OFFICE OF ATTORNEY GENERAL MARTHA COAKLEY

Examination of Health Care Cost Trends and Cost Drivers
Pursuant to G.L. c. 118G, § 6½(b)

General Appendix to Report for Annual Public Hearing

I. OVERVIEW

On June 22, 2011, the Office of the Attorney General ("AGO") submitted a report ("2011 Report") on its examination of health care cost trends and cost drivers in the Massachusetts health care market. This General Appendix to the 2011 Report contains additional information regarding the data that we reviewed and how we performed our analysis. In 2008, the Massachusetts Legislature passed *An Act to Promote Cost Containment, Transparency and Efficiency in the Delivery of Quality Health Care*, which authorized the Attorney General to review and analyze the reasons why health care costs continue to increase faster than general inflation. The AGO issued its first report regarding cost trends and cost drivers in the Massachusetts market on March 16, 2010 ("2010 Report").

The 2011 Report advances the analysis of the AGO's 2010 Report. We focused on the private, or "commercial," health insurance market, which does not include government-subsidized health care such as Medicare or Medicaid. In particular, we looked at whether efforts to expand reimbursement of provider services through global payments have reduced health care costs or the payment disparities first identified in our 2010 Report. We examined risk contracting and care coordination both from the perspective of six commercial health insurers (also referred to as "health plans"), and from the perspective of sixteen provider groups of varying size, scope of services, geographic location, and payment methodology. We also examined whether total medical spending on patients with comparable health care coverage differs depending on patient income level. We reviewed four main categories of information that relate to these examination topics, each of which is discussed in this General Appendix: (1) provider reimbursement, (2) total medical expenses, (3) provider performance on quality, utilization, and care coordination, and (4) population data.

II. PROVIDER REIMBURSEMENT

To examine how health insurers pay health care providers, and the variations in the prices paid to providers, we considered (1) relative prices that insurers maintain in the normal course of their business to track the relative prices they pay to providers, and (2) global risk budgets.

Relative prices are comprehensive overall price indicators that represent the price one provider is paid relative to another for all of the services for which providers negotiate rates, and are not a "sampling" or subset of prices. There are two metrics that the major insurers in Massachusetts use to track the relative prices that they pay to providers: "relative price" and "relative payment." We asked the insurers to produce the relative prices paid to providers in their network so that we could analyze the variation in provider prices. Based on the data produced by each insurer, we were able to review "price" relativities for Blue Cross Blue Shield (BCBS) hospitals, and "payment" relativities for Harvard Pilgrim Health Care (HPHC) and Tufts

Health Plan (THP) hospitals and for BCBS, HPHC, and THP physicians. Global risk budgets are one form of provider reimbursement, which we also examined.

"Price relativity" is a metric for comparing how much higher or lower a provider's prices are than the prices paid to other providers in an insurer's network for the same comprehensive basket of services. Price relativities do not reflect insurance product mix, service mix, or other factors that are particular to an individual hospital's payment history. Since this approach controls for both service and product mix, we were able to compare the pure "price" that insurers negotiate with different providers for the same comprehensive set of services.

"Payment relativity" is a metric for comparing how much higher or lower a provider's payments are compared to those payments if made at the insurer's standard, network-wide payment rate. Unlike "price relativity," payment relativities reflect factors particular to a provider's payment experience, such as insurance product mix and service mix.

Payment and price relativities both represent the *aggregate* amount paid to hospitals and physicians. While the comparison of individual service or procedure pricing may be useful for consumer comparison, as provided by the Health Care Quality and Cost Council's website http://www.mass.gov/myhealthcareoptions, analysis of the entire payment rate structure more accurately reflects the way health insurers and providers negotiate and set prices. Our review indicates that prices of specific services do not reflect the actual costs of those services, but rather the need for providers in negotiation with payers to arrive at a rate structure that will cover their overall costs. Therefore, in response to our subpoenas, health insurers provided detailed information regarding the variation in *aggregate* prices and payments in their networks.

We note that, pursuant to Chapter 288 of the Acts of 2010, health insurers must report certain provider relative price data to the Division of Health Care Finance and Policy (DHCFP) using a standardized methodology. That standardized relative price information reported to DHCFP was not available at the time of our examination, and so we instead relied on relative price and payment information maintained by health insurers in their normal course of business. The relative price and payment information held by each health insurer that we used in our examination was created using a methodology that is different than the methodology developed by DHCFP pursuant to Chapter 288, and further, there are differences in the methodologies used by the different health insurers. Therefore, it is likely that the relative price/payment information produced by each health insurer to the AGO will differ from the relative price information produced by the health insurers to DHCFP. See the pre-filed testimony submitted by BCBS, HPHC, and THP for more detailed information regarding the methodological differences between the relative price/payment information submitted to the AGO and submitted to DHCFP pursuant to Chapter 288. In addition, because the relativities are specific to each health insurer and the methodology differs by health insurer, the data should not be used to compare relativities across carriers or to determine whether one health insurer pays a provider more or less than another health insurer.

We also reviewed global risk budgets. While relative prices reflect the aggregate amount paid to providers for all commercial business, global risk budgets reflect the price insurers pay providers for their at-risk business. BCBS and THP provided us with settlement reports and

contracts for globally paid providers in their networks that enabled us to review provider risk budgets.

A. Physician Reimbursement

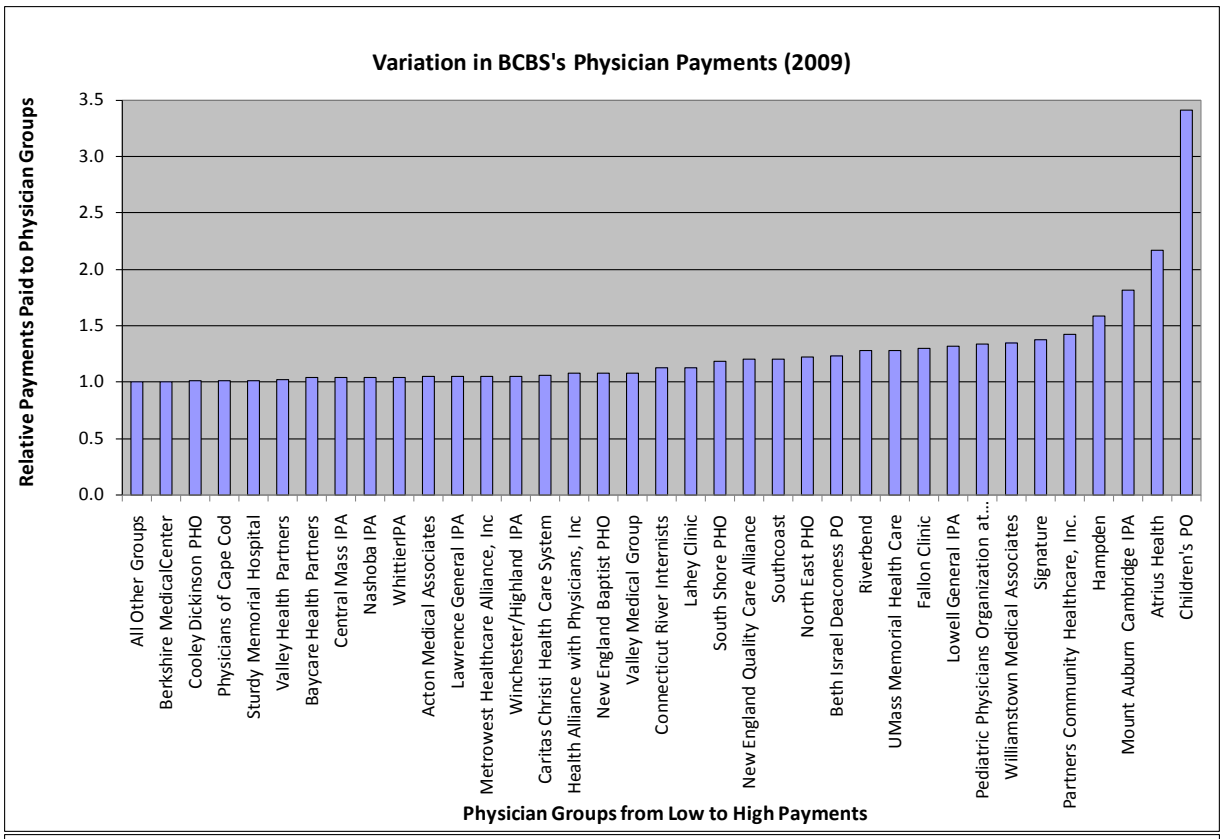
We reviewed the relative payments made by the three health insurers to physician groups in their networks. Health insurers set standard fee schedules for physician groups. The physician groups sometimes negotiate a multiplier to each of these standard fees; for example, a physician group with a 1.2 multiplier would be paid 120% of the standard fee schedule rate for professional services.

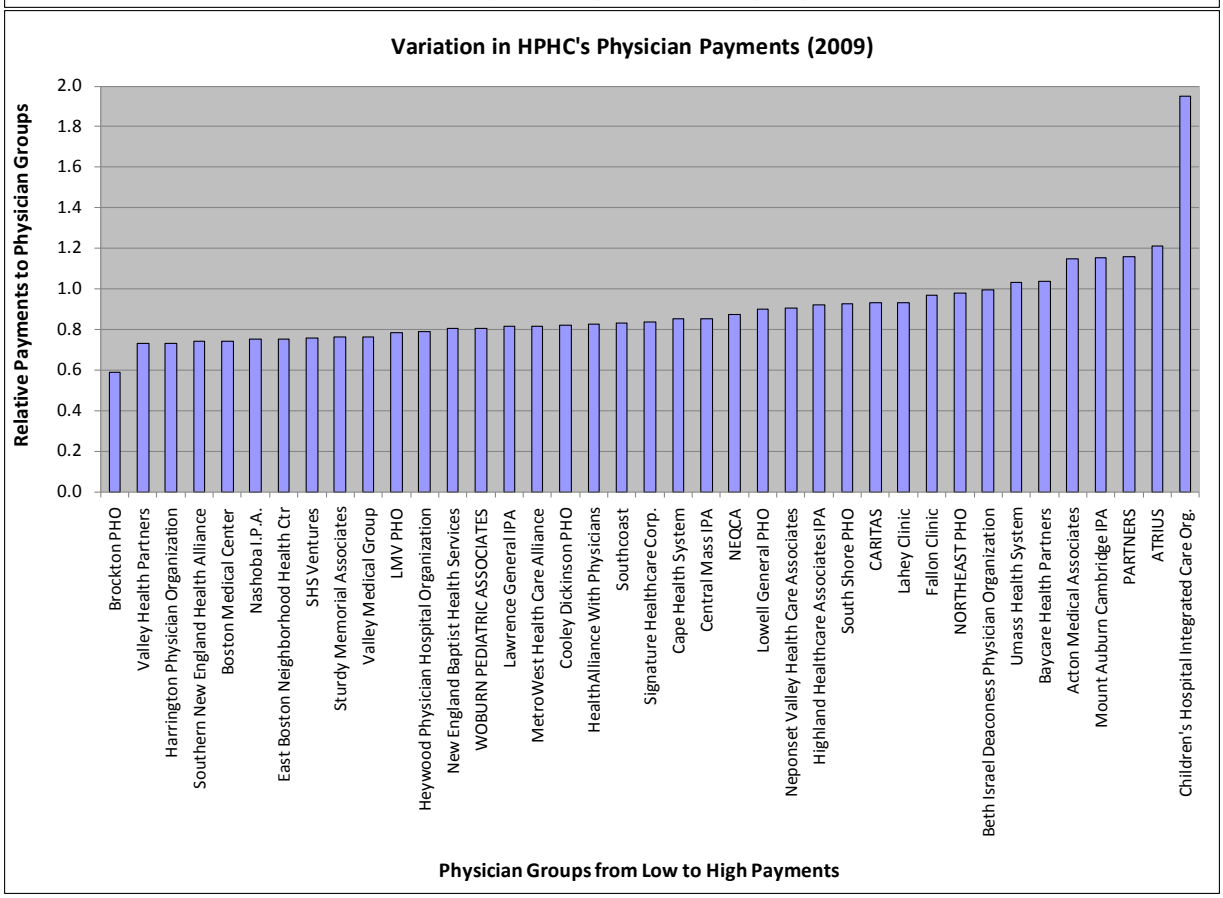
BCBS, HPHC and THP calculate physician payment relativities for physician groups in their networks. Based on information these insurers provided to us, we believe that all three insurers calculate their physician relativities by comparing total dollars actually paid for physician services to the cost of those services if paid at a standard, network-wide payment rate. Physician payment relativities generally reflect differences in the product mix of each physician group. Where the same multiplier applies to all types of physicians in a group, the relativities are neutral to service mix.

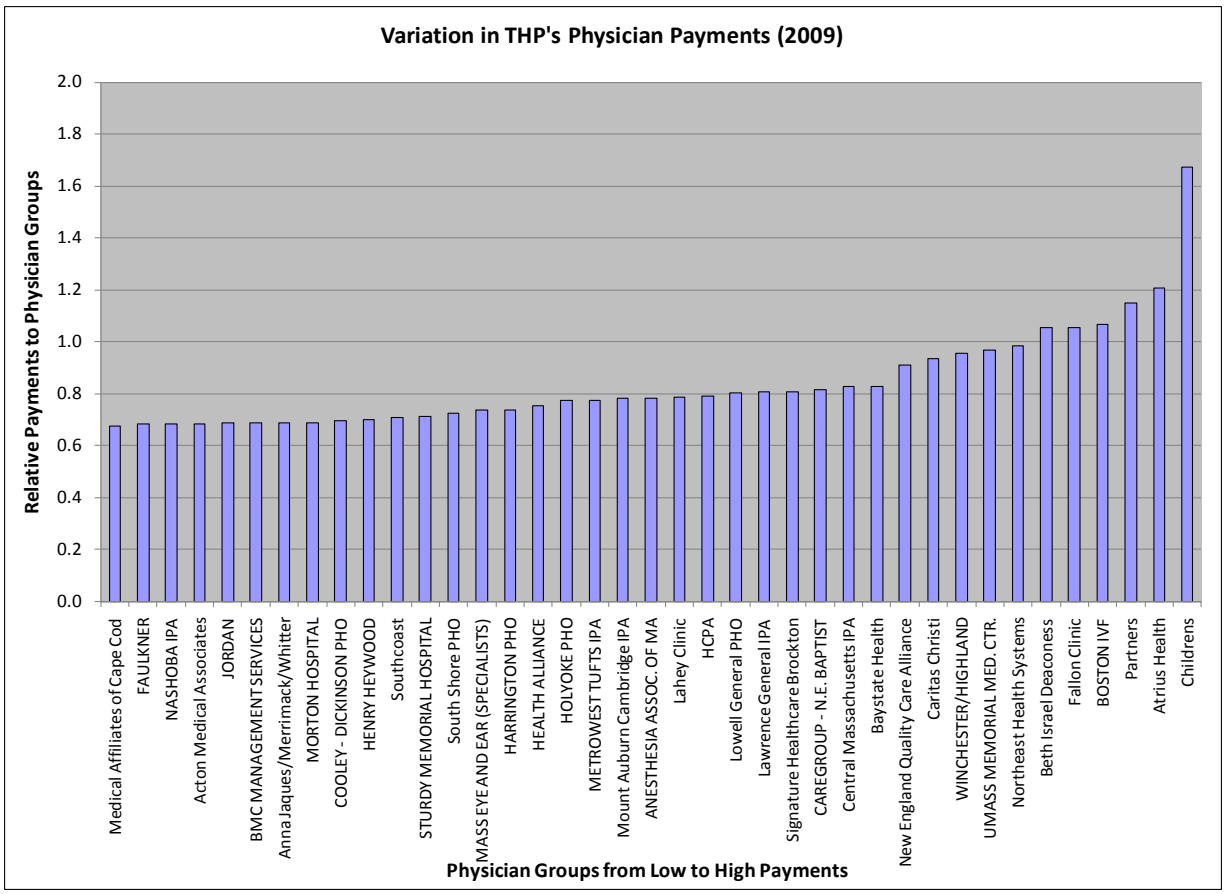
THP provided physician relativities at the local provider group level. Using mapping data from THP, and after confirming our methodology with THP, we aggregated that local provider group level information into provider system level information (e.g., relative payment information provided for Granite Medical was aggregated with other groups into system level relative payment information for Atrius). In addition, THP maintains physician relativities for a large number of physician groups. For purposes of presenting the information in a chart, we reduced THP's list by excluding those groups with less than $1 million in amount allowed claims (which include both THP payments to the provider as well as member cost sharing, or patient payments to the provider). The resulting 39 provider systems that appear on the chart account for 98.5% of THP's allowed network dollars.

BCBS and HPHC physician relativities include all payments made by those health insurers to providers, including both claims payments and non-claims payments (such as infrastructure fees, settlements, quality incentives, and other non-claims related money). THP physician relativities do not include non-claims payments. Inclusion of non-claims payments such as settlements, quality incentives, and infrastructure fees can have a material impact on the THP physician relativities (i.e., how a provider ranks relative to other providers in terms of aggregate payments may change once non-claims payments are included).

The three graphs on the following pages illustrate the differences in payments made by the three major health insurers to physicians in Massachusetts.


Variation in BCBS's Physician Payments (2009)
Relative Payments Paid to Physician Groups
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
All Other Groups
Berkshire MedicalCenter
Cooley Dickinson PHO
Physicians of Cape Cod
Sturdy Memorial Hospital
Valley Health Partners
Baycare Health Partners
Central Mass IPA
Nashoba IPA
WhittierIPA
Acton Medical Associates
Lawrence General IPA
Metrowest Healthcare Alliance, Inc
Winchester/Highland IPA
Caritas Christi Health Care System
Health Alliance with Physicians, Inc
New England Baptist PHO
Valley Medical Group
Connecticut River Internists
Lahey Clinic
South Shore PHO
New England Quality Care Alliance
Southcoast
North East PHO
Beth Israel Deaconess PO
Riverbend
UMass Memorial Health Care
Fallon Clinic
Lowell General IPA
Pediatric Physicians Organization at...
Williamstown Medical Associates
Signature
Partners Community Healthcare, Inc.
Hampden
Mount Auburn Cambridge IPA
Atrius Health
Children's PO
Physician Groups from Low to High Payments


Variation in HPHC's Physician Payments (2009)
Relative Payments to Physician Groups
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
Brockton PHO
Valley Health Partners
Harrington Physician Organization
Southern New England Health Alliance
Boston Medical Center
Nashoba I.P.A.
East Boston Neighborhood Health Ctr
SHS Ventures
Sturdy Memorial Associates
Valley Medical Group
LMV PHO
Heywood Physician Hospital Organization
New England Baptist Health Services
WOBURN PEDIATRIC ASSOCIATES
Lawrence General IPA
MetroWest Health Care Alliance
Cooley Dickinson PHO
HealthAlliance With Physicians
Southcoast
Signature Healthcare Corp.
Cape Health System
Central Mass IPA
NEQCA
Lowell General PHO
Neponset Valley Health Care Associates
Highland Healthcare Associates IPA
South Shore PHO
CARITAS
Lahey Clinic
Fallon Clinic
NORTHEAST PHO
Beth Israel Deaconess Physician Organization
Umass Health System
Baycare Health Partners
Acton Medical Associates
Mount Auburn Cambridge IPA
PARTNERS
ATRIUS
Children's Hospital Integrated Care Org.
Physician Groups from Low to High Payments



B. Hospital Reimbursement

We also examined the relative prices/payments made by health insurers to the hospitals in their networks. Typically, major health insurers and hospitals negotiate prices for inpatient health care services using a base case rate. The base case rate represents a complexity-neutral price that is then adjusted by a set of standard "weights" that reflect the complexity of each case, and may be further modified if the case becomes atypical or an "outlier." Additional prices are negotiated for a limited set of other inpatient services such as very high-cost or experimental procedures. For hospital outpatient services, health insurers have established standard fee schedules (e.g., standard fees are set for radiology, laboratory work, observation, behavioral health). The insurers and hospitals negotiate a multiplier to each of these standard fee schedules; for example, a provider with a 1.2 multiplier for radiology services would be paid 120% of the standard fee schedule rates for covered radiology services.

1. BCBS Hospital Price Relativity

BCBS pays most hospitals in its network using a base case weight structure for inpatient services, and a fee schedule structure for outpatient services, as described above. BCBS provided us with 2009 relative prices for Massachusetts hospitals in its network. Based on the information provided to us, we understand the inpatient relative price was calculated by comparing the base DRG rate for each hospital to the network average. The comparison is based

on both HMO and PPO DRG rates weighted using the network-wide product mix. A similar calculation is done on the outpatient side comparing average multipliers by hospital to the network-wide average. This was also done separately for HMO and PPO products and then combined using the network-wide product mix. For each hospital, the overall relativities for inpatient and outpatient were then combined based on the network-wide mix of inpatient versus outpatient dollars. For inpatient care, because relative prices are neutral to the complexity of services provided, the price relativity allows us to compare prices among hospitals without overstating the prices paid to hospitals that care for more intensive or complex cases, or understating the prices paid to hospitals that on average care for less intensive or complex cases. In addition, relative price methodology uses a uniform mix of services for hospital outpatient care, which allows for a comparison of prices without overstating the prices paid to hospitals that care for more intensive or complex outpatient cases.

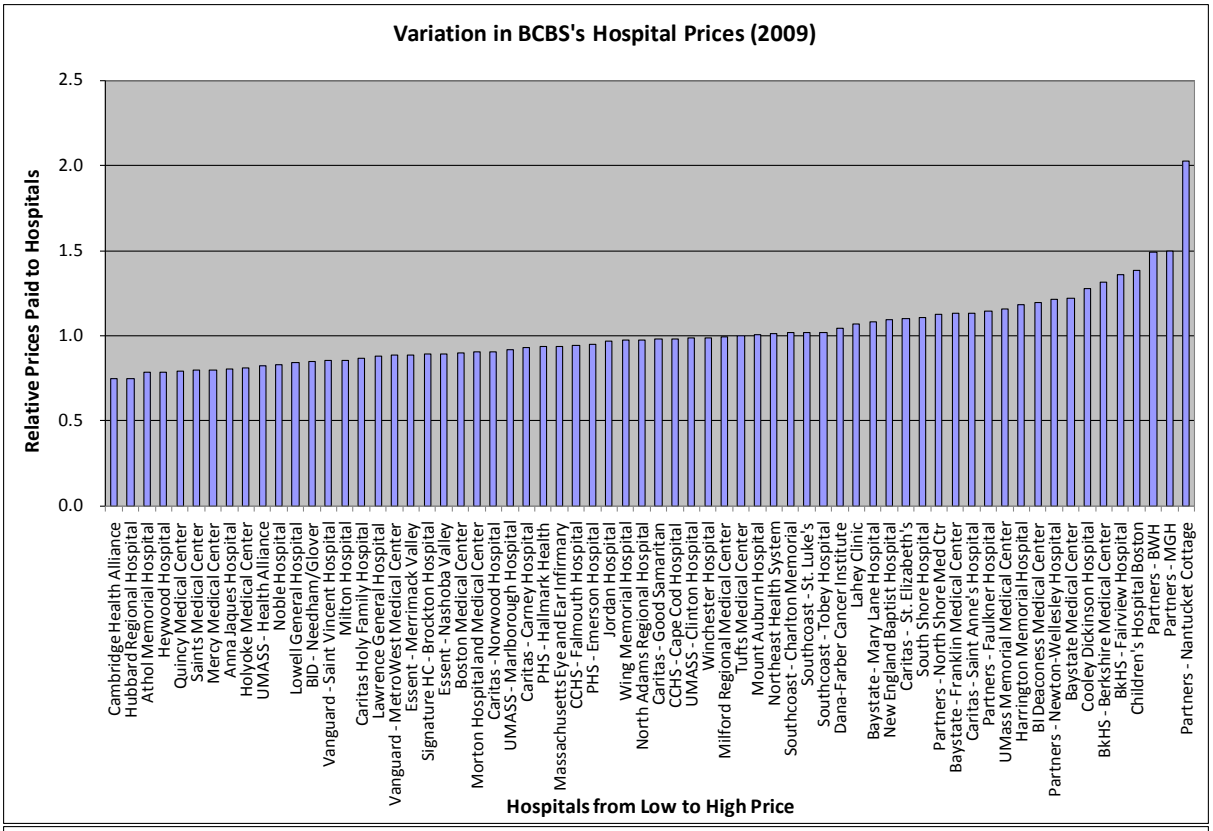
For some hospitals, rather than using the base case rate and fee schedule structures described above, BCBS pays the hospital on a "discount-off-of-charges" basis for certain services (e.g., for all inpatient services) by paying the hospital a percentage of its charge master rates.[1] For hospitals that receive their inpatient reimbursement through a discount-off-of-charges arrangement, we assumed the price relativity for inpatient services would be the same as for outpatient services. Similarly, for hospitals that receive their outpatient reimbursement through a discount-off-of-charges arrangement, we assumed the price relativity for outpatient services would be the same as for inpatient services. Two hospitals (Martha's Vineyard Hospital and Sturdy Memorial Hospital) are paid discount-off-of-charges for both inpatient and outpatient services and so were excluded from our analysis.

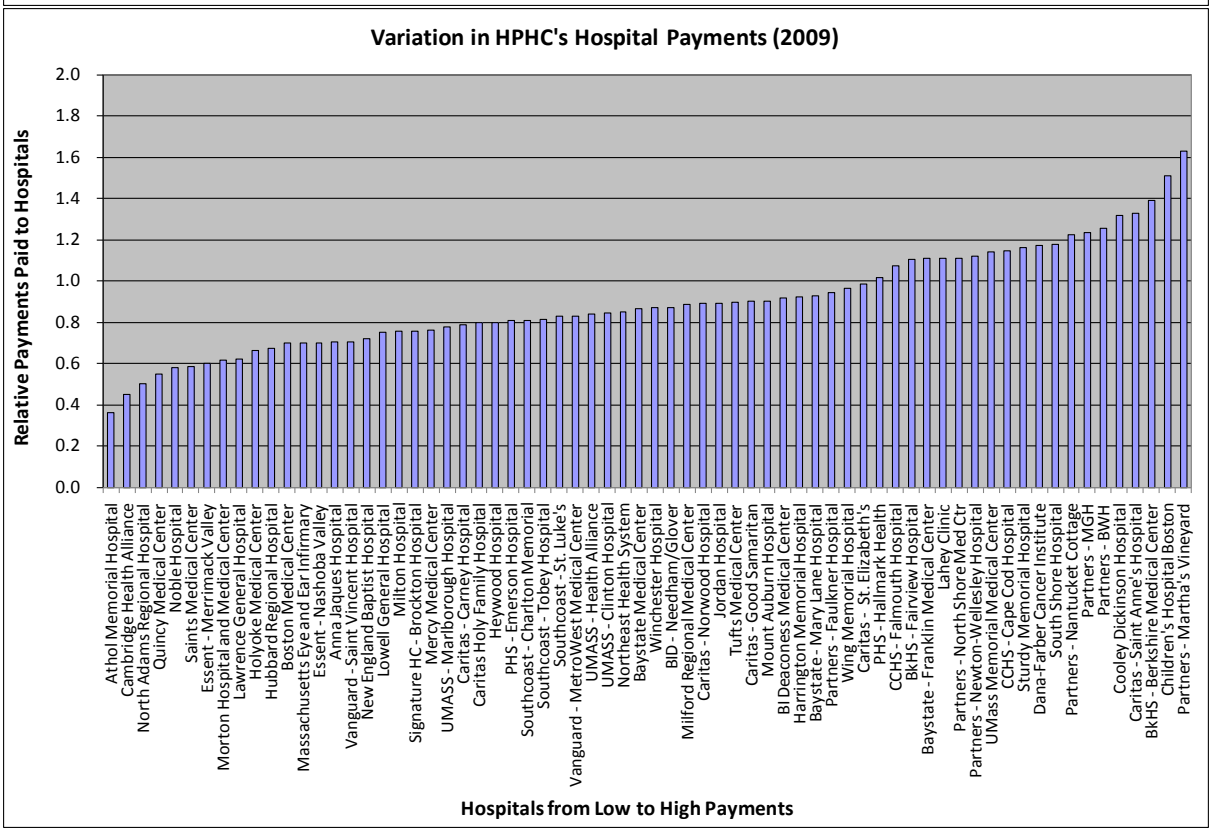
2. HPHC and THP Hospital Payment Relativities

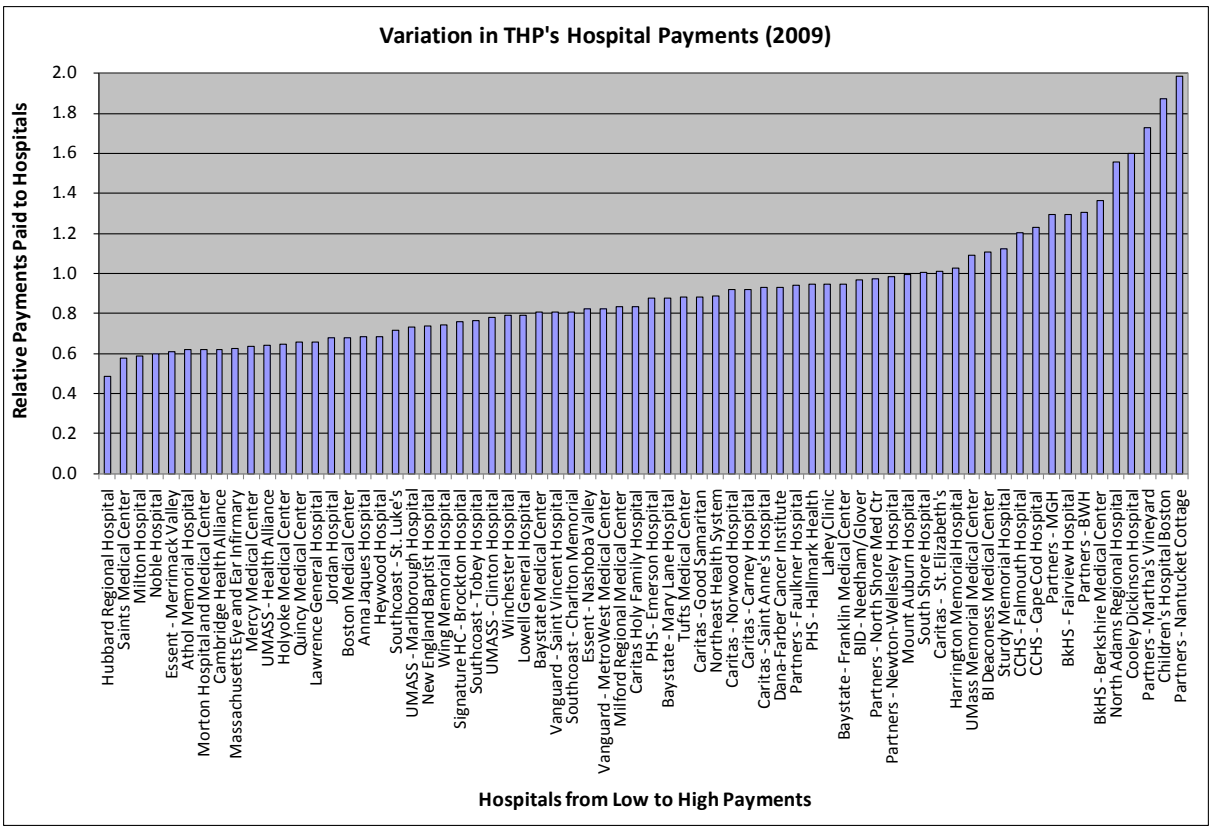
HPHC and THP provided information on hospital payment relativities. Based on information we received from these insurers, we understand they calculated these payment relativities by comparing the payments made to each hospital in their network with their standard, network-wide payment rate. We also understand that these hospital payment relativities take into account factors particular to a hospital's payment history, such as product mix and service mix. Both insurers case mix adjusted their hospital inpatient payments. Because their outpatient payments do not reflect a uniform mix of outpatient services, the overall payment relativities may reflect differences in the complexity of outpatient care provided by one hospital versus another hospital.

The three graphs on the following pages illustrate the differences in payments made by the three major health insurers to hospitals in Massachusetts.

[1] Because provider charge masters generally contain very high rates, discount-off-of-charges arrangements generally reflect higher-end pricing than either standard fee schedules or multipliers on fee schedules. Berkshire Medical Center, Cape Cod Hospital, Children's Hospital, Dana Farber Cancer Institute, Fairview Hospital, Falmouth Hospital, Martha's Vineyard Hospital, Nantucket Cottage Hospital, and Sturdy Memorial Hospital were all reimbursed on a discount-off-of-charges basis for at least some of their hospital services in 2009.


Variation in BCBS's Hospital Prices (2009)
Relative Prices Paid to Hospitals
2.5
2.0
1.5
1.0
0.5
0.0
Cambridge Health Alliance
Hubbard Regional Hospital
Athol Memorial Hospital
Heywood Hospital
Quincy Medical Center
Saints Medical Center
Mercy Medical Center
Anna Jaques Hospital
Holyoke Medical Center
UMASS - Health Alliance
Noble Hospital
Lowell General Hospital
BID - Needham/Glover
Vanguard - Saint Vincent Hospital
Milton Hospital
Caritas Holy Family Hospital
Lawrence General Hospital
Vanguard - MetroWest Medical Center
Essent - Merrimack Valley
Signature HC - Brockton Hospital
Essent - Nashoba Valley
Boston Medical Center
Morton Hospital and Medical Center
Caritas - Norwood Hospital
UMASS - Marlborough Hospital
Caritas - Carney Hospital
PHS - Hallmark Health
Massachusetts Eye and Ear Infirmary
CCHS - Falmouth Hospital
PHS - Emerson Hospital
Jordan Hospital
Wing Memorial Hospital
North Adams Regional Hospital
Caritas - Good Samaritan
CCHS - Cape Cod Hospital
UMASS - Clinton Hospital
Winchester Hospital
Milford Regional Medical Center
Tufts Medical Center
Mount Auburn Hospital
Northeast Health System
Southcoast - Charlton Memorial
Southcoast - St. Luke's
Southcoast - Tobey Hospital
Dana-Farber Cancer Institute
Lahey Clinic
Baystate - Mary Lane Hospital
New England Baptist Hospital
Caritas - St. Elizabeth's
South Shore Hospital
Partners - North Shore Med Ctr
Baystate - Franklin Medical Center
Caritas - Saint Anne's Hospital
Partners - Faulkner Hospital
UMass Memorial Medical Center
Harrington Memorial Hospital
BI Deaconess Medical Center
Partners - Newton-Wellesley Hospital
Baystate Medical Center
Cooley Dickinson Hospital
BkHS - Berkshire Medical Center
BkHS - Fairview Hospital
Children's Hospital Boston
Partners - BWH
Partners - MGH
Partners - Nantucket Cottage
Hospitals from Low to High Price


Variation in HPHC's Hospital Payments (2009)
Relative Payments Paid to Hospitals
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
Athol Memorial Hospital
Cambridge Health Alliance
North Adams Regional Hospital
Quincy Medical Center
Noble Hospital
Saints Medical Center
Essent - Merrimack Valley
Morton Hospital and Medical Center
Lawrence General Hospital
Holyoke Medical Center
Hubbard Regional Hospital
Boston Medical Center
Massachusetts Eye and Ear Infirmary
Essent - Nashoba Valley
Anna Jaques Hospital
Vanguard - Saint Vincent Hospital
New England Baptist Hospital
Lowell General Hospital
Milton Hospital
Signature HC - Brockton Hospital
Mercy Medical Center
UMASS - Marlborough Hospital
Caritas - Carney Hospital
Caritas Holy Family Hospital
Heywood Hospital
PHS - Emerson Hospital
Southcoast - Charlton Memorial
Southcoast - Tobey Hospital
Southcoast - St. Luke's
Vanguard - MetroWest Medical Center
UMASS - Health Alliance
UMASS - Clinton Hospital
Northeast Health System
Baystate Medical Center
Winchester Hospital
BID - Needham/Glover
Milford Regional Medical Center
Caritas - Norwood Hospital
Jordan Hospital
Tufts Medical Center
Caritas - Good Samaritan
Mount Auburn Hospital
BI Deaconess Medical Center
Harrington Memorial Hospital
Baystate - Mary Lane Hospital
Partners - Faulkner Hospital
Wing Memorial Hospital
Caritas - St. Elizabeth's
PHS - Hallmark Health
CCHS - Falmouth Hospital
BkHS - Fairview Hospital
Baystate - Franklin Medical Center
Lahey Clinic
Partners - North Shore Med Ctr
Partners - Newton-Wellesley Hospital
UMass Memorial Medical Center
CCHS - Cape Cod Hospital
Sturdy Memorial Hospital
Dana-Farber Cancer Institute
South Shore Hospital
Partners - Nantucket Cottage
Partners - MGH
Partners - BWH
Cooley Dickinson Hospital
Caritas - Saint Anne's Hospital
BkHS - Berkshire Medical Center
Children's Hospital Boston
Partners - Martha's Vineyard
Hospitals from Low to High Payments



C. Global Budgets

The 2011 Report put a particular focus on the global budgets in global risk contracts to understand (1) whether variation exists in global risk budgets, and (b) whether providers who are paid through global risk contracts are rewarded for efficiency.

1. Description of Global Budget Contracts

BCBS, HPHC, and THP all have global contracts with provider organizations in their network. Typically, the health insurers negotiate a "global budget" with each provider that is a target maximum amount of money that a health insurer will pay to cover *all* of the care a patient receives for a given period of time (regardless of where the patients obtains that care). Providers continue to submit claims to the health insurer and are paid on a fee-for-service basis throughout the contract year. At the end of the year, the health insurer adds up the cost of all goods and services provided (e.g., physicals, imaging, inpatient admissions, emergency department visits, physical therapy, pharmaceuticals, and any other service) to all of the patients signed up with the provider's group, and compares that amount to the target budget. This annual reconciliation of the actual cost of goods and services rendered to the negotiated annual budget maximum is called a "settlement."

There are two main types of global contract arrangements. The first is a "risk" arrangement. In a global risk arrangement, if the total of all the goods and services rendered is *less* than the target budget, then the health insurer pays a "surplus" to the physician group. If

instead, the total of all the cost of care is *more* than the target budget, then the physician would owe a "deficit" back to the health insurer. We often say that the provider group is therefore "at risk" because in this type of contract the provider is risking some portion of the fee-for-service payments it receives throughout the year if the cost of care consumed by its patients exceeds the negotiated global budget target maximum. The structure of global risk contracts is negotiated and varies from provider group to provider group. Many providers have corridors or caps that restrict how much of a surplus they are entitled to or how much of a deficit they must pay. For example, a provider might be entitled to only 50% of a surplus or responsible for only 50% of a deficit (which is often referred to as a "risk share" arrangement). Alternatively, a provider might not share any risk with the insurer, and instead be at risk for 100%, or an "unlimited" amount, of its surplus and/or deficit. For the purposes of our report, we consider providers to be "at risk" if they have the potential to experience a deficit, regardless of whether they are exposed to 100% of the deficit or whether they are exposed to a percent of the deficit through a risk share arrangement.

The other type of global contract arrangement is often referred to as a "shared savings," "gain-sharing," or "upside only" arrangement. In an "upside only" global arrangement, if the total of all the goods and services rendered is *less* than the target budget, then the health insurer pays a "surplus" to the physician group. However, if the total of all the cost of care is *more* than the target budget, then the physician still receives reimbursement in full for all of those costs. In other words, the physician group would never owe the health insurer a deficit, even if the total costs of patient care exceed the negotiated target budget. Therefore, these providers may earn a "surplus," but are never at risk of having a "deficit." For purposes of our analysis, we did *not* consider these types of contractual arrangements to be "risk" arrangements.

2. Comparison of Global Budgets

As described above, each provider with a global contract has a target global budget which is a per member per month amount negotiated between the health insurer and the provider against which claims costs are settled for the purposes of determining the amount of surplus paid, and/or deficit charged, by the health insurer to the provider. We received information from BCBS and THP that allowed us to compare the global budgets of providers in their networks in order to determine whether variations exist in health status adjusted global risk budgets.

a. BCBS Target Medical Services Budget

BCBS provided us with settlement reports and contracts for globally paid providers in its network. Those documents contained information regarding the global budget negotiated for each provider (e.g., $400 per member per month). In order to compare provider budgets, we made certain adjustments to account for differences among provider-specific budgets. BCBS provided us with information that enabled us to adjust the budgets for comparison purposes by: 1) adjusting for individual stop loss payment variations among providers; 2) adjusting for differences in the health status of the patient populations covered by the global budgets, by determining the raw DxCG score for each provider; and 3) adjusting for differences among providers in the percentage of their patient population with a pharmacy benefit. Using this

information, we were able to adjust each budget to reflect consistent DxCG scores and pharmacy benefit coverage.

Note that for provider groups that were only at risk for fully-insured members (as opposed to both fully-insured and self-insured members), we only had a DxCG score for that provider's entire patient population (fully-insured *and* self-insured members). Therefore, the DxCG score used to adjust the budget information reflects the morbidity of the provider's entire patient population, rather than just the fully-insured patient population. For purposes of internal analysis only, we estimated what the DxCG score would be for only the fully-insured population of each provider who was at risk for only fully-insured members by calculating the average difference between the DxCG scores of fully-insured and self-insured members where that information was available, and then applying that calculated difference to the DxCG score of the provider's entire patient population. The difference in the results from these two methodologies was not material to our overall comparison of risk budgets.

Many globally paid providers in the BCBS network have certain medical services excluded from their global budgets (e.g., behavioral health services). For example, if Provider A and B had the same payment ($400 per member per month) but Provider B had "carved-out" behavioral health services, then Provider B would have a "larger" budget, in the sense that Provider B's payment would not have to cover behavioral health services while Provider A's payment would have to cover all medical services *including* behavioral health services. It is therefore important to consider the value of excluded services when comparing global budgets. BCBS did not provide us with information regarding the value of excluded services, and so differences in negotiated service exclusions are not reflected in our calculation of adjusted global budgets. Directionally, if a provider's budget is larger than another provider's budget, and does not include behavioral health or out-of-area services, the stated budget difference will be understated.

b. THP Target Medical Services Budget

THP provided us with settlement reports and contracts for globally paid providers in its network, as well as the raw DxCG score for each globally paid provider's at-risk population. THP confirmed that its globally paid providers are at risk for fully-insured members only. Like BCBS, THP negotiates certain service exclusions from global risk budgets, such as behavioral health services. THP provided us with the value of those excluded services for each provider under a risk arrangement in 2009. We added the value of excluded services into the budget for each provider with exclusions and then risk adjusted the resulting budget using the raw DxCG score. In addition, THP confirmed that for one provider group, the budget does not include member liability (e.g., copayments), while all other budgets do include member liability. Therefore, using information provided by THP regarding the percent of total costs represented by member liability, we adjusted the provider's budget to gross the budget up to a level that would include member liability.

III. TOTAL MEDICAL EXPENSES (TME)

We used total medical expense (TME) data produced by the health insurers (1) to evaluate different payment methodologies (fee-for-service and global risk contracts) and (2) to examine the relationship between TME and income for each zip code in Massachusetts.

Health insurers track the TME incurred for each of their members and also track member TME back to each member's primary care provider (PCP) group.[2] TME accounts for *all* of the medical expenses associated with an insurer's member, regardless of where those expenses are incurred (i.e., it includes physician visits as well as all hospital, laboratory, pharmacy, imaging, physician therapy and other medical expenses, wherever those services occur).[3,4] As such, TME reflects both the volume of services used by each member (utilization), as well as the price paid for each service (unit price). TME also includes both the health insurer liability and the member liability. TME can be adjusted for morbidity to enable a comparison across physician groups.

We received TME data held by BCBS, HPHC and THP for each zip code in Massachusetts, and for the physician groups in their networks. All three health insurers provided us with "raw" TME (TME unadjusted for morbidity) and "adjusted TME" (TME adjusted for differences in morbidity using a DxCG adjuster). For physician groups, each of the health insurers calculated TME based on all fully-insured and self-insured HMO/POS members. For zip codes, in addition to fully-insured and self-insured HMO/POS members, each insurer also included fully-insured and self-insured members in products where no PCP designation is required, such as PPO products.

We note that, pursuant to Chapter 288 of the Acts of 2010, health insurers must report TME data to the Division of Health Care Finance and Policy (DHCFP) using a standardized methodology. That standardized TME data reported to DHCFP was not available at the time of our examination, so we used TME information maintained by health insurers in their normal course of business. The TME information held by each health insurer that we used in our examination was created using a methodology that is different than the methodology developed by DHCFP pursuant to Chapter 288, and further, there are differences in the methodologies used by each health insurer. Therefore, it is likely that the TME information produced by each health insurer to the AGO will differ from the TME information produced by the health insurers to DHCFP. See the pre-filed testimony submitted by BCBS, HPHC, and THP for more detailed information regarding the methodological differences between the TME information submitted to the AGO and submitted to DHCFP pursuant to Chapter 288.

[2] TME is expressed as a per member per month dollar figure based on allowed claims.

[3] TME for physician groups can only be calculated for HMO and point of service (POS) members, whose expenses can be attributed to a particular primary care provider. The large numbers of patients insured under HMO and POS products in Massachusetts mean that TME is a useful metric for comparing the varying levels of expenses incurred by different provider systems per patient.

[4] Some components of TME are beyond a PCP's ability to control, such as pharmacy unit pricing, benefit design differences, and patient utilization of health services outside of the recommendation of the PCP.

A. Analysis of Payment Methodologies Using TME

1. Comparison of TME and Payment Methodology

The 2011 report found that globally paid providers do not have consistently lower TME than fee-for-service providers. To perform our analysis, we identified two groups of providers: those who are paid on a fee-for-service basis and those who are paid under a global risk contract. For purposes of this analysis, we did not consider providers who have "upside only" contracts as being global risk providers (*see* Section II(C)(1), above, for a description of "upside only" contracts). Each health insurer provided a list of the providers who had a global risk contract in 2009. We excluded provider groups with less than 6,000 member months from our analysis. Using the insurer's designations of providers with risk-sharing contracts, we compared contract type to the TME for each provider group.

Note that the TME produced by all three health insurers includes all HMO/POS, fully-insured and self-insured members that are cared for by a provider organization. However, providers may not be reimbursed on a global risk basis for all of the HMO/POS, fully-insured and self-insured members assigned to their group. For example, in 2009:

- THP providers had global risk contracts for fully-insured members only.
- HPHC providers had global risk contracts for fully-insured members only.
- BCBS had global risk contracts with Fallon and HAPI for their fully-insured members only.

2. Comparison of TME and Global Risk Settlement Amounts

The 2011 Report found that providers who have global risk contracts are not always "rewarded" with surpluses for having lower TME than other globally paid providers. BCBS and THP produced 2009 settlement reports for globally paid providers in their networks that detailed the per member per month surplus or deficit experienced by each provider in 2009. Using that information, we were able to compare each globally paid providers' surplus or deficit to various measures (such as, for example, their TME and their budget).

3. AQC Provider 2008-2009 Performance

Our examination found the 2009 AQC providers experienced an increase in both relative prices and TME from 2008 to 2009. BCBS produced relative payment data, both normalized and un-normalized to the network, for each physician group in its network for 2008 and 2009. Using the un-normalized data, we were able to examine the difference in relative payment that each AQC provider experienced from 2008 to 2009. We excluded Hampden from the analysis because relative payment data did not exist for Hampden in 2008. Relative payment data did not exist for Signature in 2008. Brockton PHO existed independently in 2008, but was part of Signature in 2009. Therefore, we matched Brockton PHO 2008 data with Signature 2009 data for the purposes of this comparison.

BCBS also produced both unadjusted and risk adjusted TME data for each physician group in its network for 2008 and 2009. We were able to calculate the normalized DxCG score for each provider group by dividing the unadjusted TME by the adjusted TME. We were also able to obtain the network wide raw DxCG risk scores for both 2008 and 2009 from internal BCBS reports. Using those network-wide raw DxCG scores, we calculated raw DxCG scores for each provider group in 2008 and 2009 by taking each provider's normalized DxCG score multiplied by the network-wide raw DxCG score. For some provider groups, we were able to verify this calculation by comparing the calculated provider specific raw DxCG scores to the raw DxCG scores contained in internal BCBS reports.

Using these building blocks (adjusted and unadjusted TME and raw risk scores for 2008 and 2009) we were able to calculate the risk adjusted 2008 and 2009 TME for each provider in the BCBS network. First, we grouped providers into AQC and non-AQC buckets. We included Atrius, Lowell, MACIPA, Signature, and South Shore PHO as 2009 AQC providers, and we included all other physician groups in the BCBS network as non-AQC providers. Hampden was excluded from the analysis entirely because TME data did not exist for Hampden in 2008. Brockton PHO existed independently in 2008, but was part of Signature in 2009; therefore we again matched those two groups for purposes of this comparison. Southcoast is included in the "non-AQC provider group" trend because, although its contract resembles the AQC contract in many ways, it is not at risk and BCBS does not consider it to be an AQC provider. We also included groups that were not AQC groups in 2009 but became part of the AQC in 2010 in the "non-AQC" group.

We normalized the 2008 DxCG scores to the entire population (both AQC and non-AQC groups) and calculated risk adjusted TME for 2008. We next calculated the trend in unadjusted TME from 2008 to 2009 for the AQC and non-AQC cohort and adjusted for the change in the raw DxCG scores to calculate a risk adjusted trend. We then calculated the risk adjusted 2009 TME by applying the risk adjusted TME trend from 2008 to 2009 to the 2008 risk adjusted TME for each group. We weighted AQC and non-AQC risk scores and TME using 2009 member months.

Our report also found that, in 2009, AQC providers received larger payments for achievement of quality targets than non-AQC providers. BCBS produced settlement reports for all AQC providers in 2009 that included detail on each AQC group's performance against the quality measure targets and the financial award associated with that performance. BCBS also produced data detailing the value of various other quality payments made to non-AQC providers in the BCBS network. We calculated weighted average of all quality payments made to 2009 AQC providers on a per member per month basis and compared it to the per member per month quality payment BCBS paid to non-AQC providers in its network in 2009.

4. AQC Provider 2008-2013 Projection Analysis

The 2011 Report found that it is unlikely that 2009 AQC providers will have lower TME than non-AQC providers by the end of their five year AQC contracts, in 2013. First, we used the same methodology described above at III(A)(3) to determine the actual TME trend for AQC and non-AQC providers from 2008-2009. AQC provider groups in this analysis include Atrius,

Lowell, MACIPA and Signature. South Shore PHO is not included in this analysis because it does not have a set negotiated trend adjuster. We included groups that were not AQC groups in 2009 but became part of the AQC in 2010 in the "non-AQC" group.

BCBS produced AQC contracts which contain pre-set medical budget trends for each AQC provider for every year through 2013. We applied these contractually set trend factors to each of the AQC provider groups risk adjusted 2009 TME (calculated as described above in Section III(A)(3)) and calculated a weighted average 2010 through 2013 TME using 2009 member months to weight the TME. From the weighted average TME we calculated the average AQC trend for each year. This analysis assumes that any component of TME that is not the medical budget (for example, carved-out services, quality payments and fees) will increase at negotiated budget trends.

For illustrative purposes only, we then calculated the approximate trend that non-AQC providers would need to experience to have the same TME as AQC providers by 2013, in order to put into context the difference between AQC and non-AQC provider TME. We did this by deriving a trend that generated the approximately same risk adjusted TME in 2013 for non-AQC providers compared to AQC providers.

To sensitivity test the results, we repeated our calculations excluding provider groups that switched from non-AQC in 2009 to AQC in 2010. Excluding 2010 AQC providers from the "non-AQC" group (and therefore excluding them entirely from the analysis) changed the non-AQC 2008-2009 trend from 1.7% to 1.5%, and the trend calculated to achieve TME parity between AQC and non-AQC groups in 2013 changes from 9.75% to 9.65%. We also repeated our calculations using data produced by BCBS that indicates it projects 2009 AQC providers' average trend to be 5%. Using that trend (rather than the 5.6% trend calculated by the AGO), non-AQC providers would need to experience a 9.1% trend to achieve the same TME as 2009 AQC providers by 2013.

B. Relationship between TME and Income Level

The 2011 Report found that total medical spending is on average higher for the care of health plan members from higher-income communities. The AGO compared information on health status adjusted TME for each Massachusetts zip code with income information for each zip code to determine whether there is a relationship between health status adjusted TME and income. The TME data came from the three largest commercial insurers in MA. BCBS, HPHC, and THP provided their 2009 member months, and associated TME, for each Massachusetts zip code. This data was separated by members required to choose a PCP (e.g., those in HMO and POS products) and members not required to choose a PCP (e.g., those in PPO products).[5] For each insurer, we combined the TME for these two groups to maximize the number of member

[5] The TME data for each of the insurers reflects allowed amounts, meaning it includes both the insurer's liability and the member's liability. While this data normalizes for any differences in cost sharing by zip code, it does not allow us to adjust for any utilization differences related to product design by zip code. For example, if some zip codes had a higher proportion of members in high deductible plans, which had an additional deterrent effect on members' use of health care services, we were not able to normalize for any such differences across zip codes based on current data sources.

months per zip code, and then excluded zip codes in which the insurer's combined HMO/POS and PPO member months for the zip code were less than 1,000, in order to increase the actuarial credibility of our analysis. For each zip code, BCBS provided raw risk scores (i.e., scores not already normalized for the population within each product), which enabled us to combine unadjusted HMO/POS and PPO TME data and raw risk scores by weighting by member months, and then risk adjust and normalize the combined TME by zip code. Due to the nature of the data request, HPHC and THP provided product-specific normalized risk scores. For these two insurers, we combined risk-adjusted HMO/POS and PPO TME data by weighting by the HMO/POS and PPO member months for each zip code.

The AGO obtained income information from the Internal Revenue Service, Statistics of Income Division. For each Massachusetts zip code, we received data on adjusted gross income, total number of tax returns, and total number of joint tax returns for the most recent year available, 2007. Using this data, we calculated the average adjusted gross income per filer for each zip code so we could stratify the TME data by income groupings. To do this, we first calculated the total number of filers per zip code by counting the number of joint returns as two and the remaining returns as one. We then divided the total adjusted gross income for each zip code by the total number of filers per zip code. Note that the income data reflects all Massachusetts residents who filed a federal tax return, and does not distinguish which filers had commercial insurance with one of the three health insurers surveyed, other health insurance, or no health insurance.

Using this data, we examined for each of the major insurers the relationship between health status adjusted TME and income using the 2007 IRS data as a proxy for relative member income. For each insurer, we ranked the credible Massachusetts zip codes by average income, and by average health status adjusted TME. Each ranked list of zip codes was grouped into five quintiles of equal size. For example, the 20% of zip codes with the lowest average TME were grouped into TME Quintile 1, while the 20% of zip codes with the highest average TME were grouped into TME Quintile 5. Within each TME quintile, we then identified the proportion of members from zip codes with lower average incomes versus higher average incomes.

In addition to examining this TME and income data across all zip codes in Massachusetts, we analyzed whether there was a relationship between TME and income in specific Massachusetts regions, using the seven regions the MA Division of Insurance has defined for small group rating purposes. These regions are: Region 1 (Western MA), Region 2 (Central MA), Region 3 (Metrowest), Region 4 (Northeastern MA), Region 5 (Boston and surrounding towns), Region 6 (Southeastern MA), and Region 7 (Cape Cod and surrounding islands). For the zip codes in each of the seven regions, we replicated the analysis we conducted statewide: we grouped the regional zip codes into five equal cohorts by average TME, and then examined the income profile of the zip codes in each TME cohort. The results by region varied, with the regions with the strongest relationship between level of commercial health care spending and income being Regions 3, 4 and 5.

IV. PROVIDER PERFORMANCE

A. Quality Analysis

We reviewed numerous measures of provider quality to: (1) assess how Massachusetts providers perform on quality compared to one another and to their national peers; (2) determine whether differences in quality performance adequately explain differences in prices paid by insurers to providers; (3) compare quality performance of AQC providers versus non-AQC providers; and (4) evaluate whether certain types of provider organizations are better able to coordinate patient care.

1. Data Reviewed

We reviewed publicly available quality data from state and national government and non-profit organizations that are well-vetted and widely accepted. For measures of hospital quality, we reviewed Centers for Medicare and Medicaid Services (CMS) process, mortality and patient experience scores and the Massachusetts Data Analysis Center (Mass-DAC) mortality rates for cardiac procedures. For physicians, we reviewed information published by the Massachusetts Health Quality Partners (MHQP), including National Committee for Quality Assurance's Healthcare Effectiveness Data and Information Set (HEDIS) process measures and the Ambulatory Care Experiences Survey (ACES) patient experience measures.

a. CMS Hospital Quality Measures

CMS collects and publicly reports various quality measures. We downloaded the December, 2010 dataset of CMS measures from the CMS website. We calculated the straight line average of the patient experience measures for each hospital.

We then calculated a normalized and weighted average of the process measures reported by CMS for each hospital using indirect standardization. We first calculated a normalized score for each measure for each hospital by dividing each score by the statewide average score for that measure. For each hospital, we then calculated the average (mean) hospital normalized performance, weighted by the number of observations for each measure. The result is an actual-to-expected ratio that measures each hospital's performance as adjusted for the types of patients it treats. A ratio of 1.0 indicates that the hospital performs at the MA average. A ratio greater than 1.0 is better than expected, and a ratio less than 1.0 is worse than expected.

We also examined CMS mortality rate data for heart attack, heart failure and pneumonia. The data downloaded reflect measurements for April, 2009 through March, 2010. The CMS patient experience measures included in the calculation are:

- Percent of patients who reported that their nurses "Always" communicated well.
- Percent of patients who reported that their doctors "Always" communicated well.
- Percent of patients who reported that they "Always" received help as soon as they wanted.
- Percent of patients who reported that their pain was "Always" well controlled.

- Percent of patients who reported that staff “Always” explained about medicines before giving it to them.
- Percent of patients who reported that their room and bathroom were “Always” clean.
- Percent of patients who reported that the area around their room was “Always” quiet at night.
- Percent of patients at each hospital who reported that YES, they were given information about what to do during their recovery at home.
- Percent of patients who gave their hospital a rating of 9 or 10 on a scale from 0 (lowest) to 10 (highest).
- Percent of patients who reported YES, they would definitely recommend the hospital.

The CMS process measures included in the calculation are:

- SCIP CARD 2 – Percent of patients on beta blockers who were kept on beta blockers perioperatively
- SCIP INF 1 – Percent of surgery patients who were given an antibiotic at the right time (within one hour before surgery) to help prevent infection
- SCIP INF 2 – Percent of surgery patients who were given the right kind of antibiotic to help prevent infection
- SCIP INF 3 – Percent of surgery patients whose preventive antibiotics were stopped at the right time (within 24 hours after surgery)
- SCIP INF 6 – Percent of surgery patients needing hair removed from the surgical area before surgery, who had hair removed using a safer method (electric clippers or hair removal cream – not a razor)
- SCIP INF 9 – Percent of surgery patients whose urinary catheters were removed on first or second day after surgery
- SCIP VTE 1 – Percent of surgery patients whose doctors ordered treatments to prevent blood clots after certain types of surgeries
- SCIP VTE 2 – Percent of patients who got treatment at the right time (within 24 hours before or after their surgery) to help prevent blood clots after certain types of surgery
- AMI 1 – Percent of Heart Attack Patients Given Aspirin at Arrival
- AMI 2 – Percent of Heart Attack Patients Given Aspirin at Discharge
- AMI 3 – Percent of Heart Attack Patients Given ACE Inhibitor or ARB for Left Ventricular Systolic Dysfunction (LVSD)
- AMI 4 – Percent of Heart Attack Patients Given Smoking Cessation Advice/Counseling
- AMI 5 – Percent of Heart Attack Patients Given Beta Blocker at Discharge
- AMI 7a – Percent of Heart Attack Patients Given Fibrinolytic Medication Within 30 Minutes Of Arrival
- AMI 8a – Percent of Heart Attack Patients Given PCI Within 90 Minutes Of Arrival
- PN 2 – Percent of Pneumonia Patients Assessed and Given Pneumococcal Vaccination
- PN 3b – Percent of Pneumonia Patients Whose Initial Emergency Room Blood Culture Was Performed Prior To The Administration Of The First Hospital Dose Of Antibiotics
- PN 4 – Percent of Pneumonia Patients Given Smoking Cessation Advice/Counseling
- PN 5c – Percent of Pneumonia Patients Given Initial Antibiotic(s) within 6 Hours After Arrival
- PN 6 – Percent of Pneumonia Patients Given the Most Appropriate Initial Antibiotic(s)

- PN 7 – Percent of Pneumonia Patients Assessed and Given Influenza Vaccination
- HF 1 – Percent of Heart Failure Patients Given Discharge Instructions
- HF 2 – Percent of Heart Failure Patients Given an Evaluation of Left Ventricular Systolic (LVS) Function
- HF 3 – Percent of Heart Failure Patients Given ACE Inhibitor or ARB for Left Ventricular Systolic Dysfunction (LVSD)
- HF 4 – Percent of Heart Failure Patients Given Smoking Cessation Advice/Counseling

b. Mass-DAC CABG and Mass-DAC PCI

Mass-DAC was established under Massachusetts law to collect and analyze data on cardiac procedures (CABG and PCI). Their data collection and risk-adjustment methods are considered among the most thorough and rigorous available. We obtained Mass-DAC data for multiple years from the Mass-DAC website, www.massdac.org. We used Mass-DAC's standardized mortality incidence rates (SMIRs) for bypass surgery (CABG) and percutaneous coronary intervention (PCI) with no alteration.

c. MHQP Data

MHQP collects and publicly reports various physician quality measures. From MHQP, we obtained HEDIS process measures reflecting care rendered in 2009 by 150 physician groups (obtained from www.mhqp.org in April 2011). We obtained patient experience data from the ACES survey fielded in 2009 rating 490 adult or pediatric practices (obtained from www.mhqp.org in December 2010). The twenty-four MHQP HEDIS process measures included in our analysis are:

- Colorectal cancer screening
- Appropriate imaging for low back pain
- Spirometry testing for chronic lung disease
- Depression management – short-term and long-term medication management
- Medication management for ACEI/ARBs, anticonvulsants, and diuretics
- Appropriate asthma medication use for children and for adults
- Cholesterol testing for patients with heart disease
- Diabetes care – HgA1c testing, cholesterol testing, and tests for kidney function
- Well child visits for ages birth to 15 months, 3-6 years, and 12-21 years
- Correct antibiotic use for upper respiratory infections
- Correct testing for pharyngitis
- Follow up with children starting medication for ADHD
- Breast cancer screening
- Cervical cancer screening
- Chlamydia screening for ages 16-20 and 21-24

We calculated a normalized score for each group on each measure by dividing its score by the statewide average. We then created an overall HEDIS process score for each medical group by averaging the normalized score of each group on each measure. Whenever a physician

group was composed of multiple subgroups, we averaged the scores of each subgroup together to yield the score for the group.

We created additional sub-scores for each group. We calculated performance scores for each group for the MHQP HEDIS measures (1) that are included in the BCBS AQC incentive plan, (2) that are not included in the AQC, and (3) for a subset of measures our expert judged likely to be related to the degree of care coordination performed by a physician group ("care coordination measures"). Since high performance on some measures requires coordinated activity across specialties or over time, these were selected as the care coordination measures:

- Colorectal cancer screening
- Depression management – long-term medication management
- Medication management for ACEI/ARBs, anticonvulsants, and diuretics
- Diabetes care – HgA1c testing, cholesterol testing, and tests for kidney function
- Breast cancer screening
- Cervical cancer screening

The MHQP ACES patient experience measures included in our analysis are:

- How well doctors communicate with patients
- How well doctors know their patients
- How well doctors give preventive care and advice
- Getting timely appointments, care and information
- Getting quality care from other doctors and nurses in the office
- Getting quality care from staff in the doctor's office

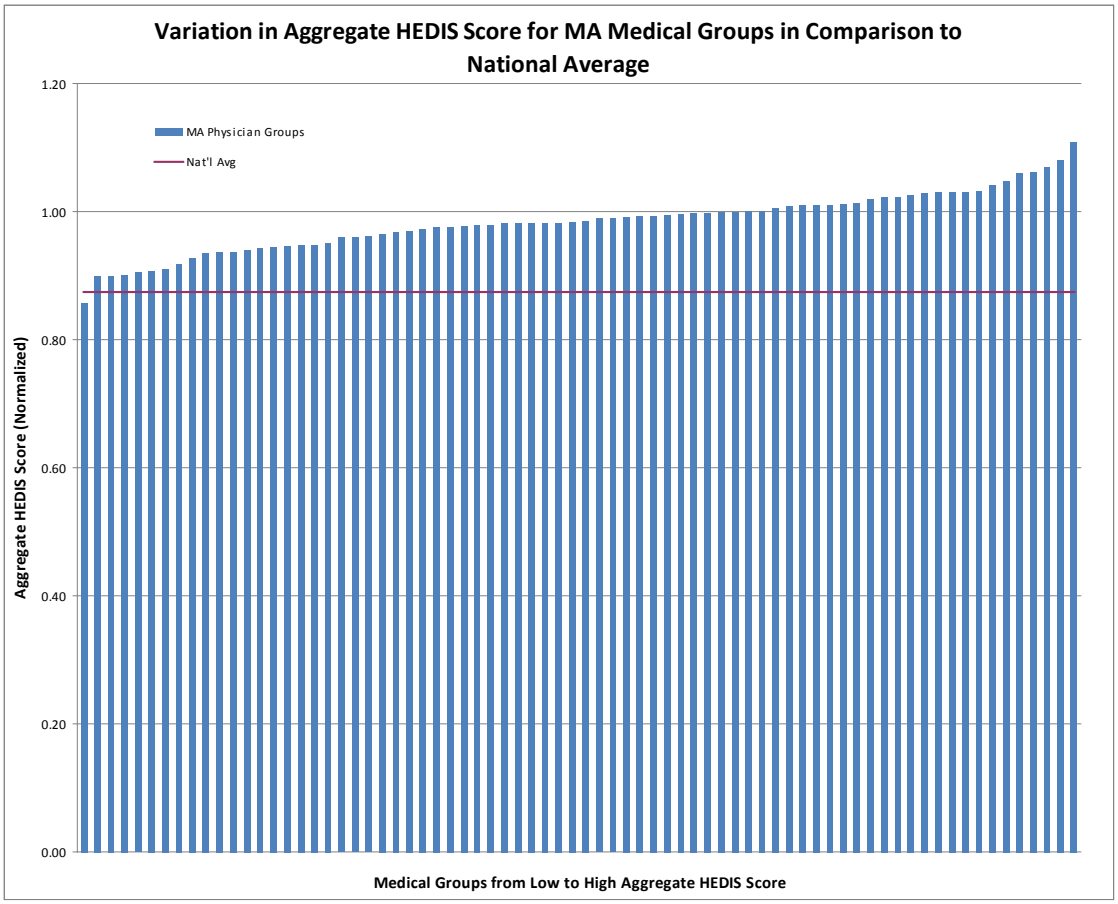
For ACES, rather than reporting a direct performance score, MHQP reports each group's rating as earning one through four stars, based on how it compares to other MA groups. One star indicates performance in the bottom 15% of groups (i.e., performance is below that of at least 85% of the other groups). Two stars indicate performance above the 15th but below the 50th percentile. Three stars indicate performance above the 50th but below the 85th percentile. Four stars indicate performance above the 85th percentile (i.e., in the top 15%).[6]

2. Quality Performance of Massachusetts Providers

First, our review of quality data shows that providers in Massachusetts generally deliver high quality care with little material variation in measured quality. While there are nuanced differences in provider quality measures, and room for improvement in certain areas of performance, no provider is uniformly better or worse than the others. Various health care entities that we spoke with agree that there is little difference in quality between providers.

[6] The exception to this scoring system is for the communication measure, where according to MHQP "[c]utpoints are not drawn at the 15th, 50th, and 85th percentiles. Because statewide performance on communication was so consistently high, for example, 93% of practices statewide achieved performance at or above 90 points on communication. Therefore for communication, cutpoints were drawn based on absolute thresholds (80, 90, and 95 points, respectively) rather than percentiles." http://www.mhqp.org/quality/pes/pesTechApp.asp?nav=031638.

In order to analyze provider performance on MHQP HEDIS process measures and ACES patient experience measures, we compared groups at the network level (that is, rolled up to the contracting entity level such as Atrius Health or Partners Health Care) wherever applicable and analyzed the data as described above. For physician organizations comprising multiple sub-groups, we used an unweighted average of sub-group scores to arrive at an overall group score. Below is a graph showing physician group aggregate performance on HEDIS measures. All but one provider performed above the national average, and most groups are tightly clustered with similar performance near the state average of 0.98.

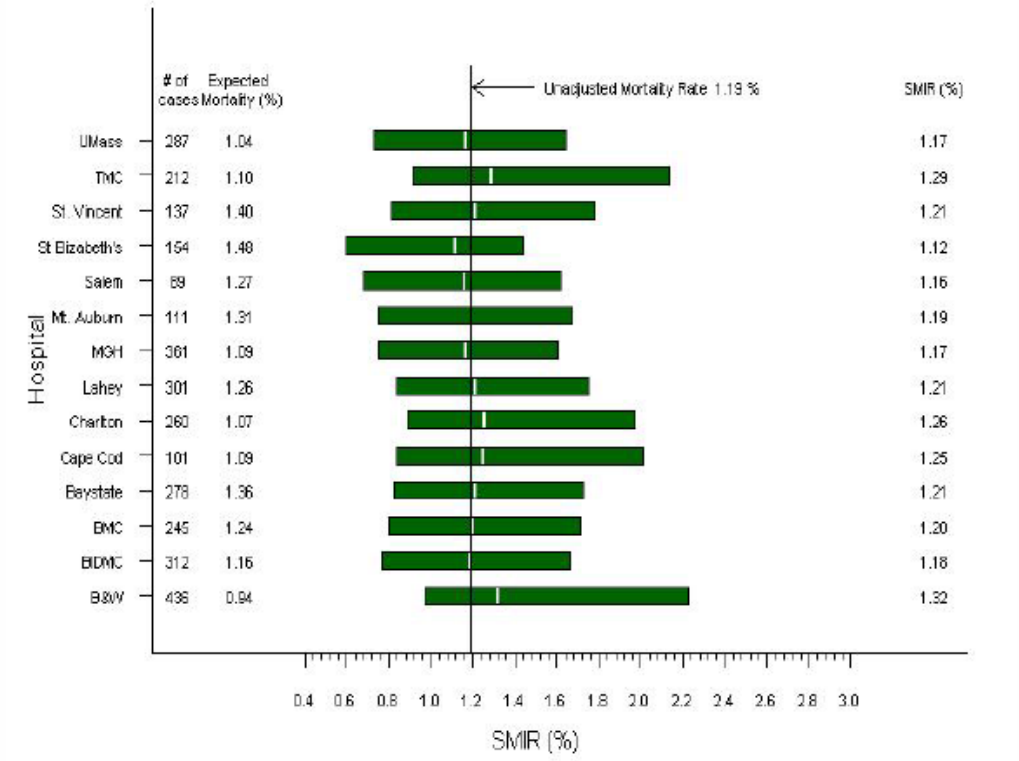


ACES physician group star ratings data must be interpreted differently from HEDIS data for two key reasons. First, there is no national average available for comparison. Second, MHQP reports ACES data by percentile or relative performance, effectively forcing there to be approximately 15% of groups to have the lowest score (one star) and 15% of groups to have the highest score (4 stars). Therefore, we focused on how the larger groups, comprised of multiple sub-groups, performed in comparison to each other and to the state average. We found that the large groups were clustered near the average performance. Although large groups comprised approximately half of all groups, no large group was in the top or bottom 5% of all groups. The middle of the distribution is dominated by these large groups, which overall perform near the state average. Further, the amount of variation within the large groups is similar to that of the variation of all groups in the state. These findings indicate that no large group is consistently better or worse than average. We hope to further explore these findings with additional detail provided by MHQP.

Mass-DAC has reported cardiac outcomes from 2002 to 2009. While the state average mortality rate for heart bypass surgery (CABG) has declined 45% over the eight years of reports, only two 2 hospitals were ever noted to have above average mortality. None have had below average mortality. Mass-DAC PCI (percutaneous coronary intervention) data for 2009 indicates that no hospital (of 14) is better or worse than average for elective (non-emergency) PCI, but one hospital (of 22) was worse than average for emergency PCI. Over the years of reporting, the average mortality rates for PCI have also declined. For elective PCI over the past seven years, only once has a hospital been different than average. This suggests remarkably consistent performance across hospitals over time. Although more variability is seen in the mortality rates for emergency PCI (6 outliers over 7 years), this still suggests that the vast majority of hospitals are indistinguishable from average, year after year. Further, each hospital that was ever an outlier for any of these three procedures was an outlier for that procedure only once. Over time, based on the Mass-DAC data, no hospital has been consistently above or below average for CABG or PCI. Below is one sample Mass-DAC graph showing that (1) the mortality rate for all MA hospitals (indicated by the white line within the green bars) are closely clustered and (2) the likely range of performance (as indicted by the green bars) all show considerable overlap, suggesting that any real differences in mortality rate between hospitals is unlikely.

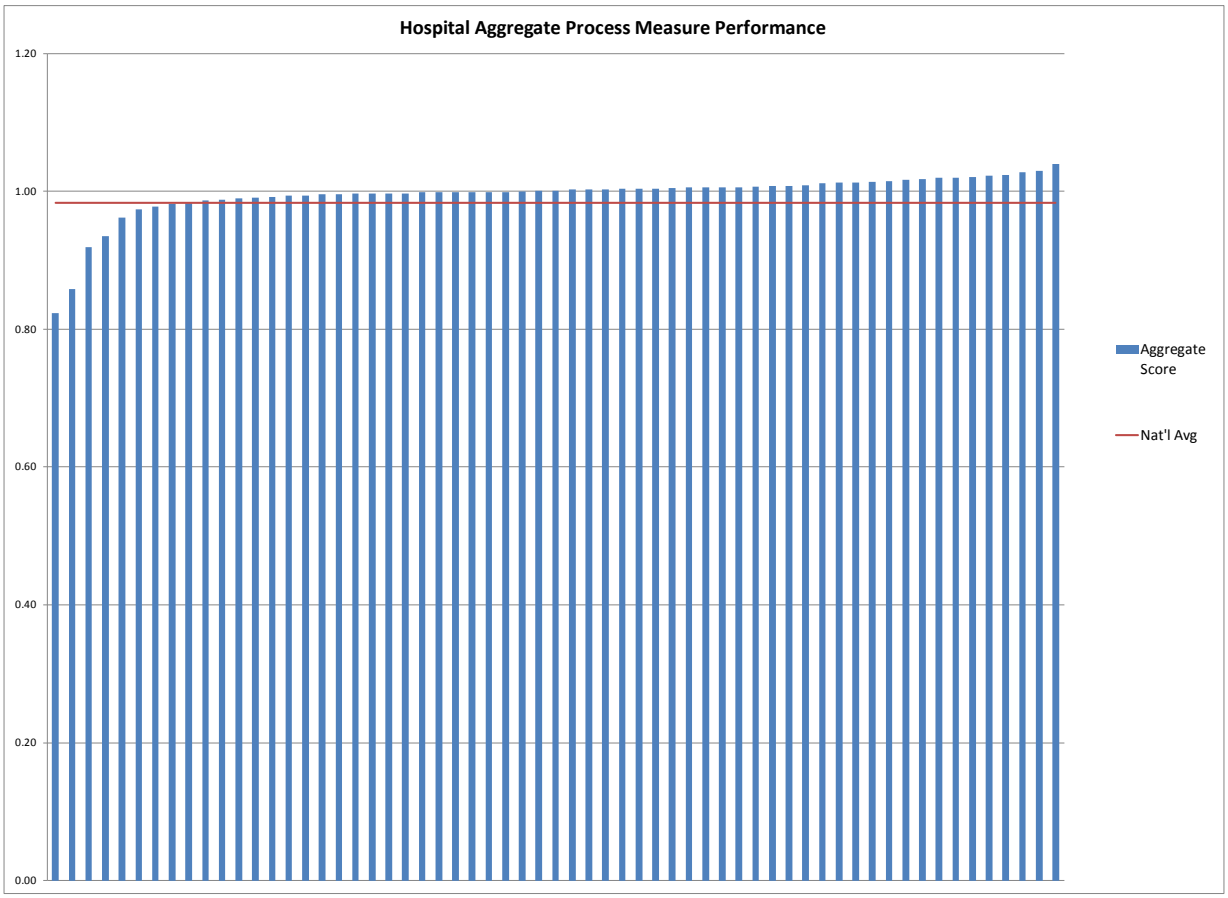
Figure 7.1: *Ninety-Five Percent Posterior Intervals for Standardized 30-Day Mortality Incidence Rates (SMIRs) Following Isolated CABG Surgery in Massachusetts: Oct 1, 2008–Sep 30, 2009*

# of cases refers to the number of isolated CABG surgery admissions; expected mortality is the percentage of cases expected to die given the case mix of the patients treated in the hospital. The white vertical line in each box is the hospital's SMIR while the black vertical line denotes the unadjusted Massachusetts 30-day mortality rate of 1.19%.



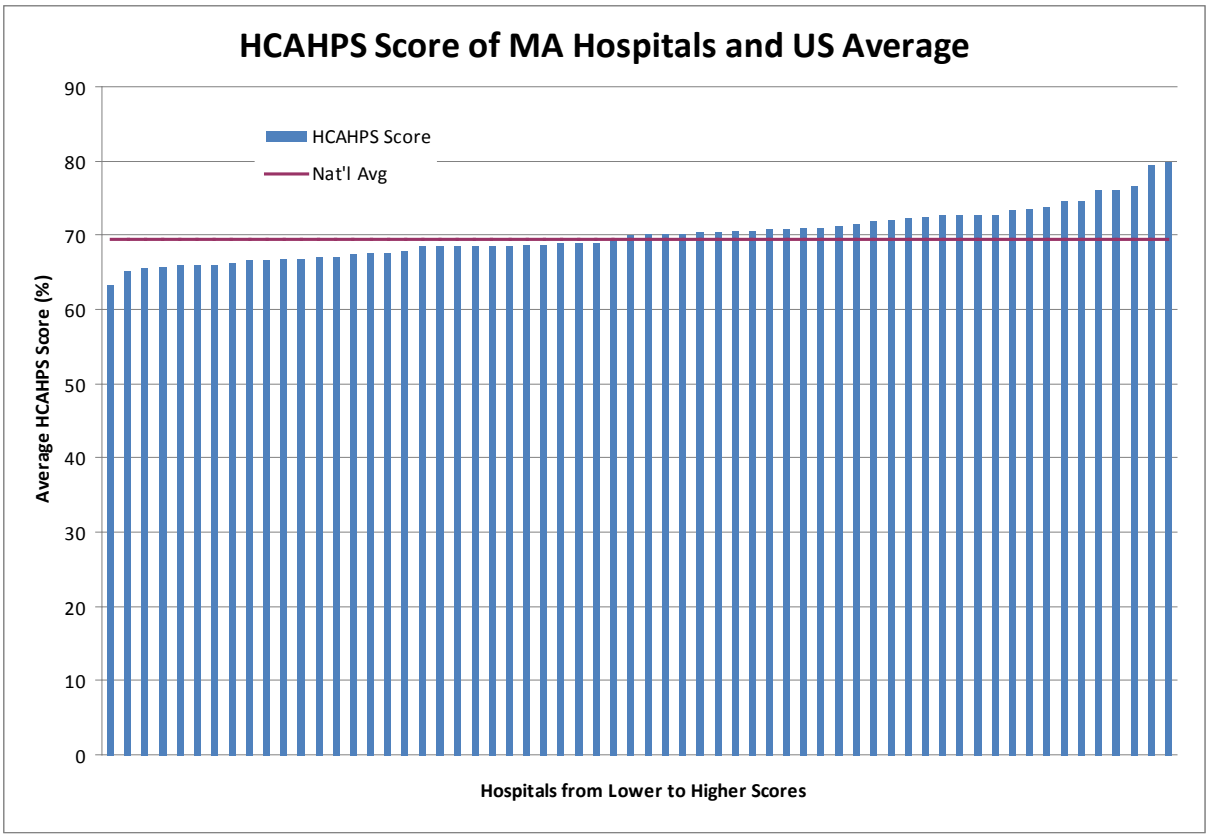
Source: http://www.massdac.org/sites/default/files/reports/CABG%20FY2009.pdf, page 25.

Using CMS hospital data for mortality, patient experience, and process measures, we evaluated the performance of MA hospitals. We created a composite weighted and case-mix adjusted performance score for 61 MA hospitals using the results of 24 process measures listed above. As shown in the graph below, only 8 of 61 hospitals (13%) were below the national average performance on these measures. Three of these hospitals were statistically below the state average performance level.



We also compared MA hospitals to the national average for mortality rates for heart failure, heart attack and pneumonia. We again found that the large majority of Massachusetts hospitals' mortality rates were better than the national average (69% of hospitals for heart attack, 73% for heart failure, and 75% for pneumonia). Greater variability was seen in the mortality rates than the process measures. In the most extreme example, the highest mortality rate for pneumonia (15.1%) was 107% higher than the lowest mortality rate (7.3%). The highest mortality rates for heart attack and heart failure were 71% and 63% greater than the lowest rates, respectively.

We examined CMS' patient experience data, HCAHPS. HCAHPS is the measure where Massachusetts hospitals had the lowest relative performance in comparison to the national average. As shown in the graph on the following page, only a slight majority (52%) of MA hospitals had average HCAHPS scores above the national average. Most hospitals were clustered near the state average of 70.2%.



3. Comparison of Prices Paid to Providers and Quality of Care

Next, we found that variations in prices paid by insurers to providers cannot be adequately explained by variations in quality of care provided. We compared hospital performance on the quality measures to the relative prices paid to them by three major MA health insurers. The results are summarized in the table below.

Correlation (Coefficient of Determination, R^2) of Hospital Relative Prices Versus Quality Performance

Quality Measure	Health Insurer		
	BCBS	HPHC	THP
CMS Process Measures Composite	0.152*	0.047	0.186*
Heart Attack Mortality	0.097	0.079	0.073
Heart Failure Mortality	0.031	0.000	0.010
Pneumonia Mortality	0.054	0.071	0.075
HCAHPS Composite	0.166	0.064	0.114
Mass-DAC Mortality Rate for CABG	0.003	0.014	0.022
Mass-DAC Mortality Rate for PCI without Shock or STEMI	0.354*	0.255*	0.207*
Mass-DAC Mortality Rate for PCI with Shock or STEMI	0.008	0.063	0.000

*These comparisons show a negative correlation with an R^2 of at least 0.100.

If quality were rewarded through the prices paid to hospitals, we would expect to see a positive correlation – that is, higher prices associated with better quality scores. Instead, we found either no correlation or a negative correlation, where higher prices were associated with lower quality. For 17 of the 24 comparisons (71%), the coefficient of determination was less than 0.10, indicating no or minimal correlation. For just two of the comparisons (8%), we found a positive relationship between prices and performance. Both of these were for HCAHPS patient experience. However, for 5 of the comparisons (21%), we found a negative correlation, where the better paid hospitals had worse performance than the lesser paid hospitals.

These results suggest that health insurers do not pay hospitals on the basis of quality of care, a finding which was corroborated in testimony from health insurers and hospitals. Thus, existing payment disparities cannot be justified on the basis of rewarding quality.

Similarly, we compared physician performance on the quality measures to the relative prices paid to them by three major MA health insurers. These results are summarized in the table below.

Correlation (Coefficient of Determination, R^2) of Physician Relative Payments Versus Quality Performance

Quality Measure	Health Insurer		
	BCBS	HPHC	THP
HEDIS Average to Expected Combined Score	0.44	0.29	0.30

For physicians, we sought to compare HEDIS process measures to physician relative payment information. We used the normalized MHQP HEDIS process quality scores for 150 physician groups in Massachusetts, as described above. In order to compare the price paid by health insurers to the quality score as published by MHQP, we first needed to identify which MHQP provider names align with which health insurer provider names. While we used our best efforts to line up the groups, naming conventions and physician grouping vary significantly from payer to payer, and between each payer and MHQP. Therefore, we were unable to compare all MHQP physician group quality scores to all health insurer physician group payments. These limitations underscore the need for a transparent, uniform set of quality measures for physician groups that enables consumers, health insurers, policy makers, and others to determine whether and to what extent quality performance is related to reimbursement.

After matching the physician group names to the best of our ability based on expert input, we compared the groups' quality performance (on the HEDIS aggregate measure) to the relative payments each received from the three major health insurers. We found a moderate positive correlation between payment and quality for all three plans. This replicates our finding from the 2010 report, and indicates that there is an association between payments and performance on HEDIS process of care measures.[7]

[7] Our data are insufficient to determine whether the higher payments are a reward for better quality performance or whether higher payment rates enable physician groups to build the infrastructure needed for success on the process measures. Based on our interviews with stakeholders, the health insurers have not consistently paid more to physician groups on the basis of quality performance. Thus, this finding may indicate that physician groups that receive higher prices apply some of their increased payments to achieve higher HEDIS scores, presumably through

4. Comparison of AQC and Non-AQC Provider Performance on HEDIS Measures

Our review found that AQC providers did not have statistically better performance than non-AQC providers on HEDIS process measures in 2009. 16 of 24 ambulatory quality measures in the AQC contract are publicly available HEDIS process measures. We examined the performance of physician groups on HEDIS process measures to see if groups participating in BCBS AQC in 2009 performed differently than those who were not participating in the AQC in 2009. We analyzed two different sets of HEDIS measures. First, we examined performance on the full set of available HEDIS process measures. Next, we examined performance on the subset of 16 HEDIS measures that are included in the performance incentive program of the AQC.

Note that HEDIS measures do not distinguish between different health insurer members; in other words, HEDIS reflects a physician group's performance on quality as it relates to *all* of the members treated by that physician group, and does not distinguish the BCBS members as opposed to members of other health plans. We spoke with multiple provider groups, all of whom indicated that they do not treat their patients differently depending on who insures their patients. As a result, we believe it is appropriate to use HEDIS measures to review BCBS physician group performance.

As described above, we normalized each available HEDIS score as follows. First, we calculated a statewide performance average by taking the mean score of all groups for each measure. We then converted each group's score to a normalized score by dividing its score by the state average for the measure. The resulting normalized scores average 1.0, with higher scores indicating better performance and lower scores indicating worse performance. For groups that consist of subgroups, we averaged the performance of all subgroups in the group, for each measure.

Next, we segregated those HEDIS process measures which are included in the AQC incentive plan ("AQC measures") from those that are not included in the AQC ("non-AQC measures"). We averaged each physician group's performance across the AQC measures and the non-AQC measures. We then compared the average normalized performance of the groups participating in the AQC to that of the groups not participating in the AQC. We report the differences in average score, and apply a 2-sided t-test for statistical significance.

Overall, our examination shows that AQC groups perform similarly to non-AQC groups on the HEDIS process measures in 2009. Looking at the 16 measures included in the AQC incentive program, the AQC groups' performance trended toward being better than non-AQC groups, but the difference was not statistically significant (actual-to-expected average score of 1.013 vs 0.978, p=0.08). Similarly, the AQC groups did not have statistically different performance than non-AQC groups on the measures not included in the AQC incentives (1.004 vs. 0.981, p=0.55).[8]

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better care of their patients or through improved documentation, while providers with lower prices have fewer resources to provide a comparable infrastructure to support providing and documenting higher quality of care.

[8] AQC groups did not do better on the AQC measures compared to the non-AQC measures (1.013 vs. 1.004, p=0.66), nor did the non-AQC groups do differently on the AQC measures vs. the non-AQC measures (0.978 vs. 0.981, p=0.54).

5. Analysis of Process Measures Related to Coordination of Care

Finally, the 2011 Report found that a variety of provider organizational models can deliver high-quality, coordinated care. There is no single or nationally recognized composite measure used to evaluate whether a provider coordinates patient care. HEDIS does not explicitly measure care coordination, but for many measures, performance is dependent upon coordinated care across specialties or over time. We created a care coordination subset metric by aggregating scores for 8 of the 24 available HEDIS measures that we judged to be most dependent upon care coordination. For example, we included colorectal cancer screening since it typically requires coordination between primary care and a gastroenterologist, breast cancer screening since it requires coordination between primary care and radiology, and long-term medication management in depression since it requires at least longitudinal monitoring by the PCP if not also coordination with a behavioral health specialist. Other measures included were screening for cervical cancer, yearly follow up for certain medications (anti-convulsants, ACEI/ARBs, and diuretics) and comprehensive diabetes care (HgA1c testing, cholesterol testing and testing for kidney disease).

To compare a subset of providers on these HEDIS measures, we created a composite HEDIS care coordination score for each physician group using these 8 measures. As we did with the other HEDIS composites used in our analyses, we normalized each score and averaged the 8 normalized scores for each group. For provider organizations comprising multiple provider groups, we used an unweighted average of sub-groups to arrive at an overall group average.

We reviewed the performance of 16 physician groups on both overall HEDIS measures and the care coordination subset. We compared the scores based on organization size (as measured by health insurer member months), whether the organizations were physician or hospital-based and whether the organization is part of a corporately integrated health system. We found that the performance of the 16 groups varied independently of these organizational characteristics. For example, the largest groups among the 16 perform similarly to the smallest of the groups for both overall HEDIS and the care coordination subset. Those groups that are organized as integrated health systems, where physicians, acute hospitals and sub-acute facilities are within the same corporate entity, similarly were not significantly different from their peers in performance, nor was any significant difference seen between groups that were physician-based versus hospital-based. We conclude that groups can succeed despite variation in size, structure (physician or hospital based), or legal structure (independent practice or corporately integrated health system).

B. Utilization Analysis

We found that utilization data provided by one major health insurer showed, on select measures, slightly lower rates of utilization by patients associated with the insurer's at-risk providers compared to patients associated with the insurer's non-risk providers. With expert assistance, we identified utilization measures currently tracked by health plans that we expect would be affected by the provider's degree of care coordination, including: (1) the number of medical and surgical inpatient facility admissions (coordinated care should result in a reduction of these types of inpatient admissions); (2) the ratio of emergency department (ED) use to

primary care provider (PCP) use (care coordination should result in a reduction of this ratio); and (3) the ratio of specialty care physician (SCP) use to PCP use (care coordination should result in a reduction of this ratio).

One health plan provided us with information on these utilization metrics for most providers in its network. We calculated each provider's total medical and surgical admissions per 1,000 members, and then divided that by each provider's DxCG score to obtain the health status adjusted rate of medical and surgical inpatient facility admissions for each provider. We also compared each provider's number of ED encounters to PCP encounters, and SCP encounters to PCP encounters.

We then compared the providers' scores on these three utilization metrics with their TME. We also compared whether at-risk providers (as identified by the insurer) had utilization scores that were different than providers identified by the insurer as non-risk. We found that on these three metrics, at-risk groups had slightly lower utilization than non-risk groups. However, we did not find that lower utilization correlated with lower TME.

V. PATIENT POPULATION RELATED DATA

The 2011 Report provides certain observations regarding the characteristics of the Massachusetts health care marketplace by examining: (1) the morbidity of patients whose care is reimbursed through global risk contracts; (2) the proportion of commercial patients whose care is reimbursed through global risk contracts; (3) the proportion of commercial patients in PPO and other plans that do not require designation of a PCP; and (4) where patients are obtaining health care services.

A. Morbidity of Patients Whose Care is Reimbursed through a Global Risk Contract

Our examination found that risk providers in Massachusetts have served populations that are relatively healthy. Using the physician group global risk designations provided by each health insurer, we identified each provider as either a global risk or non-global risk provider, by insurer, for each calendar year. Data was available for 2005 through 2009 for HPHC and THP and for 2008 and 2009 for BCBS. We then calculated a weighted average DxCG risk score for the risk and non-risk provider cohorts in each year for each health insurer using corresponding member months as weights.

B. Proportion of Commercial Patients Whose Care is Reimbursed through a Global Risk Contract

We found that less than one quarter of commercial patients in Massachusetts have their care reimbursed through global payments. Using the physician group global risk designations provided by each health insurer for 2010, the most recent year available to us, we identified each provider as either a global risk or non-global risk provider, by insurer. BCBS and THP provided us with member month data for the precise population at risk with each global risk group in 2009. From HPHC, we had information regarding the total number of members associated with each physician group (both fully-insured and self-insured members), as opposed to just those

members whose care was reimbursed through a global risk contract. We used the overall 2009 HMO/POS percentage of HPHC fully-insured membership to approximate the number of members at risk for each provider in the HPHC network with a global risk contract. Using 2009 member months and 2010 risk designations, we calculated the approximate percentage of at-risk members in each insurer's commercial network based on 2010 risk designations.

C. Proportion of Commercial Patients in PPO and Other Plans That Do Not Require Designation of a PCP

The 2011 Report found that over 40% of the commercial membership at the three major health insurers is enrolled in PPO, indemnity, and other plans that do not require designation of a PCP. Each of the major health insurers filed written testimony in advance of the hearings with data on their membership by product from 2005 through 2010. BCBS and HPHC filed this information based on members, while THP filed this information based on member months.

D. Patient Site-of-Service Analysis

We analyzed the site-of-service for hospital inpatient admissions for physician groups in global risk contracts. The 2011 Report found that many HMO patients obtain care outside of the four walls of their physician group, and often from providers who have no relationship with their physician group.

For this study we looked at two provider groups that have been globally paid for a number of years, and three groups that converted to global payments under BCBS's AQC contract in 2009. Using standard reports published by BCBS that show the location of inpatient admissions for the population assigned to each provider group, we looked at the location of medical, surgical and maternity inpatient admission expenses combined, as well as maternity expenses separately.

For all five provider groups, we analyzed the community hospital that is a party to the global risk arrangement and designated that hospital as the "home hospital." In each case, the home hospital offered the full range of medical, surgical, and maternity inpatient services. We excluded pediatrics and psychiatric admissions since not all of the "home hospitals" offered those services.

For the years 2008 and 2009, we reviewed the percentage of total revenue associated with medical, surgical, and maternity inpatient admissions at the home hospital versus other community hospitals and academic medical centers. For the purposes of this analysis, Beth Israel Deaconess Medical Center, Brigham and Women's Hospital, Massachusetts General Hospital, Tufts Medical Center, Boston Medical Center, and Children's Hospital were considered academic medical centers. All other hospitals were considered "other" community hospitals. We reviewed the percentage of medical, surgical, and maternity inpatient admissions at other community and academic hospitals as well as the change in admissions from 2008 to 2009.