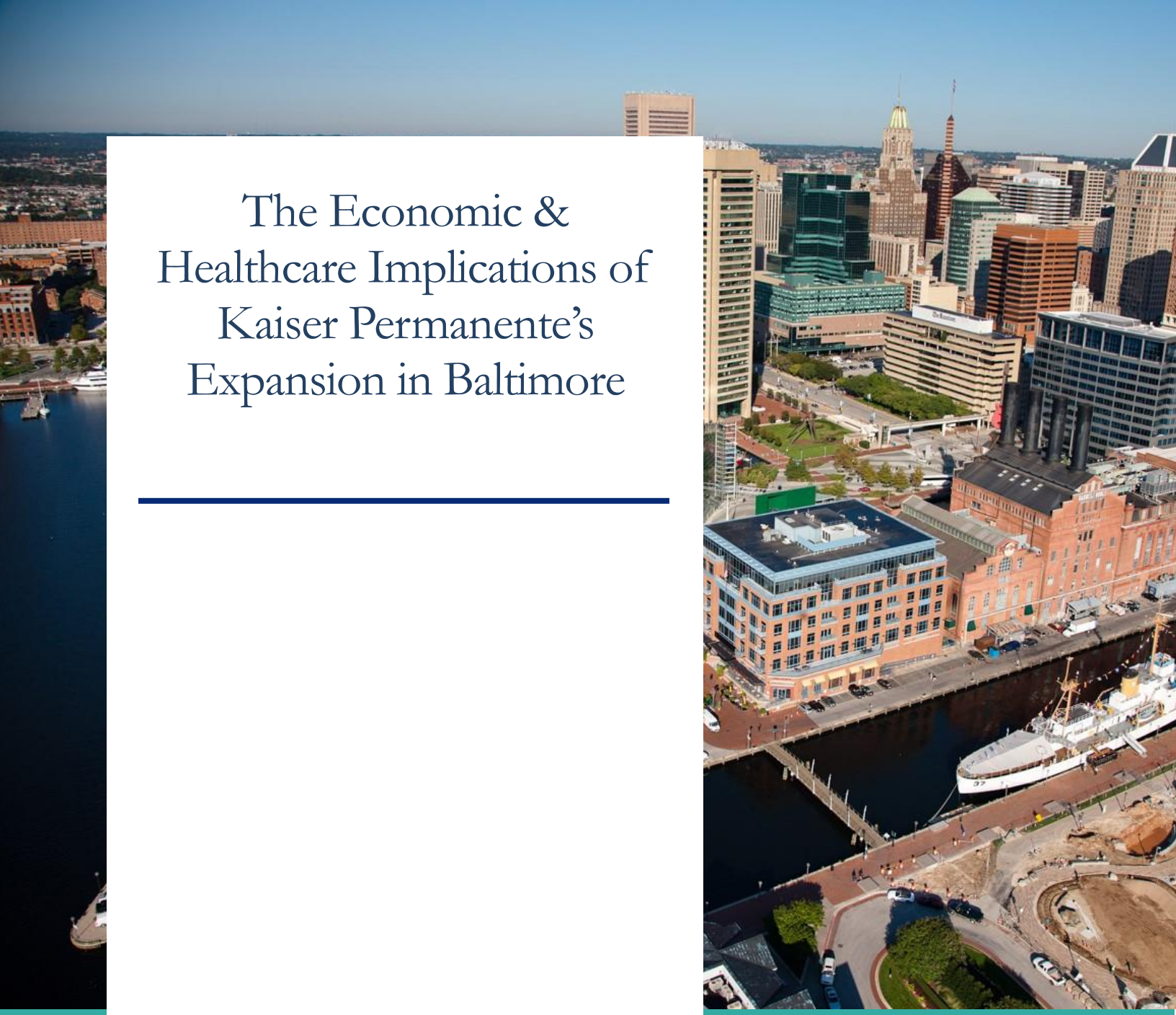

The Economic & Healthcare Implications of Kaiser Permanente's Expansion in Baltimore

JULY 2019

Sage Policy Group, Inc.
Commissioned by: Kaiser Permanente

Sage Policy Group, Inc.

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Executive Summary

Improving Quality by Adding People to the Best Performing Health Plans

When the Affordable Care Act was passed in 2010, the underlying objective was to provide more people with timely access to healthcare by expanding the number of people with insurance. According to the U.S. Department of Health and Human Services, an estimated 20 million people gained health insurance coverage between the passage of the law and early 2016, including 6 million previously uninsured young adults.[1]

Expanded access says little about the quality of care being delivered, however. In order to improve quality, policymakers have pursued a number of initiatives, including pay-for-performance measures. For instance, the Affordable Care Act authorizes Medicare to reduce payments to acute care hospitals associated with excess numbers of readmissions. The program focuses on patients who are readmitted for specific high-cost or high-volume conditions and procedures, including hip/knee replacement and heart failure.[2]

Maryland's Health Services Cost Review Commission (HSCRC) has also aggressively used pay-for-performance measures, including through its Quality Based Reimbursement (2009) and Maryland Hospital Acquired Conditions (2011) initiatives. The State is also using global payment systems in an attempt to improve population health outcomes.

But imagine a marketplace in which people simply moved into better performing, higher quality health plans resulting in improved health outcomes while boosting efficiency. In other industries, this movement toward quality is presumed. For instance, people are likely to disproportionately choose safer automobiles or airlines with better on-time records.

In those instances, however, there is an abundance of highly publicized data that allows consumers to shift their utilization to better performers. Perhaps because of their complexity, data pertaining to healthcare outcomes and quality appear to be less frequently utilized. This report focuses on the economic and healthcare impacts associated with shifting people into Kaiser Permanente of the Mid-Atlantic States (KPMAS), which is set to dramatically expand its presence in Central Maryland and is one of the nation's top-performing health plans (effectively in the top two percent of all health plans in America).

[1] "20 million people have gained health insurance coverage because of the Affordable Care Act, new estimates show," HHS.gov, Press Release, March 3, 2016.
[2] "Linking quality to payment," Medicare.gov. https://www.medicare.gov/HospitalCompare/linking-quality-to-payment.html.

Kaiser Permanente's Unique Model of Healthcare Delivery and Finance

Unlike traditional insurance companies, Kaiser Permanente (KP) is both a health plan and healthcare provider. As the largest nonprofit health system in the country and with its innovative model that combines healthcare and coverage, KP produces opportunities for synergies and efficiencies that set it apart from other entities.

Relative to the market in the Mid-Atlantic region as a whole, KPMAS is significantly more cost-effective, devoting a smaller share of health plan premium dollars to administrative activities and a larger share to direct patient services than the typical health insurance company. This cost effectiveness carries over to the delivery of healthcare services, where KPMAS generates premium savings for its members that average more than $1,200 annually. These savings result from various sources including cost-effective management of chronic health conditions, prescription drug cost management, and coordination of care that eliminates duplicative medical tests and lab work.

This cost effectiveness combined with a fully integrated delivery system including the largest multi-specialty medical group in the region and the world's largest private electronic health record system creates opportunities for improving population health. Based on independent studies and leading industry surveys regarding quality of care and patient satisfaction, KPMAS routinely outperforms other providers and health plans. On some of the broadest measures of healthcare—quality of doctors, care received, and robustness of health plans—KPMAS outperforms more than 90 percent of the marketplace in the Mid-Atlantic region.

Coming Soon: Enhanced Access to KPMAS's Efficient and Effective Health Model in Baltimore

Kaiser Permanente is a unique healthcare organization in the Greater Baltimore Region, providing fully integrated healthcare and coverage to its members and patients. To fulfill its mission of improving the health of its members and the communities it serves, KPMAS is committing to a major regional expansion. Through investments and expenditures expected to total over $13 billion by 2028, the organization expects to provide care and benefits to more than 200,000 people, increasing its current 2.5 percent market share to 8 percent by 2025.

The investment includes hundreds of millions of dollars in new and improved facilities. KPMAS's plan to achieve this goal—the Baltimore Strategy—encompasses a multifaceted approach of enhanced access to KPMAS medical providers, competitive pricing, and other strategic elements. The realization of this strategy will transform KPMAS and the Greater Baltimore Region. Here are some relevant details:

- The KPMAS annual operating expenditure on regional healthcare will more than triple between 2017 and 2028, expanding from over $500 million in 2017 to a projected $1.8 billion by 2028.
- By 2025 KPMAS expects more than 200,000 people will have direct access to its unique healthcare model, up from 63,000 people in 2012.

KPMAS's investments may also encourage additional investments by others in the regional healthcare system. These other benefits are beyond the scope of this analysis. They are, however, worthy of further investigation as they, in combination with the economic and fiscal impacts described in this report, provide a more complete assessment of the benefits of KPMAS's expanded presence in the Greater Baltimore region.

Improving Healthcare in Baltimore

KPMAS is prepared to make a significant investment in the Baltimore region. KPMAS will provide direct access to care to an estimated roughly 200,000 Marylanders. This in and of itself would be significant, but KPMAS is also ranked the second best health plan in America (out of more than 1,000) according to the National Committee for Quality Assurance (NCQA). It is one of only two commercial plans in American to receive a 5.0 rating . When the performance of KPMAS is applied to the likely characteristics of roughly 200,000 total prospective members in the Baltimore region, significant benefits are collectively enjoyed by these individuals:

- Controlling blood pressure will generate annual benefits estimated at:
    - Roughly 5,000 extra years of life for over 45,000 KPMAS members whose hypertension would be treated and controlled;
    - On an annualized basis, these added years of life would be valued at $500 million each year for these KPMAS members.
- Breast cancer screening will generate annual benefits estimated at:
    - 10.3 total avoided deaths from breast cancer for KPMAS members;
    - 163 total added years of life expectancy valued at more than $16 million.
- Better health will generate substantial workplace benefits:
    - Over 11,000 fewer days missed from work because of illness per year;
    - Over 26,000 fewer low productivity days from working while ill per year;
    - Total workplace benefits valued at almost $20 million.

These improvements in the health of KPMAS members also reduce the need for healthcare delivered at hospitals. Compared to the experience of the average Marylander, the prospective roughly 200,000 KPMAS members would require much less hospitalization and fewer visits to emergency departments of hospitals. Avoided use of these resources will likely include:

- Over 15,000 fewer days of inpatient hospital care, worth $39 million;
- 44,300 fewer emergency department visits, worth $85 million .

Economic Implications of KPMAS's Prospective Regional Expansion

While KPMAS's primary objective is to improve healthcare outcomes, KPMAS's implementation of the Baltimore Strategy will also produce substantial economic contributions to the Greater Baltimore Region. As reflected in Exhibit ES-1, between 2017 and 2028, the expansion of KPMAS in the marketplace will support approximately 193,000 job-years with the number of permanent jobs steadily increasing from around 7,600 in 2017 to more than 25,000 in 2028.

These jobs include the staff at KPMAS and its partners and collaborators (direct jobs) and workers at the businesses that supply goods and services to KPMAS and its healthcare partners (indirect jobs). This employment total also encompasses jobs in the consumer economy (induced jobs) that are supported by the spending of direct and indirect workers. These jobs are associated with approximately $11 billion in income from 2017 to 2028. Business sales associated with this economic activity will exceed $25 billion over that period.

Exhibit ES-1. Economic Impacts of Projected Investments and Expenditures in Baltimore Region, 2017-2028

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Jobs (full-time and part-time jobs)													
Direct	4,649	5,290	5,677	6,720	8,606	8,261	10,930	11,955	11,613	12,882	14,335	15,830	116,746
Indirect	1,056	1,188	1,279	1,524	2,114	1,850	2,710	2,939	2,592	2,876	3,200	3,534	26,861
Induced	1,967	2,219	2,390	2,839	3,841	3,461	4,909	5,337	4,855	5,386	5,993	6,618	49,816
Total	7,671	8,697	9,346	11,084	14,559	13,570	18,550	20,232	19,061	21,144	23,528	25,982	193,425
Income ($ millions)													
Direct	$286	$322	$347	$412	$552	$503	$703	$766	$705	$782	$870	$961	$7,208
Indirect	$57	$65	$71	$83	$118	$101	$153	$165	$142	$158	$175	$194	$1,482
Induced	$95	$107	$116	$138	$187	$167	$238	$258	$235	$260	$290	$320	$2,411
Total	$438	$494	$532	$632	$855	$771	$1,094	$1,189	$1,083	$1,200	$1,335	$1,474	$11,096
Business sales ($ millions)													
Direct	$518	$581	$626	$748	$1,052	$905	$1,351	$1,463	$1,269	$1,406	$1,565	$1,728	$13,213
Indirect	$160	$180	$193	$230	$323	$280	$414	$449	$391	$434	$483	$533	$4,070
Induced	$266	$301	$323	$385	$521	$469	$665	$723	$658	$730	$812	$897	$6,749
Total	$944	$1,061	$1,144	$1,363	$1,896	$1,654	$2,432	$2,636	$2,317	$2,570	$2,860	$3,158	$24,034

Source: Sage. Note: Numbers may not add due to rounding.

Fiscal Impacts

Economic activity triggers fiscal impacts, typically in the form of augmented tax collections. Job creation translates into augmented sales and income tax collections. A larger economy also generates additional real estate transactions and property tax collections.

Sage estimates that from 2017–2028 local governments in the Greater Baltimore Region will receive more than $250 million in income taxes attributable to the implementation of KPMAS's Baltimore Strategy. Over that period, the State of Maryland will garner more than $600 million in additional income and sales taxes. Exhibit ES-3 supplies relevant summary detail.

Exhibit ES-2. Fiscal Impacts of Projected Investments and Expenditures in Baltimore Region, 2017-2028

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Local tax revenue ($ millions)													
Income	$10	$11	$12	$14	$20	$18	$25	$27	$25	$27	$31	$34	$254
State tax revenue ($ millions)													
Indiv. income	$16	$18	$20	$24	$32	$29	$41	$44	$40	$45	$50	$55	$413
Sales and use	$8	$10	$10	$12	$17	$15	$21	$23	$21	$23	$26	$28	$214
Corp. income	$2	$2	$2	$2	$3	$3	$4	$4	$4	$4	$5	$5	$39
Total	$26	$30	$32	$38	$51	$46	$66	$71	$65	$72	$80	$89	$666
Total local and state tax revenue ($ millions)													
Total	$36	$41	$44	$52	$71	$64	$91	$99	$90	$100	$111	$122	$920

Sources: Comptroller of Maryland, Sage. Note: Numbers may not add due to rounding.

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The Economic & Healthcare Implications of KPMAS's Expansion in Baltimore

I. Introduction

This Sage Policy Group, Inc. (Sage) report examines the economic and fiscal impacts associated with Kaiser Permanente of the Mid-Atlantic States (KPMAS) expanding its presence in the Baltimore region. Through investments and expenditures totaling over $13 billion by 2028, the organization expects to provide care and benefits to more than 200,000 people, increasing its current 2.5 percent market share to 8 percent by 2025. The fundamental question addressed by this report is what economic benefits flow from the increases in healthcare services, healthcare quality, and healthcare access delivered by KPMAS as a result of this prospective expansion.

As KPMAS expands, it has and will make major investments in facilities and equipment. These investments will create significant economic benefits for the construction industry and equipment suppliers. As with all major capital investments, the direct benefits in terms of employment, income, and business sales for the construction and equipment industries will be enhanced by multiplier effects. These multiplier effects encompass the activities of suppliers and their workers in the latter's role as consumers of goods and services. Sage utilized IMPLAN modeling software to compute these multiplier effects. The model incorporates multipliers specific to Maryland and its major jurisdictions.

Expanding KPMAS operations will create another ongoing set of economic benefits as new staff is hired to meet the needs of significantly expanded KPMAS membership. Increasing operational expenditures for staff and other expenses create benefits that are essentially permanent unlike the benefits of construction and similar investments that are more generally time-limited to the period of construction.

In addition to estimating the benefits associated with KPMAS investments and expanding operations, this report identifies key features of KPMAS's distinct model of care. This model of care and KPMAS's demonstrated success in the Mid-Atlantic market are associated with sizable health benefits for prospective new KPMAS members in the Baltimore region.

Better health in turn creates another set of economic benefits. While good health is a value in and of itself, the economic consequences of better health can be difficult to measure. Nevertheless, this report addresses some important dimensions of these economic benefits.

Healthy workers show up for work more consistently than those in poorer health, creating fewer needs for replacement workers and maintaining more consistent productivity in their workplaces. Improved healthcare delivery can also make more effective and efficient use of healthcare resources. Optimizing the use of these resources can mean reducing the need for the most expensive of these resources (e.g., inpatient services at acute-care hospitals). This report looks at some key measures of these economic benefits of better health and better healthcare delivery.

II. A Different, Much-Needed Model of Healthcare

The Enormous Contribution of Multi-Specialty Hubs and other KPMAS Innovations

KPMAS combines the typical functions of a health plan with the medical services of healthcare providers. In the Greater Baltimore region, this represents a unique combination for a major player in the healthcare market.

KPMAS's distinctiveness extends well beyond this merging of health plan management and healthcare delivery services. In total, KPMAS offers the Baltimore region a different and compelling model of healthcare that provides high-quality medical services at highly competitive prices.

Integral to healthcare delivery is coordination of care that delivers to patients the appropriate level of care by the right provider in appropriate facilities. This continuum of care is a vital to effective and efficient service. Yet, as medical knowledge expands dramatically, the continuum of care becomes more nuanced and the need to guide patients through an increasingly complex array of medical providers and facilities becomes more crucial.

One of KPMAS's most important responses to this need for coordination of care and the increasingly complex continuum of care is multi-specialty hubs. These hubs fill a substantial gap in the continuum of care and are an important demonstration of how KPMAS delivers healthcare in a different, distinct manner that confers significant benefits for members and other stakeholders.[3]

Multi-specialty hubs are major facilities that provide both urgent care and more complex care requiring medical specialists on a 24-hour/7-day schedule. On the continuum of care, these hubs fill the very large gap between traditional doctors' offices and newer alternatives such as retail clinics and urgent care centers on the one hand and emergency departments and acute-care hospitals on the other.

Compared to emergency departments and acute-care hospitals, hubs are less expensive to build and less expensive to operate. KPMAS research determines that 91 percent of KPMAS patients treated in emergency departments could receive the healthcare they needed in a multi-specialty hub staffed with medical, surgical, and diagnostic expertise and appropriate equipment. Moreover, approximately 50 percent of patients admitted to a hospital from an emergency department could be treated and discharged from a multi-specialty hub where patients can be served for up to 24 hours.

A major factor in the ability of multi-specialty hubs to reduce the need for hospital admissions and emergency department services are the clinical decision units (CDUs) within these specialty hubs. CDUs, staffed by emergency room and urgent care physicians, operate on a 24-hour/7-day basis and are designed to address high acuity medical conditions that can be treated within 24 hours, in less

[3] The discussion of KP's multi-specialty hubs is derived from Pearl, Robert M., MD & Bernadette Loftus, MD, "How Multi-Specialty Hubs Fill a Major Gap in the Care Continuum," NEJM Catalyst, June 22, 2016. http://catalyst.nejm.org/how-multi-specialty-hubs-fill-a-major-gap-in-the-care-continuum/ and Kaiser Permanente Mid-Atlantic, "Kaiser Permanente Tysons Corner Medical Center Virtual Tour," 2015 https://vimeo.com/127644262.

time than is typically required by hospital emergency departments. CDUs are also supported by the full complement of specialists available within the multi-specialty hub. During regular business hours, patients at KPMAS's multi-specialty hubs being served in the medical offices can be referred, as needed, to the CDUs for more complex medical problems.

On a 24-hour basis, medical staff at the hubs can provide services to patients whose medical needs do not require transportation by ambulance or multi-day admission to an acute-care hospital. These services can include comprehensive and intensive treatment delivered by emergency medical, primary care, specialist, nursing, and/or social work staff. Diagnostic and imaging capabilities include interventional radiology and MRIs. Less complex problems (e.g., ear infections) can be treated quickly around the clock.

Electronic medical records are available to physicians and other providers both in their medical offices and CDU to facilitate coordination of care and create opportunities to address preventive care, immunizations, and other non-urgent concerns. Outpatient surgeries are routinely performed at multi-specialty hubs (more than 50,000 such procedures at multi-specialty hubs in the Mid-Atlantic since 2012). When patients' problems require hospitalization, these patients can be directly admitted to KPMAS's partner hospitals.

The impacts of multi-specialty hubs have been dramatic. Since 2010, almost one-third of the 700,000 patients treated at KPMAS's Mid-Atlantic hubs would otherwise have been treated at emergency departments. Only 2 percent of these patients were hospitalized, a much lower percentage than those treated in emergency departments. As a result, hubs have helped to reduce the number of hospital days for KPMAS members by 23 percent while delivering healthcare rated as "very good" or "excellent" by 86 percent of patients.

The presence of multi-specialty hubs is therefore an important mechanism for making more effective use of healthcare resources through the proper alignment of patient needs with appropriate staff and facilities. This in turn has consequences for the cost of healthcare delivery for KPMAS, which has risen at an annual rate of 2 percent compared to an average of 5 to 6 percent for the industry as a whole. This bending of the cost curve results in significant part because of the work of multi-specialty hubs and highly coordinated care.

Increasing Effectiveness and Increasing Quality

The creation of a different model of care that can reduce the costs of healthcare delivery does not come at the expense of the quality of that healthcare. Indeed, since KPMAS introduced multi-specialty hubs in the Mid-Atlantic, the rank for KPMAS among all U.S. health plans accredited by the National Committee for Quality Assurance (NCQA) has risen from 81st to 2nd out of more than 1,000 health plans nationwide. In the 2018-2019 health insurance plan rankings, KPMAS was one of only two health plans in the U.S. to receive a 5.0 rating.[4]

Since 2005, NCQA has rated health plans based on clinical performance with preventive care and treatment, member satisfaction and results from NCQA Accreditation surveys. The most recent survey ranked more than 1,000 health plans operating across the country, a majority of which were NCQA-accredited plans. This assessment is based on dozens of individual metrics.

Exhibit 1 summarizes KPMAS's performance in 2016 on 47 measures of care ranging from the very broad (e.g., rating of healthcare, rating of health plan) to the highly specific (e.g., timeliness of prenatal checkups). These 47 measures are the central component of NCQA's performance improvement tool, the Healthcare Effectiveness Data and Information Set (HEDIS®). These measures are used to evaluate the performance of health plans in the U.S.[5] Performance brackets reflect how well KPMAS performs on these HEDIS measures relative to other providers represented in the survey.

By definition, median performance is the 50th percentile. As indicated, in more than half of the surveyed HEDIS measures, KPMAS performed above the 90th percentile. On average, KPMAS performance exceeded that of 82 percent of all surveyed healthcare providers for all 47 HEDIS performance measures.

Exhibit 1. Kaiser Permanente Performance on HEDIS Measures Relative to Other Health Plans and Healthcare Providers

Performance bracket	No. of measures	Share of all measures
Greater than 90th percentile	25	53%
80th - 89th percentile	6	13%
70th - 79th percentile	7	15%
60th - 69th percentile	2	4%
50th - 59th percentile	2	4%
Below 50th percentile	5	11%
Total number of measures	47	100%
Average percentile score for all measures	82	

Source: National Committee for Quality Assurance (NCQA)

[4] National Committee for Quality Assurance (NCQA), "NCQA Health Insurance Plan Rankings 2018-2019 – Summary Report (Private)". http://healthinsuranceratings.ncqa.org/2018/Default.aspx.

[5] National Committee for Quality Assurance (NCQA), "NCQA Updates HEDIS Quality Measures for 2016," July 1, 2015. http://www.ncqa.org/newsroom/news-archive/2015-news-archive/news-release-july-1-2015.

Among the most highly rated measures were:

- Rating Personal Doctor (94th percentile);
- Timeliness of Prenatal Checkups (97th percentile);
- Rating Care Received (98th percentile);
- Rating Health Plan (98th percentile);
- Postpartum Care (98th percentile);
- Controlling High Blood Pressure (99th percentile);
- Breast Cancer Screening (99th percentile).

While every measure of performance is meaningful, KPMAS scores very high in many of the categories most important to patients. Arguably, the most important factor in determining satisfaction is one's view of one's own doctor, and KPMAS scores extremely high along this dimension. 2018 survey results showed that KPMAS has continued to have the highest Net Promoter Score among health plans in the region (39 compared to an industry average of 23). KPMAS is also rated very highly for breast cancer screening with mammogram results being delivered in less than one hour, controlling high blood pressure, and the overall rating of its health plan (among the top 3 in the nation by the NCQA).

- **Focusing Resources on the Delivery of Care Rather Than Upon Transactions Costs**

As noted, KPMAS combines services typically associated with health insurance companies with direct healthcare delivery. In and of itself, this combination creates an opportunity for operational efficiencies and cost effectiveness that substantially benefits KPMAS members and other stakeholders.

A straightforward example of these benefits is the share of overall KPMAS revenues devoted to "insurance" functions as opposed to the delivery of healthcare. Money spent on health insurance administration is money that isn't spent on healthcare delivery.

Concerns with the cost of insurance administration are well established. Responses to this concern were embodied in the regulatory requirements of the Affordable Care Act (ACA), which seeks to compel the health insurance industry towards greater cost efficiencies relative to the provision of medical services and improved quality of care. A recent study of the impacts of the ACA focused on the medical loss ratio (MLR) for health insurance companies.[6]

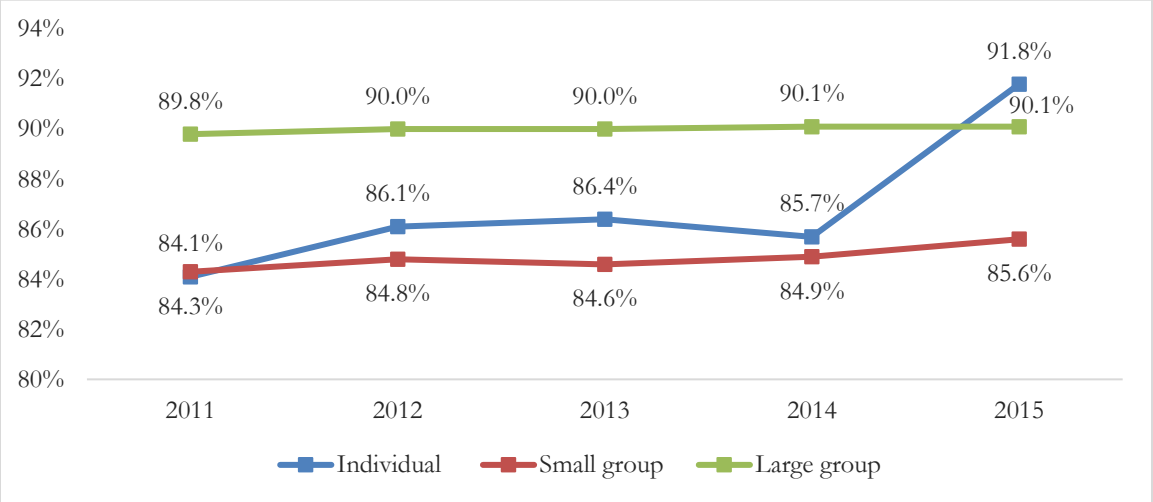
MLR refers to the percentage of health insurance premium revenue that is paid out to either medical claims (i.e. direct patient care) or quality improvement. In an effort to reduce overhead and lower the cost of insurance, the ACA established minimum thresholds for MLRs of 80 percent in the individual and small group markets and 85 percent in the large group market. Thus, health

[6] Michael J. McCue and Mark A. Hall, "The Federal Medical Loss Ratio Rule: Implications for Consumers in Year 3," *The Commonwealth Fund*, Issue Brief, March 2015.

insurance companies serving individuals and small-groups were directed to spend no more than 20 percent of premium revenue on what most people would consider "insurance functions", including administering medical claims, authorizing care, and participating in the new ACA-created health insurance marketplaces. If insurers fail to reach these thresholds, rebates to members are required.

The experience of health insurance companies with more than 1,000 members over the first five years of the ACA implementation is summarized in Exhibit 2. While the median values of MLR show that the typical health insurance company has been meeting the requirements of the ACA, a significant share failed to reach these thresholds and owed rebates to their members, including in early years approximately one-third of insurers in the individual market, one-fifth of insurers in the small group market, and one-sixth in the large group market. In the first five years of the ACA requirements for MLR, nearly $2.8 billion in rebates were paid to millions of families.[7]

Exhibit 2. Health Insurance Industry Experience with MLR: 2011–2015



Source: CMS

Recent KPMAS experience in the District of Columbia, Maryland, and Virginia markets stands in marked contrast to the overall health-insurance industry experience. On average, in 2013 and 2014, KPMAS spent just 7.5 percent of health plan premium dollars on insurance functions (see Exhibit 3). This rate is well below that of the overall insurance industry in most of the years for the individual and small group markets and significantly less than the rate of the overall insurance industry in large group markets. As a result of these efficiencies, 92.5 percent of premium dollars were available for direct medical care or improvements in the quality of care provided by KPMAS.

Exhibit 3. Kaiser Permanente Experience with MLR in DC, Maryland, and Virginia: 2013 and 2014

	2013	2014	Average
Insurance function expense	7.2%	7.8%	7.5%
Medical loss ratio	92.8%	92.2%	92.5%

Source: Kaiser Permanente

[7] Center for Medicare and Medicaid Services, "The 80/20 Rule Increases Value For Consumers For Fifth Year In A Row". https://www.cms.gov/CCIIO/Resources/Forms-Reports-and-Other-Resources/Downloads/Medical_Loss_Ratio_Annual_Report_2016-11-18-FINAL_005.pdf.

III. KPMAS's Baltimore Strategy

Coming Soon: Enhanced Access to KPMAS's Efficient and Effective Health Model in the Baltimore Region

KPMAS presently has had a relatively modest presence in the Greater Baltimore region with a market share of 2.5 percent in 2014. By 2026, KPMAS's goal is to increase that market share to 12 percent. Such a market share would place KPMAS in the upper ranks of the health plan industry in the Greater Baltimore region. CareFirst Blue Cross/Blue Shield represents the long dominant insurer in the Greater Baltimore region, with a market share recently estimated at roughly 30 percent. Several other health plans command a share of the market ranging from 8 to 12 percent.

KPMAS's strategy to achieve this growth is contained within three broad phases beginning in 2015. During the initial phase, KPMAS improved and strengthened its existing assets and resources within the Greater Baltimore region and began expanding its presence in Anne Arundel County. In the second phase of the strategy, major investments in new facilities are being made across the region expanding access to KPMAS medical offices and increasing brand awareness. The final phase of the project will add additional capacity that will reinforce and strengthen recent investments by complementary primary care locations in Baltimore County and City, improving access to care across the region.

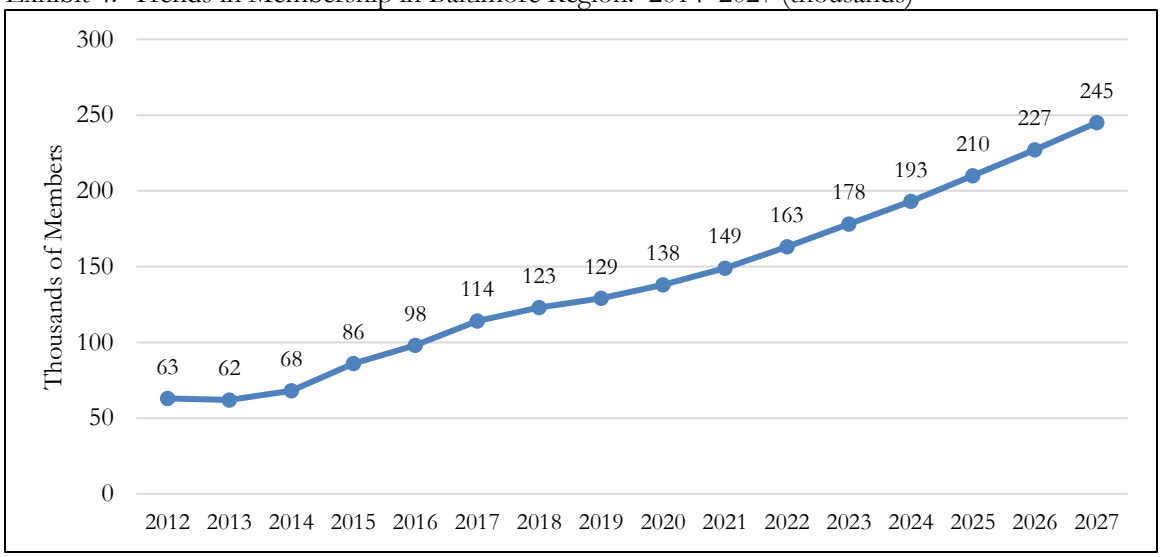
A basic measure of this strategy's success will be increased membership in KPMAS. From a base of roughly 63,000 members in 2012, the goal is to increase membership to more than 200,000 by 2025. Strategies for developing this increase in membership are comprehensive and varied.

The projected growth in membership is presented in Exhibit 4. The largest share of expected growth is derived from new investments in facilities that will provide better access to KPMAS healthcare services for the population of the Greater Baltimore region and also create an expanded service area within that region. Almost half of the expected growth will be driven by expanding service areas and supplying better access for members to KPMAS's facilities.

Competitive pricing of services is expected to be another major engine of growth for KPMAS in the region. Lower costs to prospective members is projected to account for about one quarter of the expected growth over the next nine years.

A variety of other tactics and strategies will induce the remaining expected growth including collaborations with other providers in the region and focused marketing on key membership opportunities such as State of Maryland employees. Increasing brand awareness through many efforts including work with a broad range of community agencies and other community engagement will also contribute to growth.

Exhibit 4. Trends in Membership in Baltimore Region: 2014–2027 (thousands)

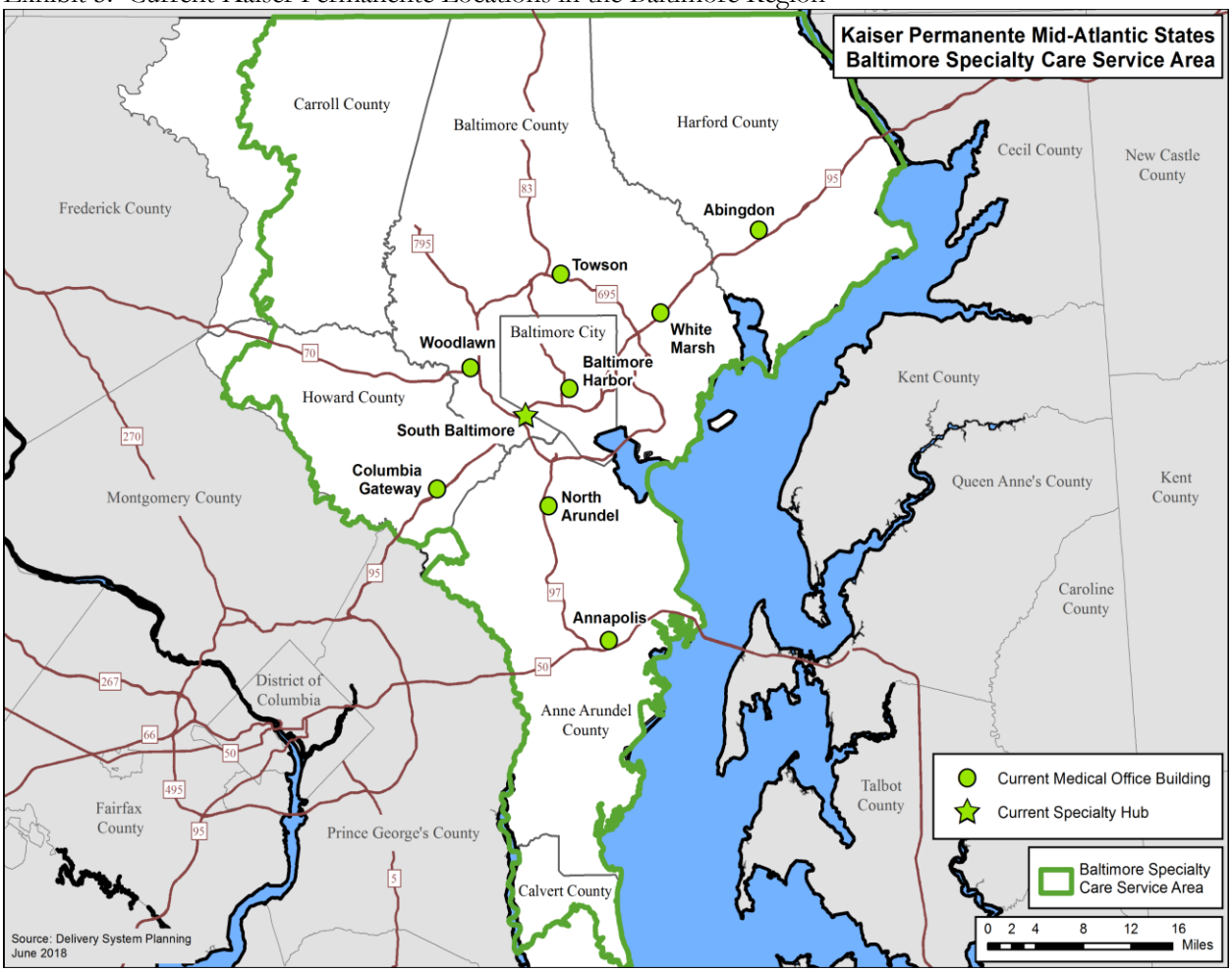


Source: Kaiser Permanente

KPMAS currently operates nine facilities in the Baltimore region—eight medical office locations and one specialty hub. Each medical office includes pharmacy, lab, and radiology services. Hubs are locations that have multiple care specialties, often including ambulatory surgery units as well as health education and member services.

Exhibit 5 maps these current locations. As shown, five of these facilities are in Baltimore City or Baltimore County. An additional two medical offices serve Anne Arundel County; one serves Howard County; and one serves Harford County.

Exhibit 5. Current Kaiser Permanente Locations in the Baltimore Region

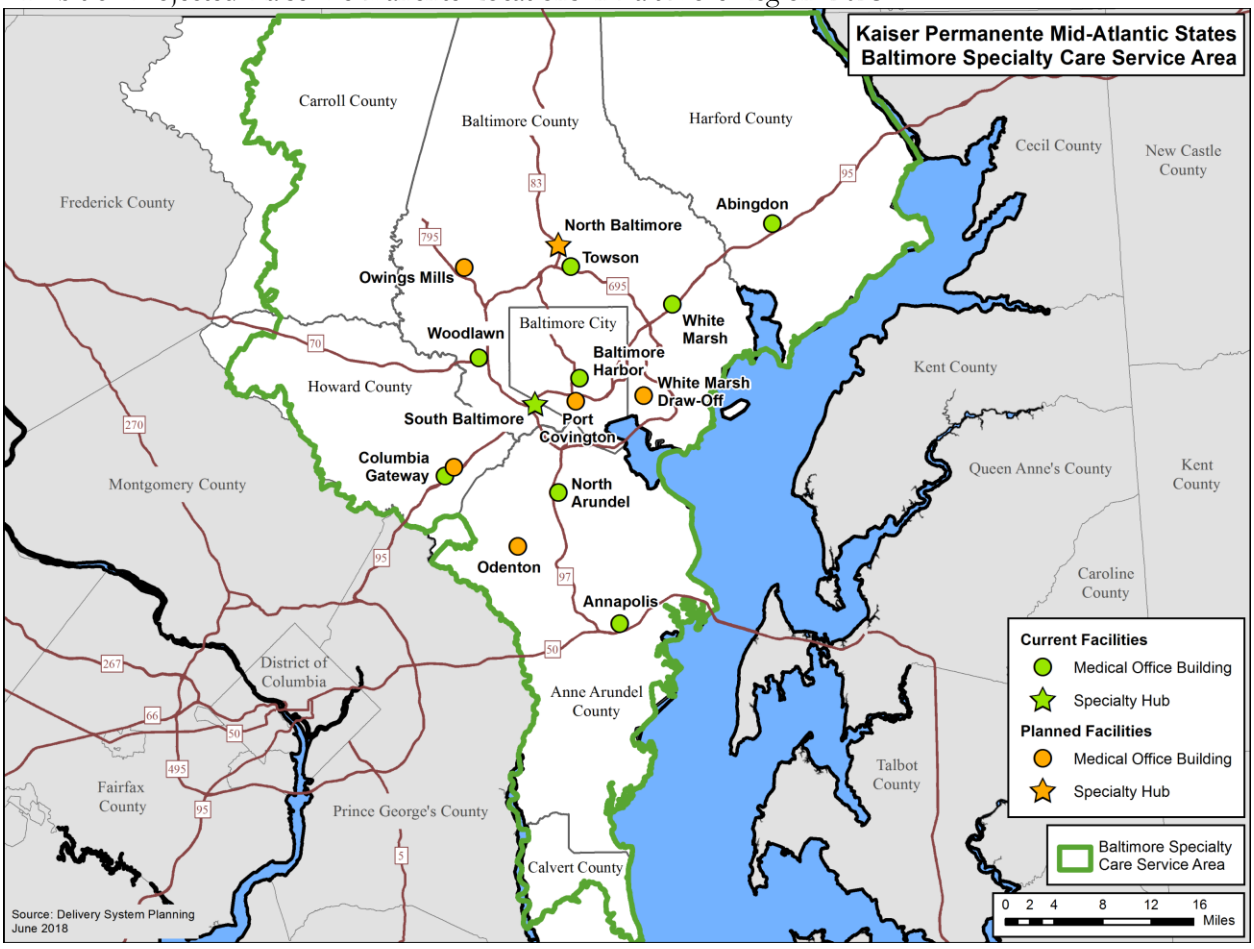


Source: Kaiser Permanente

In 2022, when the proposed investment program has been fully implemented, KPMAS will operate 15 facilities in the Baltimore region. Thirteen of these will take the form of medical offices, while two will serve as hubs providing specialized services. Another new medical office will be established in Prince George's County, which, while not within the defined Baltimore region, will be capable of serving KPMAS members in southern Anne Arundel County. Exhibit 6 supplies information regarding the location of these current and projected facilities in the Baltimore region.

This investment in new facilities substantially increases the share of the Greater Baltimore region's population that will enjoy ready access to KPMAS medical offices. The creation of a specialty hub in the Towson area, in particular, will significantly increase the share of the regional population that has reasonable access to the specialized, integrated care provided by KPMAS.

Exhibit 6. Projected Kaiser Permanente Locations in Baltimore Region: 2023



Source: Kaiser Permanente

These investments will fundamentally transform the KPMAS's presence and profile in the Baltimore region. Among the significant results of investments are the following increases in capacity and the share of the regional population that has ready access to KPMAS facilities:[8]

- Examination rooms: from 253 to 671;
- Provider offices: from 122 to 394;
- Share of population within 15 minutes of a primary care medical office: from 60 percent to 71 percent by 2028;
- Share of population within 30 minutes of a specialty care hub: from 69 percent to 84 percent by 2028.

[8] Personal communication from KPMAS to Sage Policy Group, February 26, 2019.

IV. Impacts of KPMAS's Expanding Presence in the Baltimore Region

The implementation of Kaiser Permanente's Baltimore Strategy will be undergirded by major investments in healthcare delivery facilities. Presently, KPMAS expects to invest nearly $427 million in regional facilities.

Value and Impacts of Kaiser Permanente's Investment

As indicated, the physical expansion of Kaiser Permanente's presence in the region is estimated to cost $427 million. Virtually all of this investment will take the form of construction activities. The remainder will be devoted to equipment purchases and soft costs for overhead and other administrative expenses.

Exhibit 7 provides an estimated schedule for these investments over the nine-year period stretching from 2014 to 2022. Current projections are for these investments to peak in 2021 when more than $300 million will be allocated toward capital expansion in the region.

Exhibit 7. Projected Investments in Baltimore Region ($ millions)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Construction	$1.3	$10.2	$1.8	$28.4	$7.5	$18.6	$37.9	$305.6	$9.0	$420.3
Equipment	$0.2	$0.2	$0.8	$0.3	$2.8	$1.4	$0.0	$0.0	$0.0	$5.6
Soft costs	$0.0	$0.0	$0.0	$0.2	$0.6	$0.1	$0.0	$0.0	$0.2	$1.1
Total	**$1.5**	**$10.4**	**$2.6**	**$28.9**	**$10.9**	**$20.1**	**$37.9**	**$305.6**	**$9.2**	**$427.0**

Source: Kaiser Permanente. Note: Numbers may not add due to rounding.

An investment of this scale will create substantial economic impacts in the Baltimore region. These are driven primarily by construction, much of which will be performed by local contractors. The Greater Baltimore region is home to a number of the nation's leading construction companies and therefore has the capacity to supply KPMAS with required services. Equipment purchases will have relatively modest impacts regionally because KPMAS has national contracts to provide equipment. Moreover, equipment suppliers and manufacturers have a limited presence in the Baltimore region, which is more of a service-, distribution-, and government contracting-oriented economy. Soft costs for administrative overhead and similar expenses represent a small, but important contributor to prospective regional economic activity.

Exhibit 8 summarizes the economic impacts associated with scheduled investments in KPMAS facilities. Impacts are presented for each year from 2014 to 2022 and for the total nine-year period. These impacts are time-limited and essentially correspond to the construction periods for various facilities that KPMAS will be developing.

Employment impact is measured in years of labor, where one job lasting one year constitutes one year of labor (also referred to as a job-year). Over the entire period, the total employment impact will exceed 3,200 years of work. Roughly half of this is represented by the direct impact of workers associated with the construction projects themselves. The supply chain adds more than 600 years of

work to the employment impact, while the spending of the direct and supply chain workers in the consumer economy supports more than 1,000 years of work.

The income associated with this labor exceeds $220 million, with more than $130 million of this for direct labor and more than $30 million associated with the supply chain. Workers in the consumer economy who benefit from the induced impacts of this investment will earn a total of nearly $50 million as a result of the KPMAS's prospective investments.

KPMAS's physical capital investments will generate more than $570 million in business sales for the Greater Baltimore region over the investment period. This total business sales impact includes more than $330 million in direct impacts associated with the capital projects themselves, more than $100 million in indirect impacts associated with the supply chain, and in excess of $130 million of business sales in the consumer economy resulting from the induced impacts of the spending of the direct and supply chain workers.

These estimated impacts will occur in the Greater Baltimore region (i.e. Baltimore City and the five surrounding counties that represent the definition of the Greater Baltimore region for purposes of this analysis). Multiplier effects of KPMAS's investments will extend throughout the State of Maryland and beyond. The difference between statewide and Baltimore regional impacts is not significant because the Baltimore region, with almost 3 million people, constitutes a robust and comprehensive economy in and of itself that can supply many of the resources to support KPMAS's expansion.

Exhibit 8. Economic Impacts of Projected Investments in Baltimore Region

	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Jobs (years of labor)										
Direct	5	39	10	109	41	76	142	1,148	35	1,605
Indirect	2	15	4	43	16	30	56	450	14	628
Induced	3	25	6	68	26	48	90	723	22	1,010
Total	*11*	*79*	*19*	*220*	*83*	*153*	*288*	*2,321*	*70*	*3,243*
Income ($ millions)										
Direct	$0.5	$3.4	$0.8	$9.3	$3.5	$6.5	$12.2	$98.6	$3.0	$137.8
Indirect	$0.1	$0.9	$0.2	$2.6	$1.0	$1.8	$3.4	$27.4	$0.8	$38.3
Induced	$0.2	$1.2	$0.3	$3.3	$1.2	$2.3	$4.3	$35.0	$1.1	$48.9
Total	*$0.8*	*$5.5*	*$1.3*	*$15.2*	*$5.7*	*$10.6*	*$19.9*	*$160.9*	*$4.8*	*$224.9*
Business sales ($ millions)										
Direct	$1.1	$8.1	$2.0	$22.6	$8.5	$15.7	$29.6	$238.6	$7.2	$333.4
Indirect	$0.3	$2.5	$0.6	$6.8	$2.6	$4.8	$9.0	$72.3	$2.2	$101.0
Induced	$0.5	$3.3	$0.8	$9.3	$3.5	$6.5	$12.1	$98.0	$3.0	$136.9
Total	*$1.9*	*$13.9*	*$3.4*	*$38.7*	*$14.6*	*$26.9*	*$50.7*	*$408.8*	*$12.3*	*$571.3*

Source: Sage. Note: Numbers may not add due to rounding.

Economic impacts trigger positive fiscal impacts. These new tax revenue streams for local and state government are primarily driven by the income earned by the workers whose jobs depend directly or secondarily on KPMAS's capital outlays. For local government, the primary fiscal benefit is

encompassed by the local share of Maryland income tax, also known as the piggyback tax. For the six jurisdictions in the Baltimore region, this local income tax revenue totals more than $5 million, with over $3 million generated during the peak year of 2021.

The state government benefits not only from individual income taxes, but also from sales and use taxes, and the 8.25 percent state corporate tax. The projected investment is estimated to generate over $8 million in individual income tax for Maryland, an additional $4 million in sales and use taxes, and $780,000 in corporate income tax revenues.[9] Exhibit 9 summarizes estimates of these tax revenues for each year during the investment period as well as totals for the entire investment. Total state and local tax collections during KPMAS's capital expansion phase will total over $18 million.

Exhibit 9. Fiscal Impacts of Projected Investments in Baltimore Region

	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Local tax revenue ($ thousands)										
Income	$18	$126	$31	$349	$131	$243	$457	$3,695	$109	$5,158
State tax revenue ($ thousands)										
Individual income	$28	$205	$50	$568	$214	$395	$740	$6,030	$170	$8,399
Sales and use	$15	$106	$26	$294	$111	$204	$383	$3,128	$85	$4,353
Corporate income	$3	$19	$5	$54	$20	$37	$69	$565	$12	$783
Total	$46	$330	$81	$916	$344	$636	$1,192	$9,723	$267	$13,535
Total local and state tax revenue ($ thousands)										
Total	$64	$456	$112	$1,265	$476	$879	$1,649	$13,418	$376	$18,693

Source: Sage. Note: Numbers may not add due to rounding.

Operational Impacts

The investment of almost $430 million in KPMAS facilities in the Greater Baltimore region will have a profound effect on the nature and scale of KPMAS operations. The volume of healthcare services provided by KPMAS, as measured by its expenditures for healthcare, will more than triple from 2017 to 2028.

Exhibit 10 summarizes projected expenditures in the Greater Baltimore region for each year from 2017 to 2028. These expenditures are broadly characterized as either outside medical services (i.e. care delivered by providers who work in collaboration and partnership with KPMAS), expenses related to the management of property owned or leased by KPMAS, and care provided by KPMAS employees. In 2017, these expenditures were estimated to total over $500 million. By 2028, total annual expenditures will exceed $1.8 billion. Care provided directly by KPMAS employees constitutes approximately 60 percent of these expenditures (referred to as "internal staffing and supplies" below) while outside medical services amount to roughly 36 percent of expenditures. Property related expenses amount to less than 4 percent of total expenses.

[9] While KP is a non-profit organization, vendors in the supply chain and businesses in the consumer economy that benefit from KP investments are subject to Maryland corporate taxes.

Exhibit 10. Actual and Projected Operating Expenditures in Baltimore Region ($ millions)

$ millions	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Outside medical services	$163	$174	$239	$256	$292	$323	$375	$426	$482	$541	$605	$673	$4,550
Property related	$20	$21	$25	$27	$34	$53	$55	$55	$60	$60	$64	$65	$539
Internal staffing & supplies	$334	$403	$373	$466	$523	$562	$632	$698	$781	$866	$964	$1,065	$7,668
Total	*$517*	*$598*	*$638*	*$749*	*$850*	*$937*	*$1,062*	*$1,179*	*$1,323*	*$1,468*	*$1,633*	*$1,803*	*$12,757*

Source: Kaiser Permanente. Note: Numbers may not add due to rounding.

These healthcare delivery-focused expenditures generate a large and growing set of economic impacts in the Baltimore region. Exhibit 11 summarizes these impacts for each year from 2017 to 2028 and for the period as a whole.

In 2017, it is estimated that KPMAS's expenditures will support more than 7,400 jobs in the Baltimore region (both full- and part-time),[10] with three out of five of these jobs being directly associated with KPMAS and its healthcare partners. This employment generates $423 million in income for these workers. Businesses affected by KPMAS's healthcare activities enjoy $905 million in sales in the Baltimore region.

These economic impacts grow steadily so that by 2028 it is projected that KPMAS's healthcare activities will support almost 26,000 jobs in the Baltimore region, mostly at KPMAS and its medical partners. Should the healthcare marketplace expand (likely) and KPMAS's market share grow (also likely based on considerations of efficiency and effectiveness described throughout this report), KPMAS-generated economic impacts will continue to expand beyond that point.

By 2028, the indirect employment impacts (i.e. those associated with the broader supply chain) exceed 3,500 jobs, while the consumer spending of the directly and indirectly affected workers will support more than 6,600 additional jobs (i.e. the induced effect). In other words, between 2017 and 2028, KPMAS will increase its support for employment in the Greater Baltimore region by more than 18,000 jobs.

The total employment impact will be associated with an estimated $1.5 billion in income and $3.2 billion in business sales in the Baltimore region in 2028. For the years from 2017 to 2028, more than 180,000 years of work will be supported. This employment will generate an estimated $10.4 billion in income for these workers and will support over $22 billion in business sales by Baltimore region establishments during that period.

As indicated by Exhibit 11, these economic impacts grow from year to year as KPMAS increases its membership, expands its presence in the Baltimore region, and delivers increasing volumes of healthcare services. These impact estimates do not include the effects of investments made by KPMAS's competitors to retain or regain market share.

[10] All employment estimates by IMPLAN reflect average conditions in the workplace. As a result employment is a mix of full-time and part-time positions. Given the predominance of full-time positions in most industries, certainly including healthcare, each job estimated by IMPLAN is close to the equivalent of a full-time position.

Exhibit 11. Economic Impacts of Operating Expenditures in Baltimore Region

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Jobs (full-time and part-time jobs)													
Direct	4,540	5,249	5,601	6,578	7,458	8,226	9,325	10,350	11,613	12,882	14,335	15,830	111,986
Indirect	1,013	1,172	1,249	1,468	1,664	1,836	2,081	2,311	2,592	2,876	3,200	3,534	24,997
Induced	1,899	2,193	2,342	2,749	3,118	3,440	3,899	4,328	4,855	5,386	5,993	6,618	46,820
Total	7,451	8,614	9,193	10,797	12,239	13,500	15,307	16,988	19,061	21,144	23,528	25,982	183,805
Income ($ millions)													
Direct	$276	$318	$341	$400	$453	$500	$565	$628	$705	$782	$870	$961	$6,799
Indirect	$55	$64	$69	$80	$91	$101	$115	$126	$142	$158	$175	$194	$1,368
Induced	$92	$105	$114	$134	$152	$166	$189	$209	$235	$260	$290	$320	$2,266
Total	$423	$488	$521	$612	$694	$767	$869	$964	$1,082	$1,200	$1,335	$1,474	$10,428
Business sales ($ millions)													
Direct	$496	$573	$611	$719	$814	$898	$1,018	$1,129	$1,268	$1,406	$1,565	$1,728	$12,224
Indirect	$153	$178	$188	$221	$251	$277	$313	$348	$391	$434	$483	$533	$3,770
Induced	$257	$298	$317	$373	$423	$466	$528	$586	$658	$730	$812	$897	$6,343
Total	$905	$1,046	$1,117	$1,312	$1,488	$1,641	$1,861	$2,065	$2,317	$2,570	$2,860	$3,158	$22,339

Sources: Comptroller of Maryland, Sage. Notes: 1. Numbers may not add due to rounding. 2. Employment figure represents impact measured in job-years.

As with construction phase impacts, the economic impacts of operations translate into augmented tax revenues. As indicated in Exhibit 12, local governments garnered $10 million in individual income tax revenue in 2017 as a result of KPMAS operations, while the state government collected $25 million in individual income tax, sales and use tax, and corporate income tax revenue.

By 2028 these revenue streams will expand to $34 million for local governments in the Greater Baltimore region and $89 million in state revenues. Over the entire period, local governments will receive almost $240 million in individual income tax revenues, while the State of Maryland will benefit by receiving $626 million in income tax, sales and use tax, and corporate income tax revenue. Collectively, state and local government tax collections will be bolstered by $865 million from 2017-2028.

Exhibit 12. Fiscal Impacts of Operating Expenditures in Baltimore Region

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Local tax revenue ($ millions)													
Income	$10	$11	$12	$14	$16	$18	$20	$22	$25	$27	$31	$34	$239
State tax revenue ($ millions)													
Indiv. income	$16	$18	$19	$23	$26	$29	$32	$36	$40	$45	$50	$55	$388
Sales and use	$8	$9	$10	$12	$13	$15	$17	$19	$21	$23	$26	$28	$201
Corp. income	$1	$2	$2	$2	$2	$3	$3	$3	$4	$4	$5	$5	$37
Total	$25	$29	$31	$37	$42	$46	$52	$58	$65	$72	$80	$89	$626
Total local and state tax revenue ($ millions)													
Total	$35	$40	$43	$51	$58	$64	$72	$80	$90	$100	$111	$122	$865

Sources: Comptroller of Maryland, Sage. Note: Numbers may not add due to rounding.

Summary of Impacts: Capital Investments Plus Expanded Healthcare Delivery, 2017-2028

Although the impacts of capital investments taper off after the peak construction year of 2021, the steady and significant expansion of KPMAS operations assures that the overall impact of investments and operations steadily increases. Exhibit 13 summarizes the economic impacts of both the investments and operations from 2017 to 2028.

Over that period, total employment supported by KPMAS investments and operations is projected to grow from almost 7,700 jobs to almost 26,000 jobs. The income of workers who fill these jobs is expected to grow from $438 million to almost $1.4 billion. Sales of goods and services by businesses in the Greater Baltimore region attributable to KPMAS's regional expansion and operations are expected to grow from more than $940 million presently to over $3.1 billion per annum in 2028. The cumulative impact of the KPMAS Baltimore Strategy over these years is over 193,000 years of work generating over $11 billion of income and business sales exceeding $24 billion.

Exhibit 13. Economic Impacts of Projected Investments and Expenditures in Baltimore Region, 2017-2028

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Jobs (full-time and part-time jobs)													
Direct	4,649	5,290	5,677	6,720	8,606	8,261	10,930	11,955	11,613	12,882	14,335	15,830	116,746
Indirect	1,056	1,188	1,279	1,524	2,114	1,850	2,710	2,939	2,592	2,876	3,200	3,534	26,861
Induced	1,967	2,219	2,390	2,839	3,841	3,461	4,909	5,337	4,855	5,386	5,993	6,618	49,816
Total	7,671	8,697	9,346	11,084	14,559	13,570	18,550	20,232	19,061	21,144	23,528	25,982	193,425
Income ($ millions)													
Direct	$286	$322	$347	$412	$552	$503	$703	$766	$705	$782	$870	$961	$7,208
Indirect	$57	$65	$71	$83	$118	$101	$153	$165	$142	$158	$175	$194	$1,482
Induced	$95	$107	$116	$138	$187	$167	$238	$258	$235	$260	$290	$320	$2,411
Total	$438	$494	$532	$632	$855	$771	$1,094	$1,189	$1,083	$1,200	$1,335	$1,474	$11,096
Business sales ($ millions)													
Direct	$518	$581	$626	$748	$1,052	$905	$1,351	$1,463	$1,269	$1,406	$1,565	$1,728	$13,213
Indirect	$160	$180	$193	$230	$323	$280	$414	$449	$391	$434	$483	$533	$4,070
Induced	$266	$301	$323	$385	$521	$469	$665	$723	$658	$730	$812	$897	$6,749
Total	$944	$1,061	$1,144	$1,363	$1,896	$1,654	$2,432	$2,636	$2,317	$2,570	$2,860	$3,158	$24,034

Source: Sage. Note: Numbers may not add due to rounding.

The summary of fiscal impacts attached to these capital investments and operational expenditures supported by the Baltimore Strategy is presented in Exhibit 14. For local governments in the Greater Baltimore region, local income tax revenue rises from $10 million in 2017 to $34 million in 2028. Local income taxes total $254 million for the entire period.

For the State of Maryland, total tax revenues rise from $26 million in 2017 to $89 million in 2028. Total tax revenues at the state level amount to more than $660 million for the entire period. Total estimated tax revenue received for local and state government increases from $36 million in 2017 to $122 million in 2028 and totals $920 million for entire period.

Exhibit 14. Fiscal Impacts of Projected Investments and Expenditures in Baltimore Region, 2017-2028

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
Local tax revenue ($ millions)													
Income	$10	$11	$12	$14	$20	$18	$25	$27	$25	$27	$31	$34	$254
State tax revenue ($ millions)													
Indiv. income	$16	$18	$20	$24	$32	$29	$41	$44	$40	$45	$50	$55	$413
Sales and use	$8	$10	$10	$12	$17	$15	$21	$23	$21	$23	$26	$28	$214
Corp. income	$2	$2	$2	$2	$3	$3	$4	$4	$4	$4	$5	$5	$39
Total	$26	$30	$32	$38	$51	$46	$66	$71	$65	$72	$80	$89	$666
Total local and state tax revenue ($ millions)													
Total	$36	$41	$44	$52	$71	$64	$91	$99	$90	$100	$111	$122	$920

Sources: Comptroller of Maryland, Sage. Note: Numbers may not add due to rounding.

V. Economic Impacts of Improved Medical Performance

Massive Savings and Narrower Disparities

The economic benefits of KPMAS's expansion in the Baltimore region will go well beyond the impacts associated with increased investments in facilities and KPMAS's expenditures on day-to-day operations. As a provider of high-quality, cost-effective healthcare, KPMAS creates benefits for its members and stakeholders that derive from improved health and a range of cost savings and other economic benefits.

These economic benefits derive from the improvements in the delivery of healthcare that KPMAS will deliver to new KPMAS members in the Baltimore region. KPMAS's goal is to increase membership in this region to more than 200,000 members by 2025. The likely improvements in the health of these KPMAS members can be estimated by reviewing the experience of the more than 620,000 current KPMAS members in the Mid-Atlantic states (i.e. in Maryland, Virginia, and the District of Columbia).

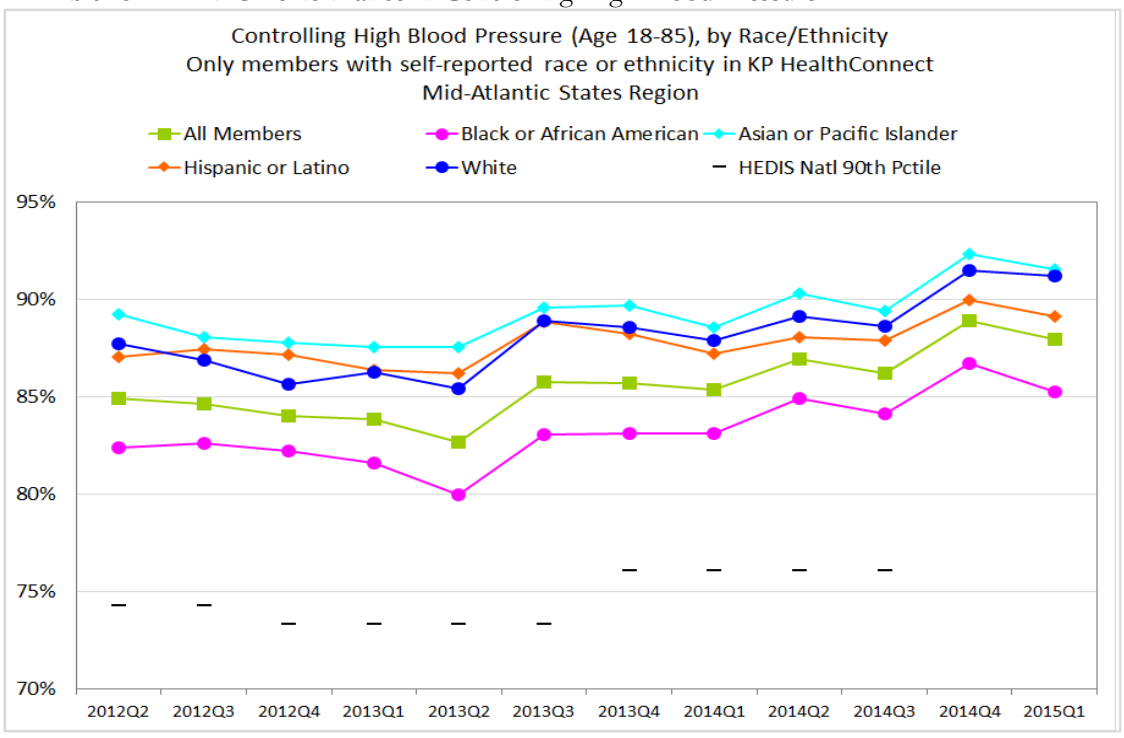
The following exhibits summarize KPMAS's recent performance in managing or screening three high-priority health concerns — a) high blood pressure (Exhibit 15), b) breast cancer (Exhibit 16), and c) colorectal cancer (Exhibit 17).[11] In each exhibit, the percentage of KPMAS members whose health conditions have been managed or screened as a result of their care received from KPMAS physicians and staff is presented for a three-year period from the second quarter of 2012 through the first quarter of 2015.

These percentages are shown for all KPMAS members and by four racial or ethnic categories based on members' self-reported racial or ethnic identity. Importantly, performance results are also presented for the HEDIS national 90th percentile. These results represent the level of performance that defines the top 10 percent of all U.S. health plans.

Two findings are clear for each of these measures of KPMAS performance. First, KPMAS performance is well above the performance that characterizes the top 10 percent of all U.S. health plans. For example, for controlling high blood pressure, the 90th percentile U.S. health plan was properly managing hypertension for approximately 75 percent of its members. By contrast, KPMAS is properly managing hypertension for approximately 85 percent of all members on average. Second, there was little disparity in the results of care by race or ethnicity. Indeed, the spread between KPMAS members ranged from a little over 5 percentage points for managing high blood pressure to well within 5 percentage points for colorectal cancer screening.

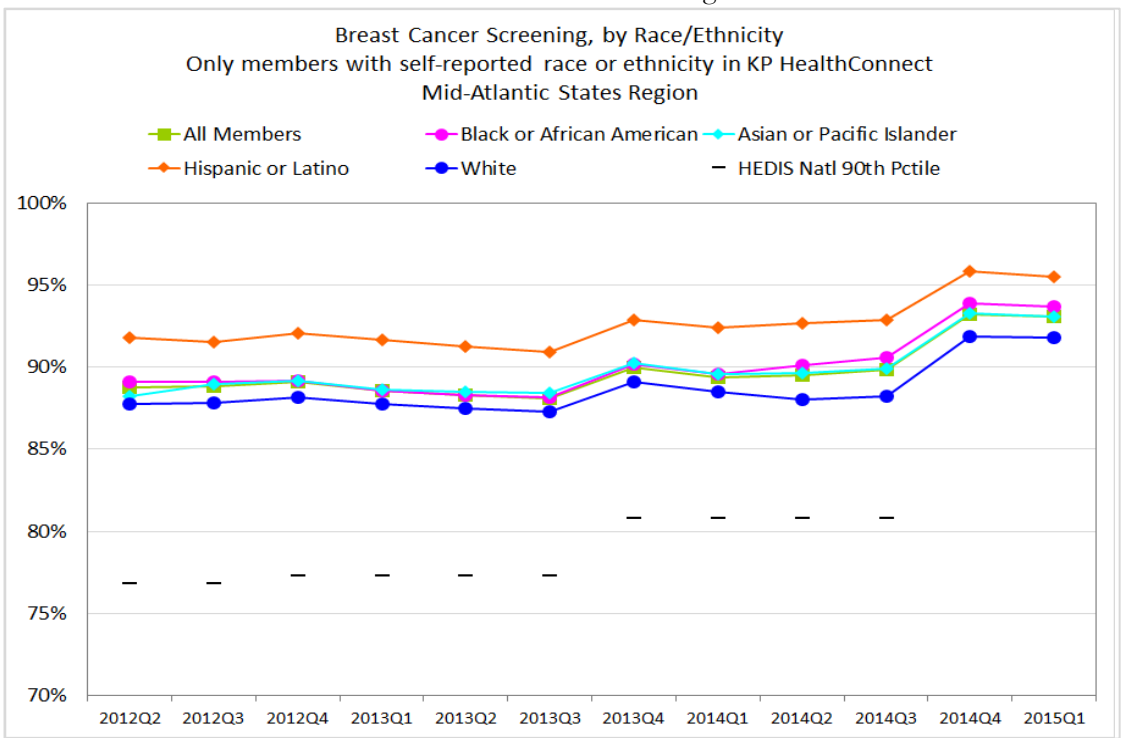
[11] The source for data in these exhibits is Quality Compass® 2015, a product of the National Committee for Quality Assurance (NCQA) as reported by KP in a presentation on delivering healthcare services in Prince George's County, Maryland. Data display, analysis, interpretation, and conclusions based on these data are solely that of KP. NCQA specifically disclaims responsibility for any such display, analysis, interpretation, or conclusion.

Exhibit 15. KPMAS Performance in Controlling High Blood Pressure



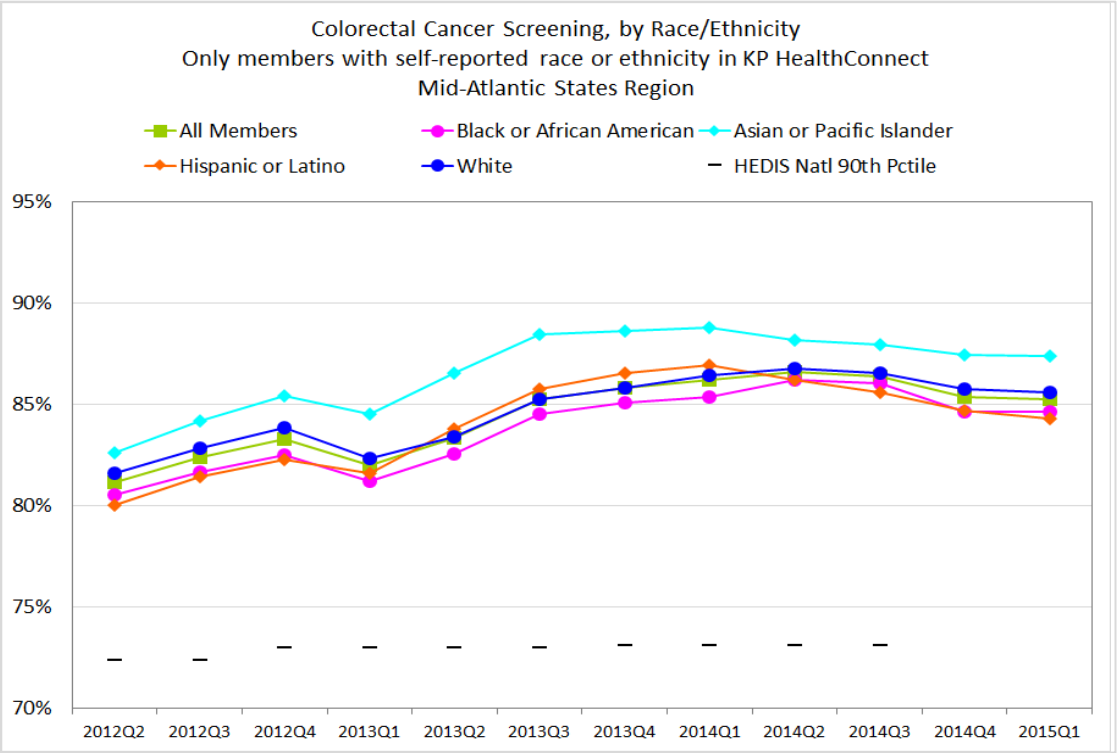
Sources: National Committee for Quality Assurance (NCQA), Kaiser Permanente (KP)

Exhibit 16. KPMAS Performance in Breast Cancer Screening



Sources: National Committee for Quality Assurance (NCQA), Kaiser Permanente (KP)

Exhibit 17. KPMAS Performance in Colorectal Cancer Screening



Sources: National Committee for Quality Assurance (NCQA), Kaiser Permanente (KP)

Translating Improved Health Outcomes into Financial Values

It goes without saying that better healthcare delivery produces better healthcare outcomes — an obvious benefit. How much of a benefit is delivered in dollar terms, however, can sometimes be difficult to measure.

Thankfully, for certain conditions, research has identified and quantified the benefits of good healthcare. The best data seems to be associated with health concerns that affect a substantial share of the population and for which untreated problems have potentially dire conditions. Two conditions that meet both these criteria are breast cancer and hypertension.

- Screening for Breast Cancer

Cancer is the second leading cause of death for men and women in the United States. Lung cancer is the most common cause of cancer deaths for both men and women. For women, breast cancer is the second most common cause of deaths related to cancer. In 2015, an estimated 40,290 women died as a result of breast cancer.[12] While early detection of lung cancer has proven problematic, KPMAS screens long-term smokers and multi-pack ex-smokers. Results of this screening for lung cancer are expected in the near future.[13] Alternatively, the use and benefits of mammography to

[12] Nichols, Hannah, "The top 10 leading causes of death in the US," Medical News Today, September 21, 2015. http://www.medicalnewstoday.com/articles/282929.php#top_10_leading_causes_of_death.
[13] Personal communication from Dr. Michael Horberg, KPMAS, to Sage, September 8, 2016.

detect breast cancer at early stages and to pave the way for effective interventions has been well documented.[14]

To estimate the likely impacts of an expanded KPMAS presence in the Baltimore region on breast cancer, the impacts of two scenarios are estimated. One scenario assumes annual mammography screening for women ages 40 through 84; the second scenario assumes biennial screening for women ages 50 through 74. These scenarios are based on research results that quantify the impacts and benefits related to these screening frequencies over these age ranges.[15]

The estimates of the impacts of breast cancer screening are based on several assumptions and conditions:

- Impacts are calculated on the basis of roughly 200,000 KPMAS members, roughly the announced goal for total KPMAS membership in the Baltimore region by 2025.
- The number of women and their age distribution among these roughly 200,000 KPMAS members mirror the current gender and age distribution of the Baltimore region population.
- The services received by these women mirror the current levels of service provided by KPMAS in the Mid-Atlantic states.

Impacts for breast cancer screening depend on how early screening starts in a woman's life and how frequently screening is conducted. Exhibit 18 estimates populations of women for the two scenarios. Women ages 40 through 84 constitute almost one-quarter of the total regional population and would number more than 50,000 out of a total 210,000 KPMAS membership projected for 2025. As shown above (in Exhibit 16), approximately 92.5 percent of KPMAS members are screened for breast cancer. This equates to more than 47,000 women ages 40 through 84. For the narrower age range of 50 through 74 years, women represent approximately 15 percent of the regional population. This translates into over 31,000 KPMAS members, of whom more than 29,000 are projected to be screened for breast cancer. Exhibit 18 supplies summary statistical detail.

Exhibit 18. For 200,000 KPMAS Members, Potential Populations of Women Screened for Breast Cancer

Age bracket	Share of Baltimore regional population	# of women among KPMAS members	Share of women screened	# of women screened
Women 40-84	24.2%	50,867	92.5%	47,052
Women 50-74	15.0%	31,600	92.5%	29,230

Sources: Maryland State Data Center, Kaiser Permanente (KP)

A recent review of research regarding the effects of breast cancer screening provides estimates of the lives saved (or more accurately fatalities averted) by this procedure. Available research has

[14] Gates, Thomas J., "Screening for cancer: Evaluating the evidence," American Family Physician, February 1, 2001. http://www.aafp.org/afp/2001/0201/p513.pdf.

[15] Hendrick, R. Edward and Mark A. Helvie, "Mammography screening: A new estimate of number needed to screen to prevent one breast cancer death," American Journal of Roentgenology, March 2012. http://www.ajronline.org/doi/pdfplus/10.2214/AJR.11.7146.

focused on the number of women who needed to be screened to prevent one breast cancer death and the number of women who needed to be screened to gain one additional year of life. These results are gleaned from randomized, controlled trial studies that are considered the gold standard for medical research. Importantly they are also based on long-term monitoring of large numbers of women.[16]

Exhibit 19 summarizes results of this research and applies them to the estimated populations of prospective female KPMAS members who would be screened under the assumptions of the two scenarios described above. Screening impact rates estimate the number of lives saved per 1,000 screenings (or deaths from breast cancer that are prevented) and the number of years of added life that are gained as a result of these screenings. Both of these rates presume that the screening protocol — either annual or biennial frequencies — is followed for the age ranges noted for the two scenarios. In other words, the lives saved and the years of life gained are based on annual mammography screening for 45 years beginning at age 40 or biennial mammography screening for 25 years beginning at age 50.

Exhibit 19. For 200,000 KPMAS Members, Impacts of Breast Cancer Screening

Screening scenarios	Screening impact rates (1)		Cumulative impacts (1)		Annual impacts	
	Lives saved per 1,000 screenings	*Life-years gained per 1,000 screenings*	*Lives saved*	*Life-years gained*	*Lives saved*	*Life-years gained*
Annual screening: women 40-84	11.90	189	560	8,893	12.4	198
Biennial screening: women 50-74	6.95	110	203	3,215	8.1	129
Midpoint of scenarios	9.43	150	382	6,054	10.3	163

Sources: Hendrick and Helvie (2012), Sage. Notes: 1. Screening impact rates and cumulative impacts are tied to the age span for each scenario: 45 years for the annual screening scenario, 25 years for the biennial screening scenario.

As reflected in Exhibit 19, for 50,000-plus women aged 40-84 among KPMAS's prospective regional membership of approximately 200,000, the annual screening scenario results in a cumulative 560 lives saved and almost 9,000 added years of life. On an annual basis, the annual screening scenario prevents over 12 breast cancer deaths and adds an estimated 198 years of life for these women.

For the second scenario, the projected 31,000-plus women aged 50-74 among the projected KPMAS membership in 2025 would avoid a cumulative 203 breast cancer deaths and would gain over 3,200 years of life as a result of KPMAS breast cancer screening. Annually, this would translate into more than 8 avoided breast cancer deaths and 129 added years of life for this cohort of women.

If screening for breast cancer increases the lifespan of women, what value can be placed on these extra years of life? This question is inherently fraught with analytical difficulties and is contentious.

The World Health Organization (WHO) represents one source for valuing what is termed a quality-adjusted life year. The WHO convention is three times per capita income. As noted in a review of this issue by Harvard's School of Public Health, a reasonable estimate of this value in the United

[16] Ibid.

States would be $100,000.[17] It should be noted that this figure is within the range of the reported benchmark used worldwide by health insurance plans ($50,000) and an estimate for valuing kidney dialysis ($129,000) generated by analysts at Stanford.[18] Alternatively, in determining the costs and benefits of regulations federal agencies have estimated the value of saved lives at a range of $3.5 million to $9.1 million.[19]

Using a value of $100,000 annually for years of life gained by screening for breast cancer, the impact of KPMAS's high rates of screening can be estimated. As shown in Exhibit 20, these values on an annual basis range from almost $13 million to almost $20 million depending on the frequency and duration of screenings. Using the midpoint of the two scenarios, the annual value of the added years of life for women who are routinely screened for breast cancer is more than $16 million. These benefits are enjoyed by the women who, as KPMAS members, participate in these screenings as well as the broader society.

Exhibit 20. For 200,000 KPMAS Members, Annual Value of Breast Cancer Screening

Screening scenarios	Life-years gained per year	Value of 1 quality-adjusted life year	Annual value of life-years gained ($ millions)
Annual screening: women 40-84	198	$100,000	$19.8
Biennial screening: women 50-74	129	$100,000	$12.9
Midpoint of scenarios	163	$100,000	$16.3

Sources: Hendrick and Helvie (2012), Harvard School of Public Health (2010), Sage. Notes: 1. Screening impact rates and cumulative impacts are correlated to the age span for each scenario: 45 years for the annual screening scenario, 25 years for the biennial screening scenario.

[17] Harvard School of Public Health, "Can cost-effective health care = better health care?" Interview with Milton Weinstein, Harvard T.H. Chan School of Public Health Magazine, Winter 2010. https://www.hsph.harvard.edu/news/magazine/winter10assessment/.

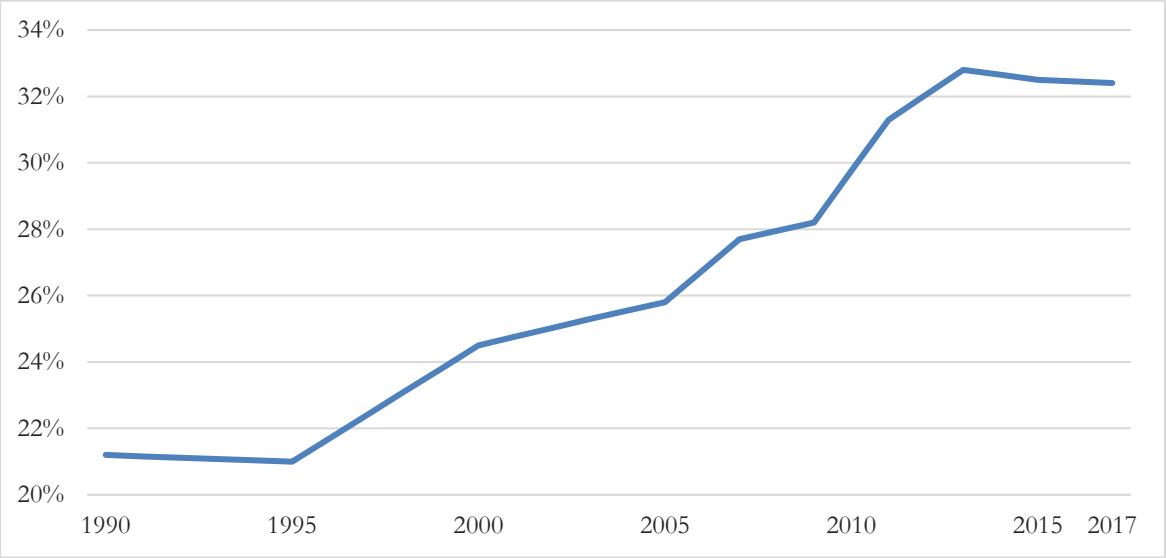
[18] Kingsbury, Kathleen, "The Value of a Human Life: $129,000," Time, May 20, 2008. http://content.time.com/time/health/article/0,8599,1808049,00.html.

[19] McGinty, Jo Craven, "Why the government puts a dollar value on life," Wall Street Journal, March 25, 2016. http://www.wsj.com/articles/why-the-government-puts-a-dollar-value-on-life-1458911310.

- Controlling Blood Pressure

High blood pressure or hypertension is among America's most common health problems. Across Maryland, almost one-third of adults are estimated to suffer from hypertension. Moreover, trends are worrisome. In 1990, just over one in five Marylanders was estimated to have high blood pressure. Since 1995, the rate of hypertension steadily and consistently increased for two decades as reflected in Exhibit 21. Since 2015, the rate has leveled off at almost one in three adult Marylanders.[20]

Exhibit 21. Trend in Hypertension, Maryland 1990-2017 (Percent of Adults with Hypertension)



Source: State of Obesity (a project of the Trust for America's Health and the Robert Wood Johnson Foundation)

Given that hypertension is costly, linked to cardiovascular disease, and pervasive (it occurs in 20 percent of all patients hospitalized for any reason), the economic impacts associated with controlling it are considerable. In 2003, the American Heart Association estimated the total costs of treating and medically addressing the effects of hypertension at over $50 billion, while the costs of treating total cardiovascular disease were an additional $352 billion. These estimates exclude costs associated with kidney disease related to hypertension which were estimated at $66 billion.[21] A recent study estimated that the cost of treating high blood pressure accounted for over 10 percent of direct healthcare spending in Canada with costs expected to rise by at least 44 percent between 2010 and 2020.[22]

Predictably, controlling hypertension has been the subject of considerable research. The benefits of controlling blood pressure by reducing it to recommended levels include substantially reduced

[20] "The State of Obesity in Maryland," a project of the Trust for America's Health and the Robert Wood Johnson Foundation, undated. http://stateofobesity.org/states/md/.
[21] Elliott, W. J., "The economic impact of hypertension," Journal of Clinical Hypertension, May-June 2003. http://www.ncbi.nlm.nih.gov/pubmed/12826765.
[22] Schmidt, Colleen, "Study evaluates economic impact of hypertension on health care costs," Calgary TV News, August 12, 2015. http://calgary.ctvnews.ca/study-evaluates-economic-impact-of-hypertension-on-health-care-costs-1.2513887.

healthcare costs, particularly regarding the need for hospitalization and emergency department visits. Controlling blood pressure has been called "one of the most cost-effective methods of reducing premature cardiovascular morbidity and mortality."[23] In addition, controlling blood pressure adds to life expectancy.

The value of reduced needs for healthcare services are discussed later in this report. To avoid double-counting the value of the impacts of controlling hypertension, the discussion here focuses on the additional years of life that are enjoyed by men and women whose blood pressure is maintained at recommended levels by treatment they can expect to receive from KPMAS.

KPMAS's ability to control blood pressure is ranked first in the country among approximately 500 health plans for which rankings exist. As shown in Exhibit 15 above, KPMAS has been able to control blood pressure in at least 85 percent and as much as 90-plus percent of its membership, depending on race/ethnicity. On average, 88 percent of KPMAS members who have hypertension are able to reduce blood pressure to recommended levels as a result of the treatment and medical services they receive from KPMAS.

The impacts on life expectancy for 210,000 prospective KPMAS members in the Baltimore region are substantial. The estimate of those impacts assumes that treatment is provided to adult KPMAS members (aged 25 or older) in the Baltimore region, that the age distribution of KPMAS members in the Baltimore region is similar to the age distribution for the region as a whole, and that hypertension in those adults occurs at the same rate as for all Marylanders.

As shown in Exhibit 22, adults 25 years or older are estimated at over 143,000, over two-thirds of the total projected KPMAS membership in the Baltimore region. Because rates of hypertension increase with age, this adult population is disaggregated into three age cohorts.[24] Rates of hypertension from a statewide survey in 2013 are estimated to range from 14.2 percent for the 25-44 age cohort to 66.3 percent for adults 65 years or older.[25] Applying these statewide rates yields an estimate of over 51,000 adult KPMAS members who have hypertension. Given KPMAS's performance, it is expected that 88 percent of these members or over 45,000 men and women will have their hypertension controlled.

Exhibit 22. Estimated KPMAS Members with Hypertension

Age cohort (years)	25-44	45-64	65+	Total
Share of statewide population	27.3%	27.1%	13.9%	68.3%
Estimated number of KPMAS members	57,330	56,910	29,190	143,430
Hypertension rate	14.2%	42.3%	66.3%	35.9%
Estimated KPMAS members with hypertension	8,141	24,073	19,353	51,567
Estimated members with controlled hypertension	7,164	21,184	17,031	45,379

Sources: Maryland State Data Center, Maryland Behavioral Risk Factor Surveillance System, KPMAS

[23] Op. cit., Elliott

[24] Age distribution of the population is derived from population data from the Maryland State Data Center, "Total Population Estimates by Race and Hispanic Origin for July 1, 2014". http://planning.maryland.gov/msdc/Pop_estimate/estimate_10to14/CensPopEst10_14.shtml

[25] "Maryland Behavioral Risk Factor Surveillance System". http://www.marylandbrfss.org/cgi-bin/broker.exe.

Many studies of the effects of hypertension on life expectancy compare the medical histories and life expectancies of those with normal/recommended blood pressure levels (normotensives) to those with elevated blood pressure levels (hypertensives). Some of these studies differentiate between those with mild hypertension (140-159 mm Hg/90-99 mm Hg) and those with more severe hypertension. One of the most cited of these studies concluded that, for 50-year-olds, those who were normotensive lived approximately 5 years longer than those who were hypertensive.26

A few studies have compared normotensives, hypertensives, and those whose hypertension is treated, either successfully or not. A recent review of the literature on hypertension found differing, and in some cases, conflicting findings on the outcomes of treating hypertension.27 One of the most comprehensive in terms of populations addressed by the analysis found that each year that an individual with hypertension has his or her blood pressure under control adds 12 days to their life expectancy.[28] Another study, of patients 60 years and older with systolic blood pressure greater than 160 mm Hg, found life expectancy gains of 105 days for all-cause mortality and 158 days for cardiovascular death, a result similar to the analysis of a broader age range that found 12 days of added life for each year of hypertension treatment. Other studies have provided even higher estimates of the impacts of controlling hypertension on life expectancy; but these estimates apply to more narrowly defined populations. For example, one study estimated that reducing blood pressure from <140/90 mm Hg to <130/85 mm Hg for a group of high-risk individuals increased life expectancy 16.5 to 17.4 years and that a cohort of 50-year-old diabetics would increase life expectancy 23 to 24 years,29 a remarkable finding given that the average life expectancy of a 50-year-old is an additional 32.2 years for men and 35.5 years for women.30

Because of its wide applicability, the finding that a year of controlling hypertension leads to 12 extra days of life expectancy is used here to estimate one end of a range of benefits for prospective KPMAS members. The upper end of the range for the estimate is based on the 5-year increase in life expectancy for normotensives compared to those with hypertension.

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[26] Franco, Oscar H. et al, "Blood Pressure in Adulthood and Life Expectancy With Cardiovascular Disease in Men and Women," Hypertension, August 1, 2005. http://dx.doi.org/10.1161/01.HYP.0000173433.67426.9b.
[27] Makridakis, Spyros and James J. DiNicolantonio, "Hypertension: empirical evidence and implications in 2014," Open Heart. http://openheart.bmj.com/content/1/1/e000048.full.
[28] Reinberg, Steven, "Treating High Blood Pressure May Add Years to Life," HealthDay News, December 20, 2011. http://health.usnews.com/health-news/family-health/heart/articles/2011/12/20/treating-high-blood-pressure-may-add-years-to-life.
[29] Op. cit., Elliott
[30] Life expectancy estimates are from the Social Security Administration's "Life Expectancy Calculator". https://www.ssa.gov/cgi-bin/longevity.cgi.

Exhibit 23 summarizes the range of estimates for the added years of life for KPMAS members who are successfully treated for hypertension. The average life expectancy is defined as the estimated remaining years of life for a typical man or woman in each age cohort.[31] Women consistently have greater life expectancy. As people age, their remaining years of life decrease. The added years of life estimates are based on 12 additional days of life for each year of life expectancy for each age cohort. Because women have longer life expectancies, they have somewhat greater added years of life when hypertension is controlled.

Exhibit 23. Estimated Impact of Controlled Hypertension on Life Expectancy of Men and Women

Age cohort (years)	25-44	45-64	65+
Average life expectancy per male (years) (1)	46.6	27.0	11.2
Average life expectancy per female (years) (1)	50.2	30.2	12.9
Low Estimate			
Added years per male with controlled hypertension	1.53	0.89	0.37
Added years per female with controlled hypertension	1.65	0.99	0.42
High Estimate			
Added years per male with controlled hypertension	8.46	4.90	2.03
Added years per female with controlled hypertension	8.48	5.10	2.18

Sources: Social Security Administration, Reinburg. Note: 1. Life expectancy based on adults aged 35.5, 55.5, and 75.5 years for the three age cohorts, respectively.

Exhibit 24 applies these added years of life (listed in Exhibit 23) to the number of prospective male and female KPMAS members whose hypertension is likely to be controlled. This generates a range of estimates of the total added years of life that KPMAS medical services can bring to Baltimore region members. Because over 45,000 prospective KPMAS members are expected to benefit from this intervention, even the relatively modest added years of life per member at the low end of the range become substantial in the aggregate. In total, these prospective KPMAS members are expected to enjoy between 38,000 and 203,000 additional years of life because their hypertension is controlled. The mid-point estimate for aggregate added years of life is over 120,000.

Exhibit 24. Estimated Added Years of Life for KPMAS Members with Controlled Hypertension

Age cohort (years)	25-44	45-64	65+	Total
Estimated members with controlled hypertension	7,164	21,184	17,031	45,379
No. of males with controlled hypertension	3,254	9,419	6,210	18,883
No. of females with controlled hypertension	3,909	11,765	10,821	26,496
Low Estimate				
Added years, male	4,986	8,361	2,286	15,633
Added years, female	6,452	11,682	4,589	22,723
Total added years	11,438	20,042	6,876	38,356
High Estimate				
Added years, male	27,523	46,152	12,621	86,296
Added years, female	33,143	60,004	23,573	116,720
Total added years	60,666	106,156	36,195	203,016
Mid-point Estimate				
Added years, male	16,255	27,256	7,454	50,965
Added years, female	19,797	35,843	14,081	69,722
Total added years	36,052	63,099	21,535	120,686

Sources: Maryland State Data Center, Maryland Behavioral Risk Factor Surveillance System, KPMAS, Social Security Administration, Reinburg.

[31] Ibid.

The value of these extended lifetimes can be estimated using the $100,000 value of a year of life discussed above for the benefits of breast cancer screening. At the low end of the range of estimates, the over 38,000 years of added life represent a value of $3.8 billion accrued over the many years that treatment occurs. The upper bound estimate of the aggregate value of added years of life is over $22 billion. The mid-point estimate for the aggregate value of added life expectancy is $13.3 billion. This benefit represents values that are generated over decades of treatment for most men and women, ranging from 50 years for women in the youngest age cohort to over a decade for men 65 years or older.

By spreading this total value over the expected periods of treatment, annual estimates of the value of controlling hypertension can be generated. The estimates for this annualized value range from $144 million to $855 million for all men and women whose hypertension is controlled, over 45,000 prospective KPMAS members. The mid-point estimate of this annual value of increased life expectancy is $500 million. See Exhibit 25 for more details.

Exhibit 25. Estimated Value of Added Years of Life for KPMAS Members with Controlled Hypertension

Value ($ millions)	*Low estimate*	*High estimate*	*Mid-point estimate*
Value of total added years, male	$1,563	$9,441	$5,502
Value of total added years, female	$2,272	$13,248	$7,760
Value of total added years	$3,836	$22,689	$13,263
Annualized value of added life, male	$60	$363	$212
Annualized value of added life, female	$84	$492	$288
Total annualized value of added life	$144	$855	$500

Sources: Maryland State Data Center, Maryland Behavioral Risk Factor Surveillance System, KPMAS, Social Security Administration, Reinburg, Harvard School of Public Health (2010).

These benefits are projected to be enjoyed by the men and women among prospective KPMAS members in the Baltimore region. It should be noted that these benefits are separate from the reductions in medical care that will result from the fact that these KPMAS members will be healthier.

As noted above, controlling hypertension substantially decreases the need for inpatient hospital services as well as the need for services from hospital emergency departments. The value of this reduced need for healthcare resources that is derived from the quality of care delivered by KPMAS is discussed later in this report. Controlling hypertension is a major contribution to these savings. Indeed, depending on whether prospective KPMAS members are more similar to the typical Maryland experience or the typical Baltimore regional experience with hospitalization, the control of hypertension may reduce annual hospitalization costs of roughly 200,000 prospective KPMAS members by $48 million to $74 million, contributing between one-quarter to one-third of the total reduction in hospitalization costs.

Impacts on Workforce Productivity

When better healthcare produces better health, those in the workforce miss fewer days of work because of illness. In addition, better health reduces the likelihood that workers will decide to go to work despite the fact that they are ill. By helping workers to reduce their absence from the workplace and the chance that they will be trying to work when less than fully healthy, better health increases the productivity of these workers, benefitting both workers and their employers.

The National Committee for Quality Assurance (NCQA) recognizes this benefit and has created a model that estimates the benefits of better health for workers and employers. Benefits are defined in terms of both the reduced number of days that workers are absent from work and in the reduced number of days that workers are less than fully productive because they come to work when ailing.

Another type of benefit estimated by the model is the reduced need that employers have for replacement workers to fill in when workers are unable to work because of illness. The NCQA model also generates values for these benefits based on the compensation of workers and the business revenues associated with those workers.[32]

Sage has used the NCQA model to generate estimates of the benefits to workers among the prospective roughly 200,000 total KPMAS members in the Baltimore region and their employers. These estimates are based on current economic conditions in the Baltimore region.

While there are many resources for describing these economic conditions, there are distinct advantages to the information generated by IMPLAN, a standard software and data product for analyzing regional economies. Not only can IMPLAN generate estimates for any county-based regional economy, but it also incorporates data on self-employed persons in addition to those employed by businesses, governments, and other organizations. Using these data for the Baltimore region, the most recent estimate of the average annual compensation (earnings plus benefits) per worker was just over $63,000. Estimated business revenue per employee in the region was approximately $162,500. Almost 63 percent of the regional population is presently employed.[33] Applying this ratio to roughly 200,000 prospective KPMAS members, Sages estimates that almost 189,000 of these KPMAS members would be employed.

The NCQA model uses regional health characteristics to estimate the number of workers who are affected by eight specific treatable medical conditions. Exhibit 26 presents the number of workers who would be expected to have these conditions out of a total worker population of over 132,000 based on Maryland's status as part of the nation's southern region.

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[32] National Committee for Quality Assurance (NCQA), "The NCQA Quality Dividend Calculator™ 2013". https://www.ncqacalculator.com/start.asp.

[33] IMPLAN, "2014 Industry Detail" for the Baltimore region. Compensation per worker ($63,116) includes employee compensation and proprietor income; business revenue per worker is defined as economic output for the region per job ($162,511).

As shown, the most common conditions are smoking and hypertension, which each affect more than one in five workers. Alcoholism is estimated to affect almost 10 percent of these workers. Other conditions affect from 3 percent (heart disease) to 6.4 percent (asthma) of these workers. These estimates are not mutually exclusive. That is, any given worker may be affected by more than one of these conditions (e.g., a smoker who is also diabetic and suffers from hypertension). Importantly, each of these conditions is potentially managed or treated if these workers receive healthcare services. As the quality of this healthcare increases, presumably, workers would enjoy improved health and emerge as more productive workers.

Exhibit 26. Of 200,000 KPMAS Members, Estimated Number of Workers Affected by Selected Medical Conditions

Medical condition	Affected workers	Share of total workers
Alcoholism	12,853	9.7%
Asthma	8,512	6.4%
Chicken Pox	6,609	5.0%
Depression	5,321	4.0%
Diabetes	7,929	6.0%
Heart Disease	3,930	3.0%
Hypertension	27,223	20.6%
Smoking	27,623	20.9%

Sources: National Committee for Quality Assurance (NCQA), Sage.

The NCQA model compares the effectiveness of health plans in their ability to improve worker health with respect to select medical conditions. The model generates comparisons of plans accredited by NCQA relative to a baseline unaccredited plan. As noted above, for 2018, the most recent span for which NCQA rankings are available, KPMAS was one of only two plans in the U.S. that received a perfect 5.0 rating for commercial plans and one of only eight plans to receive a perfect 5.0 rating for Medicare.

At 5.0, KMPAS was the highest-rated plan operating in Maryland for both commercial and Medicare plan types. One other plan—Johns Hopkins US Family Health Plan—received a 4.5 rating in the commercial type, the remaining 16 ranked commercial plans operating in Maryland had ratings ranging from 1.5 to 4.0. The eight rated Medicare plans other than the KPMAS plan received ratings between 3.0 and 4.0.[34]

To compare impacts on workplace productivity, Sage selected two plans accredited by NCQA — the national average accredited plan and the KPMAS plan. In its rating, the median national plan has a rating of 3.5 and is basically the equivalent to the rating of the typical health plan in Maryland (the median rank for all Maryland health plans is 3.5). Thus, the comparison between KPMAS and the national average plan demonstrates the likely benefit that a new KPMAS member would enjoy relative to his or her prior health plan.

[34] National Committee for Quality Assurance (NCQA), "NCQA Health Insurance Plan Rankings 2018-2019 – Summary Report (Private)". http://healthplanrankings.ncqa.org/2018/.

Exhibit 27 summarizes the reductions in absentee days (i.e. days missed from work) and reduced low productivity days (i.e. days when a worker goes to work when sick) for the average accredited plan and the KPMAS plan. In each case the reductions are measured relative to a worker who is covered by an unaccredited health plan. These estimates are based on the NCQA model that quantifies the impacts of health plans on worker productivity.[35]

These reductions apply to the approximately 189,000 workers within the prospective roughly 200,000 KPMAS members. As such, they represent the total workplace impact of the healthcare delivered to these prospective KPMAS members compared to the impacts if these prospective KPMAS members were covered by a typical Maryland health plan. For example, because they received better care with alcohol dependence problems, KPMAS members would miss 1,505 fewer days of work compared to similar workers covered by an unaccredited health plan. If these workers were covered by a typical Maryland health plan, they would miss 190 fewer days of work. Similarly, KPMAS members with alcohol dependence problems would experience 4,961 fewer low productivity days compared to workers covered by an unaccredited health plan, while similar workers covered by the average accredited plan would reduce low productivity days at work by only 626.

As shown in Exhibit 27, workers among the roughly 200,000 prospective KPMAS members would collectively experience reduced absenteeism of 11,000 days while a similar number of workers covered by the typical Maryland health plan would experience reduced absenteeism of roughly 2,000 days. Decreases in reduced low productivity days are estimated at more than 26,000 for workers among the total roughly 200,000 prospective KPMAS members, while a similar number of workers covered by the average accredited plan would reduce these low productivity days by roughly 3,200.

Exhibit 27. Of 200,000 KPMAS Members, Estimated Workplace Benefits of KPMAS Workers Compared to Workers Covered by the Average Accredited Plan (Annual, Ongoing)

Medical condition	Average accredited plan		KPMAS Mid-Atlantic	
	Reduced Absentee Days	*Reduced Low Productivity Days*	*Reduced Absentee Days*	*Reduced Low Productivity Days*
Alcohol	133	438	1,054	3,473
Asthma[36]	(22)	(115)	809	4,160
Chicken Pox[37]	433	-	931	-
Depression	158	409	1,541	3,984
Diabetes	1,031	1,031	3,775	3,775
Heart Disease	115	270	566	1,327
Hypertension	134	356	1,569	4,173
Smoking	113	809	762	5,417
Total	2,095	3,197	11,006	26,310

Sources: National Committee for Quality Assurance (NCQA), Sage. Note: Numbers may not add due to rounding.

[35] Op. cit., NCQA, "The NCQA Quality Dividend Calculator™ 2013".
[36] The negative value listed for asthma means that an average accredited plan is worse than an unaccredited plan.
[37] The lost work days pertain to caregivers taking care of children with chicken pox. As the NCQA explains, "The literature regarding the indirect effects of chicken pox is sparse. Caregiver absentee effects are directly incorporated into the QDC. We have not found any estimates of the impact on 'on-the-job' productivity."

Impacts for some of the individual medical conditions warrant comments. As noted above, these impacts are measured in relation to health plans that are unaccredited by NCQA. The fact that the values for asthma for the average accredited health plan are negative means that members of the average accredited plan miss more days of work and have lower productivity than workers in the unaccredited plan. The benefits associated with chicken pox are the reduced days that caregivers are absent from work because they have to provide care for children with chicken pox. As such, these benefits for workers reflect the extent to which health plans are effective in insuring that their children are immunized against chicken pox.

These benefits add clear economic value. When workers are absent because of health issues, replacement workers are usually required. These needs can be met with temporary workers or added time for other workers at the business. In either case, there are added costs for enterprises. Even if replacement workers can be employed, businesses run the risk of reduced revenue as productivity drops when workers are out sick and replaced by less experienced ones. Finally, workers will typically use sick leave to cover their time off, generating another expense for the business.

The estimated value of the workplace benefits is presented in Exhibit 28. With one exception these values are the expenses and losses that businesses do not incur because workers are healthier.[38]

Healthier workers reduce the need to pay for replacement workers or provide paid leave for workers absent because of illness. Healthier workers are more productive and reduce the impacts on business revenue that occur when they are not on the job. These values are based on the average income that workers in the Baltimore region receive and the average revenue that businesses generate for each worker.

[38] The exception is impacts associated with asthmatic workers covered by the average accredited health plan. As shown in Exhibit 27, the workplace benefits in terms of reduced absentee days and reduced low productivity days are negative values. In other words, workers with problems with asthma who are covered by the average health plan actually are more likely to miss work or work when sick compared to workers covered by an unaccredited plan. Because these benefits are negative values, the corresponding economic values shown in Exhibit 28 for workers with asthma covered by the average health plan are also negative. That is, workers covered by the average health plan actually cost employers and workplaces more than workers covered by unaccredited plans.

As indicated, the value of workplace benefits for KPMAS members includes $8.7 million in lower replacement costs, $2.6 million in avoided business revenue losses, and $11.9 million in sick day wage savings. The comparable estimates for workers covered by the average health plan are $1.2 million in lower replacement costs, $0.4 million in avoided business revenue losses, and $1.7 million in sick day wage savings.

Exhibit 28. Value of Workplace Benefits, Comparison of KPMAS Plan and Average Accredited Plan

Medical condition	Value Per Annum ($ thousands)					
	Average accredited plan			KPMAS Mid-Atlantic		
	Lower Replacement Costs	*Revenue Impact*	*Sick Day Wages Savings*	*Lower Replacement Costs*	*Revenue Impact*	*Sick Day Wages Savings*
Alcohol	$133	$41	$181	$1,055	$321	$1,438
Asthma	-$32	-$10	-$44	$1,158	$353	$1,579
Chicken Pox	$101	$31	$137	$217	$66	$296
Depression	$132	$40	$180	$1,288	$392	$1,756
Diabetes	$481	$146	$655	$1,760	$536	$2,399
Heart Disease	$90	$27	$122	$441	$134	$601
Hypertension	$114	$35	$155	$1,338	$408	$1,825
Smoking	$215	$65	$293	$1,440	$439	$1,964
Total	$1,233	$376	$1,681	$8,696	$2,648	$11,858

Sources: National Committee for Quality Assurance (NCQA), Sage. Note: Numbers may not add due to rounding.

Exhibit 29 indicates that roughly 200,000 KPMAS members would collectively avoid almost 9,000 absentee days and reduce low productivity days by more than 23,000. The total economic value of these workplace benefits is $28.4 million, with half of this value captured by the reduced need for paid sick days, 37 percent by the reduced need for replacement workers, and 11 percent in revenues that are not lost because healthy workers are on the job. These benefits are estimated in terms of today's dollars. Over time, as wages and business revenues rise, the value of these benefits will also increase.

Exhibit 29. Value of Workplace Benefits for Workers among the 200,000 KPMAS Members

Medical condition	*Reduced Absentee Days*	*Reduced Low Productivity Days*	Workplace Benefits ($ thousands)			Total economic benefit ($ thousands)
			Lower Replacement Costs	*Revenue Impact*	*Sick Day Wages Savings*	
Alcohol	921	3,035	$922	$281	$1,257	$2,459
Asthma	832	4,275	$1,190	$362	$1,623	$3,175
Chicken Pox	498	-	$116	$35	$158	$310
Depression	1,383	3,576	$1,155	$352	$1,576	$3,083
Diabetes	2,744	2,744	$1,279	$389	$1,744	$3,412
Heart Disease	451	1,057	$351	$107	$479	$937
Hypertension	1,436	3,818	$1,224	$373	$1,669	$3,266
Smoking	649	4,609	$1,225	$373	$1,671	$3,269
Total	8,911	23,113	$7,463	$2,273	$10,176	$19,912

Sources: National Committee for Quality Assurance (NCQA), Sage. Note: Numbers may not add due to rounding.

Impacts on Utilization of Healthcare Resources

Since better healthcare leads to improved health, it also stands to reason that this diminishes utilization of human and physical medical capital. An obvious example of this relationship is the control of hypertension, a medical condition that affects roughly one-third of all adults and contributes substantially to the need for emergency department and inpatient hospital services. Better healthcare, thus, reduces systemic medical costs.

Closely related to the need to use healthcare resources is the question of which resources are most appropriate under a given set of circumstances. A central theme of coordination of care is that patients receive appropriate care in a timely manner and that this care be provided in a suitable facility. What constitutes an appropriate facility will depend, at least in part, on the effective implementation of the coordination of care. For example, the ability of primary care physicians to refer patients to the right specialists in a multi-specialty hub with minimal delay can result in care that eliminates the need for more intensive and expensive services. As noted earlier in this report, the clinical decision units (CDUs) within multi-specialty hubs are staffed by physicians who specialize in urgent care and emergency medicine. The presence of CDUs allows KPMAS to provide care that would otherwise require the use of inpatient hospitalization and/or outpatient emergency department services. CDUs are then a significant factor in the reduced rates at which KPMAS members require these hospital-based services, as discussed below.

The American Hospital Association (AHA) and others publish annual statistics on hospitals that include basic measures of hospitalization use and finances.[39] Key among these measures are the number of inpatient days of hospitalization and the number of visits to hospital emergency departments. KPMAS also tracks use of these facilities by its membership in the Mid-Atlantic states. Comparing how KPMAS members in the Mid-Atlantic use emergency departments or require inpatient care to averages in the Baltimore region and Maryland as a whole can demonstrate the effectiveness of KPMAS's continuum of care.

The Baltimore region is well supplied with hospital resources. Although the region is home to not less than half Maryland's population and hospitals, almost 60 percent of the state's hospital beds and inpatient discharges are in the Baltimore region.

Some of the disproportionate availability of hospital beds, hospital discharges, or use of emergency departments is likely attributable to the presence of the state's two academic hospitals in Baltimore City, which provide services that are routinely used by a statewide, or even more widespread, population (e.g., shock trauma, transplant centers). Baltimore City is also home to the most concentrated poverty in Maryland, which likely also impacts hospital utilization. See Exhibit 30.

[39] American Hospital Association, "AHA Hospital Statistics, 2016"; American Hospital Directory for 2017 data. https://www.ahd.com/free_profile/.

Exhibit 30. Hospital Characteristics: Maryland and the Baltimore MSA, 2017

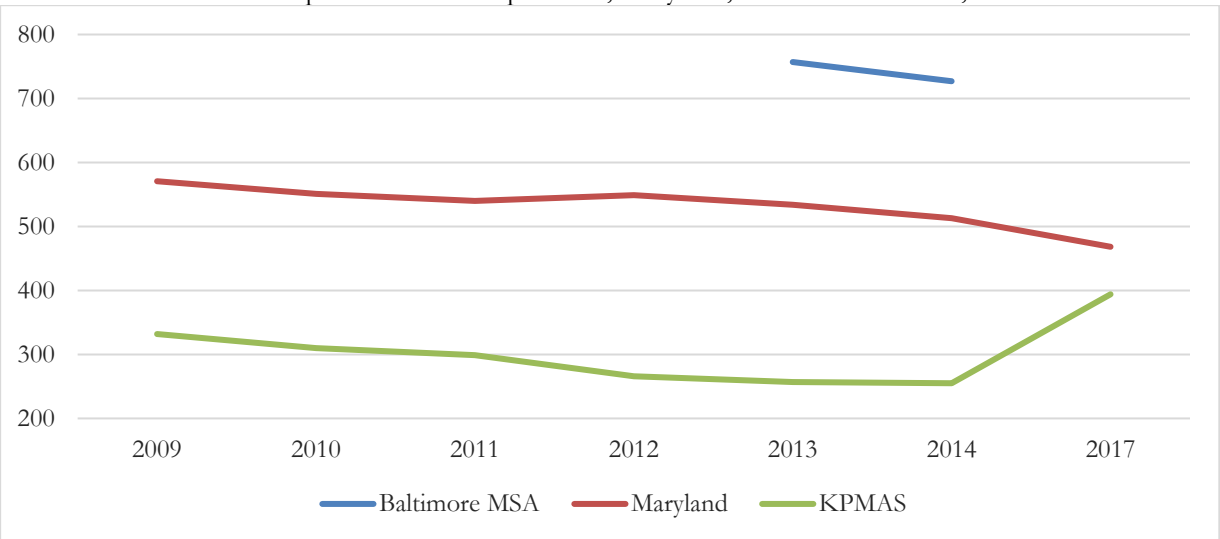
	Population	*Hospitals*	*Hospital beds*	*Discharges*
Maryland	6,025,000	52	10,963	573,212
Baltimore MSA	2,792,050	21	6,476	303,317
Baltimore MSA as share of Maryland	46%	40%	59%	53%

Source: American Hospital Directory

Optimizing the use of hospital-based resources has been a deliberate element of KPMAS's strategy. Investments in medical centers and multi-specialty hubs in the Mid-Atlantic region, improvements in providing rapid access to care, and a greater ability to provide care within KPMAS facilities have helped to reduce unnecessary use of hospitals and emergency departments. When these resources are needed, KPMAS is able to rely on its premier hospital strategy to optimize the use of resources.

The results of these efforts have been significant. KPMAS members have experienced lower rates of hospitalization when compared to average rates of hospitalization for all Maryland residents. The comparison between rates for KPMAS members and the residents of the Baltimore Metropolitan Statistical Area are even more pronounced. Exhibit 31 summarizes trends in the need for inpatient hospital care for KPMAS members compared to Maryland overall. Data for the Baltimore MSA are not available for 2017. Data for the two most recently available years for the Baltimore region—2013 and 2014—are also shown. These rates are substantially higher than the overall rates for Maryland.

Exhibit 31. Trends in Hospitalization Rates per 1000, Maryland, the Baltimore MSA, and KPMAS



Sources: American Hospital Association, Kaiser Permanente (KP)

These trend data can be applied to the prospective roughly 200,000 total KPMAS members to estimate the reduced need for inpatient hospital care as well as the avoided costs associated with reduced need for hospitalization. Exhibit 32 summarizes the need for inpatient care based on demands per 1,000 Maryland residents relative to demands for KPMAS members. Compared to the statewide experience, prospective KPMAS members would need 22,000 fewer days of inpatient hospital care worth $56 million.

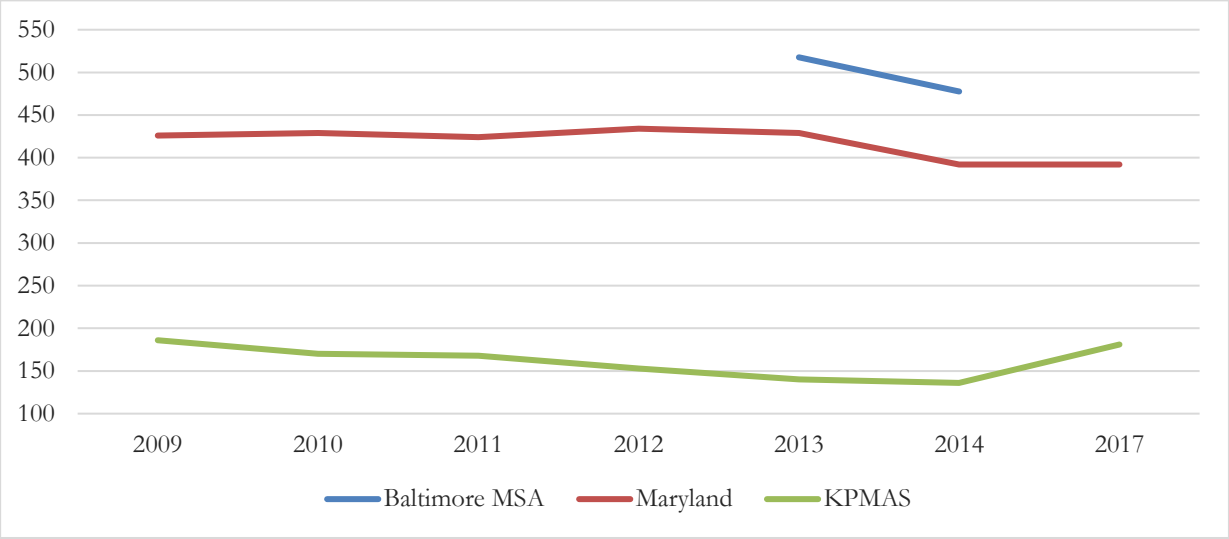
Exhibit 32. Avoided Hospitalization Costs for 200,000 KPMAS Members (Annual, Ongoing)

	Inpatient days per 1,000 in 2017	*Estimated inpatient days for 200,000*	*Cost per inpatient day, 2016*	*Excess inpatient days compared to KPMAS*	*Excess inpatient costs compared to KPMAS ($ millions)*
Statewide experience	468	98,280	$2,512	15,540	$39
KPMAS Experience	394	82,740	$2,512	0	$0

Sources: American Hospital Association, Kaiser Permanente (KP), Becker's Hospital Review

Trends characterizing emergency department utilization are similar (Exhibit 33). While use has trended lower across the state and in the Baltimore MSA, the utilization for KPMAS members is much lower than either the average resident of Maryland or the Baltimore MSA.

Exhibit 33. Trends in Emergency Department Visit Rates Per 1000, Maryland and KPMAS



Sources: American Hospital Association, Kaiser Permanente (KP)

As with hospitalization, the reduced rate of emergency department visits translates into substantial dollar savings for KPMAS members who avoid the need for emergency department visits. Exhibit 34 provides the most recent directly comparable demands for these services for the average resident of Maryland and the average for KPMAS members. Based on the most recent available national data, the average cost of an emergency room visit is $1,917.[40]

Exhibit 34 indicates that roughly 200,000 KPMAS members would likely require over 44,000 fewer emergency department visits per year compared to roughly 200,000 average Marylanders. The avoided costs associated with these visits are estimated at $85 million based on average costs.

Exhibit 34. Avoided Emergency Department Costs for 200,000 KPMAS Members (Annual, Ongoing)

	Emergency dept. visits per 1,000 in 2017	*Estimated emergency dept. visits for 200,000*	*Cost per emergency dept. visit, 2016*	*Excess emergency dept. visits compared to KPMAS*	*Excess emergency dept. visits costs compared to KPMAS ($ millions)*
Statewide experience	392	82,275	$1,917	44,265	$85
KPMAS experience	181	38,010	$1,917	N.A.	N.A.

Sources: American Hospital Association, Kaiser Permanente (KP), Becker's Hospital Review

[40] Becker's Hospital Review, "Cost of ER visits increased 31% between 2012-16: 5 findings," January 23, 2018. https://www.beckershospitalreview.com/eds/cost-of-er-visits-increased-31-between-2012-16-5-findings.html.

Summary of Improved Health Outcomes

KPMAS, the only health plan rated 5.0 for commercial and Medicare members in the 2018-2019 health insurance plan ratings by the National Committee for Quality Assurance (NCQA), has provided consistently superior performance in key areas of healthcare. For example, KPMAS's performance in screening for breast and colorectal cancers and in controlling hypertension, is significantly better than the performance that defines the top 10 percent of all national health plans.

Where the economic value of this performance can be quantified, the results are compelling. When the performance of KPMAS is applied to the likely characteristics of the roughly 200,000 prospective total members in the Baltimore region, significant benefits are enjoyed by these individuals.

- Breast cancer screening will generate annual benefits estimated at:
    - 10.3 total avoided deaths from breast cancer for KPMAS members;
    - 163 total added years of life expectancy valued at over $16 million.
- Controlling blood pressure will generate annual benefits estimated at:
    - Roughly 5,000 extra years of life for the over 45,000 KPMAS members whose hypertension is treated and controlled;
    - Annual years of life valued at $500 million each year for these over 45,000 KPMAS members.
- Better health will generate substantial workplace benefits:
    - Over 11,000 fewer days missed from work because of illness per year;
    - Over 26,000 fewer low productivity days from working while ill per year;
    - Total workplace benefits valued at almost $20 million.

These improvements in the health of KPMAS members also reduce the need for healthcare delivered at hospitals. Compared to the experience of the average Marylander, the prospective roughly 200,000 KPMAS members would require much less hospitalization and fewer visits to emergency departments of hospitals. Avoided use of these resources will likely include:

- Over 15,000 fewer days of inpatient hospital care, worth $39 million;
- 44,300 fewer emergency department visits, worth $85 million.

VI. KPMAS support for the community

As part of its Baltimore strategy, KPMAS has implemented a multi-faceted community engagement program that incorporates support to organizations, charitable coverage for individuals, and other initiatives. Many of these efforts are designed to address the social factors that substantially influence health for populations, including educational and achievement economic vitality. The value of these efforts in the period from 2015 to 2018 is over $60 million.

KPMAS has contributed over $6 million in grants, sponsorships, and donations primarily in Baltimore City and also in Baltimore County. These efforts have included over 180 individual contributions to a very broad range of nonprofits, academic institutions, philanthropies and other organizations that address many factors that contribute to population health from food security to health education to health careers to community health.

Charitable health coverage has been extended to over 1,000 residents of Baltimore City and Baltimore County who have become KPMAS members. This coverage is valued at over $20 million from 2015 to 2018.

Medical financial assistance has provided support to an average of over 20,000 unique patients in each of the past four years. This assistance is valued at almost $29 million over that period. Membership has been extended to over 15,000 Medicaid recipients in each of the past two years.

Other initiatives have received over $5 million in support. Future Baltimore has engaged almost 2,000 adults and school children. Services have included behavioral health assessments, school-based health education, and training community members for careers in healthcare. Thriving Cities and Thriving Schools have reached out to government leaders and individual schools for health education.

Conclusion

This Sage Policy Group, Inc. (Sage) report highlights the economic and health impacts associated with KPMAS's prospective expansion in the Baltimore metropolitan area. Through investments and expenditures expected to total over $13 billion by 2028, the organization expects to increase its current 2.5 percent market share to 8 percent by 2025. The KPMAS annual operating expenditure on regional healthcare will more than triple between 2017 and 2028, expanding from over $500 million in 2017 to a projected $1.8 billion by 2028. By 2025 KPMAS expects that more than 200,000 people will have direct access to its unique healthcare model, up from 63,000 people in 2012.

This matters. KPMAS is one of the nation's best performing health plans. Since KPMAS introduced multi-specialty hubs in the Mid-Atlantic, the rank for KPMAS among all U.S. commercial health plans accredited by the National Committee for Quality Assurance (NCQA) has risen from 81st to 2nd out of more than 1,000 health plans nationwide and is the only health plan to receive the highest 5.0 rating for commercial and Medicare health plans. This is the health plan that is set to massively expand in Baltimore.

Not only does KPMAS's historic performance indicate dramatically better outcomes for hypertension, breast cancer, and other conditions, improved health among prospective KPMAS members will also reduce the need for healthcare delivered in expensive settings. Compared to the experience of the average Maryland resident, the prospective roughly 200,000 KPMAS members would require much less hospitalization and fewer visits to emergency departments of hospitals. Avoided use of these resources include:

- Over 15,000 fewer days of inpatient hospital care, worth $39 million;
- 44,300 fewer emergency department visits, worth $85 million.

From 2017 to 2028, total employment supported by KPMAS investments and operations is projected to grow from almost 7,700 jobs to almost 26,000 jobs. The income of workers who fill these jobs is expected to expand from $438 million to almost $1.5 billion. Sales of goods and services by businesses in the Greater Baltimore region attributable to KPMAS's regional investments and operations are expected to grow from approximately $940 million to more than $3.1 billion per annum by 2028.

Economic activity triggers fiscal impacts, typically in the form of augmented tax collections. Sage estimates that from 2017 to 2028 local governments in the Greater Baltimore region will receive $254 million in income taxes attributable to the implementation of KPMAS's Baltimore Strategy. Over that period, the State of Maryland will garner $666 million in income and sales taxes.

Employers will also benefit from KPMAS's expansion in the Baltimore region. Better health outcomes translate into reduced absenteeism and higher productivity. The study team estimates that each year, the approximately 200,000 prospective KPMAS members would collectively avoid over 11,000 absentee days and experience over 26,000 fewer low productivity days. The total economic value of these workplace benefits is $19.9 million.

Appendix

Measuring Economic and Fiscal Impacts

From an economic perspective, the delivery of healthcare services by KPMAS represents a demand for services and goods in the local economy. These demands can be defined in terms of employment, the income associated with employment, and the value of the health services themselves.

Importantly, the demand for health services creates demand for other goods and services that are inputs to the provision of health services. For example, medical offices purchase goods ranging from clinical supplies to copy paper as well as services ranging from advertising to accounting. The vendors of these goods and services use revenues from medical offices to pay their own employees and to purchase the goods and services they need to operate their businesses. This cascading stream of business-to-business transactions constitutes the supply chain for these medical offices. Employees of the medical offices and of businesses in the supply chain are consumers whose spending supports the local economy. Collectively, these impacts represent the multiplier effect of the demand and supply for healthcare services.

To quantify economic impacts, Sage utilized State of Maryland-specific IMPLAN[41] multipliers to generate estimates of employment, income, and regional business sales (also known as output). Estimated employment impacts include both full- and part-time workers. Labor income is defined as encompassing all forms of employment income including employee compensation (wages and benefits) and proprietor income (earnings of business owners and other self-employed persons). Business sales/output represents the sum total of intermediate inputs and all value-added contributions and is generally the same as business revenue.

From a geographic perspective, economic and fiscal impacts are quantified for the Baltimore region as a whole. For purposes of this analysis, the Baltimore region comprises six distinct and mutually exclusive jurisdictions: Baltimore City, Anne Arundel County, Baltimore County, Carroll County, Harford County, and Howard County.

Statewide impacts are virtually indistinguishable from those for the Baltimore region. This is a reflection of the robust nature of the Baltimore region's economy and its ability to meet the human and physical capital needs of a burgeoning healthcare industry. The longstanding presence of two academic health systems in Baltimore City has undoubtedly helped to create a comprehensive community of vendors able to support an array of healthcare providers and researchers. Because statewide impacts are essentially the same as those for the Baltimore region, only the impacts for the Baltimore region are presented in this report.

To conduct the fiscal portion of the analysis, Sage relied upon publicly available information including government-published tax rates and budgetary information for key tax revenue streams — income and property taxes for local and state governments and sales and use taxes for state government. Sage also uses IMPLAN to estimate a range of indirect taxes and other forms of government revenue.

41 IMPLAN is the most commonly utilized econometric software for analyses of its type and has emerged as the industry standard for this type of quantification. The model comprises economic multipliers that reflect the statistical relationship between final demand for goods and services (e.g., medical appointments with KP doctors) at local industries and the likelihood that certain goods and services will be sourced locally as opposed to outside the community. These multipliers are updated each year and Sage purchases model licenses on an annual basis. This study utilizes the most recent multipliers for Maryland counties and Baltimore City.

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