDENTIFICATION AND ASSESSMENT OF RISK

The Hospitals will continue to submit bills to JHHC for all contracted and covered services. JHHC is responsible for billing the payer and collecting payments, disbursing payments to the Hospitals at their full HSCRC approved rates, and reimbursing the physicians. The System contends that the arrangement among JHHC, the Hospitals,

and the physicians holds the Hospitals harmless from any shortfalls in payment from the global price contract. JHHC maintains it has been active in similar types of fixed fee contracts for several years, and that JHHC is adequately capitalized to bear the risk of potential losses.

V. STAFF EVALUATION

Although there has been no activity under this arrangement, staff believes that the Hospitals can achieve a favorable experience under this arrangement.

VI. STAFF RECOMMENDATION

The staff recommends that: 1) the Commission waive the requirement that alternative rate applications be filed 30 days before the proposed effective date; 2) the Commission approve the Hospitals' application for an alternative method of rate determination for solid organ and bone marrow transplant services, for a one year period commencing June 1, 2010. The Hospitals will need to file a renewal application for review to be considered for continued participation. Consistent with its policy paper regarding applications for alternative methods of rate determination, the staff recommends that this approval be contingent upon the execution of the standard Memorandum of Understanding ("MOU") with the Hospitals for the approved contract. This document would formalize the understanding between the Commission and the Hospitals, and would include provisions for such things as payments of HSCRC-approved rates, treatment of losses that may be attributed to the contract, quarterly and annual reporting, confidentiality of data submitted, penalties for noncompliance, project termination and/or alteration, on-going monitoring, and other issues specific to the proposed contract. The MOU will also stipulate that operating losses under the contract cannot be used to justify future requests for rate increases.

Final Recommendations on Continued Financial Support for the Maryland Patient Safety Center

May 25, 2011

Health Services Cost Review Commission
4160 Patterson Avenue
Baltimore, MD 21215

This Final Recommendation was approved by the Commission on June 1, 2011.

Final Recommendations on Request for HSCRC Financial Support of Maryland Patient Safety Center in FY 2012

Background

The 2001 General Assembly passed the "Patients' Safety Act of 2001," charging the Maryland Health Care Commission (MHCC), in consultation with the Department of Health and Mental Hygiene (DHMH), with studying the feasibility of developing a system for reducing the number of preventable adverse medical events in Maryland including, a system of reporting such incidences. The MHCC subsequently recommended the establishment of a Maryland Patient Safety Center (MPSC or Center) as one approach to improving patient safety in Maryland.

In 2003, the General Assembly endorsed this concept by including a provision in legislation to allow the MPSC to have medical review committee status, thereby making the proceedings, records, and files of the MPSC confidential and not discoverable or admissible as evidence in any civil action.

The operators of the MPSC were chosen through the State of Maryland's Request for Proposals (RFP) procurement process. At the request of MHCC, the two respondents to the RFP to operate the MPSC, the Maryland Hospital Association (MHA) and the Delmarva Foundation for Medical Care (Delmarva), agreed to collaborate in their efforts. The RFP was subsequently awarded jointly to the two organizations for a three-year period (January 2004 through December 2006). The RFP authorizes two one-year extensions beyond the first three years of the pilot project. MHCC extended the contract for two years ending December 31, 2009. The Center was subsequently re-designated by MHCC as the state's patient safety center for an additional five years – through 2014.

In 2004, the HSCRC adopted recommendations that made it a partner in the initiation of the MPSC by providing seed funding through hospital rates for the first three years of the project (FY 2005-2007). The recommendations provided funding to cover 50% of the reasonable budgeted costs of the Center for each of those fiscal years. The Commission annually receives a briefing and documentation on the progress of the MPSC in meeting its goals as well as an estimate of expected expenditures and revenues for the upcoming fiscal year. Based on these presentations, staff evaluated the reasonableness of the budget items presented and made recommendations to the Commission.

Over the past 7 years, the rates of eight Maryland hospitals were increased by the following amounts, and funds have been transferred on a biannual basis (by October 31 and March 31 of each year):

- FY 2005 - $ 762,500
- FY 2006 - $ 963,100
- FY 2007 - $1,134,980
- FY 2008 - $1,134,110
- FY 2009 - $1,927,927
- FY 2010 - $1,636,325

- FY 2011 - $1,544,594

In each of the last two years, as part of its approval for continued financial support of the MPSC, the Commission adopted a recommendation requiring for future years that the percentage of budgeted costs covered through hospital rates should be reduced by at least 5% per year, but in no year shall the funding (on a dollar basis) exceed the amount provided in the previous year. The approved recommendation stated that the percentage decline shall be determined annually based on a continued review of MPSC activities which shall take into account the existence of demonstrable evidence of improved outcomes, efficiency, and cost savings resulting from MPSC's programs, as well as the viability and success of MPSCs strategic fundraising plan. The Commission expressed its belief in the value of the MPSC by continuing to be a minority partner with the Center, and intending to continue to provide a base level of support (potentially 25% of budgeted costs).

For FY 11, the Commission held in abeyance $171,622 of the total approved funding ($1,544,594) until the MPSC demonstrated that a viable fundraising plan was in place. On March 17, 2011, the MPSC submitted a letter to the Commission on its efforts to develop and launch the first phase of its fundraising plan/campaign. The Center will also be extending its campaign to the region's business community. Finally the MPSC re-evaluated its functions which resulted in the consolidation of programs and improved efficiency. As a result, the overall expenses of the Center are being reduced in FY 12.

Maryland Patient Safety Center Request to Extend HSCRC Funding

On March 23, 2011, the HSCRC received the attached request for continued financial support of the MPSC through rates in FY 2012 (Attachment 1). The MPSC is requesting to continue the 45% HSCRC match into FY 2012. The result would be a reduction in total support from $1,544,594 in FY 2011 to $1,314,433 in FY 12 – a 14.9% decrease.

Maryland Patient Safety Center Purpose, Accomplishments, and Outcomes

The purpose of the MPSC is to make Maryland's healthcare the safest state in the nation focusing on the improvement of systems of care, reduction of the occurrences of adverse events, and improvement in the culture of patient safety at Maryland health care facilities. The MPSC's new strategic plan directs concentration on the following 6 areas:

- Measurement of vision success and program impact;
- Patient and family voices at all levels;
- Institutions create and spread excellence;
- Institutions safety culture hardwired;
- Continuity of care initiatives; and
- Demonstrate the value of safety.

Below is a general description of the various initiatives put in place by the MPSC to accomplish the aforementioned goals as well as estimated outcomes and expected savings of each initiative.

1. Adverse Event Information System and Data Analysis

The Center has developed software that it has provided to hospitals free of charge to be used as a fully operational adverse event data collection tool. However, hospitals may report adverse events and near misses by using their existing software. Data collected through the project may be used to benchmark events against other facilities as well as to explore trends and patterns relating to the types of events occurring at hospitals. This knowledge will assist MPSC and Maryland hospitals to develop standardized best practices in an effort to prevent or reduce the number of adverse events occurring in the future.

2. Patient Safety Education Programming

The MPSC has conducted a series of educational programs designed to train leaders and practitioners in the health care industry and share strategies to improve patient safety and quality. These programs have focused on the following areas:

- Reduction of blood stream infections through a Stop BSI initiative;
- Patient safety tools training including root cause analysis;
- Professional development programs;
- Process improvement including LEAN workshops and Six Sigma certification;
- TeamSTEPPS Train the trainer programs;
- Sharing information on MedSAFE, hospital information technology, and patient falls; and
- Patient safety officers forum.

These programs, particularly the LEAN and Six Sigma programs are designed to improve efficiency and reduce costs at hospitals and nursing homes. One facility has reported savings of up to $20,000 related to pharmacy inventory reductions and annualized saving of up to $2.2 million due to reduced cases of missing or reordered medications.

3. MEDSAFE Medication Safety Initiative

The MEDSAFE program was initiated by the Maryland Hospital Association has been in existence since 1999. After being moved to the MPSC, the Initiative continues to promote the implementation of safe medication practice at Maryland hospitals. The Safe Medication Practices' Medication Safety Self-Assessment tool is used to survey hospitals and develop customized reports. The survey solicits responses from individuals at hospitals across various hospital departments on more than 200 questions relating to the level of compliance with evidence-based practices aimed at reducing medication errors.

Outcomes: Between 2005 and 2010, Maryland hospitals showed an increase of 16% in overall median score for medication safety on the annual MEDSAFE survey, most notably in patient identification and in automated prescription verification.

4. Patient Safety Collaborative Program

The MPSC has initiated a series of Collaboratives focused on the implementation and development of safe practices and culture change in high hazard settings. The Center's collaborative workshops bring together Maryland providers and national experts to focus on safety culture and specific process improvements, with the goal of implementing measurable and sustained improvement. The following Collaborative programs have been implemented by the Center:

ICU Safety and Culture Collaborative

The ICU Collaborative, which ran from 2005 to 2007, included teams from thirty-eight of Maryland hospitals' intensive care units. The program was aimed at eliminating preventable death and illness associated with healthcare-associated blood stream infections (BSI) and pneumonia in patients on ventilators.

Outcomes: Since this was the first Collaborative implemented by the MPSC, data is available to estimate the benefits of the project:

- ICUs at 5 hospitals met the challenge of zero ventilator-associated pneumonia episodes during its data collection period;
- Overall, ventilator-associated pneumonia was reduced by 20% in participating ICUs;
- An estimated 755 ventilator-associated pneumonia infections were prevented – based on statistical modeling; it is estimated that about 75 lives have been saved, reducing hospital costs by about $35 million;
- Ten hospitals achieved zero catheter-associated BSI episodes during the data collection period;
- Catheter-associated BSI have been reduced by 36%;
- An estimated 358 BSI infections have been avoided – based on statistical modeling, it is estimated that about 62 lives have been saved thereby reducing hospital costs by about $5 million;
- In total, an estimated 1,113 ventilator associated pneumonia or catheter-related blood stream infections have been prevented, saving approximately 140 lives, and resulting in about $40 million in cost savings at hospitals each year.

Emergency Department Collaborative

The Emergency Department Collaborative began in 2006 and continued through 2007. This Collaborative was conducted with the intent of improving emergency room flow and getting time-sensitive treatments to patients quickly. Twenty-nine multi-disciplinary teams representing over half of the hospitals in the State worked towards achieving a broad spectrum of ambitious goals geared towards ensuring that the sickest ED patients get the care they need quickly, and that all patients are cared for in a timely manner with the smallest possible exposure to preventable healthcare associated harm. As a starting point, the collaborative teams implemented a series of change strategies that

have been recommended in the scientific literature or reported as successful by other hospitals.

A Handoff and Transition Network has grown out of the discussions of the ED Collaborative.

Outcomes: Based on a sample of 748,237 patients seen during a one-year period at 15 participating hospitals, median length of stay was reduced by 30 minutes saving about 374,000 hours. The median number of visits per treatment space has increased by 90 visits. In addition, ambulance diversions were reduced at many participating hospitals - 24% hospitals reduced yellow alert times, and 48% reduced red alert time. It is estimated that 189 additional pneumonia patients were given an antibiotic during the appropriate time frame. This was estimated to save $130,000 in hospital costs, or, on average, $688 per patient.

Perinatal Collaborative

The Perinatal Collaborative began in March 2007 and now includes participation from 32 labor and delivery units at Maryland hospitals. It impacts more than 90% of all Maryland deliveries. The mission of the Collaborative is to create perinatal units that deliver care safely and reliably with zero preventable adverse outcomes. The goal is to reduce infant harm through the implementation and integration of systems improvements and team behaviors into maternal-fetal care using various proven methods. A more recent goal is to reduce health disparities in perinatal and neonatal care through standardization of the discharge process for post partum women and neonates, including the late pre-term infant.

Outcomes:

- Inductions without indication have reduced from 3% in the first quarter of 2009 to 0.9% in the third quarter of 2010, while cesarean sections without indication have dropped from 10% to 2.8% during the same period;
- Admissions to the NICU (for >2500 grams, >37 weeks gestational age for more than 24 hours) have declined by 10% over the course of the perinatal collaborative. These reductions and reduced length of stay has resulted in an estimated $185,000 in cost savings each year;
- Fewer overall adverse events and reported birth trauma since 2010;
- Improved compliance with central line insertion processes in the NICU. Compliance went from 70% in the first month of the project to monthly rates between 87% and 93%.

Patient Falls

Data collected by MPSC over the past two years indicate that patient falls are the second most frequently occurring, event after medication errors; however, patient falls rank first in terms of severity. The MPSC intends to reduce the number of patient injuries resulting from falls by developing standardized protocols using best practices and testing them over time.

The MPSC launched its Keeping Patients SAFE from FALLS initiative in 2009. As part of the initiative, MPSC has shared tools and methods and continues to collect data regarding outcomes.

Outcomes: Compared with falls predicted by past performance, acute care hospitals in the initiative show a total decrease of 216 falls and long-term care facilities show a decrease of 623 falls. Cost avoided from treating these injuries in acute care hospital alone is estimated to be $2,106,000.

Maryland Hand Hygiene Collaborative

Hand Hygiene is a critical factor in preventing the costly spread of potentially devastating infections. The Maryland Hospital Hand Hygiene Collaborative started in November 2009 and currently 33 facilities are participating in the project. The goal is to reduce infections, improve care, and reduce waste which can lead to savings throughout the healthcare system. The program is partially funded through DHMH and provides access to:

- Standardized measures, tools and data analyses;
- A data management system;
- Web-based training;
- Organizational and unit level audits;
- Campaign branding materials; and
- A network of expert and best practices.

Expected Outcomes: Early results show a 5% improvement in hand hygiene compliance among participants.

Other Sources of Funding

In FY 2010, MPSC implemented a strategic funding initiative to attempt to diversify it sources of support over time. For FY 12, MPSC and its partners secured program-specific funding in the following amounts:

- $250,000 from Maryland Hospitals;
- $200,000 from Delmarva Foundation;
- $200,000 from Maryland Hospital Association;
- $250,000 from DHMH for continued support of the Maryland Perinatal Collaborative;
- $293,000 from fees on participants;
- $75,000 from CareFirst in continued support of the Neonatal Collaborative;
- $200,000 from fundraising efforts; and
- Applied for a $388,419 (the FY 12 amount) grant from CareFirst to blend concepts within TeamSTEPPS and CUSP (Comprehensive Unit-based Safety Program) to provide a more streamlined tool to improve patient safety.

Findings

The All-Payer System has provided funding support for the Maryland Patient Safety Center during its initial six years with the expectation that there would be both short-term and long-term reductions in hospital costs – particularly as a result of reduced mortality rates, lengths of stays, patient acuity, and malpractice insurance costs. However, the Center has provided limited evidence that the programs have resulted in cost savings, and only to the extent that these savings relate to individual programs and for limited periods of time. The Commission is desires more information that would:

1. Show program outcomes on a longer term basis along with concomitant savings; and
2. Demonstrate the magnitude of the public's return on investment of funding support.

Staff believes that although the programs of the MPSC seem to be well conceived, there tends to be a lack of coordination with other patient-safety related initiatives across the State – particularly those sponsored by the Department of Health and Mental Hygiene. Staff believes there that should be a broader plan for patient safety in Maryland, and that MPSC should coordinate with State and other entities, such as the Department of Health and Mental Hygiene and the Maryland Health Quality and Cost Council, on State priorities. In addition, the plan should be considered in the context of overall delivery system reform. The roles of the various state entities involved with patient safety should be clearly defined.[1]

Staff is encouraged that MPSC has begun implementing a strategic fundraising plan to ensure financial sustainability into the future; however, given the economic situation, the plan has yielded little support to date. The FY 11 Commission recommendations held $171,622 in abeyance until the MPSC submitted a summary of the plan and to the Commission for review. Commission staff received a report and released the funds on March 31, 2011. The MPSC expects to receive approximately $200,000 in fundraising revenue in FY 12.

Commission recommendations before FY 2010 provided financial support to the MPSC equal to 50% of the reasonable budgeted expenses of the Center (less half of any carryover from the previous year). Beginning in FY 2010, the Commission's recommendations stated that this percentage should decline each year by at least 5%, but in no year should the dollar amount be greater than the previous year. The intent was to reduce support gradually and to encourage the MPSC to aggressively pursue other sources of revenue (including from other provider groups that benefit from Center programs) to help support the Center into the future.

In FY 10, the percentage support was reduced to 45%; however, recognizing the difficulty of raising funds during tough economic times, the Commission retained the

[1] HSCRC staff has met with MPSC on several occasions to consider how the Center can assist with HSCRC payment initiatives – such as readmissions.

45% contribution in FY 11. Nonetheless, the Commission's amount of support has declined on a dollar basis in each of the past 3 years:

- FY 2009 - $1,927,927
- FY 2010 - $1,636,325 -15.1%
- FY 2011 - $1,544,594 - 5.6%
- FY 2012 - $1,314,433 (proposed) -14.9%

The policy to provide funding on a percentage of budgeted costs has also created unintended consequences. As more funding is acquired through the Center's fundraising plan and expended on projects, the total budgeted amount increases. Thus, the policy to limit the dollar amount of support so as not to exceed what was granted the previous year may not actually reduce the amount of support, as intended. The intent was to have fundraising dollars offset funding support provided through the Commission. In addition, since it is the Commission's policy to reduce the support by half of the carryover, it has made it difficult for the Center to build up a reasonable budgetary reserve.

In light of these issues, staff recommends the following changes to the MPSC funding support policy.

Staff Recommendations:

1. **Provide funding support for the MPSC in FY 2012 through an increase in hospital rates in the amount of $1,314,433 (a 15% reduction from FY 2011).**

2. **For funding support in future years, staff recommends that as part of the FY 13 MPSC funding recommendation, staff reconsider the policy of reducing the percentage of the Center's budget by 5% each year, and either propose a new plan or consider the funding request on an annual basis. Funding support in the future should consider (1) how well the MPSC initiatives fit into a broader statewide plan for patient safety, (2) whether new MPSC revenues should offset HSCRC funding support; (3) information on patient safety outcomes and the public's return on investment (from HSCRC funding); and (4) how MPSC initiatives dovetail with the HSCRC's payment-related initiatives and priorities.**

3. **The MPSC should continue to aggressively pursue other sources of revenue, including from other provider groups that benefit from the programs of the Center, to help support the Center into the future.**

4. **In order for the MPSC to budget for FY 2012, staff recommends that the 60-day comment rule be waived so that these recommendations may be considered for final approval.**

Keeping Patients Safe

MPSC Maryland Patient Safety Center

MARYLAND Patient Safety CENTER

FY2012 MPSC Program Plan & Budget

Presented to

HSCRC Health Services Cost Review Commission

April 2011

6820 Deerpath Road
Elkridge, MD 21075-6234
410-540-9210
www.marylandpatientsafety.org

Executive Summary

Numbers often tell the story. In this case, they tell the story about the impact of medical errors on people. For example, a number you have heard before, over 100,000 patients die in hospitals each year due to medical errors. But did you know that one in four adults over the age of 50 years experiences a medical error during their medical care or at least 1.7 million patients experience healthcare acquired infections (HAIs) annually?

Numbers also tell us that errors are costly. HAIs alone generate health care costs of over $28 billion. Medical errors also burden the business community, increasing employee absenteeism, reducing workforce productivity, and generating disability, and Family and Medical Leave Act expenses. Overall, according to the Kaiser Family Foundation the average premium paid by businesses for family coverage between 2000 and 2010 increased 114%; for workers it increased 147%. Thus the costs of patient errors ultimately are paid by us all – through higher taxes, increased health insurance premiums, and related health care expenses.

Behind these numbers is the human burden. Medical errors keep patients in hospitals longer, sometimes leaving them with lifelong disabilities. They can leave children without a parent, or parents with a child whose long-term fate will be a constant concern. It also includes the healthcare providers who carry the burden of these errors through their professional lives, or leave the field despite years of preparation. These facts all underscore the continued need for comprehensive, effective efforts to improve patient safety.

Against this backdrop, MPSC is entering its seventh year well positioned to address and improve these patient safety needs. Hospitals, long term care providers, and home health agencies in the Mid-Atlantic region continue to join MPSC's programs and initiatives. Among the accomplishments of our collaboratives over the past two years include:

- Improved compliance with national recommendations to avoid elective inductions (a 3.6-fold reduction) and elective C-sections (a 4.9-fold reduction) during pregnancy without medical indications for infants less than 39 weeks gestation. This is associated with significant avoidance of medical complications in the newborn and health care utilization from such early deliveries;
- Improved newborn management reflected in decreased NICU admissions, NICU length of stay and better "golden hour" infant management (less sepsis, more stable body temperature and glucose regulation);
- Reduced incidence in the number of falls in acute care hospitals (216) and long-term care facilities (623) preventing not only the frequency but the severity of these preventable events with estimated concomitant costs of care avoided in the range of $1.3M and $2.4M respectively for collaborative participants during 2010.

Furthermore, MPSC is realigning its work to accelerate the momentum it has established in patient safety improvement and cost control. We are doing this in three ways: through improved leadership, programming and organizational development.

Leadership

During the past year, MPSC also sought to assess its leadership role as a patient safety center through two activities. We conducted a phone survey of leading patient safety centers around the country as well as an electronic survey of Maryland hospitals. Findings from the phone survey of patient safety suggest that MPSC is a leader among patient safety centers and is viewed as a model organization in the field of patient safety. Respondents pointed to the MPSC model based on a strong working partnership with stakeholders such as the Maryland Hospital Association, the Delmarva Foundation for Medical Care, the Maryland Healthcare Education Institute and with policy leaders such as the Maryland Department of Health and Mental Hygiene, the Maryland Health Care Commission, the Office of Health Care Quality, and the Health Services Cost Review Commission. In addition, respondents pointed to the breadth of our programming – from multi-provider collaboratives, to culture change training and education, and a comprehensive annual conference – as particularly unique in this field.

A March 2011 MPSC customer survey (with a final analysis pending) finds MPSC strong with its participants, receiving particularly high marks for our culture change strategies (e.g., TeamSTEPPS), our topical, intensive collaboratives, and the MPSC Annual Conference.

Programs

MPSC will focus on four service areas over the coming years.

1. Demonstration projects:
    - MPSC is concentrating on its most successful demonstrations such as our perinatal/neonatal learning networks where we will more strategically link them to obtain efficiencies and economies of scale, and our falls collaborative where we want to continue recruiting additional institutions to reach the broader patient population. We will look for opportunities to increase enrollment in our Hand Hygiene Collaborative and use this as the foundation for new work in the field of HAIs.
    - MPSC is looking for opportunities to undertake new collaboratives that are consistent with state and national safety priorities, such as HAIs.
    - MPSC will continue to serve as an incubator for smaller projects. For example, the issue of “difficult airways” and “outpatient identification protocols”, topics discussed at a recent Patient Safety Officers Forum and through our Wrist Band Initiative. Such topics can have quick impact because they are easily developed, quickly evaluated, and can be taken to scale by MPSC or others.
2. Education:

- MPSC will continue to capitalize on its role as a neutral convener/collaborator to bring together key stakeholders to facilitate patient safety programs, policy development, and peer learning such as through the successful Patient Safety Officers Forum.
- MPSC is using its momentum in culture change training (e.g., TeamSTEPPS) to respond to requests from hospitals to hardwire safety throughout their institutions that will set the stage for subsequent patient safety collaboratives and projects.
- MPSC's Annual Conference will increasingly be used to identify the most promising patient safety practices in the region. This in turn can serve as a resource for new projects and collaboratives.

3. Outreach:
    - MPSC will ensure that our work serves people in all communities, including in particular, the most vulnerable populations, so that all families receive the safest care possible.
    - MPSC is about to convene family and patient advocates to help us develop a meaningful family/patient advisory council for MPSC.
    - MPSC is reaching out to the business community as part of our fund development work to recruit them as partners in advancing patient safety throughout the region.
4. Measurement:
    - MPSC will improve the integration of measurement and documentation in our interventions
    - MPSC is strengthening its capacity to track and analyze adverse events for participating area hospitals and will seek participation from additional hospitals as we move towards annual reporting on performance related to these events

Organizational Development:

To increase its organizational capacity, MPSC is identifying opportunities to reallocate resources to increase efficiency and savings in current and future operations. This includes merging the Perinatal and Neonatal Learning Networks to increase their impact while combining resources. We have created efficiencies in our Safe From Falls Campaign and negotiated a new contract with a vendor for our Adverse Event Reporting System, both of which will produce savings. These efficiencies alone enable MPSC to reduce its request to HSCRC by 14% for FY 2012. So both the total request and percent contribution by HSCRC toward our FY 2012 budget is lower that for FY 2011, consistent with HSCRC's objective to reduce its contribution as a proportion of the MPSC overall budget.

To further achieve this objective, MPSC has undertaken a fund development strategy led by co-chairs patient safety expert Peter Pronovost MD, PhD, of Johns Hopkins Hospital, and attorney Eugene Freidman, JD, Corporate Counsel for First Mariner Bank. To date MPSC has obtained financial commitments from 100% of the MPSC Board of Trustees, and has received verbal commitments from three of the larger health care systems. The amount and timing of these health care system commitments is yet to be determined but we are in ongoing conversations

with them. We also are expanding the campaign to reach out to other independent hospitals and are launching a new strategy to extend the campaign to the region's business community since we believe there is a significant business case for safety to be made. This partnership with the business community will help cultivate the political and economic support of this sector that bears a major financial burden from medical errors occurring among their employees.

MPSC is diversifying its Board of Directors (Attachment E) to reflect the broader health care system and community. New Board members represent the disciplines of public heath, neonatology, information technology, long term care, law, insurers, and public regulatory policy. To provide our Board a broader perspective of the national health reform agenda, MPSC held a Board retreat in the fall of 2010 that included a presentation by National Quality Forum President and CEO Janet Corrigan. This generated a rich discussion of national health reform and the Forum's National Priority Framework, a document with recommendations to guide HHS Secretary Sebelius in setting national health policy. MPSC's programming, with our emphasis on HAIs, falls, patient and family engagement, care transitions (continuum of care), medication safety, and over utilization, is highly consistent with this framework.

The enclosed material includes key MPSC results (Attachment A), a detailed report on the reduced falls incidence and subsequent economic costs avoided related to our Safe From Falls Initiative (Attachment B), a comprehensive 2012 budget (Attachment C), detailed program activities (Attachment D), and a list of our current Board of Directors (Attachment E). Thank you for your continued critical support of MPSC. It is largely through HSCRC's support that MPSC has been able to achieve such great success in patient safety. We look forward to continuing this partnership in the future.

Patrick Chaulk, MD, MPH, FACPM

Executive Director and President

Attachment A: Key Results

The following provides an overview of MPSC's key results across multiple project areas.

MPSC - Key Recent Results

Participation

Participation continues to be high and climbing. Annually, 100% of Maryland hospitals participate in MPSC events and programs, and an increasing number of long term care, home health, and other participants join MPSC's initiatives. Over 1,200 providers and patient safety leaders attended MPSC's 7th Annual Conference on April 8, 2011.

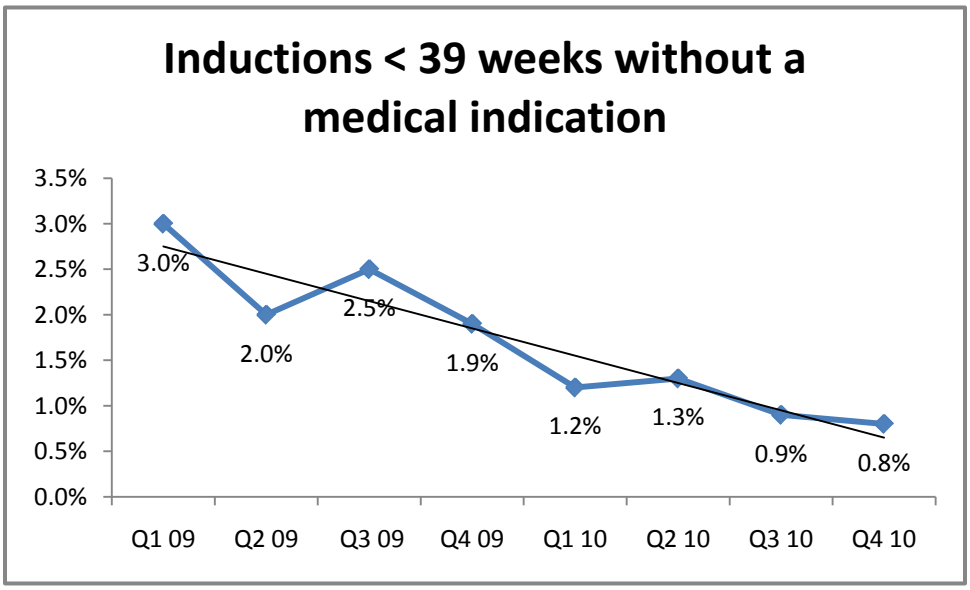
Saving Lives & Improving Quality in Labor & Delivery

Program data from the Perinatal and Neonatal Learning Networks continue to show improved quality outcomes for mothers and babies. In particular, these Learning Networks have substantially reduced elective inductions and cesarean section deliveries before 39 weeks gestation. This is critical since an extensive literature has documented a number of medical complications for newborns delivered before 39 weeks gestation by either method without a medical indication. These complications include:

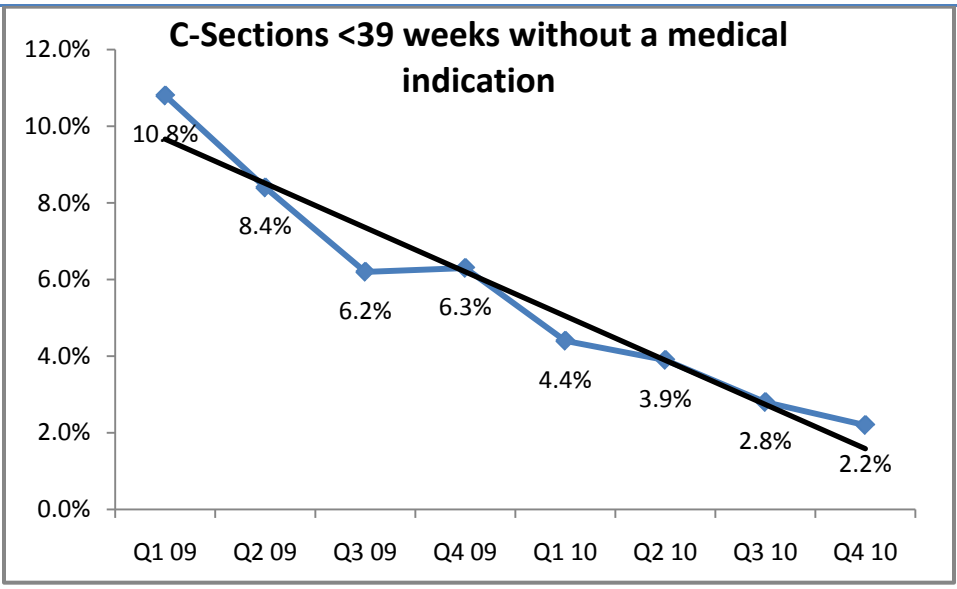
1. Increased probability of admission to NICU for care. For example the proportion of newborns transferred to the NICU following elective delivery for both methods combined is 17.8% for infants delivered between 37 and 38 weeks gestation and 8.0% for infants at 38-39 weeks gestation compared to 4.6% for infants over 39 weeks.
2. Increased probability of transient tachypnea of the newborn.
3. Increased probability of respiratory distress syndrome.
4. Increased need for ventilator support.
5. Increased probability of sepsis.
6. Increased newborn feeding problems

Because of these complications, this recommendation to reduce these elective procedures has been the official position of the American Congress of Obstetricians and Gynecologists for two decades. Nonetheless, elective inductions and elective cesarean section deliveries have risen over the past two decades.

With these national trends and documented complications as a backdrop, the Learning networks have set as a goal a reduction in the incidence of these procedures. The following charts quantify this progress.



Inductions			
Audit of Inductions to Determine Medical Necessity	Total Inductions	Number of Inductions < 39 weeks without a medical indication	Rate < 39 weeks without a medical indication
Q1 09	3420	101	3.0%
Q2 09	3605	71	2.0%
Q3 09	3577	89	2.5%
Q4 09	3790	72	1.9%
Q1 10	3585	43	1.2%
Q2 10	3840	51	1.3%
Q3 10	3934	35	0.9%
Q4 10	3678	28	0.8%



Audit of Scheduled C-Sections to Determine Medical Necessity	Total Scheduled C-Sections	Number of scheduled C-Sections < 39 weeks without a medical indication	Rate < 39 weeks without a medical indication
Q1 09	2140	232	10.8%
Q2 09	1979	167	8.4%
Q3 09	2050	127	6.2%
Q4 09	2159	135	6.3%
Q1 10	2044	90	4.4%
Q2 10	2283	93	3.9%
Q3 10	2285	63	2.8%
Q4 10	2129	47	2.2%

Additional new born outcomes produced through these Learning Networks include:

- Declining average neonatal intensive care unit (NICU) length of stay during a 16-month period.
- A 10% decrease in NICU admissions over the course of the Perinatal initiative.

- Fewer overall adverse events and reported birth trauma in labor and delivery from baseline to 2010, as collected via the Adverse Outcomes Index.
- Improved compliance with central line insertion processes in the NICU, a key infection prevention measure. Compliance rose from 70% in the first month of reporting to current monthly rates at 87 to 93%. Most importantly, proper maintenance has risen from 50% at baseline to 97% at the end of the last reporting quarter. While there was an increase in the CLABSI rate during May to July 2010, this upward movement appears to have reversed itself between August and October 2010 with the rate dropping nearly 50%.

Costs Avoided

- With the research assistance of Vahe Kazandjian of ARALEZ Health, data from the SAFE From FALLS Initiative estimates that falls in acute care settings declined by 216 for calendar year 2010. In addition to avoiding injury and suffering, falls result in costly complications for patients. Participating facilities have reported reductions in both the frequency and severity of falls. In hospitals, *these reductions are estimated to have generated avoidable treatment costs of $1,390,391.* An additional 623 falls were estimated to have been prevented. *This is associated with avoided treatment costs of $2,492,000. (The authors describe their analysis:* **See Attachment B)**
- Reductions in NICU admissions and reduced length of stay among MPSC's Perinatal Learning Network participants resulted in an estimated $185,000 in cost savings in Year 1 (2008-2009).Continued reductions in NICU admissions suggest additional cost savings in each subsequent year of the project. Cost savings for infection prevention is also an area of study.

Maryland is Advancing

Additional MPSC programs show that Maryland healthcare providers are implementing remarkable efforts to improve patient safety. For example:

- Participants in the Maryland Hospital Hand Hygiene Collaborative have reported early results of an aggregate 5% improvement in hand hygiene compliance – making Maryland the first state in the nation to employ a standard methodology.
- Medication safety continues to improve. In the last five years of MPSC's MEDSAFE program, participating facilities have accelerated their medication efforts and seen an overall improvement of 16% in their medication safety survey scores. The greatest gains were in patient identification (that ensures the right patient gets the right drug at the right time) and in automated prescription verification.

Enhanced Communication

Knowing that communication breakdowns are at the root of medical errors, MPSC is rolling out a targeted TeamSTEPPS program to train healthcare professionals on these important behaviors. MPSC's program is recognized as among the most effective statewide effort to focus on the behaviors and tools that can improve communication for patient safety.

Publications, Presentations and Awards

- An article on MPSC's Condition H program in the July/August edition of Patient Safety Quality Healthcare.
- An article about the MPSC SAFE from FALLS initiative appeared in the May 21, 2010 edition of HealthLeaders Quality newsletter.
- Maryland hospitals' involvement in the international hand hygiene campaign, sponsored by the World Health Organization, was included in the Regional News section of the national publication Advance for Nurses and featured on the Centers for Disease Control and Prevention website.
- The MPSC Perinatal Collaborative, Adventist Rehabilitation Hospital's participation in the MPSC SAFE from FALLs program, MedStar's safety culture assessment program, a Johns Hopkins Teamwork and Handoffs initiative, and two Johns Hopkins Emergency Department initiatives were all highlighted in posters at the NPSF Annual Congress in Orlando, Florida.
- *Improving Culture and Teamwork; Maryland Perinatal Collaborative*, Poster Presentation at the Institute for Healthcare Improvement Forum, Orlando, Florida, December 2009
- *Improving Culture and Teamwork; Maryland Perinatal Collaborative*, Poster Presentation at the National Patient Safety Foundation Annual Conference, Orlando, Florida, May 2010
- "The Role of Quality Improvement in Reducing Disparity in Neonatal Care" by James Rost, MD to March of Dimes Summit on Health Disparities, 11/18/10**.**
- Handout: *Overview of the Neonatal Collaborative* – provided to and briefly discussed with Carolyn Clancy, MD (AHRQ) at the March of Dimes Summit on Health Disparities (session 1 of 3) 11/18/10**.**
  - "Overview of the Neonatal Collaborative by James Rost, MD to The Maryland Premature Infant Health Network 12/9/10
  - Handout**:** *Overview of the Neonatal Collaborative* – provided to participants (on sharing table) at the March of Dimes Summit on Health Disparities (session 2 of 3) 3/31/11
- *Maryland Perinatal Learning Network Improves Patient Safety*, Plenary presentation at the 2011 Annual Conference of the New York State Perinatal Association, June 2011

Attachment B

Keeping Patients SAFE from FALLS Initiative

Methods of Projecting Cost of Falls based on data from four quarters of data, 2010

By
Vahe A. Kazandjian PhD, MPH
Principal
ARALEZ Health LLC
602 Ponte Villas North
Baltimore, MD 21230

and

Wendy Gary
VP Healthcare Quality and Patient Safety,
Delmarva Foundation for Medical Care
6940 Columbia Gateway Drive, Suite 42
Columbia, Maryland 21046

February 9, 201

Patient falls continue to rank among the most frequent safety events in hospitals, Long term Care organizations, and other settings where care is provided. Falls are also preventable events, since about 50% of all falls happen next to the patient's bed or on the way/in the bathroom.

In addition to the injuries associated with falls, there are implications for unplanned new services (diagnostic, therapeutic, rehabilitative) which often are necessary to provide following a fall, especially for the elderly patients among whom falls are most frequent. These additional care services extend length of stay, increase the cost of care, and expose patients to further iatrogenic risks.

The Maryland Patient Safety Center (MPSC), with the leadership of the Delmarva Foundation for Medical Care (DFMC) as demonstrated the urgency to consider decreasing patient falls in Maryland a priority. The purpose of this document is to serve as the second analysis of *the Safe from Falls Initiative* which completed its full year of data collection on patient falls from acute care hospitals, Home Health Agencies, and Long Term Organizations voluntarily participating in data collection, education, and adoption of better practices proposed by the MPSC. The specific goal of this report is to associate cost of care estimates with the changing patterns of patient falls across the *Safe from Falls Initiative* participants.

Background

A previous report (attached) discussed the trends in changing patient falls rates across the Initiative participants. The overall summary of findings was that the rates have decreased among and across participants in the Initiative and that this decrease was seen by participants attributable to the Initiative. In particular, participants experiencing continuous and noteworthy decreases in overall rates and proportion of stage 2 and stage 3 injuries, reported adoption of better practices triggered by the findings from the Process Measures, also collected by the Initiative.

The previous report identified the following challenges for any additional analysis, such as the estimation of cost savings associated with the decrease in rates. These challenges are also valid for the present report as they shape the assumptions to be made. The challenges are:

1. Attribution bias: While participants have reported that the Initiative assists them in their internal search for better practices to prevent patient falls, MPSC has not conducted a correlation analysis between the changes introduced in the environment of care as suggested by the Initiative, and the decrease in falls rates or severity levels.
2. As a consequence of the above, it is not known if the non-participants in the initiative have also experienced similar trends and magnitudes of change in rates.
3. The "reliable" data from the Initiative is for the 4 quarters of 2010. The data from the previous two quarters of pilot testing the data collection tool and training the participants were not analyzed in the previous report. Thus, it is too early to conduct

any statistical analysis for the significance of the rate changes i.e., were the rates expected to change and in the observed magnitude? Or the observed decrease in rates is significant and could be analyzed toward attribution to enablers such as the Initiative?

4. There are no published figures about the cost associated with patient falls in Maryland. Any projections will use national estimates and can only be an approximate guideline.
5. Data on Process Measures have been collected only once, hence any correlation analysis with the changes in falls rates is unwarranted.

Recognizing these challenges is important for qualifying the estimates of cost in the present report.

Assumptions for cost of falls analysis

A. *Focus*: The analysis can be done to estimate the cost savings across the participants in the Initiative; and, to project these trends to all of Maryland.

Recommendation: Given that only a small proportion of Long Term Care organizations and even small proportion of Home Health Agencies are represented in the Initiative, a generalization to the State is not recommended. Therefore, the analysis shown in this report is for the observed patient falls rate changes in acute care hospitals and Long Term Care organizations from Quarter 1 to Quarter 4, 2010.

B. *Scenarios*: the potential cost savings is estimated for all falls and a 1% error margin is added to the reported rate to account for possible under reporting. This percentage is arbitrary and small since it is estimated that most falls are identified and reported.

C. Method: The cost estimates are adopted from the published literature. If the published figures are not for 2010, the Inflation Calculator will be used to adjust for inflation rate. Since in the literature cost estimates are for acute care hospitals, Long Term care, the cost of falls in Long Term Care organizations will be estimated at 40% of the cost in acute care settings.

Findings from the literature

A number of studies have been published showing a range in the cost increase of hospital care following a patient fall (Hart 2009, Titler 2005). While these studies attempt to quantify the risk of falling and the associated cost, they remain studies of an institution's patients rather than based on regional or national statistics. The epidemiology of falls, hence the risk associated with patients' health status and implications for variability in cost, is increasingly well documented (Hendrich 2006, Hart 2009), suggesting that any forecasting of patient falls costs needs to adjust for patient demographics, co-morbidities, mental health, and medications used.

Cost of falls estimates from the MPSC Initiative data

During the four quarters of calendar 2010, acute care hospitals and Long Term Care organizations reported a steady decrease in the number of patient falls. As the attached document shows, the decrease was of 216 falls in acute care hospitals and 623 falls in Long Term Care organizations.

Estimates:

A. Acute care setting

If the findings from the participating acute care hospitals is generalizable to all acute care hospitals, the decrease in patient falls far calendar 2010 is estimates to be 324 falls.
The literature reports the average cost of a fall in the acute care setting (calculated as hospitals revenue lost) to be $6,437 in 2007, or about $6,769 in 2010, adjusting for a 5.2% inflation.
Thus, a rough estimate of saving from preventing 324 falls is $ 2085588.

B. Long Term Care Organizations setting

The literature provides little guidance for the estimated cost of a fall in a LTC setting. However, since it was reported that average professional liability for a fall in an acute care setting was about $3,000/bed in inflation adjusted 2010 dollars, a few scenarios can be proposed:

- If one assumes that the cost of a fall, on average, is the same in an acute care setting and a LTC setting, then the cost can be estimated at $4000/fall ($ 6769 – $ 3000).
- About 30 LTC organizations continuously reported data for calendar 2010. If one assumes that these represent 10% of LTC organizations in Maryland eligible to participate in the Initiative and report data, then the decrease in patient falls by 623 falls reported by the 30 participants can be projected to be 6230

Within these broad assumptions, the dollars saved by the LTC organizations alone is estimated to be

$4000 x 6230 = $ 24920000

Caveat

While the cost of falls projections for the acute care settings use average dollar estimates found in the literature, the cost of a fall in the LTC setting is speculative. However, even if the above used estimate of $4000/fall is decreased by 50%, the potential savings from the LTC settings alone are still more than 10 million dollars/year.

Limitations of the present analysis

There are three significant limitations:

1. Patient fall cost data are not reliably available in the literature. Even when costs are reported, these are averages and do not adjust for the severity of the fall and injuries associated with them. Further, there is no detailed cost of the various services (radiology, surgery, medication regimen change, rehabilitation, etc) associated with types of falls and their consequences.
2. Assuming that the 2010 data are representative of subsequent years falls prevention trends may be an over-estimate. With increased prevention strategies, fewer patients may be facing the risks of falls hence a decay-curve may be more appropriate than a straight line projection. However the characteristics of that decay-curve are not known yet.
3. Patient demographics are projected to change, especially in the LTC settings. Thus an analysis of patient falls without a specific focus on the types of falls would predispose the use of an "average cost of a fall" misleading.

Strategic Considerations

This analysis is a first attempt to estimate the magnitude of cost savings associated with falls prevention programs in Maryland's acute care and LTC settings. While the magnitudes of the estimates are based on broad assumptions, cost savings from falls prevention are substantial, to which MPSC's *Safe from Falls Initiative* has already contributed significantly. Strategically, increased participation by LTC organizations in MPSC's initiative to enhance safety of care may result in significant cost savings to Maryland's healthcare system.

References

Hart, J.,et al. "Epidemiology and Impact of Patient falls in Healthcare facilities". Patient Safety & Quality Healthcare, March-April 2009.
Hendrich, A. "Inpatient Falls: Lessons from the Field". Patient Safety & Quality Healthcare, May-June 2006.
"Tracking the High Growth of Hospital Professional Liability Costs".
http//www.dalcon.com/taq/patient-falls, Jan 24, 2011.
"Patient Falls: Can they be prevented?" http//envisioninc.wordpress.com/2010/06/29/fall-prevention, Jan 30 , 2011.
"Nurses' solutions to prevent inpatient falls in hospital patient rooms". BNET, The CBS interactive Business Network, http://findarticles.com/articles/mi , Feb 2, 2011.
"Fall Factors: Duke's Efforts to Prevent Patient Falls". DukeHealth.org, June 17, 2010.
Titler, M., et al. "Cost of Hospital Care for Elderly at risk of Falling". Nurs Econ. 23(6):290-306, 2005.

Attachment C: MPSC FY2012 Annual Budget

MPSC appreciates the ongoing support from HSCRC. We recognize that this support represents an investment from the HSCRC to ensure safer care for patients and families. MPSC's program plan for FY2012 reflects our ongoing commitment to work across the Maryland healthcare community in pursuit of patient safety. To make this possible, MPSC requests HSCRC's support in FY2010.

The following summary provides an overview of the expected revenues and expenses in FY2012.

Revenue Streams

The proposed budget of $2,920,963 includes assumptions for the following revenue streams:

- MPSC is asking the HSCRC to continue its support of coordinated patient safety efforts in Maryland by contributing $1,314,433 to support 45% of the overall MPSC FY 2012 budget. It should be noted that this request is $230,161 (14.9%) less than for FY 2011 representing a second year of reduced support by HSCRC.
- MPSC will ask Maryland hospitals to contribute an aggregate $250,000
- The Maryland Department of Health and Mental Hygiene (DHMH) will continue to partially fund the Perinatal Collaborative by providing revenue of $250,000.
- CareFirst will provide continued support for the Neonatal collaborative in the amount of $75,000.
- Delmarva and MHA will each be contributing $200,000.
- Other revenue sources include member fees from out-of-state facilities and income from sponsors at the Annual Conference. Moreover, MPSC has a new policy to charge participants for high-intensity process improvement educational sessions as well as a small attendance fee for the MPSC Annual Conference. In total, this revenue is anticipated to be approximately $293,000.

Expense Budget

In FY 2012, the MPSC is anticipating total expenses of $2,920,963 to implement MPSC's 2012 agenda. Following is a description for each budget line item. Additional information is available in Attachment C. Day-to-day support of the projects is provided by MHA, MHEI, and the Delmarva Foundation.

Administration ($991,500)

The core activities of MPSC Core Administration in FY2012 remain largely consistent with FY2011. In a few cases, funds were moved from other budget lines to the Core Administration budget because oversight of the budget is provided by Core Administration including:

- Supporting MPSC staff and infrastructure;
- Expanding MPSC fund development strategies;
- Strengthening the Patient Safety Organization strategy and adverse events reporting function;
- Ensuring quality programs and evaluation for sustainability;
- Producing cost benefit data on key programs;
- Disseminating MPSC program results through publication in major journals and through presentations and speaking engagements at national and regional meetings;
- Maintaining strategic relationships, planning for and promoting success and engaging in business development activities
- Strengthening relationships and partnerships in the local and national healthcare community;
- Working with the Board Nominating Committee to assess Board membership needs, then identify and reach out to potential new Board members;
- Convening the Patient Safety Officer's Forum, a bimonthly meeting of Patient Safety Officers;
- Growing the MPSC customer base. Examples include individual hospitals, and, home health, long-term care facilities, assisted living facilities, community pharmacy chains, physician offices and ambulatory surgical centers;
- Identifying new business opportunities (grants, solicitations, etc.)
- Participating on advisory boards such as the Maryland Healthcare Commission's Healthcare Associated Infections Advisory Committee and Hospital Performance Evaluation Guide Advisory Committee
- Engaging a select number of external consultants to enhance and strengthen these efforts such as communications to support the newsletter, press releases, website, and other communication initiatives (continuation of support from previous years)

Public Website ($25,000)

MPSC's public website is a key communications tool for MPSC. In addition, it will play a critical role in the MPSC fundraising initiative and contributes to MPSC's strategic agenda to spread excellence. It also ensures an electronic avenue for distribution of MPSC information, tools, and resources.

Patient Safety Education Programming ($523,400)

Education programs will continue to focus on five core areas. 1) Patient safety tools training: TeamSTEPPS Train the Trainer, Root Cause Analysis; 2) Management Development: Accountability Matters, 3) Process Improvement: LeanHealthcare Workshops, Six Sigma Green Belt certification, 4) Leadership issues; 5) The Annual MPSC Patient Safety Conference.

MPSC and MHEI staff are working together on potential pricing approaches for educational programs. However, since many are so core to MPSC's mission, MPSC may charge a very minimal fee that would not discourage participation.

Adverse Event Information System and Data Analysis ($150,800)

This reflects a transition in the management, support and oversight of the Adverse Event Reporting System that will result in considerable customer benefits and cost savings to MPSC.

MEDSAFE Survey and Conference ($62,500)

This is a continuation of the 12th year of the survey and the 11th year of the MEDSAFE conference. This supports MPSC's Measurement Strategy within the MPSC Strategic Plan. Primary support is being transition to the Institute for Safe Medication Practices, a nationally and internationally-recognized expert in this area.

TeamSTEPPS Consulting ($71,500)

From conversations with national and local experts, it is clear that many facilities have struggled with implementing TeamSTEPPS, whereas some have been very successful, including many in the Maryland Area. We believe that Maryland's success is in part because of how well TeamSTEPPS harmonizes with other MPSC programs.

MPSC believe that there is a strong need to support TeamSTEPPS in the region, and will provide consulting support through the TeamSTEPPS faculty. This is in addition to the core TeamSTEPPS training currently provided.

Hospital Culture Change Initiative ($388,419)

This initiative will use the tools and strategies of TeamSTEPPS and CUSP to create a more integrated and effective patient safety culture change intervention for Maryland hospitals.

Perinatal/Neonatal Learning Network ($420,709)

This reflects support and consolidation of two keystone programs of the Maryland Patient Safety Center. It also supports the Maryland Department of Health and Mental Hygiene's plan for reducing infant mortality in the state of Maryland.

Hand Hygiene Collaborative ($120,000)

This supports continuation of the Hand Hygiene initiative. Participating organizations benefit by having access to:

- Standardized measures, tools, and data analysis;

- A data management system supplying organizational, provider, and unit level specific reports;
- A Web-based training program for unknown hand hygiene observers;
- Organizational and unit level audits to evaluate current hand hygiene efforts;
- Campaign branding materials; and
- A network of experts and best practices.

Primary implementation is being led by the MPSC, in partnership with Maryland Hospital Association and the Delmarva Foundation for Medical Care. The Johns Hopkins Center for Innovation in Quality Patient Care is providing data collection methods and analysis. The Maryland Health Care Commission's Hand Hygiene and Infection Prevention Subcommittee serves as the expert panel for this initiative. A Steering Committee provides program oversight.

Safe From Falls ($167,135)

Falls continue to be identified as among the most frequent and highest-harm errors to occur in healthcare settings. There is great interest among the healthcare community to address patient falls. This represents the continuation and expansion of the SAFE from FALLS program and build on the program launched in FY201 and the pilot initiated in FY 2009. This is MPSC's key program that involves long-term care and home health care providers in addition to hospitals.

Maryland Patient Safety Center
Proposed FY 12 Budget

	FY 11 Budget	FY 12 Budget
REVENUE		
Cash Contributions from MHA/Delmarva	400,000	400,000
Cash Contributions from Hospitals	250,000	250,000
HSCRC Funding	1,544,594	1,314,433
Restricted Grants (Carefirst, DHMH, ARRA Stimulus)	514,674	713,419
Fundraising Campaign *	188,300	
Other Funding-Mixed Sources	535,000	243,111
Interest Income		
Total Revenue	**3,432,568**	**2,920,963**
EXPENSES		
Administration	986,820	991,500
Public Website	15,591	25,000
Patient Safety Education Programming	747,775	523,400
Adverse Event Reporting System	388,505	150,800
MEDSAFE Medication Safety Initiative	73,076	62,500
Team STEPPS Training/Learning Network	86,120	71,500
Measurement	59,915	
Perinatal/Neonatal Patient Safety Collaboratives	723,039	420,709
Hand Hygiene Collaborative **	50,000	120,000
Safe From Falls	292,589	167,135
Hospital Culture Change Initiative		388,419
Total Expenses	**3,432,430**	**2,920,963**
Net Income	138	

* In FY 2012, MPSC is also projecting fund-raising revenue of $200,000. When these funds have been secured, MPSC will add additional patient safety programs of approximately $50,000 and will set-aside the remainder of these funds to increase MPSC's operating reserves to build the long-term financial stability for the organization.
**FY2011 budget excludes additional HSCRC resources of $144,445 for this collaborative.

Attachment D: MPSC Program Overviews, Key Programs

SAFE from FALLS

The Maryland Patient Safety Center (MPSC) launched its *Keeping Patients SAFE from FALLS* Initiative in 2009. The impetus for the initiative were findings from the field that falls in care provision settings (Acute Care, Long Term Care and Home Health) ranked among the most frequent healthcare safety events, and that many of the causes and predisposing factors for falls can be prevented. Further, the MPSC's own collection of adverse events data from a set of Maryland hospitals mirrored the national statistics both in rates of falls and whether the falls resulted in injuries. The *Keeping Patients SAFE from FALLS* Initiative, following a pilot testing phase of its tools and methods, launched a statewide program of ongoing data collection from Acute Care, Long Term Care and Home Health Agencies providing care to different groups of patients organizations.

> **IMPACT: Compared to falls predicted by past performance, acute care hospitals in the initiative show a total decrease of 216 falls and LTC facilities show a decrease of 623 falls. Costs avoided from treating these injuries in acute care hospitals alone is estimated to be $2,106,000**

The number of participants in the *Keeping Patients SAFE from FALLS* Initiative for the 4 quarters of 2010 is large enough from Acute Care and LTC organizations (only 4 or less Home Health Agencies consistently reported data) to propose the following observations:

1. There is a noteworthy and consistent decrease in number of falls among the Acute Care and LTC organizations.
2. The process measures showed that organizational changes to prevent falls were clearly associated with the better practice recommendations of the Initiative
3. The cost savings potential of this initiative suggests a quantifiable and positive impact on enhancing the safety of care in Maryland.

In FY2012, the program will continue with the following activities for FY'12:

- Process and Outcome measures continue to be collected, and analysis will Be directed at identifying correlations between the adoption of better practices and changes in fall rates.
- In consideration of MPSC's strategic agenda and given the MPSC Board's interest in initiatives that work across the continuum of care; we will assemble a small group of 5 Acute Care Hospitals each matched with 1 Long Term Care facility that they share considerable transfers to work collaboratively to pilot test the cross-setting strategies included in each SAFE from FALLS toolkit.
- Given the ongoing nature of the Initiative, case studies from each setting will be complied and a paper should be written for publication to share the success story of Maryland healthcare organizations and the MPSC in decreasing patient falls.
- Maintain the SAFE from FALLS website and publish a quarterly newsletter.
- There will be quarterly conference calls via Webinar plus an annual meeting.

Perinatal-Neonatal Learning Network

In FY2012 MPSC will oversee the merger and ongoing work of two highly successful current projects: the Perinatal Learning Network and the Neonatal Learning Network. The identities of the two networks will be maintained with each continuing a focus on a single aim specific to its area of clinical focus (obstetrical or neonatal care). To maximize resource utilization and achieve economies of scale, the two networks will merge and address one aim relevant to both obstetrical and neonatal care and will be renamed the Perinatal-Neonatal Learning Network.

MPSC launched the Perinatal Collaborative in March 2007. Participants now represent 32 hospitals in Maryland and the District of Columbia. In 2008, The Maryland Patient Safety Center (MPSC) extended the work of the Perinatal Collaborative as the Perinatal Learning Network. The aim of the Perinatal Learning Network continued as in the Perinatal Collaborative: to reduce maternal and infant harm through the implementation and integration of systems improvements and team behaviors into maternal-fetal care. The Perinatal Learning Network continued to realize success in reducing maternal and infant harm (as measured through the Adverse Outcomes Index (AOI) and in reducing the number of elective cesarean sections and/or elective inductions of labor without documented medical indication. The Network touches more than 90% of all Maryland deliveries.

Following the continued success of the Perinatal Learning Network, the neonatal community approached the Delmarva Foundation and MPSC requesting development and implementation of a Neonatal Collaborative and in 2009 the Neonatal Collaborative, generously funded by CareFirst BlueCross Blue Shield, was established connecting 28 Level II and Level III nurseries in Maryland, the District of Columbia and Northern Virginia. The Collaborative participants represented 75% of area hospitals providing specialty and intensive care to neonates in our region. The work of the Neonatal Collaborative touches more than 32,000 infants born each year and afforded participants the opportunity to significantly impact health outcomes.

Following impressive progress towards meeting the aims, in July 2010, CareFirst BlueCross Blue Shield funded the extension of the Collaborative into the Neonatal Learning Network. Currently, 26 facilities (two facilities elected to leave the Network owing to administrative challenges and changes) continue participation in the Network.

In January 2011, members of the Perinatal and Neonatal planning committees convened to identify a common aim for the Perinatal-Neonatal Learning Network to guide the network into FY2012. The participants identified that the aim of the combined network would be to ***reduce health disparities in perinatal and neonatal care through standardization of the discharge process for post partum women and neonates, including the late pre-term infant***. Streamlining the focus of the networks and eliminating duplication of effort will result in maximizing Perinatal-Neonatal Learning Network resources and allow for linkages to other state initiatives.

Maryland Hospital Hand Hygiene Collaborative

The Maryland Hospital Hand Hygiene Collaborative was initiated in November 2009 and is coordinated by MPSC in collaboration with DHMH, MHCC, Delmarva, MHA, and the Johns Hopkins Center for Innovation. Hand hygiene is the simplest and most effective way to prevent HAIs; this program is the first statewide hand hygiene campaign to use direct observation by unknown observers to help hospitals understand and improve hand hygiene practices.
Key activities include collecting monthly compliance rates, assessing process measures on a quarterly basis, and monthly team calls. Individualized executive updates will be sent in the coming weeks. The project extends through June 2011, and with this proposal MPSC aims to ensure ongoing technical support and meeting support for the 33 participating facilities. DHMH is developing funding to provide ongoing support for the data collection system.

Education, training and technical assistance

TeamSTEPPS™ Learning Network & Consulting

Improving teamwork, especially in clinical teams, may be the single most important culture change that is needed to make a significant improvement in patient safety. MPSC has adopted TeamSTEPPS™ training, made available by AHRQ, as its recommended methodology for improving clinical teamwork and communication. There is substantial evidence that poor cooperation and communication is a primary cause of error in healthcare. MPSC's program, launched in 2008, takes users step-by-step through implementation, detailing the roadmap for creating change and shifting the organization toward a sustained culture of safety. There is great local interest in these innovative tools.

In FY2011 MPSC received a $15,000 grant to conduct case study evaluations on three successful Maryland TeamSTEPPS implementations. That study is underway. In addition, MPSC is developing a consulting support process for institutions that need more coaching and support beyond the two-day training. A local facility has agreed to be the initial site for this model.

TeamSTEPPS/CUSP Training

In addition to our focus on TeamSTEPPS training, we are collaborating with the Johns Hopkins Quality & Safety Research Group to develop an integrated culture change model that builds on the best components of TeamSTEPPS and CUSP, the culture change strategy for the national STOP BSI initiative. This project is seeking funding from CareFirst BlueCross BlueShield and will be piloted in Maryland hospitals. However, the tools developed from this project will be made to a wider regional audience.

Educational Training Programs

Education is one of the primary strategies the MPSC uses to encourage the adoption of safer practices in Maryland hospitals and nursing homes. MPSC's educational activities have been designed to achieve the following goals:

- Create awareness of the need for improved patient safety and of the cultural changes required for significant improvements.
- Ensure that healthcare leaders have the competencies essential for safety improvement.
- Disseminate patient safety solutions and best practices.
- Create a safety-oriented culture in organizations by focusing leadership on key issues and concepts
- Serve as a catalyst and convener for best practices and solutions in patient safety.

FY2012 programs fall into several categories outlined as follows.

Process Improvement Programs: The aim of the Process Improvement Programming is to give participants in-depth competencies in how to improve specific systems and processes so that processes can be made both more efficient and safer. There is no question that hospitals and all healthcare organizations are under significant pressure to provide safer care, improve clinical quality, and cut costs through more efficient operations. MPSC will continue to offer a combination of Lean and Six Sigma methodologies, which provides a comprehensive set of strategies to address these issues. Lean's origin is in Japanese performance improvement techniques, especially the Toyota Production System. Six Sigma is an evolution of the Continuous Quality Improvement (CQI) tools and strategies, with a greater degree of statistical use. The key is to drive out waste and improve safety through Lean use, and continually refine performance through state of the art Six Sigma methods.

Professional Development Programs: There are many topics in patient safety that need to be addressed in more depth, targeting the skills, information, and tools that professionals can apply immediately to their work. The Professional Development courses are designed for patient safety officers, other patient safety professionals, and department heads. The programs provide tools to address important topics in patient safety, including specific tools to address developing accountability and just cultures. These high-intensity programs are among the most popular that MPSC offers.

Patient Safety Tools Training: In this series of one-day workshops, healthcare managers and professionals learn how to apply basic patient safety tools and behaviors. The programs offer specific tools and skills development that directly support other programs and initiatives of MPSC. The courses include Root Cause Analysis (RCA) and Failure Mode & Effects Analysis (FMEA), with the aim to help providers proactively build safe systems.

Annual Conference

The Annual Maryland Patient Safety Conference is MPSC's signature event of the year. It provides awareness, specific education, and best practice solutions to a broad-based audience that goes well beyond MPSC's usual participants. The conference is designed to move the patient safety agenda forward in the region.

The 2011 MPSC Annual Conference will be held April 8, 2011 at the Baltimore Convention Center. Keynote speakers are patient experts and innovators Michael Leonard, MD and David Marx, JD. This year we received 120 Solutions submissions to be considered for presentations, posters, and awards at the conference. MPSC will award the first annual Minogue Award for Patient Safety Innovation at the April Conference. The Judging Panel met in January to select the top submissions. There are 10 finalists, two of which will present at the conference. The winners will be announced at the Conference and featured in a Solutions booklet.

Adverse Event Reporting Tool

The Adverse Event Reporting System (AERS) is a core program of the Maryland Patient Safety Center. In fact, MPSC By-Laws state that we "…shall collect…data relating to patient safety adverse events and near misses…". Thus this service has been offered to member organizations since MPSC's establishment. The benefits of a standard adverse event reporting system are notable, and include:

- Standardization of information: it applies a uniform approach to data collection across the participating organization;
- Centralization: it allows access to real-time data that is centralized and secure to all incidents with a high degree of specificity;
- Efficiency: management tools are designed to save time in monitoring and researching adverse events in real-time;
- Awareness: the system increases awareness across the organization as to the types and frequency of events reported.

Due to evolving requirements and sophistication of adverse event reporting systems, MPSC is investigating Patient Safety Organization (PSO)-compliant systems and analytic support. MPSC is negotiating these services with a new provider that has enhanced analytic capabilities, robust data collection systems, and national standing in the adverse event reporting industry. Plans for FY2012 are to roll out the new system to existing users and begin outreach to new users.

MEDSAFE

In Fall 2010 we celebrated the 10th Anniversary of the MEDSAFE survey and conference with a very successful and engaging event attended by nearly 300 pharmacy professionals**.** This year, MPSC is in the process of partnering with the Institute for Safe Medication Practices (ISMP) to provide Maryland facilities with access to the latest national survey and national comparisons.

ISMP is funded by the Commonwealth Fund to conduct an annual survey of patient safety practices in 2011. We aim to create a seamless process for Maryland facilities whereby you will be invited to complete one survey that addresses both the Maryland and national surveys. ISMP plans to develop a special survey process to provide Maryland hospitals with participation in the national survey. Plans are to provide hospitals with online access to the national survey in Spring 2011, instant online analysis of survey results, and individualized reports comparing each facility to Maryland and national comparators in Fall 2011.

Other Special Projects

MPSC engages in a series of other activities, hosts meetings, and partners with organizations to make resources and information available to the Maryland healthcare community. Among these activities are the On the CUSP: Stop BSI initiative and the MPSC Patient Safety Officers Forum.

- ***On the CUSP: Stop BSI:***

On the Cusp: Stop BSI, a program coordinated locally by the Maryland Hospital Association with support from MPSC took off in Fall 2010 with participation from 44 facilities. A total of 76 units are represented, which includes 57 ICUs and 19 Med/Surg or other units. On the CUSP: Stop BSI is a national initiative to reduce central line-associated bloodstream infections. Maryland has one of the highest percentages of hospital participation in the country.

Because of Maryland's reported high rate of Central-Line Associated Blood Stream Infections (CLABSI) there has been both a tremendous interest in this project as well as a huge opportunity to see improvement. As with improving hand hygiene practice, reducing the incidence of CLABSIs has a direct impact on patient mortality and the cost of care. Some states participating in the national On the CUSP initiative have seen dramatic reductions in state-wide CLABSI rates in only six months, with commensurate cost savings. Michigan, for example, has seen a 10% reduction in mortality along with a near zero rate of CLABSI infections.

Teams report monthly data, submit monthly Team Check Up reports, and complete the Hospital Survey on Patient Safety Culture (HSOPS) for participating units. Teams are invited to attend monthly national Content Calls and monthly Maryland Coaching Calls. The program is coordinated locally by the Maryland Hospital Association with support from MPSC.

- ***Patient Safety Officers Forum***

This Patient Safety Officers Forum brings together hospital and nursing home patient safety officers (PSOs) and many others engaged in improving patient safety and the quality of healthcare in their institutions. The PSO Forum, hosted every other month, offers updates, education, and information about what is happening in patient safety in the region, across the country, and around the world.

Attachment E: MPSC Board of Directors

- **Kathleen White**, Chair, PhD, RN, CNAA, BC
- **Senator John Astle**, Maryland State Senate
- **Peter Beilenson,** MD, MPH, Health Officer, Howard County, Howard County Health Department
- **C. Patrick Chaulk**, MD, MPH, FACPM, Executive Director, Maryland Patient Safety Center
- **Beverly A. Collins**, MD, MBA, MS, Lead Medical Director, PCMH, CareFirst BlueCross BlueShield
- **Carmela Coyle**, President & CEO, Maryland Hospital Association
- **Raymond Cox**, MD, Chair, OB/GYN St. Agnes Healthcare
- **John DiBona,** PharmD, Corporate Director of Pharmacy, LifeBridge Health
- **Joseph DeMattos, Jr.**, MA, President, Health Facilities Association of Maryland
- **Eugene Friedman**, Corporate Counsel, 1st Mariner Bank
- **Susan Glover**, VP, Chief Quality Officer, Adventist HealthCare
- **Nancy Beth Grimm**, Director, DHMH Office of Health Care Quality
- **William Holman**, VP of Finance, from Charles County Nursing & Rehabilitation Center
- **David Horrocks**, President, CRISP
- **Sorrell King**, Patient Advocate
- **Steve Ports**, Principal Deputy Director, Health Services Cost Review Commission
- **Sam Ross**, MD, CEO, Bon Secours Baltimore Health
- **James R. Rost,** MD, Medical Director, NICU and Medical Director of Patient Safety, Shady Grove Adventist Hospital
- **Steve Schenkel**, MD, Chair, Department of Emergency Medicine, Mercy Medical Center and Associate Professor, University of Maryland
- **William L. Thomas**, MD, Executive Vice President of Medical Affairs, MedStar HealthCare
- **Fredia S. Wadley**, MD, President & CEO, Quality Health Strategies

Final Recommendation:

HEALTH SERVICES COST REVIEW COMMISSION

Nurse Support Program II

FY 2012 COMPETITIVE INSTITUTIONAL GRANTS

June 1, 2011

This final recommendation was approved by the Commission on June 1, 2011.

INTRODUCTION

This paper presents the Evaluation Committee and HSCRC staff recommendations for the FY 2012 Nurse Support Program II (NSP II) Competitive Institutional Grants.

BACKGROUND

At the May 4, 2005 HSCRC public meeting, the Commission unanimously approved funding of 0.1% of regulated patient revenue annually over the next ten years for use in expanding the pool of bedside nurses in the State by increasing the number of nurse graduates. The catalyst for this program was the finding that in fiscal year 2004, nearly 1,900 eligible nursing students were denied admission to Maryland nursing schools due to insufficient nursing faculty. In accordance with the Maryland Board of Nursing (MBON) guidelines, nursing faculty are required to possess a Master's degree in nursing. The primary goal of NSP II is to increase the number of bedside nurses in Maryland hospitals by expanding the capacity of Maryland nursing schools and, thereby, increase the number of nurse graduates.

Following the approval of NSP II, the HSCRC assembled an advisory group of academicians, business leaders, and nurse executives. The advisory panel held a series of meetings with the Maryland Association of Nurse Executives and the Deans and Directors of the State's Schools of Nursing. In response to the issues expressed by these two groups, the advisory panel crafted two distinct but complementary programs to address the multi-faceted issues surrounding the nursing faculty shortage: 1) Competitive Institutional Grants, and 2) Statewide Initiatives. The HSCRC also contracted with the Maryland Higher Education Commission (MHEC) to administer the NSP II grants because of its expertise in the administration of grants and scholarships.

In 2006, the Governor introduced legislation to create a nonlapsing fund, the Nurse Support Assistance Fund, so that funds collected through hospital rates under NSP II can be carried forward to cover awards in future years and could not be diverted to the State's general fund at the end of the fiscal year. The legislation also provided that a portion of the Competitive Institutional Grants and Statewide Initiatives be used to attract and retain minorities to nursing and nurse faculty careers.

The Competitive Institutional Grants are designed to increase the structural capacity of Maryland Schools of Nursing through shared resources, innovative educational designs, and streamlining the process to produce additional nurse faculty.

The types of initiatives that qualify for Competitive Intuitional Grants are:

1. An initiative to expand Maryland's nursing capacity through shared resources, to combine and integrate their resources to allow for immediate expansion of nursing enrollments and graduates.

2. Initiatives to increase Maryland's nursing faculty by streamlining the attainment for Master of Science in Nursing (MSN) degrees to increase nursing faculty.

3. Initiatives to improve nursing student retention by providing tutorial support to decrease attrition, increase graduation rates and increase National Council Licensure Examination (NCLEX) pass rates.

4. Initiatives to expand the pipeline for nursing faculty by streamlining and facilitating the transition between institutions for nurses with either an Associate Degree in Nursing (ADN) or a Bachelor of Science in Nursing (BSN) to pursue an MSN, thereby increasing the pool of qualified nursing faculty.

5. Initiatives to increase capacity statewide by providing support for innovative programs that have a statewide impact on the capacity to train nurses or nursing faculty.

The Competitive Institutional Grant selection processes requires an Evaluation Committee to review, deliberate, and recommend programs for final approval by the HSCRC. The proposals are evaluated based on the criteria set forth in the Request for Applications (RFA), the comparative expected outcomes of each initiative, the geographic distribution across the State, and the priority attached to attracting and retaining minorities in nursing and nursing faculty careers. The Statewide Initiatives are evaluated less formally and are awarded based on the qualifications and credentials of each applicant.

NSP II Competitive Institutional Grants from FY 2007 – FY 2011

Between FY 2007 and FY 2011, 93 NSP II proposals have been received and 51 have been approved. Over that period of time, the program has provided $44 million in funding for projects that are aimed at:

- accelerating the number of ADN graduates with convenient entry;

- streamlining the pathway for ADN graduates to enter BSN programs;

- increasing nursing faculty educational options through accelerated MSN and doctoral programs; including distance learning programs;

- offering graduate nursing students, both MSN and DNP, a specialty post- graduate Certificate in Education;

- offering clinical simulation networking through annual conferences, seminars and updates at www.mccsun.org and a "train the trainer" approach through the Maryland Faculty Academy for Clinical Simulation (M-FAST) hosted at Johns Hopkins with a nationally recognized leader and author of a highly acclaimed simulation nursing textbook;

- adding new technology for simulation and instruction, to expand educational capacity and admit additional nursing students;

- developing partnerships across Schools of Nursing at both community colleges and universities to create simulation scenarios for statewide use and protected as intellectual property;

- expanding online education instructional design technology, with experienced faculty, thereby increasing access to undergraduate and graduate nursing students and decreasing commuting issues for working adult learners;

- Supporting new nursing programs at Maryland's Historically Black Institutions (HBI), with the goal of increasing diversity of the nursing workforce; and

- Providing additional university undergraduate BSN programs, new RN-BSN and additional semester cohorts for community college AND programs.

On an ongoing basis, MHEC staff conducts site monitoring visits to NSP II grant awardees to assist with and ensure program success in accordance with the approved project. In general, MHEC has found:

- Innovative programs that are inclusive of non-traditional entry into the nursing profession by degree-holding career changers and underrepresented populations, including men, through EMT-RN programs.

- Expertise in student retention and success. One grant recipient was recently recognized nationally as one of four institutions nationally to win the prestigious *2011 Noel Levitz Retention Excellence Award.* This Maryland

institution has developed a template with plans to share with Maryland Schools of Nursing.

- Geographically cohesive partnerships on the Eastern Shore, networking with both state and private universities, community colleges and multiple clinical sites for shared faculty resources. For example: Western Maryland's Smart Technology outreach, Northern Maryland's recruitment of minorities and men through night or weekend hybrid educational options and Southern Maryland's standardized clinical site orientation packet and community centered employment of new graduates for Maryland's health care workforce investment.

- Sponsorship and mentoring of graduate nursing students across the nine graduate and doctoral nursing programs, increasing faculty prepared nurses who then serve at all of Maryland's Schools of Nursing and/or supervise clinical rotations for students throughout hospitals and healthcare facilities statewide.

- A committed group of nursing educators, excited about developing new nurses skilled in caring and critical thinking, thereby ensuring an adequate supply of the largest group of health care workers needed for quality care.

Based on project reports ending July 2010, project outcomes include:

New RN's	901
RN- BSN's	266
Master of Science in Nursing	137
Doctor of Nursing Practice	69
Post-graduate certificates in nursing education	50

The Nurse Support Program has been referenced and highlighted in nursing and health care industry journals in multiple publications. For example, *Developing a Statewide Solution to the Faculty Shortage in Maryland* was published in *The Journal of Nursing Regulation* in October 2010. This article was developed collaboratively by professionals from UMB, MHA and HSCRC.

The national goals recommended by the Institute of Medicine's (2010) report, *The Future of Nursing: Leading Change, Advancing Health* included increasing the percentage of BSN's and doubling the number of doctoral prepared nurses. This evidence based report, as well as surveys of Maryland's graduate nursing students and nursing education leaders are under review to develop new strategies.

NSP II Competitive Institutional Grants for FY 2012

- For FY 2012, eighteen proposals were received. The seven member Evaluation Committee comprised of nursing administrators and educators recommended by the industry, a former Commissioner, and MHEC and HSCRC staff, reviewed all of the proposals and agreed to recommend funding for sixteen of the eighteen proposals (attachment I). The proposals were diverse and representative of broad geographic and educational strategies. Three focused on statewide approaches to faculty role development for nurses with newly acquired credentials for a successful entry into a nursing faculty career. Several focused on advancing simulation use, increasing student retention, hybrid instructional delivery, distance education programming and shared nursing resource development. One program was formulated with directives from the Maryland Deans and Directors of Nursing to ensure a statewide preceptor program. Many of them build on prior funded efforts and infrastructure investments to ensure student success and faculty availability. Twenty-one Maryland institutions will be involved in the sixteen proposed two to four year grants.

RECOMMENDATIONS:

1. Commission Staff recommends the sixteen Competitive Institutional Grants listed in Attachment I be approved by the Commission for FY 2012 in the funding amounts stated.

2. Request MHEC to evaluate the current competitive grant program and statewide initiative guidelines and recommend changes as needed to fine tune the program to ensure maximum effectiveness at this stage of the program life.

3. Staff recommends that the 60- day comment rule be waived so that this recommendation may be considered for final approval during this June Commission meeting.

Attachment I

Nurse Support Program II FY 2012 Competitive Institutional Grant Proposal Recommendations

INSTITUTION	TITLE	AFFILIATES	DURATION	TOTAL REQUEST	TOTAL AWARD
Allegany College	Creating a Smart Learning Environment in Rural Garrett County and Enhancing the Gatekeeper Courses Through Smart Learning to Strengthen the Pipeline of Nursing Students as well as Retain Students Already Enrolled in the Nursing Program	Garrett Memorial	2 years	$97,127	$97,127
Anne Arundel Community College	Meeting the Nursing Retention Challenge at Anne Arundel Community College	none	3 years	$170,126	$166,555
College of Notre Dame	A Caring Curriculum for Equity and Justice: Increasing Capacity and Diversity of Maryland Nurses	none	3 years	$1,833,416	$544,632
Community College of Baltimore County	Minority Student Retention and Success	none	3 years	$622,971	$571,548
Frederick Community College	Making it SIM-ple @ FCC	none	3 years	$233,440	$212,127
Hagerstown Community College	A Model to Increase Diversity, Completion, and Retention Rates of Nursing Graduates in Western Maryland	Meritus Health	3 years	$1,505,692	$700,131
Howard Community College	Increasing Internal Capacity and Nursing Student Success through a Hybrid Accelerated Associate Degree Option and Simulation to Improve Clinical Decision Making	none	3 years	$1,523,568	$644,367
Johns Hopkins University School of Nursing	Enhancing preceptor and clinical faculty preparation using online, self-paced modules with emerging technologies to increase capacity	Johns Hopkins Hospital and Johns Hopkins Bayview Medical Center	3 years	$711,455	$663,973
Montgomery College	NSP II Success Through Simulation (STS)	none	3 years	$761,421	$525,195
Morgan State University	ENNHANS (Educating Nontraditional Nurses Helps Address Nursing Shortage)	none	2 years	$2,917,531	$244,296
Prince George's Community College	Various Strategies to Enhance Nursing Students Retention through Active Learning and Patient Simulation	none	4 years	$1,305,798	$589,206
Salisbury University - Department of Nursing	Eastern Shore Faculty Academy and Mentorship Initiative (ES-FAM)	Chesapeake Community College, Sojourner-Douglass College	3 years	$376,498	$376,498
Sojourner Douglass College School of Nursing	Sojourner-Douglass College School of Nursing Model for Developing and Implementing an Online RN to BSN Program	none	2 years	$952,602	$381,628
Stevenson University	From Students to Faculty: A Multi-Faceted Approach to Increase Student Success, Build Statewide Capacity and Share Nursing Faculty in Maryland	National League of Nursing, Greater Baltimore Medical Center	4 years	$1,417,756	$420,797
University of Maryland School of Nursing	Implementing Statewide Initiatives for Nursing Faculty	none	4 years	$1,125,273	$1,087,779
University of Maryland School of Nursing	Development and Implementation of a Statewide Preceptor Program to Support Nursing Student's Education and Role Development	none	3 years	$444,199	$430,466
TOTAL				$15,998,873	$7,656,325

DRAFT RECOMMENDATION REGARDING UPDATING THE QUALITY-BASED REIMBURSEMENT INITIATIVE FOR FY 2012

Health Services Cost Review Commission
4160 Patterson Avenue
Baltimore, MD 21215
(410) 764-2605
Fax (410) 358-6217

May 25, 2011

This document is a draft staff recommendation to the Commission at the June 1, 2011 public meeting.

1. Background

The Maryland Health Services Cost Review Commission, at its June 4, 2008 meeting, approved the staff recommendation titled, "Final Staff Recommendations regarding the HSCRC's Quality-Based Reimbursement (QBR) Project - based on deliberations of the Initiation Work Group (IWG)." The QBR Initiative's development and implementation are based upon the deliberations and analysis performed by the HSCRC staff, the Initiation Work Group (IWG), the Evaluation Work Group (EWG), and Commission consultants over the past several years. The IWG completed its work in June 2008 and the EWG was then established to: provide a system for developing new measures, retiring old measures, and recommending other adjustments to the data and scoring; ensure that the QBR Initiative was meeting its established goals; and to support and increase the rationale for linking hospital performance to payment.

2. QBR Initiative Initial Year Implementation

For the first year of the QBR Initiative, the approved recommendations included using data for 19 process measures in four care domains including heart attack, heart failure, pneumonia and surgical care. For these measures, the additional approved recommendations included:

- incorporating new definitions for these core measures as they become available from CMS and the Joint Commission;
- weighting the scores for each process measure equally;
- establishing one index for the process measures for purposes of scoring, anticipating that reporting will be on performance for each domain separately;
- utilizing the Opportunity Model for scoring purposes, whereby a hospital receives credit for each time the measure is performed, and the hospital's available points will be 10 times the number of quality measures;
- utilizing calendar year 2007 as the Base Period and calendar year 2008 as the Measurement Period, establishing the scale for calibrating performance based on the prior year's experience so that thresholds and benchmarks are known in advance;
- counting (for purposes of scoring) the "higher of" either Attainment or Improvement points on each process measure for each hospital – on a 10 point scale for each measure;
- establishing the threshold for Attainment at the 50th percentile, the benchmark at 95th percentile for the non-topped off measures, and for topped off measures, 65 percent and 90 percent respectively;
- applying rewards and incentive payments maintaining revenue neutrality in FY 2010 as part of the FY 2010 Update Factor for individual hospitals;
- determining the amount of funding "at-risk" based on further deliberations and recommendations of the Payment Work Group comprising HSCRC staff and the hospital and payer industries, and based on approval of the Commission;
- scaling reward and incentive payments on a continuous basis for hospitals reporting on a minimum of 5 measures;
- utilizing an exchange rate function (cubed-root functional form) for translating scoring into rewards/incentives without high or low restrictions on eligibility or rewards/incentives achieved;

- establishing a rule to adjust for "down and up" year to year performance on any individual process measure, establishing the base-line for improvement as that hospital's best previous score on that measure;
- establishing a mechanism where the Commission can obtain necessary data directly from hospitals through its own vendor arrangement based on work with the Maryland Health Care Commission in implementing a contract with a data vendor to collect quality data for both MHCC's quality performance guide and the HSCRC QBR Initiative;
- moving over time toward use of complete data and away from sampling;
- assuring public accountability by providing accessibility to data given necessary restrictions on confidentiality;
- carefully planning and managing the public release of quality-related scoring information; and,
- investigating the feasibility in future years of incorporating additional funding ("new money") into the system if Maryland as a state can achieve certain benchmarks vs. the performance of hospitals nationally on the selected performance measures.

Hospital rate adjustments were made for FY 2010 within the parameters of the recommendations specified above. The amount of funding "at risk" for the first year was 0.5 percent consistent with the deliberations and approved recommendations of staff and the Payment Work Group, however, the distribution of payment differential was quite narrow at 0.16 percent as the cube root exchange function was used to translate performance into rewards and penalties. The hospital quality data vendor has been procured by MHCC, and began collecting patient-level quality data in the first quarter of CY 2009. The EWG met regularly to deliberate: measure additions, changes, and deletions; changes to the benchmark and threshold values for topped off measures; and the use of a blended Appropriateness and Opportunity Model for the process measures in order to raise the bar of performance and better distinguish hospital performance in light of the increasing number of topped off measures. The EWG concluded its work in May 2009 with the Commission's approval of the updated QBR recommendations for FY 2011.

3. Approved Changes to the QBR Initiative Beginning FY 2011

New Process Measures- New measures were added consistent with MHCC's timeframe for adding these measures to the Hospital Performance Evaluation Guide:

- AMI 8- Percutaneous Coronary Intervention Timing for AMI patients– base CY 2008, measurement CY 2009, and rate year FY 2011
- SCIP VTE 1- Surgery Patients with Recommended Venous Thromboembolism Prophylaxis Ordered - base CY 2009, measurement CY 2010, and rate year FY 2012
- SCIP VTE 2 - Surgery Patients with Recommended Venous Thromboembolism Prophylaxis Given 24 hours prior and after surgery–base CY 2009, measurement CY 2010, and rate year FY 2012

- SCIP CARD-2 Surgery Patients on Beta-Blocker Therapy Prior to Admission Who Received a Beta-Blocker During the Perioperative Period – base CY 2009, measurement CY 2010, and rate year FY 2012
- SCIP Inf – 4- Cardiac Surgery Patients with Controlled 6 A.M. Postoperative Serum Glucose - base CY 2009, measurement CY 2010, and rate year FY 2012
- SCIP Inf 6- Surgery Patients with Appropriate Hair Removal - base CY 2009, measurement CY 2010, and rate year FY 2012
- Children's Asthma Care Asthma Measures (CAC-1-3)- base CY 2009, measurement CY 2010, and rate year FY 2012); these measure include:
  - CAC 1-Relievers for Inpatient Asthma Systemic
  - CAC 2- Corticosteroids for Inpatient Asthma
  - CAC 3- Home Management Plan of Care (HMPC) Document Given to Patient/Caregiver

Blended Opportunity and Appropriateness Scores-To mitigate the effects of topped off measures better distinguishing hospital performance, and to raise the performance bar, a hybrid of the Opportunity and Appropriateness model was used where hospital scores are based 25% on Opportunity and 75% on Appropriateness for base CY 2008, measurement CY 2009, and rate year FY 2011.

Topped off Measures Benchmarks – Based on analysis of the data in early 2009, the benchmark for topped off measures was changed from 0.9 percent to 0.95 percent to mitigate effects of topped off measures and better distinguish performance.

Maryland Hospital Performance Changes on Measures used for FY 2010 and FY 2011 – For FY 2011 we have 17 measures, compared to 19 measures the previous year. Two measures excluded for this year were:
- AMI-6 Beta Blocker prescribed at arrival (Retired)
- PN3a Blood cultures performed within 24 hours prior to or 24 hours after hospital arrival (No longer required by CMS or MHCC)

Staff compared the average percentage of patients who received each process measure and observed some improvement between 2008 and 2009 CY performance periods as follows:
- 14 measures improved with an average of 1.08 percentage point increase
- 2 measures worsened by less than one percentage point.
- 1 measure- influenza- changed the collection period.

Appendix A contains a list of the 17 measures and their changes from CY 2008 to 2009.

Patient Experience of Care – Based upon the results of analysis of patient experience of care measures data (Hospital Consumer Assessment of Healthcare Providers and Systems – "HCAHPS") relative to other domains of quality measures, and upon

proposed modeling of incorporating the patient experience domain in the QBR formula, the Commission approved allowing the option of including this domain for base CY 2009, measurement CY 2010, and rate year FY 2012.

4. Centers for Medicare & Medicaid Services Value Based Purchasing (VBP) Program

The Patient Protection and Affordable Care Act of 2010 requires CMS to fund the aggregate Hospital VBP incentive payments by reducing the base operating diagnosis-related group (DRG) payment amounts that determine the Medicare payment for each hospital inpatient discharge. The law sets the reduction at 1 percent in FY 2013, rising to 2 percent by FY 2017. CMS issued its VBP final rule in April 2011, the details of which are summarized below.

Hospital VBP Measures- For the federal FY 2013 (which begins on October 1, 2012) Hospital VBP program, CMS will measure hospital performance using two domains: the clinical process of care domain, which is comprised of 12 clinical process of care measures, decreased from 17 in the proposed rule, and the patient experience of care domain, which is comprised of the HCAHPS survey measure. The FY 2013 measures are in Appendix B. CMS will add the following measures in the Hospital VBP program for the FY 2014 payment determination: three mortality outcome measures, eight Hospital Acquired Condition (HAC) measures, and two Agency for Healthcare Research and Quality (AHRQ) composite measures. These measures are also specified in Appendix B.

Performance Period- CMS has established a base period that runs from July 1, 2009 through March 1, 2010, and a performance period that runs from July 1, 2011 through March 31, 2012, for the FY 2013 Hospital VBP payment determination. CMS anticipates that in future program years, if it becomes feasible, it may propose to use a full year as the performance period.

Scoring Methods- CMS will score each hospital based on achievement and improvement ranges for each applicable measure. A hospital's score on each measure will be the higher of an achievement score in the performance period or an improvement score, which is determined by comparing the hospital's score in the performance period with its score during a baseline period.

For scoring on achievement, hospitals will be measured based on how much *their* current performance differs from *all other hospitals'* baseline period performance. Points will then be awarded based on the hospital's performance compared to the threshold and benchmark scores for all hospitals. Points will only be awarded for achievement if the hospital's performance during the performance period exceeds a minimum rate called the "threshold," which is defined by CMS as the 50th percentile of hospital scores during the baseline period.

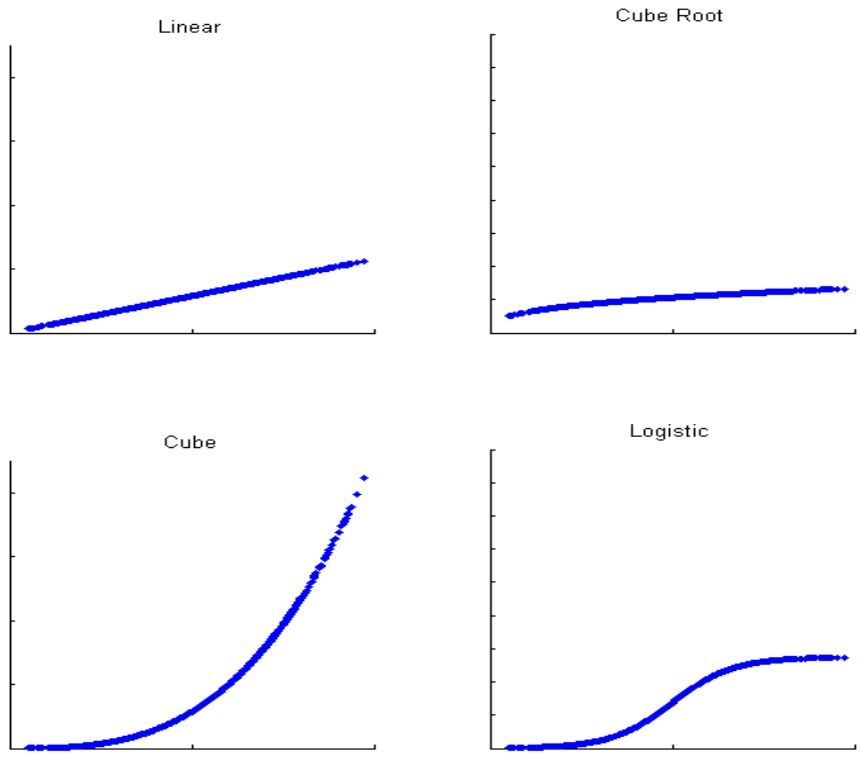
For scoring on improvement, hospitals will be assessed based on how much their *current performance* changes from their own *baseline period performance*. Points will then be awarded based on how much distance they cover between that baseline and the benchmark score. Points will only be awarded for improvement if the hospital's performance improved from their performance during the baseline period.

Finally, CMS will calculate a Total Performance Score (TPS) for each hospital by combining the greater of its achievement or improvement points on each measure to determine a score for each domain, multiplying each domain score by the proposed domain weight and adding the weighted scores together. In FY 2013, the clinical process of care domain will be weighted at 70 percent and the patient experience of care domain will be weighted at 30 percent.

Incentive Payment Calculations- CMS indicates in the Final Rule that the exchange function is the means to translate a hospital's total performance score into the percentage of the value-based incentive payment earned by the hospital, and that the selection of the exact form and slope of the exchange function is of critical importance to how the incentive payments reward performance and encourage hospitals to improve the quality of care they provide.

CMS considered four mathematical exchange function options: straight line (linear); concave curve (cube root function); convex curve (cube function); and S shape (logistic function) as illustrated in Figure 1 below.

Figure 1: Mathematical Exchanged Function Options Considered by CMS



For each of the above exchange function option, CMS evaluated:

- how each option would distribute the value-based incentive payments among hospitals;
- the potential differences between the value-based incentive payment amounts for hospitals that perform poorly and hospitals that perform very well;
- the different marginal incentives created by the different exchange function shapes; and,
- the relative importance of having the exchange function be as simple and straightforward as possible.

The linear function moves more aggressively to higher levels for higher performing hospitals than the cube root function, but not as aggressively as the logistic and cube functions. Due to the fact that the cube root function distributes lower payment amounts to higher performing hospitals, the cube root function creates the narrowest distribution of incentive payments across hospitals. The linear is next, followed by the logistic, and then the cube function, which creates the widest distribution. In the case of the linear shape, the marginal incentive does not vary for higher or lower performing hospitals; the slope of the linear function is constant, so any hospital with a Total Performance Score that is 0.1 higher than another hospital would receive incrementally the same increase.

When all of the above factors were taken together, CMS determined that the linear exchange function ensures that all hospitals have strong incentives to continually improve the quality of care they provide to their patients. CMS may revisit the issue of the most appropriate exchange function in future rulemaking as they gain more experience under the Hospital VBP program. CMS will notify each hospital of the *estimated* amount of its value-based incentive payment for FY 2013 through its QualityNet account at least 60 days prior to Oct. 1, 2012. CMS will notify each hospital of the *exact* amount of its value-based incentive payment on Nov. 1, 2012

Maryland VBP Exemption- Inpatient acute care hospitals located in the State of Maryland are not currently paid under the IPPS in accordance with a special waiver provided by section 1814(b)(3) of the Act. Despite this waiver, Maryland hospitals continue to meet the definition of a ''subsection (d) hospital" under section 1886(d)(1)(B) of the Affordable Care Act and are, therefore, not exempt from the CMS VBP program. While Maryland hospitals are not subject to the payment reduction under the CMS Hospital Inpatient Quality Reporting (IQR) program, all or nearly all of them submit data to Hospital Compare on a voluntary basis. Therefore, CMS does not believe that requiring Maryland hospitals to participate in the Hospital VBP program would create

an additional or duplicative burden, and therefore the Hospital VBP program will apply to acute care hospitals in Maryland. While he collection and submission of quality data for both the VBP and QBR programs does not constitute additional burden for the data collection and submission, participation in both programs would constitute payment changes, up or down, linked with each program.

The Health and Human Services Secretary may exercise discretion pursuant to 1886(o)(1)(C)(iv), which states that "the Secretary may exempt such hospitals from the application of this subsection if the State which is paid under such section submits an annual report to the Secretary describing how a similar program in the State for a participating hospital or hospitals achieves or surpasses the measured results in terms of patient health outcomes and cost savings established under this subsection." As a precursor to future rulemaking on this topic, CMS provides further guidance indicating that:

- The report should be received prior to the Secretary's consideration of whether to exercise discretion.
- A State shall submit, in writing and electronically, a report pursuant to section 1886(o)(1)(C)(iv) in a timeframe such that allows CMS-3239-F 126 it to be received no later than October 1, 2011, which is the beginning of the fiscal year prior to the beginning of FY 2013.
- The report should be as specific as possible in describing the quality (and other) measures included and in describing the results achieved over an applicable time period, noting that for the initial report the applicable time period would likely be before and after implementation of the State program.

Minimum Number of Measures and Case Counts for Inclusion in VBP- CMS commissioned Brandeis researchers to check the reliability of the total performance score for hospitals with only 4 measures. The approach used was to randomly select 4, 6, 10, or 14 measures and compare the reliabilities determined using these different sets of measures per hospitals. The research found that using 4 randomly selected measures per hospital did not greatly reduce between-hospital reliability (particularly in terms of rank ordering) from what would have been determined using 10 or 14 measures. The whisker plots and reliability scores demonstrated a clear difference in the distribution of scores for hospitals reporting 4 or more measures compared with those reporting fewer than 4 measures.

Examining hospitals with at least 10 cases for each clinical process measure, the analysis compared the reliability of clinical process measure scores for hospitals according to the number of such measures reported. Whisker plots and reliability scores revealed comparable levels of variation in the process scores for hospitals reporting even a

small number of measures as long as the minimum of 10 cases per clinical process measure was met. Based on this analysis, CMS has established the minimum number of cases required for each measure under the proposed Three Domain Performance Scoring Model at 10, which will allow CMS to include more hospitals in the Hospital VBP program.

The reliability of HCAHPS scores was determined through statistical analyses conducted by RAND, the statistical consultant for HCAHPS. RAND's analysis indicates that HCAHPS data does not achieve adequate reliability with a sample of less than 100 completed surveys to ensure that true hospital performance rather than random "noise" is measured. RAND's analysis indicates that HCAHPS data are significantly below 85 percent reliability levels across all HCAHPS dimensions with a sample of less than 100 completed surveys.

Based on the above analysis, in summary, CMS requires the following for inclusion of measures and cases in the VBP performance score calculations:

- Minimum number of cases per measure is 10.
- Minimum number of measures with 10 cases is 4.
- Minimum number of HCAHPS surveys is 100.

5. QBR Expansion Work

HSCRC staff began, in March of this year, convening a QBR Expansion Work Group comprising hospital quality, case mix and program operations staff, MHA staff and other stakeholders to analyze the CMS proposed and final VBP rule and requirements, to determine the updates and expansions that should be made in order to meet or exceed the patient health and cost outcomes of the CMS VBP Program and to deliberate and finalize the recommendations for updating the QBR program for FY 2012 rate adjustments. Based on discussion at the meetings, HSCRC staff is in the process of coordinating follow up discussions on the use of the linear exchange function, the magnitude of dollars at risk for rewards and penalties and the use of the blended Opportunity/Appropriateness models.

In the course of the meetings, it was also noted that the Maryland Hospital Acquired Conditions (MHAC) and QBR programs must be proposed together to CMS as meeting or exceeding Medicare's VBP program, and that the QBR Expansion Work Group was specifically focused on updating the QBR program.

The next meeting of the Work Group is planned for Wednesday, 6/15/11.

DRAFT RECOMMENDATIONS TO UPDATE AND EXPAND THE QBR INITIATIVE BEGINNING WITH FY 2012 RATE ADJUSTMENTS

Based on the analysis conducted, the CMS VBP developments and the deliberations of the QBR Expansion Work Group, staff recommend the Commission approve the following draft recommendations:

- Continue to use the 17 process measures used for FY 2011 payment adjustments (see Appendix A) and the additional measures approved for inclusion in the FY 2012 rate adjustment calculations (see Section 3).
- To mitigate the effects of topped off measures, better distinguishing hospital performance, and to raise the performance bar, continue to use a hybrid of the Opportunity and Appropriateness model where hospital scores are based 50 percent on Opportunity and 50 percent on Appropriateness for base CY 2009, measurement CY 2010, and rate year FY 2012.
- Topped off Measures Benchmarks – Continue to use 95 percent as the topped off benchmark to mitigate effects of topped off measures and better distinguish performance, and further add a truncated coefficient of variation of less than 0.1 to the topped off definition.
- Apportion 70 percent of the hospital scores to process measure performance, and 30 percent to HCAHPS performance.
- Continue to use the CMS minimum case number of 10 for process measures, and adopt the minimum case number of 100 for HCAHPS surveys for inclusion of the measures in the scoring.
- In light of the blended Opportunity/Appropriateness model, keep the minimum number of 5 process measures reported for inclusion of the hospital in the QBR program.
- Keep the topped off measures in the scoring calculation in light of the blended Appropriateness/Opportunity model recommendation.
- Use the Linear Exchange Function for translating the scores into payment adjustments, consistent with the CMS approach.
- Use the magnitude at risk determined by the Payment Work Group and approved by the Commission in a separate recommendation.
- Prepare and submit to the US HHS Secretary, a VBP program exemption request letter by October 1, 2011.

Appendix A: Change in Measure Performance for CY 08 and CY 09 Applied to FY 10 and FY 11 Rates Respectively.

MEASURE	Measure Name	2008 Average	2009 Average	Change
AMI-1	Aspirin at Arrival	96.1%	97.5%	1.31%
AMI-2	Aspirin prescribed at discharge	96.0%	95.4%	-0.65%
AMI-3	Angiotensin converting enzyme inhibitors (ACEI) or angiotensin receptor blockers (ARB) for left ventricular systolic dysfunction (LVSD)	92.4%	93.7%	1.34%
AMI-4	Adult smoking cessation advice/counseling	97.7%	98.8%	1.09%
AMI-5	Beta blocker prescribed at discharge	95.8%	94.9%	-0.88%
HF-1	Discharge instructions	83.5%	86.9%	3.45%
HF-2	Left ventricular systolic function (LVSF) assessment	94.9%	97.1%	2.14%
HF-3	ACEI or ARB for LVSD	91.5%	93.1%	1.56%
HF-4	Adult smoking cessation advice/counseling	96.6%	97.3%	0.61%
PN-2	Pneumococcal vaccination	84.2%	89.0%	4.86%
PN-3b	Blood culture before first antibiotic – Pneumonia	89.9%	91.6%	1.74%
PN-4	Adult smoking cessation advice/counseling	95.6%	95.9%	0.33%
PN-5c	Antibiotic within 6 hours	92.6%	93.7%	1.09%
PN-7	Influenza vaccination	78.6%	85.9%	7.26%
SCIP-INF-1	Antibiotic given within 1 hour prior to surgical incision	92.5%	94.7%	2.21%
SCIP-INF-2	Antibiotic selection	96.1%	96.9%	0.77%
SCIP-INF-3	Antibiotic discontinuance within appropriate time period postoperatively	88.6%	91.4%	2.74%

Appendix B: CMS VBP Quality Measures

Clinical Process of Care Measures for FY 2013 Adjustments	
Measure ID	**Measure Description**
Acute Myocardial Infarction	
AMI-7a	Fibrinolytic Therapy Received Within 30 Minutes of Hospital Arrival
AMI-8a	Primary PCI Received Within 90 Minutes of Hospital Arrival
Heart Failure	
HF-1	Discharge Instructions
Pneumonia	
PN-3b	Blood Cultures Performed in the ED Prior to Initial Antibiotic Received in Hospital
PN-6	Initial Antibiotic Selection for CAP in Immunocompetent Patient
Healthcare-associated Infections	
SCIP-Inf-1	Prophylactic Antibiotic Received Within One Hour Prior to Surgical Incision
SCIP-Inf-2	Prophylactic Antibiotic Selection for Surgical Patients
SCIP-Inf-3	Prophylactic Antibiotics Discontinued Within 24 Hours After Surgery End Time
SCIP-Inf-4	Cardiac Surgery Patients with Controlled 6AM Postoperative Serum Glucose
Surgical Care Improvement	
SCIP-Card-2	Surgery Patients on a Beta Blocker Prior to Arrival That Received a Beta Blocker During the Perioperative Period
SCIP-VTE-1	Surgery Patients with Recommended Venous Thromboembolism Prophylaxis Ordered
SCIP-VTE-2	Surgery Patients Who Received Appropriate Venous Thromboembolism Prophylaxis Within 24 Hours Prior to Surgery to 24 Hours After Surgery
Patient Experience of Care Measures	
HCAHPS	Hospital Consumer Assessment of Healthcare Providers &Systems Survey (HCAHPS) · Communication with Nurses · Communication with Doctors · Responsiveness of Hospital Staff · Pain Management · Communication About Medicines · Cleanliness and Quietness of Hospital Environment · Discharge Information · Overall Rating of Hospital

MEASURES FINALIZED FOR THE FISCAL YEAR 2014 HVBP PROGRAM IN THE FINAL RULE:

Mortality Measures:

· Mortality-30-AMI: Acute Myocardial Infarction (AMI) 30-day Mortality Rate
· Mortality-30-HF: Heart Failure (HF) 30-day Mortality Rate
· Mortality-30-PN: Pneumonia (PN) 30-Day Mortality Rate

Hospital Acquired Condition Measures:

- Foreign Object Retained After Surgery
- Air Embolism
- Blood Incompatibility
- Pressure Ulcer Stages III & IV
- Falls and Trauma
- Vascular Catheter-Associated Infections
- Catheter-Associated Urinary Tract Infection (UTI)
- Manifestations of Poor Glycemic Control

<u>AHRQ Patient Safety Indicators (PSIs), Inpatient Quality Indicators (IQIs), and Composite Measures:</u>

- Complication/patient safety for selected indicators (composite)
- Mortality for selected medical conditions (composite)

NHQR Resources

State Resources for Taking Action

2010 State Snapshots Home

Getting Started

State Selection Map

What's New

State-Specific Information

State Dashboard

Overall Health Care Quality

Strongest and Weakest Measures

Types of Care

Settings of Care

Care by Clinical Area

Focus on Diabetes

Focus on Asthma

Focus on Healthy People 2010

Focus on Clinical Preventive Services

Focus on Disparities

Focus on Payer

Focus on Variation Over Time

State Rankings for Selected Measures

Contextual Factors

Other Information

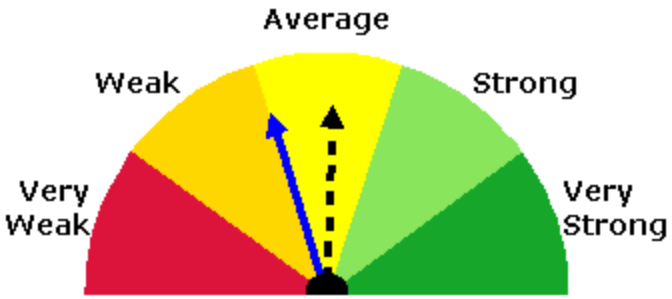
All-State Data Tables for All Measures

Snapshot Print Version

Maryland

Dashboard on Health Care Quality Compared to All States

Overall Health Care Quality



Performance Meter: All Measures

= Most Recent Data Year

= Baseline Year

(Baseline year may vary across measures)

The graphics on this page are summaries of measures reported in the National Healthcare Quality Report (NHQR) for Maryland. Above is a summary of over 100 measures in the NHQR reported at the State level, and below are graphics describing specific types of care, settings of care, and care in clinical areas. Select the graphics to find the underlying measures.

How is State performance scored? (select this link or Methods)

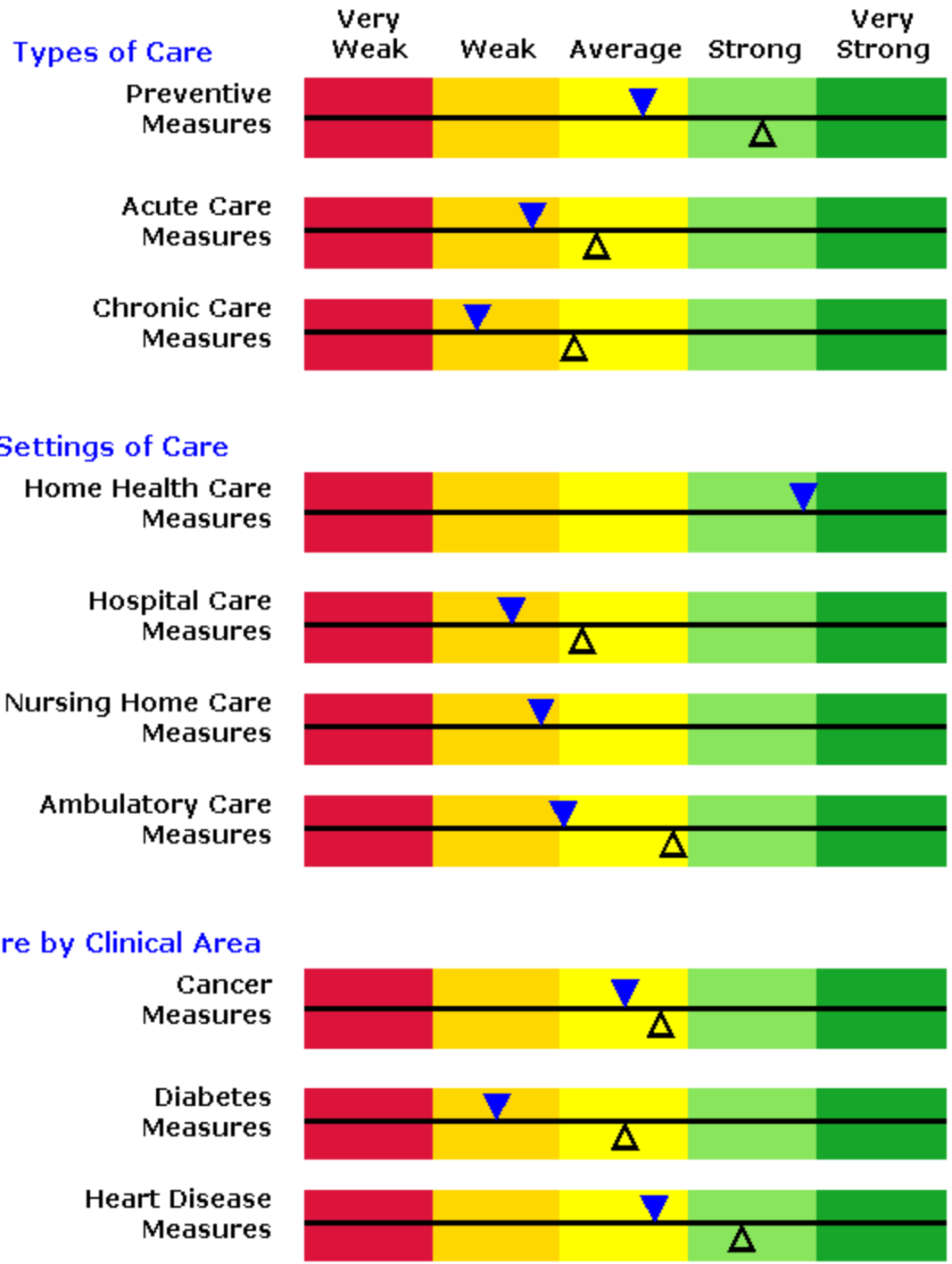
▼ Most Recent Data Year

△ Baseline Year

Other State Snapshot Years
Interpretation of Results
Methods
Technical Assistance

Related Links

Measuring Healthcare Quality
Health Care Report Card Compendium
Health Care Innovations Exchange



Each graphic shows a State's balance of below average, average, and above average measures compared to all States reporting such data in the United States. The graphics have five categories: very weak, weak, average, strong, and very strong. This State's performance for the most recent data year is described by a solid arrow or solid triangle; a dashed arrow or hollow triangle describes the baseline year. A missing arrow or triangle means there were insufficient data to create the summary measure.

An arrow or triangle pointing to "Very weak" means all or nearly all included measures for a State are below average within a given data year. An arrow or triangle pointing to "Very strong" indicates that all or nearly all available measures for a State are above average within a given data year.

How is State performance scored? (select this link or Methods)

Additional Resources for Understanding Quality in Maryland

The Agency for Healthcare Research and Quality's Health Care Report Card Compendium is a searchable database of health care report cards for comparing the quality of health plans, hospitals, medical groups, individual physicians, nursing homes, and other providers of care. The report cards demonstrate approaches to reporting data and are a resource for those interested in creating health care report cards.

Search the Health Care Report Card Compendium.

AHRQ Health Care Innovations Exchange: A searchable database of successful and attempted health care innovations, quality tools, and learning and networking opportunities—a resource for those interested in developing and adopting innovations in health care delivery. The Innovations Exchange includes information for Maryland.

Agency for Healthcare Research and Quality • 540 Gaither Road Rockville, MD 20850 • Telephone: (301) 427-1364

Maryland Physician Workforce Study: Applying the Health Resources and Services Administration Method to Maryland Data

An MHCC Extramural Report

Christopher Hogan, Ph.D.
Direct Research, LLC
chogan@directresearch.com

Outline of Presentation

- **Context:** Conflicting estimates of Maryland physician supply.
- **Method:** Compare physicians/1000 population, Maryland versus U.S.
  - Maryland: Use physician license renewal data.
  - U.S.: Use HRSA benchmarks (U.S. year 2000 average based on AMA Masterfile physician counts).
  - Broad brush: State average, then four broad physician categories x five regions. No detail, no projection of future.
  - **Most important point:** Adjust for differences between Maryland license renewal data and AMA Masterfile data.
- **Conclusions:**
  - Maryland is 27% above U.S. average for physicians/capita.
  - But Southern Maryland is well below U.S. for all types of physicians.

Main Caveat

- This is a study of Maryland state and regional physician supply.
- This is **NOT** a study of:
  - Direct measures of access to care.
  - Physician supply in small areas, counties.
  - Disadvantaged populations.
  - HPSAs or MUAs.
  - Individual physician specialties.
  - Future trends (e.g., impact of health care reform).

Context: Conflicting Estimates of Maryland Per-Capita Physician Supply, Relative to U.S. Average

Organization	Published	Maryland (vs US)
US Health Resources and Services Administration (HRSA)	2008	25% above
Association of American Medical Colleges (AAMC)	2009	29% above
MHA/MedChi	2008	15% below

Deceptively Simple Task

- Count physicians using Maryland license renewal data.
- Compare to HRSA standard from AMA Masterfile data.
- How hard can that be?
- But HRSA, AAMC used just *one source of data*.
- Here, we use *two completely different sources*.
- Important: Must account for data sources' treatment of
  - Hospital residents (= interns, residents, fellows).
  - Retirees.
  - Newly licensed physicians.
- Less important: Details of identifying Maryland active, patient-care, non-federal physicians from detailed license renewal data.

AMA Masterfile Versus Maryland License Renewal File

- AMA Masterfile (for HRSA standard).
  - Over-count is a well-known issue.
  - Retirees retained as active up to four years post-retirement.
  - Estimated net over-count from comparison between Masterfile and U.S. Current Population Survey (Staiger et. al, 2009).
- Maryland license renewal file.
  - Omits most residents as Unlicensed Medical Practitioners (UMPs).
  - Omits many initially-licensed physicians (initial license not in this file).
  - Retirees should not be an issue (active-but-retired-pre-renewal should roughly balance active-but-retired-post-renewal.)
- Remove residents from both sources, adjust for retirees, adjust for new physicians.

Accounting for Differences, HRSA 2000 Count and Maryland 2009/2010 License Renewal Count

Physicians per 1000 Population			
	US 2000 Masterfile (HRSA)*	Maryland 2009/2010 renewal file	**% Difference, MD vs U.S.**
Raw count	2.54	2.43	-4%
Remove residents	2.12	2.35	11%
Remove AMA overcount, retirees	1.93		
Add Maryland undercount, new physicians		2.44	
Final comparison	**1.93**	**2.44**	**27%**

*Note: HRSA Masterfile count may include federal and unknown status physicians. HRSA's implied count of residents is higher than counts from other sources.

Apply Same Adjustments to AMA Masterfile Count for Maryland

Physicians/1000, Maryland, AMA Masterfile (ARF) Data	
	Physicians/ 1000
Active patient care physicians	3.20
Remove residents	2.65
Adjust for Mastefile overcount, retirees	2.41
Adjust 2008 data to 2009/2010 basis (1.5 years average growth)	2.46
Memo: Adjusted count from Maryland license renewal data	2.44
Memo: Discrepancy, Masterfile versus Maryland license renewal	**-0.7%**

A Comment on the Data

- There is uncertainty in all these estimates.
- Plus or minus a few percentage points.
- Not enough to change conclusions materially.
- Mere chance that the Maryland-to-Maryland discrepancy is tiny (-0.7%).
- But no coincidence that it would be close.

Do We Need to Adjust for ...

- Maryland average population age? No, U.S. and Maryland demographics are similar.
- Border-crossing for care? No, based on Medicare claims, it's a wash.
- Lower patient-care hours for Maryland physicians? Some survey evidence of slightly lower hours. No evidence of vastly lower hours.

Maryland Physician Supply by Region (Excluding Residents)

Maryland Physician Supply Versus HRSA Standard, All Adjustments					
Region	**Total**	**Primary Care**	**Medical Specialties**	**Surgical Specialties**	**All Other**
Entire State	27%	11%	54%	19%	39%
Baltimore Metro	44%	21%	69%	40%	66%
Eastern Shore	4%	0%	8%	-2%	13%
National Capital	18%	4%	56%	8%	23%
Western	20%	12%	48%	3%	29%
Southern	-26%	-19%	-7%	-34%	-39%
Key: Green = >10%, Yellow = -10% to 10%, Red = <-10%					

Medicare Beneficiaries' Travel for Physician Services

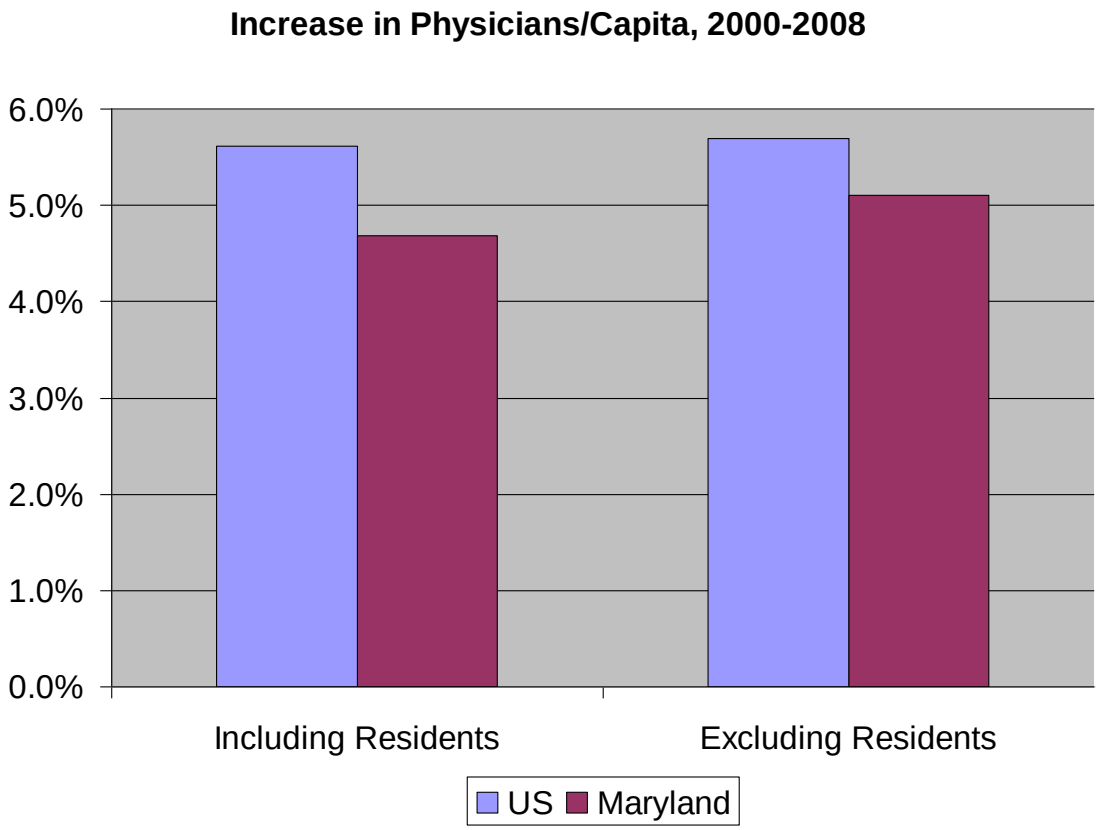
Medicare 2009 Part B Physican Services Spending per Capita								
		Physician Location						
		Balti-more Metro	Eastern Shore	National Capital	Western	South-ern	Out of state	Total
Patient Residence	Baltimore Metro	94%						$ 2,675
	Eastern Shore	13%	72%				13%	$ 2,362
	National Capital	5%		73%			19%	$ 3,181
	Western	5%		4%	80%		10%	$ 2,290
	Southern	7%		14%		67%	12%	$ 2,692
NOTE: PERCENTAGES ADD ACROSS THE ROWS (% = % OF ROW TOTAL).								
Note: Cells under 2% were suppressed for clarity								

A Reminder on Caveats

- Did not address:
  - Small areas/counties/HPSAs/MUAs.
  - Individual specialties.
  - Future trends including retirement of the baby boom generation or impact of health care reform.
  - Direct measures of access to care or health status.

Historical Trend: Maryland Slightly Below U.S. Growth in Physicians/Capita

Calculated from ARF data, M.D. only (no D.O.)



Conclusions and Suggestions

- Once you account for differences across data sources:
  - HRSA, AAMC got it right, Maryland is well above the national average.
  - My estimate: 27% above HRSA benchmark.
  - Q: Could the *real* number be 23%? 31%? A: Does that matter?
  - Maryland ARF data reconcile well with Maryland licensure count.
- Southern Maryland
  - Clearly below the U.S. average.
  - But impact other than increased travel is not clear.
- Did not address small areas, individual specialties, future, HPSAs, direct measures of access to care or health status.
- Suggestions
  - An accurate physician head count is (just) a good start.
  - Integrate the data you already own to get a better picture of impact.
  - Disease prevalence, use of services, wait times, travel patterns, …

MHCC Extramural Report

Maryland Physician Workforce Study: Applying the Health Resources and Services Administration Method to Maryland Data.

Submitted to:
Ben Steffen
Director, Center for Information Services & Analysis
Maryland Health Care Commission
4160 Patterson Avenue
Baltimore, MD 21215

Submitted by:
Christopher Hogan, Ph.D.
President
Direct Research, LLC
226 Glen Ave., SW
Vienna, VA 22180

May 19, 2011

Executive Summary

This report uses data on Maryland medical license renewals to assess the level of physician supply in Maryland. We adopt the same standards and methods that the U.S. Health Resources and Services Administration (HRSA) uses to assess the adequacy of U.S. physician supply (HRSA 2008). In effect, we assume that U.S. physician supply and demand were roughly in balance in 2000, then compare Maryland physicians per capita to that year 2000 U.S. average benchmark.

Existing research gives conflicting views of Maryland's supply of physicians. HRSA and the Association of American Medical Colleges (AAMC) both show Maryland among the states with the highest physician-to-population ratios, roughly 25 to 29 percent above the U.S. average (HRSA 2008, page 72; AAMC 2009, Figure 2 and Table 2). By contrast, a study sponsored by the Maryland Hospital Association and the Maryland State Medical Society (henceforth the MHA/MedChi study) found that Maryland physician supply was 15 percent *below* the national average, with significant and widespread physician shortages now and in the future (Boucher and Associates, 2008, page 4).

Technically, the most important point of this study is that we are comparing two completely different sources of data: Maryland license renewals and the American Medical Association (AMA) Physician Masterfile. Before we compare counts of physicians from these two files, we have to account for the large and systematic differences between them.

We must make two substantial adjustments to the physician counts, for hospital residents and file completeness. First, we must **drop hospital residents** from both counts, because they are (almost entirely) excluded from the Maryland license renewal data file. This reduces the physician counts by about 4 percent (Maryland licensure) and 14 percent (Masterfile). Second, we must adjust for different levels of file completeness in the Masterfile and the Maryland license renewal file. The Masterfile over-counts active physicians by about 10 percent due to lags in capturing physician retirements (Staiger et al., 2009). By contrast, we calculate that the Maryland license renewal file under-counts active physicians by about 4 percent, due to omission of data for about one year's newly licensed physicians.

After these adjustments to make the two data sources comparable, our study agrees closely with the HRSA and AAMC analyses. **We estimate that Maryland has 27 percent more active non-federal patient-care physicians per capita than the U.S. year 2000 average** (HRSA's benchmark). That is nearly identical to the estimates of Maryland physician supply developed by HRSA and the AAMC (HRSA 2008, page 72; AAMC 2009, Figure 2 and Table 2). **In addition, after adjustment, the two data sources give nearly identical counts of active non-federal patient-care physicians in Maryland**. While these estimates could easily be off by a few percentage points in either direction, they demonstrate that Maryland's physician-to-population ratio is substantially above the U.S. average.

Maryland active non-federal patient-care physicians appear to provide roughly as many patient-care hours per physician as the U.S. average. Using the U.S. Current Population Survey, the total work week for Maryland and U.S. physicians was essentially the same, averaging 51 hours. Using two different sources of survey data, the fraction of work hours devoted to patient care was roughly the same, around 85 percent. On balance, the data suggest that the average Maryland physician may provide slightly fewer patient-care hours than the U.S. average. Our confidence in these results is limited by the small sample size of the surveys and the need to compare results across different surveys. A more precise statement might be that, when we looked at the information that physicians themselves reported, we found no evidence that patient-care hours of Maryland active non-federal patient-care physicians were substantially below the U.S. average.

We looked at some differences between Maryland and the U.S. that might account for lower or higher average demand for physicians in Maryland. None of them would have changed the results materially.

- Based on the age mix of the population, Maryland might require 2 percent fewer physicians per capita than the U.S. average.
- Using Medicare claims, patients crossing the state border for care appeared to be a non-issue. The net inflow and outflow of patients (for fee-for-service Medicare) was almost exactly in balance.

Beneath the broad averages, we found significant differences by specialty and region. For the entire state, physician-to-population ratios exceeded the U.S. average for broad categories of physicians (primary care, medical specialists, surgical specialists, and others). By region, we found that physicians tended to work slightly longer hours in areas with low physician supply. But even after adjusting for variation in patient-care hours, **the supply of physicians in Southern Maryland was significantly below the HRSA benchmark for all four broad categories of physicians that we studied.** All other regions were at or above the HRSA benchmark, with the Eastern Shore ranking just at the HRSA benchmark for some types of physicians.

We did not, however, find systematic evidence of reduced access to care in Southern Maryland, on average, using the limited data available for this study. Physicians in Southern Maryland were as likely to be accepting new Medicare and Medicaid patients as physicians in the rest of the state. Fee-for-service Medicare beneficiaries in that region received as much physician care as those in other regions of Maryland, but were more likely to travel outside the region for care.

These results are averages for all areas within these regions, combining urbanized areas with relatively high physician supply and rural areas with lower physician supply. **A finding that average physician supply in a region exceeds the HRSA benchmark does *not* imply that supply exceeds the HRSA benchmark for all areas or populations within that region.**

This is a limited study, focusing on state- and region-level supply of broad classes of physicians. It should *not* be construed as showing that Maryland has no physician supply problems. In particular, we did *not* look at:

- counties or sub-county areas;
- individual physician specialties;
- vulnerable populations;
- Health Professional Shortage Areas or Medically Underserved Areas;
- expected future changes in physician supply and demand based on retirement of the baby boom generation and the implementation of health reform legislation;
- market-based indicators of supply and demand for physicians, such as unfilled vacancies; or
- indicators of the process and outcomes of care, such as waiting times for care, reported difficulty in obtaining needed care, or effects on health status of Maryland residents.

That said, we believe the results of this study can be helpful in two ways. First, the results confirm the historical view of Maryland as a state with substantial physician resources. Prior to 2008, Maryland was typically judged to have a physician-to-population ratio well above the national average. Our results suggest that remains true. Second, the results can help focus policy discussion. The absence of evidence for widespread, severe, state-wide shortage means that policy makers can return attention to a more traditional view, looking for the small geographic areas and specific specialties or patient populations for which there is strong, objective evidence of problems with access to physicians' services.

The next study of this issue needs to do more than count physicians. For a given physician specialty, a low physician-to-population ratio in an area *may* flag an access problem within the health care system. But it also *may* reflect low prevalence of particular disease, desirable regionalization of some specialized services, substitution between non-surgical and surgical interventions, or other factors. Conversely, above-average supply may suggest either a lack of access issues, or merely above-average need for health care.

Ideally, we would like to have enough information in hand to sort these cases out and focus on the ones that matter most. That requires more than just the count of physicians.

Policy makers should ask, pro-actively, what information would be helpful for making informed decisions in this area. Maryland has access to a wealth of information on the provision of health care, starting with claims data for the Medicare, Medicaid, and privately insured populations. Given that, it is inefficient to look at physician supply data in isolation. Future studies should bring these and other sources of information together. As a start, coupling the analysis of physician supply to measures of service use and patient travel (as was done here using Medicare claims) seems a reasonable way to ask whether and where low levels of physician supply are adversely affecting the health care of citizens of Maryland.

1 Introduction and Outline of the Analysis

This study examines the supply of physicians in Maryland, using the most recent available (2009/2010) Maryland physician license renewal database. For broad classes of physicians, we compare measures of active non-federal patient-care physicians per capita in Maryland (and sub-regions) to a level that is used by the Federal Government as the benchmark for adequate physician supply for the U.S. as a whole.

The goal is to determine whether the supply of physicians in Maryland falls below this national benchmark, and if so, where and for what specialties. That requires not only analyzing Maryland physician supply data, but also clearly showing how the Maryland data differ from data used for national benchmarks, and how closely our calculation matches the calculation behind the national benchmarks.

1.1 Recent history of this issue

The final report of the Maryland Task Force on Health Care Access and Reimbursement (HCAR) recommended that the state improve its ability to measure physician supply (HCAR 2008, page 40). Specifically, HCAR suggested that the Maryland licensure survey be improved to capture information on patient-care time, site of service, admitting privileges and other factors useful for measuring the effective supply of physician services in Maryland.

The HCAR recommendation was driven by sharply conflicting information received by the Task Force regarding the adequacy of Maryland physician supply. Traditionally, Maryland has been considered a well-supplied state. Using active patient-care physician counts from the American Medical Association Physician Masterfile, the U.S. Health Resources and Services Administration (HRSA) singled out Maryland as one of a handful of states with physician-to-population ratios unambiguously higher than the national average (HRSA 2008, page 72.) A similar analysis by the Association of American Medical Colleges (AAMC) showed Maryland as having the second-highest active patient-care physician-to-population ratio in the country (AAMC 2009, Figure 1). This was also the core of the testimony presented to HCAR by CareFirst Blue Cross Blue Shield who, in addition, noted that use of physician services among privately-insured Maryland residents was 20 percent above the U.S. average (Navigant, 2008).

By contrast, a study sponsored by the Maryland Hospital Association and the Maryland State Medical Society (henceforth, the MHA/MedChi study) concluded that Maryland faces significant and widespread physician shortages now and in the future (Boucher and Associates, 2008). This was due mainly to the use of Maryland licensure data (not AMA Masterfile data) for the Maryland physician counts, further reduced by an average of 15 percent to account for low patient-care hours of Maryland physicians. The 15 percent reduction was based on estimates provided by medical directors of teaching hospitals regarding typical physician patient-care time (Boucher and Associates, 2008). The lower average patient-care time of Maryland physicians was attributed loosely to an above-average fraction of physicians in teaching and research, and possibly to a higher proportion of female physicians in Maryland (HCAR 2008, page 40).

The now-improved licensure data are the basis for the physician supply estimates in this report. We used newly-obtained information on 2009 and 2010 license renewals to count the active non-federal patient-care physicians practicing in Maryland.

1.2 Conceptual issues for identifying adequate physician supply, and the HRSA method.

This section of the introduction briefly summarizes approaches that have been used to define "an adequate supply of physicians", then describes the HRSA methodology that we will be adopting here. The material is all drawn from HRSA's most recent analysis (HRSA 2008).

Almost all analyses of physician adequacy follow the same broad outline. They estimate the supply of physicians, estimate the need for or demand for physicians, then compare the two to identify shortage and surplus of physicians.

The population's need for physicians is an inherently imprecise concept. And, unsurprisingly, the methods used to quantify the need for physicians have changed over time.

The earliest formal studies of physician shortage worked from a medical model of need. They multiplied the average prevalence of diseases, the time required to treat the average person with each disease, and the U.S. population, to arrive at total physician time needed to treat the U.S. population. The time estimates were, by and large, based on the opinions of experts, and the only factors considered were medical -- disease prevalence and time required for treatment.

Later approaches recognized that economic and organizational factors affect the amount of physician time that patients actually demand. For example, higher income increases use of physician services, managed care enrollment reduces it, and lack of any insurance reduces it still further. These latter approaches are more in the spirit of estimating the population's effective economic demand for physician services, rather than measuring need based solely on medical criteria.

Focusing on the uninsured provides a clear contrast between these two different approaches. The uninsured use substantially less care than those with insurance. The earlier, strictly-medical approaches assumed those populations need as much physician care as the insured population. Effectively, they assumed the population would (or perhaps, should) be served as well as the insured population. Later approaches accept the presumed under-service of this population when generating an estimate of physician requirements. In effect, they accept that these populations may need care in some absolute clinical sense, but we do not need physicians to provide it, because the uninsured population will, in fact, use less health care than the insured population.

Some have gone further in this direction, to a purely economic model of the need for physicians. That approach bases the projected need for physicians on pre-existing trends and projected changes in income and demographics. It does not even attempt to reference a specific underlying medical model of need. Instead, it implicitly assumes that the principal limitation on the use of physician services has become *willingness to pay*, rather than prevalence of disease.

At present, the mainstream approach for modern studies of the adequacy of physician supply is something of a hybrid. In effect, the modern methods stipulate that some observed level of physician supply is adequate, then extrapolate from that baseline level. The baseline could be physicians per capita as observed in the U.S. in some base year, physicians per capita as used in efficient managed care plans, or even physicians per capita observed in some foreign nation whose health care system appears to provide adequate access to care. This is then trended forward in time using whatever factors appear to be relevant to estimating requirements – projected changes in demographics, insurance, income, technology, and similar factors.

HRSA's most recent projections of physician requirements fall into this now-mainstream approach. For national planning purposes, HRSA's method boils down to this:

- Assume that physician supply was adequate in some base year (in this case, 2000).
- Adjust for growth and aging of the population (because older persons use more care).
- Adjust for changes in insurance coverage (because the uninsured use less care, and managed care plans use fewer physicians per enrollee).
- Show how the projected requirements would change if other factors influencing the demand for physician time were included, for example, growth in income (HRSA 2008).

Using HRSA's approach, the adequacy of physician supply (at some later date, or in some small area) is based on a comparison between actual supply and that projected need for physicians. If the projected need for physicians exceeds the projected supply, that is deemed to be a shortage, and if supply exceeds needs, that is deemed to be a surplus.

The main advantage of HRSA's approach is that it is both concrete and objective. It does not rely on expert opinion on the time required to treat patients or as to the level of services that a population requires.

Further, it appears to be the basis for many physician supply studies both nationally (e.g., AAMC 2009) and for individual states (e.g., Virginia 2010).

While we adopt HRSA's benchmarks, we should repeat the shortcomings that HRSA mentions. Mainly, this approach effectively assumes a static and geographically uniform health care system. With only small exceptions, the pattern of physician supply per capita observed in the base year is the pattern required for all subsequent years and across all areas. The only variation built into the system is that driven by changes in demographics (both of physicians and the population), health care coverage, and, in some scenarios, income. In particular, changes in medical practice and changes in underlying medical technology may be discussed as a type of sensitivity analysis, but are not part of the main projections of adequacy of physician supply. Variation in prevalence of disease across geographic areas (for example, areas of above-average cancer prevalence) does not factor into the analysis.

As an essentially static model of physician supply, the HRSA approach would not pass a hindcast (as opposed to forecast) test. Empirically, U.S. physician-to-population ratios have risen steadily, beyond what would be forecasted with demographics or insurance changes. If we were to apply the year 2000 HRSA standard to the decades prior to 2000, the U.S. would appear increasingly under-supplied the further back in time we looked. The best we can say is that the HRSA approach is widely used, and that it makes reasonable sense for the type of short-term analysis done in this report (how the 2009/2010 Maryland supply compares to some standard).

Finally, we note that "shortage" in this sense has nothing to do with Health Professional Shortage Areas (HPSAs).[1] Absent any other factors, a geographically-defined primary care HPSA must have fewer than 0.29 full-time-equivalent (FTE) primary care physicians per 1000 population.[2] By contrast, in 2000, HRSA estimates that the U.S. had 0.95 FTE primary care physicians per capita (HRSA 2008, page 33).[3] The "primary care HPSA" threshold is more than three times lower than the HRSA threshold for identifying a shortage of primary care physicians.

1.3 Plan of this report

In broad outline:

- First, we focus on getting the aggregate, total-physicians-per-capita number calculated properly. Mainly, that is a detailed accounting for the differences between the AMA Physician Masterfile data and the Maryland license renewal data.
- Then, we can proceed to do the detailed analysis by specialty group and region.

The next section of the report (Section 2) works out the mechanics of getting a comparable count of Maryland and U.S. physicians in the aggregate (all physicians, for the entire state). In that section, we are merely trying to get a correct "apples-to-apples" comparison between the Maryland license renewal data and the HRSA U.S. benchmark. The section ends with comparisons of the count of physicians per 1000 population in Maryland and the US.

Section 3 of the report asks whether we need to adjust those counts for other factors that may materially affect supply of, or demand for, physicians in Maryland. Most importantly, in response to the MHA/MedChi analysis, we ask whether Maryland physicians provide fewer patient-care hours than the U.S. average. In addition, we ask whether differences between U.S. and Maryland population demographics would materially affect the estimated demand for physicians. Finally, we demonstrate that patient border-crossing into and out of Maryland would not materially affect the demand for physician services, using fee-for-service Medicare patients as a proxy for all patients.

[1] Geographic HPSA status qualifies an area for certain types of Federal aid, including additional Medicare physician payments.
[2] That is, one physician for every 3500 residents, as shown here: http://bhpr.hrsa.gov/shortage/primarycare.htm .
[3] These are not strictly comparable, because they use two different definitions of FTE. The HPSA analysis counts 40 or more hours of patient-care per week as full time, and any fraction of that as a pro-rata fraction of an FTE. The HRSA analysis, by contrast, defines FTE to be the mean patient-care hours actually observed in the base year, by specialty, for active patient-care physicians.

Section 4 presents the detailed results by broad physician class and region of Maryland. We group physicians into primary care, medical specialists, and surgical specialists, then compare physician to population ratio in the five regions of Maryland to HRSA's benchmarks. The differences in the two data sources (Maryland license renewal and AMA Masterfile) place some significant limitations on this analysis.

Section 5 briefly presents a summary of the results. We also present the general caveat that we have only looked at broad classes of physicians and large geographic areas, and show that there is evidence for some physician supply issues in Maryland. We close with some remarks about ways to proceed with more targeted analysis of the adequacy of physician supply in Maryland.

2 Counting Active Non-Federal Patient-care Physicians

This section of the report accounts for the differences between the American Medical Association Physician Masterfile and the Maryland license renewal database. These files are the sources for the two physician counts we will compare: HRSA's national benchmark and the number of physicians in Maryland.

The bulk of this section is a lengthy discussion of methods. Readers who are only interested in detailed tables of results should skip to section 2.7.

2.1 Overview

Most analyses of physician supply rely on *one uniform source of data*. For example, HRSA's analysis of U.S. physician supply compares counts from the AMA Masterfile from a baseline year (2000) to the same counts in subsequent years. The HRSA and AAMC state-level analyses noted above compare AMA Masterfile counts in the states to identically-calculated counts for the US.

In those cases, the analyst can largely ignore any overall bias or consistent flaws in the data. As long as the error is consistent across time and uniform across states, analysis of the Masterfile will show the correct relationship of one year relative to another or one state relative to the U.S. average. Consistent errors in the data are largely "a wash" and typically do not need to be specifically addressed.

Here, by contrast, we are comparing counts of physicians derived from *two completely different data sources*, the Maryland license renewal file and the AMA Physician Masterfile. To get an accurate comparison, we must account for the significant differences between these two data sources.

Accordingly, the initial portion of the analysis consists of documenting the adjustments we must make to get comparable numbers from these two data sources. This requires several different assessments of the data sources.

- What are the important differences between the Maryland license renewal data and the AMA Masterfile data (HRSA's source)? Do we have enough information to make an accurate adjustment for those differences?
- How can we select physicians from the Maryland license renewal file in a way that matches the HRSA/AMA definition of active patient-care non-federal physicians?

2.2 Brief summary of findings

The main findings are as follows:

Hospital Residents. HRSA's baseline *includes* hospital residents. The Maryland license renewal file almost completely *excludes* residents. (Maryland tracks most residents as Unlicensed Medical Practitioners or UMPs.) This is a major difference, because residents account for about 14 percent of U.S. active non-federal patient-care physicians. For the aggregate comparison (all physicians in Maryland), we have the option to add some rough count of residents to the Maryland data, based largely on the count of UMPs. But for any detailed analysis (e.g., by specialty or region), **our only option is to exclude residents from both the U.S. benchmark and the Maryland data.**

Retired physicians/new physicians, AMA Masterfile. The AMA Masterfile is widely known to overstate the number of active physicians in the U.S. (Staiger et al., 2009). The Masterfile survey occurs every four years, and so retains (up to) four years of retirees as if they were active physicians. By contrast, it captures most new physicians in a timely manner, taking information from graduate medical education programs and state licensure data. When compared to equivalent counts from the U.S. Current Population Survey, the Masterfile appears to overstate active physicians by about 10 percent, with the degree of over-count

increasing with physician age (Staiger et al., 2009). Our calculation from other sources, based on completely different methods, yields estimated over-counts ranging from 7.3 percent to 15 percent. **We reduced the Masterfile data by 10 percent to account for its average *over*-count of active physicians.**

Retired physicians/new physicians, Maryland renewal file. Residents aside, the Maryland license renewal file undercounts total active physicians by about 4 percent. Retirees are not an issue. On net, the person-years of care that the file omits (from physicians active in this period but retiring prior to re-licensure) should balance the person-years that the file over-counts (from physicians who retire during this period after re-licensure). Newly-licensed physicians are the issue. New physician licenses are tracked separately from renewals. The license renewal file omits nearly one year's worth of active newly-licensed physicians, on average. (Those physicians only enter the renewal file as they synchronize with their scheduled time of re-licensure). **We increased the licensure file data by 4 percent for the *under*-count of newly licensed physicians in the license renewal data.**

Other technical issues in identifying physicians. We performed a sensitivity analysis to see whether modest changes in the way we defined active, patient-care, non-federal, and Maryland physician mattered. **These had little material effect on the aggregate results.**

No reduction of the HRSA baseline for physicians whose activity status is unknown. Finally, we note that HRSA's year 2000 baseline is higher than comparable estimates (including other estimates from HRSA). It also exceeds the count of active non-federal patient-care physicians calculated from the Area Resource File (ARF), which itself is a summary of Masterfile data. We believe that HRSA included both active physicians and physicians of unknown activity status in its baseline. **We make no adjustment for the unusually high HRSA year 2000 baseline.**

After adjustment, we find that Maryland's physician supply exceeds the HRSA baseline by 27 percent. This is virtually identical to findings from prior analyses by HRSA and the AAMC (HRSA 2008, AAMC 2010). Correspondingly, we also find that, after adjustment, the Masterfile and the Maryland license renewal database provide very similar counts of Maryland physicians.

2.3 Preliminary definitions

Before discussing data sources, we need to clarify a handful of issues relating to the count of physicians. Among these are the inclusion of DOs with MDs, and defining "residents" to include individuals who might informally be termed "interns".

"Physicians" includes MDs and DOs. Almost all U.S. physicians are doctors of medicine (MDs), with only about 5 percent of the U.S. physician supply consisting of doctors of osteopathy (DOs.) Throughout, when we refer to "physician supply", we are referring to the sum of MDs and DOs. And, while we refer to comparisons from the AMA Masterfile, we mean the Masterfile as augmented, where necessary, using an equivalent file from the American Osteopathic Association.

"Residents" includes interns and fellows. A second source of confusion is failure to define interns, residents and fellows. Traditionally, interns are medical school graduates in their first year of postgraduate training; residents are those in their second and later years; and fellows are those who have completed residency and are continuing training for a sub-specialty. Typically, one year of internship is required before an individual *may* apply for a medical license. Residents are typically not *required* to apply for license while they continue their post-graduate medical training.

Various sources of data differ in the treatment of interns, residents, and fellows. Most sources of physician supply information include interns, residents, and fellows under the rubric of "residents". In those cases, "residents" means residents, interns, and fellows (e.g., AAMC 2010, ACGME 2009). By direct calculation, we verified that the AMA Physician Masterfile count of "residents" includes what might informally be called interns and residents. **Thus, for purposes of counting physicians, there is no such thing as an "intern," since "resident" includes both interns and residents.**

In addition, we group self-reported fellows with residents. We have to do this because one of our sources (the ARF) includes clinical fellows with residents.[4] Other studies of graduate medical education (e.g., ACGME 2010) follow that standard as well. As we note below, the licensure status of fellows is somewhat ambiguous in the Maryland data.

2.4 Characteristics of the AMA Masterfile and Area Resource File

The AMA Physician Masterfile is the principal source of information on the number of physicians in the United States. It is the main data source for HRSA's physician supply estimates. The Masterfile tracks U.S. physicians from entry into medical school through death, using a variety of sources, including medical school enrollments, state licensure data, graduate medical education rosters, and surveys of physicians.[5]

The Area Resource File (ARF) is a publicly-available dataset that contains a detailed summary of the Masterfile data. Physician counts from either the Masterfile or the ARF will reflect the strengths or weaknesses of the Masterfile data. In principle, physician counts taken from the ARF should closely match those developed directly from the Masterfile.

New and retiring physicians. It is well established that the Masterfile overstates the number of active physicians in the US.[6] This occurs due to lags in recognizing the retirement status of older physicians. The AMA surveys physicians every four years, and therefore may include some physicians as active up to four years past their actual date of retirement.

Compared to surveys of the current U.S. workforce, the Masterfile appears to overstate active U.S. physicians by about 10 percent (Staiger et al. 2009). That is the difference between a modest understatement of younger (presumably newly-licensed) physicians and a much larger overstatement of older (presumably retired) physicians, compared to surveys of the current U.S. workforce (Staiger et al., 2009).[7]

Other information also suggests a significant over-count. For 2008, using a variety of sources, the U.S. Bureau of Labor Statistics estimated just 661,000 working U.S. physicians, including the self-employed.[8] That is 15 percent below HRSA's estimate of active patient-care physicians for that year (including residents, interpolated from the data on HRSA 2008, page 32). By contrast, the AAMC modeled the likely non-retired physician population based on their own survey data showing typical retirement behavior (AAMC 2010). We estimate that the AAMC method would have resulted in a roughly 7.3 percent reduction in the Masterfile count of active patient-care physicians.[9]

The rough correspondence of these estimates (10 percent based on the CPS, 15 percent based on Bureau of Labor Statistics tabulations, 7.3 percent based on AAMC survey data) is adequate evidence that the AMA Masterfile significantly overstates the count of active physicians. We therefore must reduce the Masterfile-based counts before comparing to other data sources. We adopt the CPS-based 10 percent adjustment because that is the easiest to understand, being a simple contrast between the Masterfile count and a count

[4] The ARF user documentation states that clinical fellows are included with residents (DHHS 2010). The ARF shows 108,000 U.S. hospital residents in 2008, identical to the ACGME count that is clearly identified as including interns, residents, and fellows (ACGME 2010, page 4).

[5] Taken from the AMA's description of the Masterfile, located at: http://www.ama-assn.org/ama/pub/about-ama/physician-data-resources/physician-masterfile.shtml.

[6] See the introductory material in Staiger et al. (2009) for a summary, or see the sections on adjustment for retirements in AAMC (2010). Kletke (2004) is a summary of the issue from the standpoint of a senior AMA staff member with full access to all details of the processing behind the Masterfile. HRSA (2006, page 5), suggests that the problem is both large and increasing over time.

[7] Although not explicitly stated in that paper, this appears to be after removing all physicians age 75 and over from the sample (Staiger et al., 2009, page 1677). That would be consistent with the methodology HRSA adopts when using the Masterfile.

[8] The data are from on-line tabulations supplied by the U.S. Bureau of Labor Statistics. As of 4/1/2011, the relevant table could be accessed at http://www.bls.gov/oco/ocos074.htm.

[9] "After adjusting for workforce activity probability, there were an estimated 782,200 active physicians under age 75 in 2006 (approximately 29,000 fewer than were listed as active in the Masterfile despite using a broader definition of active for older physicians)." (AAMC 2009, page 84). We used 29,000/782,200 = 3.7 percent as the raw estimate, to which we added a further 3.6 percent for our estimate of the difference between the AAMC active definition (> 1 hour) compared to the AMA active definition (> 20 hours), based on the Maryland licensure file data.

based on ongoing surveys of the U.S. population. It is also in the middle of the range of adjustments we have noted, and was published in a major U.S. medical journal.

Residents and fellows. Finally, we note that residents and fellows are included in HRSA's year 2000 baseline (HRSA 2008). By direct calculation, we verified that all of the active patient-care counts on the ARF also include residents and fellows. Thus, by default, all of the Masterfile-based statistics shown here include residents unless we specifically adjust the data to remove them.[10]

2.5 Characteristics of the Maryland license renewal survey file.

Physicians licensed to practice in Maryland must renew their licenses every two years. The most recent version of the Maryland license renewal survey database contains information on all successful physician license renewals in Maryland in 2009 and 2010.

Currently, at time of renewal, physicians are required to complete a survey summarizing their professional activities. The data from this survey form the basis for the estimates of Maryland physician supply presented here.

As with many state licensure databases, many individuals licensed in the state of Maryland actually practice elsewhere. Thus, the raw count of active license renewals is not a reasonable proxy for active patient-care physicians practicing in Maryland.

This database does not contain information on all Maryland physicians, and is not directly comparable to U.S. estimates based on the Masterfile data. The file does not contain records for most hospital residents (including interns) and fellows. And it does not contain records for physicians obtaining their initial license, only for license renewals. These points are discussed below.

Residents and fellows. Residents and fellows who have not yet been granted a medical license are tracked by Maryland as Unlicensed Medical Practitioners (UMPs). These individuals are registered as UMPs for the duration of an individual post-graduate contract, typically one year.

The Maryland UMP count can only be used as an approximate estimate for the number of interns in Maryland. Based on the literal text of state regulations, residents and fellows who are fully licensed should be excluded from the UMP file, while out-of-state physicians performing a temporary rotation in a Maryland hospital should be counted as UMPs.[11] The licensure rate for fellows might reasonably be expected to be higher than that of interns, which should remove them from the UMP file (and, eventually, place them in the license renewal file).

The Maryland UMP count is similar to other estimates of hospital residents (or residents plus fellows) in Maryland. In 2010, Maryland registered (or re-registered) 2,638 UMPs.[12] We also found approximately 600 physicians in the license renewal database who would be counted as Maryland active patient-care non-federal physicians, and who self-identified as residents or fellows.[13] At present, we have no way to know the extent to which those individuals were already counted in the UMP file. This suggests between 2600 (UMP) and 3200 (UMP plus license renewal) residents and fellows in Maryland hospitals.[14] The Accreditation Council for Graduate Medical Education (ACGME) estimates 2693 residents, interns, and fellows in residencies in Maryland for the 2009-2010 academic year (ACGME August 2010, page 95). By contrast, the Area Resource File shows 3215 Maryland total hospital residents and fellows for 2008. At

[10] The HRSA summaries and the ARF place residents and fellows into two different categories. As a practical matter, we can only remove residents from the HRSA or ARF estimates. Counts of fellows are commingled with full-time hospital staff.
[11] Code of Maryland, 10.32.07.01 B(10)a, http://www.dsd.state.md.us/comar/comarhtml/10/10.32.07.01.htm
[12] Mark Higby, Chief, Information Systems Division, Maryland State Board of Physicians, personal communication, 3/2/2011.
[13] It is also possible that the term "fellow" was misinterpreted by some applicants to include "postdoctoral research fellows" and similar positions that are not part of a graduate medical education program. Nearly one-quarter of the license renewals for Maryland-based "fellows" were for physicians employed by the Federal government.
[14] These counts ignore the potential to miss some newly-licensed residents, who might not be counted in either the UMP or license renewal files.

best, we are able to say that the data sources roughly agree, showing between 2600 and 3200 residents and fellows in Maryland.

New and retiring physicians. Maryland physician license renewal takes place every two years. Thus, at any time, there will be a pool of retired physicians who have retired after their last renewal, but who still appear to be active based on the most current data in the license renewal file. In addition, information on newly licensed physicians is not included in the renewals file. Those physicians only enter the file as they obtain their first scheduled license renewal.

For retiring physicians, while the issue for the Maryland licensure file appears *similar in concept* to the well-documented AMA Masterfile over-count discussed above, is quite *different in practice*. The licensure file does not over-count physicians due to retirements. The reason for this is simple: unlike the Masterfile, the Maryland license renewal file both omits some active physician time and includes some inactive physician time. On net, these two factors should roughly balance.

The AMA Masterfile always carries a record for every physician, up to the time of retirement. The bias in that file is all in the direction of over-count. It never under-counts a retiree, but may over-count one as active until the subsequent survey round reveals that a physician has retired. The Maryland license renewal file, by contrast, *only shows those physicians who renew their licenses during the period*. Similar to the Masterfile, the Maryland license renewal file will incorrectly count physicians who retire after their most recent license renewal. But, unlike the Masterfile, the Maryland license renewal file will omit physicians who are active early in the licensure cycle but retire prior to re-licensure. This file will have no record of their period of activity because they did not renew the license or were retired at time of license renewal.

The simplest way to see this is to consider an active patient-care physician retiring on 1/1/2010 (precisely in the middle of the two-year file period). This analysis will either under-count that physician (count as retired for the entire period) or over-count that physician (count as active for the entire period) *based on the first letter of the physician's last name*. That is what determines whether the physician renewed the license in 2009 (and was counted as active) or 2010 (and was counted as retired or omitted entirely). The under-counts and over-counts should more-or-less cancel each other.[15,16]

For newly licensed physicians, the situation is quite different. The Maryland license renewal file does not contain initial license applications. Initial applications are tracked separately, and newly-licensed physicians are captured only as they synchronize with the correct date for the two-year renewal cycle. This means that there are some newly-licensed physicians practicing in Maryland who are not captured on the renewal file.

Given that roughly half of physicians renew their licenses each year (based on first letter of the last name), we would expect about half of the newly licensed physicians in Maryland to be missing from the renewal file.[17] And in fact, when we matched an extract of the 2009/2010 new physician file to the license renewal file, we found that 42 percent (just under half) of the two years' worth of newly licensed physicians was missing from the renewal file. Stated differently, the license renewal file understates the count of active physicians by 84 percent of *one year's* average new license cohort. One year's license renewals amounted to 6.2 percent of the total count of physicians on the file. **Thus, on net, the Maryland license renewal file *undercounts* Maryland physicians by 4 percent, from the omission of an average of (nearly) one year's worth of newly licensed physicians.** To put this on the same basis as the AMA Masterfile after adjustment, we need to account for that adjustment in our calculation in some fashion.

[15] As long as physicians retire in some fairly uniform fashion throughout the year, regardless of re-licensure date, this will be true. Because re-licensure involves little expense or effort (while retirement is a major decision), it seems plausible to assume that the physicians do not typically make their retirement date dependent on their re-licensure date. We cannot, however, test this in any direct fashion using the available license renewal data.

[16] This is based on having enough retiring physicians to ensure a close average match between the incorrectly omitted and incorrectly included active physician count. For a small area with few annual retirements (for example, a sparsely populated rural county) this need not be true.

[17] In fact, because the re-licensure year is determined by first character of the last name, and because the physician population continues to increase slightly, 2010 renewals (A-L) accounted for about 55 percent of all renewals, 2009 renewals (M-Z) accounted for about 45 percent.

Finally, we note two caveats. First, this new physician adjustment is only correct in the aggregate, and may not be correct separately for every Maryland region and specialty. In theory, a different adjustment would be needed for regions or specialties with particularly rapid (or slow) growth in physician supply. The adjustment is small enough, however, that we are going to use one adjustment for the entire analysis.

Second, we made no distinction between the count from the license renewal file (physicians active as of the specific point in time, the renewal date) and the count of new physicians (physicians who became active over a two year span of time). This appears to be conventional for analysis of physician supply. (We have not found a study that attempts to distinguish between physicians active at one point in time and physicians with any activity over a span of time.) In other health care contexts, however, that distinction can increase or decrease the population count by several percent.[18] Arguably, in this case, the missing 4 percent of *physicians* might account for closer to 2 percent of the total *physician-years of service* if they were typically active for roughly half the time span. But the adjustment is small and this distinction is routinely ignored in the literature on physician supply. Accordingly, we are leaving the adjustment at 4 percent of physicians, and note that one could make a reasonable argument for an adjustment of 2 percent of physician-years instead. As with the retirement issue, there is no way to test the accuracy of that alternative adjustment directly from the data available for this analysis.

2.6 Defining active, patient-care, non-Federal Maryland physicians using the Maryland licensure survey data.

HRSA's physician supply benchmarks are derived (ultimately) from counts of physicians on the American Medical Association (AMA) Physician Masterfile (HRSA 2008). The same Masterfile data are provided in summary form on HRSA's Area Resource File (ARF, 2010). We need to know how the Masterfile (and therefore HRSA and the ARF) define active, patient-care, and non-Federal physicians in order to perform the matching calculation on the Maryland licensure data.

Key elements of the Masterfile data are based on periodic AMA surveys of U.S. physicians. In some instances, we will need to note the wording of questions to understand differences between the Masterfile based definitions and the analogous definitions on the Maryland licensure survey.

Throughout this section, we first describe what we actually used in the calculation. Then, at the end of the section, we demonstrate the effect that alternative choices would have had, and compare our choices to those in the MHA/MedChi report.

Active physician: The HRSA study (following the AMA definition) includes physicians working 20 or more hours per week in professional activities, under age 75 (HRSA 2008, footnote 5). The age restriction is due to an acknowledged problem with the Masterfile data. Every U.S. physician is surveyed every four years, so the Masterfile is slow to reflect physician retirements and may not do so at all for non-respondents to the survey underlying the Masterfile data (HRSA 2008, footnote 13). While the ARF documentation lists this restriction (age 75), that may be shorthand for "age 75 and no positive evidence of non-retirement" (HRSA 2008, footnote 13).

For the Maryland survey data, we define active physicians as those with at least 20 reported work hours per week, under age 75. Following the AMA model, this is defined in terms of total hours of work.[19]

Patient-care physician: The HRSA study inherits the AMA/ARF classification of "patient-care" physicians. The AMA physician survey asks physicians to self-designate their principal professional activity as "Patient Care" or "Other Professional Activity". To make the Maryland data analogous, patient-care physicians were defined as those having the plurality of work hours in patient care. (That is, of the

[18] For example, in Medicare, the population enrolled on July 1 of a year is typically 5 percent less than the population ever enrolled over the course of a year, due to the turnover of new enrollees and decedents (the equivalent of new physicians and retirees in this analysis.) Illustrative data can be found here: http://www.resdac.org/docs/Always_Ever_Enrolled_Table.pdf

[19] As noted below, we believe HRSA also included physicians with unknown activity status in their baseline counts of active physicians. We, by contrast, exclude all physicians reporting zero work hours in the license renewal survey, even though about a third of those physicians are less than 55 years of age.

categories of hours on the Maryland survey, patient care had to be as large as or larger than any other category.)

Federal physician: Although the HRSA report never states this and never labels any totals as non-federal physicians, we initially *assumed* that HRSA dropped federal physicians from their counts, because that is how physician supply analyses have typically been done. HRSA has typically compared non-federal physicians to the U.S. civilian population.[20,21]

We must drop federal physicians from the Maryland counts, or risk significantly overstating the supply of physicians available to treat the Maryland civilian population. Federal physicians account for just 2.9 percent of all active physicians, so the treatment of federal physicians matters relatively little for HRSA's U.S. estimates. In Maryland, by contrast, the ARF shows federal physicians accounting for 8.2 percent of active physicians in the state.[22]

The ARF documentation defines a Federal physician as a "Physician whose principal employer is the federal government. This includes physicians in the armed services, U.S. Public Health Service, Indian Health Service, and the Department of Veterans Affairs" (DHHS 2010).

The Maryland license renewal survey, by contrast, asks a much broader question: "Are you employed by the Federal government?" Analysis of the data shows (below) that many physicians have *some* federal employment but had a *principal* practice that was not a Federal practice. We restrict Federal physicians to those who answered "yes' to the federal employment question and whose principal practice is not a private practice.

The issue of federal physicians seems straightforward, but, by inference, it brings up a potential confounding issue for any regional analysis. HRSA traditionally calculated non-federal physicians per 1000 *civilian* population. This gave a proper match between numerator and denominator. On average, active-duty armed forces account for a negligible fraction of the population. In counties with large military facilities, however, that may not be the case. We could not find any current data source showing active-duty military residents as a fraction of population by state or county, so we cannot address this issue. We merely note that we may misstate local physician supply requirements in counties that have a large cohort of active-duty military personnel that are counted as residents of that county.

Residents and fellows: The ARF/Masterfile counts include residents, and so effectively counts residents on the same basis as any other physician. HRSA's estimate of physicians per capita includes interns and residents in the physician count (verified by direct calculation, Exhibits 21 and 22, HRSA 2008). We have the option of removing residents from any counts derived from the ARF.

Treatment of residents and fellows in the Maryland license renewal file is problematical for many reasons. First, as noted above, most residents are probably counted as UMPs. Second, a small number of residents can be found on the license renewal file. Third, residents may be over-represented among the initial license applications that are not included in the license renewal file. Fourth, based on the large fraction of self-reported "fellows" who were federal physicians, there is a chance that some survey respondents counted research fellowship positions as "fellows", instead of restricting that term to mean the final years of post-graduate medical education. Finally, self-identified residents and fellows do not report some of the fields on the survey, including detailed practice data. Including them requires placing them in counties based on the ZIP code of their "public" address (typically, but not always, a recognizable medical institution).

To analyze residents and fellows in the license renewal file, we first cross-walked Maryland ZIP codes to the counties accounting for the plurality of the population in the ZIP code. (ZIP codes frequently span county boundaries.) Residents and fellows were then tracked geographically in the same way as all other physicians in the database.

[20] E.g., http://bhpr.hrsa.gov/healthworkforce/reports/factbook02/FB201.htm.
[21] That assumption is examined in section 2.8 below. It is not clear that HRSA did, in fact, drop those physicians in its baseline.
[22] Both federal physician figures were calculated from 2008 data in the 2009/2010 release of the ARF.

Ultimately, for the final estimates, we removed any self-identified resident or fellow from the Maryland license renewal file. We removed them from the HRSA baseline as well.

Maryland physician. We have three fields from which to identify physicians practicing in Maryland:

- Number of practice locations in Maryland.
- County of location of principal practice
- County of location of secondary practice

Of these options, we delineated a physician as a Maryland physician only if the principal practice was located in Maryland. In a little over a thousand cases, individuals had a principal practice in Maryland and a secondary practice outside of Maryland, or vice-versa. These were split roughly equally between those with a principal practice in Maryland and a principal practice outside of Maryland.

Incomplete surveys and missing values. Because this is survey data, we need to state explicitly what we do with individuals who appear not to have filled in critical portions of the survey. We only gap-filled the fields necessary to defined Maryland active non-federal patient-care physicians.

Work hours: no gap-fill. More than 1100 physician license renewals had zero work hours reported. Of those, about a third are less than 55 year of age. We ignore the possibility that those younger, non-working individuals reflect misreporting, and count them as inactive physicians.

The AMA faces a similar problem, in that physicians with unknown activity status are carried on the Masterfile. As with all our other adjustments, if the non-response rates differ across the files, then the Masterfile and licensure data are not strictly comparable. On the ARF, for 2008, physicians of unknown status amounted to 6 percent of active non-federal physicians on the file. For the Maryland licensure data, persons with zero reported work hours amounted to 5 percent of active non-federal physicians. Thus, although we cannot tell whether or not these are active physicians (so there is no clear way to adjust the file counts based on this), roughly the same percentage of the file is missing. We count these physicians as inactive, by analogy, with the omission of persons with unknown activity status from the Masterfile active physician counts.[23]

Primary practice county: gap-fill with primary practice ZIP or public address ZIP. We found about 3000 active physicians for whom the county of location for the primary practice was not reported. We gap-filled that information based on the ZIP of principal practice, if present. If not, we used the "public" (presumably, workplace) ZIP, if present. All residents and fellows required this imputation because they are not required to report data on their practices.

Age 75 or older: no gap-fill needed. The file appears to have birth date or calculated age for all entries.

Federal physician: gap-fill with the "any federal employment" field. Individuals who did not fill in the principal practice information have no information on whether or not that practice location is a federal facility. In those cases, we gap-filled using the question on any federal employment, and assigned those with missing practice data to the federal status if they had any federal employment.

2.7 Results: Physicians per 1000 population, Maryland versus the HRSA Baseline.

In this section of the analysis we show our baseline count of active, non-federal Maryland patient-care physicians. First, we show that, with adjustments, Maryland has about 27 percent more active non-federal patient-care physicians per capita than the HRSA benchmark. Second, we show that the same adjustments result in a close match between Maryland physicians as counted on the ARF, and Maryland physicians as counted from the license renewal file. Finally, we provide a sensitivity analysis to show that alternative

[23] Note, however, that it appears that HRSA included a significant portion of these physicians as "active" in its year 2000 baseline. The result of excluding them from the Maryland count may be a small under-count of Maryland physicians, to the extent that some fraction of those with missing data are actually active patient-care physicians.

ways of counting physicians from the Maryland license renewal file would have little material affect on the results.

Table 1 shows the results of the analysis. The top portion of the table starts from the data as published by HRSA, and then makes the adjustments to remove hospital residents and to remove the effects of the average over-count of active physicians. This takes the data from 2.53 active non-federal patient-care physicians per 1000, to 1.93 physicians per 1000 population, excluding residents, adjusted for the Masterfile over-count. The bottom portion of the table makes the equivalent adjustments to the Maryland license renewal file, taking out the (few) residents with license renewals, and adjusting the data up 4 percent for the average undercount of newly licensed physicians. This takes the Maryland license renewal data to 2.51 active non-federal patient-care physicians per 1000, excluding residents, adjusted for undercount of new licenses.

The result, on the bottom line of Table 1, is that Maryland has 27 percent more physicians than the HRSA baseline, after adjustments. That compares to estimates from HRSA and the AAMC in the range of about 25 to 29 percent (HRSA 2008, AAMC 2009). In contrast to this analysis, those studies were done entirely from AMA Masterfile data. The upshot is that when the Masterfile and Maryland license renewal data are correctly adjusted to provide a proper "apples-to-apples" comparison, one obtains the same result that has been shown previously using Masterfile data for both Maryland and the U.S.

Table 1: Adjusting HRSA Masterfile and Maryland License Renewal Data to a Common Basis			
	Value	Source	Line ID
HRSA Baseline, 2000			
1: Active (non-federal) patient-care physicians, 2000			
HRSA, active "clinical" physicians, 2000	713,810	HRSA 2008, exhibit 21	A
HRSA physicians/capita, 2000	2.53	HRSA 2008, exhibit 22	B
Check that calculation:			
Memo: 2000 U.S. population, 1000s	281,422	US Census Bureau	C
Memo: Calculated total physicians/1000 (A/C)	2.54	Calculated, A/C	D
2: Remove Hospital Residents (and Fellows)			
HRSA, active "clinical" physicians less residents, 2000	597,430	HRSA 2009, exhibit 20	E
HRSA physicians/capita, excluding residents	2.12	Calculated, E/C	F
3: Adjust for Masterfile over-count of active physicians			
AMA Masterfile over-count	10%	Staiger et al., 2009	G
Adjustment factor for over-count	0.91	Calculated, (1/(1+G))	H
Adjusted physicians/1000	1.93	Calculated, F*H	I
Maryland License Renewals, 2009/2010			
4: Maryland license renewal file, all physicians	25,687	MD lic. Renewal file	J
5: Active non-federal patient-care physicians	14,278	MD lic. Renewal file	K
6: Remove hospital residents	13,779	MD lic. Renewal file	L
7: Adjust for missing initial license data	4%	Discussed in text	M
8: Adjusted Maryland license renewal data	14,330	Calculated, L*(1+M)	N
Maryland resident population, 2009, 1000s	5,844	US Census	O
Maryland resident population, 2010, 1000s	5,905	US Census	P
Average, 000s	5,875	Calculated, (O+P)/2	Q
Maryland physicians/1000, excluding residents	2.44	Calculated (N/Q)	R
Difference, Maryland less HRSA standard, %	**27%**	**Calculated (R/I)-1**	**S**
Source: HRSA (2008), analysis of Maryland license renewal file 2009/2010, U.S. Bureau of the Census			

Table 2 applies the same set of adjustments to 2008 Maryland physician supply data from the ARF. The ARF data are summaries of the Masterfile. If these adjustments are roughly correct, then the ARF, for Maryland, should give roughly the same estimated count as the Maryland license renewal file, after adjustments. The bottom section of Table 2 shows that it does. The 2009/2010 Maryland license renewal file, with adjustments, shows about 2.3 percent more active non-federal patient-care physicians (excluding residents) than the ARF shows, for Maryland, for 2008. Based on the difference in timing, we would have expected to see about 2 percent more physicians. On net, the two files, after adjustment, differ by just 0.7 percent in their count of active non-federal patient-care physicians, excluding residents.

Table 2: Compare Maryland License Renewal Count to Maryland 2008 ARF Count (Same Adjustments as Table 1, Applied to Maryland Counts)

Label (using ARF file label where available)	**ARF variable**	**Value**
Active non-federal patient-care physicians, 2008		18,774
Total M.D.s, 2008	f1121508	18,358
Total D.O.s, 2007	f1398507	416
Active non-federal patient care residents, 2008		3,215
Total M.D.s, 2008	f1249908	3,056
Total D.O.s, 2007	f1412507	159
Active non-federal patient-care physicians, less residents		15,559
Adjustment for Masterfile over-count		91%
Estimated Maryland physicians, ARF with adjustments		14,145
Estimated Maryland physicians, license renewal file with adjustments		14,330
Discrepancy, Maryland less ARF:		1.3%
Memo:		
Active non-federal patient-care M.D.s, 2000	f1121500	16,487
Annual physician growth rate, 00 to 08		1.4%
1.5 years of growth -- expected discrepancy		2.0%
Unexplained difference, Maryland versus ARF		**-0.7%**
Source: ARF 2009 for ARF data, Maryland 2009/2010 license renewal file.		

Finally, Table 3 shows the impact of modest changes in our definition of Maryland active non-federal patient-care physicians under age 75. None of these changes would materially change our conclusion that Maryland has far more physicians per capita than the HRSA standard based on the year 2000 U.S. average. There is additional uncertainty that is not captured here (for example, in the discussion of missing values for the work hours data, above). But, the main point seems clear: any reasonable modification of the method will still show that Maryland has substantially more physicians per capita than the U.S. average.

Table 3: Active Maryland Non-Federal Patient-Care Physicians Under Age 75		
Showing sensitivity to changes in the definition		
	Physicians	**Impact of Change**
Active Maryland non-federal patient-care physicians under age 75, excluding residents (from Table 1)	13,770	0.0%
Testing variations on the definition		
Remove age restriction	13,995	1.6%
Any Maryland practice, not just principal	14,388	4.5%
Alternative Federal employment definitions:		
No non-federal restriction	14,253	3.5%
Exclude any Federal employment, not just principal	13,642	-0.9%
Require majority (not plurality) of time in patient care	13,359	-3.0%
Memo: Remove patient care restriction (all active)	15,423	12.0%
Source: Analysis of Maryland license renewal data 2009/2010		

2.8 Addendum: Attempting to Validate the HRSA Baseline

One of the more puzzling aspects of this analysis was our inability to replicate HRSA's baseline numbers, using ARF data and adopting a standard approach to counting physicians. The ARF contains a summary of the same underlying Masterfile data using the same AMA definitions as the HRSA analysis. In principle, summaries from the ARF should closely match the HRSA baseline. Yet, we found that HRSA's baseline count of year 2000 active (presumably) non-federal patient-care physicians was higher than we could obtain from the ARF, and much higher than other published sources, including publications from HRSA.[24]

This matters because we would like to use ARF data for the analysis of specific specialties and regions in Maryland. If HRSA summarized the physician counts in a way that cannot be duplicated, in detail, from the ARF (the only source of AMA Masterfile data available for this analysis), that will introduce a discrepancy into all subsequent analysis. Therefore, we would like a better understanding of how the ARF data compare to the HRSA baseline, and what, exactly, HRSA appears to have included in the physician counts in its baseline.

Our prime candidate for the additional physicians is those with unknown activity status. The Area Resource File identifies a number of U.S. physicians for whom the AMA does not know whether they are active or inactive. These are carried on the file as "not classified". This pool of "not classified" physicians is roughly 6 percent as large as the pool of active physicians. Many of these "not classified" physicians may be recent residency graduates for whom the AMA has not yet determined practice status (Rittenhouse et al. 2004). While the ARF documentation is not clear, by adding the data fields we verified that the ARF carries "not classified" physicians as a subset of *inactive* physicians. That is, total physicians is the sum of active and inactive, not the sum of active, inactive, and not classified. By default, counts based on the ARF active physician data fields will *exclude* physicians with unknown activity status. However, this practice is not uniformly used. Some analyses of physician supply appear to include the physicians of unknown status together with active physicians (e.g., Staiger et al 2009, page 1675). Other analyses clearly exclude them (Health U.S. 2010, page 518). The only way to know whether or not an estimate of active physicians includes the "not classified" physicians is to examine the details of the underlying study.

[24] For example, for the year 2000, other HRSA reports show 718,000 total active non-federal physicians, not restricted to patient care (http://bhpr.hrsa.gov/healthworkforce/reports/factbook02/FB201.htm). That count of *all active non-federal physicians* is about 20,000 *less* than the HRSA (2008) report of active *patient-care* physicians *under age 75*.

Our second candidate for the discrepancy is federal physicians. Federally-employed physicians have been traditionally excluded from physician supply estimates. They are devoted to treating a particular subset of the population (e.g., active military, veterans) and they tend to be highly clustered in a few locations (e.g,, Veterans Administration hospitals, military bases). The HRSA report, however, never used the term non-federal to describe their patient counts. That suggests that either the writing was imprecise, or, for some reason, they did not exclude federal physicians in their most recent analysis.

To match the HRSA baseline, we must augment the standard ARF active non-federal patient-care physician count with *both* the federal physicians and the physicians with unknown activity status (Table 4). When we do that, we get within 1 percent of the HRSA baseline count. This does not prove that the HRSA baseline includes both federal physicians and physicians of unknown activity status. But, given the language of HRSA's report (no use of the term non-federal) and the occasional practice of including unknown activity status with active, this seems to be a plausible explanation.

Table 4: HRSA 2000 Baseline Compared to ARF Data

	ARF variable	**Value**
HRSA: Baseline With age 75 and older physicians added, 2000		738,158
HRSA: Active "clinical" physicians, 2000 (from HRSA 2008)		713,810
Estimate of active patient-care over age 75, 2000		24,348
ARF: Initial Count, Active Non-Federal Patient Care Physicians, 2000		676,432
ARF: M.D.s, 2000	f1121500	631,236
ARF: D.O.s, Active Non-Federal, 2001	f1325701	45,196
ARF: Estimated Physicians With Unknown Activity Status, 2000		36,009
Non-Federal Physicians, Not Classified, 2005	f0481905	39,931
Ratio, patient-care M.D.s 2000/patient-care M.D.s 2005 (from ARF)		0.90
ARF: Active Federal physicians, 2005		20584
Augmented ARF total: Active non-federal plus unknown activity status and federal		733,025
Discrepancy, HRSA versus initial ARF total		**9%**
Discrepancy, HRSA versus *augmented* ARF total		**1%**

We choose not to modify our baseline analysis based on these findings, but note that if we did, it would only increase the measured supply of Maryland physicians relative to the US. As shown above, including active patient-care federal physicians would increase the Maryland count by about 4 percent. Including physicians with unknown activity status (due to missing data on work hours) would raise the count roughly another 5 percent. As it stands, we have already made the point that Maryland's active non-federal patient-care physicians per capita greatly exceed the HRSA year 2000 standard.[25]

[25] Adding these physicians to the count would result in a ratio of Maryland physicians to the HRSA baseline that was about 9 percent higher than either the HRSA or AAMC studies showed. However, *we* are comparing 2008 Maryland data to the HRSA 2000 U.S. baseline, while *those studies* were contemporaneous comparisons of Maryland and the US. Growth in Maryland physician supply in the intervening eight years could plausibly account for the additional 9 percentage point discrepancy that would occur from including these physicians in the counts.

Finally, this creates an odd situation for updating the national benchmark data to a later year. We took the most recently available data (2008 physician supply) from the ARF and constructed a national estimate that was *completely* analogous to the Maryland licensure file data. That is, we omitted federal physicians and those with unknown activity status. Doing that, we found an average of 2.48 active non-federal patient-care physicians per 1000 (including residents). This is nearly identical to the HRSA baseline number of 2.53. In short, the HRSA *2000* baseline *including* those extra physician groups is very nearly identical to a traditionally-calculated *2008* baseline *excluding* those groups. In aggregate, we would get essentially the same result whether we used the published HRSA year 2000 baseline or generated a more traditional comparison (excluding federal physicians and those of unknown activity status) for the Maryland file using 2008 ARF data.

3 Accounting for Differences Between Maryland and the U.S.

This section of the report looks at three potential adjustments to account for differences between Maryland and the U.S. as a whole. We ask three questions:

- Do Maryland active non-federal patient-care physicians provide fewer patient-care hours, on average, than the typical U.S. physician?
- Would we expect the population of Maryland to require more physicians per capita than average, based on its demographics compared to the U.S. average?
- Is there a net flow of patients into or out of Maryland that would require more or fewer physicians than the U.S. average?

3.1 Overview

Thus far, we have shown that Maryland's physician-to-population ratio greatly exceeds the HRSA benchmark. But the per-capita physician count does not tell the entire story. We should ask whether any other factors suggest a higher need for physician care in Maryland or a lower effective supply of patient-care hours per physician. If Maryland patients need more care, or Maryland physicians supply less care per person, that would partially account for the high physician-to-population ratio in Maryland.

3.2 Summary of main findings

The answer to all three questions is no. As far as we can tell, for the state as a whole, adjusting for these three factors would make no material difference in the results shown in Section 2 above.

- **Patient-care time per active non-federal patient-care physician might be slightly lower in Maryland than for the U.S. as a whole, but the size of that effect is both small and uncertain.**
- **The age distribution of Maryland's population suggests no significant difference in demand for physicians per capita, relative to the U.S. average.**
- **Using Medicare fee-for-service claims as a proxy for all patients, the flow of patients into and out of Maryland has essentially no impact on the demand for physician services in the aggregate.**

3.3 Patient-care hours per active non-federal patient-care physician

The MHA/MedChi analysis identified a substantial physician shortage based, in part, on an estimate that Maryland physicians average 15 percent less patient-care time per physician than the national average. If true, Maryland would require more than the national average of physicians per capita to meet the need for care. Thus, the assertion that Maryland physicians provide much less patient care than average played a key role in the estimated shortage of physicians in the MHA/MedChi analysis.

The MHA/MedChi adjustment was unusual in many respects. First, as far as we can tell, studies of state-level physician supply typically make no adjustment for actual hours worked, but sometimes adjust for the expected difference in hours based on physician demographics. This is true of the HRSA and AAMC state-level analyses (HRSA 2008, AAMC 2009). This is also true for a recent analysis of Virginia's physician needs, even though, in that case, they had survey data showing typical work effort (Virginia 2010, page 13).

Second, the adjustment was not based on physician surveys that could, in theory, be compared to a comparable national standard.[26] Instead, the reduction was based on a unique survey of Maryland teaching hospital medical directors and, possibly, equivalent persons in Maryland's medical schools (MHA/MedChi 2008b). In effect, it was based on what the relevant medical directors believed about staff work hours.

[26] The MHA/MedChi analysis pre-dates the current version of the licensure survey in which physicians report their typical weekly work hours, so that information was not available.

Further, the choice to count most hospital residents as equivalent to 0.1 full-time-equivalent (FTE) physician appears to have been arrived at by consensus or by an expert panel, although it has some precedent (MHA/MedChi 2008).[27] In particular, that choice would (nearly) eliminate residents from the Maryland portion of the calculation while leaving them in the HRSA benchmark.

Third, there is no such FTE approach in either the 2008 final HRSA report or an earlier 2006 report (HRSA 2008, HRSA 2006). In both cases, HRSA defines an FTE physician of a given specialty as the average patient-care hours actually observed for physicians of that specialty in the base year (2000, but in fact, 1998 survey data). HRSA does not define FTE physicians in terms of a fixed number of hours per week (e.g., 40 or more hours per week), but instead simply uses the FTE concept to track changes in average physician patient-care hours after the base year.[28] In HRSA's analysis, the average physician in 2000 is 1.0 FTE, by definition.

Although the MHA/MedChi approach no longer applies to the current HRSA analysis, it nevertheless raises a serious question: Do Maryland physicians provide as many patient-care hours as similar physicians in other states?

The 15 percent reduction reported by the MHA/MedChi study was loosely explained as being due to the number of teaching and research slots in Maryland, the above-average number of interns and fellows, and, possibly, the higher proportion of physicians who are female (HCAR 2008). Recall, however, that we are looking solely at *active non-federal patient-care* physicians. We have already excluded physicians whose principal employment is in teaching, research, or administration, or in federal employment of any type, as well as residents and fellows.

Further, we can directly show that the higher percentage of female physicians in Maryland has no material impact on the hours we would expect for Maryland physicians vis-à-vis the U.S. average. Female physicians work shorter hours on average. An AAMC survey estimated that, at most, male physicians work an average of 19 percent more hours than female physicians (AAMC 2009, page 58.) (That difference would narrow if adjusted for specialty.) But for 2008, for all active physicians, the ARF shows 31 percent of U.S. physicians and 36 percent of Maryland physicians were female (calculated from the 2009/2010 ARF). That difference is not large enough to matter much. The 5 percentage points of additional female physicians in Maryland would predict less than 1 percent fewer patient-care hours per physician, on average ($0.05 \times 0.19 \approx 0.01$).

Even though there appears to be no clear a priori reason to expect lower hours, and although we found no state studies that adjusted for observed differences in patient-care hours per physician, this still seems like a reasonable question to ask. If Maryland physicians do, in fact, provide fewer patient-care hours, that would need to be accounted for in the analysis.

This turns out to be remarkably difficult to answer. For Maryland, we have excellent data on work hours. Physicians had to answer work hour questions to renew their license, so nearly all active physicians in Maryland answered the same work hour questions asked in the same way.[29] The problem is that we have nothing directly comparable for the U.S., because *estimates of average U.S. physician patient-care hours vary widely across data sources*. The answer to the question "how many hours do you work" appears to depend on when, how, and by whom the question was asked.

[27] For purposes of HPSA designation, a primary care resident is counted as 0.1 FTE (http://bhpr.hrsa.gov/shortage/hpsaguidepc.htm). As noted earlier, the HPSA designation rules have no bearing on HRSA's assessment of adequacy of U.S. physician supply.

[28] We believe this in part explains why the HRSA standard used here (2.53 physicians per 1000) is substantially higher than the national standards the MHA/MedChi analysis attributes to HRSA. It was not possible to tell where the MHA/MedCHI study obtained their HRSA standards. The October 2006 draft HRSA analysis cited there is no longer available on line, and neither the 2006 nor 2008 versions that are still available contained the numbers cited by MHA/MedChi. The MHA/MedChi study assumed that the average U.S. active patient-care physician amounted to 0.79 FTE physicians, while in the final HRSA analysis, the average physician in the year 2000 is 1.0 FTE *by definition*.

[29] Although we have excellent data on hours per week, the survey does not ask for typical weeks per year, so we have to assume that average work days per year does not vary widely across physicians.

Table 5 shows the magnitude of the problem. Three roughly contemporaneous surveys of U.S. physicians (restricted to active patient-care physicians) yield very different estimates of work hours. Sample sizes are large enough in each case that this cannot be attributed to sampling error, but instead must reflect systematic differences from the surveys themselves, such as the way in which physicians were selected and questions were asked. In particular, the difference in the two estimates of patient-care hours, for the U.S. as a whole, is larger than the 15 percent difference we are trying to identify for Maryland. In other words, the systematic noise that arises from comparing data across survey sources is larger than the effect we are trying to identify. This makes it methodologically risky to compare counts of hours across different surveys.

Table 5: Poor Agreement of Physician Work Hours Data

	Total Hours	Patient-Care Hours	Source
Health Systems Change, 1999	55	45	A
American Medical Association, 1998		52	B
CPS, 2000, Typical Hours Worked	54		C
CPS, 2000, Average Hours Actually Worked	51		C
Largest difference observed	-6%	17%	

Sources: A: Trude (2003), B: Calculated from Table 10, HRSA (2008), C: Calculated from 2000 CPS Data Files

In keeping with this, we broke the analysis into two tasks. For *total* work hours per week, the U.S. Current Population Survey provides one uniform data source within which we can compare Maryland physicians to the U.S. average. For *the fraction of total hours devoted to patient care*, by contrast, we have no choice but to compare the Maryland license renewal data to some other survey source.

Maryland physicians appear to work perhaps 2 percent fewer hours than the U.S. average (Table 6). The U.S. Current Population Survey (CPS) gathers information on work hours for roughly 50,000 U.S. residents monthly, of which roughly 300 are physicians. Individuals stay in the survey up to six months. To achieve adequate sample size, we pooled eleven years of monthly data (2000 to 2010). We selected physicians and surgeons, excluding those employed by the federal government or working under 20 hours per week. This yielded just over 1200 observations on Maryland physicians (which would be, in fact, just over 200 unique individuals). Within the limits of this relatively small sample, the data suggest that Maryland physicians work just slightly fewer *total* hours than the average U.S. physician.[30]

Table 6: Active Non-Federal Physicians, Average Work Hours Per Week, 2000 to 2010

	Observations	**Average hours**	**Difference from US**
U.S. Physicians			
Typical hours worked, weekly	41,655	52.7	
Actual hours worked, last week	41,655	49.9	
Maryland Physicians			
Typical hours worked, weekly	1,241	51.9	-1.4%
Actual hours worked, last week	1,241	48.9	-2.1%

Source: Analysis of U.S. Current Population Survey monthly data files, 2000-2010.

[30] The CPS analysis also suggested why the question of actual hours per physician is seldom addressed in state studies. Even with the assumed sampling errors in the survey, average hours were within 5 percent of the U.S. average for 80 percent of the states. That suggests that state-to-state variation in physician work effort is typically small.

Table 7 shows that the fraction of hours spent on patient care in Maryland is similar to that shown in an ongoing national survey, although the hours of care are not. The Center for Studying Health Systems Change (CSHSC) physician survey gathers information on a sample of active patient-care physicians, using the AMA Masterfile and definitions as the framework (CSHSC 2008). It is not clear that the sample, methods, or questions from that survey are comparable to those in the Maryland license renewal survey. (For example, the early years of the survey are clustered in just a handful of U.S. communities). But, with that caveat, the fraction of work time devoted to direct patient care in Maryland appears within the range of estimates shown by the ongoing CSHSC study. At worst, Maryland active patient-care physicians appear to devote perhaps a 4 percent smaller fraction of total work time to patient care.

Table 7: Patient Care as Percent of Total Work Hours, Active Patient-Care Physicians

Survey and Subset of Active Patient-Care Physicians Included	Year	Total hours	Patient-Care Hours	% patient care	Source
CSHSC					
All	1997	55.5	44.7	81%	A
All	1999	54.5	44.7	82%	A
All	2001	54.4	46.6	86%	A
All	2004	53.0	46.0	87%	B
All	2008	51.4	N/A	N/A	C
Maryland					
Non-federal, excl, residents	2009/2010	49.2	41.6	84%	D
Non-federal	2009/2010	49.6	41.8	84%	D
All	2009/2010	49.7	41.6	84%	D
Memo: Maryland versus 2004 CSHSC				96%	
N/A: Survey was redesigned, question was not asked.					
Sources: A = Trude (2003), B = CSHSC summary file 2005, C = CSHSC summary file 2008, D = Analysis of Maryland license renewal file.					

Given that the data sources either have a small sample size (CPS) or are not necessarily comparable (CSHCS survey and Maryland license renewal data), it is difficult to say what we should do with this result. Both parts of the analysis suggest that Maryland active non-federal patient-care physicians may work fewer hours than the U.S. average. That seems like a sensible result, given the apparently abundant supply of physicians in Maryland. But the estimated effect is nowhere near large enough to offset Maryland's high physician-to-population ratio. On net, given the uncertainties involved, we think these results should best be viewed as providing a small caveat to the main analysis. It is reasonable to suggest that some modest portion of Maryland's high physician-to-population ratio is offset by fewer patient-care hours per active non-federal patient-care physician. Nothing in the available physician survey data suggests that the portion should be as high as 15 percent.

3.4 Maryland population demographics compared to the US.

HRSA (2008) estimates need for physicians for subsets of the population split by age and gender. Using Census 2009 population projections, we estimated that physician requirements in Maryland would be about 1.5 percent lower than for the nation as a whole, based on the age distribution of the Maryland population relative to the U.S. average (Table 8). This seems small enough that it is not worth including as a separate adjustment in the analysis.

We note further that HRSA assumes lower physician needs for populations enrolled in managed care. Given the relatively high managed care penetration in the state, we believe that this would also argue for a further slight downward adjustment in the expected need for physicians. We again expect that any such adjustment would be small compared to the extent to which Maryland physicians per capita exceeds the national average.

Table 8: Demographic Influences on Physician Requirements, Maryland Compared to the US

	HRSA Physicians/1000 Population Requirements					2009 Population Estimate	
	Primary Care	Medical Specialties	Surgical Specialties	Other	Total	U.S. population, 2009	Maryland Population, 2009
0–17 years	95	10	16	29	149	74,202,891	1,398,554
18–24 years	43	15	54	48	159	30,257,490	599,470
25–44 years	59	23	52	62	196	82,769,818	1,601,780
45–64 years	89	41	59	81	270	79,560,530	1,541,721
65–74 years	175	97	125	145	543	20,713,282	375,066
75+ years	270	130	161	220	781	18,768,384	327,584
Total	95	33	55	70	253	306,272,395	5,844,175
Population Weighted Averages, 2009							
US 2009	95	35	57	73	259		
MD 2009	93	35	56	72	256		
% difference	-2%	-2%	-1%	-1%	-2%		

Source: Requirements are from HRSA 2008, exhibit 29. Population data are U.S. Census Bureau, Population Division, Interim State Population Projections, 2005.

3.5 Maryland patient border crossing.

We used Medicare 2009 5 percent sample limited data set standard analytic file claims to assess the extent to which patients travel across Maryland borders. While the elderly may not be an ideal proxy for all patients, this should give us some notion of whether or not a border-crossing adjustment would change the results of the analysis significantly.

For traditional (fee-for-service) Medicare patients, the net flows into and out of Maryland are almost exactly in balance (Table 9). There is a small net inflow of fee-for-service Medicare patients into the state, but an imbalance of patient flows of this size would have no material effect on the results.

Table 9: Medicare Fee-for-Service physician Services, Maryland Border Crossing, 2009

	Millions of services	Millions of dollars
Non-Maryland resident served in Maryland	1.70	$ 171
Maryland resident served outside Maryland	1.62	$ 167
Maryland resident served in Maryland	17.89	$ 1,659
Memo: Outflow less inflow as % of total care delivered in Maryland	0.4%	0.2%

Source: Analysis of Medicare 5 percent sample LDS SAF claims, 2009. Data inflated by a factor of 20 to estimate actual totals from 5% sample claims.

4 Estimates by broad specialty group and region.

This section of the report looks separately at four broad groups of physicians within five sub-regions of Maryland. We compare them to the (adjusted) HRSA standards, and, as with the state-level analysis, ask whether regional adjustments would make a significant difference in the results.

4.1 Overview and caveats.

In this section we look separately at four groups of physicians: primary care, medical specialists, surgical specialists, and all others. We calculate physicians per 1000 population in the five regions of Maryland and compare them to the relevant HRSA benchmarks by specialty group.

Moving from the state-level analysis to the regional analysis raises several caveats. We process the regional data exactly as we have done nationally, dropping residents and inflating by a uniform factor of 4 percent to account for missing new physicians, then making no further adjustments. Each of these steps could be questioned for the regional analysis.

First, the removal of residents from the analysis raises a significant caveat for a regional analysis because residents are highly concentrated in the Baltimore and National Capital regions. We will significantly under-state the true variation in available physician resources across regions. But to address this using Maryland's own data, we would have had to obtain and integrate the Maryland UMP registry data with the license renewal file.

Second, as noted earlier, there could be specialty or regional variation in the adjustment for newly licensed physicians omitted from the license renewal file. The 4 percent adjustment is a statewide all-specialty average. We suspect that any variation in a specialty-specific or region-specific adjustment would be fairly small, but we do not investigate whether or not that is true. We would have needed to make an additional request for more detail on newly licensed physicians to be able to make such an adjustment.

Third, we demonstrated that population demographics should have little effect on the demand for physician services in Maryland as a whole. We do not test that separately for each region of Maryland.

Finally, while border-crossing for care was not a significant issue for the state as a whole, it is a major issue for a regional analysis. In general, people living in rural areas travel to urban areas for a significant portion of their care. In this analysis, we merely tabulate the extent of intra-state border crossing (for the Medicare population), but we do not adjust the regional data to account for care delivered out-of-region.

4.2 Summary of main findings

After all adjustments, including adjustment for variation in average patient-care hours per physician, **Southern Maryland is below the HRSA benchmark for all categories of physicians.** The Eastern Shore is roughly at the HRSA standard for primary care physician and surgeons. All other areas exceed the HRSA standards. All of these are regional averages and do not address the issue of supply problems for small areas or specific populations within those regions.

Physicians and patients appear to have adapted somewhat to the low physician supply in Southern Maryland. Physicians in that region work longer hours, and patients tend to travel outside the region for a significant portion of their care. Medicare beneficiaries residing in that region got as much physician care as beneficiaries in the rest of Maryland.

4.3 Regional Analysis

Table 10 shows the distribution of physicians per 1000 population by broad specialty category and region.[31] The results should be unsurprising to anyone roughly familiar with the distribution of physicians in Maryland.

- In the Baltimore region, physician-to-population ratios exceed the HRSA benchmarks.
- Southern Maryland has physician-to-population ratios below the HRSA benchmark for all types of physicians.
- The National Capital area exceeds the HRSA benchmark for all types of physicians, but is only modestly above the HRSA benchmark for primary care.
- The Eastern Shore is below the HRSA benchmark for primary care physicians and surgeons.
- The Western region has a physician-to-population ratio below the HRSA benchmark for surgeons.

Table 10: Maryland Supply by Type of Physician and Region, 2009/2010

	Total	Primary Care	Medical Specialties	Surgical Specialties	All Other
Maryland physicians per 1000, residents excluded, with all adjustments					
Baltimore Metro	2.85	0.86	0.48	0.61	0.90
Eastern Shore	1.86	0.62	0.27	0.39	0.57
National Capital	2.25	0.72	0.41	0.48	0.64
Western	2.17	0.73	0.39	0.42	0.63
Southern	1.34	0.53	0.25	0.26	0.30
Total	2.44	0.77	0.42	0.52	0.74
Memo: HRSA baseline, interns excluded, with all adjustments	1.93	0.69	0.27	0.43	0.53
Percent difference from HRSA baseline					
Baltimore Metro	48%	24%	76%	41%	70%
Eastern Shore	-4%	-10%	0%	-11%	8%
National Capital	17%	4%	49%	11%	21%
Western	12%	5%	41%	-4%	19%
Southern	-31%	-24%	-8%	-40%	-43%
Total	27%	11%	54%	19%	39%

Source: Analysis of Maryland 2009/2010 license renewal database, calculations from HRSA 2008, population counts from U.S. Bureau of the Census

We can adjust these data for variations in average patient-care hours per physician. First, we used the license renewal data to create an index of patient-care hours by region and specialty, normalizing the average patient-care hours by region and specialty to the state average for that specialty. We can see a slight tendency for physicians to offset variations in physician supply with variation in an average work week. On average, hours are slightly higher in the areas with fewer physicians per capita (Table 11).

[31] Appendix A lists the counties in each region.

Table 11: Average Patient-care Hours per Physician, and Hour Index					
	Total	**Primary Care**	**Medical Specialties**	**Surgical Specialties**	**All Other**
Average hours per week					
Baltimore Metro	40.68	40.08	41.15	44.41	38.47
Eastern Shore	45.14	45.83	46.47	49.30	40.95
National Capital	41.97	40.92	44.74	43.76	40.05
Western	44.33	43.52	44.77	48.15	42.47
Southern	44.40	43.60	43.37	49.44	42.30
Total	41.71	41.10	42.87	44.90	39.44
Hour index					
Baltimore Metro	0.98	0.97	0.96	0.99	0.98
Eastern Shore	1.08	1.12	1.08	1.10	1.04
National Capital	1.01	1.00	1.04	0.97	1.02
Western	1.06	1.06	1.04	1.07	1.08
Southern	1.06	1.06	1.01	1.10	1.07
Total	1.00	1.00	1.00	1.00	1.00
Source: Analysis of Maryland 2009/2010 license renewal database					

After adjusting the count of physicians per 1000 by the hour index above, we still see low physician-to-population ratios in Southern Maryland. In all other areas, low supply has been offset by higher patient-care hours per physician, other than a smaller value for surgeons on the Eastern Shore (Table 12).

Table 12: Difference From HRSA Baseline, After Adjustment for Variation in Average Patient-care Hours					
	Total	**Primary Care**	**Medical Specialties**	**Surgical Specialties**	**All Other**
Baltimore Metro	44%	21%	69%	40%	66%
Eastern Shore	4%	0%	8%	-2%	13%
National Capital	18%	4%	56%	8%	23%
Western	20%	12%	48%	3%	29%
Southern	-26%	-19%	-7%	-34%	-39%
Total	27%	11%	54%	19%	39%
Source: Analysis of Maryland 2009/2010 license renewal database, calculations from HRSA 2008, population counts from U.S. Bureau of the Census					

While Southern Maryland has a physician-to-population ratio that is well below the HRSA benchmark, this does not affect physicians' willingness to accept new Medicare and Medicaid patients. Table 13 shows that, on net, the percent of practices treating some Medicaid or Medicare patients exceeds the state average

substantially. Of those taking such patients, perhaps 1 percent more practices are closed to new patients than for the state as a whole. On net, the low physician-to-population ratio in that area has not resulted in any material increase in practices closed to new patients.

Table 13: Acceptance of Medicaid and Medicare Patients, by Region

	Medicaid		Medicare	
Region	% of practices accepting Medicaid	Of those, % accepting new Medicaid patients	% of practices accepting Medicare	Of those, % accepting new Medicare
Percent of physicians				
Baltimore Metro	80%	88%	85%	94%
Eastern Shore	89%	90%	91%	94%
National Capital	61%	85%	79%	93%
Western	80%	85%	86%	91%
Southern	86%	86%	89%	93%
Total	75%	87%	84%	94%
Percent difference from state average				
Baltimore Metro	6%	1%	2%	1%
Eastern Shore	18%	4%	8%	1%
National Capital	-19%	-2%	-6%	-1%
Western	6%	-3%	2%	-3%
Southern	15%	-1%	6%	0%
Total	0%	0%	0%	0%
Source: Maryland license renewal survey, 2009/2010				

One more significant question remains: do residents of Southern Maryland simply use less care than the state average, or do they travel to regions outside of Southern Maryland to get care? We can get some idea of the answer to this by looking at Medicare claims. While this (largely) includes only elderly individuals, it is a population with uniformly good health insurance coverage. We would expect that differences in use and travel patterns would therefore reflect the interaction with the supply of physicians, rather than, for example, variations in coverage.

Physician services spending per capita for Medicare fee-for-service beneficiaries in Southern Maryland is not much different from the rest of the state. Instead, these beneficiaries are more likely to travel to get their care. The physicians located in Southern Maryland only provided 67 percent of the care their residents received (Table 14). The rest was obtained from physicians in the National Capital Area, physicians out-of-state, and to some degree, physicians in the Baltimore area. For Medicare, at least, the low physician-to-population ratio in Southern Maryland has largely been handled by a greater degree of patient travel for care.

Table 14: Intrastate Travel for Care, Medicare Fee-for-Service Part B Beneficiaries, 2009								
Maryland Residents, Physician Services Spending Per Capita								
	Physician Location							
Beneficiary Residence	Baltimore Metro	Eastern Shore	National Capital	Western	Southern	Out of state	Total	% of spending in own region
Baltimore Metro	$ 2,503	$ 12	$ 56	$ 23	$ 7	$ 74	$ 2,675	94%
Eastern Shore	$ 299	$ 1,712	$ 26	$ 6	$ 2	$ 318	$ 2,362	72%
National Capital	$ 159	$ 4	$ 2,335	$ 15	$ 73	$ 595	$ 3,181	73%
Western	$ 121	$ 8	$ 101	$ 1,834	$ 3	$ 224	$ 2,290	80%
Southern	$ 182	$ 4	$ 378	$ 6	$ 1,806	$ 316	$ 2,692	67%
Source: Analysis of Medicare 5% sample limited data set standard analytic files and denominator file, 2009								

5 Summary

This chapter presents a brief summary. This includes the results the analysis *did* show, a quick reminder of what it *did no*t show, and some suggestions for further research.

5.1 Summary of findings

This study was motivated by conflicting information on physician supply presented to the Maryland HCAR taskforce. Traditional studies, based solely on AMA Masterfile data, showed Maryland physician supply much higher than the U.S. average. The 2008 MHA/MedChi report, by contrast, compared Medicare license renewal data to a standard based on AMA Masterfile data, and concluded that there were significant shortages of physicians in Maryland.

The purpose of this study was to estimate an accurate count of physicians delivering patient care. As such, it has been an exercise in tracking down important details of methods. Exactly what physicians are included or excluded, and by what criteria? How do the data sources differ in completeness? How were interns, residents, and fellows handled? How are federal physicians defined, and were they excluded or not? How rapidly are physician retirees removed from the counts, and how rapidly are newly licensed physicians included in the counts? Can we determine, from objective data of any sort, whether Maryland physicians work more or fewer hours than the U.S. average?

These details mattered substantially. The resulting adjustments were large. At root, the conflicting information arose from the large differences between the Maryland license renewal data and the AMA Masterfile data.

Once we properly reconciled those differences, we arrived at two completely unremarkable conclusions:

- Our estimates align with those made by the premier U.S. organizations for modeling physician supply and demand, HRSA and the AAMC, who state that Maryland's physician-to-population ratio is well above the U.S. average.
- The gold standard for U.S. physician supply information, the AMA Masterfile, appears to match the Maryland license renewal data well, as long as we make the necessary and relevant adjustments to account for differences between the files.

Beyond that, for the state as a whole, our results boil down to "no further adjustments appear warranted at this time". In particular, based on relatively scant data, we found nothing to suggest that Maryland active patient-care non-federal physicians provide substantially fewer patient-care hours than the U.S. average. In a uniform national survey of total work hours, a small sample of Maryland physicians reported a slightly lower work week than the U.S. average. Contrasting two different surveys, Maryland physicians seemed little different from the U.S. average in terms of the fraction of work hours devoted to patient care. Both of those results are methodologically weak (one for the use of a small sample, the other for contrasting two different physician surveys). But that appears to be the best available information on physicians' own estimates of time spent treating patients.

Taken together, these findings should be reassuring. For the state as a whole, a proper comparison of Maryland licensure data with AMA Masterfile data suggests no immediate state-wide crisis in physician supply. Instead, the historical estimates of Maryland as a relatively well-supplied state appear to remain true.

By region and specialty, we identified a low physician-to-population ratio in Southern Maryland. Again, that was a completely unremarkable conclusion, as Southern Maryland has long been an area of concern in this regard. (In addition, supply for some types of physicians was at the U.S. benchmark for the Eastern Shore.)

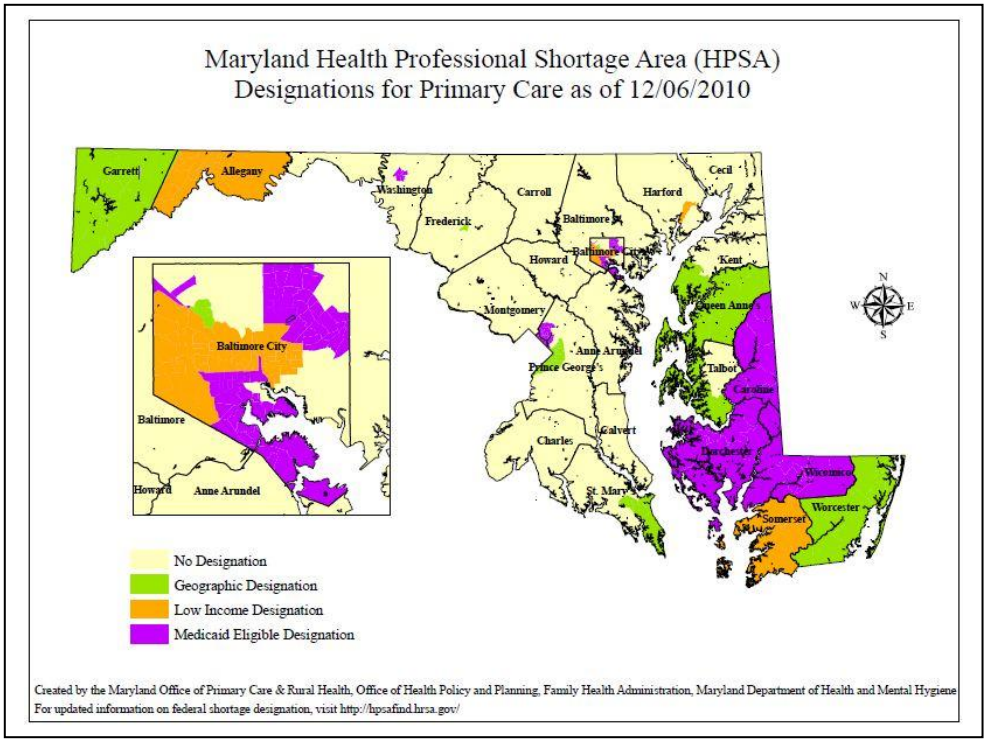
We provided some genuinely new information on the reaction of the health care system to these regional variations in physician supply. The low physician supply in Southern Maryland did not cause physicians to

close their practices to new patients. Instead, they tended to work longer hours, on average. For the Medicare population, residents of Southern Maryland were more likely to travel outside the region to get care, but there was no reduction in the total amount of physician care they received relative to the state average.

5.2 What we did *not* do in this study, and what we did *not* conclude

The overall conclusion of this report should not be used to argue that there are no physician supply problems in Maryland. This has been a broad-brush study, focused on areas no smaller than regions, and on broad classes of physicians. In particular, this study did not address the issue of shortages for small geographic areas or individual physician specialties. Nor does it address the potential for physician supply issues to develop as the baby boom generation retires or as health care reform reduces the number of uninsured persons in Maryland.

First, Maryland clearly has some geographic areas with severe primary care physician shortages. The map below shows federally recognized primary care Health Professional Shortage Areas (HPSAs). Green areas are geographically defined HPSAs, meaning that they qualify solely due to low physician-to-population ratios for primary care physicians. As noted earlier in the report, an area must be well below the national average primary care physician-to-population ratio to qualify as a geographically defined HPSA. In Maryland, as in most states, geographic HPSAs (where HPSA status applies to all residents of the area) tend to be located in rural areas. Here, the entire counties of Garrett, Queen Anne's, and Wicomico qualify as geographic HPSAs, along with a few more limited areas elsewhere in the state. (The remaining HPSA areas are based on levels of under-service for the population in poverty, not the general population.)



There is no inconsistency between Maryland's above-average total physician supply and the presence of localized shortage areas within the state. Maryland ranks fourth lowest among states in terms of the fraction of the population living in primary care HPSAs, having 4.7 percent of the population in those areas, compared to a national average of 11.8 percent (Kaiser 2010). The relatively modest extent of HPSA designation in Maryland could be consistent with the finding of above-average overall physician supply in the State.

The low proportion of Maryland population in HPSAs may, however, reflect the way in which HPSAs are defined. Under the current HPSA definition, states with populations that suffer from income-based or, more broadly speaking, social-determinants-driven access issues are less likely to obtain HPSA designations. The Patient Protection and Affordable Care Act of 2010 requires HRSA to use a negotiated rulemaking process to define HPSAs (and other shortage area designations) on a broader range of criteria.[32]

Second, Maryland may have shortages in some specialty areas. In general, the long lead time from medical school entry to licensure means that the mix of physicians responds slowly to changes in demand for services. Any rapid changes in medical technology or shifts in patterns of service use can place pressure on the existing supply of specialists.

Identifying those shortages in a HRSA-type approach may be difficult. HRSA uses average U.S. health care in 2000 as the standard. This may be sufficient to gauge overall supply, and might even provide a reasonable yardstick for broad categories of physicians. But it will not reflect changes in patterns of service use since 2000, for example, the rapid growth in use of advanced imaging (CT, MRI, and nuclear) since 2000, or rapid growth in hospital emergency department use. And it will not reflect state-specific factors such as variation in prevalence of disease. For example, that approach would not predict a greater need for oncologists in states with high prevalence of cancer.

We did not display physician supply data for individual specialties. The results appeared mixed, and we had no way to validate or refute the findings. For example, on the one hand, general and thoracic surgeons appeared among specialties having the lowest supply in Maryland relative to the year 2000 national average. HRSA had projected ongoing declines in physician supply for these specialties (HRSA 2008, Table 20). So, low supply in Maryland in 2010 seems at least plausible. On the other hand, emergency medicine physicians were among the specialties in most abundant supply relative to the HRSA standard. But Maryland consistently ranks near the bottom of states in terms of average hospital emergency department waiting times (MHCC 2007). On the face of it, that seems substantially less plausible. Yet both sets of results come from the same underlying methodology. That suggests that the methodology needs to be improved or replaced with some alternative before becoming the basis for policy action at the level of individual specialties.

Third, this study did not project future physician requirements or supply for Maryland. Historically, Maryland's physician supply has risen roughly in step with U.S. physician supply. Using ARF data on all active patient-care MDs (including residents), U.S. per-capita physician supply increased 5.6 percent from 2000 to 2008. For Maryland, the comparable figure was 4.7 percent. Excluding residents, the comparable figures were 5.7 percent and 5.1 percent, respectively.[33] Consistent with slightly slower growth, Maryland's physician workforce appears slightly older than the US average. Physicians age 60 and older account for about 27 percent of active Maryland physicians, compared to roughly 25 percent for the U.S. as a whole (AAMC 2009, Table 7). Based on that comparison, Maryland may face modestly higher pressures on physician supply from the retirement of baby boomer physicians.

Nationally, HRSA has projected a leveling off of physicians per capita in this decade, and an absolute decline in full-time-equivalent physicians per capita due to reductions in average patient-care hours over time (HRSA 2008, figures 22 and 23). Over the same period, they project steady, modest increases in the number of physicians per capita needed (HRSA 2009, Figure 40). HRSA suggests that, absent a modest increase in medical school graduates, these conditions will lead to some degree of shortage of physicians required to maintain current standards of care (HRSA 2008, page 100). The AAMC, by contrast, looked at the same underlying data but concluded that a more aggressive expansion of medical education was required (AAMC 2009, page 5). If either view is correct, Maryland will likely experience at least some of the pressure on physician supply that is projected for the U.S. as a whole.

[32] The current status of the rulemaking process can be found at: http://www.hrsa.gov/advisorycommittees/shortage/index.html
[33] These figures were all calculated from the 2009/2010 ARF using data for MDs and Census population counts.

5.3 Suggestions for further analysis

To bring this full circle, the Maryland HCAR task force recommendation to improve Maryland's physician supply data was an excellent first step in this area. Thanks to that decision, we can now categorize active non-federal patient-care Maryland-licensed physicians in a way comparable to national data sources, and, with adjustments, make a reasonably accurate comparison between Maryland and U.S. physician-to-population ratios. Based on the results of this analysis, we offer three general suggestions to policy makers for further work in this area.

First, use a broader array of indicators where possible. We could have more confidence in the results of an analysis if we could triangulate across a diverse set of indicators. A low physician-to-population ratio provides some indication of potential difficulties in the health care system. But, consider how much stronger the case for policy intervention would be if that same low ratio were found in combination with reduced service use, increased emergency use of care, rising physician salaries, higher rates of unfilled positions, increased patient travel for care, increased wait times for care, higher rates of practices being closed to public patients, higher impacts on the poor and those with mobility limitations, and so on. Many of those indicators could be made available from sources that Maryland can access now (such as hospital, physician, and other claims data), or could readily develop in partnership with medical providers in the state.

In short, basing policy decisions on a single study or a single measure of adequate physician supply is needlessly risky. Instead of looking at the information that happens to be made available, policy makers need to decide, pro-actively, what information they want to see in order to be comfortable making policy interventions in this area. Asking for better information on physician work hours and practice location was a good start. Having now looked at that new information, it may be time to assess what other information, which is feasible to obtain, that would be helpful in making decisions in this area. As a start, we suggest that coupling the analysis of physician supply to measures of service use and patient travel (as was done here using Medicare claims) is a relatively easy way to start determining whether low physician supply is adversely affecting patient care and, potentially, patient health.

Second, use a more sophisticated approach for analysis of individual physician specialties. In a very real sense, all the work in this report was performed so that Maryland policy makers could see an accurate physician head count. Somehow, given the sophistication and complexity of the health care system, it hardly seems reasonable that a simple head count really provides the information policy makers need to know.

In particular, when the analysis gets down to the level of individual physician specialties, it is no longer plausible to assume that all areas need the same level of physician supply. First, the prevalence of most diseases varies widely across areas. For example, death rates from cardiovascular disease vary more than two-fold across states.[34] What use is improving the accuracy of the count of Maryland cardiovascular or thoracic surgeons without knowing the prevalence of heart disease in Maryland relative to the US? In addition, regionalization appears desirable for some types of services, including a wide variety of surgeries where higher surgical volume is associated with better patient outcomes ("practice makes perfect"). From a quality standpoint, it is far from clear that you want to see every specialty equally represented in every geographic area of the state, which is what a HRSA-type analysis implicitly assumes. Assessment of physician supply, by region, probably needs to incorporate any official Maryland policies regarding triage or regionalization of certain types of cases. Finally, as shown here, travel for care within the state can ease the effects of low physician supply. But that only applies to patients who have the mobility, resources, and time to travel. That means that a complete analysis of the adequacy of regional physician supply might need to distinguish emergency from elective care, and might concentrate on the oldest and poverty populations for indications of the minimum physician supply levels required for adequate access to care.

[34] Calculated from Kaiser state health facts, http://www.statehealthfacts.org/comparemaptable.jsp?ind=77&cat=2

Third, pay adequate attention to the details of methodology in this area. Physicians lead complex work lives that can be hard to quantify. Significant numbers split their time across professional roles, provide care in multiple locations and multiple sub-specialties, or work for several employers. Their training takes a long time, and their timing of professional retirement is hard to predict. They can work part time, full time, or substantially more than what most people would call full time. And worst of all, they tend to be busy people, yet we only get detailed information on any of that when they take the time to fill out a survey, either mandated by the state or suggested by the AMA.

The upshot of that is that anyone who thinks counting physicians is a straightforward task will be in for a surprise. In this report, we took pains to write out all the details of methods that appeared to be relevant. Most of those, we found only by accident, from sets of numbers that should have "added up" but did not. Despite the length of this report, we hope that the next organization to look at this issue for Maryland will benefit from having all the detail organized in one place, so that the next study in this area can improve on this one.

References

AAMC 2009. 2009 State Physician Workforce Data Book. Association of American Medical Colleges, Center for Workforce Studies, November 2009. Accessible at www.aamc.org/download/47340/data/statedata2009.pdf

ACGME 2010. ACGME data resource book, academic year 2009-2010. (Chicago: Accreditation Council for Graduate Medical Education, August 2010.) Accessible at: http://www.acgme.org/acwebsite/databook/2009-2010_ACGME_Data_Resource_Book.pdf

Boucher and Associates, 2008. Maryland Physician Workforce Study, Sponsored by the Maryland Hospital Association and MedChi, the Maryland State Medical Society (Boucher and Associates, April 2008). Accessible on line from the Maryland Hospital Association website, at this page: http://www.mdhospitals.org/workforce/physicians

CSHSC 2005, 2008. These are summary files and documentation for the 2005 and 2008 Center for Study Health Systems Change physician surveys, available from their website at: http://www.hschange.com/index.cgi?func=pubs&what=8

DHHS 2010: User Documentation for the Area Resource File (ARF) 2009-2010 Release, U.S. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Professions, Office of Workforce Policy and Performance Management, August 2010. This is a machine-readable file accompanying the ARF file itself. While DHHS does not post the file, as of 4/1/2011 it could be accessed on-line at Penn State University, http://sodapop.pop.psu.edu/codebooks/arf/USR2009.doc

HCAR 2008. Task Force on Health Care Access and Reimbursement Established under Senate Bill 107, Final Report and Recommendations, December 2008. Accessible at: http://www.dhmh.maryland.gov/hcar/html/agenda.htm

HCAR 2008b, January 23, 2008 letter to John Colmers from Robert A Barish, MD, Chair, Physician Workforce Study Steering Committee, page 2, posted at: http://www.dhmh.maryland.gov/hcar/pdf/jan2008/LtrtoColmersfromMHA1-23-08.pdf

HRSA 2006. Physician Supply and Demand: Projections to 2020. Washington, DC, Health Resources and Services Administration, Bureau of Health Professions, September 2006. Accessible at: http://bhpr.hrsa.gov/healthworkforce/physiciansupplydemand/physiciansupplydemand.pdf

HRSA 2008. The Physician Workforce: Projections and Research into Current Issues Affecting Supply and Demand. Washington, DC: U.S. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Professions, December 2008. Accessible as if 4/1/2011 at http://bhpr.hrsa.gov/healthworkforce/reports/physicianworkforce/requirements.htm

Kaiser 2010. Estimated Underserved Population Living in Primary Care Health Professional Shortage Areas (HPSAs), as of September, 2008. Tabulated data posted on the internet, accessible as of 4/1/2011 at the Kaiser Foundation State Health Facts website, http://www.statehealthfacts.org/comparetable.jsp?typ=2&ind=682&cat=8&sub=156&sortc=1&o=a

Kletke 2004. "Physician Workforce Data: When the Best Is Not Good Enough", Health Serv Res. 2004 October; 39(5): 1251–1256. As of 4/1/2011, this was accessible at http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1361068/

Navigant, 2008. Access to Care and Physician Workforce Requirements, Presented to: The Governor's Task Force on Health Care Access and Reimbursement (Navigant Consulting, January 28, 2008). This was a PowerPoint presentation on behalf of Carefirst BlueCross BlueShield), accessible as of 4/1/2011 at http://www.dhmh.maryland.gov/hcar/pdf/jan2008/CarefirstPresentationonPhysicianSupplyAccess1-28-2008.pdf

Trude 2003. So Much to Do, So Little Time: Physician Capacity Constraints, 1997-2001. (Washington, DC: Center for Studying Health Systems Change, Tracking Report Number 8, May 2003). Accessible at: http://hschange.org/CONTENT/556/

Virginia 2010. Physician Forecasting in Virginia 2008 – 2030. (Henrico, VA: Virginia Department of Health Professions, Healthcare Workforce Data Center, September 2010). Accessible at: http://www.dhp.virginia.gov/hwdc/docs/Physician2008/ForecastingSupplyAndDemand8-23-2010%20.pdf

Appendix A: Maryland Regions

Maryland Regions		
County Name	**Code**	**Region**
ALLEGANY	01	Western
ANNE ARUNDEL	02	Baltimore Metro
BALTIMORE CITY	30	Baltimore Metro
BALTIMORE COUNTY	03	Baltimore Metro
CALVERT	04	Southern
CAROLINE	05	Eastern Shore
CARROLL	06	Baltimore Metro
CECIL	07	Eastern Shore
CHARLES	08	Southern
DORCHESTER	09	Eastern Shore
FREDERICK	10	Western
GARRETT	11	Western
HARFORD	12	Baltimore Metro
HOWARD	13	Baltimore Metro
KENT	14	Eastern Shore
MONTGOMERY	15	National Capital
PRINCE GEORGE'S	16	National Capital
QUEEN ANNE'S	17	Eastern Shore
ST. MARY'S	18	Southern
SOMERSET	19	Eastern Shore
TALBOT	20	Eastern Shore
WASHINGTON	21	Western
WICOMICO	22	Eastern Shore
WORCESTER	23	Eastern Shore

STATE OF MARYLAND
DEPARTMENT OF HEALTH AND MENTAL HYGIENE

Frederick W. Puddester
Chairman

Kevin J. Sexton
Vice Chairman

Joseph R. Antos, Ph.D.

George H. Bone, M.D.

C. James Lowthers

Herbert S. Wong, Ph.D.

Robert Murray
Executive Director

Stephen Ports
Principal Deputy Director
Policy & Operations

Gerard J. Schmith
Deputy Director
Hospital Rate Setting

HEALTH SERVICES COST REVIEW COMMISSION
4160 PATTERSON AVENUE, BALTIMORE, MARYLAND 21215
Phone: 410-764-2605 · Fax: 410-358-6217
Toll Free: 1-888-287-3229
www.hscrc.state.md.us

TO: Commissioners

FROM: Legal Department

DATE: May 25, 2011

RE: Hearing and Meeting Schedule

Public Session:

July 6, 2011 Time to be determined, 4160 Patterson Avenue, HSCRC Conference Room

August 3, 2011 Time to be determined, 4160 Patterson Avenue, HSCRC Conference Room

The Agenda for the Executive and Public Sessions will be available for your review on the Commission's website on the Thursday before the Commission meeting. To review the Agenda, visit the Commission's website at: http://www.hscrc.state.md.us/commissionMeetingSchedule.cfm.

Post-meeting documents will be available on the Commission's website following the Commission meeting.