

# The Economic Impact of the Florida Department of Health, Comprehensive Statewide Tobacco Education and Use Prevention Program, on the State of Florida



February 25, 2010

**The Economic Impact of the Florida Department of Health,  
Comprehensive Statewide Tobacco Education and Use Prevention Program,  
on the State of Florida**

Commissioned by:

Florida Department of Health  
Comprehensive Statewide Tobacco Education and Use Prevention Program

Study completed by:

Dr. Gerald A. Doeksen, Regents Professor and Director  
National Center for Rural Health Works  
Oklahoma State University

and

Cheryl F. St. Clair, Associate Director  
National Center for Rural Health Works  
Oklahoma State University

**February 25, 2010**

# **The Economic Impact of the Florida Department of Health, Comprehensive Statewide Tobacco Education and Use Prevention Program, on the State of Florida**

## **Executive Summary**

Everyone knows the importance of the Comprehensive Statewide Tobacco Education and Use Prevention Program on the health of Florida residents. However, few realize the impact the program has on the economy of Florida. This study, “The Economic Impact of the Florida Department of Health, Comprehensive Statewide Tobacco Education and Use Prevention Program, on the State of Florida” was commissioned by the Florida Department of Health, Bureau of Tobacco Prevention Program (Bureau) and conducted by Dr. Gerald A. Doeksen, Regents Professor and Director of the National Center for Rural Health Works, Oklahoma State University, and Cheryl F. St. Clair, Associate Director of the National Center for Rural Health Works. This report will only estimate the economic impact of the FY 2009-2010 program expenditures of \$63.8 million. This greatly underestimates total program economic benefits from numerous Floridians who have become tobacco-free, resulting in increased productivity of workers and decreased medical costs. These benefits would need to be captured in a separate future study.

Using a computer program developed specifically to measure the economic impact, Dr. Doeksen analyzed not only the direct economic contributions of the Bureau, but also calculated the secondary impacts of employment, labor income, and total program expenditures. The secondary impacts generated in other businesses and industries are measured with employment, labor income, and output multipliers derived specifically for the State of Florida.

### **The Impact of the Bureau on Employment in Florida**

The Bureau employs a significant number of employees and generates a large number of secondary jobs. To estimate the total employment impact, the number of secondary jobs generated in the economy was calculated based on employment multipliers from the computer model. In this study, the term employment is defined as the number of total full-time and part-time employees or the total number of jobs. The impact from employment is:

- 663 jobs created directly by the Bureau;
- 628 secondary jobs created in other businesses and industries; and
- 1,291 total jobs created in Florida from the Bureau.

### **The Impact of the Bureau on Labor Income in Florida**

The impact on labor income (wages, salaries, and benefits) was estimated using labor income multipliers. The impact from labor income is:

- \$21.8 million in labor income paid to employees working directly in the Bureau;
- \$15.7 million in secondary labor income created in other businesses and industries; and
- \$37.5 million in total labor income generated in Florida from the Bureau.

### **The Impact of the Bureau on Total Expenditures in Florida**

The impact on the total program expenditures was estimated using output multipliers. The output impact from expenditures is:

- \$63.8 million total direct expenditures from the Bureau;
- \$49.5 million of total direct Bureau expenditures were spent in the State of Florida;
- \$46.1 million in secondary expenditures created in other businesses and industries; and
- \$95.6 million in total expenditures generated in Florida from the Bureau.



## **The Impact of the Bureau on State Sales and Use Taxes in Florida**

Although the Florida Department of Health, Bureau of Tobacco Prevention Program, does not pay sales and use taxes, its expenditures generate many dollars worth of sales and use taxes in other business and industries from the spending of the Bureau, its contractors and grantees, and the spending of the direct and secondary employees. The main taxes paid by these employees are sales and use taxes. *During FY 2009-2010, the labor income impact of \$37.5 million will generate an estimated \$2.3 million in State sales and use taxes' impact on the State of Florida.*

## **The Economic Impact of the Florida Department of Health, Comprehensive Statewide Tobacco Education and Use Prevention Program, on the State of Florida**

Everyone knows the importance of the Comprehensive Statewide Tobacco Education and Use Prevention Program on the health of Florida residents. As stated in its 2009 Annual Report [8], the Florida Department of Health, Bureau of Tobacco Prevention Program (Bureau), focuses on reducing tobacco-related disease, disability, and death through the programmatic goals adopted from the Centers for Disease Control and Prevention's Best Practices for Comprehensive Tobacco Control Programs:

- Prevent the initiation of tobacco use among youth and young adults;
- Promote cessation of tobacco use; and
- Eliminate secondhand smoke exposure.

Some selected highlights from the 2009 Annual Report include:

- The Quitline served over 22,000 callers;
- Nicotine replacement therapy was provided to over 11,500 users;
- Over 4,400 health professionals and 8,100 health professional students received tobacco cessation training;
- Over 90,000 youth were provided with tobacco prevention education; and
- The Area Health Education Centers provided more than 7,000 Floridians with cessation counseling.

These health-related benefits of the Bureau are tremendous. However, few realize the impact the Bureau has on the economy of Florida. The Bureau is investing \$63.8 million in FY 2009-2010 for prevention and cessation programs and activities for Floridians. This investment generates expenditures (output) that create jobs and labor income (wages, salaries, and benefits)

for Florida residents. The objective of this report is to estimate the economic impact of this investment. More specifically, the report will:

- Summarize the total Bureau expenditures by major categories;
- Estimate employment and labor income (wages, salaries and benefits) created directly by these expenditures;
- Estimate the secondary employment and labor income impact due to spending in Florida as the expenditures flow through the economic system;
- Estimate the output impact of total Bureau expenditures in Florida, and
- Estimate the impact on State sales and use taxes.

This report estimates the economic impact of the Bureau expenditures only. This greatly underestimates total Bureau economic benefits from numerous Floridians who have become tobacco-free, resulting in increased productivity of workers and decreased medical costs. These benefits would need to be captured in a separate future study.

### **Overview of FY 2009-2010 Bureau Expenditures**

The Bureau has competitive contracts or grants for most of the services provided by the Bureau. The majority of the funds are spent with Florida vendors. The following is the general breakdown of Bureau expenditures for FY 2009-2010:

Advertising and Counter-Marketing .....\$20.6 million

The contractor is responsible for the implementation of the multi-faceted marketing campaign, including the following components: graphic design and printing, media production, media buying, public relations and web/interactive. Typical expenditures include TV and radio production, hiring talent, type-setters, photographers, travel, full-scale statewide media buying, contracting with one in-state vendor, event team that travels statewide, and event sponsorships.

Area Health Education Centers .....\$10.0 million

The contractors provide tobacco prevention and cessation training to healthcare students, healthcare professionals, and pre-healthcare students

throughout Florida. They also provide in-person cessation counseling and in some cases, nicotine replacement therapy, to residents in each of Florida's 67 counties.

State and Community Intervention .....\$10.9 million

The Bureau has provided competitive community-based grants to private non-profits, for-profits or county health departments in 64 of Florida's 67 counties. These grantees work collaboratively with communities, businesses and other organizations to garner support for anti-tobacco policies and systems changes. They also work towards educating the public about the dangers of exposure to secondhand smoke, tobacco use cessation and youth prevention. Expenditures are for personnel, event sponsorship, meetings, etc.

Hospital Cessation Efforts .....\$3.0 million

Rural hospital cessation efforts (n=14) are developing and implementing tobacco-free campus policies. They are also providing cessation counseling and nicotine replacement therapy to hospital staff, patients and family members of patients.

Surveillance and Evaluation .....\$2.0 million

The Bureau contracts with two Florida-based groups that are responsible for the evaluation of the advertising/counter-marketing and community-based Bureau components. A software development company has also been contracted to design and implement a web-based reporting and data collection system used by the community-based private non-profits, for-profits and county health department grantees.

Administration and Management.....\$2.8 million

This component covers salaries, travel, overhead, equipment and related expenses for personnel working within the Bureau. It also pays for various statewide trainings, conferences and meetings.

Other – Out-of-State Vendors (chosen as mandated by Florida competitive procurement laws).....\$14.5 million

This component covers contracting for evaluation, contracting for nicotine replacement therapy, contracting for the phone cessation Quitline. The majority of these funds are spent out-of-state and will not impact the State of Florida.

Total Bureau Expenditures .....**\$63.8 million**

These are the Bureau's expenditures for FY 2009-2010.

## **The Direct Economic Impact of the Bureau**

The Bureau's expenditures create jobs and generate labor income (wages, salaries and benefits). The number of employees and the related labor income are needed in order to illustrate the impact of employment and labor income on the State of Florida. In this study, the term employment is defined as the number of total full-time and part-time employees or the total number of jobs. Labor income is a portion of the total Bureau expenditures.

The Bureau provided the number of employees and the amount of labor income within the Bureau and from the contractors or grantees, except for the advertising and counter-marketing component. For instance, the Bureau provides grant funds to fourteen rural hospitals for total expenditures of \$3.0 million; data were available from the hospitals to indicate that the hospitals employ 38 employees with labor income of \$1.0 million. The surveillance and evaluation component employs a large number of part-time workers to conduct surveys. When surveys are being conducted, about 100 part-time workers are employed. The total employment for this component is 122 employees with labor income of \$1.8 million. The component, other – out-of-state vendors, needs further explanation because of the small number of employees and labor income. The majority of the Bureau expenditures for this component are spent out-of-state with only two jobs created in the State of Florida with labor income of \$100,000.

Employment and labor income were not available for the advertising and counter-marketing component. Coefficients were utilized from the State of Florida economic impact model (**Appendix A**) to estimate its employment and labor income. [2,4,6] Further discussion on the economic impact model are included in subsequent sections of the study. The advertising and counter-marketing component has annual expenditures of \$20.6 million and is estimated to generate 177 employees with estimated labor income of \$7.3 million. This component includes

television and radio production, hiring talent and conducting full-scale statewide media buying; thus, a considerable portion of the expenditures are for items other than employment and labor income.

The direct Bureau expenditures, estimated number of employees, and estimated labor income (wages, salaries, and benefits) are shown in **Table 1. *For FY 2009-2010, the \$63.8 million in total Bureau expenditures will create an estimated 663 employees and will generate estimated labor income of \$21.8 million in the State of Florida.***

In summary, the Bureau is vitally important as a state employer and important to the economy of the State of Florida. The Bureau's employees and the employment directly created from the Bureau's expenditures purchase a large amount of goods and services from businesses and industries in the State of Florida. These impacts are referred to as secondary impacts to the economy. Before the secondary impacts are discussed, basic concepts of state economics will be discussed.

### **Some Basic Concepts of State Economics and Employment, Labor Income, and Output Multipliers**

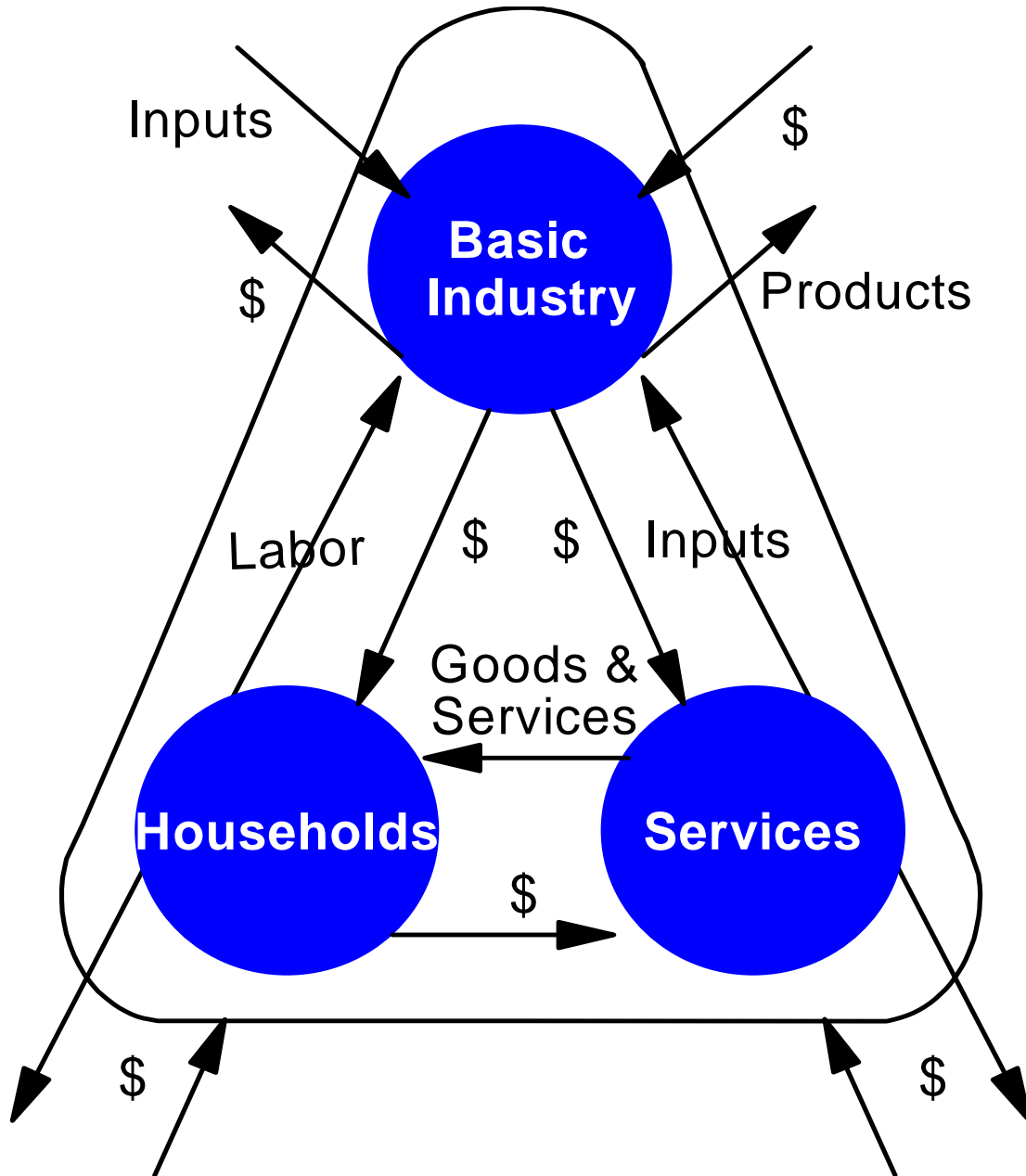
**The economic impact of the Bureau, measured by employment, labor income, and expenditures (output), is significant.** However, this does not tell the complete story as secondary economic impacts are created when the Bureau, its contractors and grantees spend money (the business expenditures), and the Bureau employees and employees of the contractors and grantees spend money (the employees' personal expenditures); the indirect impacts and the induced impacts, respectively. These secondary benefits are measured by multipliers using an economic impact model and data from IMPLAN (model and data are further discussed in **Appendix A**). IMPLAN data are developed by Minnesota IMPLAN Group, Inc. in Stillwater,

**Table 1**  
**Direct Expenditures, Employment, and Labor Income**  
**for Florida Department of Health, Bureau of Tobacco Prevention Program, FY 2009-2010**

| Expenditure by<br>Component | Total<br>Expenditures  |
|-----------------------------|------------------------|
| (000)                       | (000)                  |
|                             | \$20,600               |
| \$14,900                    |                        |
| \$2,100                     |                        |
| \$600                       |                        |
| \$100                       |                        |
| \$700                       |                        |
| \$2,200                     |                        |
|                             | \$10,000               |
|                             | \$10,900               |
|                             | \$3,000                |
|                             | \$2,000                |
|                             | \$2,800                |
|                             | \$14,500               |
|                             | <b><u>\$63,800</u></b> |

ention Program; Employment and labor income data provided by the Florida Department of Health, Bureau of Tobacco Prevention Program and its contractors and grantees, except the advertising an

**Figure 1**  
**State Economic System**



Minnesota. The model is widely used by economists and other academics across the United States.

A brief description of the input-output model and the multiplier effect is included and illustrated in **Figure 1**. The major flows of goods, services, and dollars of any economy are illustrated in **Figure 1**. The businesses, such as manufacturing, mining, and agriculture, purchase goods and services within and outside the state, and purchase labor income from households. These businesses are the foundation of a state's economy. Such a business is a basic industry. The flow of products out of, and dollars into, a state are represented by the two arrows in the upper right portion of **Figure 1**. To produce these goods and services for "export" outside the state, the basic industry purchases inputs from inside and outside of the state (upper left portion of **Figure 1**), labor from the residents or "households" of the state (left side of **Figure 1**), and inputs from service industries located within the state (right side of **Figure 1**). The flow of labor, goods, and services in the state is completed by households using their earnings to purchase goods and services from the state's service industries (bottom of **Figure 1**). A change in any one segment of a state's economy will result in corresponding changes in the other components, resulting in adjustments throughout the entire economic system of the state.

Consider, for instance, the contract with an advertising firm. The advertising firm purchases inputs from other service firms and will hire workers to fulfill the contract. This increases labor income in the "households" segment of the economy. Since earnings would increase, households would increase their purchases of goods and services from businesses within the "services" segment of the economy. This, in turn, increases these businesses' purchases of labor and inputs. Thus, the change in the economic base works its way throughout the entire state's economy.

The total impact of a change in the economy consists of direct, indirect, and induced impacts. Direct impacts are the changes in the activities of the impacting industry, such as the advertising firm. The impacting business, such as the advertising firm, changes its purchases of inputs as a result of the direct impact. This produces an indirect impact in the other business sectors. Both the direct and indirect impacts change the flow of dollars to the state's households. The households alter their consumption accordingly. The effect of this change in household consumption upon businesses in a state is referred to as an induced impact. The combined indirect and induced impacts are referred to as secondary impacts.

A measure is needed that yields the effects created by an increase or decrease in economic activity. In economics, this measure is called the multiplier effect. Multipliers are used in this report. An employment multiplier is defined as:

*“...the ratio between direct employment, or that employment used by the industry initially experiencing a change in final demand and the direct, indirect, and induced employment.”*

An employment multiplier of 2.5 indicates that if one job is created by a new industry, 1.5 jobs are created in other sectors due to business (indirect) and household (induced) spending.

### **Impacts of the Bureau on the Economy of the State of Florida**

Employment, labor income, and output multipliers for the State of Florida have been calculated using the IMPLAN model. IMPLAN was developed by the U.S. Forest Service [2,4,6] and is a model which allows for development of state multipliers. Additional information on the model and the IMPLAN data are included in **Appendix A**.

#### ***Employment Impact***

The total employment impact of the Bureau is presented in **Table 2**. The advertising and counter-marketing component creates 177 employees. The multiplier for this component is 2.15.

**Table 2**  
**Employment Impact**  
**of Florida Department of Health, Bureau of Tobacco Prevention Program, FY 2009-2010**

| Expenditure<br>Component   | Direct<br>Employment | Employment<br>Multiplier | Secondary<br>Employment | Total<br>Employment |
|--|----------------------|--------------------------|-------------------------|---------------------|
| <b>Advertising and Counter-Marketing</b>                                 | 177                  | 2.15                     | 204                     | 381                 |
| <b>Area Health Education Centers</b>                                     | 130                  | 1.90                     | 117                     | 247                 |
| <b>Private Non-Profits, For Profits or County Health<br/>Departments</b> | 180                  | 1.91                     | 164                     | 344                 |
| <b>Hospitals</b>   | 38                   | 1.90                     | 34                      | 72                  |
| <b>Surveillance and Evaluation</b>                                       | 122                  | 1.83                     | 101                     | 223                 |
| <b>Administration and Management</b>                                     | 14                   | 1.50                     | 7                       | 21                  |
| <b>Other - Out-of-State Vendors</b>                                      | 2                    | 1.50                     | 1                       | 3                   |
| <b>Totals</b>  | <b><u>663</u></b>    |                          | <b><u>628</u></b>       | <b><u>1,291</u></b> |

SOURCE: Employment data provided by Florida Department of Health, Bureau of Tobacco Prevention Program and its contractors and grantees, except the advertising and counter-marketing component; Employment and labor income for the advertising and counter-marketing component were estimated from the economic impact program; Employment multiplier from IMPLAN.

This means that for every job created in the component, another 1.15 jobs are created in other businesses and industries in the State of Florida, due to the spending from the advertising and counter-marketing activities and the spending of its employees. The total secondary impact is 204 employees, resulting in total employment impact of 381 employees for the advertising and counter-marketing component. The employment multipliers for the other components were derived from IMPLAN and the multipliers were applied to the employment for the other components. *In FY 2009-2010, the Bureau will create 663 direct jobs and 628 secondary jobs, for a total employment impact of 1,291 employees on the economy of the State of Florida.*

#### ***Labor Income Impact***

The total labor income impact of the Bureau is presented in **Table 3**. The direct income by expenditure component is presented in the first column. The advertising and counter-marketing component generates \$7.3 million in labor income during FY 2009-2010. The labor income multiplier for this component is 1.87. This means that for every dollar of labor income created in the component, another \$0.87 in labor income are created in other businesses and industries in the State of Florida, due to the spending from the advertising and counter-marketing activities and the spending of its employees. The total secondary labor income impact is \$6.4 million, resulting in total labor income impact of \$13.7 million for the advertising and counter-marketing component. The labor income multipliers for the other components were derived from IMPLAN and the multipliers were applied to the direct labor income for the other components. *In FY 2009-2010, the Bureau will generate \$21.8 million in direct labor income and \$15.7 million in secondary labor income, for a total labor income impact of \$37.5 million on the economy of the State of Florida.*

**Table 3**  
**Labor Income Impact**  
**of Florida Department of Health, Bureau of Tobacco Prevention, FY 2009-2010**

| Expenditure<br>Component   | Direct<br>Income<br>(\$000) | Labor Income<br>Multiplier | Secondary<br>Income<br>(\$000) | Total<br>Income<br>(\$000) |
|--|-----------------------------|----------------------------|--------------------------------|----------------------------|
| <b>Advertising and Counter-Marketing</b>                             | \$7,300                     | 1.87                       | \$6,351                        | \$13,651                   |
| <b>Area Health Education Centers</b>                                 | \$4,500                     | 1.54                       | \$2,430                        | \$6,930                    |
| <b>Private Non-Profits, For Profits or County Health Departments</b> | \$6,500                     | 1.76                       | \$4,940                        | \$11,440                   |
| <b>Hospitals</b>   | \$1,000                     | 1.66                       | \$660                          | \$1,660                    |
| <b>Surveillance and Evaluation</b>                                   | \$1,800                     | 1.62                       | \$1,116                        | \$2,916                    |
| <b>Administration and Management</b>                                 | \$600                       | 1.32                       | \$192                          | \$792                      |
| <b>Other - Out-of-State Vendors</b>                                  | \$100                       | 1.32                       | \$32                           | \$132                      |
| <b>Totals</b>  | <b><u>\$21,800</u></b>      |                            | <b><u>\$15,721</u></b>         | <b><u>\$37,521</u></b>     |

SOURCE: Labor income data provided by Florida Department of Health, Bureau of Tobacco Prevention Program, and its contractors and grantees, except the advertising and counter-marketing component; Labor income for the advertising and counter-marketing component were estimated from the economic impact model; Labor income multipliers from IMPLAN.

### *Expenditures Impact*

The economic impact of total expenditures on the State of Florida is measured using output multipliers. The total expenditures impact on the State of Florida for FY 2009-2010 is presented in **Table 4**. The Bureau expenditures in the State of Florida are presented in the first column. Note that only \$200,000 of the other – out-of-state vendors’ expenditures are being spent in the State of Florida. The other – out-of-state vendors were chosen through Florida’s legally-required competitive procurement process; selected vendors were either the only vendor responding to the competitive solicitation or chosen as the vendor best able to provide the services. For FY 2009-2010, total direct program expenditures in the State of Florida will be \$49.5 million. The advertising and counter-marketing component will have \$20.6 million in program expenditures. The output multiplier for this component is 2.03. This means that for every dollar expended in the component, another \$1.03 are expended in other businesses and industries in the State of Florida, due to the spending from the advertising and counter-marketing activities and the spending of its employees. The total secondary expenditures impact is \$21.2 million, resulting in total expenditures impact of \$41.8 million for the advertising and counter-marketing component. The output multipliers for the other components were derived from IMPLAN and the multipliers were applied to the direct expenditures for the other components.

*In FY 2009-2010, the Bureau will generate \$49.5 million in total direct program expenditures, with \$46.1 million in secondary expenditures impact and \$95.6 in total expenditures impact on the economy of the State of Florida.*

**Table 4**  
**Expenditures Impact**  
**of Florida Department of Health, Bureau of Tobacco Prevention Program, FY 2009-2010**

| Expenditure<br>Component   | Direct<br>Expenditures<br>(\$000) | Output<br>Multiplier | Secondary<br>Expenditures<br>(\$000) | Total<br>Expenditures<br>(\$000) |
|--|-----------------------------------|----------------------|--------------------------------------|----------------------------------|
| <b>Advertising and Counter Marketing</b>                                 | \$20,600                          | 2.03                 | \$21,218                             | \$41,818                         |
| <b>Area Health Education Centers</b>                                     | \$10,000                          | 1.96                 | \$9,600                              | \$19,600                         |
| <b>Private Non-Profits, For Profits or County Health<br/>Departments</b> | \$10,900                          | 1.80                 | \$8,720                              | \$19,620                         |
| <b>Hospitals</b>   | \$3,000                           | 2.02                 | \$3,060                              | \$6,060                          |
| <b>Surveillance and Evaluation</b>                                       | \$2,000                           | 1.91                 | \$1,820                              | \$3,820                          |
| <b>Administration and Management</b>                                     | \$2,800                           | 1.55                 | \$1,540                              | \$4,340                          |
| <b>Other - Out-of-State Vendors*</b>                                     | \$200                             | 1.55                 | \$110                                | \$310                            |
| Totals   | <b><u>\$49,500</u></b>            |                      | <b><u>\$46,068</u></b>               | <b><u>\$95,568</u></b>           |

SOURCE: Expenditure data provided by Florida Department of Health; Output multipliers from IMPLAN.



### ***Impact on Florida's State Sales and Use Taxes***

Although the Florida Department of Health does not pay sales and use taxes, its expenditures generate many dollars worth of taxes in other business and industries from the spending of the Bureau, its contractors and grantees, and the spending of the direct and secondary employment. The main tax paid by these employees is sales and use taxes. Tax data are not directly available; thus, an estimate of sales and use taxes was made using the best estimation procedures. The estimate was derived by calculating the percentage of State sales and use taxes to the total labor income for the State of Florida; the resulting percentage was then multiplied times the total labor income impact of the Bureau. ***During FY 2009-2010, the labor income impact of \$37.5 million will generate an estimated \$2.3 million in State sales and use taxes' impact on the economy of the State of Florida.***

## References

1. Alward, G., Sivertz, E., Olson, D., Wagnor, J., Serf, D., and Lindall, S. Micro IMPLAN Software Manual. Stillwater, MN, University of Minnesota Press. 1989.
2. Doeksen, Gerald A., Johnson, Tom, and Willoughby, Chuck. Measuring the Economic Importance of the Health Sector on a Local Economy: A Brief Literature Review and Procedures to Measure Local Impacts. Southern Rural Development Center. SRDC Pub. No. 202. 1997.
3. McGuire T. On the Relationship Between Infrastructure and Economic Development. Stony Brook: State University of New York. 1986.
4. Miernyk, W.H. The Element of Input-Output Analysis. New York, NY; Random House. 1965.
5. Minnesota IMPLAN Group, Inc. User's Guide, Analysis Guide, Data Guide: IMPLAN Professional Version 2.0 Social Accounting & Impact Analysis Software, 2<sup>nd</sup> Edition. June 2000.
6. Minnesota IMPLAN Group, Inc. User's Guide, Analysis Guide, Data Guide: IMPLAN Professional Version 2.0 Social Accounting & Impact Analysis Software, 3<sup>rd</sup> Edition. February 2004.
7. Siverts, Eric, Charles Palmer, Ken Walters, and Greg Alward. IMPLAN USER'S GUIDE. U.S. Department of Agriculture, Forest Service, Systems Application Unit, Land Management Planning, Fort Collins, Colorado. 1983.
8. Florida Department of Health, Bureau of Tobacco Prevention Program. 2009 Annual Report. <[http://www.doh.state.fl.us/Tobacco/tobacco\\_home.html](http://www.doh.state.fl.us/Tobacco/tobacco_home.html)>. 2010

## APPENDIX A

### **Model and Data Used to Estimate Multipliers**

## **Appendix A**

### **Model and Data Used to Estimate Multipliers**

A computer spreadsheet that uses state IMPLAN multipliers was developed to enable community development specialists to easily measure the secondary benefits of any sector on a state, regional or county economy. The complete methodology with an emphasis on health is presented in Measuring the Economic Importance of the Health Sector on a Local Economy: A Brief Literature Review and Procedures to Measure Local Impacts. [2] This includes an aggregate version, a disaggregate version, and a dynamic version. A brief review of input-output analysis and IMPLAN are presented here.

#### **A Review of Input-Output Analysis**

Input-output (I/O) (Miernyk, 1965) was designed to analyze the transactions among the industries in an economy. These models are largely based on the work of Wassily Leontief (1936). Detailed I/O analysis captures the indirect and induced interrelated circular behavior of the economy. For example, an increase in the demand for Bureau services requires more equipment, more labor, and more supplies, which, in turn, requires more labor to produce the supplies, etc. By simultaneously accounting for structural interaction between sectors and industries, I/O analysis gives expression to the general economic equilibrium system. The analysis utilizes assumptions based on linear and fixed coefficients and limited substitutions among inputs and outputs. The analysis also assumes that average and marginal I/O coefficients are equal.

Nonetheless, the framework has been widely accepted and used. I/O analysis is useful when carefully executed and interpreted in defining the structure of a region or state, the interdependencies among industries, and forecasting economic outcomes.

The I/O model coefficients describe the structural interdependence of an economy. From the coefficients, various predictive devices can be computed, which can be useful in analyzing economic changes in a state, a region or a county. Multipliers indicate the relationship between some observed change in the economy and the total change in economic activity created throughout the state's economy.

### **MicroIMPLAN**

MicroIMPLAN is a computer program developed by the United States Forest Service (Alward, et al., 1989) to construct I/O accounts and models. Typically, the complexity of I/O modeling has hindered practitioners from constructing models specific to a community requesting an analysis. Too often, inappropriate U.S. multipliers have been used to estimate local economic impacts. In contrast, IMPLAN can construct a model for any county, region, state, or zip code area in the United States by using available state, county, and zip code level data. Impact analysis can be performed once a regional I/O model is constructed.

Five different sets of multipliers are estimated by IMPLAN, corresponding to five measures of regional economic activity. These are: total industry output, personal income, total income, value added, and employment. Two types of multipliers are generated. Type I multipliers measure the impact in terms of direct and indirect effects. Direct impacts are the changes in the activities of the focus industry or firm, such as the closing of a hospital. The focus business changes its purchases of inputs as a result of the direct impacts. This produces indirect impacts in other business sectors. However, the total impact of a change in the economy consists of direct, indirect, and induced changes. Both the direct and indirect impacts change the flow of dollars to the state, region, or county's households. Subsequently, the households alter their consumption accordingly. The effect of the changes in household consumption on businesses in a

community is referred to as an induced effect. To measure the total impact, a Type II multiplier is used. The Type II multiplier compares direct, indirect, and induced effects with the direct effects generated by a change in final demand (the sum of direct, indirect, and induced divided by direct).

**Minnesota IMPLAN Group, Inc. (MIG)**

Dr. Wilbur Maki at the University of Minnesota utilized the input/output model and database work from the U. S. Forest Service's Land Management Planning Unit in Fort Collins to further develop the methodology and to expand the data sources. Scott Lindall and Doug Olson joined the University of Minnesota in 1984 and worked with Maki and the model.

As an outgrowth of their work with the University of Minnesota, Lindall and Olson entered into a technology transfer agreement with the University of Minnesota that allowed them to form MIG. At first, MIG focused on database development and provided data that could be used in the Forest Service version of the software. In 1995, MIG took on the task of writing a new version of the IMPLAN software from scratch. This new version extended the previous Forest Service version by creating an entirely new modeling system that included creating Social Accounting Matrices (SAMs) – an extension of input-output accounts, and resulting SAM multipliers. Version 2 of the new IMPLAN software became available in May of 1999. For more information about Minnesota IMPLAN Group, Inc., please contact Scott Lindall or Doug Olson by phone at 651-439-4421 or by email at [info@implan.com](mailto:info@implan.com) or review their website at [www.implan.com](http://www.implan.com).