ECONOMIC IMPACTS OF MEDICAID EXPANSION

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INTRODUCTION

This report was prepared for the Kentucky Cabinet for Health and Family Services on the basis of their estimates of program eligibility, enrollment and expenditures by gender and age cohort based on current participants. From that information we estimated economic impacts to the Commonwealth of Medicaid expansion to 133% of the federal poverty line (US Census Bureau) for the period 2014-2020.

ASSUMPTIONS AND PROCESS

Under the Affordable Care Act, the federal government would pay 100% of the cost of Medicaid expansion for the first three years after implementation, 95% in 2017, 94% in 2018, 93% in 2019 and 90% of the cost thereafter. Because the federal share of Medicaid expansion costs varies from state to state based on the extent of coverage currently provided by the state, each state will receive a different match rate. According to a May 2012 study by the Kaiser Commission on Medicaid and the Uninsured, the expansion would cover approximately 61% of the currently uninsured in the Commonwealth of Kentucky. However, not every person eligible would choose to participate in Medicaid.

Using 2010 data in an economic input-output model (IMPLAN, Version 3) customized for Kentucky, we first estimated the private sector effects of total spending for Medicaid expansion. Next, we estimated the tax effects of the increase in payroll attributable to the expansion that would be returned to the Commonwealth in the form of local occupational taxes, and state income and sales taxes.

The dollar value of private sector impacts is shown for six different categories for the period 2014-2020 is shown in Table 1.

Annual Economic Impact of Medicaid Expansion in Kentucky, Calendar Years 2014-2018

Impact Type	Employment	Labor Income	Value Added	Output	Employee Compensation	Payroll Estimate
			CY2014			
Direct Effect	8,384	$529,637,123	$588,421,109	$1,045,695,192	$476,127,521	$394,368,217
Indirect Effect	2,571	$101,198,027	$168,347,943	$276,031,589	$87,351,127	$72,472,281.65
Induced Effect	4,302	$164,918,041	$295,350,244	$488,627,769	$145,219,636	$120,483,830.30
Total Effect	**15,256**	**$795,753,191**	**$1,052,119,296**	**$1,810,354,550**	**$708,698,284**	**$587,324,329**
			CY2015			
Direct Effect	8,740	$562,487,351	$625,307,594	$1,122,336,708	$505,758,609	$418,913,284
Indirect Effect	2,678	$107,545,977	$178,906,465	$295,258,036	$92,836,392	$77,023,560.83
Induced Effect	4,478	$175,163,858	$313,698,794	$517,883,367	$154,241,652	$127,969,657.26
Total Effect	**15,895**	**$845,197,186**	**$1,117,912,854**	**$1,935,478,110**	**$752,836,653**	**$623,906,503**
			CY2016			
Direct Effect	9,012	$590,894,679	$657,303,328	$1,191,453,683	$531,406,715	$440,159,548
Indirect Effect	2,758	$113,051,555	$188,063,576	$312,524,067	$97,595,253	$80,972,203.20
Induced Effect	4,611	$184,027,752	$329,572,405	$543,283,441	$162,046,805	$134,445,953.25
Total Effect	**16,382**	**$887,973,986**	**$1,174,939,310**	**$2,047,261,191**	**$791,048,772**	**$655,577,704**
			CY2017			
Direct Effect	8,775	$586,094,702	$652,382,168	$1,194,164,380	$527,195,845	$436,673,987
Indirect Effect	2,683	$112,206,017	$186,655,543	$312,460,165	$96,871,674	$80,372,225.96
Induced Effect	4,483	$182,550,052	$326,925,381	$538,454,770	$160,745,603	$133,366,972.96
Total Effect	**15,941**	**$880,850,771**	**$1,165,963,092**	**$2,045,079,315**	**$784,813,122**	**$650,413,186**
			CY2018			
Direct Effect	8,866	$603,253,626	$671,918,377	$1,241,931,128	$542,740,401	$449,551,822
Indirect Effect	2,708	$115,565,188	$192,242,160	$324,297,322	$99,778,424	$82,784,259.48
Induced Effect	4,523	$187,911,985	$336,527,312	$554,121,664	$165,467,082	$137,284,888.88
Total Effect	**16,096**	**$906,730,799**	**$1,200,687,848**	**$2,120,350,115**	**$807,985,906**	**$669,620,970**

Annual Economic Impact of Medicaid Expansion in Kentucky, Calendar Years 2019-2020

Impact Type	Employment	Labor Income	Value Added	Output	Employee Compensation	Payroll Estimate
			CY2019			
Direct Effect	9,037	$627,383,856	$698,795,208	$1,291,608,534	$564,450,093	$467,533,958
Indirect Effect	2,760	$120,187,819	$199,931,882	$337,269,266	$103,769,580	$86,095,645.66
Induced Effect	4,610	$195,428,513	$349,988,488	$576,286,657	$172,085,808	$142,776,319.89
Total Effect	**16,407**	**$943,000,189**	**$1,248,715,577**	**$2,205,164,456**	**$840,305,481**	**$696,405,924**
			CY2020			
Direct Effect	9,212	$652,479,264	$726,747,074	$1,343,273,036	$587,028,145	$486,235,356
Indirect Effect	2,813	$124,995,330	$207,929,160	$350,760,057	$107,920,362	$89,539,470.49
Induced Effect	4,699	$203,245,679	$363,988,077	$599,338,238	$178,969,262	$148,487,390.67
Total Effect	**16,723**	**$980,720,273**	**$1,298,664,311**	**$2,293,371,330**	**$873,917,769**	**$724,262,217**
Long-Term Multipliers	1.815	1.503	1.787	1.707	1.489	1.490

Source: Customized IMPLAN (IMpacts for PLANing), version 3, model of Kentucky, using 2010 economic data.

INTERPRETING THE RESULTS

Input-output modeling quantifies interactions between firms, industries and social institutions within a local economy. It produces transactions along with multipliers that capture the indirect and induced effects of direct spending for certain goods or services. Multipliers measure the total impact of the change in one industry on all other industries in the state economy.

Reading along the bottom row of Table 1, for example, the employment multiplier of 1.815 indicates that the creation of 100 new jobs in the medical services sector by direct spending will result in a total of 181 jobs in the Kentucky economy.

Similarly, the labor income multiplier of 1.503 indicates that a $100 in new spending for medical services would produce $150 of final demand (or total purchases of goods and services by consumers, businesses and governments).

Output multipliers estimate the value of the total change in industry production resulting from a $1 increase in output from the sectors involved in Medicaid spending. For every $1 of medical services produced as a result of the expansion of Medicaid, an additional $0.71 of goods and services are produced by business and households that supply the affected medical sectors within the state.

The value added multiplier estimates the indirect and induced value added to the state as a result of the annual spending for Medicaid services. Value added includes employee compensation, indirect business taxes (sales and other excise taxes, property taxes that are shifted to the consumer) and proprietary and other property income. For example, $1 million in new spending would result in $0.8 million in value added.

STATE AND LOCAL TAX EFFECTS

The estimation of annual local and state taxes resulting from Medicaid expansion is shown in Table 2.

Estimation of the tax impacts was achieved by applying effective state and local tax rates to total payroll. Assuming that the structure of each of these taxes remains unchanged over the analysis period 2014-2020, the totals represent the nominal dollars of tax revenue attributable to Medicaid expansion over the period.

Table 2. Estimated Annual Local and State Tax Revenues Resulting from Medicaid Expansion				
	Local Occupational Taxes	State Income Taxes	State Sales Taxes	Totals
CY 2014	$9,753,912	$24,298,734	$23,823,809	$57,876,455
CY 2015	$10,361,304	$25,811,855	$25,307,357	$61,480,516
CY 2016	$10,887,121	$27,121,760	$26,591,659	$64,600,540
CY 2017	$10,801,203	$26,907,722	$26,381,804	$64,090,728
CY 2018	$11,120,022	$27,701,957	$27,160,515	$65,982,494
CY 2019	$11,564,825	$28,810,040	$28,246,941	$68,621,805
CY 2020	$12,027,418	$29,962,444	$29,376,821	$71,366,683
Totals	$76,515,805	$190,614,510	$186,888,906	$454,019,221
Note: The tax figures include the indirect and induced economic impacts of Medicaid expansion.				

LIMITATIONS OF THE ANALYSIS

In the technical appendix to this memorandum we discuss the theory, use and limitations of economic impact analysis using input-output models at some length. In conclusion, it is useful to reiterate some limitations common to all input-output modeling and comment on their applicability to this analysis.

A state economy is complex and dynamic. Without simplifying assumptions it would be impossible to create input-output models and use their results for decision making. Those simplifying assumptions have consequences that should be understood by decision makers.

First, the model is static in that it measures the flow of inputs and outputs at one point in time. If the model were not static we could not describe the economy prior to the change, introduce the change and evaluate the results of the change on the economy. Economists call this type of analysis “partial equilibrium” analysis.

Partial equilibrium analysis lets us compare the economy before and after the change but it does not tell us how the economy moves from one equilibrium position to the next. We fully expect that there will be changes in wage rates, input prices, property values, labor and capital productivity over the study period of this model. Moreover, we expect that there will be future

changes in population due to in-and out-migration and changes in the economy as businesses enter and leave the state. Because the model cannot predict those changes and incorporate them, the decision maker should have more confidence in the accuracy of near term estimates than longer term estimates. The implications of fixed factor and other assumptions for in-output modeling are discussed in more detail in the technical appendix.

Input-output modeling requires some judgment on the part of the user as to the sectors affected by direct impacts. Our general approach is to opt for the more conservative scenario such that when we err, it will be in the underestimation of impacts rather than overestimation of impacts. Further, CHFS staff made some assumptions regarding participation rates, capitation fees and other facts based on their experience with the existing Medicaid program providers. We believe these assumptions are reasonable and appropriate, but acknowledge that a different set of assumptions would have yielded different results.

We appreciate the opportunity to conduct this analysis on behalf of CHFS and hope you find the results helpful in your deliberations.

TECHNICAL APPENDIX

Input-Output Modeling

In late 1930s while a professor at Harvard, Wassily Leontief calculated an input-output table for the American economy. By the time he was awarded the Nobel Prize for this work in 1973, economists had refined the matrix model of interdependencies between industries in a national economy. An input-output model begins with a transactions table that provides a reasonably comprehensive description of an economy and linkages between economic sectors. With the advent of computers, the large tables of data that describe the interconnectedness of these sectors (industries, households and governments) could be used by researchers to track the flow of money throughout the economy. Excellent secondary economic data from government agencies (Bureau of Economic Analysis, Bureau of Labor Statistics, and US Census Bureau) combined with economic impact modeling software results in products that can be used by most desktop computers.

Input-output models provide a comprehensive representation of an economy, but are not absolutely precise because the economy itself is dynamic. Additionally, the equations used to estimate some inputs have statistical error associated with them. An input-output model assumes that the economy is in equilibrium – that is, supply equals demand (or inputs equal outputs). One way to conceptualize this is to think of double-entry accounting in a rectangular spreadsheet. The economist "shocks" the equilibrium in some way and traces the impacts from one sector to another until equilibrium is reestablished.

Continuing the spreadsheet analogy, consider a very large spreadsheet (too large for desktop computing) where the columns are "buyers," i.e., industries, households and governments that make purchases. Some purchases are made within the state; others are imported from outside the state. The columns represent economic demand. The rows of the spreadsheet are "sellers." Sellers include industries selling to other industries, households and governments both inside and outside the economy. Households are sellers because they sell labor to firms and governments.

Economists use input output models to describe an economy, to forecast impacts of events or policy changes or to do scenario assessments for certain structural changes in the economy. For example, researchers can evaluate the relative importance of various industry sectors to the local economy. Forecasting requires manipulation of the economic data using matrix algebra. This manipulation produces multipliers that allow researchers to estimate the effect a change in

one sector of the economy has on the economy as a whole. Some researchers use input-output analysis to estimate the impacts of climate change or land use or energy alternatives on the economy.

Assumptions of Input-Output Modeling

An economy is complex and dynamic. Without simplifying assumptions it would be impossible to create input-output models and use their results for decision making. Those simplifying assumptions do have consequences that should be understood by decision makers.

First, the model is static in that it measures the flow of inputs and outputs at one point in time. If the model were not static we could not describe the economy prior to the change, introduce the change and evaluate the results of the change on the economy. Economists call this type of analysis "partial equilibrium" analysis. Partial equilibrium analysis lets us compare the economy before and after the change but it does not tell us how the economy moves from one equilibrium position to the next.

IMPLAN (Impacts for PLANning)

The input-output modeling system used in this study is IMPLAN (IMpact for Planning), originally developed by the USDA Forest Service. The Forest Service made IMPLAN widely available because it was developed using public funds. Later, an investment by the USDA Cooperative Extension Service made the IMPLAN modeling system available throughout the Land Grant University System. Users of IMPLAN made increasing demands on the capability of the software and recommended improvements over time. Two researchers from the University of Minnesota entered into a technology transfer agreement with the Forest Service to privatize IMPLAN in 1993. In 1995 the Minnesota IMPLAN Group (MIG) wrote a new version of IMPLAN and included the Social Accounting Matrices and the SAM multipliers. Version 3 of IMPLAN (used in this analysis) was released in November of 2009.

The University of Louisville purchased the software and the data used in this analysis from the Minnesota IMPLAN Group in 2010. The data consist of economic sectors in the Commonwealth of Kentucky and all its counties.

Where the Data Come From

The IMPLAN software uses publicly available data in the input-output model. The employment data comes from the Census of Employment and Wages (CEW) from the Bureau of Labor Statistics. When CEW suppresses for privacy, IMPLAN uses the US Census Bureau's County Business Patterns (CPB) to adjust for the suppressed data.

Value added data also come from the CEW and CPB, however income data have to be derived from state level income-per-worker ratios and adjusted to the Bureau of Economic Analysis's Regional Economic Accounts (REA). REA data are expanded to separate income of workers from proprietor's income.

Output data come from the BEA's annual input-output accounts and the US Census Bureau's Annual Survey of Manufacturers. Institutions data come from the BEA Personal Consumption Expenditures and BLS Consumer Expenditure Survey (households), the Census Bureau's Annual Survey of State and Local Government Finances (governments), the Census Bureau's Annual Survey of Manufacturers (inventory), the Department of Commerce (imports and exports) and the BEA Income and Produce Accounts (capital).

Inputs into the IMPLAN Software

The scenario that produced the estimates for the annual economic impact of Medicaid expansion in Kentucky was relatively straight-forward. First, CHFS identified the eligible participants in Medicaid expansion based on the income threshold under the Affordable Care Act (133% of federal poverty line) according to the 2010 Census for each county in Kentucky.

Based on their experience and research, CHFS staff estimated a participation rate for eligible participants. Not everyone who is currently eligible to participate in Medicaid chooses to do so. We should expect some proportion of the newly eligible to decline coverage as well. Estimation of the participation rate changed over the time period of the analysis and varied county-by county based on the current participation in Medicaid coverage.

Then CHFS staff identified the range services rendered to current Medicaid participants by and provided the dollar reimbursement value of those services. From that report, we identified the IMPLAN sectors that would be impacted by increased demand resulting from Medicaid expansion.

IMPLAN Sector #	IMPLAN description	2007 NAICS
394	Offices of physicians, dentists, and other health practitioners	6211-3
395	Home health care services	6216
396	Medical and diagnostic labs and outpatient and other ambulatory care services	6214-5, 6219
397	Hospitals	622
398	Nursing and residential care facilities	623
325	Retail - Health and personal care*	446
363	General and consumer goods rental except video tapes and discs*	53221-2, 53229, 5323

*Denotes that a fraction of activity in the sector was included in the analysis.

The "shock" or change to the economic equilibrium was the estimated distribution of current expenditures on Medicaid, multiplied by the total spending associated with expansion.

IMPLAN returned impacts across a number of sectors. The ten sectors most affected were:

Sector	Description
394	Offices of physicians, dentists, and other health practitioners
397	Private hospitals
396	Medical and diagnostic labs and outpatient and other ambulatory care services
325	Retail Stores - Health and personal care
319	Wholesale trade businesses
382	Employment services
413	Food services and drinking places
355	Nondepository credit intermediation and related activities
395	Home health care services
398	Nursing and residential care facilities

IMPLAN calculates the impacts for employment, labor income, value added, output and employee compensation. We calculated the payroll estimate from the employee compensation calculation.

Employment	Number of jobs (full and part-time) gained or lost by the increased demand for medical services
Labor Income	Total payment to workers (does not include business owners).
Value Added	The economy's total output minus intermediate inputs (consumption of goods and services) purchased from other industries or imported.
Output	The value of production from the affected sectors (for this analysis, sales or business revenues).
Employee Compensation	Total payroll cost of the employee paid by the employer (wages, fringes and payroll taxes).

Each of the impacts represents changes in economic activity as a result of an initial change in demand for medical services. The impacts that are directly attributable to the change in demand are identified as direct effects. For example, the increased demand associated with Medicaid expansion would result in 8,152 full and part time jobs in direct services. Additionally, some jobs will be created as a result of multiplier effects.

Impact Types

Returning once again to the spreadsheet analogy for the input-output model, when we increase the "buyer" columns across the top of the spreadsheet as a result of increased demand, it triggers changes throughout the spreadsheet. The first "round" of changes is the direct effects as a result of the increased demand. For example, roughly 8000 new jobs should be created in 2014 in the affected economic sectors (hospitals, physicians' offices, etc.) as a result of increased spending for medical services under Medicaid expansion.

But the effect does not stop there. The hospitals and physicians offices will need to purchase more goods and services from other industries in order to accommodate the increased demand. Examples might include medical supplies and equipment and skilled nurses. These are called ***indirect effects***. Some purchases will come from within the state's economy and some from outside. Once the spending leaves the state economy it is lost, but spending inside the economy is re-spent on more inventory or new hires. Again, some dollars are lost to exports but others stay in the state to be spent again. It may be helpful to think of this as a spending cycle, where each round of spending "leaks" dollars out of the state economy until the cycle stops. We estimate that 2500 jobs will be created as Kentucky industries supply the goods and services needed to support the providers of medical services.

Induced effects are created when workers hired by the service provider spend their income. Induced effects work just like indirect effects in that the earner spends a portion of his/her

earnings in the state and a portion outside the state. The cycle of spending continues until all the dollars of income leak out of the state economy. We estimate that more than 4000 jobs will be created as a result of induced effects from the increased demand for medical services.

Comparing the indirect and induced effects can be very useful. The medical services industry is quite labor intensive (as compared, say, to some types of manufacturing which are quite capital intensive). Industries that are more labor-intensive will tend to have larger induced effects and smaller indirect effects. Moreover, the wages and salaries for medical services workers are typically higher than the average wage and salary. Industries that pay higher wages and salaries will also tend to have larger induced effects. Contrasting induced and indirect effects can provide a better understanding of the relationship of the industry to the state's economy.

Economic Multipliers

Economic impact multipliers allow researchers to follow the initial change in economic activity as it "ripples" through each industry sector, summarizing the total impact that can be expected from a change in any given economic activity. The three types of economic impacts – direct, indirect and induced – have just been described. The long term multiplier (reported in the last row of Table 1) captures these ripple effects and reports them as a ratio of total change to initial change. They can be interpreted this way:

The ***employment multiplier*** measures the total change in employment resulting from a one-unit change in the labor force of a particular sector. For example, 100 new medical service workers would result in 180 new jobs in the state economy (100 in medical services and 80 in related sectors).

The ***income multiplier*** measures the total change in income in the state resulting from a $1 unit change in final demand in a sector. For example, $1 million in new spending for Medicaid expansion would result in $1.5 million in final demand (or total purchases of goods and services by consumers, businesses and governments).

The ***value added multiplier*** estimates the indirect and induced value added to the state as a result of the annual spending for Medicaid services. Value added includes employee compensation, indirect business taxes (sales and other excise taxes, property taxes that are shifted to the consumer) and proprietary and other property income. For example, $1 million in new spending would result in $0.8 million in value added.

The ***output multiplier*** estimates the value of the total change in industry production resulting from a $1 increase in output from the sectors involved in Medicaid spending. The output multiplier helps the researcher understand the interdependence of sectors in the state. If most of the services and supplies associated with the increase in Medicaid spending were purchased outside Kentucky, the multiplier would be lower. In this case, for every $1 of medical services produced as a result of the expansion of Medicaid, an additional $0.71 of output is produced by industries that supply the affected medical sectors within the state.

One sometimes hears "multiplier" used interchangeably - and incorrectly - with "turnover." Turnover refers to the number of times a dollar received from outside the state changes hands within the state. A multiplier refers to how much of each dollar turns over in the community. As described earlier, during each exchange of money for goods and services, some of the original dollar leaks out of the state economy and the rest cycles for another exchange. Turnover simply counts the number of rounds in the cycle while a multiplier measures the impact of a dollar on the local economy.

Limitations of Input-Output Modeling

Input-output modeling has grown in popularity for three reasons. First, the expanded capabilities of desktop computing puts modeling software in the hands of everyone who can afford to purchase it. Second, government data collection efforts have expanded and become more sophisticated. Third, policy makers demand information driven decisions, especially when the state's economy is impacted.

IMPLAN and other static input-output models assume constant returns to scale. That is, if the demand for medical services doubled as a result of increased Medicaid spending, all of the inputs into medical services would double. In fact, production relationships are not fixed, and exhibit economies and diseconomies of scale that vary with the level of output, especially over time.

Input-output models like IMPLAN do not allow changing input prices to affect production decisions; rather, they assume that changes in an economy will change the output of industries but not the mix of inputs that they use. In reality, an increase in the demand for medical services in the state might cause the wages of some medical workers to rise, which might lead to development of technologies that make some tasks less labor intensive. Moreover, input-output models assume the supply of inputs is unlimited and can be acquired at current prices.

Finally, time is a factor in input-output modeling. Indirect and induced effects take time to filter throughout the economy. Researchers use economic multipliers as a mathematical short cut for providing an estimate of final impacts. We may expect that 1000 new jobs created by demand for medical services under Medicaid will result in 1800 new jobs in the state economy, but we do not know how quickly.

Even if assumptions about Medicaid eligibility and participation rates are relatively accurate, changes in the Medicaid eligible population due to in-and out-migration is likely, especially as the time horizon lengthens. From a practical standpoint, input-output models constructed with the most current data available will produce reliable results in the short run. Decision makers should therefore have more confidence in the accuracy of near term estimates than longer term estimates.