John A. Burns School of Medicine (JABSOM) and the University of Hawai’i Cancer Center (UH Cancer Center) influence the medical community, the lives of students and residents, and the O’ahu economy as a whole. They facilitate new research and company developments and draw clinical patients, their guests, and other visitors to the region, generating new dollars and opportunities for O’ahu. JABSOM also impacts the economy through its residency program spending, improves higher education delivery throughout the region, and helps students become experts in the medical field.

Together, JABSOM and the UH Cancer Center added $510.6 million to the O’ahu economy in FY 2014-15, equivalent to creating 5,972 new jobs.

The University of Hawai’i at Mānoa supports one of the leading medical education institutions in the United States, JABSOM. The Kaka’ako campus’ state-of-the-art health sciences facilities allow JABSOM to retain its Liaison Committee on Medical Education (LCME) medical doctorate degree accreditation. Also located on the Kaka’ako campus is the UH Cancer Center, which is one of 69 National Cancer Institute (NCI) designated cancer centers in the United States.

As Hawai’i’s only medical school and research-focused cancer center, JABSOM and the UH Cancer Center provide community-based health education, research, and service on behalf of the people of Hawai’i. This study investigates the economic impacts created by JABSOM and the UH Cancer Center on the regional community through increased consumer spending and enhanced business productivity. While the school and center serve the entire state of Hawai’i, this analysis focuses on their contribution to O’ahu. When exploring these impacts, we consider the following hypothetical question:

**How would economic activity change in O’ahu if JABSOM and the UH Cancer Center did not exist in FY 2014-15?**

Results are stated in terms of net impacts, or what would not have existed in the O’ahu economy if not for JABSOM and the UH Cancer Center. The economic impacts stem from initial rounds of spending from JABSOM and UH Cancer Center activities. We then capture the multiplier effects that occur as the initial rounds of spending create more spending across regional businesses.

Multiplier effects are derived using Emsi’s Social Accounting Matrix (SAM) input-output model that captures the interconnection of industries, government, and households in the region. The SAM contains industry sectors at the highest level of detail available, and supplies industry-specific multipliers required to determine the impacts associated with increased activity within the region.

Results are measured in terms of the change in income across O’ahu. This measure is referred to as the commonly used gross regional product (GRP). Also reported are the number of new jobs created as a result of this change in income. Results are presented in two sections: one for the collective impacts of JABSOM and the UH Cancer Center and one for impacts of JABSOM’s student body.
Collective impact of JABSOM and the UH Cancer Center

JABSOM and the UH Cancer Center promote economic growth in O'ahu through their direct expenditures and resulting expenditures of their clinical patients and guests, visitors, and entrepreneurial relationships. The school and center serve as employers and buyers of goods and services for their day-to-day and research operations. Numerous start-up and spin-off companies have formed through programs and intellectual property at JABSOM and the UH Cancer Center. The reputation of the school and center attract clinical patients and their guests, as well as other visitors to the region, whose expenditures benefit vendors.

All JABSOM and UH Cancer Center results reflect financial data for FY 2014-15. Results are organized according to the following impacts: (1) impact of day-to-day operations; (2) impact of research expenditures; (3) impact of start-up and spin-off companies related to JABSOM and the UH Cancer Center; (4) impact of the spending by their clinical patients and guests; and (5) impact of the spending of their out-of-region visitors.

OPERATIONS SPENDING IMPACT

JABSOM and the UH Cancer Center are important employers in O'ahu. Excluding research and residency program activities, the school and center employed 625 full-time and part-time faculty and staff in FY 2014-15, all of whom lived in the region. Payroll at the school and center was $28.2 million, much of which was spent in the region for groceries, eating out, clothing, and other household expenses. In addition, JABSOM and the UH Cancer Center are large-scale buyers of goods and services. In FY 2014-15, the school and center spent $24.4 million to cover their general expenses for facilities, professional services, and supplies.

JABSOM and the UH Cancer Center added $45.8 million in income to the region during the analysis year as a result of their day-to-day operations. This figure represents the payroll of the school and center, the multiplier effects generated by their non-pay spending and their employees, and a downward adjustment to account for funding that they received from state and local sources. The $45.8 million in added income is equivalent to creating 884 new jobs.
Executive Summary

March 2016

Research Spending Impact

Research activities impact the economy by employing people and requiring the purchase of equipment and other supplies and services. Over the last seven years, JABSOM and the UH Cancer Center have seen robust growth in the number of patents filed by their researchers, filing 101 new patent applications since FY 2009. This growth is the result of significant infrastructure investment and faculty recruitment. The work of these initiatives is especially telling over a period of time in which the economy has generally not been strong.

In FY 2014-15, JABSOM and the UH Cancer Center spent $37.8 million on payroll to support research activities. This, along with other expenditures, created an impact of $81 million in added income for the regional economy. This is equivalent to creating 757 new jobs.

Start-Up and Spin-Off Company Impact

JABSOM and the UH Cancer Center create an exceptional environment that fosters innovation and entrepreneurship, evidenced by the number of start-up and spin-off companies related to the school and center that were created in the region. Start-up companies, created specifically to license and commercialize JABSOM and UH Cancer Center technology or knowledge, have a strong and clearly defined link to the school and center. Spin-off companies, created and fostered through programs or faculty and alumni, have a clear but weaker link to JABSOM and the UH Cancer Center.

In FY 2014-15, start-up and spin-off companies related to JABSOM and the UH Cancer Center added $7 million in added income to the O‘ahu economy, which is equivalent to creating 80 new jobs. Of this added income, $3.2 million was due to the start-up companies, with the remainder due to spin-off companies.

Collective Impact of JABSOM and the UH Cancer Center in FY 2014-15

<table>
<thead>
<tr>
<th>Added income</th>
<th>Jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>$45.8 million</td>
<td>884</td>
</tr>
<tr>
<td>Operations spending impact</td>
<td></td>
</tr>
<tr>
<td>$81 million</td>
<td>757</td>
</tr>
<tr>
<td>Research spending impact</td>
<td></td>
</tr>
<tr>
<td>$7 million</td>
<td>80</td>
</tr>
<tr>
<td>Start-up and spin-off company impact</td>
<td></td>
</tr>
<tr>
<td>$2.6 million</td>
<td>47</td>
</tr>
<tr>
<td>Clinical patient and guest spending impact</td>
<td></td>
</tr>
<tr>
<td>$1 million</td>
<td>15</td>
</tr>
<tr>
<td>Visitor spending impact</td>
<td></td>
</tr>
<tr>
<td>$137.6 million</td>
<td>1,782</td>
</tr>
</tbody>
</table>

Total impact

* Numbers may not add due to rounding
CLINICAL PATIENT AND GUEST SPENDING IMPACT

Part of the mission of JABSOM and the UH Cancer Center is to help patients live longer, healthier lives. JABSOM accomplishes this by offering specialist services through research and clinical activities in the areas such as maternal fetal medicine, geriatrics, HIV/AIDS, speech pathology, hyperbaric oxygen therapy for divers and wound care. Furthermore, the UH Cancer Center conducts clinical research through cancer trials to diagnose, treat, and prevent cancer.

These specialist clinical activities not only help patients, but the regional economy as well. They attract patients from outside the region. They also provide local community members with options, saving them from making a costly trip to receive treatment elsewhere. These patients receive support from friends and family, meaning they have guests who come to the region or who stay in the region given the local treatment option.

In FY 2014-15, the spending from patients and their guests who came to O’ahu to receive specialist clinical care, as well as the spending of those who were able to stay local rather than go elsewhere, added approximately $2.6 million in income during the analysis year. This $2.6 million is equivalent to creating 47 new jobs in the region.

VISITOR SPENDING IMPACT

Thousands of visitors come to JABSOM and the UH Cancer Center every year to attend continuing medical education, the white coat ceremony, tours, outreach events, fairs, symposia, and workshops. Around 2,500 of these visitors were from outside O’ahu, bringing with them new monies to the region for lodging, food, transportation, and other personal expenses.

The expenditures of out-of-region visitors generated a net impact of $1 million in added income for the regional economy in FY 2014-15. This is equivalent to creating 15 new jobs.

TOTAL COLLECTIVE IMPACT OF JABSOM AND THE UH CANCER CENTER

JABSOM and the UH Cancer Center added monies to the regional economy through their day-to-day operations and research spending, as well as the spending of their clinical patients and their guests, and other visitor spending. Their entrepreneurial activities also have a positive impact on the economy. Overall, JABSOM and the UH Cancer Center added $137.6 million in income to the O’ahu economy, which is equivalent to creating 1,782 new jobs. This is equivalent to 0.2% of the GRP.
Non-economic impacts
OF JABSOM AND THE
UH CANCER CENTER

JABSOM and the UH Cancer Center have a significant positive effect on their community that an economic analysis does not capture. For example, their cancer-related work extends beyond simply bringing new and innovative clinical trials to patients and conducting cutting edge research that impacts treatment. It also conducts a variety of community outreach programs intended to increase awareness about what causes cancer and how it can be prevented.

One of the UH Cancer Center’s major community outreaches is the Hawai’i Skin Cancer Coalition. With prevention as its primary goal, the Coalition supports numerous events annually intended to bring skin cancer into the public mind, raise awareness of its severity, and educate the public about how to prevent it. Beyond skin cancer, the UH Cancer Center sponsors many other outreach events focusing on other forms of cancer, including breast, colon, prostate, and mesothelioma cancers.

JABSOM also interacts with the surrounding community through a wide variety of programs and outreaches intended to make sure that all of Hawai’i benefits from the school’s presence. For example, JABSOM sponsors the Hawai’i H.O.M.E. Project, a student-run outreach clinic founded in 2005 that provides quality healthcare for the homeless population of Hawai’i in numerous locations around the island. JABSOM also offers support to O’ahu kūpuna (elders) via the Mini-Medical School On Healthy Aging, a very popular free course intended to help the elder citizens of Hawai’i understand the aging process and approach it proactively.

Both JABSOM and the UH Cancer Center are members of the University of Hawai’i Cancer Consortium, a unified clinical cancer research effort that also includes Queen’s Medical Center, Hawai’i Pacific Health, and the Kuakini Medical Center. Together, the Consortium works to facilitate efficient and effective clinical research in Hawai’i, with a goal of reducing the negative effect of cancer on Hawaiians. JABSOM also partners with the Hawai’i Medical Association to run the Hawai’i Consortium for Continuing Medical Education (HCCME), an accredited program designed to provide continuing medical education for the state’s physicians.

To ensure that Hawai’i is able to attract medical talent, JABSOM has joined with six acute care facilities in O’ahu to establish the Hawai’i Residency Programs, Inc. (HRP). Run as a non-profit, HRP serves the state by coordinating the administration of physician residency programs run by the university. HRP makes it simple for medical students to receive the residency training they need at participating hospitals. And it establishes relationships between students and local physicians and health professionals, which not only improve the quality of their training but also provide an incentive to remain in-state at the conclusion of their education.
Impact of JABSOM’s Student Body

JABSOM is Hawai‘i’s only medical school, and its student body contributes to O‘ahu’s economy in a variety of unique ways. In fact, Hawai‘i is ranked number 1 in the United States by the Association of American Medical Colleges (AAMC) in 2014 for the highest physician retention of doctors in a state’s active physician workforce. According to the AAMC, 86% of all practicing physicians who completed both their medical doctorate and residency training at JABSOM also practice in Hawai‘i.

The school’s residency program is a buyer and seller of goods and services. JABSOM also attracts monies that otherwise would not have entered the regional economy through the expenditures of its students. Further, it provides students with the knowledge, skills, and abilities they need to become productive citizens within the medical field and add to the overall output of the region.

RESIDENCY PROGRAM SPENDING IMPACT

JABSOM’s residency program is not only supported by the university, but by hospitals as well. It embodies strong collaborations with local hospitals and would not exist without the hospitals’ support. The residency program positively impacts O‘ahu by not only training resident physicians, but by employing faculty and staff to teach and support them. The program also re-

IMPACT OF JABSOM’S STUDENT BODY IN FY 2014-15

<table>
<thead>
<tr>
<th>Added income</th>
<th>Jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>$46.7 million</td>
<td>715</td>
</tr>
<tr>
<td>Residency program spending impact</td>
<td></td>
</tr>
<tr>
<td>$2.7 million</td>
<td>123</td>
</tr>
<tr>
<td>Student spending impact</td>
<td></td>
</tr>
<tr>
<td>$323.6 million</td>
<td>3,352</td>
</tr>
<tr>
<td>Alumni impact</td>
<td></td>
</tr>
<tr>
<td>$373 million</td>
<td>4,190</td>
</tr>
<tr>
<td>Total impact</td>
<td></td>
</tr>
</tbody>
</table>
quires the purchase of equipment and other supplies and services to support their education.

In FY 2014-15, the residency program employed full-time equivalent of 515 employees, with 223 of them being resident physicians. The program spent over $35.8 million supporting its operations, with $31.6 million going towards payroll. These expenditures generated an impact of $46.7 million in added income to the region, which is equivalent to creating 715 jobs.

STUDENT SPENDING IMPACT

Around 21% of students attending JABSOM originated from outside O’ahu in FY 2014-15. Some of these students relocated to the region. These students would not have come to the region if the school did not exist. In addition, a number of in-region students would have left for other education opportunities if not for the existence of JABSOM.

While attending the school, these relocator and retained students spent $5.3 million to purchase groceries, rent accommodation, pay for transportation, and so on. A significant portion of these expenditures occurred in the region, generating an impact of $2.7 million in added income in the economy during the analysis year. This $2.7 million in added income is equivalent to creating 123 new jobs.

ALUMNI IMPACT

The medical education and training JABSOM provides results in the greatest impact. Since the school was established, students have studied at JABSOM and entered the workforce with new skills as physicians or medical researchers. Today, many of these former students are employed in O’ahu.

During the analysis year, past and present students of JABSOM generated $323.6 million in added income for the region. This figure represents the higher wages that students earned during the year, the increased output of the businesses that employed the students, and the multiplier effects that occurred as students and their employers spent money at other businesses. This $323.6 million in added income is equivalent to creating 3,352 new jobs.

TOTAL IMPACT OF JABSOM’S STUDENT BODY

JABSOM positively impacts O’ahu not only through its residency program spending, but also through the students it attracts to the region to attend the school. JABSOM also trains a skilled workforce of medical students that earn higher wages and increase business productivity within the region.

Overall, JABSOM added $373 million to the regional economy, which is equivalent to creating 4,190 new jobs. This is approximately equal to 0.9% of the GRP. By comparison, this impact from the school is larger than the region’s entire Arts, Entertainment, & Recreation industry.

ABOUT THE STUDY

Data and assumptions used in the study are based on several sources, including the 2014-15 academic and financial reports from JABSOM and the UH Cancer Center, industry and employment data from the U.S. Bureau of Labor Statistics and U.S. Census Bureau and outputs of Emsi’s Social Accounting Matrix (SAM) model. The study applies a conservative methodology and follows standard practice using only the most recognized indicators of economic impact. For a full description of the data and approach used in the study, please contact the University of Hawai’i for a copy of the technical report.

ABOUT EMSI

Economic Modeling Specialists International, a CareerBuilder company, is a leading provider of economic impact studies and labor market data to educational institutions, workforce planners, and regional developers in the U.S. and internationally. Since 2000, Emsi has completed over 1,200 economic impact studies for educational institutions in four countries. Visit www.economicmodeling.com for more information about Emsi’s products and services.