

FEBRUARY 2012



The  
**ECONOMIC**  
**IMPACT**  
*of Eastern Virginia*  
Medical School in  
Hampton Roads

*by*

**James V. Koch, PhD**

Board of Visitors Professor of Economics

Old Dominion University

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**EVMS**

**The Economic Impact  
of Eastern Virginia Medical School  
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## EXECUTIVE SUMMARY

Eastern Virginia Medical School (EVMS) is one of the region's most powerful economic engines. During a time when the region's economy has been sputtering, EVMS's economic impact has expanded. It now is the 20<sup>th</sup> largest private sector employer in Hampton Roads and its estimated annual economic impact has risen to \$823.6 million, \$125.8 million (18.0 percent) higher than in 2007. Were it not for the international economic recession, EVMS's economic impact likely would have approached \$1.0 billion. A minimum estimate of the costs that the region would incur if EVMS did not exist is \$220 million, or \$132 per citizen. Except for EVMS, approximately 98,000 patients would be forced to travel to other metropolitan areas to obtain appropriate medical care.

In the words of a prominent physician within the region, *"It all really starts with EVMS. EVMS supplies us with the M.D.s and other skilled health professionals we need, provides thousands of patients with excellent health care, and is involved in some terrific applied research that we can use in our every day practices."* A hospital administrator put it this way: *"The quality of life in Hampton Roads would fall substantially if we did not have EVMS."*

The presence of EVMS continues to attract highly qualified medical personnel that provide a menu of high quality medical care that otherwise would be beyond our regional grasp. The regional economic impact of EVMS alumni (M.D.s and health professionals) approximates \$222 million annually.

An increasingly large number of EVMS faculty are involved in cutting edge translational research that immediately is reflected in improved patient care. EVMS has become a leader in the field of medical modeling and simulation, a field that bodes to become increasingly important in the future.

Because EVMS is a not-for-profit institution dedicated to serving human needs, it provides very large amounts of charitable service and care to individuals and organizations unable to pay for these services. In 2011, the estimated value of the uncompensated health services provided by EVMS Clinical Enterprises exceeded \$51 million. In addition, EVMS annually provides approximately 100,000 young people with unbilled medical services that include counseling, vaccinations, and prevention. EVMS also supplies approximately 7,500 key adults (parents, teachers) with similar gratis services.

EVMS is an excellent employer. This fiscal year, it will pay its employees more than \$108.9 million in wages and salaries and \$21.2 million in fringe benefits. EVMS's average salary per employee (\$78,989) is 90.6 percent above the regional average of \$41,440 reported by the Bureau of Labor Statistics.

Finally, EVMS's economic activities have a ripple effect upon the region. EVMS, along with its students, residents and alumni, spends about \$428 million per year. Its total economic impact, however, approximates \$824 million per year as these dollars are spent and re-spent. The incremental \$396 million of annual economic impact generates an estimated 3,752 additional jobs throughout Hampton Roads.

## I. EVMS AS AN EMPLOYER

Eastern Virginia Medical School is one of the largest private sector employers in the region. In 2010, it was the 20th largest non-governmental employer in Hampton Roads. Table 1 reports these data.

TABLE 1

### LARGEST NON-GOVERNMENTAL EMPLOYERS IN HAMPTON ROADS, 2010

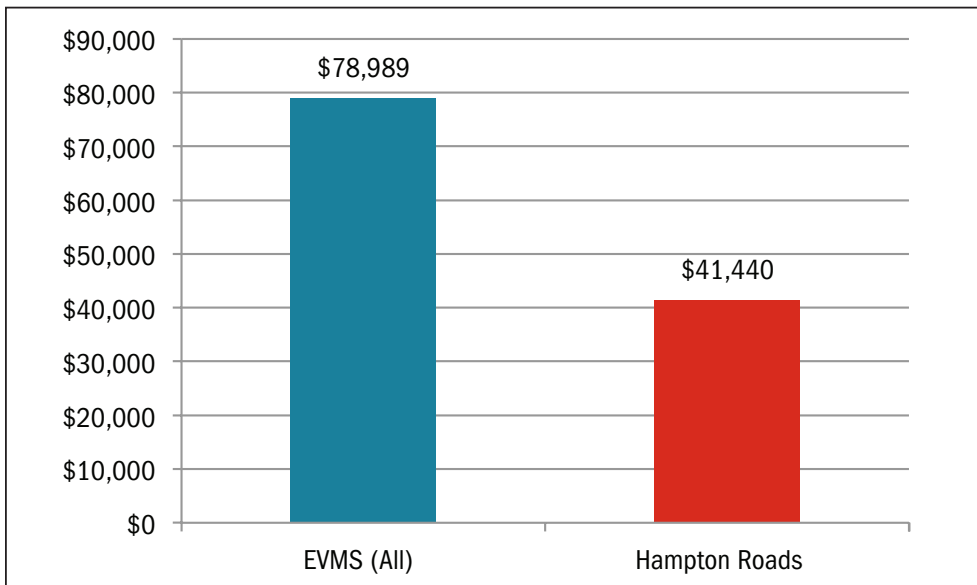
*Hampton Roads Ranking of Firm or Organization  
by Approximate Number of Employees in Region*

Rank	Employer	2010 Employees
1	Huntington Ingalls	20,000
2	Sentara	17,000
3	Riverside Health	7,050
4	Colonial Williamsburg	4,000
5	Bank of America	3,600
6	Bon Secours Hampton Roads	3,000
7	Smithfield Foods	2,700
8	Chesapeake Regional Medical Center	2,400
9	GEICO	2,300
10	BAE Systems	2,200
11	Measurement Specialties	2,184
12	Gwaltney of Smithfield	2,100
13	PRA	2,093
14	Stihl	2,016
15	Children's Hospital	1,905
16	LTD Management	1,810
17	Amerigroup	1,700
18	FHC Health	1,500
19	Canon Virginia	1,460
20	EVMS	1,379

EVMS, however, is no ordinary employer. As Figure 1 illustrates, EVMS pays its average employee \$78,989 annually and this is more than 90 percent higher than the regional average according to the U.S. Department of Labor’s Bureau of Labor Statistics.<sup>1</sup> However, as Figure 2 reveals, EVMS also pays its employees more than the national and regional averages for health care employees. For example, EVMS’s average salary of \$78,989 is about 10 percent higher than the national average of \$71,280 and about 16 percent higher than the regional average of \$67,780.<sup>2</sup>

**FIGURE 1**

**AVERAGE SALARY OF AN EVMS EMPLOYEE  
VERSUS AVERAGE SALARY OF AN EMPLOYEE IN HAMPTON ROADS**



<sup>1</sup> “Metropolitan and Nonmetropolitan Area Occupational Employment and Wage Estimates, May 2010,” [www.bls.gov/oes/current/oesrcma.htm](http://www.bls.gov/oes/current/oesrcma.htm).

<sup>2</sup> Note, however, that this particular health care comparison does not control for the proportion of physicians and surgeons relative to nurses and other health professionals. EVMS could be more “physician heavy” than the region and the nation.

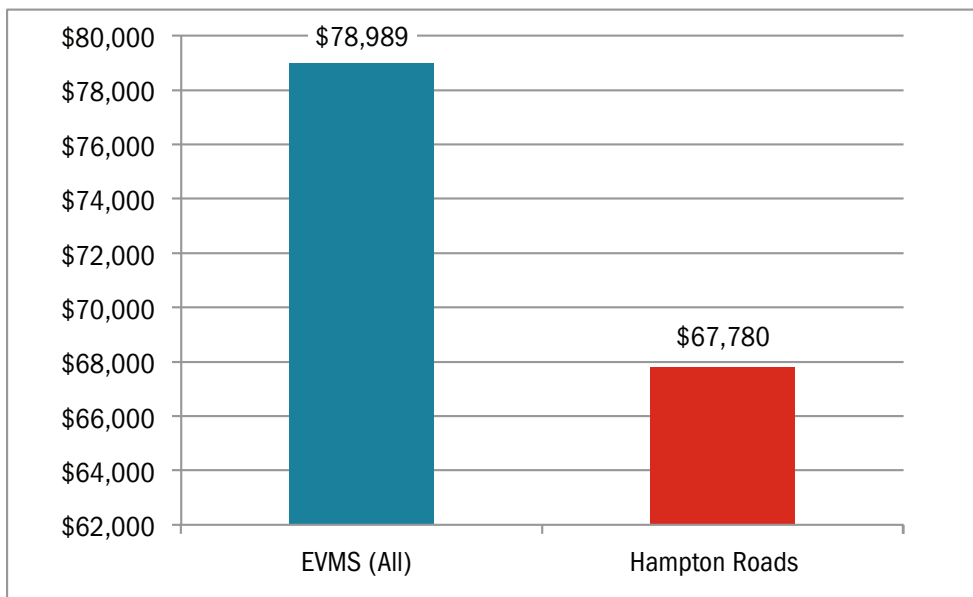
## II. COMPUTING THE ECONOMIC IMPACT OF EVMS

Eastern Virginia Medical School's economic impact can usefully be divided into ten parts:

- Salaries and wages paid to employees
- Fringe benefits paid to employees
- Purchases of supplies
- Contractual services
- Operating expenses
- Capital expenditures
- Student expenditures, net of tuition
- Residents' expenditures
- Alumni expenditures
- Value of charitable care provided

FIGURE 2

### AVERAGE SALARIES OF HEALTH CARE EMPLOYEES AT EVMS COMPARED TO THE HAMPTON ROADS AVERAGE



The analysis presented here is based upon estimates that rely upon a variety of economic models, including the U.S. Department of Commerce's RIMS II economic model. RIMS II is the most frequently used model where economic impact studies are concerned and in essence supplies regional input-output multipliers that show how economic activity is distributed in industries across a geographic area and how those industries are interrelated, economically speaking.

After wages and salaries, the next largest category of expenditures by EVMS is on general operating expenses, which include a myriad of different items ranging from electricity to insurance. In 2011, EVMS spent an estimated \$30.7 million on operating expenses and \$29.0 million on contractual services, the next largest category. Table 2 reports these numbers as well as EVMS's expenditures in the other categories noted above.

**TABLE 2**

**ECONOMIC IMPACT OF EASTERN VIRGINIA MEDICAL SCHOOL  
IN HAMPTON ROADS, 2011**

(1) <b>Expenditure Category</b>	(2) <b>Estimated Expenditures</b>	(3) <b>Net of Leakages Outside Hampton Roads</b>	(4) <b>Economic Impact Including Ripple Effect</b>
Salaries and Wages	\$108,925,511	\$96,943,705	\$225,878,832
Fringe Benefits	\$ 21,268,341	\$19,354,190	\$ 45,095,263
Supplies	\$ 7,822,250	\$ 7,118,248	\$ 16,443,152
Contractual Services	\$ 29,005,143	\$26,394,680	\$ 61,499,605
Operating Expenses	\$ 30,794,579	\$25,559,501	\$ 53,930,546
Capital Expenditures	\$ 26,666,667	\$21,600,000	\$ 44,712,000
Students	\$ 32,627,135	\$30,343,236	\$ 70,699,739
Residents	\$ 7,000,000	\$ 6,510,000	\$ 15,168,300
Alumni	\$109,951,720	\$95,657,996	\$222,883,132
Charity	\$ 54,000,000	\$49,140,000	\$ 67,321,800
<b>Totals</b>	<b>\$428,061,346</b>	<b>\$378,621,555</b>	<b>\$823,632,369</b>

The \$26,666,667 capital expenditures number in Table 2 is EVMS's three-year average capital expenditure, 2009-2011. EVMS's student enrollment approached 1,000 in Fall 2011 and the estimate of student expenditures contained in Table 2 is based upon the projected student budget for each student in his/her course of study according to established U.S. Government financial aid guidelines.. However, that estimate does not include the tuition students paid to EVMS, as those tuition payments are revenue to EVMS and hence already are included in the other expenditure columns. The annual expenditure of each of an estimated 350 residents is assumed conservatively to be \$20,000.

EVMS alumni impact the Hampton Roads region in many different ways as citizens and health professionals. These alumni have a computable economic impact. As Table 3 illustrates, if one simply multiplies the number of EVMS alumni in a typical Hampton Roads city times their estimated annual salary, one emerges with a very impressive contribution to the economic development of the region. **EVMS alumni in the largest seven cities (but not including alumni elsewhere in the region) earned more than \$109 million in wages and salaries in 2011.** Figure 3 illustrates these data, which demonstrate the significant economic impact EVMS has upon the region, even after its students graduate.

**TABLE 3**

**DISTRIBUTION OF EVMS PHYSICIAN AND HEALTH PROFESSIONAL ALUMNI IN THE SEVEN MAJOR CITIES OF HAMPTON ROADS AND THEIR ESTIMATED EARNINGS**

<b>City</b>	<b>EVMS M.D. Alumni</b>	<b>EVMS Other Health Professionals Alumni</b>	<b>Estimated Annual Wages and Salaries</b>
Chesapeake	63	98	\$16,964,360
Hampton	15	16	\$3,542,080
Newport News	23	17	\$4,920,580
Norfolk	146	120	\$32,054,240
Portsmouth	12	21	\$3,389,460
Suffolk	41	39	\$9,360,860
Virginia Beach	175	163	\$39,720,140
<b>Totals</b>	<b>475</b>	<b>474</b>	<b>\$109,951,720</b>

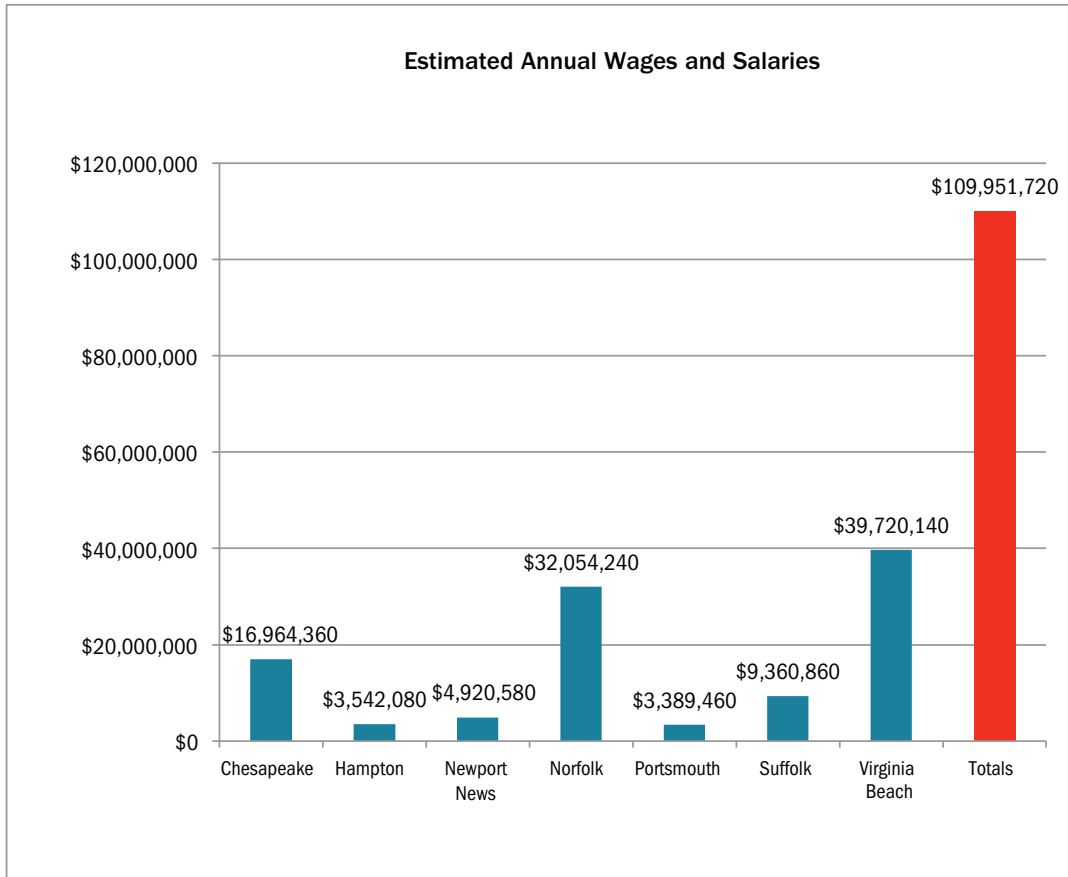
NOTE: An average annual salary of \$163,840 is assumed for an M.D. and \$67,780 for all other health care professionals. These are the regional averages according to the Bureau of Labor Statistics, [www.bls.gov](http://www.bls.gov). City averages are not available.

The estimated value of the charitable resources and services supplied by EVMS in 2011 — **\$54,000,000** — consists of two parts: (1) the uncollected value of health care services provided by EVMS Clinical Enterprises in the amount of \$51,122,439; and, (2) the estimated value of the numerous uncompensated public services ventures that EVMS provides the region in the amount of \$2,877,561. These included tens of thousands of K-12 students counseled and served annually in schools in Hampton Roads, enrolling as many as 20,000 youth in children’s insurance programs, immunizations, obesity and diabetes information sessions, pregnancy counseling and assistance, etc. Based primarily on the value of the time of the EVMS personnel involved, I have valued each contact with youth at \$21 and each contact with adults at \$50. While these values are rough approximations, they do correspond to the values assumed in a variety of studies performed by the U.S. Government.



FIGURE 3

**DISTRIBUTION OF EVMS PHYSICIAN AND HEALTH PROFESSIONAL ALUMNI IN THE SEVEN MAJOR CITIES OF HAMPTON ROADS AND THEIR ESTIMATED EARNINGS**



Regardless, \$54,000,000 is an impressively large number, one almost surely made larger by deteriorating economic conditions that have diminished the ability of many individuals to pay for the health care that EVMS provides them. EVMS nearly always does so without any firm prospect of payment. EVMS, then, is a good citizen in a fashion rarely matched in Hampton Roads.

The total expenditure number at the bottom of column (1), \$428,061,346, is the sum of the dollars actually expended by EVMS (for example, for wages and salaries) plus student and resident expenditures, plus the salaries earned by EVMS alumni in Hampton Roads, plus the estimated value of the charitable health care services supplied by EVMS. All numbers represent the EVMS 2012 fiscal year except for alumni salaries, which represent a 2011 calendar year estimate.

## Leakages Outside the Region

When Eastern Virginia Medical School compensates its employees, or purchases any item, some of those expenditures are made to hire employees, or to patronize companies, located outside of the region. Since the focus of this study is upon EVMS's economic impact on Hampton Roads, column (3) in Table 2 reduces EVMS's expenditures by these "leakages." Some EVMS activities have higher rates of leakage than others. For example, larger proportion of expenditures on capital construction end up not being spent inside the region compared to expenditures on wages and salaries. **The EVMS community's estimated 2011 gross expenditures of \$428,061,346 are reduced to \$378,621,555 once one takes all leakages outside the region into account.**

## Economic Ripple Effects

When Eastern Virginia Medical School purchases necessary items such as food, furniture, gasoline and computers within the region, the dollars spent on these items initiate an economic ripple process as the dollars are spent and re-spent throughout the region. This process gradually diminishes to zero as additional leakages occur. Column (4) of Table 2 applies a variety of multipliers to the estimated 2011 expenditures in column (3). It is well to bear in mind that these multipliers reflect averages based upon RIMS II and national economic studies and they will not hold true for specific expenditures initiated by EVMS.

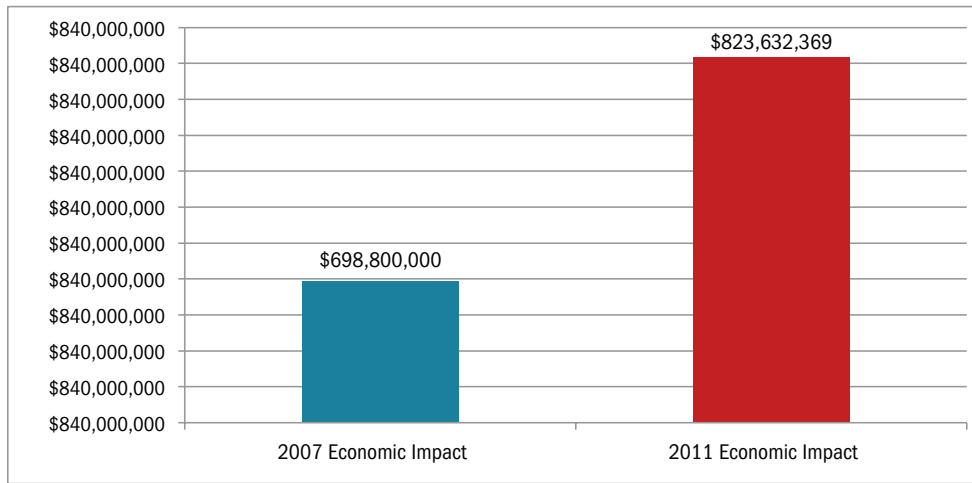
**Thus, the ultimate economic impact of the original \$378,621,555 million expenditures upon employees, goods and services by the EVMS community in the region expands to \$823,632,369.** These multipliers effects combine what usually are referred to as the "*indirect*" and "*induced*" economic effects (see a section below for a discussion of these two effects). **Note that this is \$125 million (18 percent) higher than my 2007 estimate of EVMS's regional economic impact.** Figure 4 illustrates this growth.

Were it not for the international economic recession, EVMS's economic impact likely would have approached \$1.0 billion. The recession has caused both households and businesses to readjust their balance sheets and this has reduced the size of the usual economic multipliers.

Nevertheless, in a time period when the regional economy has been stagnant or even contracting, the economic impact of EVMS has been expanding. EVMS's economic impact grew almost three times as rapidly as the region's economy, 2007-2011. Clearly, EVMS has become an economic growth engine *par excellence* within Hampton Roads. Indeed, EVMS has become one of the region's most reliable and important sources of economic growth. This is a result that should not be lost upon our elected officials and decision-makers. Investments in EVMS pay rich economic dividends in addition to the more obvious elements of health care enhanced quality of life so often associated with medical schools.

FIGURE 4

**GROWTH IN THE ECONOMIC IMPACT OF EVMS, 2007-2011**



**Tax Payments**

There is another economic benefit generated by EVMS’s economic activities that is not included in the previous analysis. Although many of the activities of EVMS are not directly taxable, the spin-off from the economic activities of EVMS and its employees generates substantial sales, license and property tax revenues that benefit virtually every governmental unit in the region as well as state government. For example, EVMS’s purchases of supplies and services and their subsequent economic ripple effects that generate a variety of taxes (license, income, sales) for local government units. **For example, the \$108.9 million in wages and salaries paid to EVMS employees generates an estimated \$ 5.55 million in income tax collections for the Commonwealth. The purchases of goods and services by EVMS, its employees, students, residents and alumni, and the connected economic ripple effects generate approximately \$25 million in annual sales tax revenues for the Commonwealth of Virginia. Local Hampton Roads governments eventually receive approximately one-quarter of this amount (\$6.25 million) after all legislative actions are taken into account.**

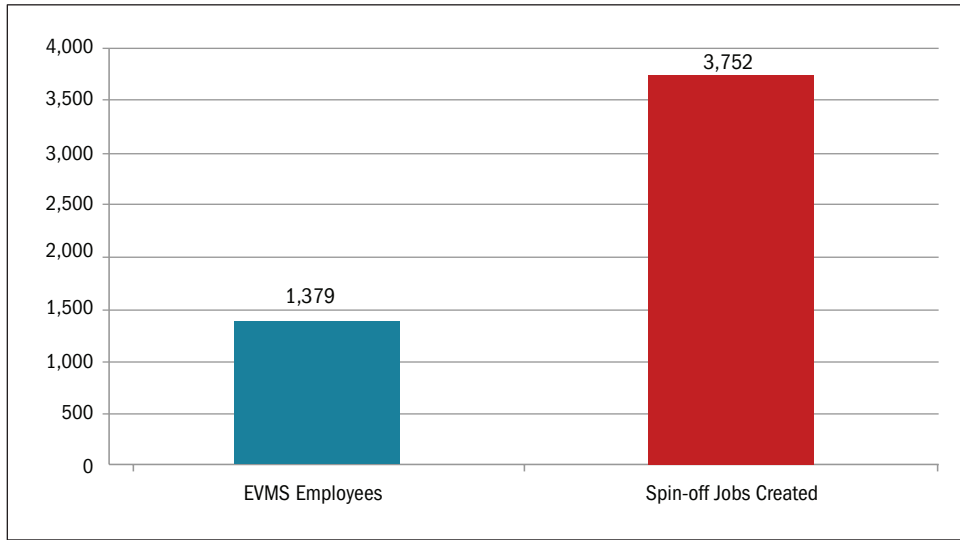
**Job Generation**

Eastern Virginia Medical School employs almost 1,400 individuals and as we have seen these employees are well compensated. These employees are proud and highly visible. Less well understood, but perhaps just as important, is the job generation thrust that EVMS provides elsewhere within the Hampton Roads region.

The economic ripple effect from EVMS’s activities is almost \$500 million within the region and this is a magnificent job creator. Some regional businesses supply EVMS and others sell houses, automobiles, pizzas, higher education and food to EVMS employees and those same suppliers. **On average, each \$113,250 of EVMS’s ripple economic effect results in one new full-time job within Hampton Roads. Thus, EVMS’s economic ripple effect generates an additional 3,752 jobs inside the region. This is yet another reason why EVMS is one of the most important economic engines in Hampton Roads. Figure 5 illustrates this job generation effect.**

**FIGURE 5**

**REGIONAL JOB GENERATION BY EASTERN VIRGINIA MEDICAL SCHOOL**



**III. THE COST TO HAMPTON ROADS IF EVMS DID NOT EXIST**

It is well worth considering what costs our region would incur if EVMS did not exist. Because EVMS is the centerpiece of the region’s health care system, the costs would be significant and both the quantity and the quality of health care would deteriorate.

Table 4 explores some specific economic costs that would be incurred by the residents of Hampton Roads if EVMS did not exist.

**TABLE 4**

**SPECIFIC ECONOMIC COSTS THAT WOULD BE INCURRED BY HAMPTON ROADS IF EVMS DID NOT EXIST**  
*INCLUDES ECONOMIC RIPPLE EFFECT*

Cost Of Indigent Care Borne By Other Medical Providers In Hampton Roads	\$ 82.30 million
Lost Medical Revenue From Paying Patients at EVMS Health Services	\$ 51.60 million
Patient Migration Costs Incurred By Patients Forced to Travel to Health Providers In Other Metropolitan Areas	\$ 86.54 million
<b>Total</b>	<b>\$220.44 million</b>

It is obvious that \$220.44 million, the estimated financial cost that would be incurred by citizens of our region if EVMS did not exist, represents a lot of money by any standard---more than \$132 annually per person living in our region. It is fair to say that many, perhaps most, of the region's citizens are unaware of the costs they would incur if EVMS were to disappear.

It is one thing to compute a financial number. It is another thing for citizens to find out how that would impact them on a day to day basis. How would citizens be affected if EVMS did not exist? First, those desiring medical care would find it increasingly difficult to obtain an appointment because physicians would be in scarce supply. **The reality is that without EVMS, Hampton Roads would be the most populous metropolitan area in the United States not to be served by a local medical school.** Further, because the presence of a medical school frequently is used as an indicator of the quality of health care in a region, we would find it all the more difficult to attract physicians because some prospects would view us as a medical backwater.

Without EVMS, the 23 percent of local physicians who have graduated from EVMS would not be available and there can be little doubt that it would be expensive to attract replacements. According to the American Association of Medical Schools, a national shortage of 150,000 physicians looms in 2025. The absence of EVMS would transform this shortage into disaster proportions in Hampton Roads.

As it stands, EVMS Health Services provides access to its physicians throughout the region. In addition to the wide range of services provided in Norfolk, obstetrics and gynecology, maternal and fetal medicine, dermatology, cosmetic plastic surgery, hearing and balance services, and Jones Institute services are provided by EVMS Health Services in Virginia Beach; family medicine in Portsmouth; surgery in Suffolk; maternal and fetal medicine and Jones Institute services in Newport News; and diabetes medicine in Hampton. In the words of a Virginia Beach physician, "*EVMS comes to us.*"

**Second, without EVMS, the quality of medical care would decline because many of the individuals who provide that care would not be present.** The personnel who likely would be absent include the physicians produced or attracted by EVMS, but also medical residents, physician assistants, nurses, physical therapists, etc., who are produced or attracted by EVMS. This does not mean that Hampton Roads would not eventually be able to attract many of these essential professionals from other regions if EVMS did not exist. It does mean that it would be expensive to do so.

**Third, the absence of EVMS researchers would mean that patients would not have access to cutting-edge medical knowledge and techniques.** Currently, the path from laboratory to hospital room for an innovation frequently is remarkably short because EVMS researchers (within the provisions of law and regulatory practice) have the ability to implement new developments quickly. The laboratory to practice time-frame is shorter within Hampton Roads because of EVMS.

**Fourth, the absence of EVMS would require many patients to leave the region and travel to other metropolitan areas such as Richmond, Washington, DC, or Raleigh-Durham in order to receive treatment.** Some Hampton Roads patients would find such travel impossible. Others would find it too expensive. Unfortunately, still others would not survive such travel and relocation.

**Fifth, EVMS faculty and EVMS Health Services personnel are heavily involved in the region's provision of trauma care.** Thousands of individuals within the region utilize the region's trauma care facilities annually as a result of automobile accidents, gunshot wounds, heart attacks and strokes, allergic attacks, poisonings, and the like. EVMS is significantly involved both in applied research and practice in trauma care and were EVMS to disappear, "*our cutting-edge advantage also would soon disappear*" (the comment of a senior physician).

**Sixth, EVMS research often proceeds to the development stage and later to commercialization.** Arguably the most well-known research connected to the medical school has been generated by the Jones Institute for Reproductive Medicine. Since its founding in 1978, the Jones Institute has focused on fertility problems. Pioneering scientists Drs. Georgeanna and Howard Jones guided the first *in vitro* fertilization resulting in birth in the United States in 1981. Jones Institute research was the foundation for the patented oral contraceptive SEASONALE™, which has generated significant revenue for the Institute and the medical school.

Modeling and simulation additionally provides a superb example of a very promising current arena for EVMS research, development and commercialization. The National Center for Collaboration in Medical Modeling and Simulation was established in 2001 with EVMS and Old Dominion University as the major partners. Improving the quality of medical care being provided to American military forces is an important goal of the Center. EVMS is a key player in the burgeoning regional modeling and simulation activities that have centered in Suffolk. The judgment of knowledgeable individuals is that the modeling and simulation activities of EVMS are among those most likely to survive the demise of the JFCOM headquarters.

**In sum, EVMS professionals are intimately involved in research (they generate approximately \$40 million of external funding annually) and in the development and commercialization of that research. These are activities that attract substantial outside funding to the region and generate attractive jobs.**

#### **IV. METHODOLOGICAL NOTES ON ECONOMIC IMPACT**

These estimates of Eastern Virginia Medical School's economic impact on Hampton Roads rely primarily upon source data supplied by EVMS. The data were then plugged into several models such as the U.S. Department of Commerce's RIMS II model in order to translate the data into actual economic impact. In essence, RIMS II and similar models supply regional input-output multipliers that show how economic activity is distributed in economic industries across a geographic area and how those industries are interrelated, economically speaking. Since the match between models such as RIMS II and EVMS activities is not exact, adjustments were made as necessary to enable the estimates to reflect the reality of EVMS.

It's also true that models such as RIMS II provide average estimates for the region---essentially what usually is the case within the region. For example, as noted above, these models assume "leakages" in expenditures. Some expenditures made by EVMS are made to hire personnel that do not live in the region. Also, some EVMS expenditures are made for goods and services supplied by firms situated outside of the region. This is inevitable and there is nothing unusual about it. Nevertheless, if it were the case that EVMS actually spent less (more) money outside of the region than the models assume, then the estimates presented here will understate (overstate) its regional economic impact.

Regardless, there is no reason to believe that EVMS's economic activities and expenditure patterns differ significantly from the models' assumptions and therefore the estimates presented here rely upon the expenditure multipliers in the models. Even so, one should bear in mind that the estimates in this report are not written in stone, but instead represent reliable approximations of the real world.

The empirical work presented here combines what usually are referred to as "*indirect*" economic impacts and "*induced*" economic impacts into one multiplier effect. Indirect economic impacts relate to increased activity by firms and industries that supply EVMS (e.g., food and fuel suppliers). Induced economic impacts reflect households spending the increased money that appears in their paychecks because of the original direct expenditures and the indirect impact upon suppliers.

**Finally, it is impossible to place an economic value upon many additional things that indisputably occur in and around EVMS, up to and including saving lives. EVMS is a caring organization dedicated to doing good deeds and improving the human condition. When EVMS restores faith, reduces pain, makes individuals more productive and, yes, saves lives, indisputably this has a positive impact not only on the affected individuals, but also on the entire region. While I have placed dollar values on the uncompensated services that EVMS provides, it is not possible to place a specific financial number on the value of the activities just noted. Nevertheless, they are vitally important to us and we would be much poorer as a society if they disappeared.**

